EXECUTIVE CHAMBERS
HONOLULU

BENJAMIN J. CAYETANO
GOVERNOR

May 22, 1996

Mr. Eugene S. Imai
Senior Vice President for Administration
University of Hawaii
2444 Dole Street
Bachman Hall
Honolulu, Hawaii 96822

Dear Mr. Imai:

With this letter, I accept the Final Environmental Impact Statement for the Hawaii Institute of Marine Biology Marine Laboratory and Support Facilities, Kaneohe, the Island of Oahu, as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. The economic, social and environmental impacts which will likely occur should this project be implemented are adequately described in the statement. The analysis, together with the comments made by reviewers, provides useful information to policy makers and the public.

My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws but does not constitute an endorsement of the proposed action.

I find that the mitigation measures proposed in the environmental impact statement will minimize the negative impacts of the project. Therefore, if this project is implemented, the Hawaii Institute of Marine Biology and/or its agents should perform these or alternative and at least equally effective mitigation measures at the discretion of the permitting agencies. The mitigation measures identified in the environmental impact statement are listed in the enclosed document.

With warmest personal regards,

Aloha,

Benjamin J. Cayetano

BENJAMIN J. CAYETANO

Enclosure

c: Lawrence Miike
Office of Environmental Quality Control

1996 - Oahu - FEIS -
HIMB Marine Lab

FILE COPY

FINAL ENVIRONMENTAL IMPACT STATEMENT

MARINE LABORATORY AND SUPPORT FACILITIES
HAWAII INSTITUTE OF MARINE BIOLOGY

This document was prepared pursuant to Chapter 343, Hawaii Revised Statutes

Petitioner:

Hawaii Institute of Marine Biology
School of Ocean and Earth Science and Technology
University of Hawaii at Manoa

Prepared by:

Belt Collins Hawaii
680 Ala Moana Boulevard
Honolulu, Hawaii 96813

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Prepared by:

Belt Collins Hawaii
680 Ala Moana Boulevard
Honolulu, Hawaii 96813

Submitted by:

Eugene S. Imai
Senior Vice President for Administration,
University of Hawaii

2/22/96
Date

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CHAPTER ONE
INTRODUCTION AND SUMMARY

This Environmental Impact Statement (EIS) is being prepared in compliance with Hawaii Revised Statutes (HRS) Chapter 343 for expansion proposed by the Hawaii Institute of Marine Biology, School of Ocean and Earth Science and Technology, University of Hawaii at Manoa (UH) relating to its facility on Moku O Loe (Coconut Island), Kaneohe Bay.

This introductory chapter provides a statement of purpose and objectives for the proposed action, an overview of the proposed action, and a summary of the major considerations, potential impacts, and mitigation measures required in connection with the proposed action. Subsequent chapters cover the material in greater detail.

1.1 ACCEPTING AUTHORITY

The Governor of the State of Hawaii is the accepting authority for the Environmental Impact Statement. The Office of Environmental Quality Control (OEQC) will provide a recommendation to the Governor regarding the acceptability of the final EIS.

1.2 PURPOSE OF DOCUMENT

This EIS is an informational document prepared in compliance with rules adopted under HRS Section 343-6 and is intended to disclose information on the proposed action and the environmental effects of the proposed action. Environmental effects refer to both natural and human environments, including socioeconomic impacts. Alternatives to the proposed action and measures to minimize adverse effects will be discussed.

The initial EIS filed for public review is called the Draft Environmental Impact Statement (DEIS). This document is open for public review and comment. Responses to the comments will be incorporated into the final Environmental Impact Statement that will be evaluated for acceptability by the accepting authority.

1.3 STATEMENT OF OBJECTIVES

The Hawaii Institute of Marine Biology (HIMB) is engaged in ocean science and technology studies, with a special focus on two aspects of near-shore tropical marine biology—biodiversity and biotechnology. HIMB's mixture of basic and applied research

makes it a unique resource for solving the global problems of food production and environmental protection.

The existing facilities, located on Coconut Island in the southern portion of Kaneohe Bay (Figure 1-1), serve as the aquaculture research center for HIMB. Other facilities are found at Hakipu'u on the northern shore of Kaneohe Bay, about eight miles from Lilipuna Road Pier on Pohakea Point. Over the years, gradual increases in research and educational needs have resulted in a shortage of laboratory facilities. In addition, as the research at HIMB has expanded, support facilities to handle the maintenance and repair of equipment have not kept pace.

HIMB is proposing an expansion of its existing facilities to meet the demands and maintain its role as a world leader in research and education in aquaculture and marine biotechnology. It is the objective of HIMB to expand, as well as to consolidate and replace, existing facilities while minimizing any possible impacts the proposed project might have on the surrounding environment.

1.4 GENERAL BACKGROUND INFORMATION

Coconut Island is a 28.8-acre island in Kaneohe Bay, along the east shore of Oahu (see Figure 1-1). 16.3 acres of the island (6.15 of which are underwater) are owned by the State and leased to HIMB from the State Department of Land and Natural Resources. The remainder of the island, 12.5 acres, was purchased in August 1995 by the University of Hawaii Foundation from Hachidai, USA, Inc. (Figure 1-2). This former private land is now being leased to the University of Hawaii, which is a separate entity from the UH Foundation. A 1.4-acre property on Lilipuna Road (Figure 1-3) was included in the purchase and it, too, is being leased to the University of Hawaii.

The main HIMB facilities are on the southern portion of Coconut Island. They consist of 18 primary buildings that house research laboratories, classrooms and offices, three houses and living quarters, and four maintenance/support operations buildings. Several boat moorings, two boat landings, and a pier provide access and parking for marine vessels at the island (Figure 1-4).

HIMB's daytime population consists of researchers, students, staff members, and visitors, averaging approximately 81 people. HIMB's primary focus is research, but there are also administration and maintenance operations on the island, both of which serve as support services for HIMB research.

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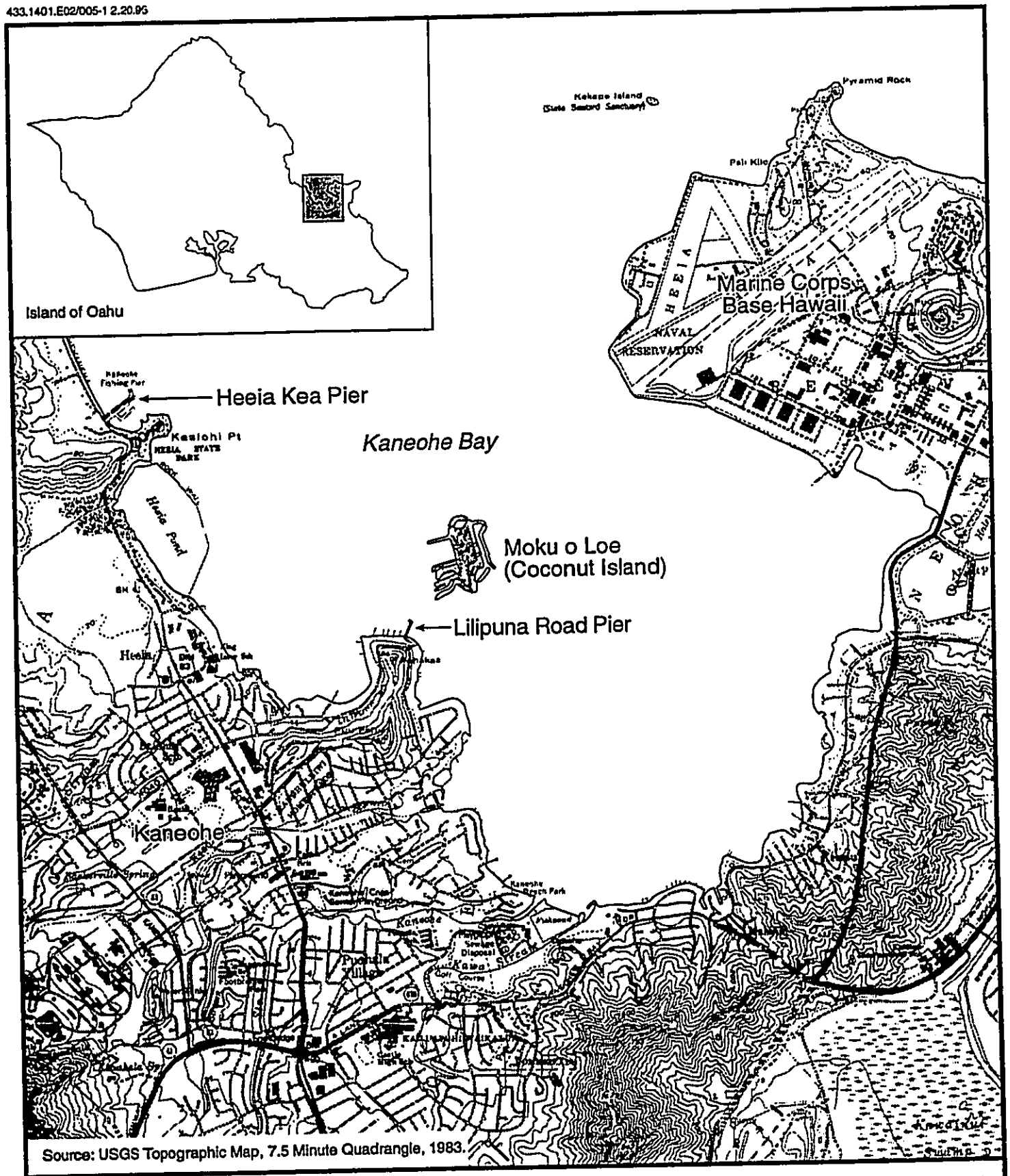


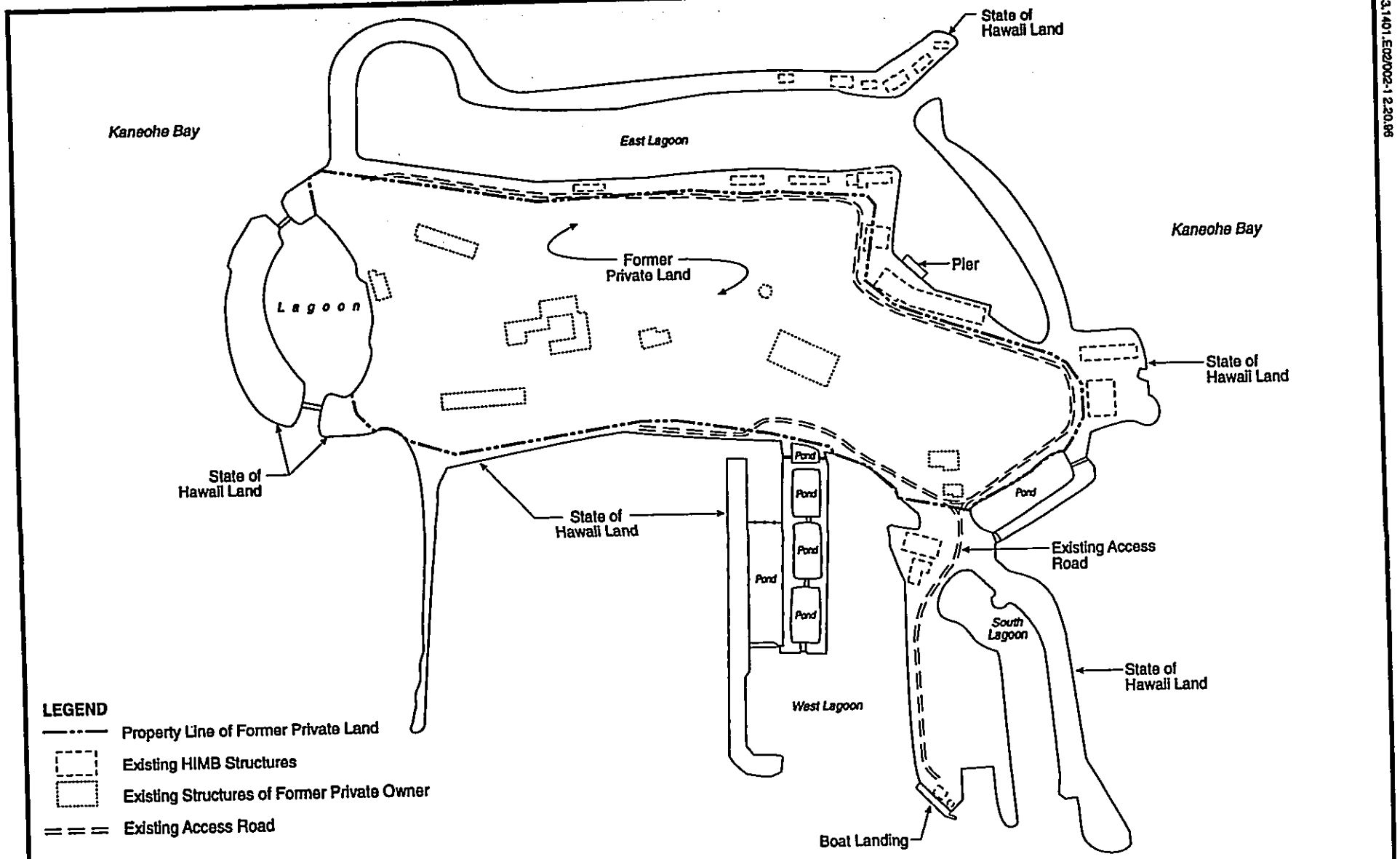
ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 1-1
LOCATION MAP

0 1500 3000
Scale in Feet

North



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Hawaii Institute of Marine Biology

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FIGURE 1-2
MOKU O LOE (COCONUT ISLAND)

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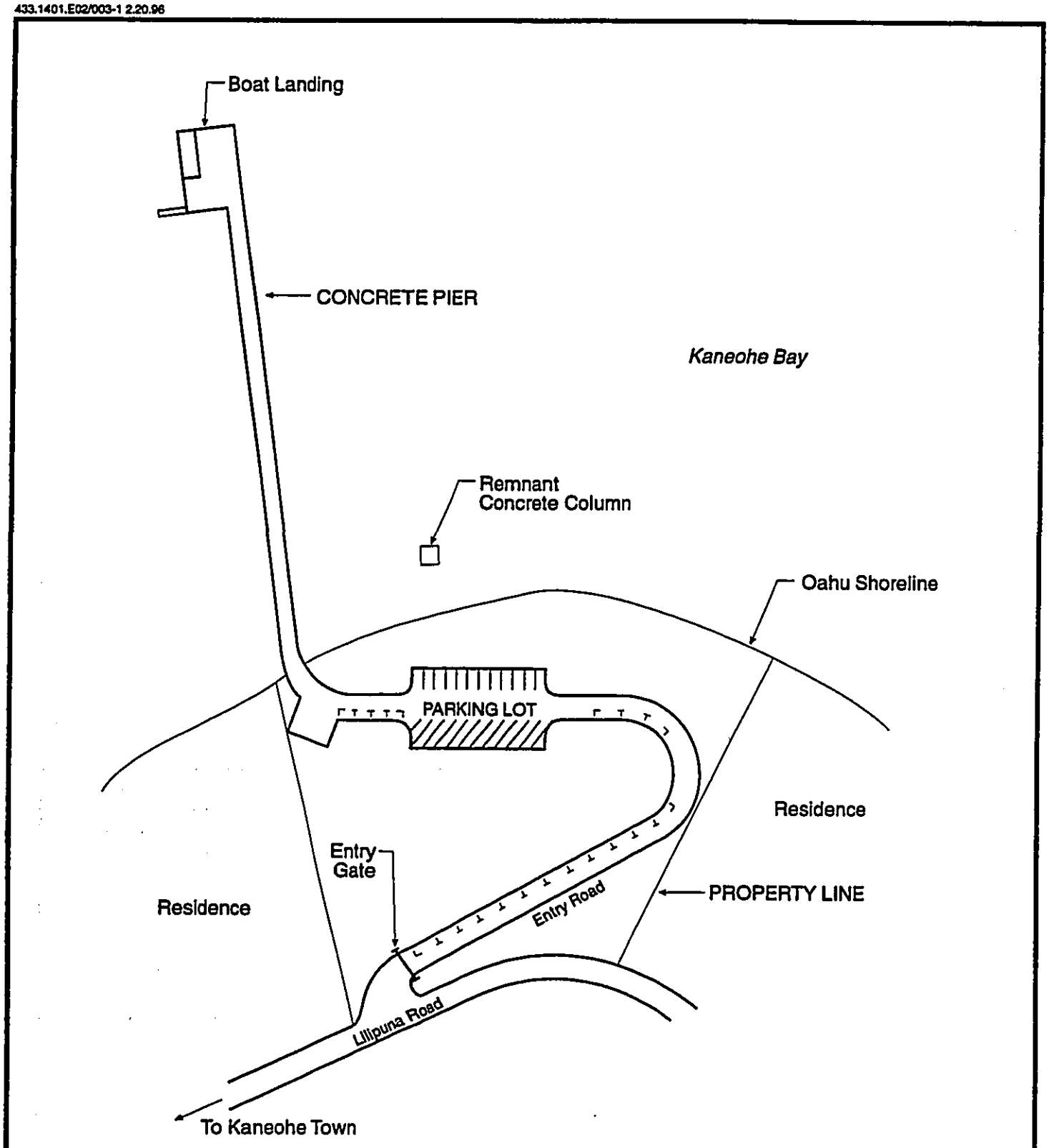

Source: Hawaii Institute of Marine Biology

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

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FIGURE 1-3
LILIPUNA ROAD PIER

0 50 100
Scale in Feet

North

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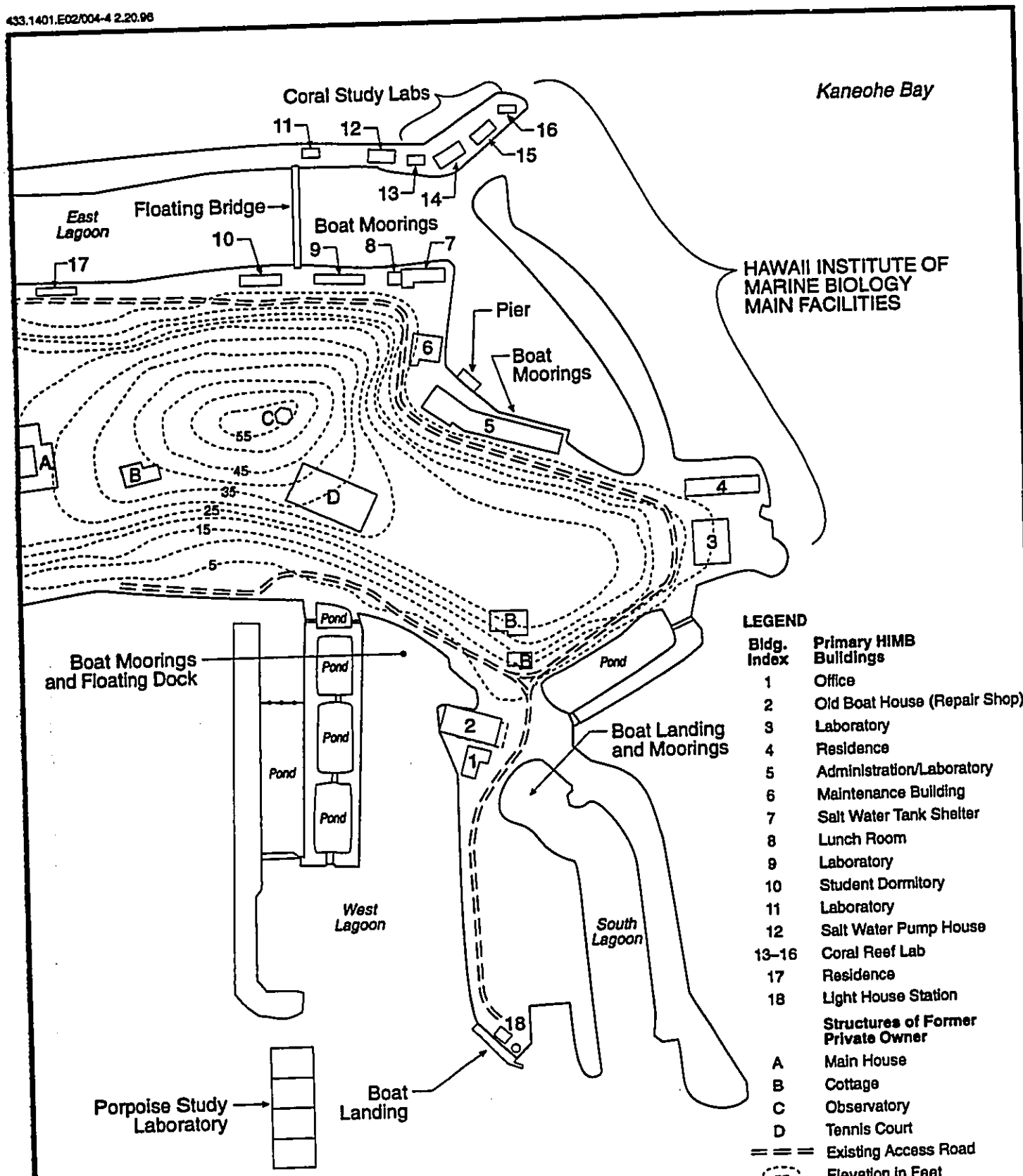

LEGEND

Bldg. Index	Primary HIMB Buildings
1	Office
2	Old Boat House (Repair Shop)
3	Laboratory
4	Residence
5	Administration/Laboratory
6	Maintenance Building
7	Salt Water Tank Shelter
8	Lunch Room
9	Laboratory
10	Student Dormitory
11	Laboratory
12	Salt Water Pump House
13–16	Coral Reef Lab
17	Residence
18	Light House Station
	Structures of Former Private Owner
A	Main House
B	Cottage
C	Observatory
D	Tennis Court
= = =	Existing Access Road
(55)	Elevation in Feet

Source of Base Map: TRW-Redl Tax Map 4-6-01, 1993, HIMB

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 1-4
EXISTING LAND USE

0 100 200
Scale in Feet

North

1.5 GENERAL DESCRIPTION OF THE PROPOSED ACTION

The proposed action consists of three components (Figure 1-5). For each component, short-term construction-related impacts and long-term operational considerations exist.

1) Demolition of three (3) existing buildings. This includes removal of an existing saltwater tank shelter, a lunch room, and a maintenance building to make way for the proposed improvements.

2) Construction of a new marine laboratory facility with a total floor area of approximately 21,000 square feet. The facility will consist of three buildings, two of which will be on a hill behind an existing administration/ laboratory building, and a third that will be on a lagoon on the east side of the island.

3) Construction of a new maintenance building on the west side of the island near an old boat repair house. In the Draft EIS, the site of the old boat house was the original location of the proposed maintenance facility. Since receiving public comments on the Draft EIS and after further environmental consideration, HIMB is now proposing the new site to be approximately 200 feet west of the original location.

Details of the proposed action are given in Section 2 of this EIS.

1.6 SUMMARY OF THE ALTERNATIVES CONSIDERED

Different alternatives to the proposed action were considered, including taking no action. Alternative development schemes identified different building locations, project sizes, building and seawall design, and construction methodologies. The no action alternative fails to meet HIMB objectives of providing adequate facilities to meet increasing demand for aquaculture and marine biotechnology research and education. The preferred alternative has minimal environmental impacts, compared with other development schemes, and it is believed that those impacts can be mitigated. A full discussion of the alternatives considered for the proposed action can be found in Chapter 3 of this document.

1.7 SUMMARY OF ANTICIPATED SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Anticipated significant impacts and proposed mitigation are presented below. A full discussion of impacts to the physical and natural environments can be found in

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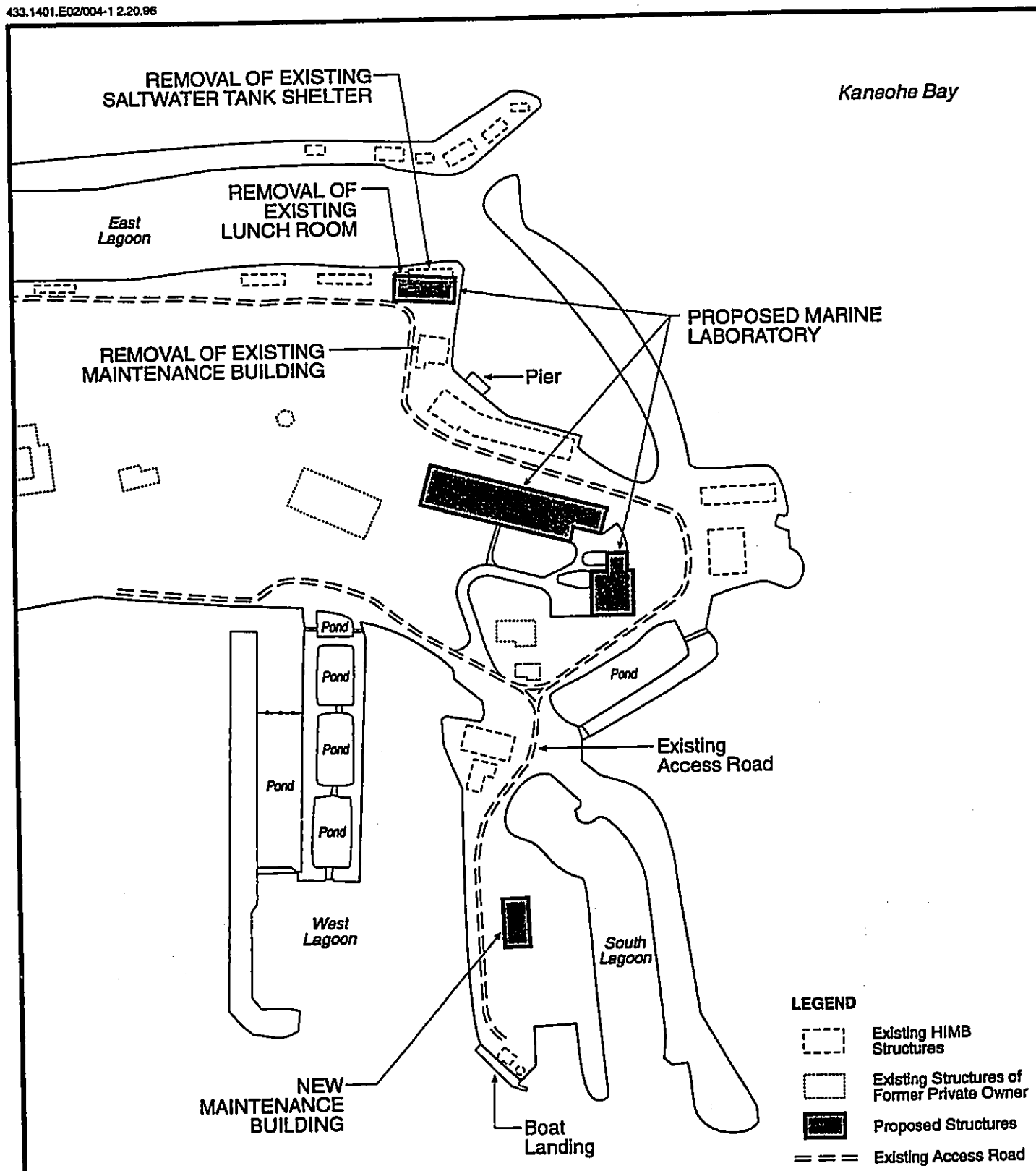

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
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FIGURE 1-5
SITE MAP

0 100 200
Scale in Feet

North

Chapter 4. A full discussion of the socioeconomic impacts can be found in Chapter 5. A full discussion of impacts on infrastructure and public facilities can be found in Chapter 6.

1.7.1 Marine Environment

Analyses of the physical, chemical, and biological environment in marine waters of Coconut Island show that the lagoons surrounding this island have no major environmental degradation. Short-term impacts are expected during construction of the proposed buildings. These impacts, however, will be mitigated by using erosion and sediment control measures. These mitigation measures need to be included in construction specifications.

No significant long-term impacts are expected on the marine environment from operation of the proposed facilities. HIMB will continue to discharge saltwater effluent with varying levels of nutrients into the east lagoon, but operation of the new building will not further affect the water quality or increase the discharge flow.

1.7.2 Air Quality

Short-term air quality impacts include fugitive dust generated by construction activity and the possibility of encountering asbestos-containing materials during construction. Long-term effects include emissions from the use of laboratory chemicals during operation of the new buildings.

Fugitive dust impacts will be mitigated through adherence to the mitigative measures outlined in Section 4.5.3 of this document. If asbestos is found during pre-demolition inspection, asbestos-containing materials will be handled according to existing federal and state regulations for the handling and removal of asbestos. Airborne laboratory emissions during operations will be of small quantity—below the level requiring regulatory permitting—and will be controlled by using laboratory flume hoods equipped with an air pollution control system.

1.7.3 Acoustical Environment

Noise impacts associated with the proposed action will come from operation of equipment during construction and from equipment noise associated with the operation of the new buildings. A permit will be obtained from the Department of Health to allow operation of equipment during construction emitting noise above regulatory limits. Hours that equipment can be operated will be restricted. No mitigation measures will be necessary for the operation phase of the proposed action. Cumulative noise effects from aircraft operations at Marine Corp Base Hawaii Kaneohe Bay (MCBH) require noise mitigation. Noise attenuation will be incorporated into building design.

1.7.4 Socioeconomic

The proposed action will have a beneficial impact on the economy of Oahu. Construction will support up to a total of 49 person-years of direct employment, with an associated income totaling $2.4 million. Construction is also expected to support up to 96 person-years of indirect and induced employment with an estimated total income of $2.6 million. Positive operational impacts will include the hiring of up to ten new employees at HIMB, with a total estimated income of up to $0.4 million, as well as the addition of up to nine induced jobs with an estimated income of $0.2 million.

Impacts on the government would include revenues of approximately $0.6 million in taxes from the construction phase of the project. This will include revenues from excise taxes, corporate income taxes, and personal income taxes. The project may also create spinoffs for Hawaii's aquaculture industry, but definite dollar amounts cannot be predicted.

1.7.5 Marine Transportation

The proposed action will impact the requirements for marine transportation to Coconut Island in three ways—first, for transporting construction personnel, equipment, and material to Coconut Island, second, for removal of demolition and construction debris during the construction phase, and third, for the long-term increase in HIMB staff requiring transportation to the island. Construction impacts will be mitigated by using a newly acquired former military landing craft utility (LCU) for the transport of materials, equipment, and waste materials to and from a staging area on Oahu. The movement of construction personnel to the island can be accommodated by HIMB's existing marine shuttle service. Likewise, the additional long-term staff at HIMB can be accommodated by the same system.

Pending final coordination and approval with the DLNR Division of Boating and Ocean Recreation, Heeia Kea Pier will be used for the staging and mobilizing of construction equipment and materials, and for movement of some workers to Coconut Island. Loading and unloading of the LCU will occur only during specified hours on the weekdays to avoid peak period use of the pier. Use of the staging area will displace some parking stalls and make the boat wash-down area inaccessible to the public. Temporary hose bibs near the staging area will be installed to provide an interim wash-down area.

1.7.6 Ground Transportation

Short-term increases in traffic and parking demand at the Lilipuna Road Pier will occur during construction. The additional number of HIMB employees will increase traffic and parking demand during the operation of the expanded facilities. Parking demands must be met at off-site facilities, or through alternative parking management measures, because the existing parking facility on the Lilipuna Road property is fully used. To address the short-term traffic and parking effects from the construction phase, a ground shuttle service will be used. To accommodate the additional operational staff, a number of alternative parking management programs can be carried out. These include car pooling, shuttle services, assigned parking stalls at the Lilipuna Road pier, and starting a parking fee and fine system.

Heeia Kea Pier will also experience short-term increases in traffic and parking demand during construction. To avoid parking impacts, workers will use the pier only on weekdays when parking demands are less.

1.7.7 Air Transportation

A construction crane on Coconut Island may penetrate approach/departure slopes for aircraft flight paths of MCBH. No permanent structure will pose an obstruction to air navigation. The height of the crane at maximum working extension reaches above the height limit for vertical obstructions under Department of Defense (DOD) regulations. Because the crane is underneath the normal flight path of fixed-wing aircraft into MCBH, it will be marked with a flag during operations, and air traffic control at the base will be notified at the start of construction. A notice of construction activities affecting navigable airspace will also be filed with the Federal Aviation Administration (FAA) more than 30 days before construction begins. When not in use, the crane will be lowered to a position below the approach surface elevation.

1.7.8 Water Supply

The proposed action may add as many as ten new HIMB personnel. Water use from the increased number of personnel and from irrigation of newly landscaped areas will increase the total water use by approximately 2,500 gallons per day (gpd). The existing water source is expected to be adequate to handle the increase in use. However, a water allocation for additional use must be obtained by the State Department of Land and Natural Resources (DLNR) before a building permit can be issued.

1.7.9 Wastewater

A sewer moratorium is currently in place for new projects. The City Department of Wastewater Management (DWM), however, is allowing projects generating no more

than 1,200 gpd (the equivalent of three single-family housing units) in average flow to be connected with the Kaneohe wastewater system. To connect the additional fixtures planned for the proposed project, the average flow into the City system needs to be held nearly constant. Total flow can be kept within the system's capacity if some existing fixtures on the island are retrofitted with low-flow devices and the proposed facilities are also fitted with the same devices. These plans, however, are still unresolved and require approval from the City's Department of Wastewater Management (DWM).

1.7.10 Hazardous Materials and Solid Waste

The proposed action may cause changes in the use of hazardous materials on the island, as well as increases in the amount of solid and hazardous waste to be removed from the island. The construction phase of the proposed action will produce solid waste in the form of construction and demolition debris, and increase the use of petroleum products by construction equipment. The operation phase of the proposed action will increase the use of hazardous materials in laboratory facilities and in the maintenance facilities.

Construction debris will be disposed at permitted landfills after removal from the island by the LCU. The construction company will be required to have a spill prevention plan in place for handling petroleum products and mitigating spills.

Handling and disposal of laboratory chemicals and other hazardous or regulated materials are strictly controlled on Coconut Island by state and federal regulations and by the University of Hawaii's Environmental Health and Safety Office (UHEHSO). These practices will extend to the use of similar materials in the new facilities.

1.7.11 Fire Protection

The proposed action will require on-island fire protection because Coconut Island is inaccessible to fire trucks. Automatic fire sprinkler systems are not planned to be provided in the new facility due to lack of adequate water pressure and volume on the island to provide firefighting service. To mitigate this situation, the building design will incorporate elements such as fireproof material and one-hour fire protected construction walls that will slow and contain the spread of fire. Portable firefighting equipment will also be available on the island. Additional firefighting measures may be required and will be reviewed by the Honolulu Fire Department.

1.8 SUMMARY OF UNRESOLVED ISSUES

The proposed action has four unresolved issues:

- An appropriate central parking and pickup point in Kaneohe for commuting HIMB personnel and construction workers needs to be selected.
- Determination of future use of buildings that may be abandoned when the new marine laboratory facility and maintenance building are constructed.
- Approval to install low-flow wastewater devices in the existing and new facilities to meet moratorium flow limitations must be obtained from the DWM.

1.9 SUMMARY OF COMPATIBILITY WITH LAND USE POLICIES AND PLANS

HIMB's proposed use is consistent with the intent of State and City land use policies for the property. The proposed project is located within the Conservation District as established by the State Land Use Commission. Jurisdiction over land use controls for the property rests with the Department of Land and Natural Resources, State of Hawaii. In conforming with the State's land use designation for the property, the City and County of Honolulu has classified Coconut Island as Preservation on its Development Plan.

A Conservation District Use Permit from the Board of Land and Natural Resources, State of Hawaii and a Special Management Area Use Permit from the City Council, City and County of Honolulu, will be required before construction of the proposed facilities is allowed.

1.10 REQUIRED PERMITS AND APPROVALS

Table 1-1 contains a listing of the land use approvals and permits required for the proposed action. Other approvals and permits pertinent particularly to environmental regulations and construction codes will be required during the project design and construction stage or as part of the review and processing of the listed approvals. These are provided in Table 1-2. Following these mitigation measures is necessary to assure that development adheres to environmental laws and government land use standards.

Table 1-1 Summary of Required Permits and Approvals

PERMIT/APPROVAL	APPROVING AGENCY
STATE OF HAWAII	
Chapter 343, HRS, Environmental Review	Office of Environmental Quality Control
Conservation District Use Permit	Board of Land and Natural Resources
Revocable Permit for Use of State Lands	Board of Land and Natural Resources
Airport Zoning Permit	Department of Transportation
Chapter 6E, HRS, Historic Preservation	Department of Land and Natural Resources
CITY AND COUNTY OF HONOLULU	
Special Management Area Use Permit	Department of Land Utilization/City Council
Shoreline Setback Variance	Department of Land Utilization/City Council

Table 1-2 Summary of Potential Impacts and Mitigation Measures

CATEGORY/ACTIVITY	POTENTIAL IMPACTS	MITIGATION MEASURES (Responsible Party)[1]
Marine Laboratory construction: • Site clearing, grading, stockpiling of materials, use of construction equipment	• Removal of some existing vegetation, including several large trees	• Incorporate as many existing trees as possible into landscape design and replant removed trees (architect) • Incorporate native or Polynesian-introduced species into replanting program (architect)
	• Stormwater runoff into lagoon	• Landscape immediately, using grasses & other ground cover plants to control erosion (contractor) • Use sedimentation basins to collect and settle runoff (contractor) • Use pre-batched concrete. Capture concrete mixer rinse water and re-use or treat
	• Accidental fuel or chemical spills from gas or oil-driven equipment	• Use sedimentation basins, berms, or other containment to protect fuel and lubricant storage areas (contractor) • Maintain construction equipment regularly to reduce faulty operations, spills, and leaks (contractor)
	• Potential petroleum product spills	• Construct consolidated petroleum storage area for oil and diesel fuel (contractor) • Locate firefighting and clean up equipment in this area (contractor) • Keep ground surfaces clean and unpolluted to reduce stormwater contamination (contractor)
	• Disturbance of burial sites, hearths, or other subsurface archaeological deposits that may exist	• Conduct archaeological monitoring for construction excavation if evidence of subsurface deposits is encountered (contractor and archaeologist)
Air Quality: • Short-term air quality impacts from construction	• Significant airborne emissions, including fugitive dusts (resulting in PM-10 emissions) from earth-moving, cement mixing activities, and vehicular travel in construction areas • Potential emissions of asbestos as a result of demolition activities	• Implement measures for fugitive dust control (contractor) • Perform a building inspection prior to demolition to determine if asbestos is present; follow proper removal guidelines if asbestos is present (contractor)
• Operational impacts on air quality from laboratory hood exhaust	• Airborne releases of small quantities of hazardous air pollutants from laboratories	• Use laboratory hoods with adsorption systems (HIMB) • Use controlled quantities of hazardous chemicals (HIMB)
Natural Hazards: • Earthquakes and strong winds associated with storms	• Structural damage to buildings and impediment of movement of personnel and supplies	• Comply with building codes that take into account horizontal loadings likely to be experienced from seismic events or storm winds (architect)

CATEGORY/ACTIVITY	POTENTIAL IMPACTS	MITIGATION MEASURES (Responsible Party)[1]
Acoustical Environment: • Construction phase equipment noise • Cumulative aircraft noise	• Construction equipment could exceed DOH's allowable noise levels during the daytime; this will affect nearest residents to the island • Aircraft overflights to and from MCBH may cause adverse acoustical impacts on project	• Obtain DOH permit that will specify allowable daytime hours of operation of construction equipment and will specify "not to exceed" noise limits during construction hours (contractor) • Design buildings to reduce impacts of external noise sources as well as internal mechanical noise to achieve noise level recommended for classroom environment (architect)
Visual Environment: • Aesthetic effect of new marine laboratory building	• Potential visual impacts to boaters and nearby residents	• Partially screen building with existing and planned vegetation (architect/landscape architect) • Use materials and colors that blend with surroundings (architect)
Marine Transportation: • Use of Heeia Kea Pier for materials staging and shipment to the island	• Conflicts with other uses of pier • Security issues regarding equipment storage	• Discuss with and obtain approval from State Division of Boating and Ocean Recreation regarding availability of and conditions for pier use (contractor) • Stage construction mobilization during non-peak-use hours. Night use is an option (contractor) • Verify allowable surface pressure and live-load on pier and plan embarkation to stay within limits (contractor) • Attach temporary hose bibs to wash-down water points within the storage areas for public access (contractor) • Secure the storage area with a security fence and/or watchman
• Transport of construction workers to Coconut Island from Lilipuna Road Pier and Heeia Kea Pier	• Increase in use of boat shuttle service in construction phase	• The shuttle will make extra trips if necessary (HIMB)
• Increase in HIMB staff transport to island	• Increase in use of boat shuttle service in operation phase	• Provide additional trips with the current passenger boat shuttle system (HIMB)
• Transport of construction materials on LCU to Coconut Island	• Possible discharge or release of material during transit or loading	• Properly contain construction materials on LCU to decrease accidental discharges (contractor) • Implement spill prevention and response plan (contractor) • Provide immediate notice to marine mammal research staff should release of any petroleum or other chemical occur into West Lagoon (contractor)

CATEGORY/ACTIVITY	POTENTIAL IMPACTS	MITIGATION MEASURES (Responsible Party)[1]
Ground Transportation: • Commuter trips by construction workers to Lilipuna Rd. Pier • Trips by infrequent large classes & conferences	• Short-term increases in traffic on Lilipuna Rd. and increased parking demand at LR Pier	• Establish shuttle van service to Lilipuna Road Pier for construction workers (contractor) • Arrange shuttle service for special groups from UH Manoa campus or Windward Community College or a central parking area in Kaneohe (HIMB)
• Commuter trips by new HIMB employees to Lilipuna Rd. Pier	• Long-term increases in commuter traffic and increased parking demand at LR Pier	• Establish other transportation and parking management programs for HIMB staff (HIMB)
• Transport of construction materials on Coconut Island	• Potential for accidental spills and sediment runoff into marine environment	• Minimize spill potential by using proper containers and handling procedures during transport and storage (contractor) • Use only designated roads to minimize ground disturbance impacts from mobilizing construction equipment (contractor) • Restore all staging areas after construction
• Staging and waste hauling at Heela Kea Pier	• Interference with local traffic patterns by construction and waste hauling vehicles	•Use Heela Kea Pier only during off-peak hours (contractor)
Air Transportation: • Use of a construction crane	• Penetration of airspace used by aircraft operating at MCBH	• Notify ATC/MCBH at start of construction and when crane is extended (contractor) • Place flag or other marker at top of crane to indicate potential obstruction (contractor) • Notify FAA within 30 days of potential obstruction (contractor)
Water Consumption: • Water usage for construction (concrete mixing, washing of equipment, fugitive dust control) • Water usage by increased number of staff/researchers	• Potable water consumption increase	• Obtain water allocation for additional use from State DLNR/BWS (engineering consultant) • Use of recycled water in other operational activities.
Wastewater: • Increase in wastewater generation due to new facility and increase in research operations • Additional flows generated by large conference groups or special classes	• Exceeding City's existing wastewater system capacity	• Obtain approval from DWM for installation of low-flow devices (architect) • Retrofit existing and new buildings with low-flow devices to reduce or maintain existing average flow (contractor)

CATEGORY/ACTIVITY	POTENTIAL IMPACTS	MITIGATION MEASURES (Responsible Party)[1]
Solid Waste: • Solid waste will be generated during the construction and operation phase of the project	• Solid waste is a burden to existing disposal systems on Coconut Island • Temporary solid waste storage on Heela Kea Pier interfering with other uses	• Prepare plan for proper off-island disposal of construction wastes, including hazardous wastes (contractor) • Educate workers regarding use of disposal plan (contractor) • Conduct an investigation to determine if leaded or biological retardant paints were used in the old boat house (contractor) • Perform demolition of lead-based paint-coated surfaces with appropriately trained workers in accordance with applicable safety requirements (contractor) • Obtain commercial compactor to more efficiently store and transport solid waste for disposal (HIMB) • Solid waste will be transported frequently off the pier (contractor)
Fire Protection: • Fire protection at Coconut Island	• Insufficient pressure for fire protection in six-inch line on island	• Construct buildings using fireproof material and build one-hour fire-protected construction walls to slow and contain spread of fire (architect) • Provide portable firefighting equipment (HIMB) • Coordinate training for staff in use of firefighting equipment (HIMB)

CATEGORY/ACTIVITY	POTENTIAL IMPACTS	MITIGATION MEASURES (Responsible Party)[1]
Solid Waste: • Solid waste will be generated during the construction and operation phase of the project	• Solid waste is a burden to existing disposal systems on Coconut Island • Temporary solid waste storage on Heela Kea Pier interfering with other uses	• Prepare plan for proper off-island disposal of construction wastes, including hazardous wastes (contractor) • Educate workers regarding use of disposal plan (contractor) • Conduct an investigation to determine if leaded or biological retardant paints were used in the old boat house (contractor) • Perform demolition of lead-based paint-coated surfaces with appropriately trained workers in accordance with applicable safety requirements (contractor) • Obtain commercial compactor to more efficiently store and transport solid waste for disposal (HIMB) • Solid waste will be transported frequently off the pier (contractor)
Fire Protection: • Fire protection at Coconut Island	• Insufficient pressure for fire protection in six-inch line on island	• Construct buildings using fireproof material and build one-hour fire-protected construction walls to slow and contain spread of fire (architect) • Provide portable firefighting equipment (HIMB) • Coordinate training for staff in use of firefighting equipment (HIMB)

CHAPTER TWO
DESCRIPTION OF THE PROPOSED ACTION

2.1 STATEMENT OF OBJECTIVES AND NEED FOR PROPOSED ACTION

The Hawaii Institute of Marine Biology (HIMB), School of Ocean and Earth Science and Technology, is engaged in ocean science and technology research. The laboratory was established in 1947, when Edwin Pauley, one of the owners of Moku O Lo'e (commonly known as Coconut Island), led efforts to set up the Hawaii Marine Laboratory (the original name of HIMB) on the island.

Today, HIMB is a recognized leader in marine studies, with a special focus on two aspects of near-shore tropical marine biology—biodiversity and biotechnology. The focus of biodiversity studies at HIMB includes coastal ecology and management (with emphasis on coral reef ecosystems), conservation biology, and evolution and environmental adaptation. Exploring the unique marine biological resources of the tropics, research at HIMB in biotechnology applies molecular biology and other advanced technologies to problems of conservation biology, environmental remediation, fisheries biology, aquaculture, human biology, and medicine. It is this mixture of basic and applied research that makes HIMB a vital resource for contributing to the solution of such global problems as food production and environmental protection.

In addressing the global challenge of increased demand for food production, HIMB has become a leader in aquaculture research. To this end, HIMB requires top researchers in biotechnology, animal physiology, and fish nutrition to develop new techniques in the rapidly expanding field of biotechnology and to train student researchers and production specialists. As one of the principal educational institutions in the tropical Pacific, HIMB has a unique opportunity to support graduate education leading to master and doctorate degrees in its areas of special focus.

The laboratory facilities on Coconut Island in Kaneohe Bay serve as the aquaculture research center for HIMB; it has other facilities at Hakipu'u in the northern section of Kaneohe Bay. Many facilities on the island date from the formation of the Hawaii Marine Laboratory in the 1940s and from the mid 1960s. The previous laboratory building, constructed in the 1940s, was destroyed by fire in 1961. The present administration/laboratory building was built in 1966.

Over the years, gradual expansion of research and educational needs has resulted in a shortage of laboratory facilities. In addition, support facilities to handle the maintenance and repair of equipment need to be replaced. HIMB's single classroom is currently the

only facility for group teaching on Coconut Island, and no space is available for conferences.

As a result of its continued growth in programs, HIMB is proposing an expansion of its existing facilities to meet research and educational demands and to maintain its role as a leader in tropical food production (aquaculture) and marine biotechnological research and training.

The new facility that is being planned by HIMB is designed to meet the expanding needs of the Institute for a number of years. It will contain additional laboratory space, classroom space, and a space for large-group seminars and conference sessions that can accommodate 50 or more persons. The new facility is also intended to replace many existing facilities that are old and inadequate. A number of existing buildings were built or renovated with the intent of being temporary for use in specific experiments or research projects. The operations from many of these old wood-frame buildings will be consolidated and relocated in the new marine laboratory facility. The phasing or scheduling of this relocation is not yet determined, because a major part of the scheduling depends on the current progress or status of the research projects housed in the buildings to be replaced. As part of the current project, however, three buildings will be immediately demolished, primarily because they will need to make way for construction of the new facilities or because they will be part of the project's building replacement plan.

The proposed action includes the construction of three new structures: 1) a new marine laboratory that will contain research labs, classroom/conference room, library/computer center, and a kitchen with a lunch room; 2) wet laboratory annex that will include saltwater tanks and a pelagic fish research laboratory, and 3) a replacement support facility that will house maintenance shops for HIMB.

As an institution familiar with marine ecology, HIMB has as one of its roles to support environmental protection, especially of the surrounding waters of Kaneohe Bay. These waters serve as a natural laboratory for research in marine studies. In that regard, HIMB intends to avoid or mitigate any possible impacts that may be generated by the proposed action on the surrounding environment.

2.2 DESCRIPTION OF THE REGIONAL SETTING

Coconut Island consists of approximately 28.8 acres located in the southern portion of Kaneohe Bay, on the windward side of Oahu. It is situated approximately 0.4 miles northeast of the closest shoreline in this bay, which is used for recreational boating and fishing. The island is surrounded by a marine sanctuary of approximately 64 acres used by HIMB for scientific research.

The project area also includes a 1.4-acre parcel of land on Oahu fronting on Lilipuna Road (see Figure 1-3). Access to Coconut Island is by boat from a pier on the Lilipuna Road property.

The Oahu shoreline south of Coconut Island is predominately residential, mostly single-family homes, with some multi-family housing along sections of Lilipuna Road. The shoreline to the east of Coconut Island is occupied by MCBH, formerly the Kaneohe Bay Marine Corp Air Station. This base has a mixture of military uses, including an airfield and military family housing. Aircraft approaching MCBH from the southwest pass almost directly over Coconut Island.

Coconut Island and the surrounding area of Kaneohe Bay fall within various State Conservation District Subzones. A full description of these designations is discussed in Section 7 of this EIS.

2.3 PROJECT SITE DESCRIPTION AND LAND TENURE

2.3.1 Coconut Island and Existing Facilities

The island consists of two physiographic parts. The first is the central area of the island, consisting of the original island, which was privately owned until recently. This original island existed prior to the 1930s, before extensive alteration occurred to the shoreline. During the 1930s, substantial dredged material was deposited on the perimeter of the island (see Figure 1-2).

Along with the placement of dredged material around the island, spits were built to form four lagoons, and six tidal ponds were created. The northern lagoon was used as a swimming pool by past landowners, the east lagoon is currently occupied by HIMB for its research operations, and the south and west lagoons are currently being used as access and mooring areas for marine vessels.

Boat landing and berthing facilities on the island are located in two inlets at the southwest corner of the island and in a lagoon at the HIMB main laboratory facility on the east side of the island (see Figure 1-4). Land access to the HIMB main laboratory facility from the southwest boat landing facility is by a dirt/gravel road that runs along the south and east portion of the island.

The original land in the center of the island (TMK 4-06-01: parcel 1) was acquired by the University of Hawaii Foundation from Hachidai, USA, Inc. on August 30, 1995 (see Figure 1-2). The 12.5-acre former private land is now being leased to the University of Hawaii for HIMB's long-term use. The remaining area (approximately 16.3 acres, 6.15 of which are underwater) is owned by the State of Hawaii (TMK 4-06-01, parcel 51) and

leased to the University of Hawaii under General Lease No. S-5325. The terms of the lease run for 65 years starting in 1989.

The majority of site development is along the south and east portions of the island. Buildings consist of a number of research structures, a maintenance shop, administrative office, and houses. A list of primary buildings with their uses is provided in Table 2-1 and referenced in Figure 1-4. There are also accessory structures that include instrument and storage sheds, tool shelters, and utility vaults.

The main building within the HIMB complex is the administration/laboratory building behind a concrete pier in the eastern lagoon (Building 5). It is a three-story concrete structure that houses HIMB's administrative functions and a number of research labs. The other buildings are one-story wood structures, except for five buildings that are concrete or metal. Many are old structures—some having been built in the 1940s. Others are temporary structures constructed for specific research experiments.

2.3.2 Coral Reef Sanctuary

In 1959, the State of Hawaii designated the 64 acres of coral reef around Coconut Island as the Hawaii Marine Laboratory Refuge. The designation made it unlawful to take any aquatic life within the designated areas, encompassed by the high water mark on the shoreline and the seaward boundary extending 25 feet beyond the edge of the reef surrounding the island. The restriction, however, does not apply to faculty or students of the University of Hawaii, who, under the monitoring of the HIMB Director, may catch aquatic life for scientific purposes only.

2.3.3 Lilipuna Road Property

The affected project area also includes the parcels of land fronting on Lilipuna Road on Oahu (see Figure 1-3). The parcels (TMK 4-06-01: parcels 15, 16, and 17) total 1.4 acres and have been recently acquired by the University of Hawaii Foundation from Hachidai, USA, Inc. These parcels are now being leased to the University of Hawaii, a separate entity from the Foundation. HIMB previously used the property under an easement recorded in the deed with the former private owner (see Section 2.3.4). The parcels have an entrance road that leads to a vehicular parking lot for Coconut Island. A concrete pier also extends out from the property into the bay. HIMB maintains an electrically operated control gate to the property.

Table 2-1 List of Primary HIMB Buildings and Their Use

BUILDING # (SEE FIGURES 1-4)	BUILDING SIZE & CONSTRUCTION	USE
1	one story, wood	office space/storage
2	one story, high ceiling, metal	old boat house or boat repair shop (boat storage and maintenance)
3	one story, cinder block	laboratory (larval studies)
4	one story, wood	residence (caretaker)/student dormitory
5	three story, concrete	administration/laboratory building
6	one story, wood	maintenance building
7	one story, wood	saltwater tank shelter
8	one story, wood	lunch room
9	one story, cinder block	laboratory
10	one story, wood	student dormitory/laboratory
11	one story, wood	research lab
12	one story, wood	saltwater pump house
13	one story, wood	coral reef laboratory
14	one story, wood	coral reef laboratory
15	one story, concrete	coral reef laboratory
16	one story, wood	former electrical switching station
17	one story, wood	residence
18	one story, wood	lighthouse station

2.3.4 Easements, Rights-of-Way, Rights of Entry

The Lilipuna Road property provides access to Coconut Island. As shown in Figure 1-3, it contains a paved parking area for approximately 54 vehicles and a concrete pier from which shuttle boat service is provided to the island. HIMB had an agreement with the previous owner that allowed use of the parking and pier facilities. Certain rules applied allocating time and space for use of the facilities by HIMB. Upon the acquisition of the pier property from Hachidai USA, HIMB will have full, unrestricted use of the pier and parking facilities.

On Coconut Island, access and utility lines traverse the central portion of the island. State survey maps show easements for road access around the south and west ends of the island and easements for some of the water, sewer, electrical and telephone lines across the central section of the island.

2.4 PROPOSED ACTION—FACILITIES DEMOLITION AND CONSTRUCTION

The proposed action consists of three components: 1) demolition of three existing buildings; 2) construction of a new marine laboratory facility; and 3) construction of a new maintenance building. A map showing the proposed expansion is included as Figure 1-5.

2.4.1 Demolition

An existing saltwater tank shelter and lunch room will be demolished (see Figure 1-4) to make way for one building of the new Marine Laboratory Facility. HIMB's repair and maintenance operations have outgrown their quarters in the existing maintenance building. This building, which is next to the existing administration/laboratory building, will be demolished and replaced by larger quarters in a new facility that will be located on the west side of the island near an old boat house.

2.4.2 Marine Laboratory Facility

The new Marine Laboratory Facility will consist of three buildings. Two of the three buildings will be located on a hill immediately behind the existing administration/ laboratory building in the existing HIMB complex. They will house various research laboratories, classroom/conference room, offices, library/computer center, kitchen and dining room, and other accessory facilities, including rest rooms, utility rooms, and storage rooms. The two one-story buildings will have a total floor area of approximately 17,900 square feet and occupy a site of approximately 39,000 square feet.

The third building will be located in a separate structure to the east of the existing administration/laboratory building next to the island's east lagoon. It will contain saltwater tanks and the pelagic fish research activities of the new complex. This wet laboratory annex will be one story in height and have a floor area of approximately 3,050 square feet. A site plan and elevation plans of all three buildings are included in Figures 2-1 through 2-4.

An access road will be developed with the new marine laboratory. It will be constructed of concrete for durability and suitability on sloped land. The new access road will curve up the west bank of the new lab site and enter the complex from the north (see Figure 1-5). The steepest segment of the road will be approximately 10 percent; thus, grading will be required.

2.4.3 Maintenance Building

The new maintenance building, which will occupy a site near the old boat house site, will contain a floor area of approximately 4,700 square feet. In the Draft EIS, the old boat house site was the original location for the proposed maintenance facility. Since receiving public comments on the Draft EIS and after further environmental consideration, HIMB has decided that the new proposed site, which is approximately 200 feet west of the old boat house, is better suited for the maintenance facility. The new building will contain shops for plumbing, metal work, wood work, refrigeration and air conditioning, painting and fiberglass, internal combustion and electric motor repair, and a security office. The maintenance building will also contain a tool room and a material storage room. A site plan/floor plan is included in Figure 2-5 and an elevation plan is included in Figure 2-6. Monies for grounds maintenance will come from the University of Hawaii operations and maintenance fund.

2.4.4 Construction Methodology

A typical scenario for the construction of the new buildings on Coconut Island is described below. The specifics of this process are subject to change as the needs of the project are better defined during the design and contracting stage. This description, however, accurately depicts the major parts of the construction process for the proposed project.

Construction will begin with the mobilization of equipment and materials. The materials and supplies will be staged at Heeia Kea Pier and transported to the island in an LCU owned by the University of Hawaii. The vessel will initially deliver construction equipment to the island from Heeia Kea Pier, pending final coordination and approval with the DLNR Division of Boating and Ocean Recreation. MCBH is being considered as a possible alternative staging area. Permission to use the area is being requested by HIMB.

Subsequent trips to the island from Heeia Kea Pier will be for transport of construction materials; on the return trips, construction debris will be taken away from the island.

Currently, several round trips per week by the LCU during off-peak hours (i.e., late evening to early morning) are estimated over the approximately 15-month construction period.

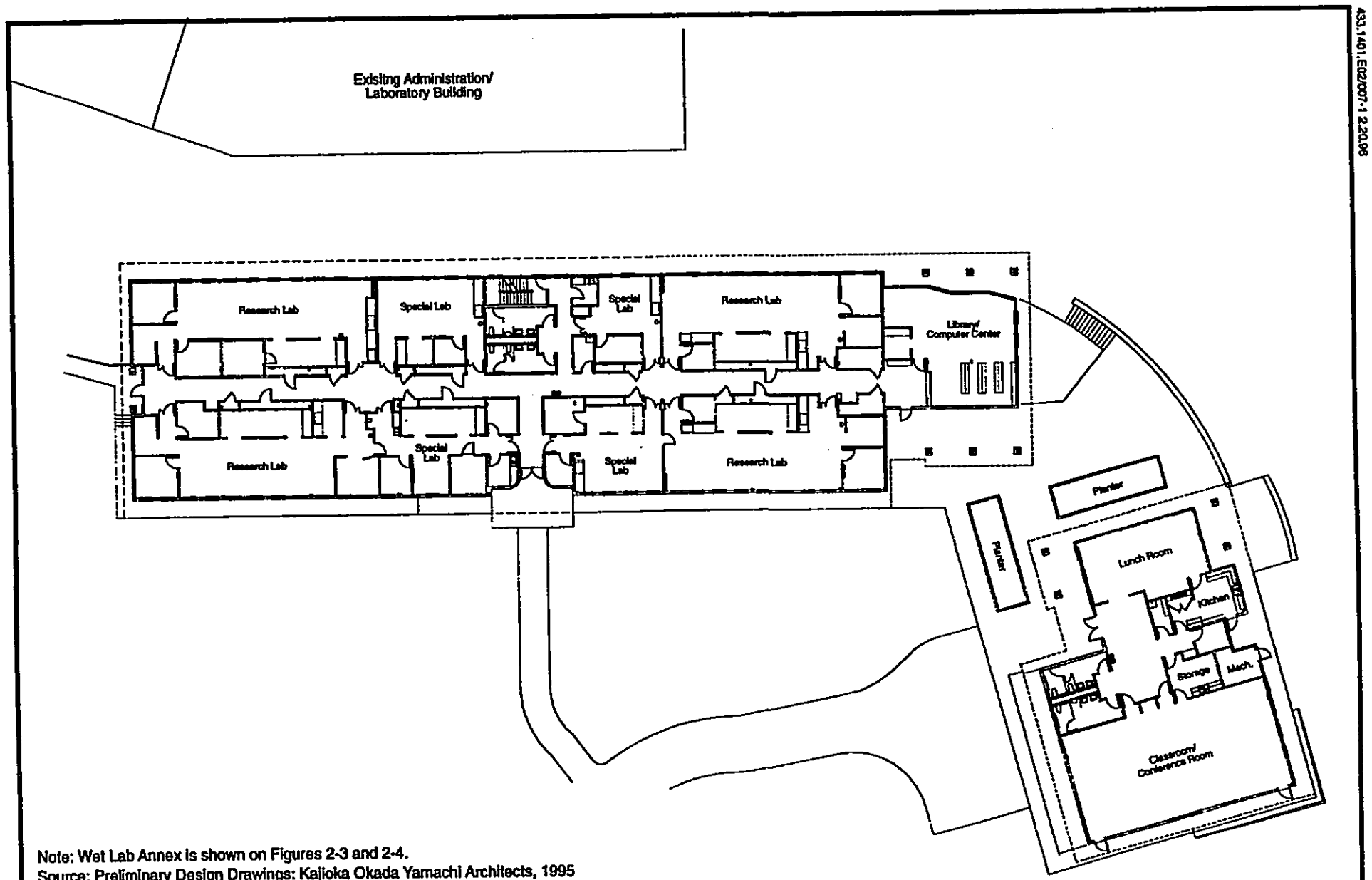
Following initial mobilization, some utilities on the island will be relocated. This includes the relocation and extension of the sewer, water, telephone, and power lines to the new buildings. After utility line installation and subsequent earthwork and grading, work will begin on the foundations. No basements, which would involve subsurface excavation, are planned for the new buildings, although a room for the storage of mechanical equipment will be built at grade on the lower slope under the main floor of the marine laboratory. The foundations will be slab on grade and, in some cases, concrete slab on piers where the new building encroaches over the slope of the hill. Preparation for laying the foundations will include minor grading of each site, concrete forming, and laying of rebars; no dewatering or excavation below the water table is planned.

Concrete will be mixed on the site. Besides the foundations, concrete will be used for bonding concrete masonry units (CMUs) on the exterior walls. Three- to four- cubic-yard mixers will be used, and no batching or transporting of premixed concrete to the island is planned. Dry mixed concrete in plastic bags will be used, so only water will be required. Rinsewater from the concrete process will be contained in settling tanks; after suspended particulate matter has settled, the water will be remixed with additional concrete or reused for fugitive dust control.

After the slabs for the new buildings are laid and cured, construction of the building frames will begin. The buildings are planned to have steel frames. The steel will be transported to the site precut, pre-primed and pre-painted, ready for use in the four buildings. Construction will continue until all steel is in place. Once this stage is completed, work will commence on the building exteriors. The exteriors are planned to be predominantly a metal stud system, although portions of the exteriors may be made of CMUs or hollow-tile concrete blocks. The marine laboratory buildings will also have stucco on hard boards, while the wet laboratory annex and maintenance building will have metal sidings.

Once the buildings are enclosed, work on the mechanical systems and the interiors of the buildings will begin. Landscaping will also occur during this stage of construction. Upon completion of the project, all demolition debris, construction debris, and equipment will be transported off Coconut Island for disposal.

No temporary office space will be used during the construction; the contractors will use existing office space on the island.



Note: Wet Lab Annex is shown on Figures 2-3 and 2-4.
Source: Preliminary Design Drawings: Kajioka Okada Yamachi Architects, 1995

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 2-1
PROPOSED MARINE LABORATORY FACILITY SITE PLAN

0 12 24
Scale in Feet

North

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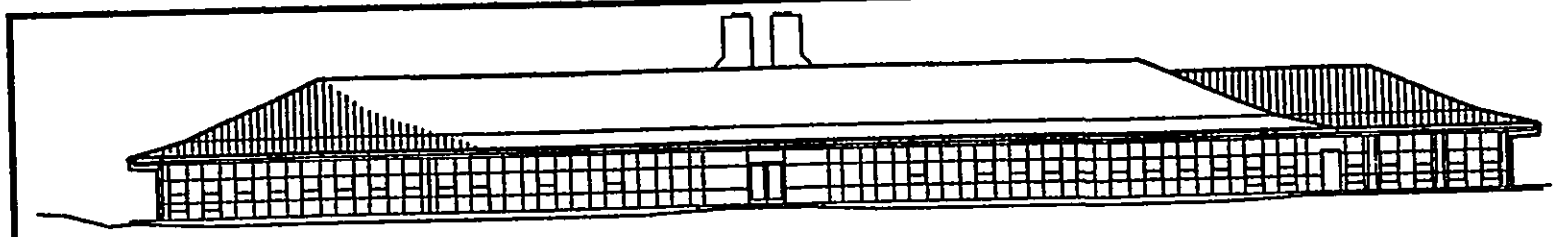
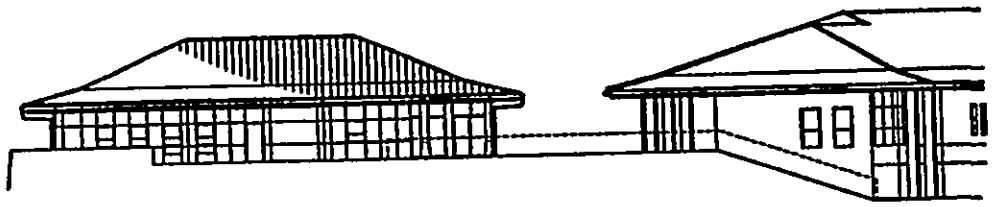
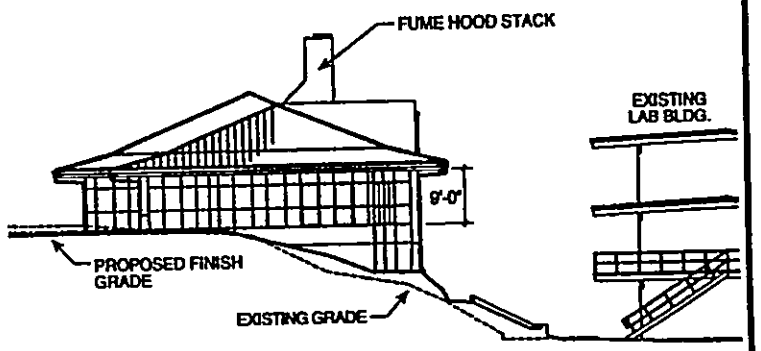


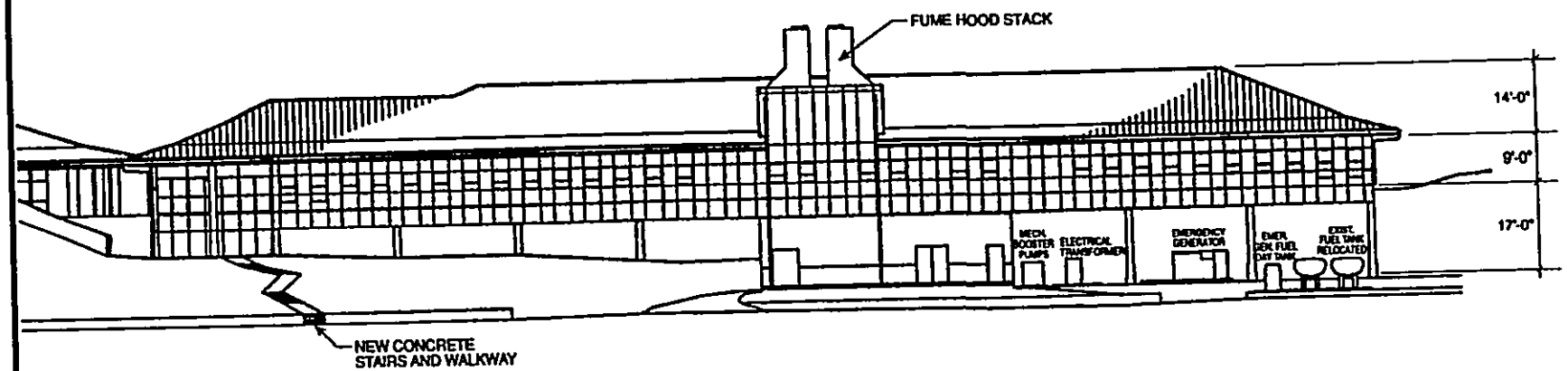
WEST ELEVATION LAB WING



SOUTH ELEVATION CLASSROOM WING



SOUTH ELEVATION LAB WING



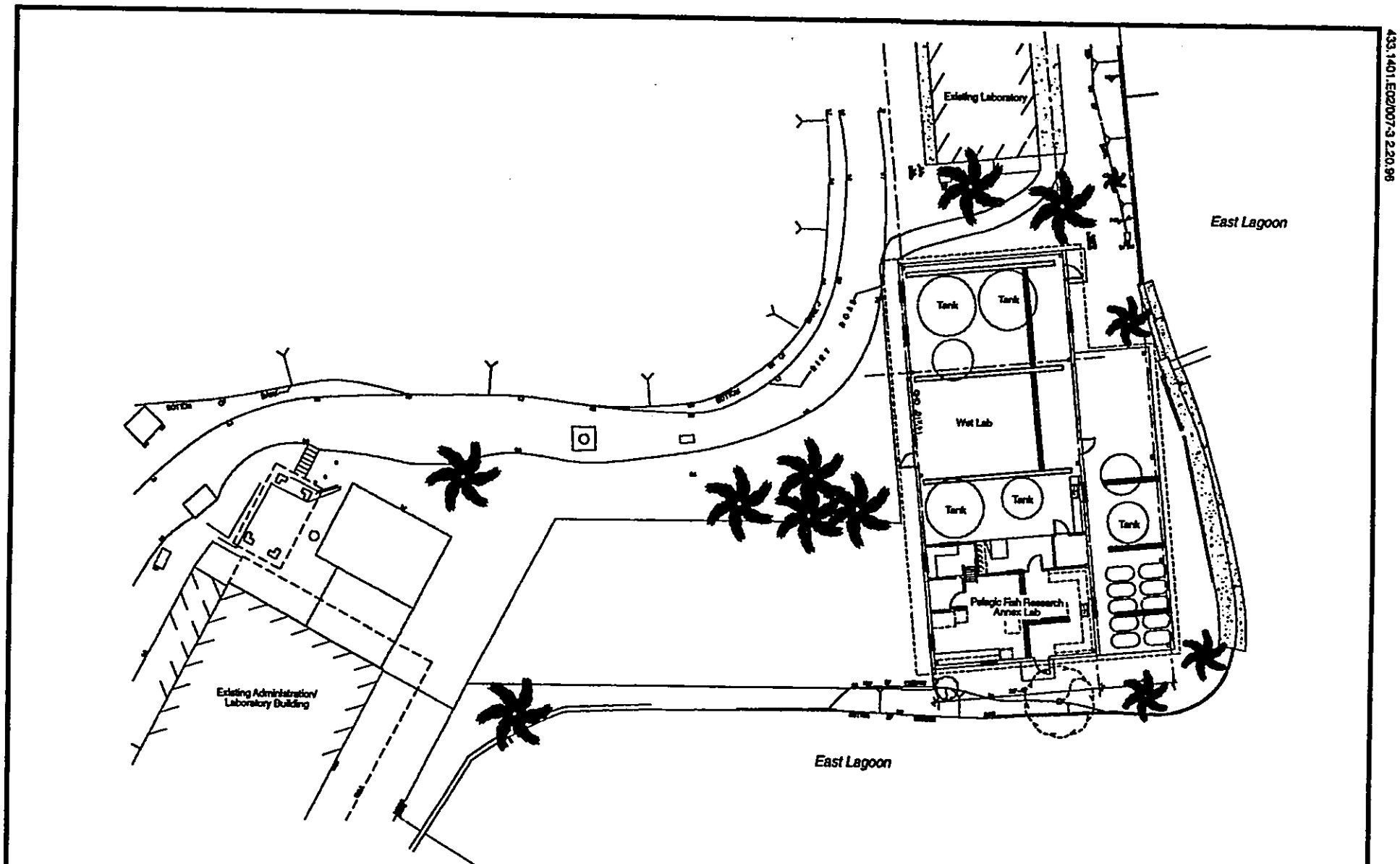
EAST ELEVATION LAB WING

Source: Preliminary Design Drawings: Kajioka Okada Yamachi Architects, 1995

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 2-2
PROPOSED MARINE LABORATORY FACILITY ELEVATION PLAN



Source: Preliminary Design Drawings: Kajioka Okada Yamachi Architects, 1995

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

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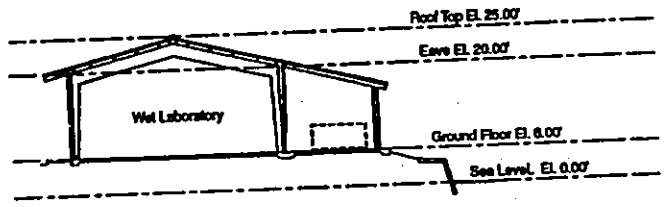
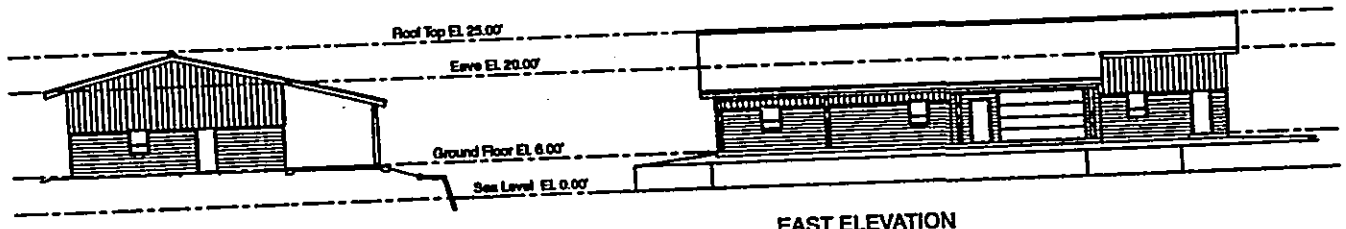
FIGURE 2-3
PROPOSED WET LABORATORY ANNEX SITE PLAN

0 15 30
Scale in Feet

North

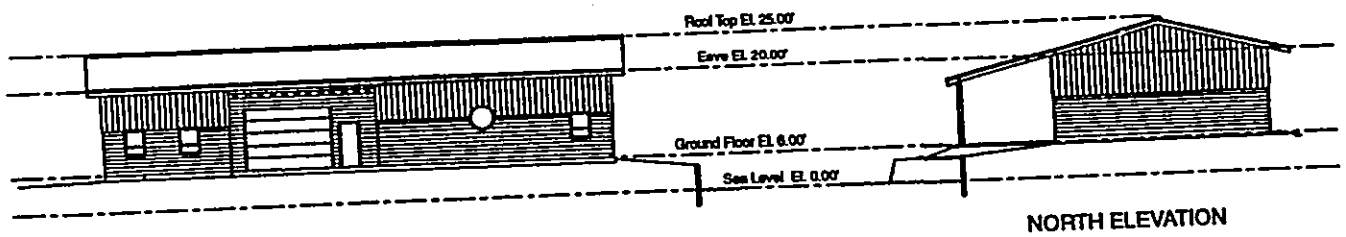


BUILDING SECTION



SOUTH ELEVATION

EAST ELEVATION



WEST ELEVATION

NORTH ELEVATION

Source: Preliminary Design Drawings: Kajioka Okada Yamachi Architects, 1995

FIGURE 2-4

PROPOSED WET LABORATORY ANNEX ELEVATION PLAN

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

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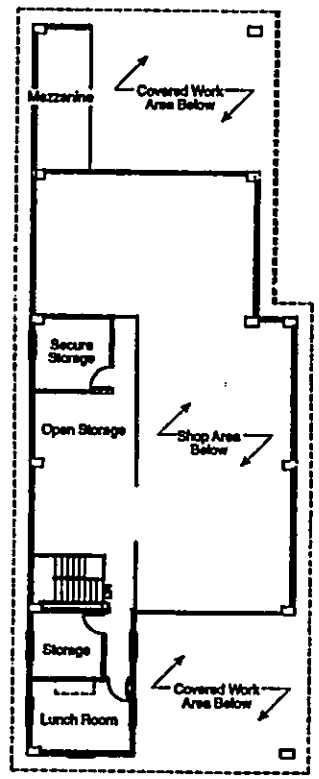
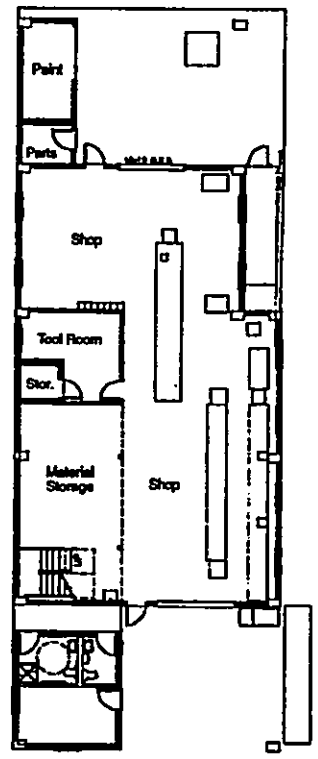


Mezzanine Floor



Ground Floor

Source: Preliminary Design Drawings: Kajioka Okada Yamachi Architects, 1995

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

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February 1996

FIGURE 2-5
PROPOSED MAINTENANCE BUILDING SITE PLAN

0 15 30
Scale in Feet

North

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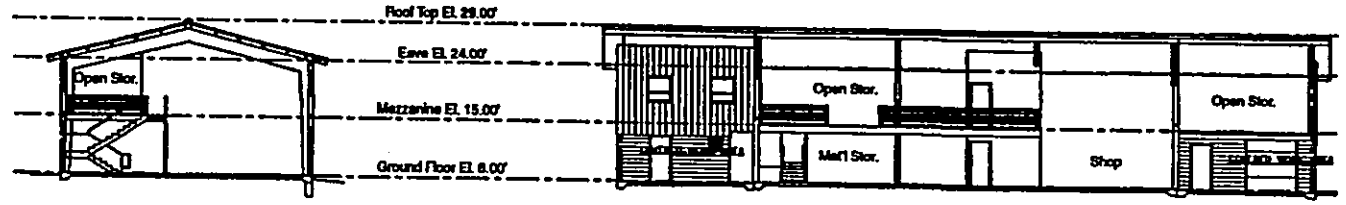
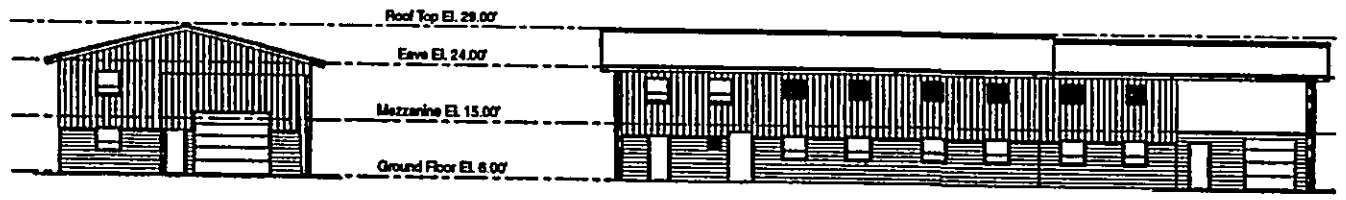


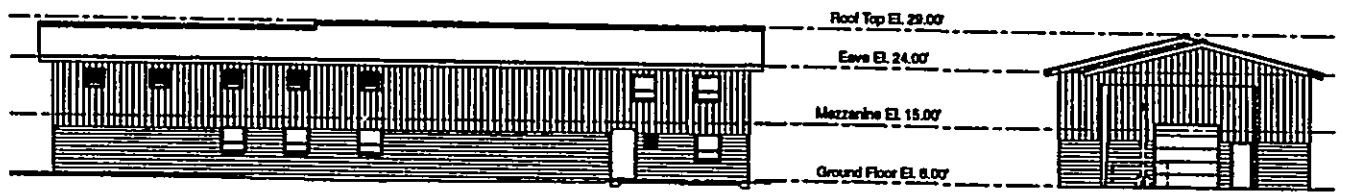
BUILDING SECTION

BUILDING SECTION



SOUTH ELEVATION

EAST ELEVATION



WEST ELEVATION

NORTH ELEVATION

Source: Preliminary Design Drawings: Kajioka Okada Yamachi Architects, 1995

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 2-6
PROPOSED MAINTENANCE BUILDING ELEVATION PLAN

2.4.5 Schedule and Cost

The total cost of the proposed project is estimated at $6.6 million. Funding for the construction is from a private donation; no State funds are involved. The project construction will take about 15 months to complete. Its schedule is broken into roughly four phases:

Month 1:	Mobilization of equipment and materials
Month 2-4:	Demolition, clearing of debris, grading of building sites
Month 5-12:	Construction of structures
Month 13-15:	Interior finishing and landscaping.

Construction is currently planned to start approximately in September 1996.

2.5 PROPOSED ACTION—OPERATIONS

The reader should refer to the floor plans shown in Figures 2-1, 2-3, and 2-5 in the following discussion of new facility operations.

2.5.1 Marine Laboratory

The new facility will have general research laboratories and special-purpose labs, such as sterile labs, special instrument labs, and culture rooms, that will be equipped with fume hoods for the safe use of chemicals. The type of research to be conducted will be similar to the current research done in other laboratory buildings on the island. These activities include the study of larval and adult fish behavior and growth, fish physiology, biogeochemistry, and molecular biology studies.

All the labs and some selected areas will have access to fresh water and saltwater supplies. An existing Board of Water Supply (BWS) water main provides fresh water from Oahu, and a saltwater supply system is currently in place on the island (see Section 6.4 for more information on water supply). All the labs will have independent temperature and lighting controls to maintain specific environments for experimentation. Many experiments require the controlled use of small quantities of chemicals and radioactive substances. These are currently used in other laboratories on the island and are handled and controlled in accordance with state and federal regulations. The use of these materials is discussed in more detail in Section 6.8 of this EIS.

Additionally, the new marine laboratory will have a single, multi-purpose space for use as both classroom and lecture/conference area. The room will be subdividable into several smaller classrooms using a partition system, or expandable for use during conferences, lectures and receptions. The building will house a library and a computer

laboratory (that could be networked to computers at HIMB and at the University of Hawaii-Manoa campus), as well as a lunch room and kitchen to replace the existing lunch room scheduled for demolition.

In a separate building, the wet laboratory annex will be equipped with spaces for large saltwater tanks for experimentation, as well as a special laboratory area for pelagic fish research.

The saltwater tanks in the new wet laboratory will be connected to HIMB's existing saltwater system. Discharge from the tanks will be into HIMB's existing sumps to prevent the release of alien larval species into the adjacent waters.

2.5.2 Maintenance Building

The maintenance building will have several large spaces for general repair and maintenance work (see Figures 2-5 and 2-6). Operations will center on fabrication, repair, and maintenance of equipment and supplies used in research and operations and on ground and marine vessels. These activities are expected to include small engine repair and service, fiberglass repair, metal and wood working, and minor painting. There will also be space for an office and a lunch room. Above the ground floor will be a partial mezzanine that will contain space for storage. Outside the building, plans call for utilizing an existing mobile hoist to lift boats from the lagoon for dry docking repairs and maintenance. The maintenance building will also be located near a boat ramp on the East Lagoon for additional access to the water.

Some materials that would be used in the repair and maintenance activities include paints, solvents, and lubricants. These materials are currently handled and controlled according to state and federal regulations and are discussed in more detail in Section 6.8 of this EIS.

2.5.3 Replacement of Existing Operations

As part of the proposed action's intent to expand and upgrade HIMB's facilities, it will also allow the removal and replacement of old, inadequate research buildings and support facilities. Operations in seven existing HIMB structures with a total floor area of 11,091 square feet will be relocated in the new marine laboratory building. Many existing structures are old, inadequate, or temporary and will be abandoned or demolished.

Five structures that currently hold repair, maintenance, and storage operations will be relocated in the proposed maintenance building at the old boat house site. These structures, which have a total floor area of 2,712 sq. ft., are located at various sites

throughout the HIMB complex. Consolidation of these operations under one roof will improve the efficiency of their activities.

Of the 12 total structures to be replaced, only the existing maintenance shop, saltwater tank shelter, and lunchroom near the administration/laboratory building are scheduled for demolition. The other structures have no removal timetable because the transfer of the operations to the new marine laboratory is dependent upon the nature and progress of their research activities.

CHAPTER THREE
ALTERNATIVES CONSIDERED

Alternative development schemes were evaluated to determine a preferred concept for the proposed action. The alternative development schemes identified different project sizes, building locations, building designs and construction methodologies. Factors affecting the determination included HIMB's future operational needs, its functional and spatial requirements for the new facilities, and the potential environmental consequences of the proposed action.

Alternatives were considered in the following order in the planning and design process:

- No action;
- Location of the project on- or off-island;
- Alternative project size and building design;
- Alternative construction methodology; and
- Alternative landing sites for the LCU.

3.1 NO ACTION ALTERNATIVE (USE OF EXISTING FACILITIES)

In this alternative, HIMB would take no action on the island and would not construct the proposed new facilities. It would leave the island in its present state, with continued use of the existing research facilities.

The facilities at the HIMB/Coconut Island complex are, however, already overcrowded. Researchers currently compete for an insufficient amount of existing laboratory space and the island's single classroom. HIMB has become a world leader in research areas such as aquaculture, fish endocrinology, biogeochemistry of coral reefs, and other marine studies, and the lack of new facilities has curtailed the expansion of programs designed to develop new food sources and to study the ecology of marine systems.

Except for one small classroom, HIMB currently has no facility to host lectures and conferences on the island. Facilities at the UH Manoa campus, far removed from Coconut Island, must be used. A lecture/conference facility for groups of more than 50 would allow HIMB to hold these events on the island, next to the research facilities, and would correct a major limitation in carrying out its educational mission. The facility would also provide support facilities to accommodate community activities and educational programs in marine science.

3.2 ALTERNATIVE BUILDING LOCATIONS

Several alternative sites for building location were evaluated for both the marine laboratory facility and the maintenance building. Locations off- and on-island were considered.

3.2.1 Locations Off the Island

An alternative to the proposed action on Coconut Island would be to site the proposed facilities off the island at another HIMB facility that has access to Kaneohe Bay. The only such facility is at Hakipu'u in the northern section of the bay. There is, however, insufficient space for the proposed laboratory facility here due to planned expansion of aquaculture ponds and Hakipu`u does not have an adequate saltwater system. Moreover, this alternative would limit interaction among scientists working on related endeavors and would limit the use of research facilities available on Coconut Island. It would not allow the shared use of research boats, laboratories, maintenance staff, and the ocean water collection and discharge system. It is believed that locating the new laboratory off-island would impose a greater economic cost and have greater environmental impacts than expansion at Coconut Island.

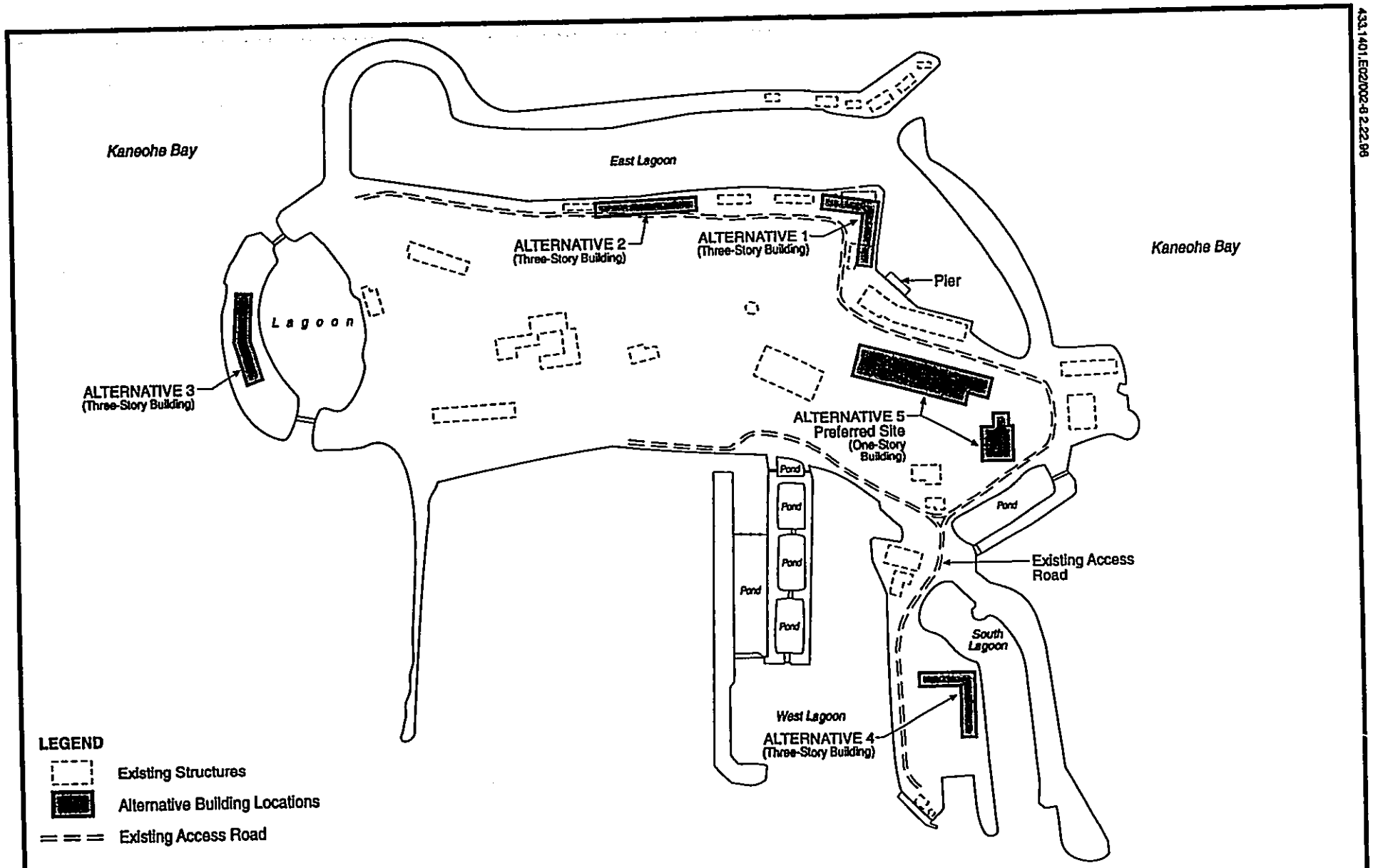
3.2.2 Locations on the Island

Various locations on the island were evaluated for siting the marine laboratory facility and the maintenance building. Major considerations were land ownership, access, and availability of infrastructure. During the project's initial planning stage, Coconut Island was under two ownerships. The central elevated portion of the island was privately owned and unavailable for HIMB use. The perimeter portion, which consists of filled land, was the only portion owned by the State and available for use by HIMB. The narrow, undeveloped "peninsulas" of the island were ruled out during the evaluation process, because these areas have no road access or infrastructure improvements. In many cases, these areas are too narrow to accommodate the needed structures and would be undesirable from the standpoint of visual impact on Oahu and Kaneohe Bay.

Since the initial planning stage, HIMB has acquired the use of the private portion of the island. Alternative sites for each facility are discussed in detail below and shown on Figures 3-1 and 3-2.

3.2.2.1 Marine Laboratory Facility

Alternative sites for the original marine laboratory concept were chosen based on the need for a foundation (footprint) of approximately 7,000 square feet, requiring a three-story structure. The need for a multi-story building was initially dictated by the



Source: TRW Redi Tax Map, 4-6-01, 1993

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FIGURE 3-1
ALTERNATIVE SITES FOR MARINE LABORATORY BUILDING

0 130 260
Scale in Feet

North

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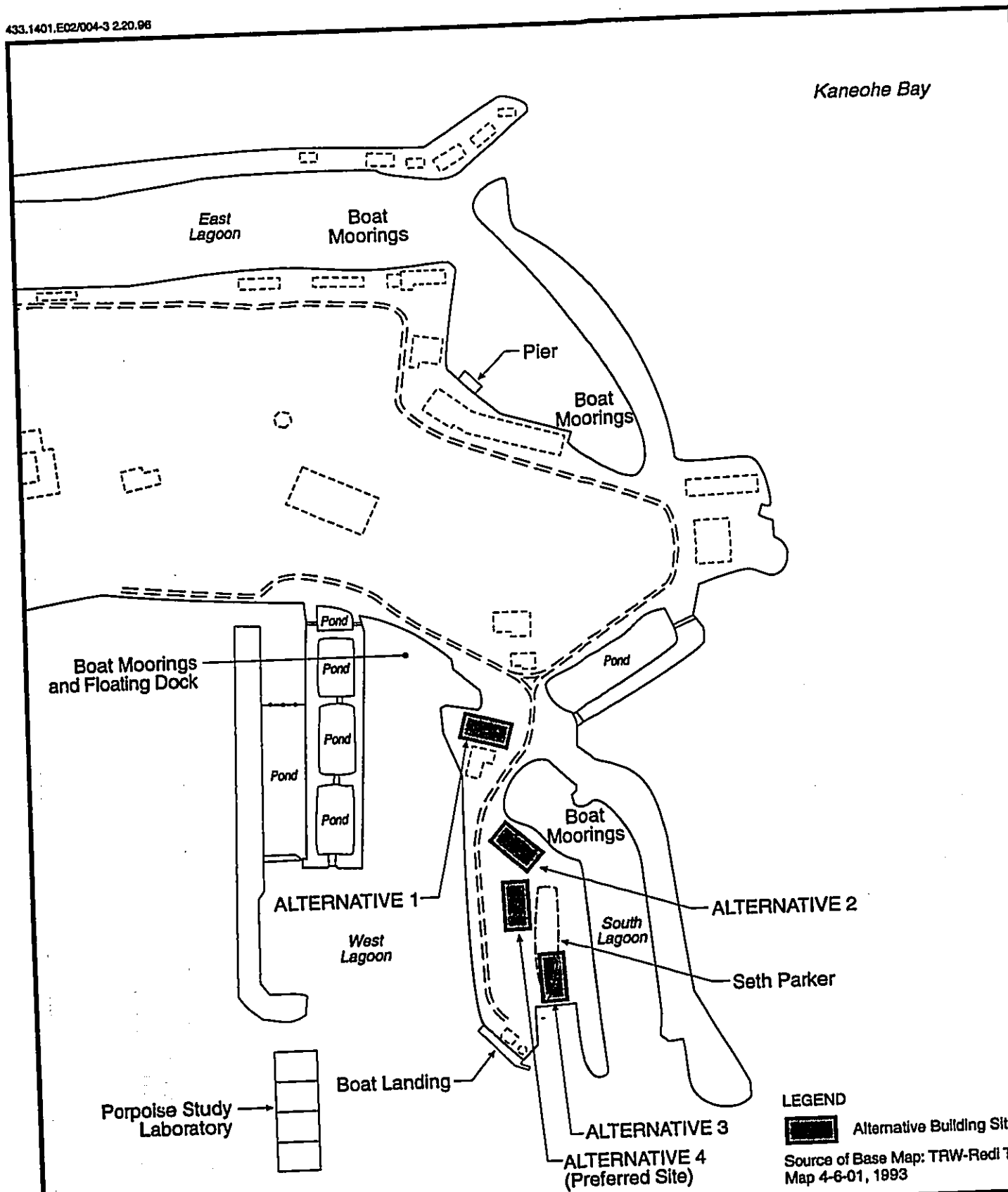

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FIGURE 3-2
ALTERNATIVE SITES FOR MAINTENANCE BUILDING

availability of only the filled land (the original State property) for use and the lack of sites that could accommodate a lower but wider building. Alternative sites on the island that were evaluated are shown in Figure 3-1.

Alternative Site 1. Site 1 is next to the east lagoon. The site is currently occupied by three structures (lunch room, saltwater tank shelter and maintenance building) that would be demolished and would require the relocation of the maintenance facility elsewhere on the island. Sections of the existing seawall along the lagoon would need to be repaired or replaced before the construction of the building could begin.

The major advantage to this site is its location in the existing HIMB complex of buildings around the east lagoon. The building would have easy access to existing infrastructure, including the existing saltwater system for the large research tanks planned for the building. The site allows for the easiest interaction of scientists on the island with the existing facilities and the new facilities planned for the building. Locating the building at this site also disturbs less of the island because the site has already been developed. Vegetation to the south of the building would shield the three-story structure from views on Oahu at its nearest proximity (an existing three- story building next to this alternative site does not significantly affect views from the Oahu shore), allowing the visual quality of the bay to remain significantly intact.

The main disadvantage is the width of this site. The building would require a forced configuration to fit into the site, which is confined by the lagoon on one side and by the steep embankment of the island's elevated section on the other side. Demolition of existing structures at this site and disposal of the resulting debris would add to the costs of construction.

Alternative Site 2. This site is also on the east lagoon, next to the student dormitory building. It is currently covered with trees and other vegetation. The shoreline in this area is not bordered by seawalls, which would need to be constructed.

This site is on the edge of the HIMB complex and would have access to existing infrastructure. Existing lines, however, would need to be extended to the building for saltwater service, and the existing access road would require relocation. The building would be shielded by surrounding vegetation and would not be visible from the Oahu shoreline.

A major disadvantage of the site is the lack of width between the lagoon and the elevated section of the island. This would require designing a long, narrow building. It would also require the construction of a seawall along the lagoon to fortify the project site.
An advantage of Site 2 is that the construction of the new building would not require removal of any existing structures.

Alternative Site 3. This site is on the north end of the island. It is filled land connected to the rest of the island by a wooden foot bridge and vehicle bridge (see Figure 3-1).

This site would have sufficient room for the building and would not require removal of any existing structures. It is, however, approximately 1,300 feet (1/4 mile) from the rest of the HIMB complex. An additional saltwater intake system would need to be constructed for the building, or lines would need to be extended and pumps installed to provide seawater from the existing HIMB facility. Utilities would also have to be extended from the other HIMB facilities to the site. In addition, the wooden bridge to this section of the island would need to be replaced for the passage of construction equipment and to support utility lines. These changes to the bridge would add to the construction costs. Also, the construction of a three-story building in this location would have major visual impacts to the north.

Alternative Site 4. This site is found near the current boat landing on the southwest portion of the island, approximately 1,000 feet (1/5 mile) from the existing administration/laboratory building. It is the resting place of the *Seth Parker*, a four-masted sailing ship brought to the island in 1935 and has settled in place. The site is covered by vegetation and would require clearing, filling, and compacting to provide adequate foundation support. Additionally, seawalls in the area would require either repair or replacement, depending on the exact location of the building.

There is sufficient space at this site for the construction of the building in a variety of footprint configurations. Vegetation to the south of the building would shield the three-story structure from views on Oahu along the south shore of Kaneohe Bay, but would only partially shield the building from the western shore, including Heeia State Park.

A disadvantage is that there is no saltwater system on this side of the island, meaning that a new intake system must be constructed or lines must be extended from the existing system on the east side of the island. The building would also be isolated from the rest of the HIMB research complex, although it would be closer to the boat dock for the convenience of conference attendees. Additionally, this location contains the landfall for utilities coming from Oahu to the island. Construction of the building in this location could require the resiting of these landfalls.

Alternative Site 5 (Preferred Alternative). This site was evaluated after it became available to HIMB through the purchase of the rest of the island by the University of Hawaii Foundation. It is on a hill behind the existing administration/laboratory building. The site is relatively level on an elevated section of the island that is approximately 25 feet above mean sea level (msl). There is sufficient space in the area to allow flexibility in design and the possibility of constructing a one-story building. The site provides the opportunity for the new building to be close to the existing laboratory/administration building and other support facilities, including utilities.

Construction on this site will require more grading than on the other sites, and the existing lunch room and saltwater tank shelter will need to be demolished. A new service access road will be required, and realignment of some utility lines that traverse the site will be needed. Buildings will be placed to take advantage of existing vegetation. Relandscaping will be performed to replace many displaced trees and to create visual screens to reduce the visual impact of the new building.

After determining that this alternative had outstanding potential in terms of land area and utility access, it became evident that the operations of the new laboratory could be separated into three different buildings and located on the most suitable sites. The research labs and offices, classroom/conference room, library/computer center and kitchen and dining room will be in two buildings and located on the Alternative 5 site. The saltwater tanks and related pelagic fish research laboratory will be in a separate building near the lagoon, where it can directly connect with the existing saltwater intake system. This wet laboratory annex, which will contain the saltwater tanks and associated laboratories, will still be within the existing HIMB complex and still provide excellent opportunities for staff and researchers to interact.

3.2.2.2 Maintenance Building

Alternative sites for the maintenance facility were chosen based on the need for a building footprint size of approximately 3,000 square feet, requiring a mezzanine level for the remaining floor space, and the need to conduct boat repair at the facility easily. Thus, the facility needs to be next to the shoreline. The alternative sites considered for the facility are shown in Figure 3-2.

Alternative Site 1. This site is the present location of the old boat house (see Figure 3-2), which will require demolition before the new maintenance building can be built. The adjacent portion of seawall will also require a permit for replacement.

The major advantages of this site are its proximity to the old boat ramp, allowing boat repair to be conducted at the building, and its location next to a lagoon deep enough to allow a variety of boats to be brought to the building for repair without damaging the reef ecosystem. The site may also have reduced construction costs if portions of the existing foundation can be used for the new building. Placing the building at this site will also disturb less of the island because the site has already been developed. Infrastructure improvements (electricity, water and sewer) already exist at this location, reducing the costs of the structure. Vegetation to the south and west of the building will shield the two-story structure from views on Oahu, allowing the aesthetic quality of the setting to remain intact.

A disadvantage of this and the other three alternative sites is that they are removed from the majority of HIMB research facilities on the island and will require longer transport

of material and equipment to and from other buildings during daily operations. Their remote location from research activities, however, has certain advantages in keeping noisy operations (e.g., running outboard motors, hammering sounds) away from the quiet research environment.

Alternative Site 2. This site is found near the old boat house next to the south lagoon. It is currently open and has enough space to accommodate the proposed building.

The site has boat access from the south lagoon, where boats could be serviced. A boat ramp already exists on the site and could be used by the maintenance facility. Vegetation to the west and south of the site would shield the two-story structure from views on Oahu. Part of the building, however, might be visible from the northwest.

Although a ramp already exists on the site, it would require installation of rails or other mechanisms to equip the ramp for hauling boats ashore and into the work area for repair and maintenance. Construction of a hoist is an alternative.

Development of this site would require removal of five to six coconut palm trees and possible clearing of part of the deteriorated remains of the *Seth Parker*. Some filling might be required after the deteriorated vessel is removed. Site preparation for this alternative might be more costly than Alternative Site 1.

Alternative Site 3. This site is near the current boat landing on the southwest portion of the island. It is in the resting place of the *Seth Parker* and would require clearing, filling, and compacting to provide adequate foundation support.

The site is next to an opening in the reef, allowing an approach by boats. Vegetation to the south of the building would shield the two-story structure from views on Oahu from the south, but not from the west, where it would be visible from the Oahu shoreline.

A disadvantage is that there is no boat ramp next to the facility, so a new one would need to be built, adding to the cost of this site. Permits would also be required for the filling of land in this location and the building of a seawall. In addition, this area is the location of the landfall of utilities from the Lilipuna Road property to the island (see Section 6.4). The locations of these utilities could preclude the mooring and moving of boats in this area for repair and maintenance purposes.

Alternative Site 4 (Preferred Alternative). This site is located near the old boat house and adjacent to Alternative Site 2. It is 40 to 45 feet from the East Lagoon and over 40 feet from the South Lagoon. It sits adjacent to but does not encroach into the Seth Parker resting place as does Alternative Site 2.

The site is open and flat. Vegetation to the west and south of the site would shield the proposed structure from views on Oahu. Part of the building might be visible from the northwest but would not be as visible as Alternative Site 1.

A disadvantage of this site is that it is not located adjacent to the lagoon where it would have direct access to the water. Logistically, this would be an important function for boat repairs and maintenance operations. The site is located near enough to the shoreline, however, that an existing mobile hoist could be used to lift marine crafts from the lagoon and place them into the buildings repair area. Similar to Alternative Site 2, a small boat ramp on the South Lagoon is available within relative proximity of the building. It however would require installation of rails or other mechanisms to equip the ramp for hauling boats ashore and into the building's work area for repairs and maintenance.

Development of the site would require removal of probably one tree. The Seth Parker would not be affected which would save on excavation and fill costs. Utility line relocation may be required, but no seawall replacement or shoreline fortification will be necessary. Exclusion of the latter work from this site would be a substantial savings over Alternative Site 1.

3.3 ALTERNATIVE PROJECT SIZE

HIMB has conducted studies of its existing and future needs, and these studies have determined the needed facilities and square footage requirements. Constraints were imposed by available funding for the new facilities. Table 3-1 shows the criteria for each of the two proposed facilities, based on the needs analyses conducted by HIMB.

If HIMB developed a larger building for its marine laboratory facility than is presently planned, it would provide more space than needed and would not efficiently use its available funding. That funding is better allocated to other items, such as more supplies and equipment for the research labs or better infrastructure upgrades for the site.

The alternative of reducing the project size by decreasing the floor area of the marine laboratory facility or eliminating the maintenance building replacement would cause HIMB to fall short of its program requirements and would negatively affect its operational efficiency. A smaller facility might be expected to reduce the amount of impact on the environment, but a closer examination of the potential effects show that might not be the case, especially in the construction phase of the project.

Although the project size could be decreased, any down-sizing of the project would not meet HIMB's needs. With the project at its currently approved size, it is hoped that facilities will be built that will meet HIMB's current and future needs.

Table 3-1 Criteria for the Proposed HIMB Facility Expansion

CRITERIA	MARINE LABORATORY	MAINTENANCE BUILDING
Square Footage:	21,000	4,700
Required Facilities:	- Classroom space - Laboratory space - Restroom facilities - Space for large-group seminars and conference sessions (1,920 square feet) - Laboratory space for saltwater marine research - Ready access to fresh and saltwater	- Adjacent to lagoon of sufficient depth to remove boats for maintenance - Enclosed space for machine and plumbing shop, wood shop, office, and electronics shop - Boat ramp

3.3.1 Decrease the Size of the Marine Laboratory

The total square footage of the marine laboratory could be decreased, either by eliminating some of the laboratory space or by reducing the large group room for seminars and conferences.

Although these measures would decrease the size of the project, they would not significantly mitigate potentially adverse impacts on the Kaneohe Bay environment and the island. The construction of the Marine Laboratory Building would still require the mobilization and demobilization of personnel and equipment, whose impacts will require mitigation no matter what the size of the proposed project.

3.3.2 Eliminate the Relocation of the Maintenance Building

Another alternative to decreasing the size of the project would be to leave the existing maintenance facilities (the old boat house and existing maintenance building) intact and build only the new marine laboratory. This is a possibility under Alternative Sites 2 through 5 of the proposed new marine laboratory, but not under Alternative Site 1. Leaving the maintenance building and old boat house on their original sites would eliminate the impacts associated with demolition, but would only result in the existing operations continuing in their crowded, antiquated surroundings.

3.4 ALTERNATIVE BUILDING DESIGN

Another factor in the consideration of alternatives is the design of the proposed buildings. Design alternatives include changing the floor plan, height, and footprint of the structures. In considering alternatives, it is assumed that the total square footage of the building would remain constant and the design of the buildings would change to accommodate that total area.

In the case of the marine laboratory, the footprint of the building could be configured to allow a single story or multi-story building. The advantage of a single-story building would be easy access for the handicapped without the need for an elevator, and the aesthetic considerations of less visibility from the Oahu shoreline.

In the initial evaluation of alternative sites, only the sites on the filled land portion of the island were available for consideration. These sites were all constrained by the amount of land available for construction. Hence, Alternative Sites 1 to 4 would not be large enough to accommodate a single-story, 21,000-square-foot building, or even a two-story, 10,500-square-foot structure. It was determined that the marine laboratory would need to be at least a three-story structure with a footprint of approximately 7,000 square feet. The three-story structure planned in the proposed project would contain an elevator, although not required by building code, for handicapped access. A disadvantage of the three-story design, however, is that it would have potential aesthetic considerations.

With Alternative Site 5 added to the final site evaluation, a one-story structure for the marine laboratory became a real possibility. It has adequate land area and is tucked within a growth of mature trees where there would be vegetation buffers on the project perimeter.

In the case of the maintenance building, the machine and wood shops are required to be on a ground floor, giving this building a minimum footprint of approximately 3,000 square feet. Other shops in the proposed building do not need to be on the ground floor, leaving the option of making the building a one-story or two-story structure. Because the project designers initially wanted to use the existing foundation of the old boat house as much as possible, the maintenance building footprint was kept to a specified size, and any additional space requirement was placed in the building's mezzanine floor. Now that a new site is available, the building footprint could expand. However, the new site is constrained by a lack of land area and it has been decided that the building footprint should be kept the same.

3.5 ALTERNATIVE CONSTRUCTION METHODOLOGY

Alternative construction methodologies were considered as part of the process to assess how different techniques would affect the cost as well as the environmental impact of the project.

The alternatives include the amount of steel versus concrete to be used in the construction process in the two facilities. The extensive use of concrete forms in the two facilities would require extensive batching (mixing of concrete on the island or the transport of liquid concrete to the island for the pouring of foundation, walls, etc.). This method of construction could potentially have significant impact on the environment of Kaneohe Bay, due to the possibility of spilling concrete into the bay. The size of particulate matter as well as the pH of this material could potentially impact the surrounding coral reef. A large concrete operation (other than that needed for the foundations of the new facilities) would be difficult to mitigate. Concrete could be batched on Oahu and transported to Coconut Island. However, continuous transport of concrete from Oahu would be expensive.

The preferred alternative for the marine laboratory building is steel frame construction, with concrete masonry units (CMU) and stucco on hard board for the exterior walls, and pre-mixed concrete for the floor decking, beams and columns. For the maintenance building and wet laboratory annex, wood framing for the structure and CMU for the exterior walls will be used. A form of coating or metal treatment may be required to protect the steel from rust. The premixed concrete will only require the addition of water at the construction site. It will optimize the use of all materials and minimize transport to the island, eliminating the need for concrete batching. Further discussion of the use of concrete during the proposed activities and its mitigation is included in Chapter 6 of this EIS.

Transport of construction materials will be conducted from a staging area on Oahu (see Section 6.1) using a 115-foot LCU. The initial load will transport the heavy equipment used for construction. This will include a 40-ton crane, boom truck with flat bed, fork lift, concrete batch plant or large mixer, vibratory hammer, compressor/generator, and service truck. A backhoe and a bulldozer recently acquired by HIMB are already on-site. This load could theoretically originate from Honolulu Harbor; however, insurance requirements for the LCU restricts the vessel from traveling over the open ocean. The initial load will thus operate out of Heeia Kea Pier pending final coordination and approval with the DLNR Division of Boating and Ocean Recreation. Subsequent loads will transport construction supplies and material. These trips will also operate out of the public Heeia Kea Pier.

Alternative sites for landing the vessel on Coconut Island were evaluated (Figure 3-3). Potential landing sites included the three lagoons open to Kaneohe Bay (Alternatives 1,

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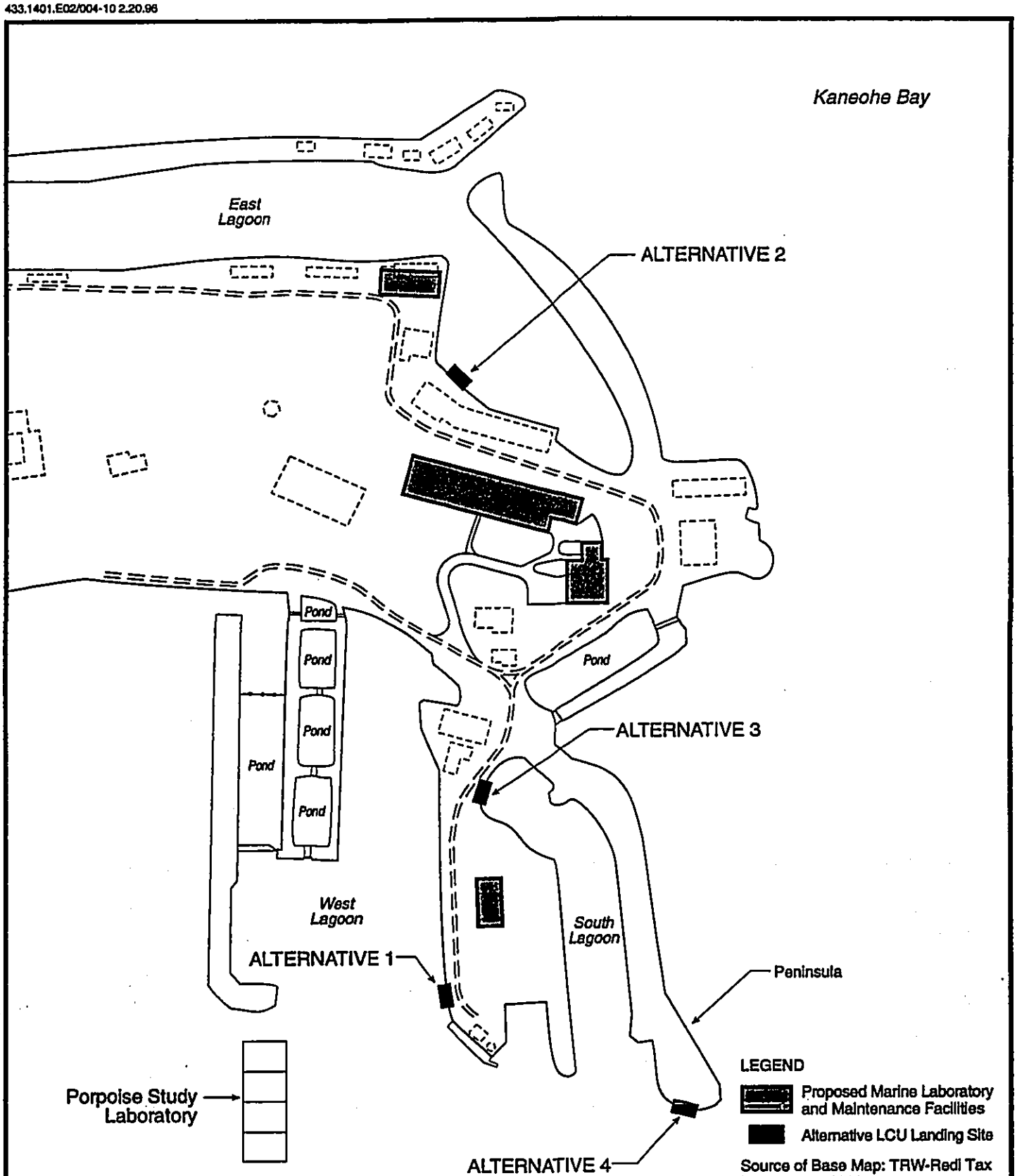

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FIGURE 3-3
ALTERNATIVE LANDING SITES FOR LCU

2, and 3) and one of the peninsulas on the island that is not restricted due to the presence of coral heads (Alternative 4).

The peninsula area was eliminated from consideration due to the need to clear trees from the area to allow movement of material from the landing point to the interior of the island. Of the three remaining alternatives, only the southwest lagoon (Alternative 1) has the room and the depth to accommodate the LCU. Tests conducted on September 7, 1994 with the LCU indicate that the vessel has the maneuverability to deliver equipment and material to this location while still providing access to the rest of the lagoon and not creating significant disturbance to the marine environment.

3.6 COMPARATIVE EVALUATION AND PREFERRED ALTERNATIVE

The criteria used in the site evaluation were land area, proximity to existing facilities, amount of site preparation, shared utilities, need for removal of existing facilities, cost, and environmental impacts; these combined to provide a limited number of viable alternatives for the placement of the proposed buildings. Footprints for the marine laboratory facility and maintenance building are strongly controlled by the needed floor area, usage, and physical constraints of the site. A matrix for the evaluation of the alternative sites for the proposed marine laboratory in relation to the criteria is provided in Table 3-2.

Table 3-2 Evaluation Matrix of Marine Laboratory Facility Alternatives

Lab Location Alternative	Relocate Maintenance Building	Proximity to Existing Facilities	Amount of Site Preparation	Shared Utilities	Environmental Effects	Visual Effects
1	YES	GOOD	FAIR	GOOD	FAIR	FAIR
2	NO	FAIR	FAIR	FAIR	FAIR	FAIR
3	NO	POOR	POOR	POOR	POOR	POOR
4	NO	POOR	FAIR	POOR	GOOD	POOR
5	NO	GOOD	FAIR	GOOD	FAIR	GOOD
Off-Island	NO	POOR	POOR	UNKNOWN	POOR	FAIR

GOOD Best alternative with minimum of impacts
FAIR Not the best alternative, with some impacts
POOR Least attractive alternative, with extensive impacts

In reviewing the site alternatives, the only real possibility for the location of the marine laboratory facility is Alternative 5. As shown in the matrix, this location allows the whole marine facility to be in one-story structures, keeping a low profile on the island and minimizing visual impact on the surrounding area. The buildings will be near the research core of HIMB and will have direct access to existing utilities and other support facilities. Additionally, this location does not require the immediate demolition and relocation of the existing maintenance building in order to build the new marine laboratory facility. The result is that this alternative could expedite construction scheduling.

Based on these factors, the best alternative appears to be Alternative Site 5 and is shown in this EIS as the proposed action. This is the alternative that will be considered for the purposes of this EIS. There are a number of potential environmental impacts associated with this alternative, and the following sections will discuss these impacts and their mitigation.

No evaluation matrices were prepared for the alternative maintenance building site, or LCU landing sites. These project elements, however, were selected from different alternatives to insure that consideration was given to project function, environmental effects and construction costs.

In the initial evaluation of maintenance building sites, three alternative locations were considered. A fourth site was later added, after public input was received on the Draft EIS and additional considerations were made on environmental effects. Identified as Alternative (Maintenance Building) Site 4 in Section 3.2.2.2, this new site presented itself as the preferred location. Environmentally, it is anticipated to generate less adverse effect than Alternative Site 1 which was the previous preferred site (provided in Draft EIS). Replacement of a portion of an existing seawall, which was necessary for Alternative Site 1, is now not a requirement for Alternative Site 4. Consequently, there would be no construction work in the lagoon. The new site is developable as well as accessible to two lagoons, and it will not require demolition of any existing facility.

The preferred landing site for the LCU is on the lighthouse peninsula (see Section 3.5). These selected alternatives have demonstrated the most benefits to HIMB and the least adverse effects to the environment. Mitigation measures for anticipated impacts are discussed in Chapters 4 and 6.

CHAPTER FOUR
PHYSICAL AND NATURAL ENVIRONMENT

This chapter describes the potential impacts of the proposed action on the physical and natural environment and specifies measures to mitigate these impacts.

4.1 PHYSIOGRAPHY AND GEOLOGY

4.1.1 Existing Conditions

Coconut Island comprises approximately 29 acres and is located in the southern portion of Kaneohe Bay, on the windward side of Oahu (see Figure 1-1). It is approximately 0.4 miles northeast of the closest shoreline.

Geologically, the island sits in an area believed to be the former Koolau caldera, the source of the volcanic material that formed the present-day Koolau Mountains (MacDonald and Abbott, 1970). The eruptive phase of this volcano (approximately 1.8 million years ago) was followed by a period of erosion where most of the caldera was removed, forming the familiar Koolau Pali—the steep cliffs visible from the windward side of Oahu.

Approximately 600,000 years ago, a second "post erosional" stage of volcanism occurred on eastern Oahu, creating a series of cinder cones. The most familiar of these are Diamond and Koko Head. A map from 1882 showing the dimensions and topography of Coconut Island depicts a volcanic cone forming the island's highest point (IARII, 1994). It is believed that Coconut Island may be one of these post erosional cinder cones, although no detailed studies of the island have been conducted.

The island has two physiographic parts. The first is the central area of the island, consisting of the original land (Figure 4-1). This original portion of the island is surrounded by the second part, an area filled with dredged material, whose placement around the original island dates from the 1930s (Figure 4-2). The center portion of the island is elevated and well-landscaped. Elevation ranges from zero to 55 feet above msl.

The island is surrounded by a 64-acre marine preserve established in 1959 and is used primarily for marine research by HIMB. The marine preserve consists mostly of coral reef (living coral and coralline algae) with water depths at high tide in the range of two to five feet.

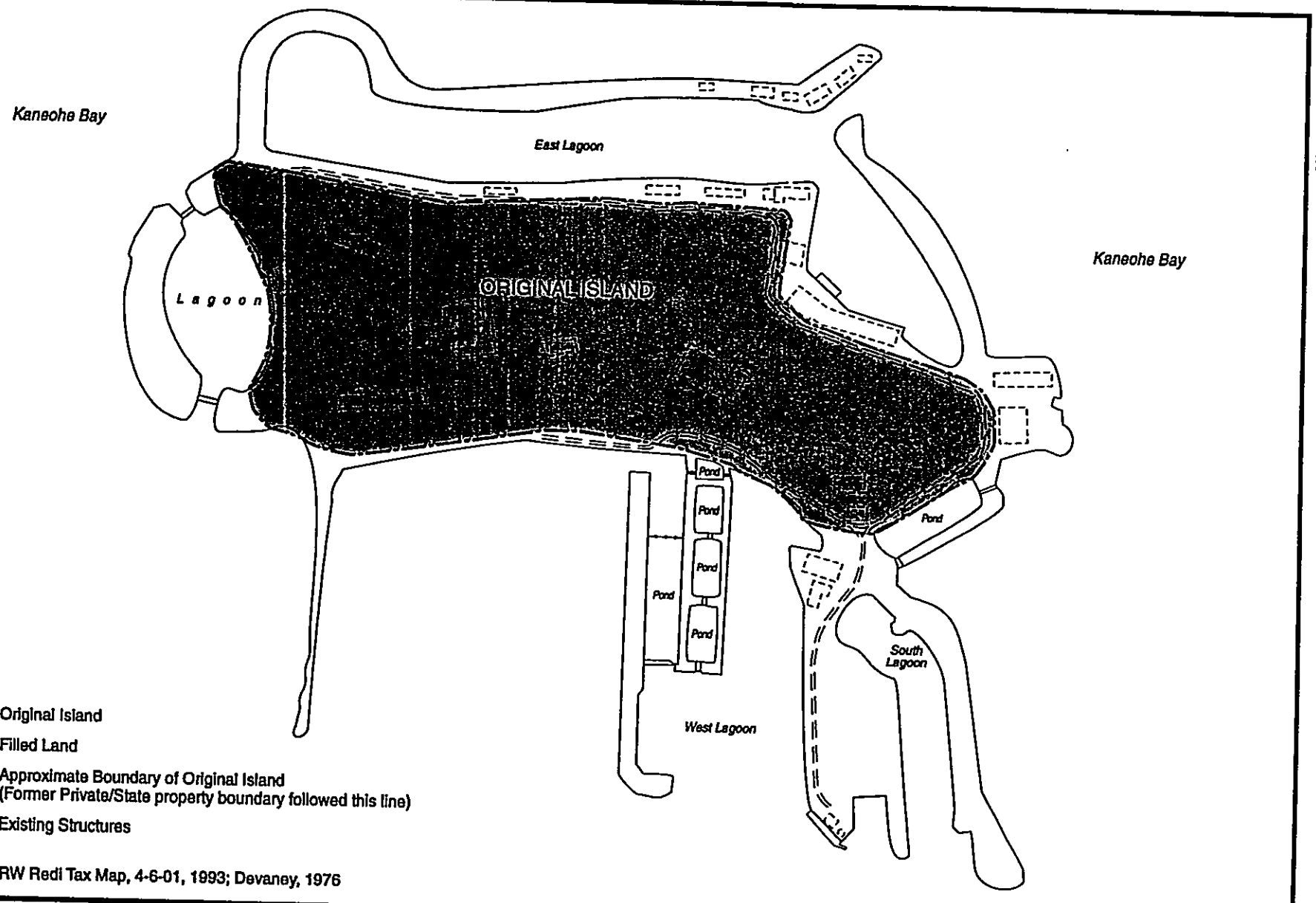

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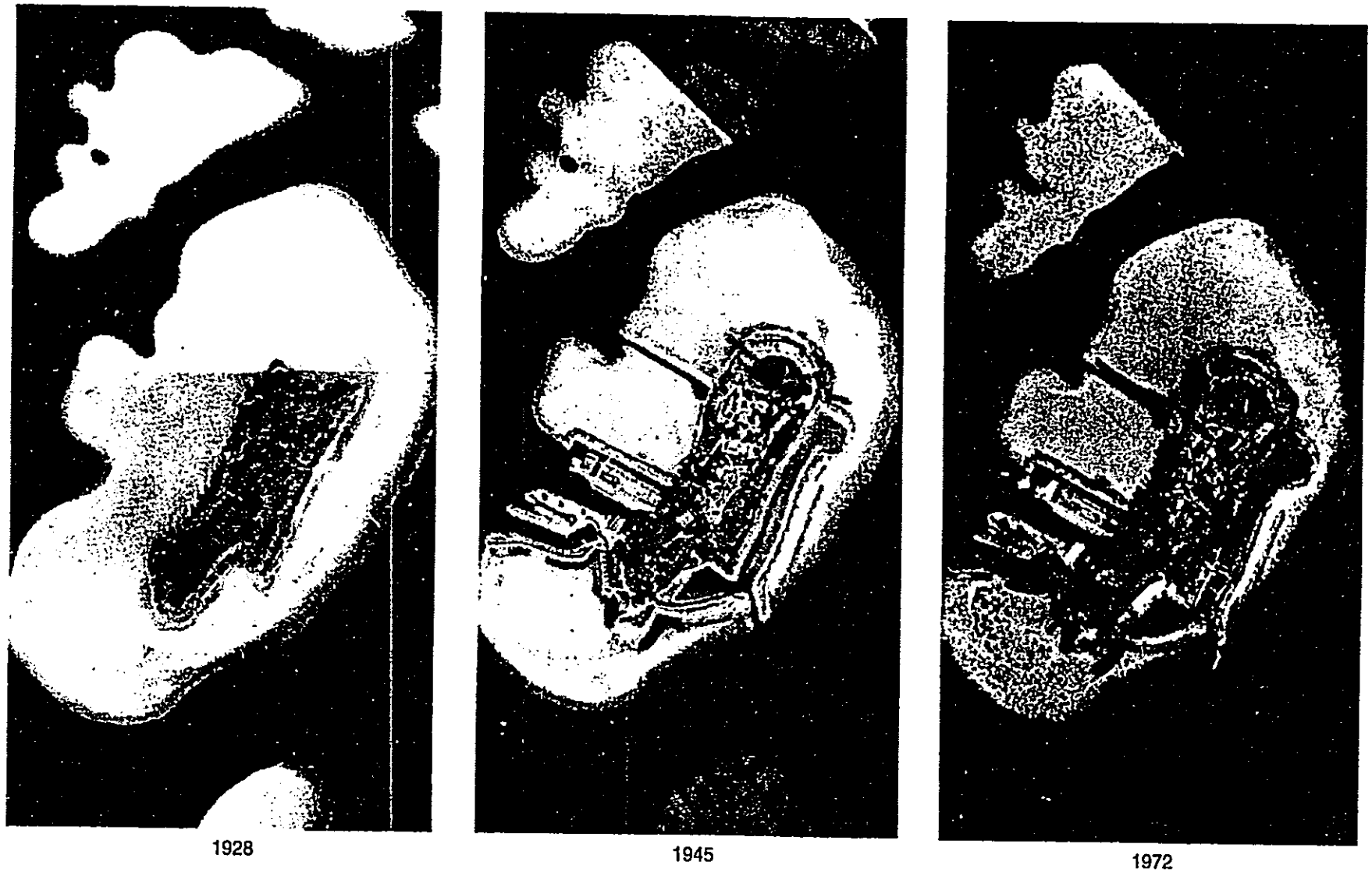
FIGURE 4-1
COCONUT ISLAND PHYSIOGRAPHY



1928 1945 1972

Source: Devaney, Kelly, Lee, Motteler; *Kaneohe, A History of Change*; October 1992

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FIGURE 4-2
AERIAL PHOTO OF COCONUT ISLAND: 1928, 1945 AND 1972

0 400 800
Scale in Feet

North

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4.1.2 Potential Impacts and Mitigation Measures

No impact to the geology or general physiography of the island is expected from the proposed action, and no mitigation measures are necessary. Physical impacts to the specific building sites on the island, however, will be generated and are described in the following sections of this chapter.

4.2 CLIMATE

The climate in the Hawaiian Islands is northern hemispheric, tropical. Climatological characteristics include relatively little variations in air temperature throughout the year and consistent east to west tradewind flow. The moisture content of the lower atmosphere, below the inversion layer, is generally relatively high. Climatological records for the Honolulu Airport indicate that the average monthly air temperatures range from 72.4 degrees Fahrenheit (°F) to 79.4°F, with an annual average temperature of 75.9°F. Prevailing winds are from the east-northeast with an average speed of 11.6 miles per hour (U.S. Weather Bureau, 1967).

The proposed action will be within the windward lowlands, one of seven climatological regions within the state of Hawaii defined by the U.S. Weather Bureau. This region is generally oriented perpendicular to the prevailing tradewinds and is moderately rainy with frequent tradewind showers. Temperature variations are more mild and more uniform than in other areas of the island, and partly cloudy days to cloudy days are common. HIMB has maintained a meteorological monitoring station at Coconut Island since 1984; however, electronic data summaries have only been made available since September 1992. Temperature data, wind data, and precipitation data collected during the period of September 1992 to July 1994 are summarized and presented in Table 4-1.

4.3 SOILS

4.3.1 Existing Conditions

The soils on the island and on the Lilipuna Road property belong to the Alaeloa Series (U.S. Department of Agriculture, Soil Conservation Service, 1972). This soil, which is classified as Alaeloa silty clay (ALF), is found most commonly on slopes ranging from 45 to 53 percent, but sometimes also occurs in rocky areas with slopes of as little as 35 percent. In steep areas, runoff is rapid and erosion hazard is severe if no vegetation exists.

Table 4-1 Summary of Meteorological Conditions at Coconut Island

Month/Year	Average Temperature (Degrees F)	Average Wind Speed (miles/hour)	Predominant Wind Direction	Precipitation (Inches)
9/92	78.8	10.5	NE	5.51
10/92	77.7	8.2	NE	4.93
11/92	75.6	9.9	NE	11.10
12/92	75.2	11.2	E	6.33
1/93	71.1	7.1	SW	1.25
2/93	71.0	9.9	E	1.02
3/93	71.4	11.3	NE	0.61
4/93	73.8	12.9	NE	1.00
5/93	74.1	12.1	NE	1.90
6/93	76.5	12.4	E	0.68
7/93	77.2	11.7	NE	4.78
8/93	78.1	11.1	NE	2.21
9/93	78.3	7.8	NE	2.60
10/93	77.4	9.1	NE	5.47
11/93	74.8	13.0	NE	4.42
12/93	73.2	12.0	NE	1.46
1/94	70.7	8.9	NE	4.36
2/94	72.0	8.5	NE	11.47
3/94	71.8	13.1	NE	6.64
4/94	72.9	13.5	NE	2.84
5/94	74.8	12.5	E	1.15
6/94	76.1	13.3	SE	1.27
7/94	77.5	12.3	SE	1.43

A study done by Ernest K. Hirata & Associates, Inc. (1994) to verify the U.S.D.A. findings described the soil as a mottled brown clayey silt derived from weathered basalt. This clayey silt extends to a depth of at least 13 feet and is underlain by moderately weathered, medium-hard basalt. Although the clayey silt was found to have a slight to moderate expansion potential, its characteristics allow for the site to be developed as planned.

The soil classification types identified above apply only to areas of Coconut Island that are original, and therefore pertain only to the proposed marine laboratory site. The proposed maintenance building and wet laboratory annex will be in areas of fill material dating from the 1930s; this is confirmed by recent soil borings taken in the area (Hirata & Associates, 1994). This fill is a mixture of coral material dredged from the surrounding reef and soil backfill that was either brought to the island in the 1930s or "borrowed" from the original portions of the island.

4.3.2 *Potential Impacts*

Soils on the island will be affected during construction, excavation, and earth moving. Minimal earth work will be required for the proposed maintenance building and wet laboratory annex because they will be sited where there are open level areas or already existing structures. Negligible earth moving will be done near the shoreline. This is unlikely to affect water quality in the lagoons next to the construction, but mitigation measures will be provided if necessary.

The new marine laboratory will require a minimum of excavation work because the foundation will be partially concrete slab on grade and partially post and beam on the slope area. Earth work should involve mostly finish grading of the site. Potential for sedimentation and runoff exists because the marine laboratory site is on the sloped section of the island. Long-term operation of the facility will not affect soil conditions.

4.3.3 Mitigation Measures

The impact to soils will be localized and of limited extent during construction. Measures that will be used to mitigate sedimentation and runoff from the marine laboratory construction site include relandscaping during and upon completion of construction using grasses and other appropriate ground cover plants. Sedimentation basins will also be used to collect and settle runoff and prevent it from entering the adjacent lagoons. Pre-batched concrete will be used, and concrete mixer rinse water will be captured for re-use or treatment. Additional measures as prescribed by the City and County Public Works Department will be undertaken if necessary to mitigate any sedimentation or additional runoff into the lagoon or bay.

4.4 MARINE ENVIRONMENT

A study of the marine environment around Coconut Island and the proposed action's impact on the environment was conducted by Oceanit Laboratories, Inc (July 1995). This section presents the results of this study; the complete report is included in Appendix A.

4.4.1 Existing Conditions

The marine environment of Coconut Island is characterized by its currents, bathymetry, water quality, and marine biology (Oceanit Laboratories, Inc., July 1995). Details of each attribute are described for the marine water environment around the proposed maintenance building and the wet laboratory annex. As presented in Figure 4-3, the lagoon around the wet laboratory annex is identified as the east lagoon (the subsequent report calls it the laboratory lagoon); the lagoon around the maintenance building is the west lagoon (the subsequent report calls it the maintenance lagoon). These east and west lagoon references are used throughout the rest of this section.

4.4.1.1 Currents

East Lagoon

The east lagoon, surrounded by the heavily vegetated peninsula on the east and north and the main island on the west, does not appear to be affected by the northeasterly wind. Figure 4-4 depicts the current patterns (i.e., flood and ebb current) in the lagoon based on data obtained by Oceanit Laboratories, Inc. on August 2, 1994. The flood tidal current shows an inward movement at the mouth of the lagoon; the ebb tidal current shows an outward movement at the mouth. Winds were about ten miles per hour (mph) from the northeast on the day the drogues were released in the east lagoon. The effects of wind were determined to be negligible due to the shelter provided by thick shrubbery growing on the east peninsula and the land mass of Coconut Island on the west side.

The east lagoon is surrounded by two artificial peninsulas, one on the east and one on the south side. The lagoon is connected to the outer water via a 40-foot-wide channel across the peninsula from the proposed wet laboratory annex and via shallow inlets at the north and south extremities of the lagoon. These inlets are open only at high tide.

Water circulation in this lagoon is generally poor, especially at both ends of the lagoon. The current in the southeast end of the lagoon is measured at 0.98 feet per minute (ft/m). The current near the proposed building is measured at 3.06 to 5.86 ft/m.

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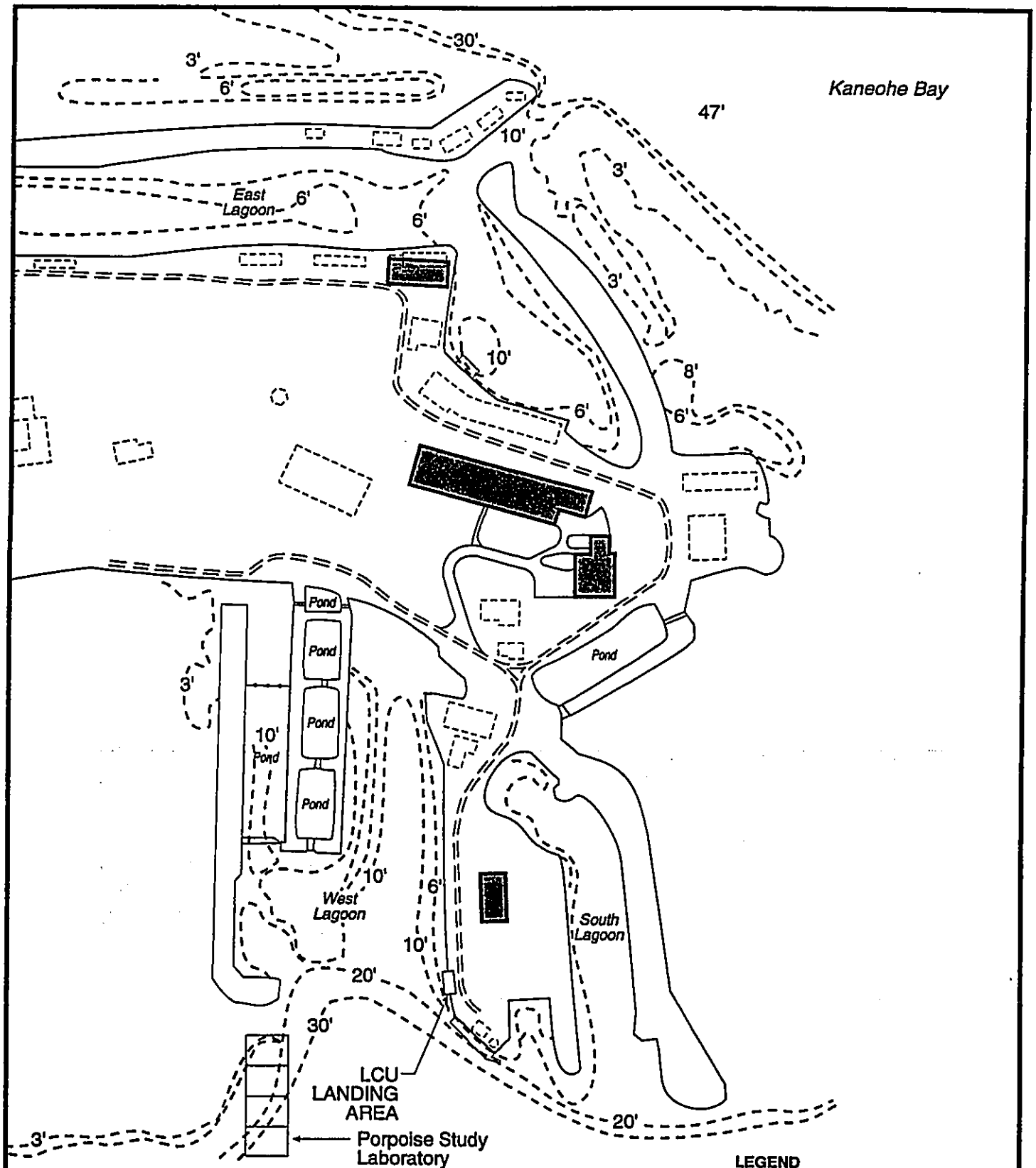

Source: Oceanit Laboratories, Inc., 1995

LEGEND

- - - - Bathymetry Contours in Feet

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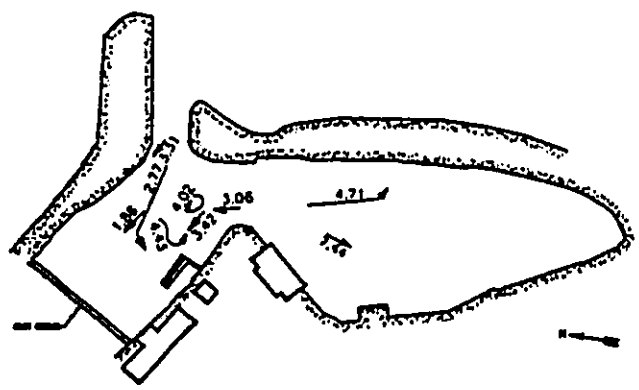
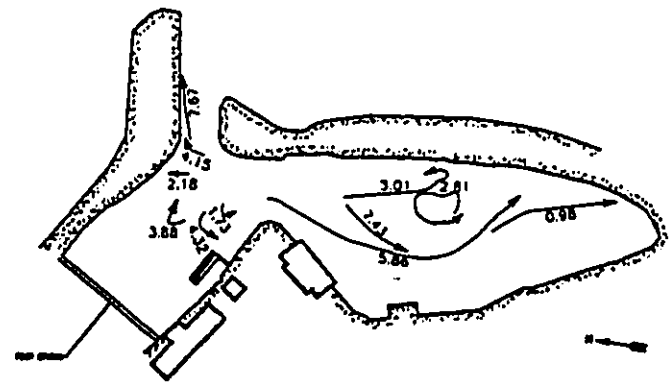
FIGURE 4-3
BATHYMETRY IN EAST AND WEST LAGOONS

0 100 200
Scale in Feet

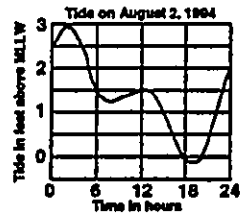
North



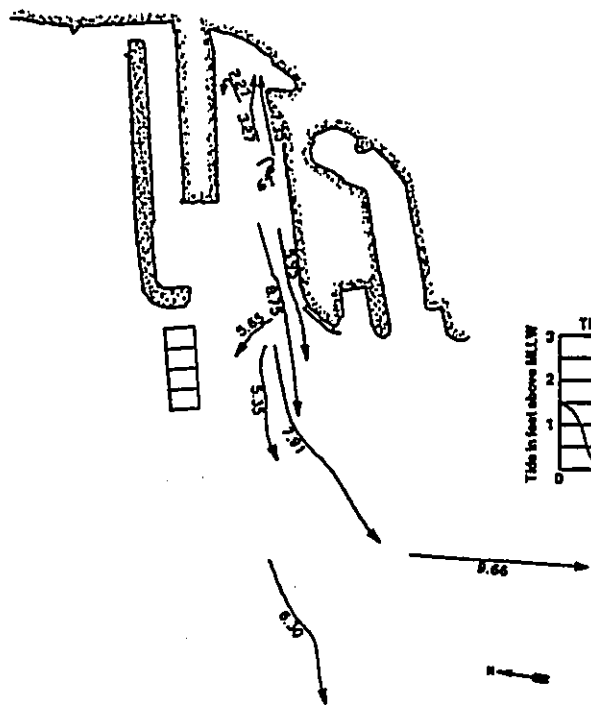
FLOOD TIDAL CURRENT
11:00–14:00

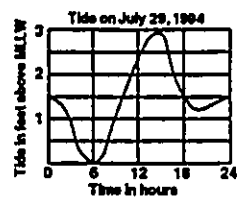


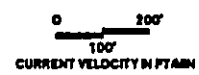
EBB TIDAL CURRENT
14:00–16:30

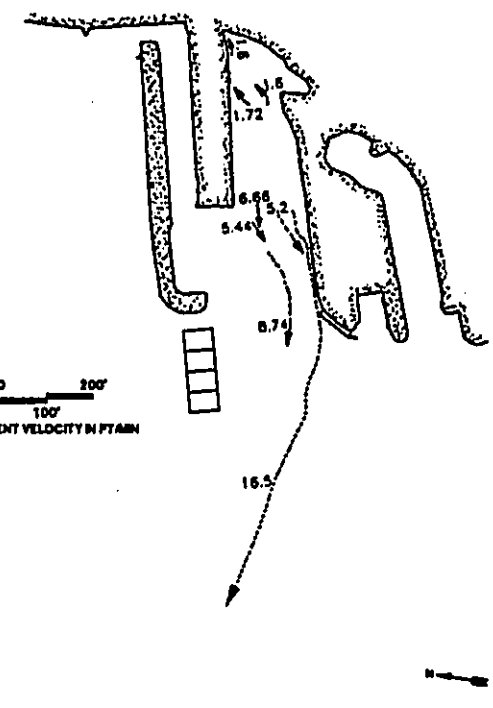


Currents in East Lagoon









FLOOD TIDAL CURRENT
11:00–14:00

EBB TIDAL CURRENT
14:00–16:30

Currents in West Lagoon

Source: Oceanit Laboratories, Inc., 1995

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FIGURE 4-4
CURRENTS IN EAST AND WEST LAGOONS

West Lagoon

The west lagoon, on the west side of the island, is well connected to the surrounding marine environment with a wide opening on the west end. Based on data collected by Oceanit Laboratories, Inc. on July 20, 1994, northeasterly winds at 10 mph may have greater effects at the mouth of the lagoon than near the inside of the lagoon.

As shown in Figure 4-4, the current moves outward at speeds from 5.2 to 16.5 ft/min near the proposed landing area. At the east end of the lagoon, the current moves inward toward the main island at speeds ranging from 1.6 to 7.35 ft/m.

4.4.1.2 Bathymetry

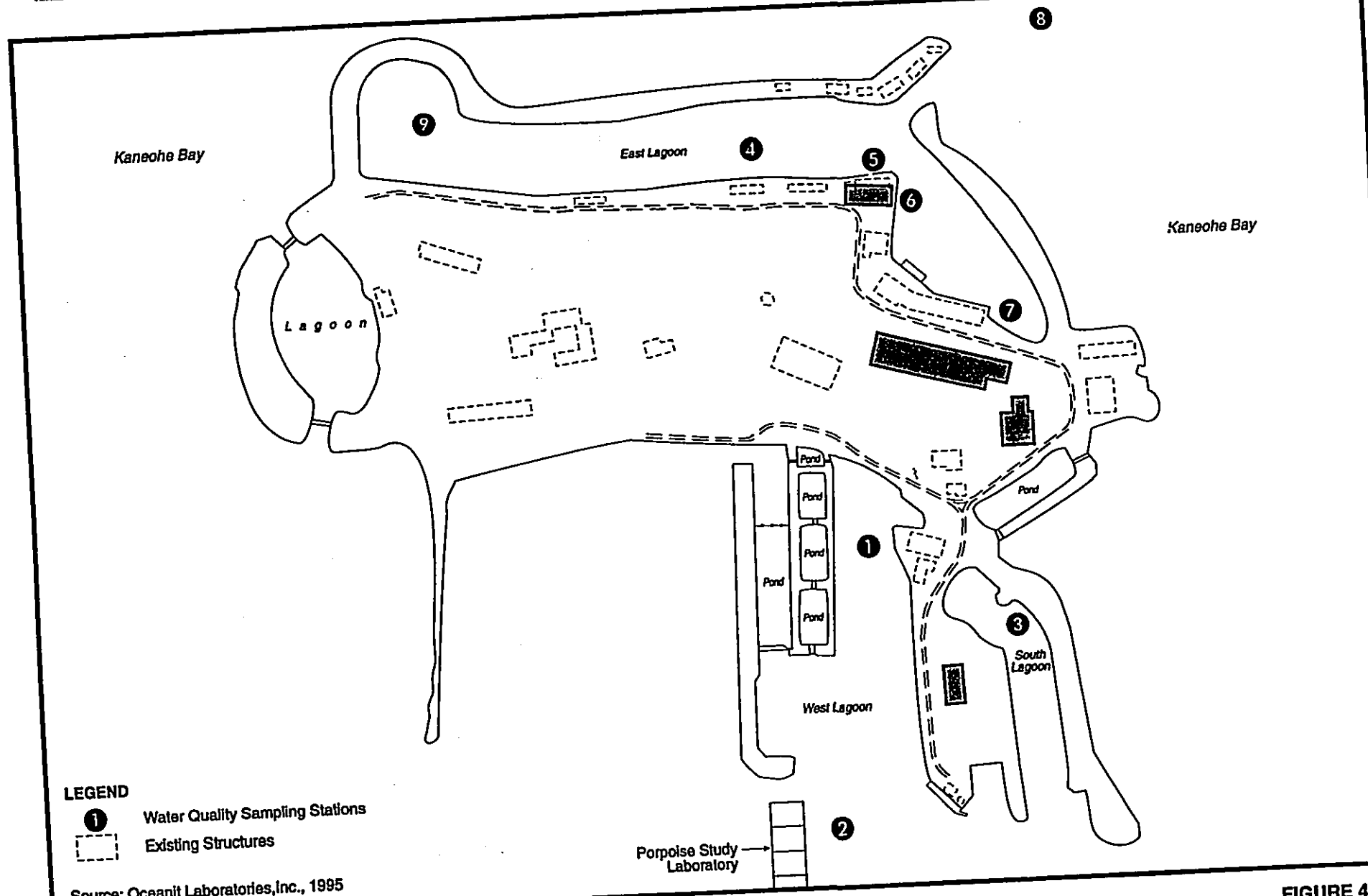
Depths of the east lagoon range from six to 10 feet (see Figure 4-3). The deepest part of the lagoon lies at the south end of the existing administration/laboratory building. The lagoon area around the proposed maintenance building is approximately 6 feet deep.

As shown in Figure 4-3, the west lagoon is generally deeper than the east lagoon, especially at the mouth of the lagoon where depths range from 10 to 30 feet. The depth near the LCU landing area is between 10 and 20 feet.

4.4.1.3 Water Quality

The waters around Coconut Island in Kaneohe Bay are classified as Class AA waters, according to Hawaii Administrative Rules, Chapter 11-54 (DOH, October 1992). Due to rapid urbanization in the watershed, sections of Kaneohe Bay are subject to various nonpoint source pollutants such as sediments, bacteria, nutrients, heavy metals, and hydrocarbons. Shoreline waters frequently exceed water quality standards for turbidity, fecal coliform, phosphorus, and nitrogen (DOH, 1990, and Lai, 1991). Without additional action to control nonpoint sources of pollution, Kaneohe Bay water cannot reasonably attain or maintain the objectives of Class AA water "to remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions" (HAR, Chapter 11-54). The bay is identified as a Water Quality-Limited Segment for which urban runoff continues to be the major source of pollution resulting in noncompliance with Class AA water quality standards.

To establish the baseline water quality data in the immediate waters around the two proposed buildings, Oceanit Laboratories, Inc. (July 1995) sampled at nine locations around the two lagoons as shown in Figure 4-5. A summary of the water quality test results is presented in Table 4-2.



LEGEND

1 Water Quality Sampling Stations

Existing Structures

Source: Oceanit Laboratories,Inc., 1995

FIGURE 4-5
MARINE WATER QUALITY STUDY

0 130 260
Scale in Feet

North

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Table 4-2 Water Quality and Nutrient Data

Station	Geometric Mean Values				Nutrient Data			
	Temp °C	pH (Units)	Salinity (ppt)	DO (mg/l)	Turbidity (NTU)	TN (µg/l)	TP(µg/l)	Chl. a (µg/l)
Maintenance Lagoon								
1-Surface	27.38	7.98	34.6	5.72	0.73[1]	186[1]	17	0.61[1]
1-Bottom	27.00	8.11	34.3	5.28	1.46[1]	154[1]	18	0.68[1]
2-Surface	26.57	8.19	33.7	5.99	0.65[1]	144	17	0.60[1]
3-Surface	27.11	8.16	34.3	5.77	1.49[1]	154[1]	16	0.91[1]
Laboratory Lagoon								
4-Surface	27.34	8.08	34.2	6.10	0.95[1]	168[1]	19	1.14[1]
5-Surface	26.92	8.10	32.4	5.69	1.22[1]	189[1]	18	0.77[1]
6-Surface	27.00	8.09	32.5	5.68	—	—	—	—
6-Bottom	26.80	8.17	33.9	6.77	0.99[1]	158[1]	11	1.31[1]
7-Surface	26.33	8.01	32.5	4.70	1.37[1]	231[1,2]	22[1]	1.92[1,2]
8-Surface	26.81	8.20	34.2	6.16	2.44[1,2]	151[1]	10	0.86[1]
9-Surface	27.06	8.07	34.4	4.84	1.24[1]	N/A	N/A	N/A
DOH Dry Criteria					0.40	150	20	0.50
DOH Wet Criteria					1.50	200	25	1.50

Note:
DO = dissolved oxygen
TN = total nitrogen
TP = total phosphorous
Chl. a = chlorophyll a
ppt = parts per thousand
mg/l = milligrams per liter
µg/l = micrograms per liter
NTU = nephelometric turbidity units
1 = exceeds dry standard
2 = exceeds wet standard

DOH Dry Criteria When the average fresh water inflow from the land is less than one percent of the embayment volume per day.

DOH Wet Criteria When the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day.

Sources: Oceanit Laboratories, Inc., July 1995; HAR Chapter 11-54, October 1992.

East Lagoon

Five locations were sampled within the east lagoon (see Figure 4-5). Locations five and six were the nearest to the proposed building construction of the wet laboratory annex. The sample at Location 6 was taken at the bottom of the water column. Other locations were only sampled at the surface.

Water temperature ranged from 79.4°F to 81.2°F. Water pH ranged from 8.01 to 8.20. Lower salinities were recorded at stations 5, 6, and 7, where laboratory saltwater effluent is discharged. Dissolved oxygen levels ranged from 4.70 to 6.16 milligrams per liter (mg/l). Turbidity, which is a function of activity in the water and is measured by the intensity of scattered light in the water, can vary greatly with rainfall. Turbidity measurements ranged from 0.6 Nephelometric Turbidity Units (NTU) to 2.44 NTU.

Except for Station 7, which experienced exceedance of wet water quality standards for total nitrogen and Chlorophyll a, the stations were in general compliance with the wet standards, which apply when the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day. The exceedance at Station 7 may indicate the effect from the existing laboratory effluent discharged at that location, causing varying levels of nutrients in nearby waters.

West Lagoon

In the west lagoon, two locations were sampled—one near the old boat house, the other at the opening to the bay (see Figure 4-5). The temperature, pH, salinity, turbidity, and nutrient levels were in general compliance with wet standards for Class AA waters established in Chapter 11-54 (see Table 4-2).

4.4.1.4 Marine Biology

In the past, Kaneohe Bay teemed with marine life. Fish were raised in numerous fish ponds along the shoreline. Edible seaweeds were plentiful. Fish and crustaceans could be caught on the numerous reef flats of the bay (DOH, 1990). The bay is still an important source of *nehu* (tuna bait fish).

The reefs around Coconut Island were surveyed in July 1994 to establish baseline biological resources. Two transects were laid across the proposed seawalls: one within the east lagoon; the other within the west lagoon (Figure 4-6). The survey results are presented in Table 4-3.

Table 4-3 Biological Survey Results

SPECIES	LABORATORY [A]	B	MAINTENANCE [C]	D
FISH				
Abudefduf abdominalis	1	x	0	x
Cirripectes vanderbilti	1	x	0	x
Dascyllus albisella	2	x	0	x
Stolephorous purpureus	100	x	0	x
Acanthurus sp.	0	x	0	
Mulloides flavolineatus	0	x	0	x
Scarus perspicillatus	0	x	0	
Sphyraena barracuda	0	x	0	
Zanclus cornutus	0	x	0	x
Zebrasoma flavescens	0	x	0	x
Mugil cephalus	0	x	0	
Chaetodon miliaris	0	x	0	
C. lunula	0	x	0	
C. ephippium	1	x	0	
CORALS				
Porites compressa	common	x	dominant	x
Pocillipora damicornis	rare	x	rare	x
Montipora verrucosa	common	x	rare	x
INVERTEBRATES				
Ophiodesoma spectabilis	18	x	7	x
Ostrea hanleyana	NQ	x	NQ	x
Palythoa vestitus	NQ	x	0	
Sabellastarte sanctijosephi	57/18 m^2	x	17/12 m^2	x
Zoanthus sp.	NQ	x	0	
ALGAE				
Dictyospheria cavernosa	NQ	x	NQ	x
Dictyota acutiloba	NQ	x	0	
Dictyota bartayresii	NQ	x	0	
Hypnea sp.	NQ	x	0	
Padina australis	NQ	x	NQ	x
Acanthophora spicifera	NQ	x	NQ	x
Gracilaria salicornia	NQ		NQ	x

[A] and [C] represent species within the transect boundaries.
[B] and [D] indicate qualitative presence of species noted in or near the transect.
NQ Present but not quantified within transect.

Source: Oceanit Laboratories, Inc. July 1995. Marine Environmental Assessment for the Proposed Marine Laboratory and Support Facilities. Prepared for Kajioka Okada Yamachi Architects.

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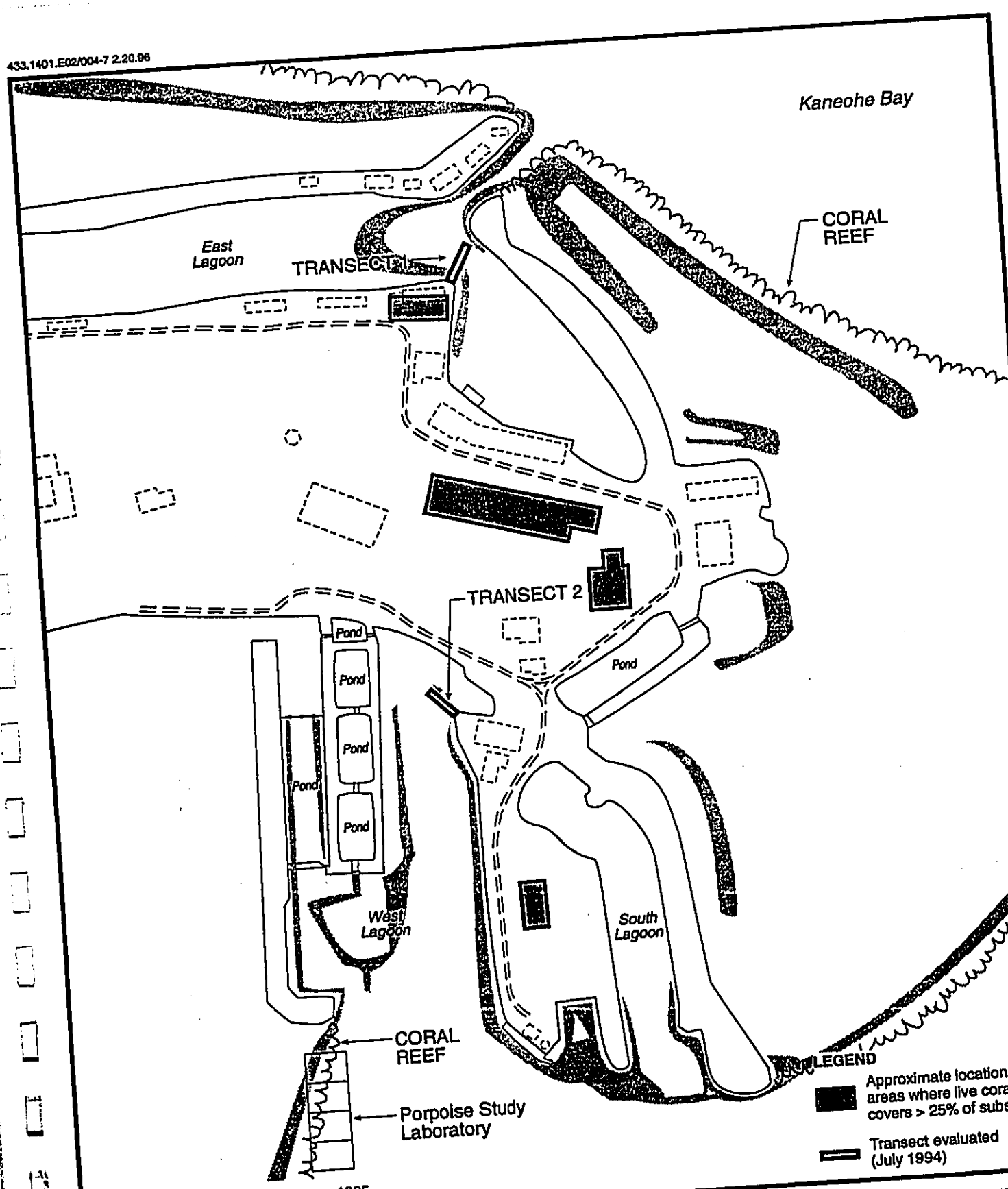

Source: Oceanit Laboratories, Inc., 1995

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FIGURE 4-6
CORAL REEF AND TRANSECT LOCATIONS

In general, live corals such as *Prorites compressa* and *Montipora verrucosa* cover a band around the island as shown in Figure 4-6. Fish, invertebrates, and algae are also found around the island. Though not encountered during the survey, the threatened green sea turtle *(Chelonia mydas)* is known to enter the bay waters and, on infrequent occasions, the lagoons (Oceanit, 1995). No known nesting sites of the green sea turtle were found in the lagoons. Marine mammals protected under the Marine Mammal Protection Act, such as monk seals and whales, are unlikely to be found in the bay waters and are not usually known to enter the confines of either lagoon. Although sightings of monk seals in Kaneohe Bay occurred in December of 1994 and March and April of 1995, no sightings were made before these dates. The presence of these seals may be the result of recent capture and release programs, and not a normal migratory pattern. Coconut Island is not known to be a natural habitat for the monk seal.

Fish, coral, invertebrates, and algae were found around the island and in both lagoons. Corals were abundant on the bottom of both lagoons near the proposed building sites. Bay oysters, sea worms, carpet anemones, sponges, and 14 species of fish were also encountered in the east lagoon. The west lagoon has similar diversity but much less abundance, i.e., fewer filter feeders, large fish, and sea worms. A porpoise laboratory containing several dolphins for experimentation is also at the entrance of the west lagoon across from the LCU landing site.

4.4.2 Potential Impacts and Mitigation Measures

The marine environment will be affected by marine transportation to and from Coconut Island and by the proposed expansion on the island. Impacts from marine transportation are discussed in Section 6.1.

Analyses of Coconut Island lagoons' physical, chemical, and biological environment show the lagoons have no major environmental problems and, based on the details on the proposed action, are not expected to develop long-term impacts. The physical, chemical, and biological factors that influence the lagoons were evaluated by both field and analytical work. While these studies were not comprehensive, results were sufficient to make both qualitative and limited quantitative estimates of the effects from proposed development activity.

4.4.2.1 Short-Term Construction Impacts and Mitigation Measures

Construction activities that are expected to directly affect the lagoons include the grounding and/or anchoring of the LCU and potential discharge of construction debris.

Construction Landing Sites

The LCU is approximately 115 feet long, 30 feet wide, and when fully loaded, has a draft of three feet at the bow and four feet at the stern. It has a cargo capacity of 150 long tons (165.9 metric tons). As discussed in Section 3.5, several potential sites for landing the craft have been considered within the west lagoon. Factors such as wind direction, tidal fluctuation, slope of the landing site, and presence of coral reefs were considered. The preferred location is approximately 80 feet west of the proposed maintenance building site.

Shoreline modification required at this site is minimal. The LCU will not likely affect the coral habitat at its landing site because the coral reef at this site is far below the water surface and will not be in contact with the bottom of the LCU. However, small turbidity plumes may be created near the docking site. The dolphin labs are at the opposite side of the lagoon from the docking site and are not expected to be impacted by the LCU landing operations. The marine mammal research staff will be notified when the LCU will be in operation in the lagoon and will be immediately notified if any release of petroleum or other chemical occurs into the west lagoon. Coral heads may be moved if LCU operations threaten the coral habitat. Accidental discharges of construction materials into the lagoon will be minimized by using proper containment for the construction materials on the LCU. These and other mitigation measures for which the contractor is responsible will be included in the construction specifications.

On-Island Materials Storage and Transport

Construction materials will be temporarily stockpiled in the following areas on Coconut Island (see Figure 4-7):

- an area inland from the LCU landing site,
- an area next to the proposed marine laboratory facility on the hill, and
- an area between the proposed wet laboratory annex and existing maintenance building.

The areas identified above are generally flat and located away from the marine environment; therefore, berms or other containment will be easily built to minimize impacts from stormwater runoff. The storage areas will be cleaned on a regular basis to ensure the effectiveness of the berms and to prevent over-accumulation of construction debris.

A new road to the proposed marine laboratory facility will be graded and stabilized for transportation of construction materials. Soil tests have been conducted and construction techniques, such as compacting, matting, and hydroseeding, will be used to stabilize the slope. Runoff from the access road will flow into sedimentation basins so that no

increase in runoff to the adjacent lagoons will result. Use of only designated roads will minimize ground disturbance impacts resulting from mobilizing construction equipment, and will protect the marine environment from being affected by sediment runoff.

The existing dirt road around the south end of the island will be temporarily improved and used for construction of the new wet laboratory building. The road will not be widened. A portion of this road bordering the "south-end pond" will be built up with a suitable aggregate to allow equipment to traverse this leg of the road where sewer lines may be damaged. A compatible non-toxic soil stabilizer will be used on the other segments of the road that are susceptible to muddy conditions. The extent of stabilization could occur from the old boat house to the wet laboratory site. If the existing road condition becomes too much of an adversity, an existing driveway around the far north end of the island may be used as an alternative.

The south-end dirt road will not be impacted by the larger, heavier equipment which will be used for construction of the main laboratory. Rather, small, lightweight construction equipment is expected to be employed in the construction of the wet laboratory building, thus reducing the impact on the dirt road. The contractor will ultimately determine the type of equipment to be used for construction and decide if the access road will require support next to the "south-end pond." It should be noted that the contractor will be liable for any damage to the road or adjacent pond.

Indirect construction-related impacts include siltation by runoff from unprotected ground, accidental fuel spills from gas or oil-driven equipment, and settlement of airborne fugitive dust on the lagoons' surface. These will be mitigated by minimizing unprotected ground, maintaining construction equipment regularly, constructing berms around the fuel and lubricant storage areas, placing liquids and cement storage far from the shoreline, and implementing rigid dust control measures.

After construction impacts dissipate, the LCU landing area will be restored to its previous state. The lagoons will continue to support a variety of fish, invertebrates, and filter feeding biota.

4.4.2.2 Long-Term Impacts and Mitigation Measures

The steel framing for the building will be coated to resist corrosion and the exterior paint for the building walls will be non-toxic. The new laboratory roof will consist of aluminum panels with shop pre-coated fluoropolymer coating, Kynar 500. Finishes on the roof material will not contain substances, such as heavy metals, which can harm human health and the environment.

Indirect impacts from operation of the marine laboratory facility are primarily associated with the increased number of researchers and increased academic and research activities. As a result, an increase in long-term boat traffic in and out of the east lagoon is anticipated. The demand for transfer and storage of chemicals, transfer of petroleum products, and disposal of waste materials will be increased. The potential impacts include accidental spills of chemicals, waste materials, and petroleum products. Accidental spills will be minimized by using experienced transporters who provide proper containment and handling during transport and storage. The contractor will be required to have a spill prevention and control plan for releases during transportation or use on-island. Spill containment and sorption materials will be available on-site for a maximum forseeable release.

HIMB will continue to discharge saltwater effluent from the research tanks into the east lagoon at the proposed wet laboratory annex site. Although the amount of nutrients added to the aquaculture tanks is not excessive, the combination of nutrients from fish food and fish excreta from the tanks may be contributing to varying levels of nutrients in the lagoon at the discharge point. Detrimental effects from this discharge have not been noted in water quality evaluations. For many years, HIMB has pumped a steady 350 gallons per hour of seawater to serve their Coconut Island facility. Varying amounts of this water are used for experimental purposes, depending on the programs being served. What is not used for research purposes goes out the overflow of the header tank and is returned to the lagoon. Most of the time, between 50 and 75 percent is used; only rarely is it all used. The volume of water used by the new wet laboratory will remain at similar levels as the volume used in the existing tank shelter that it replaces. Therefore, the overall usage and discharge will not increase.

An existing sump near this area will be used to prevent the release of alien larval species into the lagoon waters. The well is four feet in diameter and six feet deep, with a two-foot layer of sand on the bottom. The sand layer traps the larvae and drains saltwater back into the lagoon via a four-inch PVC pipe. Operation of the new building will not increase the discharge flow and will not increase the impact on water quality. Therefore, no mitigation measures will be required.

4.5 AIR QUALITY

The proposed action will result in gaseous and particulate emissions escaping into the surrounding atmosphere during both construction and long-term operation of the proposed facility. To address air quality concerns, existing meteorological and air quality conditions, potential air quality impacts, and mitigation measures were evaluated.

4.5.1 Existing Conditions

Because of the consistent and strong tradewinds that act to readily disperse air pollutants, the State of Hawaii experiences good air quality. One of the most impacted air quality monitoring stations in the state, downtown Honolulu, has air pollutant concentrations that are generally compliant with established state and federal ambient air quality standards (AAQS) (Table 4-4).

Air pollutant concentrations measured at the downtown Honolulu monitoring station are provided in Table 4-5. These data show that the one carbon monoxide (CO) standard has been exceeded in the six-year period (1988–1993). While the downtown Honolulu monitoring station is expected to be of significantly lesser quality than the air quality at the proposed action site, it has been used to monitor many of the criteria pollutants and can be used to infer the current condition of state-wide air quality.

The nearest air quality monitoring station to the proposed HIMB project site is the Waimanalo station, located at 41-1069 Kalanianaole Highway. This station is the only site on the windward side of Oahu. Only PM-10 (particulate matter equal to or less than 10 microns in diameter) has been measured at this station. Table 4-6 presents the last five years (1989-1993) of available PM-10 data for Waimanalo. Based on data collected at the Waimanalo station, PM-10 concentrations meet PM-10 AAQS. Although these concentrations are compliant with state and federal AAQS, it should be noted that PM-10 concentrations at the proposed action site are expected to be even less than those measured at the Waimanalo monitoring station, as fewer mobile and stationary source emissions impact the project site.

4.5.2 Potential Impacts

Potential air quality impacts will depend upon the types of operation occurring on Coconut Island. Since the types of operation are expected to vary significantly between the construction and operational phases of the project, potential air quality impacts are discussed by phase and are presented in the following sections.

4.5.2.1 Construction Impacts

Construction impacts are short-term and temporary in nature. If mitigation measures are not provided, significant airborne emissions could include fugitive dusts (resulting in PM-10 emissions). Emissions of asbestos and lead could also occur, without proper mitigation measures, because of demolition activities. Emissions consisting of oxides of sulfur (SO_x), oxides of nitrogen (NO_x), CO, and PM-10 are expected from the combustion of fossil fuels used to power construction equipment, the LCU, and commuter vehicles.

Table 4-4 Summary of State of Hawaii and Federal Ambient Air Quality Standards

POLLUTANTS	SAMPLING PERIOD	FEDERAL PRIMARY STANDARDS $\mu g/m^3$ (ppm)	FEDERAL SECONDARY STANDARDS $\mu g/m^3$ (ppm)	STATE STANDARDS $\mu g/m^3$ (ppm)
Total Suspended Particulate Matter (TSP)	Annual Geometric Mean			60
	Maximum Average in Any 24 Hours			150
Particulate Matter Less Than 10 Microns in Diameter (PM-10)	Annual	50	50	
	Maximum Average in Any 24 Hours	150	150	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	80 (0.03)		80 (0.03)
	Maximum Average in Any 24 Hours	365 (0.14)		365 (0.14)
	Maximum Average in Any 3 Hours		1,300 (0.5)	1,300 (0.5)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	100 (0.053)	100 (0.053)	70 (0.037)
Carbon Monoxide (CO)	Maximum Average in Any 8 Hours	10,000 (9)		5,000 (4.5)
	Maximum Average in Any 1 Hour	40,000 (35)		10,000 (9)
Photochemical Oxidants (O_3)	Maximum Average in Any 1 Hour	235 (0.12)	235 (0.12)	100 (0.05)
Hydrogen Sulfide (H_2S)	Maximum Average in Any 1 Hour			35 (0.025)
Lead (Pb)	Maximum Average in Any Calendar Quarter	1.5	1.5	1.5

Note: $\mu g/m^3$ = micrograms per cubic meter of air
ppm = parts per million

Source Hawaii Administrative Rules, Title 11, Chapter 11-59 (June 1992); U.S. Government. 40 CFR, Pt. 50, National Primary and Secondary Ambient Air Quality Standards (July 1991)

Table 4-5 Air Quality Monitoring Data Downtown Honolulu—1988-1993

TYPE OF DATA	1988			1989			1990			1991			1992			1993		
	PM ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)	Pm ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)	Pm ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)	Pm ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)	Pm ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)	Pm ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)
Sampling Period	24-hr	24-hr	1-hr	24-hr	24-hr	1-hr	24-hr	24-hr	1-hr	24-hr	24-hr	1-hr	24-hr	24-hr	1-hr	24-hr	24-hr	1-hr
Number of Samples	59	50	328	59	52	323	53	60	362	NA	NA	NA	NA	NA	NA	NA	NA	NA
Range of Concentrations ($\mu g/m3$)	15-45	<5-5	0.2-10.3	16-48	<5-8	0.3-9.7	13-47	<5-<5	0.1-7.1	21-38*	<5*	1.0-2.9*	22-34*	0-2*	1.0-2.6*	15-28*	0-3*	1.0-2.5*
Arithmetic Average ($\mu g/m3$)	26	<5	1.7	29	<5	1.9	30	<5	1.5	30	<5	1.7	28	1	1.6	21	2	1.8
Number of Days State AAQS Exceeded	0	0	1	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = not available
$\mu g/m^3$ = micrograms per cubic meter
AAQS = Ambient Air Quality Standards
mg/m^3 = milligrams per cubic meter of air

PM = particular matter (or total suspended particulates)
SO_2 = sulfur oxides
CO = Carbon Monoxide

* Range based on monthly averages

Source: State of Hawaii Department of Health, Clean Air Branch, *Hawaii Air Quality Data, January 1988 - December 1990*, (DOH) and subsequent annual summaries provided by DOH for the years 1991 through 1993.

Table 4-6 PM-10 Concentrations 1989–1993 (Waimanalo, Oahu, Hawaii)

	1989	1990	1991	1992	1993
Range of 24-Hour Average Concentrations ($\mu g/m^3$)	10-57	6-35	11-27*	12-21*	12-32*
Arithmetic Average ($\mu g/m^3$)	20	15	17	17	17
Number of Days State AAQS Exceeded for PM-10	0	0	0	0	0

PM-10 = Particulate matter equal to or less than 10 microns in diameter

* Data for 24-hour average concentrations not available; data presented are monthly averages based on 24-hour averaged concentrations.

Source: State of Hawaii Department of Health, Clean Air Branch, *Hawaii Air Quality Data, January 1988 - December 1990*, (DOH) and subsequent annual summaries provided by DOH for the years 1991 through 1993.

Fugitive dust emissions are expected to result from earth-moving, cement-mixing activities, and vehicular travel in construction areas. HAR Section 11-60.1-33 prohibits the generation of fugitive dusts without taking reasonable precautions to limit these emissions. As a result, significant fugitive dust generating activities will be minimized through mitigation measures identified in Section 4.5.3.

In accordance with 40 CFR Part 61, Subpart M (National Emission Standard for Asbestos), a building inspection will be performed to determine if asbestos is present before demolition. If asbestos is determined to be present, an Asbestos Demolition/ Renovation notification will be filed with the Department of Health at least ten working days before demolition of the building. All regulated quantities and types of asbestos-containing materials will be subject to specific emission controls, collection procedures, containment procedures, and disposal, as specified by this regulation.

Due to the age of the buildings to be demolished, lead-based paint could be present. A building inspection will be conducted by the contractor before demolition to determine if lead-based paint is present. Demolition of surfaces coated with lead-based paints will be done by appropriately trained workers according to applicable safety requirements identified in Section 4.5.3. Dust control precautions will be carried out during demolition work to minimize the potential of particles of paint being released during demolition.

The operation of construction-related equipment will result in emissions from the combustion of fossil fuels, specifically diesel. Based upon the type of equipment and number planned for use, emissions of NO_x, SO_x, CO, and PM-10 have been estimated on a daily and annual basis and are provided in Appendix B. Information on equipment type and numbers were provided by the project architects. Emission factors used to estimate emissions were based on U.S. Environmental Protection Agency (EPA) data unless otherwise noted.

No levels of significance have been established for construction equipment exhaust. Using stationary source levels of criteria for major sources, construction-related emissions are not expected to be significant (a major stationary source is one that emits 100 tons per year or more of a criteria pollutant). Based on the emissions per year presented in Appendix B, the construction equipment emissions fall well below these criteria levels.

Besides emissions resulting from the combustion of fossil fuels from construction equipment, vehicular emissions will also occur from commuting construction workers. Based on the expectation that approximately 20–30 construction workers will be needed at the proposed site, the number of additional vehicles used by these construction workers was estimated to be 20–30. Emissions resulting from commuting construction workers' vehicles will not occur on Coconut Island, but will be added to the regional

loading of airborne emissions, as commuters will begin their trip from anywhere on the island of Oahu and will travel to a central pick-up point in Kaneohe (where construction workers will then be shuttled to and from the Lilipuna Pier). Because the additional impact on regional emissions is small (a maximum of 30 additional vehicles) and is not expected to result in significant localized or regional air quality impacts, these emissions have not been quantified.

4.5.2.2 Operation Impacts

Operational impacts should be assumed to be long-term because they are expected to occur over the lifetime of the facility. Several sources of operational air emissions have been identified and include the following:

- Laboratory hood exhaust;
- Emergency stand-by generator; and
- *Vehicular emissions from employees.*

Based on the materials expected to be used in the proposed laboratory, small quantities of hazardous air pollutants (as defined by HAR Chapter 11-60.1-172) may be present. Airborne releases of the materials are expected to occur throughout the laboratory, but primarily under the laboratory hoods. A listing of the chemicals expected to be used in the proposed laboratory and their expected rate of use is provided in Table 4-7. In addition, those materials considered hazardous air pollutants (HAP), per HAR 11-60.1, are noted.

As listed in Table 4-7, the quantities of potentially hazardous material and radioactive isotopes are small. To further minimize emissions of these materials, laboratory hoods equipped with air pollution controls will be provided. These hoods and their associated air pollution controls are discussed in Section 4.5.3.

One emergency stand-by generator is planned for the proposed laboratory. Emissions from this source will be characteristic of the combustion of fossil fuels, as described in previous sections. Emissions from this source will be minimal as it will be used for emergency and maintenance uses only. No mitigation for this source is needed or planned.

Additional airborne emissions will result from the vehicles used by possible additional employees at the proposed site. However, because only ten additional people may be employed, resulting in a worst-case scenario of ten additional vehicles (plus one van to shuttle employees from a central pick-up area in Kaneohe to the Lilipuna Pier), the air quality impact from these vehicular sources is expected to be minimal with respect to localized impacts and negligible with respect to the regional loading of air pollutants.

Table 4-7 Hazardous Materials Proposed for Use in New Laboratory Building (Flammable, Toxic, Reactive, Corrosive, and Radioactive Substances)

Item/Substance	HAP** (Y/N)	Estimated Quantity/mo.	Use/Storage Requirements
FLAMMABLES			
Acetone	NO	3 liters	Storage in secure/fireproof locker
Butyl alcohol	NO	0.5 liters	Storage in secure/fireproof locker
Chloroform	YES	4 liters	Storage in explosion proof refrigerator
Diethyl ether	NO	2 liters	Storage in explosion proof refrigerator
Ethyl alcohol*	NO	15 liters	Storage in secure, fireproof, metal locker
Isopropanol	NO	0.2 liters	Storage in secure, fireproof, metal locker
Methyl alcohol	YES	3 liters	Storage in secure, fireproof, metal locker
Scintillation cocktail	***	2 liters	Storage in secure, fireproof, metal locker
Toluene	YES	0.5 liters	Small quantity in metal cabinet in hood; Use in hood
Xylene	YES	1 liter	Storage and use in hood
RADIOISOTOPES			
Calcium^{45}*	YES	3.0 millicurie	Secure storage
Carbon^{14}*	YES	2.0 millicurie	Secure storage
Iodine^{125}*	YES	3.0 millicurie	Storage in designated refrigerator or freezer in locked room
Phosphorus^{32}*	YES	1.0 millicurie	Secure storage
Sulfur^{35}*	YES	0.5 millicurie	Secure storage
Tritium (H^3)*	YES	600 millicurie	Labeled storage in designated refrigerator or freezer in locked room
COMPRESSED GASSES			
Oxygen (mixed) (95%-5% O_2/CO_2)	NO	1 cylinder	Storage as per established safety procedures
Helium	NO	0.2 cylinders	Storage as per established safety procedures
Nitrogen	NO	0.8 cylinder	Storage as per established safety procedures
Oxygen (Industrial grade)	NO	6 cylinders	Storage as per established safety procedures
REACTIVE AND CORROSIVE SUBSTANCES			
Acetic acid	NO	1 liter	Stored in locked, fireproof enclosure
Hydrochloric acid	YES	3 liters	Stored in locked, fireproof enclosure
Sodium hydroxide (pellets)	NO	20 grams	Stored in locked, fireproof enclosure
Sulfuric acid	NO	1 liter	Stored in locked, fireproof enclosure
OTHER			
Class 3 non-narcotics (i.e., methyltestosterone)*	NO	1.0 millimole	Kept in locked safe in locked room with alarm
Sodium barbitol*	NO	20 grams	Kept in locked safe in locked room with alarm

Note:
* Designates a controlled substance
** HAP Hazardous Air Pollutant as defined by HAR 11-60.1
*** Contents Unknown

General Note: Types and quantities of materials listed in this table are estimates based on materials used in research in other biotechnology research laboratories in the United States. The actual use of various hazardous materials will depend on the experiments conducted and the individual researcher.

Source: Letter from Philip Helfrich of HIMB to Douglas Allen of Kajioka, Okada and Yamach, dated August 26, 1994.

4.5.3 Mitigation Measures

Mitigation measures will be employed to control fugitive dust emissions, contain asbestos emissions, and minimize releases of lead-based paint (if present) and hazardous air pollutants in accordance with applicable regulations. Mitigation measures, suggested by DOH (DOH, Clean Air Branch, to Glen Koyama, August 8, 1993) in response to the *HIMB, Marine Laboratory and Support Facilities, Environmental Impact Statement (EIS) Preparation Notice* (BCH, July 1994), have been incorporated into the proposed action.

Mitigation Measures for Fugitive Dust

Unmitigated construction activities will result in fugitive dust emissions from grading and other earthmoving activities. To comply with HAR Section 11-60.1-33, fugitive dust emissions will be minimized through specific mitigation measures that include:

- phasing activities expected to generate fugitive dust such that the impact at any one time is minimized;
- centralizing material transfer points and on-site vehicular traffic routes in areas expected to be least impacted by other sources of fugitive dust;
- providing a source of water to be used for water sprinkling prior to initiating construction;
- frequent watering of land to be graded;
- using a tree-resin-based sealant on gravel roads; and
- immediately landscaping bare areas around the newly constructed buildings.

Mitigation Measures for Asbestos

All regulated quantities and types of asbestos-containing material will be subject to specific emission controls, collection procedures, containment procedures, and disposal. If asbestos is found within the existing maintenance building, salt water tank shelter, and lunch room proposed for demolition, it will be handled in accordance with 40 CFR Part 61, Sub-part M—National Emission Standard for Asbestos and implementing DOH regulations.

If it is determined that lead-based paint has been used on buildings to be demolished, engineering and work practice controls will be implemented. Regulations governing construction work where employees may be occupationally exposed to lead are found in 29 CFR §1926.62.

Mitigation Measures for Hazardous Air Pollutants

Laboratory hoods, equipped with air pollution control devices, will be used in laboratory spaces where hazardous chemicals are used. Laboratory hoods will be used whenever HIMB staff are conducting activities requiring a negative pressure environment and/or are working with hazardous materials. The laboratory hood serves to direct hazardous air emissions away from the employee. These emissions are then directed to an adsorption system (used to remove most of the pollutants) and ultimately vented to the open atmosphere. The adsorption system selected for use will be of a type that has been demonstrated to be effective for minimizing hazardous air emissions for similar operations at other universities.

4.5.4 Air Quality Permits

Based on a review of potential stationary source emissions at the proposed action, no air quality permits from DOH, Clean Air Branch, are anticipated. Stationary sources evaluated for permit requirements included the laboratory hood exhaust and the emergency stand-by generator.

Vented hazardous air pollutant emissions (as defined by HAR Chapter 11-60.1-172) are expected to be present from laboratory operations. While emissions from the laboratory hoods will be controlled and minimized through the use of air pollution control devices, the laboratory hood exhaust is exempt pursuant to HAR Chapter 11-60.1-82(g)(4) from DOH operating permit requirements. This exemption applies to laboratory equipment used exclusively for chemical and physical analyses.

Emissions resulting from operation of the standby emergency generator are also expected to be exempt from HAR Chapter 11-60.1 permitting requirements. The exemption, identified in HAR Chapter 11-60.1-62(d)(7), is applicable to standby emergency generators operated on diesel fuel that will not be operated over time periods that would exceed Prevention of Significant Deterioration (PSD) significant emission levels.

4.6 NATURAL HAZARDS

Natural hazards that could affect the project area include the effects of storms, such as hurricanes, and the effects of seismic events, such as earth movement, horizontal acceleration, and tsunamis.

4.6.1 Hurricane and Flood Hazards

Tracks of hurricanes over the past 30 years (Armstrong, 1973) show that no hurricanes have directly impacted the island of Oahu. However, the effect of hurricanes and other large storms that pass close to Oahu can still create potential damage from strong winds, increased rainfall, and storm surge, which can cause local and regional flooding.

Federal Flood Insurance Rate Maps (FIRM) are intended to provide information about flood prone areas. According to the FIRM, both Coconut Island and the property on Lilipuna Road are in areas determined to be outside the 500-year floodplain, meaning that the areas are within a zone with a 0.2 percent or less chance of a flood of a certain level occurring in a given year. The Federal Emergency Management Agency (FEMA) considers this to be an area of "minimal flood hazard" (FEMA, 1987).

4.6.2 Earthquake and Tsunami Hazards

The state of Hawaii experiences thousands of seismic events (earthquakes) every year, most of them of minor magnitude. The Hawaiian Islands are divided into four distinct seismic zones, based upon the probable maximum strength of earthquakes that may occur in each zone, using the modified Mercalli scale of earthquake effect intensity. Oahu, Molokai and Lanai are in Zone 1, which corresponds to intensity VI on the Mercalli scale. Intensity VI is defined as "Felt by all; glassware broken, books off shelves." The Mercalli scale does not correlate to the better known Richter scale, which measures the amplitude of the earthquake at its source, but instead measures the shaking of the ground based on human experience.

Coastal inundation can occur where seismic-induced waves, known as tsunamis, run up on the shore. According to information published by the State of Hawaii Civil Defense System, the area around Lilipuna Road and Coconut Island are not considered to be in an area of tsunami hazard (GTE Hawaiian Tel telephone book). Waves in this portion of Kaneohe Bay are not expected to rise more than 4 feet above mean sea level during a tsunami incident.

4.6.3 Potential Impacts

Wind conditions associated with storms pose the largest hazard to the proposed action. Strong winds could cause damage to structures on the island and make movement of personnel and supplies to the island difficult.

Coconut Island is not expected to be severely affected by waves produced by seismic events. However, structural damage could occur to proposed buildings in the event of a strong earthquake around Oahu.

4.6.4 Mitigation Measures

City and County of Honolulu building codes specify standards for construction of new buildings. These codes have specific construction criteria that take into account horizontal loadings likely to be experienced from seismic events or storm winds. These building codes will be adhered to during the design and construction process.

4.7 TERRESTRIAL BIOLOGY

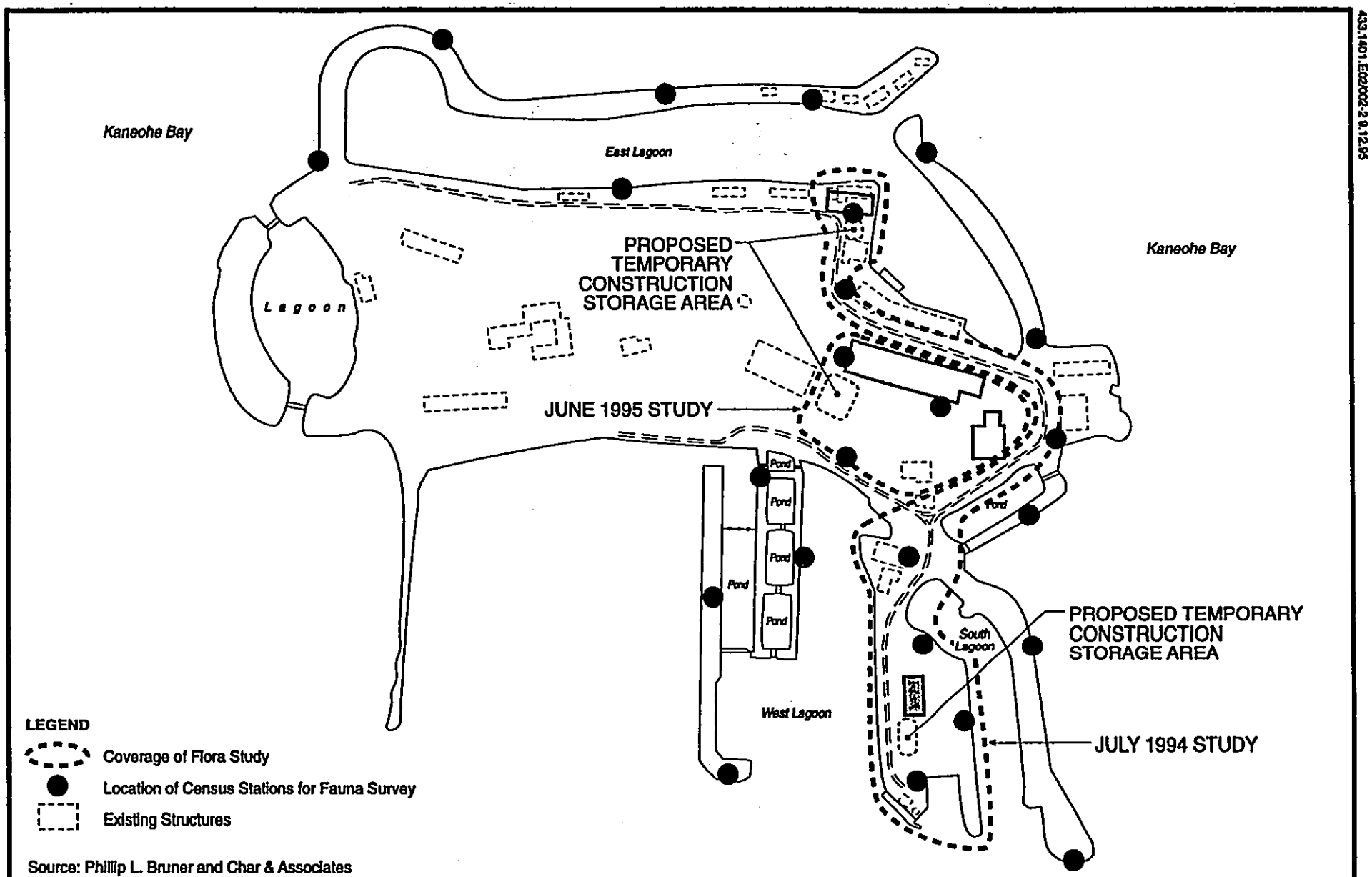
Construction and operation of the proposed action could potentially impact plants and animals on Coconut Island. Flora and fauna on the island were evaluated to help assess project impacts.

4.7.1 Existing Conditions

As part of this EIS, flora and fauna studies of Coconut Island were conducted. Botanical surveys were conducted in June of 1994 and June of 1995 by Char and Associates of Honolulu, Hawaii. Copies of these reports are attached as Appendix C. An avifaunal and feral mammal survey was also conducted in June of 1994 by Dr. Phillip L. Bruner. A copy of this report is attached as Appendix D. Areas of coverage for these two studies are shown in Figure 4-7.

4.7.1.1 Flora

The vegetation on the island consists primarily of introduced species, many of which are ornamental landscape species. Areas subject to impact by the proposed action are dominated by introduced alien plant species, with only nine percent of the species found being of either Polynesian or native origin. Flora in the proposed maintenance and wet laboratory project areas consists of various species of lawn grasses and a variety of weedy species. Trees include coconuts and ironwoods. The project site for the proposed marine laboratory was formerly landscaped, and there are many scattered remnants of plantings and small groves of trees. However, much of the site is now overgrown by weedy scrub vegetation composed of koa-haole shrubs, clumps of sourgrass, and dense, sprawling mats of Chinese violet. Trees in the area include banyan, pink tecoma, milo, macadamia nut, and a variety of fruit trees (see Appendix C for a complete plant list). No endemic (native solely to the Hawaiian Islands), endangered, or threatened species were found during the survey conducted by Char & Associates.



ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 4-7
FLORA & FAUNA SURVEY COVERAGE AND PROPOSED TEMPORARY CONSTRUCTION STORAGE AREAS

0 130 260
Scale in Feet
North

433.1401.E02002-2 9.12.95

4.7.1.2 Fauna

Fauna on the island consists almost entirely of alien bird and mammal species. These include the common myna, red-vented bulbul, dove, and house finch. With the exception of rats and possibly mice, no mammal species, either endemic or introduced, were observed during the survey.

Coconut Island provides a variety of habitats for birds. The most important area for native birds is the shoreline and the exposed reef flats at low tide. A survey of areas of the island likely to be impacted by the proposed action found a total of 14 exotic bird species but no endemic or endangered birds. However, the short-eared owl (pueo or *Asio flammeus sandwichensis*), which is listed as an endangered species on Oahu, may occasionally occur in this area, as may the endangered black-necked stilt (*Himantopus mexicanus knudseni*), which occurs in several wetlands nearby and may occasionally forage along the shoreline of Coconut Island. A pair of what appeared to be Hawaiian ducks (koloa, or *Anas wyvilliana*), which are an endangered species, were observed flying near the island, but this species readily hybridizes with feral mallards and the observed pair may have been hybrids. The only native resident waterbird observed in the survey was the black-crowned night heron (auku'u or *Nycticorax nycticorax*), which is neither threatened nor endangered. No seabirds were observed on the island, but eight brown noddies (*Anous stolidus*) were observed foraging offshore.

No migratory ducks or shorebirds were observed during the survey, which is not surprising given the time of year the study was conducted. During the winter months the two most common migrant ducks on Oahu likely to occur in the protected bays are the northern shoveler (*Anas clypeata*) and the northern pintail (*Anas acuta*). All four of the common migratory shorebirds found in Hawaii are likely to be supported by the extensive intertidal zone surrounding Coconut Island. These shorebirds consist of the wandering tattler (*Heteroscelus incanus*), the ruddy turnstone (*Arenaria interpres*), the sanderling (*Calidris alba*), and the Pacific golden plover (*Pluvialis fulva*). Some of the open lawn areas of the central section of the island may also support Pacific golden plovers during the migratory season from August to late April.

4.7.2 Potential Impacts

The proposed action will require clearing of the project site for grading and foundation work. Two of the building sites, the wet laboratory annex and new maintenance building, will use sites that have already been developed. On one site, two existing buildings will be removed. On the other site is an open grass area that is not presently being used. Thus, no impact on existing flora or fauna will occur at these sites.

The new marine laboratory above the existing administration/laboratory building will require site clearing and grading for the building foundation and access road. This will

involve the removal of existing vegetation, including a number of large trees. According to Char & Associates' July 1995 botanical study, no rare or endangered flora exist in the project area. No impact on these species is expected to occur.

Preliminarily, there will be three staging or construction storage areas on Coconut Island during the construction stage of the project (see Figure 4-7). One will be situated on the boat landing/light house peninsula near the proposed LCU landing site. Another will be adjacent to the wet laboratory annex, and a third site will be on the hill near the proposed marine laboratory building.

The first site is on fill land and contains a single banyan tree. The temporary storage area next to the wet laboratory annex was a former building site and is now overgrown with various grasses and weeds. Existing vegetation and natural habitats on these two sites will not be impacted. The staging area near the marine laboratory will require clearing and minimal grading of approximately 4,600 square feet of land and will affect a small number of trees.

4.7.3 Mitigation Measures

Prior to the July 1995 botanical study by Char & Associates, a tree inventory survey of the marine laboratory site was conducted by a land surveyor. The survey identified the largest trees on the site so that efforts could be made to preserve them. While the proposed marine laboratory facility will displace a number of the trees on the site, the majority of the larger trees will be preserved in place and incorporated into the project's landscape design. Some of the smaller trees that will be displaced will be replanted as part of the new landscape plan and used, wherever possible, as visual screens. These screens will help shield the building from any adverse visual impact it might have on the surrounding community.

Whenever possible, native species or Polynesian-introduced plants will be incorporated into the replanting program. This is in accordance with HRS, Chapter 103-24.6, which was enacted by the 1992 Hawaii State Legislature. The act mandates that any new or renovated landscape for any building, housing, or other facility developed with State funds incorporate native Hawaiian plants wherever and whenever possible. Although State funds are not involved with this project, HIMB believes that native plants compatible with the area are the most suitable for the project.

4.8 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

An investigation to assess possible impacts on historical and archaeological resources was conducted in connection with the proposed action by International Archaeological Research Institute, Inc. (IARII) of Honolulu, Hawaii. A copy of this report is included in

Appendix E. This archaeological investigation included a literature search and a baseline survey of areas of the island to be impacted by the proposed action.

4.8.1 Historical Perspective

The historical research included in the IARII report and a general background study by Belt Collins Hawaii are summarized below.

The origin of Moku O Lo'e's name is uncertain, but one account tells of Pukui and Elbert as having recorded the Hawaiian word "lo'e" as referring to the curve of a fishhook. Additionally, past accounts have indicated that the island was used as a lookout by fishermen to signal the location of fish schools and that the area around the island was once claimed as the "He'eia Fishery." Given the use of offshore islands as temporary camps for fishermen, the location of an encompassing fishery, and the name relationship to a particular aspect of a fishhook design, IARII concluded it is probable that the name of the island is associated with fishing.

Another account tells of a women named Lo'e who lived on the island, thus the name *Island of Lo'e*. IARII, however, is inclined to discount this account because it is believed that there was no water on the island to sustain prolonged habitation there.

According to IARII, Moku O Lo'e was designated as Crown Land during the Great Mahele and was included in an award to Abenera Paki, the father of Bernice Pauahi Bishop. As a Crown Land award to an alii, there was no Land Court testimony relating to mid 1880s land use on the island. Later, court records showed that no one had permanently resided on the island since at least 1884. According to various newspaper reports, the island was put to various uses including a luau in honor of Queen Emma in 1884 and sheep grazing and raising of various crops from 1897 to about 1899.

During the ensuing years to the 1920s, the island underwent various ownerships. In 1928, Christian R. Holmes (heir to the Fleischman yeast fortune), who had recently arrived from the mainland, subleased the island from the He'eia Company, Limited. By 1933, he leased the island directly from the Bishop Estate, the owner in fee. In 1936, Holmes expressed an interest in purchasing Moku O Lo'e that prompted a Land Court Application to secure title to the island. A year later, Holmes completed the transaction and obtained title to the land.

Extensive improvements to the shoreline were undertaken when Christian Holmes occupied the island. By 1935, the reef area surrounding the island was dredged, creating channels in the marine structure. Holmes developed filled land, two large lagoons, six large ponds, and four peninsulas with the excavated material. Holmes also brought in a large inventory of landscape plants and constructed numerous buildings, including

several greenhouses, a large central house, a bowling alley, an observatory, and a small private cottage.

Holmes' peculiar interests led to unusual improvements on the island, including the construction of a small private zoo and the purchase and mooring of a four-masted schooner (the *Seth Parker*) in a permanent site behind the old lighthouse. The schooner proved unseaworthy and was converted to a motion picture theater and bar.

After Holmes' death in 1944, the military (U.S. Army) leased the island as a rest and recreation center for approximately one year (other accounts show that the island was leased for three or four years). Buildings were constructed to accommodate the military's use of the island. Only three buildings (lunch room, residence/lab, and guest quarters) remain standing and are now being used by HIMB.

In 1946, a group of five California businessmen purchased the island from the Holmes estate for $250,000. Moku O Lo'e Corporation was formed to hold the ownership interest for the five businessmen.

The name "Coconut Island" may have originated when a large shipment of coconut trees was brought to the island and used for landscaping, and probably took on permanency when the Moku O Lo'e Corporation in 1946 proposed to establish a Coconut Island Club International, a small private club intended to cater to an elite international group. The club never went beyond the conception stage.

In 1947, the Moku O Lo'e Corporation, through the strong efforts of Edwin Pauley, one of the Corporation's owners, offered to establish a marine laboratory on the island for the University of Hawaii. The Hawaii Institute of Marine Biology was subsequently established in 1947. The original laboratory was housed in a series of wooden structures built by the military during its use of the island during the 1940s. In addition, tanks, ponds, and a small storage shed on the northeastern portion of the island were used.

While taking a land inventory in 1955, the Territorial Tax Commissioner found that the "filled land" surrounding the island was not shown on the tax maps and consequently no property taxes were being collected.

This issue then raised another question regarding the legal ownership of the filled land that was found to be subject to federal laws. The law states that "any man-made or artificial additions to the shorelines became federal property unless they are turned over to private ownership by act of Congress." In 1962, after reviewing the case, the State Attorney General issued an opinion that "the title to the more than 11 acres of land reclaimed by Mr. Holmes is in the State of Hawaii" (Attorney General letter to Mr. James Dunn, Surveyor, State of Hawaii, DAGS, March 28, 1962). The State subsequently

assumed ownership of the property, and in 1989 leased the land to HIMB for a period of 65 years under General Lease No. S-5325.

In 1961, the original marine laboratory (constructed in the 1940s) was destroyed by fire. In 1966, with the financial help of Edwin Pauley, a replacement laboratory building (the present main administration/laboratory building) was constructed by the State of Hawaii on the same site.

On October 11, 1962, Bishop Estate conveyed by indenture deed the interest in the Lilipuna Road property to the Pauley family. As part of the land conveyance, the Pauley Estate was required to grant a perpetual easement over an "adequate" road to the property's shoreline and a perpetual license for use of an "adequate" dock. The easement and license were granted to the State of Hawaii for use by the University of Hawaii. Two years later, in 1964, a driveway, parking lot, and pier were constructed. Since this construction, the University has used these facilities for access to Coconut Island (Form of Deed, 1962).

In 1987, Hachidai, USA, Inc. bought the private portion of the island and the Lilipuna Road property from the Pauley family. The filled land surrounding the private land is still owned by the State. On August 30, 1995, the University of Hawaii Foundation purchased the private portion from Hachidai and now leases it to the University of Hawaii for HIMB's long-term use.

4.8.2 Historic and Archaeological Resources

International Archaeological Research Institute, Inc.'s (IARII) study of the project site consisted of a baseline survey and a literature search. Site visits were conducted on two separate occasions by IARII, once in June 1994 and again in June 1995 (see Appendix E). In response to concerns received during the public comment period for the Draft EIS, the 1995 report was revised in 1996.

4.8.2.1 Potential Historic Structure

From the literature search of the island, it was found that building improvements have occurred since the late 1920s and early 1930s. Christian Holmes made extensive improvements during this early period, and consequently there are potential historic structures. The military later added a number of barracks and other rest and recreation facilities. IARII's study indicated that there are only two structures that remain from the military R&R activities—a military latrine building and a barracks building. The latrine building is now used by HIMB as a lunch room. The barracks building has been refurbished and is currently being used by visitors, resident students, and a State caretaker. An HIMB official also identified another building that was left from the military R&R activities. This building was a barracks that is now used as a multiple

facility for a dormitory, a visitor's apartment, and two research laboratories. The *Seth Parker*, which was brought to the island in 1935 and is presently in a state of total disrepair, and the old boat house, which was constructed at about the same time, are located in the proposed maintenance building area.

In the southern interior portion of the island is a caretaker's residence that was constructed in 1962. Also in the southern section are numerous large, abandoned, and collapsing bird coops and an area formerly used as a pen for small animals.

4.8.2.2 Potential Archaeological Features

The first one-day baseline reconnaissance survey covered the filled land area, which at the time was the only portion of the island owned by the State. The second survey involved a walkthrough reconnaissance of the island's interior area. In both instances, the surveys specifically focused on the southern and southwestern sides where the proposed buildings would be located and where construction activities might occur.

Results of the first archaeological survey show that there are no archaeological sites in the filled land portion of the project area. The study noted that the project sites are composed of coral and coral sand dredge spoils that have created fill areas approximately five feet in height above sea level. Additionally, the dirt access road between the proposed wet laboratory annex and maintenance building is not likely to have any subsurface archaeological deposits. The access area has already been disturbed by the creation of the road and the installation of a previous subsurface sewer line.

Although nodules of volcanic glass were found in the filled land around the proposed maintenance building site, IARII is inclined to believe that it may not have been part of the original land and is really a part of the land transformation that occurred in the 1930s. Further, IARII noted that none of the volcanic glass had been flaked or appeared to be artifactual. Hawaiians have been known to use volcanic glass in the manufacture of flaked tools.

The second survey and field work led to the conclusion that intact archaeological surface remains are unlikely to be present on any interior portion of the island, due to previous disturbance from residents' use and landscaping. However, there is a possibility that Coconut Island may contain human burial sites, hearths, or other subsurface archaeological deposits. Unverified verbal accounts from some long-term Coconut Island employees indicate that there are a few unmarked human burials on the island. One of the locations indicated as a possible burial is situated near the proposed marine laboratory facility (Figure 4-8). The location is marked on the ground by a narrow basalt boulder set upright in a small foundation of basalt cobbles fixed with concrete mortar. There are no markings on the boulder.

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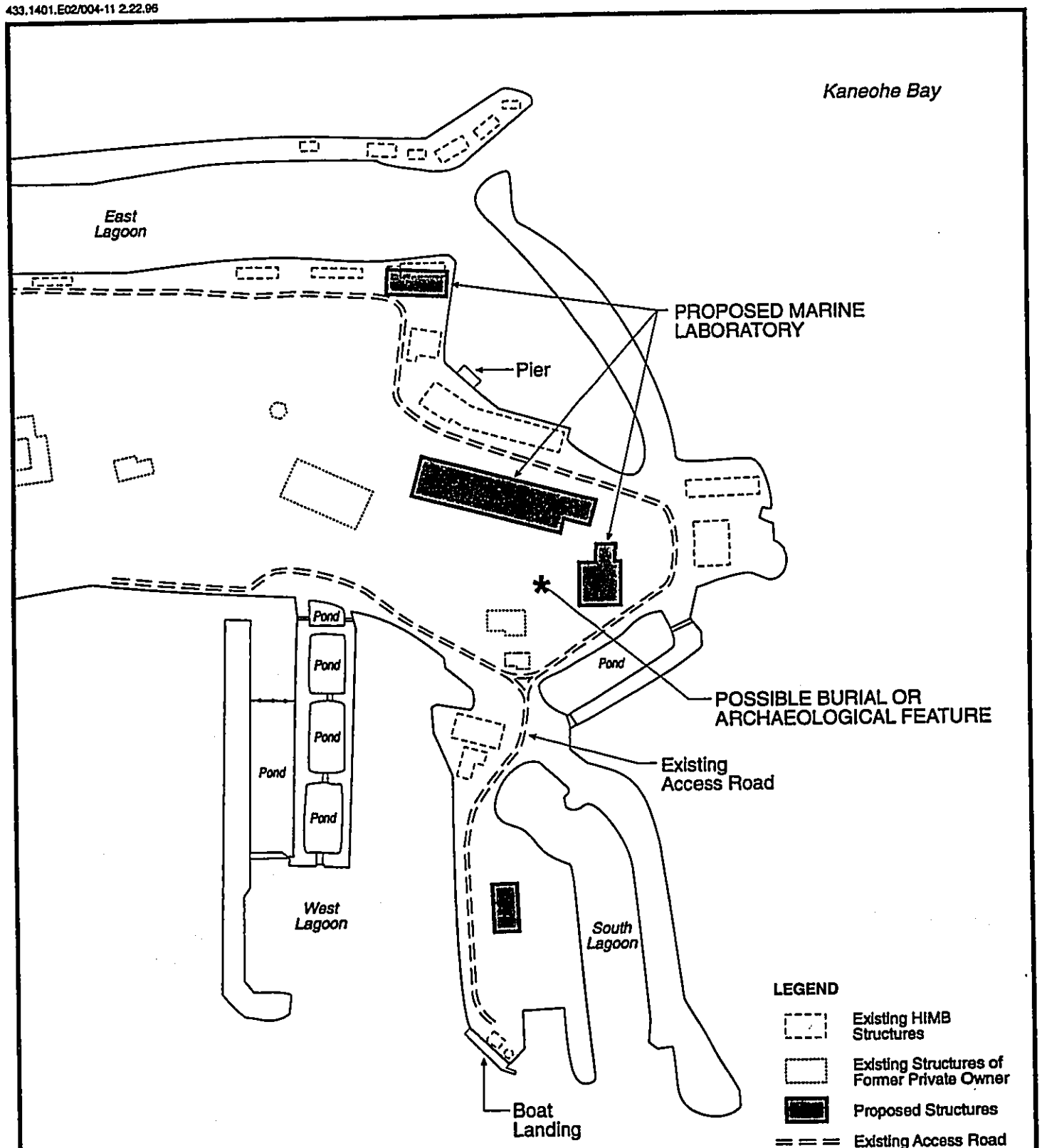

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FIGURE 4-8
ARCHAEOLOGICAL SITES

The site has not been tested to determine if a burial is present. It is also uncertain if the site is more than 50 years old. HIMB is currently planning to leave the site intact and establish a landscape buffer around it. Although the Oahu Island Burial Council would not be involved with the proposed treatment until it is determined that the site is a burial and within their jurisdiction, HIMB will brief the Council on the site and subsequently work with the organization and the State Historic Site Preservation Division on an appropriate treatment plan if the site is later determined to be a burial.

4.8.3 Potential Impacts

The 1962 caretaker's residence and the two barracks will not be impacted by the proposed project. The lunch room, however, will be demolished to make way for the proposed wet laboratory annex, and the southern section of the island containing the abandoned bird coops and the area formerly used as a pen for small animals will be cleared to make way for the new marine laboratory. A dilapidated wooden structure located adjacent to the existing road on the southwestern corner of the island, the "monkey house," will also be removed.

Areas of potential archaeological significance that might be impacted by the proposed action include all areas of the island not previously filled that would require construction excavations. This would apply only to the new marine laboratory site, which will require grubbing and grading, and to the dirt access road between the proposed wet laboratory annex and the maintenance building, which may be used for transport of construction materials.

4.8.4 Mitigation Measures

Five structures within the archeological study area (the lunchroom, the student housing unit, the old boat house, the monkey house, and a concrete foundation for animal pens) can be considered historic sites. All of these structures, except the student housing unit and old boat house, will be subjected to impact by the proposed action. Given their limited significance, mitigation of impacts to these sites has been addressed by preservation through documentation.

As recommended by the State Historic Preservation Division, DLNR, an archaeologist will be available on call in the event that human burial sites, hearths, or other subsurface archaeological deposits are discovered during construction excavations in the interior areas of the island that have not previously been filled.

4.9 ACOUSTICAL ENVIRONMENT

An environmental noise assessment was conducted for the proposed project by Darby and Associates Acoustical Consultants of Honolulu Hawaii. A copy of this report is included in Appendix F. This investigation included a regulatory review and measurement of ambient noise levels in areas of the island affected by the proposed project.

4.9.1 Existing Conditions

Short-term (5-6 minute) average ambient noise level measurements were taken at selected locations on the island on the afternoon of June 23, 1994. Levels measured were within the allowable daytime levels for residential and business zoning on Oahu.

Coconut Island is within the flight path of aircraft approaching and departing the air facility at MCBH. Recently, the two squadrons of FA-18 aircraft that had been stationed at MCBH were reassigned, leaving only rotary wing aircraft stationed at the base.

Figures 4-9 and 4-10 show flight paths for fixed- and rotary-wing aircraft approaching and departing from the air facility. A 1990 study of Air Installation Compatible Use Zones (AICUZ) indicated that Coconut Island was within the 65-70 decibel (db) Ldn (day-night average noise level) from the MCBH air facility (Belt Collins, 1990). Although no update of this study has been conducted since the reassignment of the FA-18 squadrons from MCBH, personnel at HIMB have noted a marked decrease in noise levels on the island. The noise measurements conducted for this EIS by Darby and Associates noted no aircraft noise in the monitoring period (Darby and Associates, 1994). However, the 1990 AICUZ study states that 13 percent of traffic at MCBH is from transient aircraft that include fixed-wing jet and propeller aircraft; occasional noise from these transient aircraft will still impact Coconut Island.

4.9.2 Potential Impacts

Noise impacts generated by the proposed action will come from the operation of equipment during the construction phase and from equipment noise associated with the operation phase. Populations most susceptible to project-related noises will be the residential populations along Lilipuna Road (approximately 0.4 miles (2,112 feet) across Kaneohe Bay from the project location) and the student population that will use the proposed buildings.

Demolition, excavation, grading and other construction activities will generate higher than normal noise levels of between 68-105 db, approximately 50 feet away. Using the inverse square law for point sources in an unobstructed environment, estimated noise

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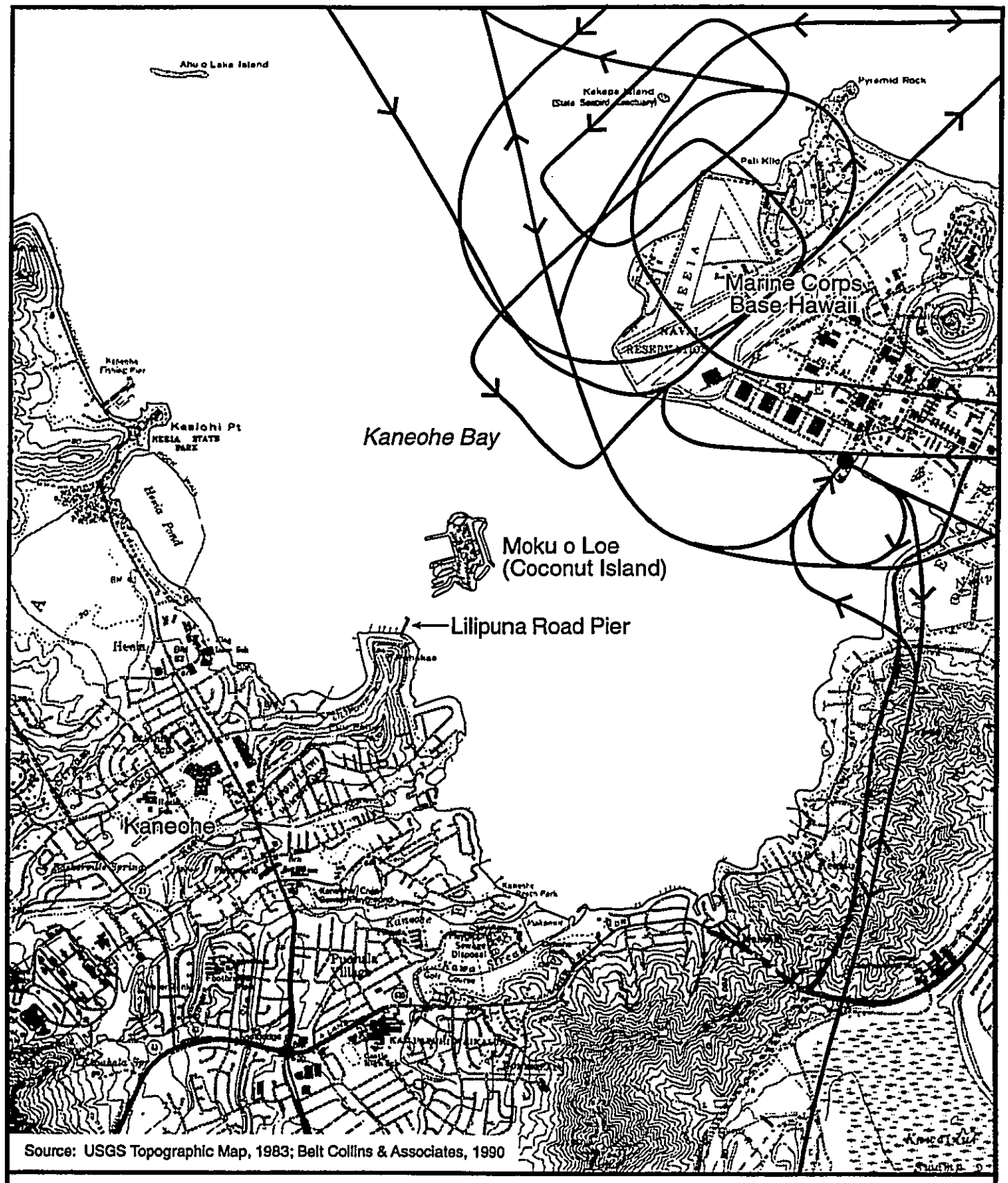

Source: USGS Topographic Map, 1983; Belt Collins & Associates, 1990

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FIGURE 4-9
SELECTED ROTARY–WING FLIGHT TRACKS

0 1500 3000
Scale in Feet

North

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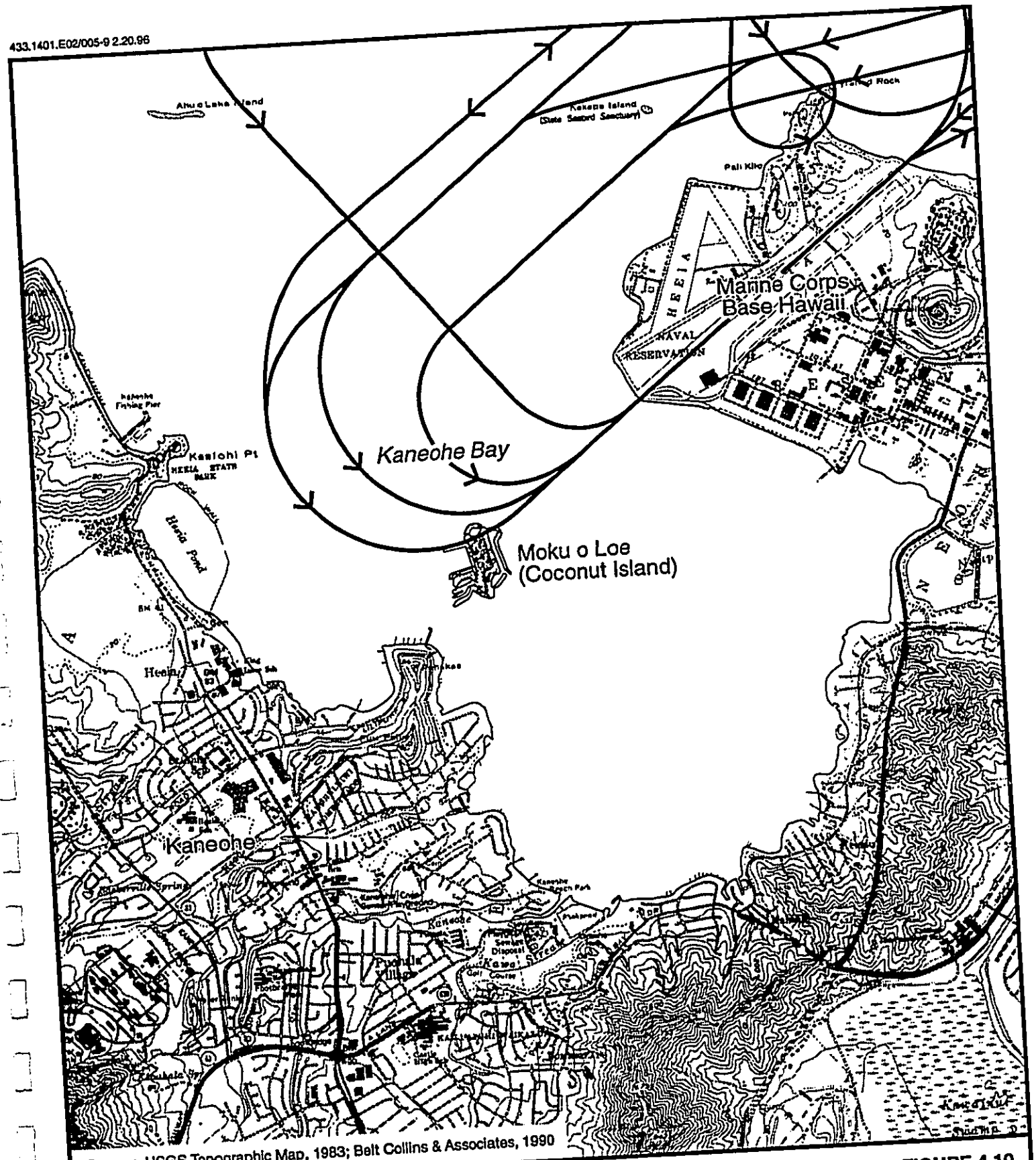

Source: USGS Topographic Map, 1983; Belt Collins & Associates, 1990

FIGURE 4-10
SELECTED FIXED–WING FLIGHT TRACKS

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0 1500 3000
Scale in Feet

North

levels of 35 to 72 db are possible at the nearest residence.[1] While specific noise levels will be dependent upon the type of equipment used (Appendix F, Figure 6), based on the 35 to 72 db range calculated, noises created during the construction phase of the project will periodically exceed the DOH's allowable daytime noise levels (greater than or equal to 55 db for more than 10 percent of the time during any 20-minute period).

Operational activities, such as the use of power equipment in the proposed maintenance building and the air conditioning and ventilation systems of the proposed marine laboratory facility, maintenance building, and a portion of the wet laboratory annex, will contribute locally to ambient noise levels. With the exception of the proposed building occupants, no other populations will be affected by the operational noise.

4.9.3 Cumulative Impacts

Since the latest noise assessment was conducted and summarized in *Environmental Noise Assessment New Laboratory Building Moku O Loe (Coconut Island), Oahu, Hawaii* (Darby and Associates, July 1994), the Navy has proposed new plans that would alter the acoustical impacts in the area of the proposed action. Such changes include the transfer of aircraft squadrons from Barber's Point Naval Air Station to MCBH. At this time, the transfer of aircraft and resulting impact on noise has not been quantified; however, because no F/A-18 squadrons would be involved in the transfer, noise impacts are expected to remain below the 65 to 70 db Ldn estimated in the 1990 AICUZ study. F/A-18 aircraft will, however, continue to be a part of the transitional aircraft that use MCBH and squadrons comprised of these aircraft could be stationed at MCBH again in the future.

4.9.4 Mitigation Measures

Due to the potential for increased noise levels during construction, mitigation of these levels will be required. In the case of the construction phase of the project, noise levels may exceed the DOH's allowable daytime limit. A DOH permit to allow the operation of vehicles, construction equipment and other related machinery that will emit noise levels in excess of these allowable limits should, therefore, be obtained (Darby and Associates, 1994). This permit will specify times of the day that operation of construction equipment will be allowed, as well as "not to exceed" limits during construction hours.

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[1]The inverse square law applies for point-type sources, e.g., jackhammer, and in unobstructed environments. The relationship is expressed as the following: $L_2 = L_1 - 10\log (r_2/r_1)^2$, where L_1 is the sound pressure level (db) at a distance of r_1, and L_2 is the sound pressure level at r . Therefore, at the nearest residential receptor, $L_2 = 68$ db $- 10\log(2112/50)^2 = 35$ to $L_2 = 105$ db $- 10\log(2112/50)^2 = 72$ db.

No significant sources of noise have been identified for the operation phase of the proposed project. Any noise associated with the maintenance building will be short-term, will occur during the day, and is not expected to exceed DOH allowable levels. Buildings will be designed to reduce the noise of air conditioning and ventilation to those recommended for a classroom environment—equal to or less than 52 db energy equivalent sound level (Leq)[2] (Federal Highway Administration Procedures for Abatement of Highway Traffic Noise, U.S. Department of Transportation; Title 23, Chapter 1, Sub-chapter J, CFR Part 772, June 19, 1973; Revised 47 FR 29654, July 8, 1982).[3]

Cumulative noise effects on the proposed facilities from present and future air operations, including fixed-wing jet aircraft such as F/A-18s, will require noise mitigation. The Navy will be conducting an environmental assessment that will evaluate the potential noise impacts resulting from the Navy's BRAC recommendation (transfer of aircraft squadrons). Because higher noise-generating fixed-wing aircraft such as F/A-18s will continue to be present, either as part of transitional flights or as part of future MCBH-based squadrons, HIMB buildings will need to be sufficiently noise attenuating to provide satisfactory shielding. Buildings will be designed to reduce exterior noise levels of 65 to 70 db Ldn to an interior noise level of no more than 52 db Leq. Aircraft noise projected in Ldn was used to develop design criteria for acoustical insulation for the proposed building. This 24-hour averaged sound level was determined by the Federal Interagency Committee on Noise (FICON) to be the most appropriate noise metric to use when evaluating noise impacts on populations and land-use compatibility in the general vicinity of airports.

4.10 VISUAL CHARACTERISTICS

4.10.1 Existing Conditions

The Coastal View Study, prepared for the City and County of Honolulu (1987), identifies the coastal and offshore areas from Kualoa Park to the Marine Corps Base Hawaii as the Kaneohe Bay Viewshed. The steep cliffs and ridges of the Koolau Mountains act as a backdrop to a panoramic view that encompasses the waters and undulating shoreline of this windward side bay.

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[2]Leq is the constant sound pressure level that is identical to the acoustical energy for any fluctuating sound occurring during a particular time period.

[3]Projected noise levels of 65 to 70 db were estimated in Ldn while the recommended maximum interior level of 52 db is an Leq. Leq and Ldn are both time-averaged sound pressure levels; the difference between the sound measurements is that 10 db is added to sound pressure levels measured during the nighttime period of 10:00 PM to 7:00 AM.

Kamehameha Highway, Lilipuna Road, and Kaneohe Bay Drive are important coastal roads that offer excellent views of the viewshed. The study noted, however, that although these roads follow the coastline, surprisingly few views can be found except from public parks and occasional glimpses through breaks in the vegetation. Two significant stationary viewpoints in the southern section of the bay are at the Heeia State Park and Kaneohe Beach Park. The most dramatic views are from the H-3 Freeway, which is located inland from the bay but at a higher elevation. Figure 4-11 shows areas of significant views available around Coconut Island.

Coconut Island is closest to the Lilipuna Road viewpoint, with a separation distance of approximately 1,500 feet. The southwestern side of the island, where the proposed maintenance building will be located, faces this coastal right-of-way on Pohakea Point. The old boat house, which has almost the same dimensions as the proposed maintenance building, does not significantly impact the view as seen from across the water. Dense vegetation in the foreground will partially screen the proposed maintenance building.

The main facilities at HIMB are located on the eastern side of the island. These facilities are in the viewline of MCBH and the residential areas of Kokokahi and Oneawa Hills' western slopes. The distance to the island from these vantage points is at least 1-1/4 miles. Visibility of the existing facilities is somewhat screened by the island's vegetation and furthered obscured by the great distance across the bay.

The visual character of the HIMB is dominated more by the overall visual appearance of the island within the bay than by the presence of facilities on it. The island, notably, represents only a small element in the overall panorama of the viewshed (see Figure 4-11).

Recreational boaters and sailors have more access to and movement around Kaneohe Bay and are able to see all sides of Coconut Island at close range. The shallow coral reef surrounding the island, however, would cause boaters to keep a certain distance from the island's shore, making Coconut Island a somewhat distant visual feature.

4.10.2 Potential Impacts and Mitigation Measures

The proposed buildings will not result in any significant visual impact to the surrounding communities or to boaters in Kaneohe Bay. The distance from Oahu's shoreline and the existing vegetation on Coconut Island make visibility of the proposed facilities somewhat obscure. The view seen by boaters on the water will be the most affected by the proposed project. With the aid of computer simulations, Figures 4-11 and 4-12 provide visual representations of what the proposed maintenance building and marine laboratory facility will look like after construction. The images of the proposed facilities

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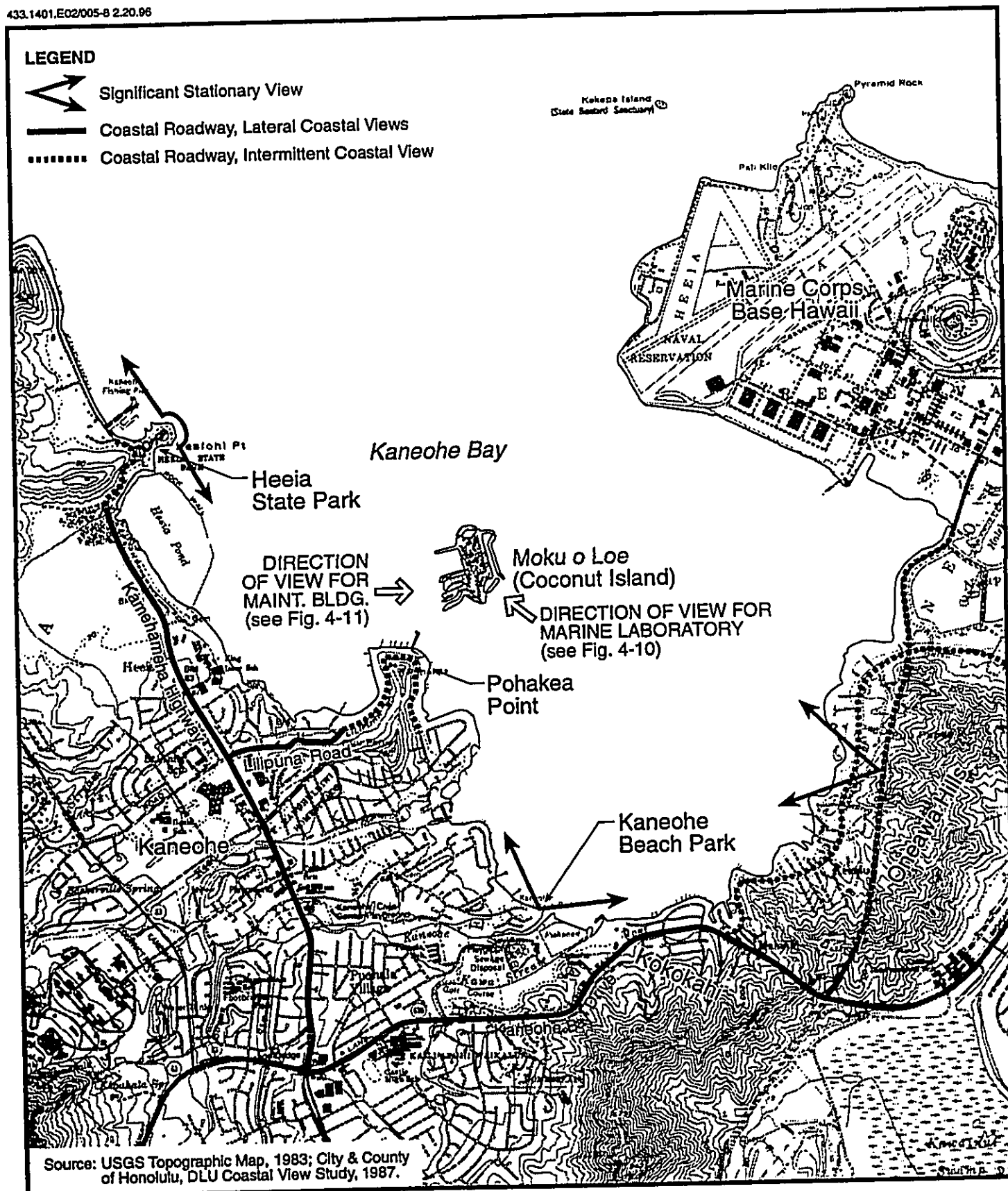

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FIGURE 4-11
VISUAL IMPACTS

0 1500 3000
Scale in Feet

North

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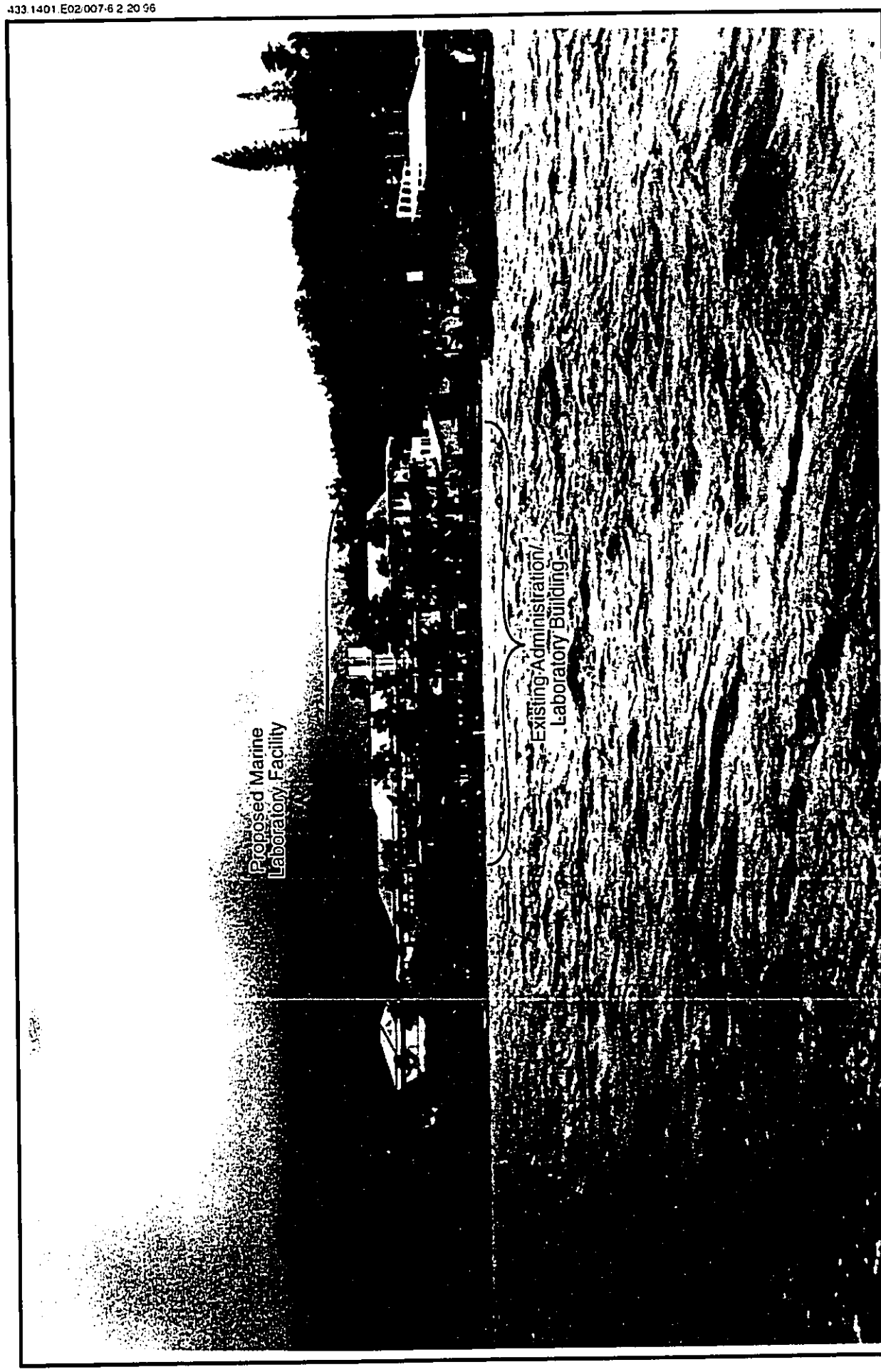

FIGURE 4-12
VISUAL ANALYSIS
PROPOSED MARINE LABORATORY FACILITY
(View from East Direction)

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were taken at a distance of approximately 600 feet from the island—the closest distance typical boaters would travel past the island.

The new marine laboratory facility will be built on the hill above and behind the existing main administration/laboratory building as seen from the eastern side of Coconut Island (see Figure 4-12). The complex will be one-story and partially screened by existing vegetation along the perimeter of the hill. A major tree inventory has been conducted, and as much vegetation as possible will be preserved or replanted in the area.

A modified hip roof will make the height of the new one-story structure greater (when situated on the hill) than the existing three-story administrative/laboratory building. The height difference of 8 1/2 feet (excluding the fume hood stacks) will be insignificant when viewed from a distance.

Because of the one-story building's low profile and surrounding foliage, its visual impact is expected to be minimal. The northern half of the proposed structure will be essentially hidden behind the existing administrative/laboratory building, and only the modified hip roof and fume hood stack enclosures will be slightly visible from the east. The southern half of the complex will extend out beyond the existing building, but some foliage on the perimeter will be preserved and some foliage will be replanted from the construction and lay down areas to screen the structure as much as possible. New vegetation, consisting of native trees and plants whenever possible, will be planted for landscaping purposes. In addition, off-white and earth-tone colors, as well as colors that match the surrounding environment, will be used on the new buildings to minimize visual impact.

The new wet laboratory annex is planned on the same site as the existing laboratory on the southeastern corner of the island. The structure's design is similar to that of the existing facility, though larger, and it will stand within the existing complex. The building will be no higher than the tallest building in the compound, allowing it to blend in with the existing structures. As a result, no visual impact is anticipated and no mitigation is proposed.

The maintenance building will be located further inland than the existing old boat house and in an area surrounded by existing vegetation. Foliage will remain largely intact and will screen the structure. The visual character of the area on the western side of the island thus will be minimally affected (see Figure 4-13).

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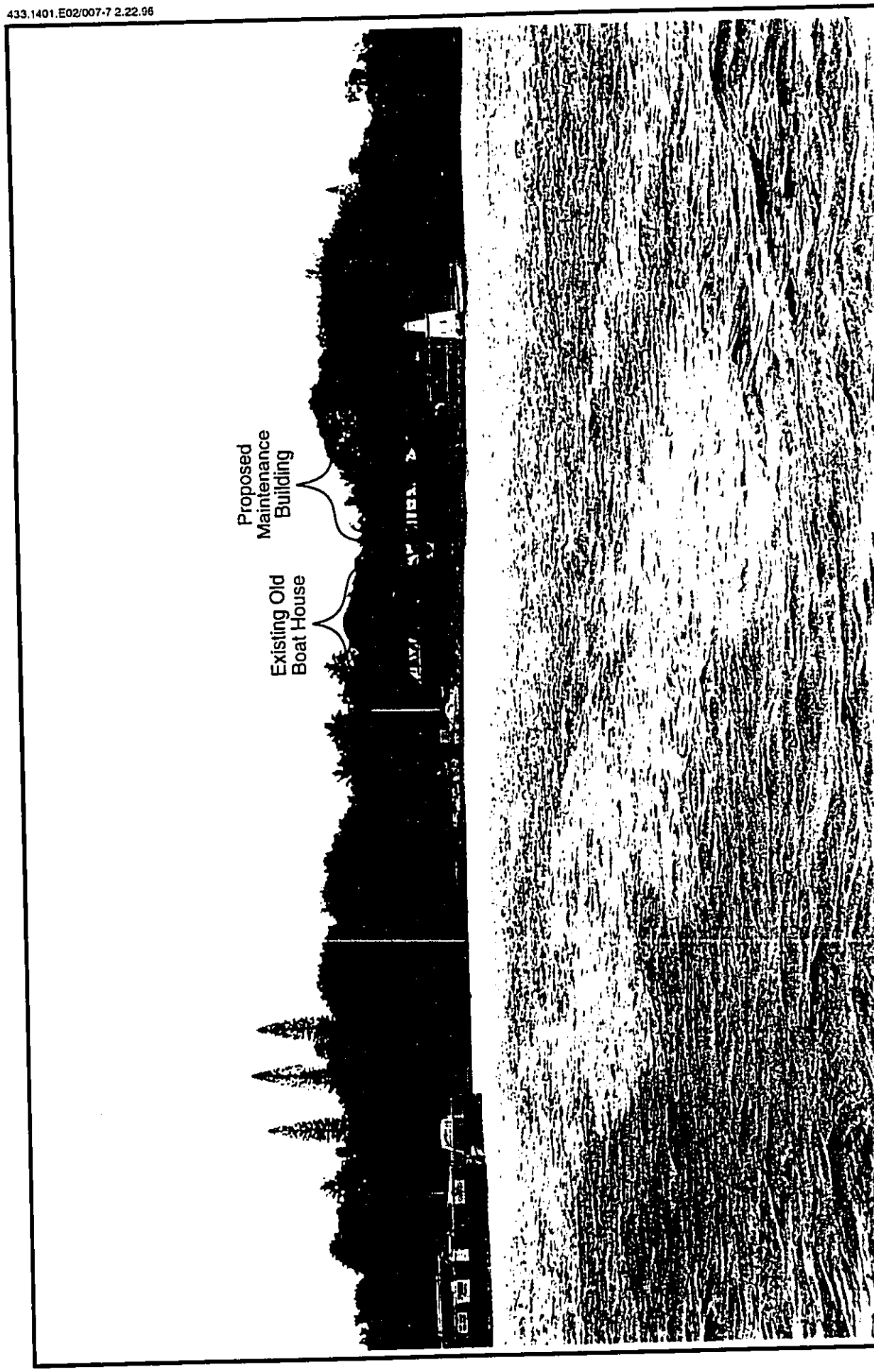

FIGURE 4-13
VISUAL ANALYSIS
PROPOSED MAINTENANCE BUILDING
(View From West Direction)

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CHAPTER FIVE
SOCIOECONOMIC CHARACTERISTICS

This section summarizes Community Resources, Inc.'s socioeconomic impact study for the proposed HIMB project. The complete Community Resources, Inc. report is included in Appendix G.

5.1 REGIONAL SETTING

5.1.1 Population, Growth Trends and Settlement Patterns

With its rich fish resources and favorable conditions for crop cultivation, the Kaneohe region was well populated before the 19th century. Poi, in particular, was a major crop that helped sustain habitation in the area. Western contact and the introduction of Western disease caused the population of Kaneohe to decrease drastically to between two and three thousand by the 1920s.

Since the 1880s, the region has seen several experiments in large-scale plantation agriculture. Sugar was planted but never thrived. Rice was grown and was briefly successful until it was supplanted by pineapple in the first decade of the 1900s. When pineapple production declined in the area after 1925, cattle ranching became predominant. Later, rural homes and small farms began to increase in the region.

The bay itself has undergone many modifications. In the last century, 30 fishponds existed along the shoreline. In the years that followed, many were filled to provide additional land for roads and housing. Extensive dredging and filling by the military occurred in the 1930s, when Mokapu Peninsula was expanded and various channels were created. Dredging reached its peak during World War II when the Kaneohe Naval Air Station (now MCBH) was undergoing construction on Mokapu Peninsula.

Urbanization of the Kaneohe region began during the 1940s and 1950s, but it was not until the 1960s that population growth accelerated. Development pressures occurred in outlying areas of Honolulu after the Pali Highway was completed in 1957 and the Wilson Tunnel was completed in 1960. These two trans-island connections opened Oahu's windward area to suburban development. Kaneohe, Heeia, Ahuimanu, Kahalu'u and Oneawa Hills now contain extensive residential developments which serve as bedroom communities for Honolulu commuters. Kaneohe town is the commercial hub of the region, but neighborhood shopping centers are also located in Ahuimanu and other neighboring communities.

Kaneohe and the adjacent region comprising Kailua make up the most populated section of the Koolaupoko District, which spans from Kualoa in the north down to Makapu'u Point. Census counts show that Koolaupoko District has had an average annual growth rate of seven to eight percent from 1940 to 1970 (Figure 5-1). During this period, the Koolaupoko District outgrew Honolulu County on the whole by about four or five percent.

The urbanization of Kaneohe's watershed, channeling of streams, development of flood control projects, dredging in the bay, increased marine use, and other human activities have contributed to sedimentation and decreased flow of freshwater in Kaneohe Bay. Seasonal floods have also impacted coral reefs, but no permanent damage has occurred. People who frequently fish the bay perceive that there has been a substantial decline in certain fish species over many years, though the causes for this decline are uncertain.

In an attempt to specify water quality management objectives, the State Department of Health has classified waters inside the bay as Class AA waters. These waters are intended to remain in their current condition with an absolute minimum of pollution or change in water quality due to human activity.

5.1.2 Regional Public Facilities and Services

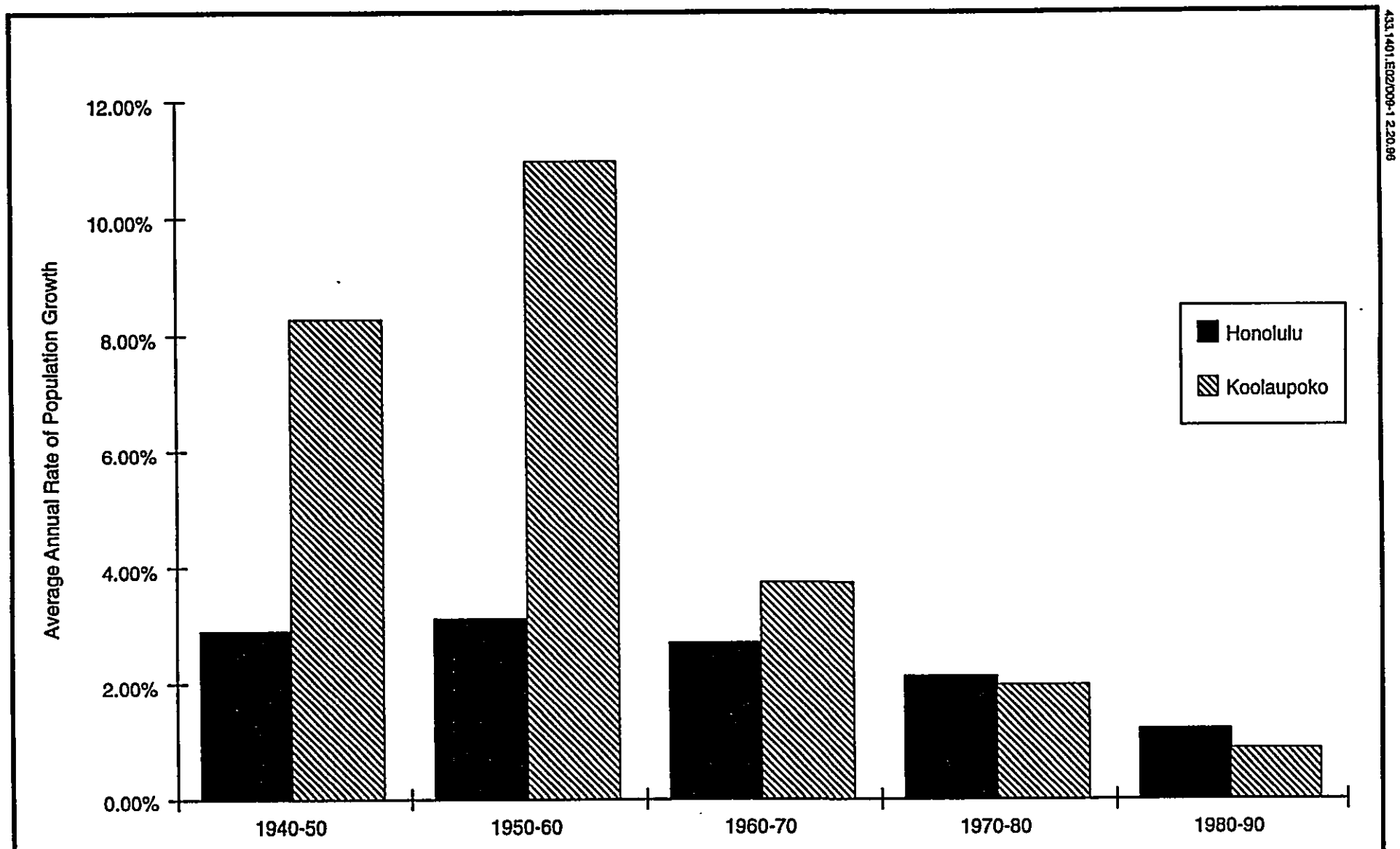
Kaneohe is a suburb of Honolulu with its own satellite city hall. With a population of more than 40,000 (1990 U.S. Census), the Kaneohe-Heeia region has a sufficient population base to support a number of community facilities including a high school, an intermediate school and a number of elementary schools. Windward Community College is also in the region. There are fire stations, a police substation, a public library, neighborhood parks, a community center, and a hospital. Water recreational amenities include beach parks, a small boat harbor, a State park, and several private marinas.

Public bus service is provided by The Bus, which is operated by the Oahu Transit Services, Inc., and solid waste collection is provided by the City and County of Honolulu.

5.1.3 Economic and Employment Trends

Kaneohe is a residential community with supporting commercial and public service facilities. Industries in the area reflect the commercial and service orientation of employment in Kaneohe and its surrounding areas.

One exception is the presence of MCBH on Mokapu Peninsula. Approximately 7,500 military personnel and 700 civilian men and women were stationed at the base in 1991.



Source: Community Resources, Inc., September 1994

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Prepared by: Belt Collins Hawaii
February 1996

FIGURE 5-1
KO'OLAUPOKO AVERAGE ANNUAL POPULATION GROWTH, 1940–1990

The impact of this station in the region is significant in terms of social and economic benefits. Local businesses benefit from the domestic and recreational/entertainment needs of the base personnel. Military personnel also have integrated into the community and are involved in community facilities/services and social activities.

Diversified agriculture, although not as large in employment numbers as other industries, is a major economic activity, especially in the northern sectors of the Kaneohe-Kahaluu-Waikane region. Its products supply local markets.

5.2 COCONUT ISLAND AND ENVIRONS

5.2.1 Existing Conditions

The State owns Coconut Island and the 1.4 -acre shoreline property along Lilipuna Road. HIMB presently occupies the southern shoreline area of the island.

5.2.1.1 HIMB Facilities

HIMB currently leases its site on Coconut Island from the State Department of Land and Natural Resources. Its facilities consist of 18 primary buildings that house research laboratories, classrooms and offices, three houses and living quarters, and four maintenance/support operations buildings (see Figure 2-2). Several boat moorings and boat landings provide parking and access for marine vessels at the island. The main access for marine vessels on the east side of the island is the pier in the east lagoon. The main access on the west side of the island is a boat landing in the west lagoon at the lighthouse station, with a secondary access at the boat landing in the south lagoon.

HIMB's daytime population on Coconut Island consists of 81 people (34 full-time and 47 part-time employees). In the evening, visitors, temporary residents (consisting of staff members and students), and researchers working after hours can include as many as 34 persons or as low as 20 persons. Most of the existing HIMB jobs result from scientific research teams that consist of a principal investigator aided by technicians and graduate students. Most of the non-research positions are administrative, providing clerical and organizational support for the research teams. The remaining jobs are building maintenance, boat operation, and custodial.

The typical working hours for HIMB staff are from 8:00 AM to 5:00 PM, Monday through Friday. However, the research teams at HIMB often have different schedules, which may extend into the nights and weekends, depending on their research projects.

5.2.1.2 Former Hachidai Property

Hachidai USA, Inc. purchased Coconut Island from the Pauley family on April 1, 1987. The purchase included the 12.5-acre central portion of the island and the 1.4-acre Lilipuna Road pier and parking lot on Pohakea Point. The company owner did not live on the island, but occasionally used it for company meetings and entertainment. In 1995, the two properties were purchased by the University of Hawaii Foundation and are now being leased to the University of Hawaii for HIMB's long-term use.

The former private portion of Coconut Island was maintained by a staff of four. The resident caretaker and his family lived on the property's main compound, which has a guest house, banquet room, and kitchen building. A cottage and one-story multiple guest quarters are nearby. Other buildings on the property include a bowling alley, a small beach house (unoccupied), a lookout gazebo and two caretakers' houses. A mooring facility and a floating dock in the west lagoon of the island provided the former owner with access to Coconut Island from the Lilipuna Road pier (see Figure 2-2).

5.2.2 Potential Impacts

The proposed action will involve construction, new facilities and new HIMB personnel. These would result in short-term or temporary economic impacts that are primarily associated with construction and long-term impacts that are generally associated with the operations of the proposed action.

5.2.2.1 Short-Term Impacts

A development project can generate impacts in the regional and state economies at three levels. They are:

Direct Employment and Income: Construction and project operations involve new jobs and hence new salaries for project workers. Construction jobs associated with a particular project are short-term; operation jobs are usually permanent jobs.

Indirect Employment and Income: These are created when a new operation (or construction firm building a new project) buys materials and services elsewhere in the regional economy during work on or for a project.

Induced Employment and Income: These consist of the impacts of spending by workers in direct and indirect jobs, who support others in the region as they spend their pay.

In Community Resources, Inc.'s study, it was estimated that construction of the proposed action would support about 49 person-years (or full-time-equivalent jobs) of direct employment in the construction industry and another 96 person-years in indirect and

induced jobs (Table 5-1). (Person-year figures are used because construction work actually involves an even larger number of workers, not all of whom are present at the same time.) Thus, the total workforce income associated with this construction would amount to about $5.0 million (see Table 5-1).

Table 5-1 Construction Employment and Income, HIMB Project

	PROJECT IMPACT
CONSTRUCTION SPENDING (Million $s)	$6.6
DIRECT CONSTRUCTION EMPLOYMENT[1]	
Total Jobs (person-years)	49
Share On-Site Jobs[2]	80%
Average Number of Construction Workers On-Site (person-years)	20
Income (Thousand $s)[3]	$2,407.7
INDIRECT & INDUCED CONSTRUCTION EMPLOYMENT[4]	
Total Jobs (person-years)	96
Income (Thousand $s)[3]	$2,601.4
TOTAL WORKFORCE INCOME	$5,009.1

Notes:
1 Estimate based on average ratio between construction put in place in Hawaii in 1993 and construction workforce, lowered slightly (to 8.25 jobs per million dollars) to allow for the high cost of transport on this project.

2 Number of workers on-site changes from phase to phase in any construction project. The average used here is a rule of thumb for the industry.

3 Estimated using average statewide heavy construction earnings (for direct jobs) and the average earnings, all industries (for indirect jobs). 1992 data were used and adjusted to 1994 data in proportion with change in the Consumer Price Index for Honolulu.

4 Estimated from employment multipliers for Heavy Construction, DBEDT Input-Output Model for Hawaii.

Source: Community Resources, Inc., 1994

5.2.2.2 Long-Term Impacts

In the operational phase of the project, it was assumed that the new marine laboratory would respond to existing needs for new and expanded research space. The additional space will make it possible for HIMB to support up to three additional research teams. Operations employment due to the project could range from zero to 15 new direct jobs. Approximately 10 new jobs would be the likely possibility (personal communication from Phil Helfrich of HIMB to Cheryl Vann of Belt Collins Hawaii, August 1995). Were operations to expand to the new capacity made possible by the proposed action, HIMB operations could support an additional nine indirect and induced jobs elsewhere. Thus, an estimated $0.6 million in annual wages would be paid to additional direct, indirect, and induced operational workers (Table 5-2). The proposed action does not include funding for new operations at HIMB.

There is no guarantee that new research will result in new services and products for Hawaii's aquaculture industry; currently, the largest component of the aquaculture industry is research. HIMB grant awards since 1987 have totaled $8.15 million, approximately two-thirds of which come from federal sources. Using State projections of possible future growth in aquaculture, it is reasonable to estimate that new applied research could yield spin-offs valued at 100% to 319% of the investment in research funding. From this analysis, it appears that new research at HIMB could help to support other services and production valued up to $1.1 million annually.

The impact of the proposed action on the island's existing population will be minimal. No accommodations are planned in the new facility. Hence, no additional staff or any visitors are expected to stay overnight on the premises. However, the peak daytime staff on the island may increase by between one to 15 persons, with a most likely increase of up to ten individuals.

Occasional conferences held in the new marine laboratory facility could temporarily increase the daytime population by as many as 30 persons (personal communication from Phil Helfrich of HIMB to Cheryl Vann of Belt Collins Hawaii, August 1995). Because existing accommodations are extremely limited, none of these conference visitors could remain on the island overnight.

The number of graduate students temporarily living on the island is anticipated to remain the same.

There could be a small increase in housing demand from workers associated with project operations when and if operations at the new facility reach capacity. If new

Table 5-2 Operations Employment and Income, HIMB Project

	Existing Project	Future Growth Without Project	PROJECT IMPACT	
			Low Range[1]	High Range[2]
DIRECT OPERATIONS EMPLOYMENT				
Total Jobs (annual full-time equivalents)	50	4	0	15
Research:				
Team Leader	N/A	1	0	3
Technicians and Graduate Students	N/A	3	0	8
Education/Library	N/A	0	0	2
Administrative	N/A	0	0	1
Custodial	N/A	0	0	1
Income (Thousand $s)[3]	$1,424.8	N/A	$0.0	$392.8
INDIRECT AND INDUCED OPERATIONS EMPLOYMENT ASSOCIATED WITH PROJECT[4]				
Total Jobs (annual full-time equivalents)	N/A	N/A	0	9
Income (Thousand $s)[3]	N/a	N/A	$0.0	$239.6
TOTAL DIRECT, INDIRECT, AND INDUCED OPERATIONS EMPLOYMENT ASSOCIATED WITH PROJECT				
Total Jobs (annual full-time equivalents)	N/A	N/A	0	23
Income, (thousand $s)	N/A	N/A	$0.0	$632.4

NOTES:
1 Estimated on basis of funding currently associated with project.
2 Estimated on basis of building capacity and Institute needs.
3 Estimated using average earnings, all industries. 1992 data were used and adjusted to 1994 data in proportion with change in the Consumer Price Index for Honolulu.
4 Estimated from State Input-Output employment multipliers for "Other Industries." Excludes job creation due to training and impacts on Hawaii's aquaculture industry.

SOURCE: Hawaii State Department of Labor & Industrial Relations, 1993.

operations research is largely done by visiting scholars, it is anticipated that about ten workers and their dependents would need to find short-term housing. This would be a small impact on the local rental market should University facilities not be available.

5.3 FISCAL COST-REVENUE ANALYSIS

5.3.1 Project Financing

Construction of the proposed action is estimated to cost approximately $6.6 million. Funding for the construction will come from a private source that has an interest in HIMB. No public funds are involved in the construction of the proposed action.

5.3.2 Public Cost

The proposed action will have little or no impact on government costs. It is anticipated that the City and County of Honolulu will not incur new costs to serve additional HIMB people. Even if the project does support new workers and their families, these people—visiting marine biologists, for example—would seem unlikely to demand or need much in the way of City and County services. Any infrastructure improvements required for the proposed action will be coordinated with the City and would very likely be provided by HIMB. The State also is not likely to incur any significant cost associated with the proposed action.

5.3.3 Public Revenues

Because the project size is relatively small, the proposed marine laboratory facility will have little impact on government revenues. The project will not add to City and County revenues. As a State facility, HIMB does not pay property taxes, which is a major source of income for the City. Additionally, the project will have little or no population impact. Thus, there should be little or no increase in fees, fines and population-based revenues accruing to the City.

At the State level, some revenues will be accrued, at least from the project's construction. A total of approximately $631,000 would be generated from excise, corporate income and personal income taxes (Table 5-3).

5.4 SOCIAL CONDITIONS ON COCONUT ISLAND

In its social impact assessment, Community Resources, Inc. noted several issues presenting points of disagreement between the HIMB and Hachidai. These issues pertained to property boundaries, maintenance standards, waste disposal procedures,

Table 5-3 State Revenues Associated with Project Construction

STATE TAX	REVENUES (Thousands)
Excise Tax	
Construction Spending[1]	$260.0
Construction-Related Workforce Spending[2]	152.6
Corporate Income Tax[3]	
Construction	16.3
Personal Income Tax[4]	
Construction-Related Workforce Incomes	202.4
TOTAL	$631.2

Notes:
1 Calculated at 4% of direct construction spending.
2 Calculated at 4% of workforce income spent on taxable items. Disposable income estimated from 1988-1989 U.S. Bureau of Labor Statistics Survey.
3 Calculated at 0.25% of construction spending, from 1989-1990 data on business receipts and corporate income taxes collected.
4 Calculated at 4.04% of wages.

Sources: Community Resources, Inc., 1994

and use of the Lilipuna Road parking lot and pier. However, since the privately-owned portion of the island was acquired from Hachidai, these issues are no longer pertinent.

5.5 SOCIAL ISSUES IN SURROUNDING COMMUNITY

In August 1994, Community Resources, Inc. conducted interviews with key members of the Kaneohe and Kahaluu Neighborhood Boards and State Department of Land and Natural Resources (see Appendix G for the list of persons interviewed). The interviewees were asked to identify issues and concerns related to the proposed action.

In general terms, the interviewees expressed strong concern for protection of Kaneohe Bay while maintaining quality of life for area residents. They also identified other water resources in the region that are unrelated to the project, such as freshwater streams and Waiahole Ditch, which would need protection.

Regarding HIMB, the interviewees generally support its research efforts because they feel HIMB has often proved a positive influence on the Kaneohe Bay environment. The

Coconut Island facility, however, is also perceived as being isolated from community affairs due to its remote location and restricted access.

The project's construction phase is a main point of concern for the interviewed Neighborhood Board members. They are particularly worried that the project's construction activities may harm the environment. For instance, construction could produce unchecked run-off into the bay, as well as destruction of coral heads, and construction noise could affect HIMB staff and laboratory animals.

New facility operations could increase sedimentation, negative visual impacts could result from the new marine laboratory, negative water quality impacts could result from activities in the new maintenance building, and infrastructure could be inadequate to handle expanded uses. There was also concern on the potential damage that may result from the seawall replacement. This aspect of the proposed project is no longer a part of the development program.

These potential impacts on the environment and their mitigation are discussed in other sections of this EIS.

The tangible impacts on the surrounding community are expected to be only slight because the new laboratory will not be located directly within Kaneohe, and its new employees would not generate a significant demand on existing public facilities and services. No mitigation is required.

The most significant impact would be intangible and beneficial. The new marine laboratory is seen to provide additional facilities at HIMB in order to accommodate the increasing demand for research and educational needs, to increase the quality of research and education with better facilities, to attract better faculty, and ultimately to bring recognition to Hawaii as a leader in marine sciences.

5.6 SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

The proposed action will have a beneficial impact on the economy of Oahu. Construction would support up to a total of 139 person-years of both direct and indirect employment with an associated income totaling $4.9 million. If operations expand to the new capacity made possible by the project, HIMB would support up to 15 direct and nine indirect and induced jobs, for a total of $0.6 million in annual new income in Hawaii.

Positive impacts on government revenues would include approximately $0.6 million associated with the construction phase of the project. The project may also create spinoffs from Hawaii's ocean economy, but definite dollar amounts are hard to predict.

Social impacts vary according to the location of affected neighbors. Interviewed residents of Kaneohe expressed concerns on environmental and parking/transportation issues; these potential impacts and their mitigation are discussed in detail in other sections of the EIS.

CHAPTER SIX
INFRASTRUCTURE AND PUBLIC FACILITIES AND SERVICES

The proposed project will affect the infrastructure of Coconut Island and increase demand for infrastructure support from municipal systems and utility companies on Oahu. This section describes the potential impacts of the proposed project on infrastructure and public facilities and suggests mitigative measures to address these impacts.

6.1 MARINE TRANSPORTATION

The only access to Coconut Island is by vessel from the Oahu shoreline. Therefore, the consequences of marine transportation must be considered as part of the EIS.

6.1.1 Existing Conditions

6.1.1.1 Marine Transport Facilities

Coconut Island currently has several facilities supporting marine transportation, which are located in the lagoons that border the island (Figure 6-1). There are docking and mooring facilities in two lagoons in the southwest portion of the island, and a boat landing for the passenger shuttle on the peninsula between them. There is also a floating pier in front of the administration/laboratory building in the east lagoon. Smaller additional floating piers are found elsewhere in the lagoon.

The Oahu landing facility is a pier that extends from the Lilipuna Road property. This pier is constructed of concrete and extends approximately 400 feet from the Oahu shoreline. It forms the Oahu end of Coconut Island's passenger shuttle service and includes a parking area.

Heeia Kea Pier, a public small boat harbor and marina, is approximately three nautical miles northwest of Coconut Island. The pier is operated by the State and is heavily used by recreational boaters and commercial operators during the weekdays and on the weekends. The pier has several areas adequate for large-scale staging of equipment.

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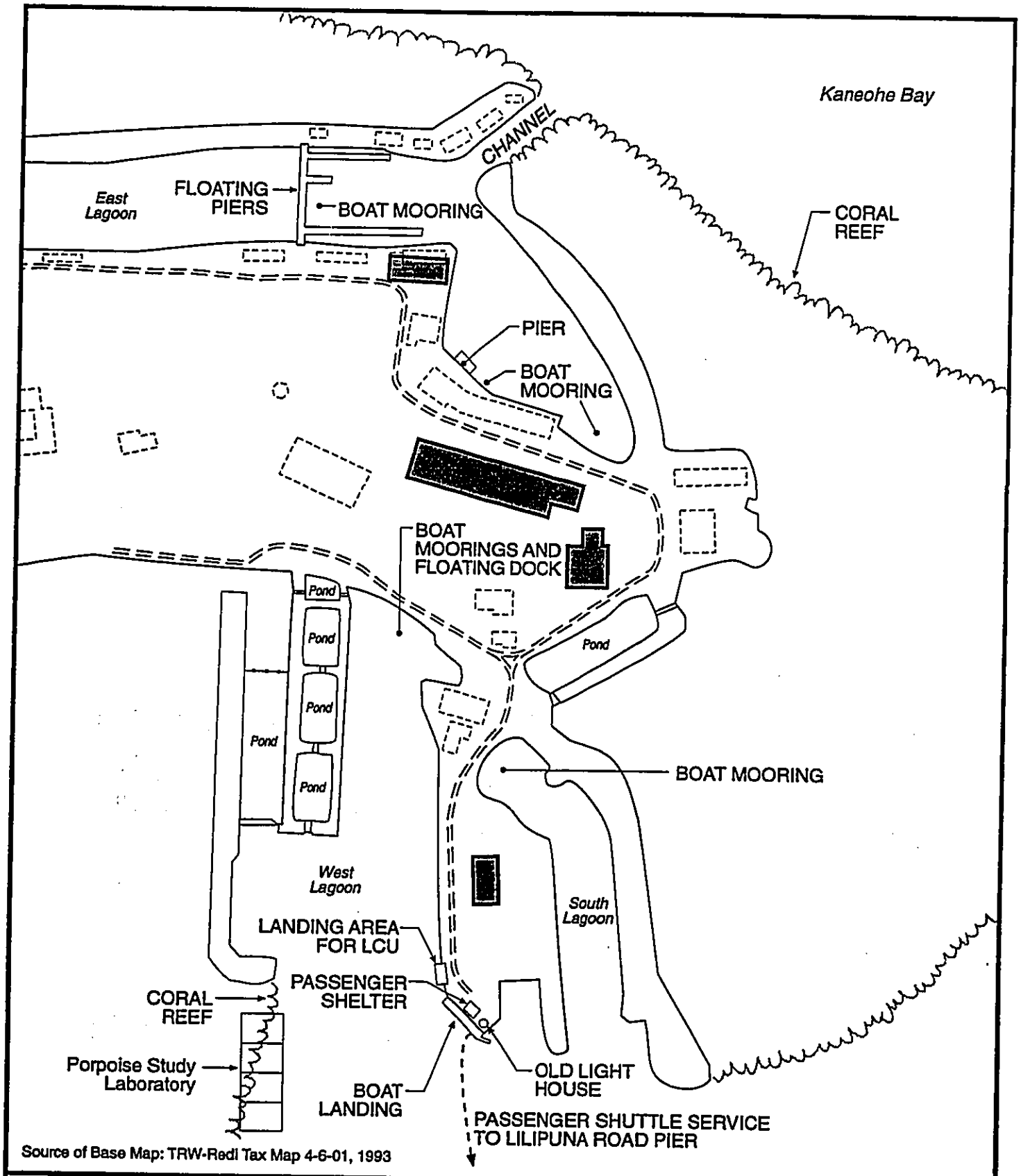

Source of Base Map: TRW-Redl Tax Map 4-6-01, 1993

ENVIRONMENTAL IMPACT STATEMENT
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Prepared by: Belt Collins Hawaii
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FIGURE 6-1
MARINE TRANSPORTATION
COCONUT ISLAND

0 100 200
Scale in Feet

North

6.1.1.2 Passenger Shuttle Service

HIMB currently employs 81 people (34 full-time, 47 part-time) on Coconut Island. Some live on the island, but the majority require transport to and from the facilities each day. A regular passenger boat shuttle service is provided from the Lilipuna Road pier to the boat landing on the southwest portion of the island. The shuttle service, which is a small motor boat with seating for six, runs on an as-needed basis from approximately 7:00 AM to 4:30 PM Monday through Friday and every two hours from 8:00 AM to 5:00 PM Saturday, Sunday, and holidays. This shuttle service is currently sufficient for transport of staff personnel to and from the island.

6.1.1.3 Bulk Load Transport Service

HIMB maintains a utility boat for the transport of bulk material to and from Coconut Island. The utility boat docks at the pier near the administration/laboratory building and makes runs to Heeia Kea Pier as needed. It is currently used for the transport of all bulk material to the island such as supplies and fuel. Solid waste (trash) is transported off-island by this method.

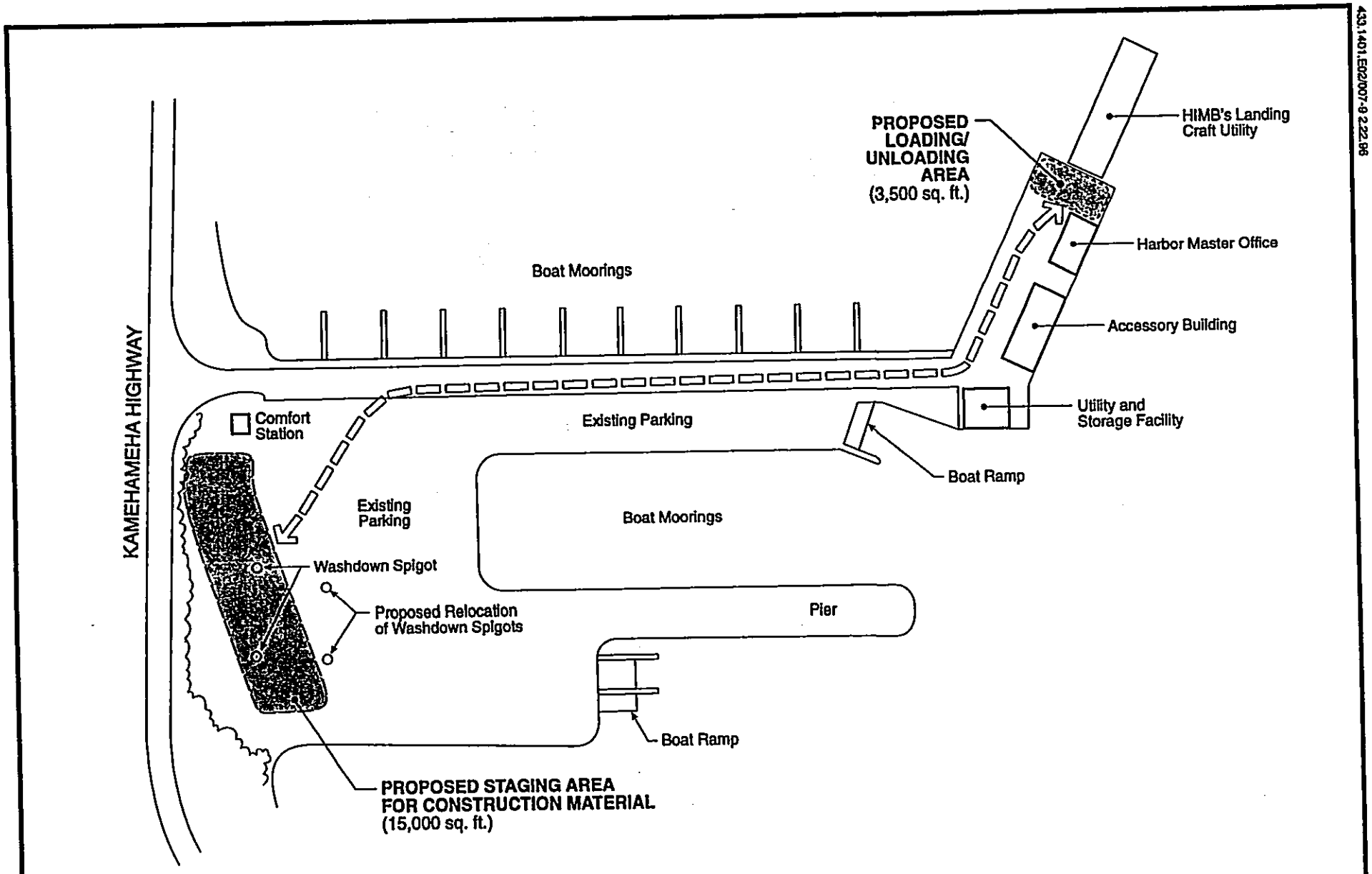
Early in 1995, HIMB acquired a 115-foot long surplus LCU from the military. It is moored in the south lagoon and is planned to be used for transport of bulk materials and for future construction work on the island.

6.1.1.4 Use of Heeia Kea Pier

Pending final coordination and approval with the Heeia Kea Pier harbor master and the DLNR Division of Boating and Ocean Recreation, Heeia Kea Pier will be used for the staging and mobilizing of construction equipment and materials. The southwest end of the pier parking lot will be used to stage materials, and the LCU will be moored, loaded, and unloaded at the far north end of the pier, approximately 1,000 feet from the staging area (Figure 6-2). A 3,500-square foot area of the pier will be used on an interim basis to provide for the transfer of material and equipment. A 25-ton crane, a 10-ton extending boom type forklift, and two flatbed trucks will be used in the loading and unloading operations.

6.1.1.5 Navigation Hazards

Hazards to navigation around Coconut Island consist primarily of coral patch reefs, boat mooring areas, commercial recreation activities (Figure 6-3), and other marine traffic. These hazards are common to all marine traffic in the bay. The direct channel to HIMB is only partially marked with navigational aids.



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Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
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FIGURE 6-2
CONSTRUCTION STAGING AREA AT HEEIA KEA PIER

Scale: 1"=1000' North

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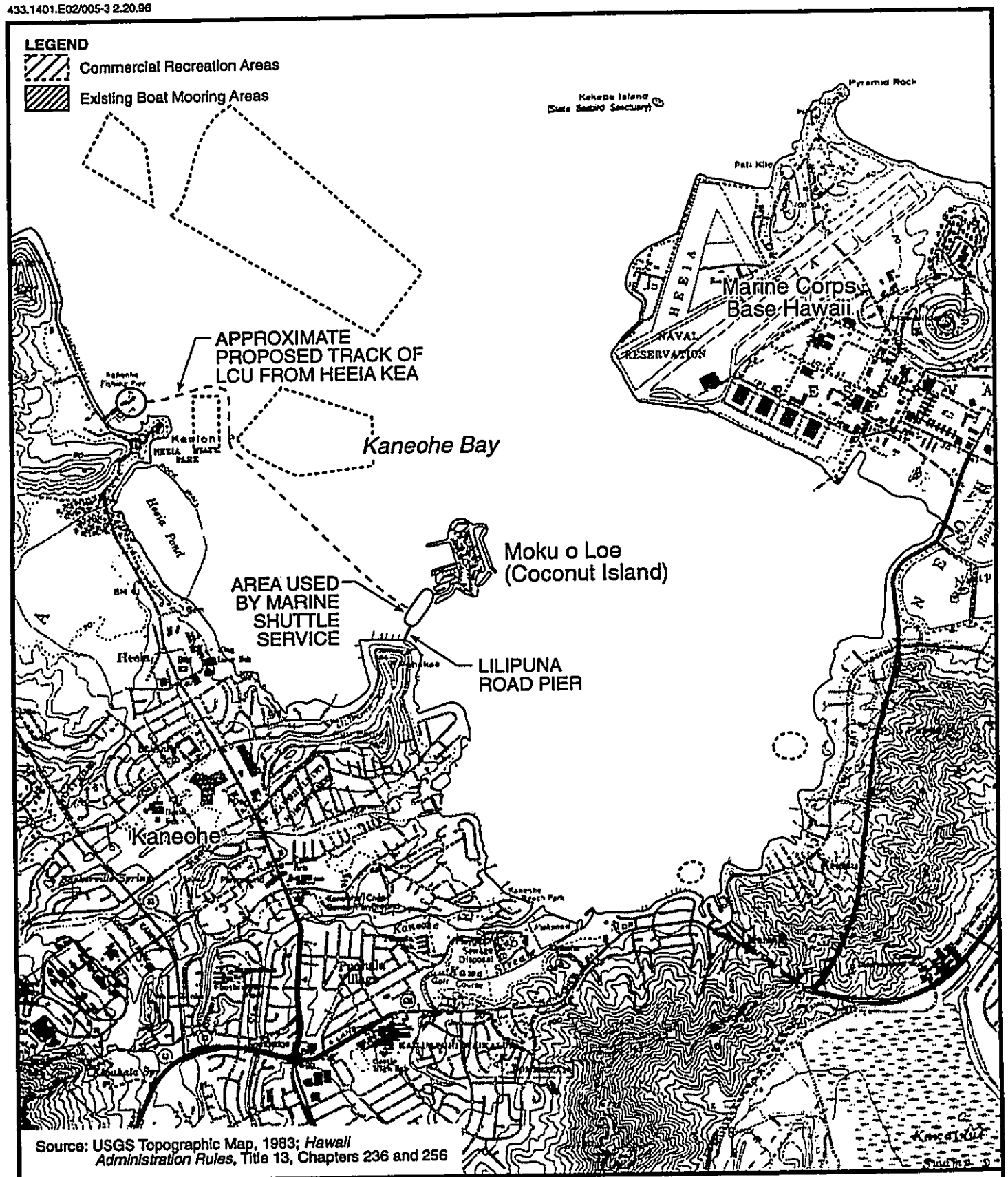

Source: USGS Topographic Map, 1983; *Hawaii Administration Rules*, Title 13, Chapters 236 and 256

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FIGURE 6-3
MARINE TRANSPORTATION
KANEOHE BAY

0 1500 3000
Scale in Feet

North

6.1.2 Potential Impacts

During the construction phase, the LCU will transport equipment and materials from Heeia Kea Pier to Coconut Island. The LCU will also transport demolition debris back to Heeia Kea Pier for disposal on Oahu. Several round trips a week are anticipated during some periods of the approximately 15-month construction schedule. Landing the LCU at the pier for loading and unloading equipment and demolition waste has the potential to interfere with ongoing heavy use of the pier by recreational boaters and commercial operators who take customers on fishing or diving trips or sightseeing.

Use of the staging area should not conflict with general use of the pier. It will, however, temporarily make a boat wash-down area inaccessible to the public and displace some parking stalls. Mitigation is required.

The shallow-draft LCU will operate in the deeper sections of the channels and is unlikely to affect coral heads. When fully loaded, the 115-foot-long LCU will have a forward draft of three feet and an aft draft of four feet. The west lagoon in which the LCU will operate has depths of ten to 20 feet. The lagoon is shallower close to the shoreline (see Figure 4-2), but the LCU will be able to clear any coral heads in the area.

Use of the LCU in Kaneohe Bay is not expected to create any marine traffic problem. The LCU will use normal navigational routes through the bay at speeds of 4.0 to 8.5 knots and will be operated by a qualified crew. The number of trips will be no more than one per day during the peak mobilization of the 15-month construction schedule. If nighttime operations are required, appropriate nighttime navigational lights will be installed.

During the construction phase, it is estimated that an average of 20–30 construction workers will need to be transported to and from Coconut Island each work day. This number of workers may be accommodated by the current boat shuttle service from Lilipuna Road Pier to the island. The shuttle will make extra trips if necessary so that the transport needs of HIMB employees will not be adversely affected. Construction workers and small equipment may also be transported from Heeia Kea Pier.

In the operational phase of the project, it is estimated that ten full-time personnel may be added to the daily population of the island. This will be accommodated by the current boat shuttle service from Lilipuna Road Pier without adverse impacts.

6.1.3 Mitigation Measures

Because Heeia Kea Pier is heavily used, cargo operations will not be conducted on weekends or during peak weekday periods (8:30-10:00 AM and 2:00-4:30 PM) when heavy recreational and commercial activities occur. The LCU will load at the pier only

Tuesday through Friday between 6:30-8:30 AM, 10:00-2:00 PM, and 4:30-6:00 PM. Scheduling of the largest loads will be coordinated on a case by case basis between the Harbor Master and the contractor to avoid conflicts with Aku boats, recreational boaters, and commercial tour operators. Large equipment loads will be scheduled to avoid heavy use periods, especially during the summer months.

During peak hours at the pier, loading equipment will be moved from the pier to the staging area. Trucks will deliver materials to the staging area during vehicular non-peak hours to minimize traffic congestion on the roadways. A security fence and/or guard will be used for security of the staging area. Temporary hose bibs will be provided in the interim for the displaced wash-down area. Empty construction trailers and construction debris will not be stored on the pier. Some parking stalls will be displaced in the proposed staging area. When establishing the staging area, the contractor will also organize a more efficient layout for the existing parking.

The contractor will provide proof of insurance for liability at the pier, with the state as a named insured. The pier is an earth/coral fill structure that has experienced larger loads than the proposed action will generate. However, as a precautionary measure, metal plates may be used to reinforce the pier surface, if needed, to avoid damage to the pier pavement during cargo crane operations.

6.2 GROUND TRANSPORTATION

Ground transportation issues, such as parking and road congestion, can have significant impacts on the community. Impacts and mitigation of ground transportation issues regarding the proposed project are discussed below.

6.2.1 Existing Conditions

6.2.1.1 Roadway System

Access from Kaneohe town to the project site is via Lilipuna Road from Kamehameha Highway. Lilipuna Road is a low-speed winding road, which loops from Kamehameha Highway and the Kahuhipa Street intersection along the shoreline to Kamehameha Highway and the Haiku Road intersection (Figure 6-4). The posted speed limit along Lilipuna Road, a local classified right-of-way, is 25 mph, with reduced speeds of 15 mph near the pier. The lane widths on Lilipuna Road vary from 20 feet near Kamehameha Highway to 8.5 or 9.5 feet near the pier. The pier and parking facilities for HIMB are approximately at the mid-point of the Lilipuna Road loop.

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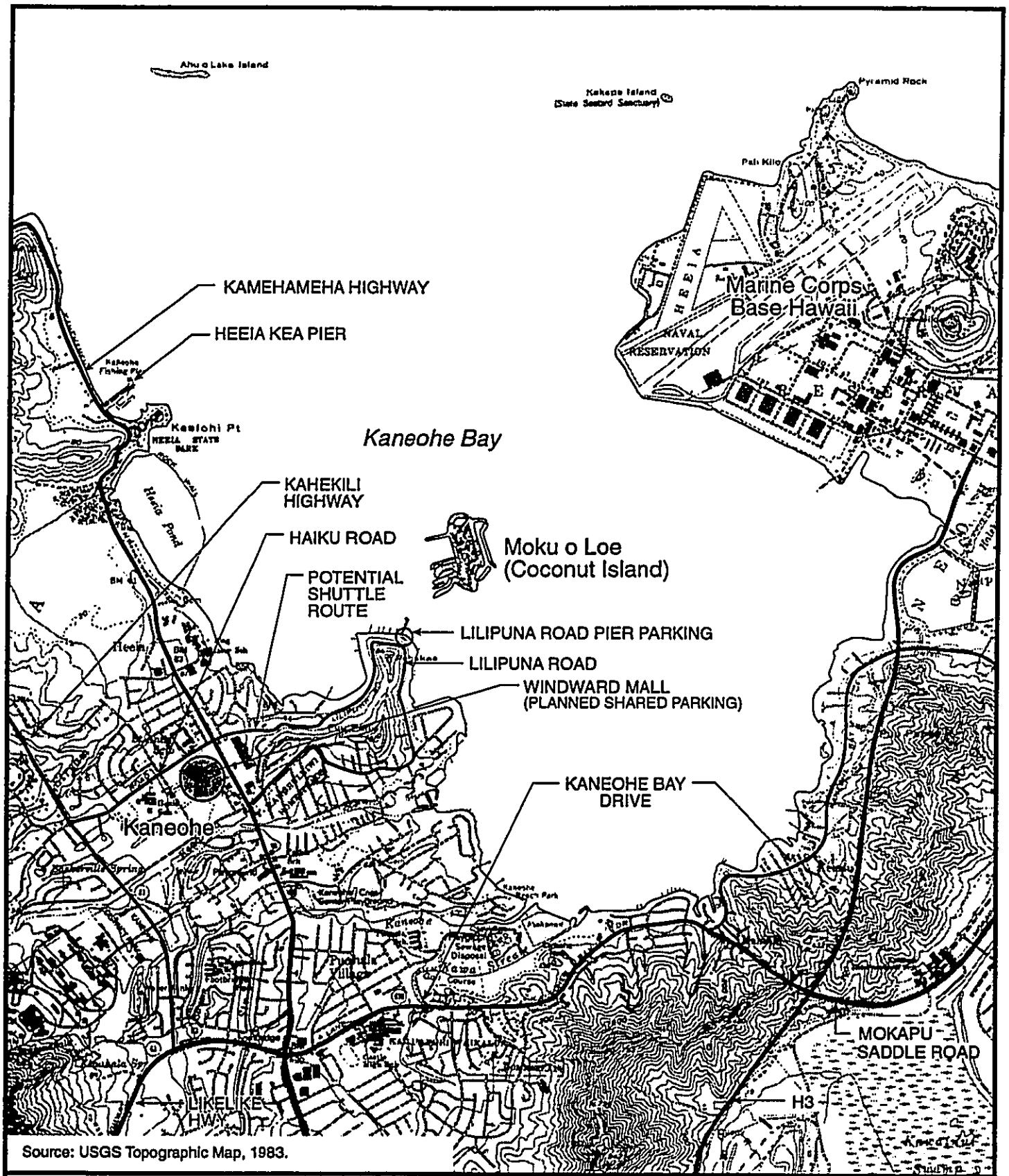

Source: USGS Topographic Map, 1983.

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Prepared by: Belt Collins Hawaii
February 1996

FIGURE 6-4
GROUND TRANSPORTATION

0 1500 3000
Scale in Feet

North

Heeia Kea Pier, which will be the Oahu site for the construction staging, is approximately 2.8 miles from the Lilipuna Road Pier. Access to Heeia Kea Pier is via Kamehameha Highway, which is a two-lane coastal road. The pier is off the highway, just north of Heeia State Park.

6.2.1.2 Vehicular Traffic

Lilipuna Road is used primarily for access to homes in the area and the facilities at Coconut Island. Currently, users of Lilipuna Road indicate that normally there is no traffic problem, except during times when there is an accident or construction along Kamehameha Highway and motorists use the road as a bypass. Accidents or construction along the highway will also affect traffic to the Heeia Kea Pier.

To assess existing traffic and parking concerns of the HIMB staff, a questionnaire was distributed. The survey included questions on possible improvements and mitigative measures for congestion on the Lilipuna Road Pier. A total of 28 of the 80 questionnaires distributed were returned. A sample of the questionnaire, with responses, is attached as Appendix H.

As viewed by the respondents, traffic is currently not a problem in the Lilipuna Road area. The weekday arrival times of the respondents varies from 6:00 AM to 10:00 AM, with a peak around 8:00 AM. The weekday departure time varies from 3:00 PM to 6:00 PM, with the majority leaving between 4:00 PM and 5:00 PM. HIMB personnel commute to and from the pier in a counterflow direction from the neighborhood peak-period traffic. Construction workers commuting to Heeia Kea Pier will also be traveling counterflow to the peak-period traffic.

6.2.1.3 Parking

Parking demand at the Lilipuna Road Pier varies with the time of day, the day of the week, and seasonally (summer has a very high demand). No parking is allowed along Lilipuna Road near the pier. Fifty-four parking stalls in the pier parking lot are available for 81 employees. Consequently, the parking lot is fully used, with vehicles illegally parked on the pier and emergency turnaround area. There are no plans to expand the pier parking facilities at this time.

Parking demand at the Heeia Kea Pier is high during the weekdays and especially on the weekends. The pier parking lot accommodates recreational and commercial users.

6.2.1.4 Transportation Programs

An occasional shuttle to the Lilipuna Road Pier from the Windward Community College has been arranged for students in special classes at HIMB. However, no other

transportation programs are currently in service. A shuttle service from a central parking area in Kaneohe was implemented approximately five years ago. The initial service was used by many of the staff; however, due to the lack of an established shuttle service program and non-enforcement of parking regulations in the pier lot, shuttle use declined and the service was stopped after three years.

6.2.2 Potential Impacts

Without properly implemented mitigation measures, short-term increases in traffic on Lilipuna Road and parking demand at the Lilipuna Road and Heeia Kea pier parking lots are anticipated during the project's approximately 15-month construction period. On average, it is anticipated that 20–30 construction workers will be commuting daily to the island from Lilipuna Road Pier.

Kamehameha Highway will experience some delays from slow-moving construction vehicles traveling to and from the Heeia Kea Pier. Kamehameha Highway, especially from Haiku Road to the pier, will be most impacted because it is a two-lane road with little or no shoulders and is the likely route to transport material from Honolulu. The transport of construction material will occur sporadically, and will cause minor inconveniences to the local traffic, as it will not occur in a rush-hour direction.

Long-term commuter traffic on Lilipuna Road could also increase, which could increase parking demand at the pier parking lot. This demand will be generated by the addition of up to ten employees on the HIMB staff. Traffic and parking demands are also anticipated to increase during the evenings and weekends for classes and conferences held at the new facilities.

6.2.3 Mitigation Measures

To address the short-term traffic and parking problems at the Lilipuna Road Pier, a shuttle van service will be established. During construction, an average of 20–30 construction employees will commute to the island. The shuttle van service will pick up the construction workers from a central point in Kaneohe and transport them to the Lilipuna Road Pier. A shuttle boat will ferry the workers from the pier to the island.

Traffic on Lilipuna Road is normally not a problem because commuters going to work on Coconut Island are traveling counterflow to the area residents commuting to work. The long-term increase of ten employees to the HIMB staff will have a minimal effect on traffic in the area. Therefore, no mitigation is required.

Various parking management programs will be carried out to accommodate the long-term parking needs of additional staff members, classes, and conferences on the island.

The following is a list of potential measures recommended by staff members of HIMB and that are being considered for the project:

- Car pool
- Shuttle service from a central parking area
- Assigned parking stalls in double parking arrangement
- Enforcement of parking regulations at the existing lot
- Parking fees

Use of a car pool or shuttle service would maintain or reduce traffic volume on Lilipuna Road. A prearranged car pool or a shuttle vehicle service could be set up based upon the arrival and departure times of HIMB staff. Staff members would meet at a central parking area in Kaneohe and a car pool would be taken to the pier. Car pooling to the pier would reduce the need for a shuttle vehicle service. Shuttle vehicles would be run every hour on the hour during the morning and afternoon arrival and departure times for people missing their car pools. A set schedule for the shuttle service would encourage the use of either car pools or the reliable shuttle vehicle system.

Assignment of parking stalls and enforcement of parking regulations at the lot would further encourage the use of car pools or a shuttle vehicle system. Assignment of stalls would help in determining which vehicles are illegally parked. Vehicles parked illegally would be cited and towed.

A fee for parking at the pier parking lot could also help in the use of a car pool or shuttle vehicle system. A monthly fee would be prorated, with single occupant drivers paying the most and vehicles used in the car pools paying a reduced fee based upon the number of people in the vehicle. Fees collected for the monthly parking would be used for renting parking stalls at the central location in Kaneohe.

Classes and conferences are held in the evenings and weekends on the island. During the evenings and weekends, most of the staff are not on the island and no traffic or parking problems are anticipated for small functions. For large conferences and class field trips, shuttle services from the University of Hawaii campus at Manoa or Windward Community College or a central parking area in Kaneohe would be arranged. Attendees would be encouraged to use the services and would be advised that parking will not be available at the lot. Shuttle vehicles would then be parked at the pier lot for return services.

The preferred alternative will include some or all of the mitigation measures outlined above. The most feasible solution involves the use of a shuttle vehicle service from a common parking area in Kaneohe town. The provisions of this service will be started during the initial operational stage of the new laboratory and support facilities.

6.3 AIR TRANSPORTATION

6.3.1 Existing Conditions

No air transportation currently occurs to and from Coconut Island and none is planned for the project. However, Coconut Island was, until recently, within the flight track of fixed-wing aircraft approaching MCBH (see Figure 4-10). Coconut Island is still in the area of approach for transient fixed-wing aircraft to MCBH. DOD regulations for airfield operations (DOD, 1981) impose a 50:1 slope criteria for vertical obstructions within 25,000 feet of an approach/takeoff area. Coconut Island is within this 50:1 slope area (Belt Collins, 1991). Specifically, the proposed marine laboratory site is approximately 5,000 feet from the end of the active runway, limiting allowable vertical obstructions in the site to 100 feet or less in height.

6.3.2 Potential Impacts

The potential impacts on air transport from the proposed action are the intrusion of new structures or construction cranes into the airspace used by aircraft operating at MCBH. No permanent structures will extend above the 100-foot limit. However, discussion with the proposed construction contractor indicates a crane with a maximum extension of 120 feet will be used at the project site, which is approximately 25 feet above msl. This combined height of 145 feet is above the 100-foot height restriction established in the DOD regulations.

6.3.3 Mitigation Measures

According to Air Traffic Control (ATC) at MCBH, an aircraft encountering an obstruction of 145 feet over Coconut Island would be in violation of flight rules (personal communication, MCBH/ATC, September 9, 1994). ATC will be notified when the crane is extended, and a flag or other marker will be placed at the top of the crane to indicate the potential obstruction. When not in use, the crane will be lowered to a position below the approach surface elevation. The contractor will contact ATC/MCBH at the start of construction so that it can inform pilots of the possible obstruction through the base's Automated Data Information System. Federal Aviation Administration (FAA) regulations also require notification of that agency within 30 days of such a potential obstruction. The contractor will notify FAA prior to construction.

6.4 WATER SUPPLY

6.4.1 Existing Conditions

Potable water is currently supplied to the island from a Board of Water Supply main on Lilipuna Road through a two-inch meter on the Lilipuna Road property. A six-inch line runs from the meter, across the property, down to the pier, and under Kaneohe Bay to landfall on the southwest corner of the island. Service on the island is via four-inch lines. Maps of existing utilities are provided in Figures 6-5 and 6-6.

Current fresh water use by HIMB facilities on the island is approximately 115,000 gallons per day (gpd) (1992 Board of Water Supply billing records), with approximately 4,200 gpd being consumed by the former Hachidai residence for irrigation and domestic use. As recently as 1995, an updated reading for the total fresh water use by HIMB and the former private section of the island is approximately 167,000 gpd (obtained from BWS records by UH Environmental Center). Water that serves HIMB is used for various purposes, including research and laboratory work, landscape irrigation, and for domestic purposes in the dining room, kitchen, rest rooms, outdoor equipment, washdown areas, and guest houses. All of the water is disposed of in the sanitary sewer, except for water used in research and laboratory work, which, if uncontaminated, is discharged into the lagoon.

Saltwater is used in experiments at the research facility. Currently, saltwater is supplied from four intake lines located on the reef off the east shore of the island (see Figure 6-5) then pumped from this location. Two FYBROC electrical pumps are operated with two identical standby pumps. The intake of saltwater is continuous. For many years, HIMB has pumped a steady 350 gallons per hour of seawater to serve their Coconut Island facility. Varying amounts of this water are used for experimental purposes, depending on the program being served. What is not used for research purposes goes out the overflow of the header tank and is returned to the lagoon. Most of the time, between 50 and 75 percent is used or approximately 4,200 to 6,300 gpd; only rarely is 100 percent used.

Two 1,000-gallon storage tanks are located next to the existing administration/ laboratory building. Saltwater is dispensed to the research laboratories from these tanks. Some distribution is made directly from the pump house. If uncontaminated, saltwater from the research tanks is discharged into the east lagoon. Potentially polluted water is discharged into the sewer system.

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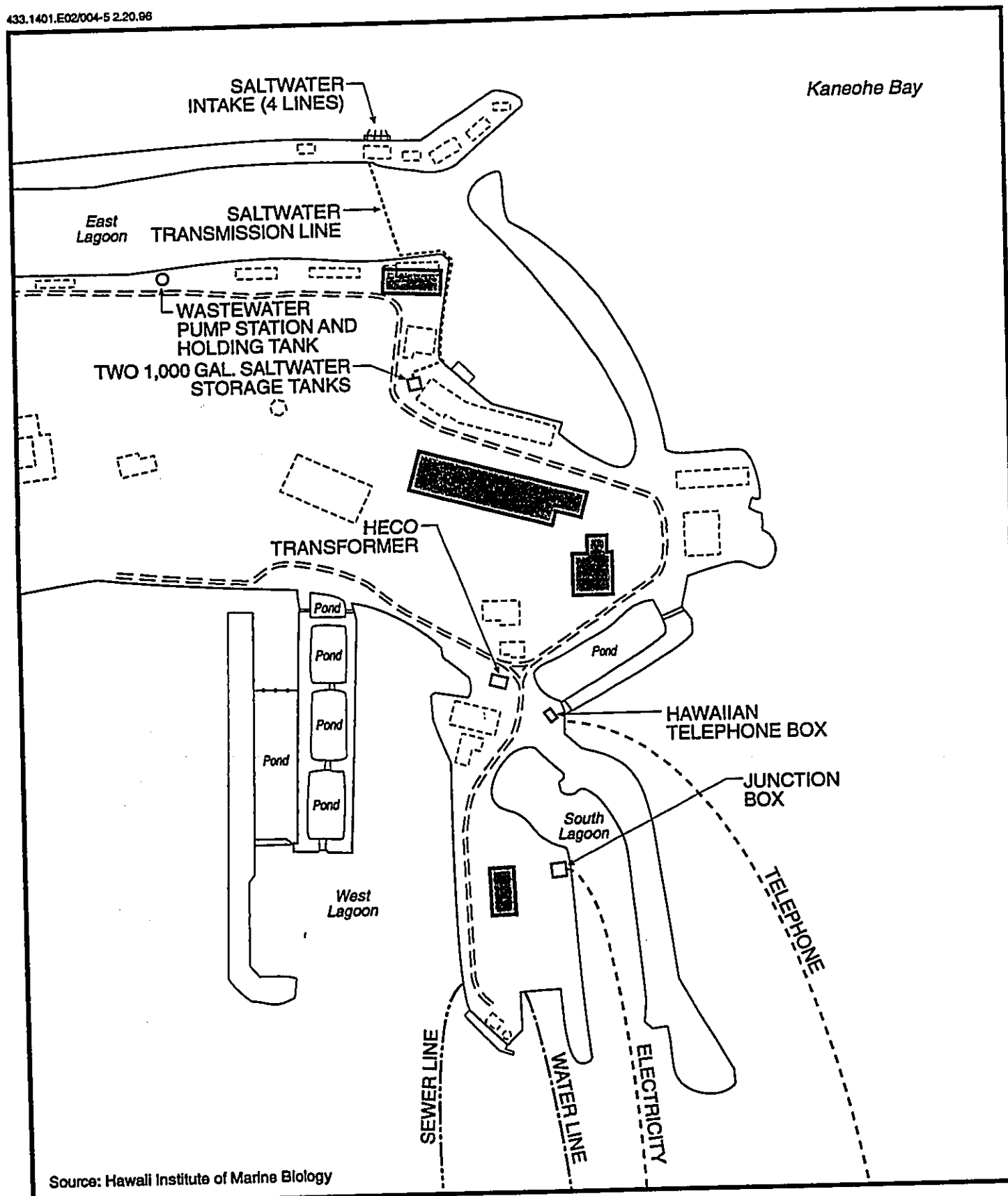

Source: Hawaii Institute of Marine Biology

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 6-5
EXISTING UTILITIES
COCONUT ISLAND

0 100 200
Scale in Feet

North

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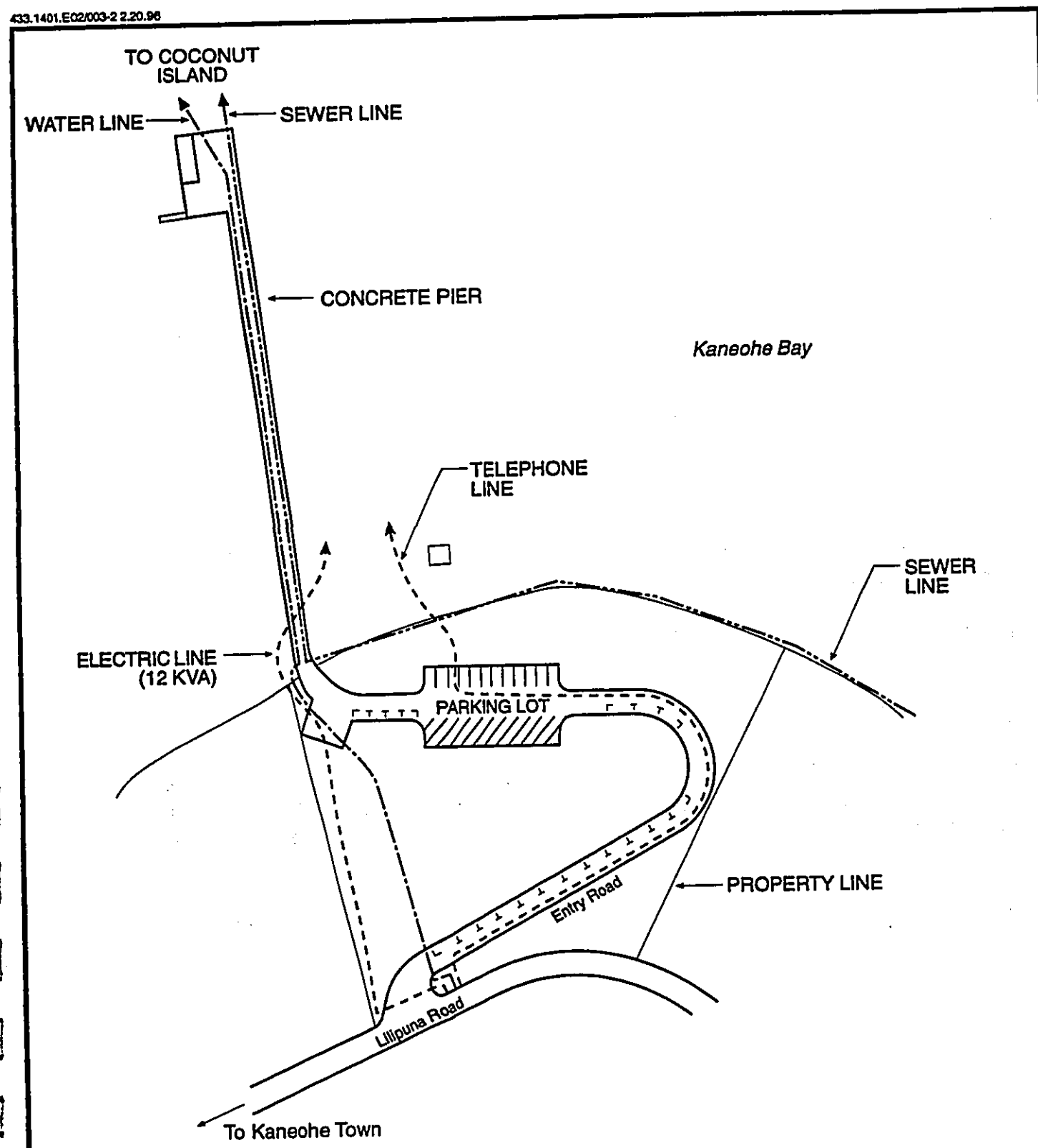

Source: Hawaii Institute of Marine Biology

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 6-6
EXISTING UTILITIES
LILIPUNA ROAD PIER

0 50 100
Scale in Feet

North

6.4.2 Potential Impacts

Construction water demand will occur primarily from concrete mixing and the washing of equipment. In addition, some water may also be used for fugitive dust control during the construction phase.

When implemented, the proposed action may add as many as ten more daytime research personnel to the staff. The estimated increased water demand based upon ten additional staff is 2,500 gpd. This is the sum of the additional laboratory/domestic demand based upon existing laboratory consumption of 146 gallons per capita per day plus approximately 1,000 gpd to irrigate the 5,000 square feet of landscaped area. Total fresh water use will rise to about 117,500 gpd. The existing source is expected to be adequate to handle the increase in use. The maintenance building and wet laboratory annex will be supplied with water through new connections to existing waterlines. The marine laboratory will be supplied through a relocated existing waterline.

Saltwater supply for laboratory work will be sufficient, given the current and future needs on the island (personal communications from HIMB staff to Belt Collins Hawaii, July 1995). The nutrient levels in the waters near the discharge point will remain affected, but no further impact on the water quality or increase in the discharge flow is anticipated.

6.4.3 Mitigation Measures

Before the BWS will sign the Building Permit Application for this project, a water allocation for the additional 2,500 gpd must be obtained from the State DLNR, Division of Water and Land Development. The allocation will likely be approved due to the small amount of additional use being requested.

No mitigation is proposed for the saltwater system. The nutrient levels in the waters near the discharge point will remain affected, but no significant additional impact is anticipated.

6.5 WASTEWATER

6.5.1 Existing Conditions

Sanitary wastewater generated on the island is pumped to the public sanitary sewer system along Lilipuna Road through a four-inch sewer force main (SFM). The wastewater pump station (WWPS) is located on the east side of the island, with two gravity runs connecting it to improvements throughout the island. This WWPS has a holding tank with a five-day holding capacity and a float system in the tanks that currently controls

flow from the tank to the SFM. The SFM runs under Kaneohe Bay across the Lilipuna Road property and into City and County of Honolulu Sewer manhole 3372 on Lilipuna Road. Sewage from the SFM then flows to the Kahanahou WWPS and to a pumping station at Kaneohe Wastewater Treatment Plant (WWTP), where it is pumped to the Kailua WWTP.

The wastewater system handles all facilities on the island, including laboratory sinks. In accordance with the City's Department of Wastewater Management (DWM) regulations, no hazardous substances are disposed into the domestic sewer system. Hazardous liquids that require disposal after use are treated as hazardous waste and are properly drummed and disposed off-island according to federal regulations, via the University of Hawaii Department of Environmental Health and Safety (see Section 6.8).

In 1989, DWM placed a moratorium on additional sewage flow in Kaneohe in order to prevent increases in average flow from existing connections, due to a lack of capacity at the Kaneohe WWTP. In October 1994, the Kaneohe WWTP was converted into a pumping station and a new force main was provided to divert its flow to the Kailua WWTP. The moratorium has not been lifted due to capacity problems at the Kailua WWTP. The moratorium has been modified, however, to allow sewer applications in Kaneohe for flows equivalent to three single-family housing units (1,200 gpd) or less.

DWM calculations show that the existing wastewater system is at its maximum capacity between the SFM discharge point on Lilipuna Road and the Kahanahou WWPS. Moreover, the newly converted treatment plant/pump station in Kaneohe, as well as Kailua WWTP's effluent pumps, are still insufficient to handle additional capacity.

6.5.2 Potential Impacts

The proposed action will generate an increase in wastewater of approximately 1,460 gpd based upon the addition of ten new HIMB personnel. Infrequent conference groups or special classes on the island will generate additional flows for short periods. These increases will exceed the City's allowable wastewater flow increase of 1,200 gpd under the conditions of the moratorium. A building permit for new facilities thus will not be issued by the City and County unless the system's average flow rate for the project area remains near constant. DWM has said that capital improvement funds have been allocated to improve the capacity of the Kaneohe-Kailua sewer system, and when completed, the moratorium could be lifted. This is expected to occur in 1999. HIMB, therefore, cannot connect to the City sewer system until that year.

6.5.3 Mitigation Measures

To mitigate the possible impacts of the moratorium on the proposed action, HIMB will have to consider other options to reduce its wastewater flow to allowable levels. The use

of an existing on-site holding tank for storing wastewater during peak periods and discharging flow into the City system during off-peak periods was removed from consideration when the City determined that the holding tank was not a feasible option because its average flow would still exceed the City's sewer system capacity.

A possible solution to allow connection of additional fixtures at HIMB while keeping the average flow into the City system constant is to replace the existing fixtures at HIMB with low-flow devices. Four percent of the existing research laboratory wastewater generation will need to be reduced by retrofitting in order to maintain the current flow level into the Kaneohe WWTP. This will be achieved by converting four percent of the total fixture units in the existing laboratory to low-flow (e.g., three toilets). All of the fixtures in the new marine laboratory will be low-flow. These plans, however, still need to be reviewed and approved by the DWM.

6.6 ELECTRICAL POWER

6.6.1 Existing Conditions

Electrical power for the island is provided from Hawaii Electric Company (HECO) lines on Lilipuna Road. Two submarine cables provide 2,159 kilovolt amperes (kVA) of power to the island as a whole, of which 200.4 kVA is fed to HIMB facilities and 32.9 kVA to the former Hachidai residence. A total of 233.3 kVA is used by existing facilities on the island.

The 12.47-kilovolt (kV) electrical lines run under Kaneohe Bay from the vicinity of the Lilipuna Road Pier (see Figure 6-6) and come to the island near the current shuttle boat landing (see Figure 6-5). A HECO transformer located near the old boat house distributes power at 122.08 volts to the HIMB facilities, while another transformer provides 4 kV-lines to the former Hachidai residence. Electric meters are located on the island near the transformers.

Power supplied by HECO is backed up by an on-site 35-kilowatt electric generator. A 50-kilowatt diesel fuel generator is stored on-site but has not been installed.

6.6.2 Potential Impacts and Mitigation Measures

Power lines on Lilipuna Road and lines coming onto Coconut Island are sufficient to handle the expected additional load. The proposed project will require roughly 630.8 kVA which, in addition to the 233.3 kVA currently used, will leave spare capacity of about 1,294 kVA.[1] Transformers to condition power are incorporated into the project buildings' design to handle the extra load.

[1]Personal communications from Dean Pang of ECS, Inc. to Belt Collins Hawaii, July 14, 1995.

6.7 COMMUNICATIONS

6.7.1 Existing Conditions

Telecommunications for the island are provided by GTE Hawaiian Telephone circuits that connect to telephone lines on Lilipuna Road (see Figure 6-6). Telephone lines run under Kaneohe Bay from the vicinity of the Lilipuna Road Pier and onto the island near the current shuttle boat landing (see Figure 6-5). Switching equipment on the island distributes telecommunications needs to HIMB. GTE has stated that no additional telephone "trunk" lines are available on Lilipuna Road (pers. comm., HIMB, August 2, 1994), restricting the addition of new lines to Coconut Island. Computers on Coconut Island are linked to the UH Manoa campus and other research resources using a modem system.

6.7.2 Potential Impacts and Mitigation Measures

The telecommunications systems both on the island and on Lilipuna Road are sufficient to support the new telephone extensions for the proposed project. Additional switching equipment is incorporated into the building design to accommodate the additional extensions.

Because no additional off-island trunk lines can be obtained by HIMB, employees may have longer waits for their outgoing calls. This will also affect outgoing facsimile transmissions. Computers will be converted from a modem system to a frame relay system to allow more efficient communications between remote stations. No further mitigation measures are proposed.

6.8 HAZARDOUS MATERIALS AND SOLID WASTE

The proposed project will increase the volume of solid waste generated on Coconut Island as well as increase the usage of hazardous materials in laboratories and maintenance areas. Potential impacts and proposed mitigations are discussed below.

6.8.1 Existing Conditions

6.8.1.1 Domestic Solid Waste Disposal

Currently, solid waste generated by operations on the island is collected by HIMB maintenance personnel and transported off-island for disposal in Oahu's solid waste stream. According to operations personnel, four dumpster loads (approximately six cubic yards each) are transported off-island each week (personal communication with Phil Helfrich of HIMB to Cheryl Vann of Belt Collins Hawaii, August 1995). According to *A*

Solid Waste Estimation Procedure: Material Flows Approach (EPA/530/SW-147, May 1975), this is about 7.2 tons per month. This material is transported to Heeia Kea Pier by HIMB's 30-foot utility boat and from there is transported by a licensed contractor (Waste Management, Inc.) to the municipal collection system. The LCU will only be used for new construction and special operations, and will not be used for routine solid-waste disposal. "White goods" and other large-size domestic trash are transported on an as-needed basis off-island for disposal.

6.8.1.2 Hazardous Materials Storage and Hazardous Waste Disposal

A few HIMB scientists use a variety of hazardous chemicals and radioactive isotopes for laboratory research. The materials are used in small quantities and in controlled laboratory environments. These materials are tightly controlled and regulated by the University of Hawaii's Environmental Health and Safety Office (UHEHSO) in compliance with regulations published by state and federal agencies, including the Nuclear Regulatory Agency, Food and Drug Administration, Drug Enforcement Administration, and DOH. UHEHSO has established written guidelines for the handling and disposal of chemicals and radioactive materials used by HIMB personnel.

Estimates of types and quantity of substances that may be used in the new laboratory are listed in Table 4-7. HIMB based these estimates on similar biotechnology programs at other research institutions; it is not an exact list of actual materials and quantities that will be used in the new laboratory. The level of use of these substances will vary depending upon the researcher and the type of experiments being conducted.

A variety of hazardous substances is used in the existing maintenance facility and will also be used in the new maintenance building. These substances include solvents, oils, paints, and other chemicals and substances associated with repair of small engines and small fiberglass boats. In addition, based upon historic activities usually associated with boat houses, the possibility exists that contamination may be present at the old boat house. Potential contaminants include marine-based paints that may have contained lead or biological retardants. Further investigation is required to determine if contamination exists due to these activities.

Hazardous wastes are disposed according to state and federal regulations. Wastes from HIMB are transported off-island on an as-needed basis at the request of the individual scientist. Wastes are then transported by licensed UH transport personnel to the UHEHSO facility on the UH/Manoa Campus, where they are disposed of by a licensed contractor. Waste has been transported in this fashion from Coconut Island since the founding of the institute with no adverse incidents.

No underground storage tanks are located within the HIMB complex. On the former privately-owned portion of the island, two underground tanks were found and removed

in the summer of 1995. Necessary approvals from the DOH were obtained before the removal procedures were undertaken.

6.8.1.3 Petroleum Products

HIMB uses petroleum products on Coconut Island for a variety of uses, including motor fuel and oils for boats and land vehicles and diesel fuel for emergency power generators. Storage is aboveground; no regulated underground storage tanks exist on the present HIMB complex. Storage currently consists of two stationary 600-gallon aboveground tanks (one is currently empty) for diesel fuel for emergency power generation and one mobile 500-gallon tank for gasoline. The two 600-gallon tanks are set on a non-bermed concrete pad near the north end of the administration/laboratory building. According to discussions with HIMB personnel, these tanks are refilled via 55-gallon drums brought in with other bulk items to the island. An underground transmission line for diesel fuel exists from the aboveground tank to the emergency generator next to the administration building. Currently, spill control plans, cleanup materials, and firefighting equipment are not located in this area.

Containerized oil is stored in a wooden cabinet near the south end of the administration/laboratory building. This area stores quart-size containers of boat motor oil and three 55-gallon drums on racks for dispensing lubrication oil. Waste oil generated by HIMB is transported off-island with other hazardous waste for disposal via the UHEHSO facility at UH/Manoa.

6.8.2 Potential Impacts

6.8.2.1 Solid Waste Impacts

Solid waste impacts will be predominantly from the demolition phase of the project. Waste materials will include wood, concrete, and metal. Construction waste will also be generated during the construction phase and, like demolition waste, will require off-island disposal.

The new facilities will generate an additional two loads per month of domestic solid waste. Total off-island disposal will be about eight tons (18 dumpster loads) per month. The materials will include cardboard, glass, metal cans, plastics, paper products, fabric materials, wood scraps, and other dispensable items.

6.8.2.2 Hazardous Waste and Petroleum Product Impacts

Petroleum products will be used in construction vehicles and equipment during the construction phase of the project. Hazardous waste, in the form of used petroleum products, will be generated by these activities and will require off-island disposal. There

is a small potential for a release of these petroleum products from the operation of construction equipment during the construction phase, which would impact soil or water quality.

It is estimated by HIMB that the volume of hazardous materials used on the island will increase only slightly with the operation of the proposed buildings. These materials will slightly increase the hazardous waste stream from HIMB, and proper mitigation will be required.

6.8.3 Mitigation Measures

6.8.3.1 Construction Waste

A plan for the proper disposal of construction wastes will be prepared by the construction company for use during the demolition and construction phases. This plan will include staging locations for transporting waste off-island, and plans to transport the waste to a licensed landfill.

If asbestos is found in the structures proposed for demolition, it will be handled in accordance with 40 CFR Part 61. All regulated quantities and types of asbestos-containing material will be subject to specific emission controls, collection procedures, containment procedures, and disposal as specified by this regulation.

Demolition of surfaces coated with lead-based paints will be performed by appropriately trained workers in accordance with applicable safety requirements (see Section 6.8.3.3).

6.8.3.2 Domestic Solid Waste

The increase in the amount of domestic solid waste will not be significant given the small addition of personnel. The current disposal system will adequately handle the additional material (personal communication from HIMB to Belt Collins Hawaii, July 1995). A commercial compactor will be obtained by HIMB in the near future to more efficiently store and transport solid waste for disposal. A program for recycling will be considered and may be implemented in the future at HIMB.

6.8.3.3 Hazardous Waste

The contractor will take precautions to insure the proper transport and use of petroleum products and the proper disposal of any hazardous waste generated during construction. A plan of preventive measures, such as plans for spill prevention and proper containment and disposal in the event of a spill, will be instituted by the contractor before construction begins, and all workers will be well versed in its use and implementation.

The storage area near the above-ground tanks will be improved. A consolidated petroleum storage containment area will be constructed for the storage of drums containing new and used oil, for the dispensing of motor oil, and for the storage of diesel fuel for emergency power generation. This area will be a bermed concrete pad designed to contain any potential spills. The existing pad under the diesel storage tanks will be expanded to provide a containment area large enough for the petroleum products used on the island by HIMB. This containment area will be designed to hold at least 55 gallons of spilled material. Adequate firefighting equipment will be located in the area, as well as clean up materials.

Demolition of surfaces coated with lead-based paints will be handled by appropriately trained workers according to applicable safety requirements. Building materials painted with lead-based paints may be disposed of as demolition debris if the paint is left intact on the material. Dust control precautions will be carried out during demolition work to minimize the potential of particles of paint being released during demolition.

Hazardous wastes generated by HIMB will continue to be handled under the care of UH/UHEHSO. Plans for handling and disposal currently provide proper mitigation of HIMB's hazardous waste stream; these measures will continue to provide mitigation of potential impacts of hazardous wastes generated during normal operations on the island.

6.9 POLICE AND FIRE PROTECTION

6.9.1 Existing Conditions

6.9.1.1 Police Protection

The Honolulu Police Department (HPD) has three substations that serve the windward area of Oahu: Kahuku Station, Kaneohe Station, and Kailua Station. The Kaneohe Station, which is at the corner of Waikalua Road and Kamehameha Highway, is the headquarters of this windward region and serves the Coconut Island area. Because patrol units have limited access to Coconut Island, HIMB must rely on internal security. HPD will only be called for assistance when there is a specific crime or emergency.

6.9.1.2 Fire Protection

Currently, the Lilipuna area is served by two fire stations. The first station that can respond is the Kaneohe Fire Station, which is located across the street from the Police Station on Waikalua Road. In an emergency, the first response station would take the HIMB shuttle to the island via the Lilipuna Road pier. Response time is approximately five minutes to the pier.

The Aikahi Fire Station is the second response location. In an emergency, this station would take HIMB's shuttle from the Lilipuna Road pier or a shuttle from MCBH. Neither Kaneohe Fire Station nor Aikahi Fire Station has a fire boat or rescue boat, although a vessel can be made available from the Fire Alarm Bureau or central dispatching. Water is currently available on the island via a six-inch line from Lilipuna Road; there is, however, insufficient pressure in the line for fire protection.

6.9.2 Potential Impacts and Mitigation Measures

The proposed action will require fire protection service in case of a fire. Because Coconut Island is accessible only by boat, fire trucks could not reach the HIMB facility. The proposed buildings will be constructed of fire-proof material and built with one-hour fire protected construction walls. These building elements will slow the spread of fire and contain it to a limited area. Portable firefighting equipment will be used to extinguish whatever fire is contained. HIMB will coordinate training for staff in the use of firefighting equipment. Due to the lack of water pressure on the island, the use of automatic fire sprinkler systems would require improvements that are not currently part of the design. Other firefighting measures may be needed for additional precaution and will be reviewed with the Honolulu Fire Department.

The proposed action is not expected to increase the need for additional police protection services on the island; thus, no mitigative measures will be required.

6.10 HEALTH CARE FACILITIES

6.10.1 Existing Conditions

Currently there are a hospital, a mental health facility, an elderly care home, and a child care center in the immediate area of the island. Castle Medical Center is located on Ulukahiki Street, near Kamehameha Highway. The Hawaii State Mental Hospital is also located in this vicinity. The Aloha Respite Service provides elderly care and is on Alaloa Street. Kamaaina Care provides child care and operates out of Benjamin Parker Elementary School on Waikalua Road.

6.10.2 Potential Impacts and Mitigation Measures

The addition of ten personnel to HIMB should cause little or no impacts on these services, and therefore no mitigation measures are necessary.

6.11 EDUCATIONAL FACILITIES

6.11.1 Existing Conditions

6.11.1.1 Schools

Currently, four elementary schools are located near the island: Benjamin Parker Elementary School on Waikalua Road, Heeia Elementary School on Haiku Road, Kapunahala Elementary School on Keneke Street, and Puohala Elementary School on Kulauli Street. Secondary schools include King Intermediate School on Kamehameha Highway and Castle High School on Kaneohe Bay Drive. Windward Community College provides higher education programs for high school graduates.

6.11.1.2 Libraries

The Kaneohe Public Library is the closest library to the island. It is the only public library in the district and is located on Kamehameha Highway. The library hours and services are as follows: Sunday 1:00–5:00 PM, Monday-Wednesday 10:00 AM to 8:00 PM, and Thursday-Saturday 10:00 AM to 5:00 PM. These are the new school session hours; the schedule changes according to school holidays and vacations. HIMB also has a small reference library on the island for use in marine research.

6.11.2 Potential Impacts and Mitigation Measures

HIMB is an educational institution, and the expansion of the facility will have a positive impact on the community as a resource on marine biology issues. HIMB works with groups such as the Friends of Heeia State Park to promote awareness of marine biology issues. The proposed project will allow HIMB to continue that role.

6.12 RECREATIONAL FACILITIES

6.12.1 Existing Conditions

6.12.1.1 Land/Shoreline-Based Recreational Facilities and Activities

Kaneohe Bay contains many land- and shoreline-based recreational facilities (Figure 6-7). The Heeia Kea Small Boat Harbor, Heeia State Park, and Heeia Pond are located in the northwest section of the bay. South of the Heeia Pond is Alii Shores Marina. The Marine Corps Recreational Area is located east of Coconut Island, and the Kanohuluiwi Fishpond, Makani Kai Marina, Kaneohe Beach Park, Kaneohe Yacht Club, Waikalua Fishpond, and Kokokahi Pier are south of Coconut Island. The Bay View Golf Course is found inland of this area.

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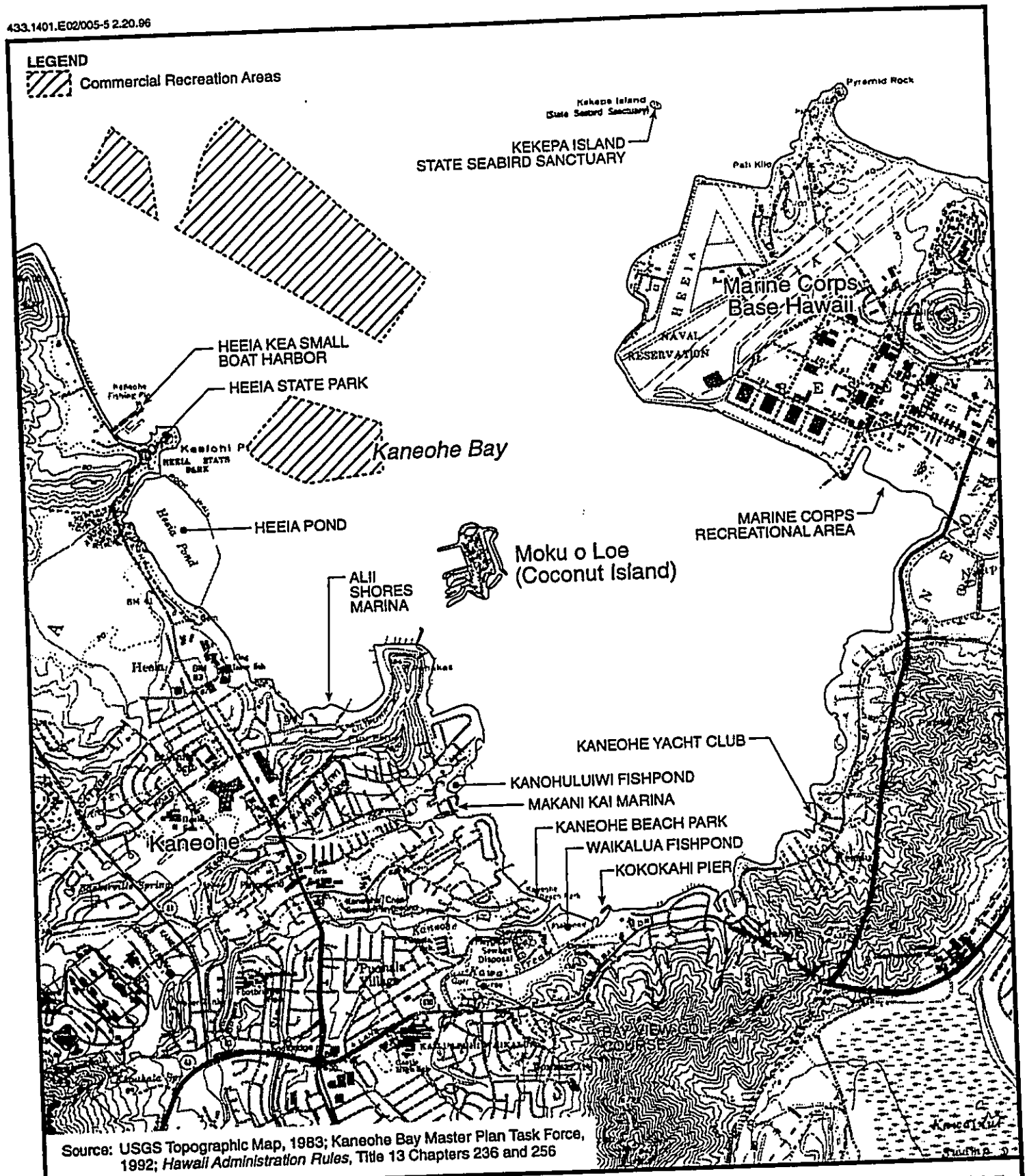

Source: USGS Topographic Map, 1983; Kaneohe Bay Master Plan Task Force, 1992; *Hawaii Administration Rules*, Title 13 Chapters 236 and 256

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Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
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FIGURE 6-7
KANEOHE BAY RECREATIONAL FACILITIES

6.12.1.2 Ocean Recreational Activities

Kaneohe Bay contains many ocean recreational activity areas (Figure 6-8). In the Heeia section, activities such as excursion boating, canoe paddling, thrownetting, pole and line fishing, torch fishing, crabbing, and gill netting are available. Commercial recreational activities also occur in the bay in designated areas. Unauthorized water skiing occurs on the leeward side of Coconut Island, and the southwesternmost tip of Coconut Island, known as Maile Point, is used by boaters as a landing and picnic area.

6.12.2 Potential Impacts and Mitigation Measures

Although construction and operations activities will generate an increase in marine traffic in Kaneohe Bay, no significant impact will occur in recreational areas. Most recreational activities occur during weekend periods and in the late afternoons; both construction and operational activities and their associated marine transportation activities will occur mostly during weekdays in the mornings and early afternoon and will not interfere with peak recreational demands. No mitigation is required.

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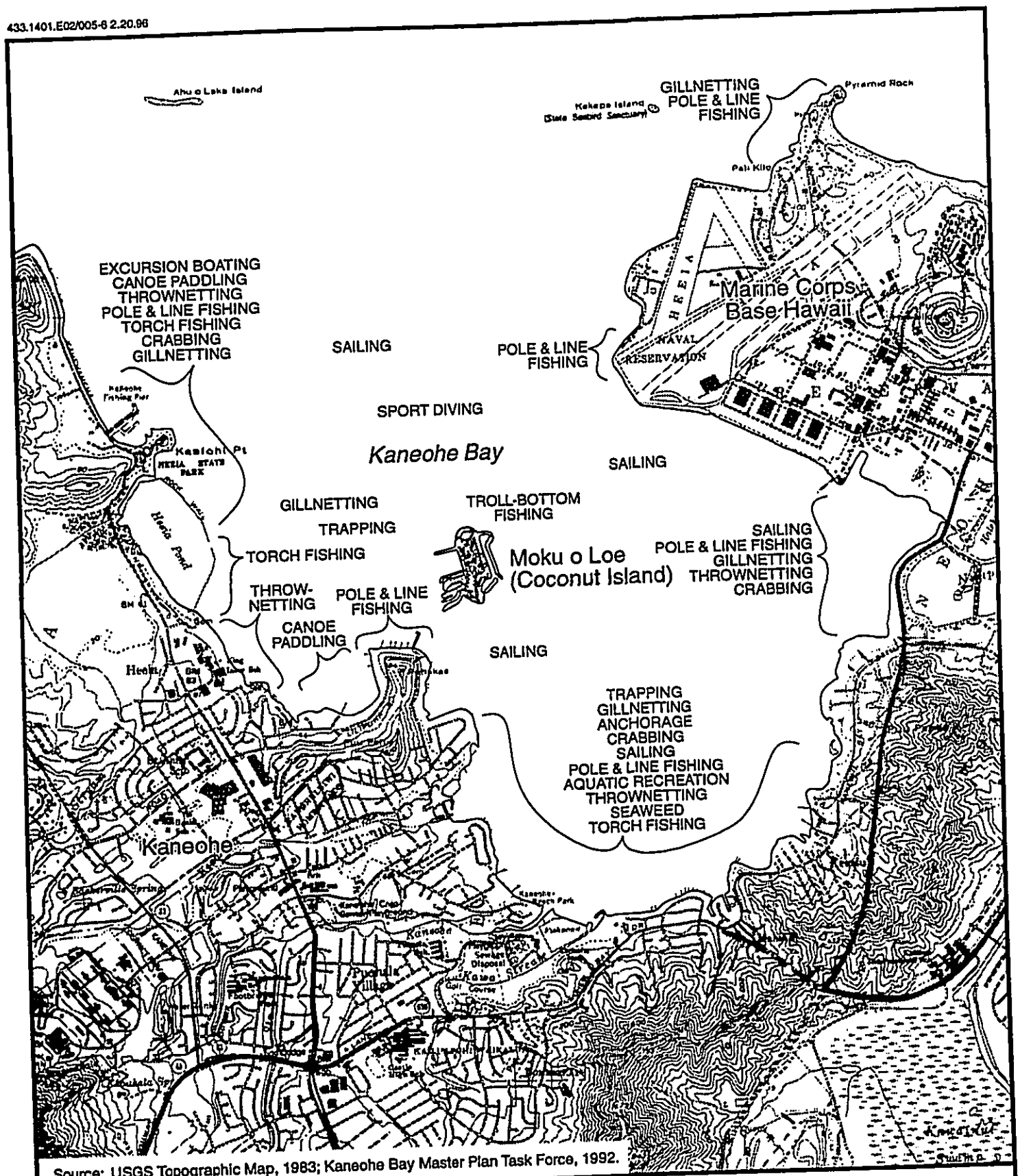


Source: USGS Topographic Map, 1983; Kaneohe Bay Master Plan Task Force, 1992.

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
February 1996

FIGURE 6-8
KANEOHE BAY RECREATIONAL ACTIVITIES

0 1500 3000
Scale in Feet

North

CHAPTER SEVEN
RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE AND ENVIRONMENTAL POLICIES/REGULATIONS

This section reviews the proposed action's relationship with federal, state, and City and County of Honolulu land use and environmental goals, objectives, plans and regulations. An assessment is then made of the project's consistency with these public policies and what permits and approvals will be required to implement the proposed improvements.

7.1 LAND USE POLICIES/REGULATIONS

7.1.1 Federal

Most of the land use policies, plans and controls that affect the proposed action are within State and local jurisdiction. A few programs are administered by the federal government and are described in the following sections.

7.1.1.1 Coastal Zone Management Act

The federal Coastal Zone Management (CZM) program is administered in Hawaii by the Office of State Planning and affects all state and federal projects in the coastal zone but *not* on federal lands.

The objectives and policies of the CZM program are to: provide recreational resources; protect historic, scenic, and open-space resources; protect coastal ecosystems; provide economic uses; reduce coastal hazards; manage development in the coastal zone; encourage public participation; protect beaches; and manage marine resources. As part of the CZM program in Hawaii, counties are responsible for designating special management areas (SMA) and the rules governing the permit procedures for development in these areas.

The proposed action is located in an SMA as designated by the City and County of Honolulu and will therefore require an SMA Use Permit. Consistency with the overall objectives of the CZM program will need to be demonstrated. Each of the ten CZM program objectives is presented in the following subsections.

Recreational Resources

One objective of the CZM program is to provide coastal recreational opportunities accessible to the public. The island on which the proposed action is located is not available for public use. Use of the shoreline area for recreational purposes is not feasible as it is currently being used by HIMB for scientific research and educational purposes. Additionally, the coral reef surrounding the island has been designated a marine sanctuary.

Historic Resources

CZM program objectives concerning historic resources strive to protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the CZM area that are significant in Hawaiian and American history and culture. Consistent with these objectives and because the project site may have been used by Hawaiian royalty and by the military during World War II, an archaeological study was conducted to ensure that proposed construction does not affect significant historic resources.

Scenic and Open Space Resources

The CZM program strives to protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources. The proposed site is not designated as a scenic or open space resource; however, efforts to minimize the impacts on the island to preserve the remaining undisturbed environment have been made. Such efforts include minimizing additional disturbed areas by utilizing areas that have already been altered by past development and utilizing "footprints" of existing structures. Building heights of the new structures are also being kept at a low profile.

Coastal Ecosystems

The coastal ecosystems objective is to protect valuable coastal ecosystems from disruption and minimize adverse impacts. The proposed action will continue to provide actively for the protection of coastal ecosystems, as the research activities conducted at the proposed site will be used to further the understanding of regional and global coastal ecosystems. Acute impacts due to the proposed action will be mitigated or minimized. For example, the new maintenance building site and the docking area proposed for loading and unloading construction materials have been selected to minimize adverse impacts on the marine environment.

Economic Uses

The economic uses objective is to provide public or private facilities and improvements important to the State's economy in suitable locations. Approval of the proposed action would provide additional sources of revenue for the State as improvements in the University's research programs attract students, educators, and grants. The proposed use of the land is dependent upon its coastal location.

Coastal Hazards

The coastal hazards objective is to reduce hazard to life and property from tsunamis, storm waves, stream flooding, erosion, and subsidence. The proposed action will incorporate structural designs to protect HIMB facilities from natural coastal hazards.

Managing Development

This CZM objective is intended to improve the development review process, communication, and public participation in the management of coastal resources and hazards. Public participation is integral to the environmental analysis process required by HRS, Chapter 343, in accordance with which this document has been prepared.

Public Participation

The objective and corresponding policies of "Public Participation" relate to stimulating public awareness, education, and participation in coastal management. Part of HIMB's mission is to assist in coastal zone management programs and stewardship. The nature of its research and educational activities is in accordance with the dissemination of information on coastal management issues by means of educational materials and published reports. In addition, the EIS for the proposed project provides for public notification, public comments, and community input in the decision process regarding the proposed activities and associated impacts.

Beach Protection

The objective and corresponding policies of "Beach Protection" related to the protection of beaches for public use and recreation. The proposed project includes a new marine laboratory complex comprised of three buildings, a replacement maintenance building and avoiding any adverse impact to the island's existing seawalls. These shoreline elements have provided long-term beach and shoreline protection for Coconut Island.

Marine Resources

The objective and corresponding policies of "Marine Resources" relate to implementing the State's ocean resources management plan. The mission of HIMB as a marine research and education facility is consistent with the stated objectives and policies of the state. Specifically, HIMB conducts research and provides education regarding marine conservation and near-shore tropical marine biology-diversity and biotechnology. HIMB uses basic and applied research to work on new and innovative solutions for the global problems of food production and environmental protection. These include ecologically and environmentally sound and economically beneficial uses and development of marine and coastal resources.

7.1.1.2 Federal Aviation Act of 1958

The Federal Aviation Act (FAA) of 1958, Section 307, and its regulations require that notification be provided to the Administrator of the FAA before construction of an object that affects navigable air space, including approach and departure surfaces of airfields.

The proposed action is situated approximately 5,000 feet from the air facility at MCBH. The tallest equipment that will be used by the construction contractor will be a crane with a boom that can extend to a height of 120 feet. The crane will be working from a site with a maximum elevation of about 25 feet above sea level. This will result in a total height of 145 feet, which will penetrate the approach slope to MCBH when the crane is in use. A flag or other marker will be placed at the top of the crane to indicate the potential obstruction, and the FAA, as well as the Air Traffic Control office at MCBH, will be notified at least 30 days before the crane is put into operation.

7.1.2 State

State of Hawaii policies, plans, and controls anticipated to affect the proposed action are presented in the following sections.

7.1.2.1 State Land Use Law

The State Land Use Law, enacted in 1961, resulted in the classification of all state lands into four categories: Urban, Conservation, Agricultural, and Rural. The proposed action site is on land categorized as Conservation, which is designated for protecting watersheds and water sources; preserving scenic and historic areas; providing park lands, wilderness, and beach reserves; conserving indigenous or endemic plants, fish, and wildlife; preventing floods and soil erosion; forestry; open space areas (with specified conditions); areas of value for recreational purposes; other related activities; and other permitted uses not detrimental to a multiple use conservation concept.

Subzone designations are also provided within the Conservation District. Coconut Island is designated in the General Subzone (Figure 7-1), the reef surrounding Coconut Island is within the Protective Subzone, and Kaneohe Bay is classified in the Resource Subzone. According to Section 13-5-14 of the Hawaii Administrative Rules, research and education (that require no physical facilities) are permitted activities in the General Subzone where the proposed HIMB facilities are located. However, a permit will be required from the State Board of Land and Natural Resources for the structural improvements proposed by HIMB (see Section 7.1.2.2).

7.1.2.2 Conservation District Use Application

Coconut Island was placed in the Conservation District in 1964. Any construction project proposed in this district was required to file an application with the Department of Land and Natural Resources for a Conservation District Use Permit (CDUP). Six CDUPs have been issued, thus far, and are listed in Table 7-1.

Because the proposed action involves State Lands, approval for use of the land will also be required from the Board of Land and Natural Resources.

7.1.2.3 Hawaii State Plan

The purpose of the Hawaii State Plan, Chapter 226, HRS (1991), is to provide a guide for the future long-range development of the State; identify the goals, objectives, policies, and priorities for the State; provide a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; improve coordination of State and county plans, policies, programs, projects, and regulatory activities; and establish a system for plan formulation and program coordination to provide for an integration of all major State and county activities. Sections of the State Plan's overall theme, goals, objectives, and policies, along with Priority Guidelines that relate to the proposed action, are identified in the following section.

Part I – Goals, Objectives, and Policies

> ***SEC. 226-10 Objective and policies for the economy—potential growth activities.***
>
> *(a) Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawaii's economic base.*

Table 7-1 Conservation District Use Permits For Coconut Island

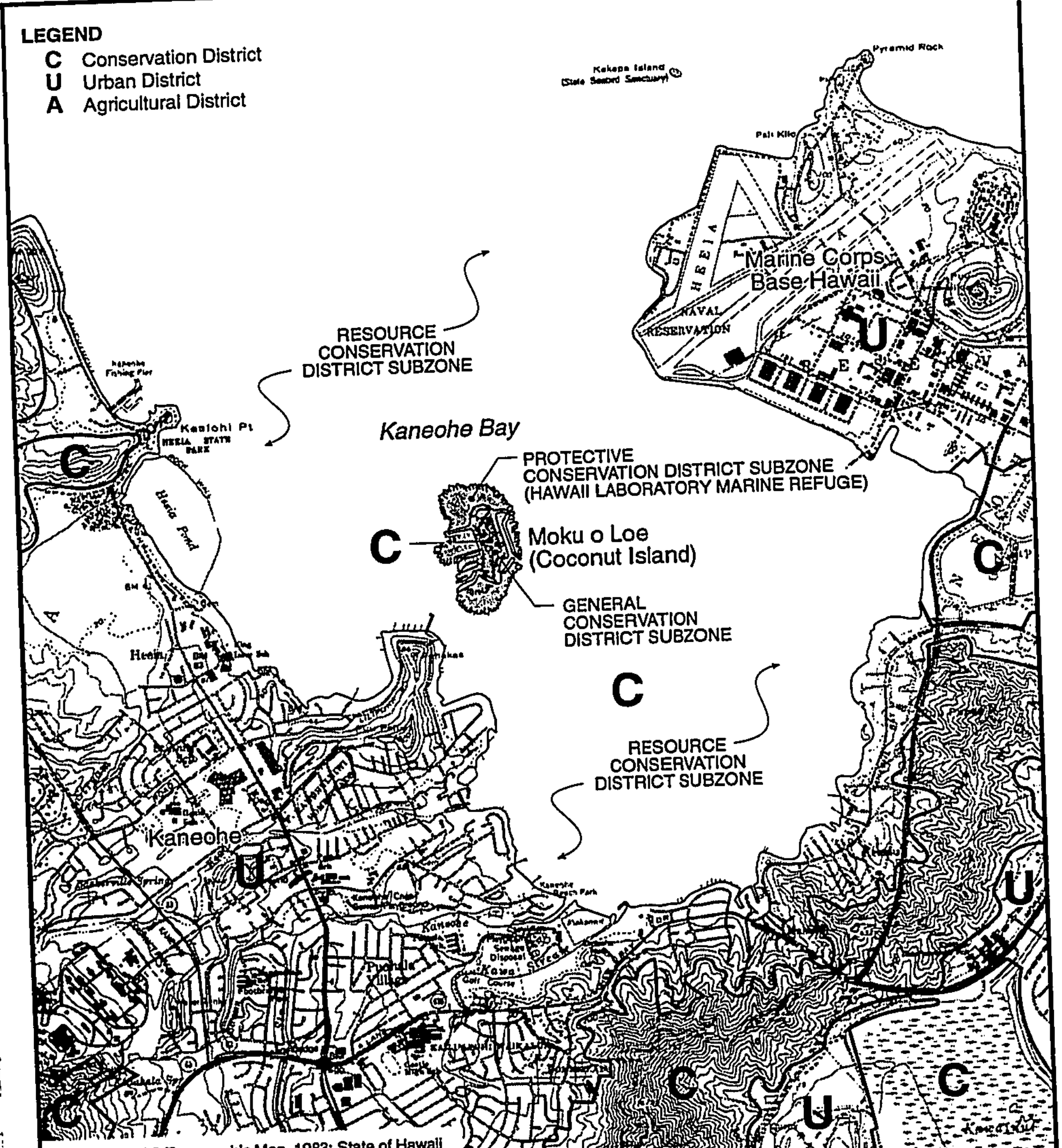
DLNR File	Description	Applicant	Action	Date
0447	Treatment Plant, Sewer & Electrical Improvements	UH	Denied	09-28-73
0687	Pump Station and Sewer Force Main Installation	UH	Approved	10-24-75
0761	Sea Water Pumping System Improvements	DAGS/ HIMB	Approved	05-14-75
1583	Repair of Existing Floating Docks	Coconut Is. Prop.	Approved	12-02-83
1607	Restore Seawall on East Shore of Island	City Dept. of P.W.	Approved	01-16-84
1697	Religious Retreat for Windward Unity Church	Pauley Trust/W. Pagen	Withdrawn	08-08-84
2134	Filtered Seawater Intake System (After-the-Fact)	UH	Approved	09-23-88
2340	6-Inch Water Line Installation to Island	Hachidai USA, Inc.	Approved	06-22-90

Source: Office of Conservation and Environmental Affairs Files

Notes: UH = University of Hawaii; DAGS = Department of Accounting and General Services, State of Hawaii; HIMB = Hawaii Institute of Marine Biology; Is. = Island; Prop. = Property; P.W. = Public Works.

(b) To achieve the potential growth activity objective, it shall be the policy of this State to:

(1) Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production, and energy and marine-related industries.



Source: USGS Topographic Map, 1983; State of Hawaii Land Use Commission, Land Use District Maps.

ENVIRONMENTAL IMPACT STATEMENT
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Prepared by: Belt Collins Hawaii
February 1996

FIGURE 7-1
STATE LAND USE DISTRICTS

0 1500 3000
Scale in Feet

North

(2) Expand Hawaii's capacity to attract and service international programs and activities that generate employment for Hawaii's people.

(3) Enhance and promote Hawaii's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.

(5) Promote Hawaii's geographic, environmental, social, and technological advantages to attract new economic activities into the State.

(7) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.

(8) Develop, promote, and support research and educational and training programs that will enhance Hawaii's ability to attract and develop economic activities of benefit to Hawaii.

SEC. 226-11 Objectives and policies for the physical environment—land-based, shoreline, and marine resources.

(a) Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:

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

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

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:

(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.

(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

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

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

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

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

SEC. 226-21 Objective and policies for socio-cultural advancement—education.

(a) Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.

(b) To achieve the education objective, it shall be the policy of this State to:

(5) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.

(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.

(9) Support research programs and activities that enhance the education programs of the State.

Part III - Priority Guidelines

SEC. 226-103 Economic priority guidelines.

(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:

(1) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.

(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:

(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.

(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.

(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.

SEC. 226-107 Quality education. Priority guidelines to promote quality education.

(1) Pursue the establishment of Hawaii's public and private universities and colleges as research and training centers of the Pacific.

The proposed action will result in both direct and indirect effects that will support the State's broad objectives and specific policies identified above. Specifically, the proposed action is anticipated to increase and diversify the State's economic base through scientific research and educational activities, protect the unique and fragile environmental resources of Coconut Island and Kaneohe Bay, provide a compatible relationship between marine research and the existing marine environment, enhance the State's education program, and increase the educational and research activities ultimately supporting Hawaii's aquaculture.

7.1.2.4 State Functional Plans

State functional plans, as specified in Section 2 of the State Plan, include the policies, programs and projects designed to carry out the objectives of a specific field of activity when such activity or program is proposed, administered, or funded by any agency of the State. The 14 functional plans were reviewed to determine the relationship of the proposed action to each of their administrative areas of responsibility. Parts of those plans that have direct relevance to the proposed action are presented in the following sections.

State Conservation Lands Functional Plan

The objective of the State Conservation Lands Functional Plan is to provide for a management program allowing for judicious use of the State's natural resources balanced with the need to protect these resources to varying degrees (DLNR, 1991). Objectives and policies that could be affected by the completion of the proposed action are presented below.

Objective IID: Appropriate development of natural resources.

Policy IID(5): Determine feasibility of product development for commercially viable natural resources and assist in initial steps necessary for such determination.

Implementing Action IID(5)b: Provide State Phase I construction funds to upgrade the University of Hawaii's Mariculture Research and Training Center into the "Hub" facility of a statewide network of pond research and technology transfer facilities.

Implementing Action IID(5)h: Provide increased funding for high leverage aquaculture research to support further development of the commercial industry and establish Hawaii as a national and international center of excellence.

Consistent with the Conservation Functional Plan's objective identified above, the proposed action and location will be mutually beneficial to one another. The proposed location will provide an ideal site, rich with marine life, where marine research can be efficiently conducted. In return, the research conducted will expand the current knowledge of marine life and aid in protecting this ecosystem and others like it. Because of the nature of the research, the presence of this proposed facility may provide greater protection of the natural environment than alternative uses or no use.

State Higher Education Functional Plan

The State Higher Education Functional Plan (1987 Draft) is "intended to serve as a guide to the objectives and policies pursued by the post-secondary education community in meeting its many responsibilities." The plan was developed with the objectives of the Hawaii State Plan in mind and several broad constraints (see State Higher Education Functional Plan for constraints). Resulting State Higher Education Functional Plan objectives are presented under the following categories: diversity, quality, access, coordination, and financing. The objectives and subsequent policies and implementing actions applicable to the proposed action are provided in the following sections.

Objective A: Maintain a number and variety of postsecondary education institutions sufficient to provide the diverse range of programs required to satisfy individual and societal needs and interests.

Policy A(2): Focus increased attention on the role higher education plays in supporting the economic development of the State.

Implementing Action A(2)(a): Provide increased research, education, and cooperative and vocational training opportunities in programs which respond to the changing State economy, job market, and workplace, including: the developing high technology industry; the visitor industry; biotechnology, agricultural technology and management, diversified agriculture and aquaculture; small businesses; teacher education; and the service sector of the economy.

Objective B: Attain the highest level of quality, commensurate with its mission and objectives, of each educational, research, and public service program offered in Hawaii by an institution of higher education.

Policy B(2): Maintain and strengthen the position of the University of Hawaii as a leading national and international research center.

Implementing Action B(2)(b): Continue to develop national leadership in the areas of alternate energy research, ocean and earth science and technology, and tropical agriculture.

Policy B(3): Identify for program enrichment and emphasis those programs considered important in terms of State needs and emphases, those programs for which special advantages in Hawaii provide an opportunity for national or international prominence, and those programs which have already achieved such prominence.

Implementing Action B(3)(a): Continue to develop leadership in research and education relating to the ocean.

Consistent with the objectives identified above, the proposed action will serve to enhance the diversity and further the quality of post-secondary education at the University of Hawaii. The proposed action will provide the tools and programs needed to meet the changing technological needs of marine biology.

State Transportation Functional Plan

The State's Transportation Functional Plan (1991) addresses the following issues: congestion, economic development, funding, and education. The objective and policy applicable to the proposed action follow.

Objective 1.C: Management of existing transportation systems through a program of transportation systems management (TSM).

Policy I.C.3: Develop park-and-ride facilities.

Implementing Action I.C.3.a.: Require park-and-ride facilities be constructed in new residential developments.

While specific objectives and policies of the Transportation Functional Plan are not directly applicable to the proposed action, the goals and objectives are understood and incorporated into the proposed action. Because construction workers and HIMB staff will be shuttled to the Lilipuna Road Pier, the proposed action will be consistent with the State objective identified above.

7.1.2.5 Revocable Permit for Use of State Lands

Revocable permit applications for use of State lands must be filed and reviewed by the Division of Land Management of the State Department of Land and Natural Resources; the Board of Land and Natural Resources makes the final approvals. A revocable permit for use of State lands is required for all activities on State land, including this proposed action.

7.1.2.6 Hawaii Marine Laboratory Refuge

The reefs and bay waters surrounding Coconut Island measuring from the high water mark on the island extending outward to 25 feet beyond the outer edges of the reefs are defined as the Hawaii Marine Laboratory Refuge. Pursuant to HRS 188-36, other than any officer, faculty member, employee, or student of the University of Hawaii or licensee of the board of regents of the University of Hawaii, it is unlawful to take aquatic life from this designated area. In addition, all laws enacted to protect aquatic species apply in this area. Because the proposed action will comply with this law and the University of Hawaii will employ measures to protect aquatic species within their own refuge area, the proposed action is consistent with the provisions of the law.

7.1.2.7 Airport Zoning

HRS Chapter 262 and its subsequent regulations (HAR Title 19, Chapter 12) require that a permit be obtained from the Airport Division of the State Department of Transportation. These regulations apply when land use is altered or a structure greater than 35 feet in height, located in an established airport hazard zone, is proposed. Because the proposed action is in an airport hazard zone of MCBH and will use a crane greater than 35 feet in height, a permit from the State Department of Transportation is required.

7.1.3 City and County of Honolulu

The City and County's land use plans, policies, and regulations are encompassed in the General Plan, Development Plans, Land Use Ordinances, Special Management Area Rules and Regulations, and Shoreline Setback Regulations. The proposed action's relationship to these plans, policies, and regulations are described below.

7.1.3.1 General Plan

The General Plan (1992) establishes the City and County of Honolulu's long-term objectives and policies. These objectives tend to be broad in scope; subsequent Development Plans' land use policies provide more specific policies to achieve the General Plan objectives. General Plan objectives and policies that may relate to the proposed action are presented in the following sections.

II. Economic Activity

Objective D: To make full use of the economic resources of the sea.

Policy 2: Encourage the development of aquaculture, ocean research, and other ocean-related industries.

III. Natural Environment

Objective A: To protect and preserve the natural environment.

Policy 7: Protect the natural environment from damaging levels of air, water, and noise pollution.

Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu.

The proposed action will use the resources available at the project site while minimizing the impact to these resources and the natural environment. In an effort to minimize impacts to the biological and natural environment, mitigation measures are proposed and identified in Chapter 4 of this document.

7.1.3.2 Development Plan

Pursuant to Chapter 226, HRS, each County within the State of Hawaii is mandated to carry out the Hawaii State Plan through the adoption and use of a County General Plan. Development Plans (DPs) have been established to provide land use controls designed to implement the objectives and policies of these General Plans and to provide guidance

for more specific zoning and density regulations. The Oahu DP consists of two main sections: the Common Provisions that are common to all of Oahu's DPs, and the Special Provisions that vary depending upon the location of the area of concern. The DPs are relatively detailed guidelines for physical development on Oahu.

The proposed action site is on land designated as Preservation. However, since the land is also classified by the State Land Use Commission as Conservation, jurisdiction over the land is with the State Board of Land and Natural Resources.

7.1.3.3 Land Use Ordinance

The proposed action is on land designated as Restricted Preservation District, P-1. The general purpose of a preservation designation is to preserve and manage major open space, recreation lands, and lands of scenic or other natural resource value. As described above, the project site is situated within the Conservation District and therefore jurisdiction over land use is with the State Board of Land and Natural Resources.

7.1.3.4 Special Management Area

The federal Coastal Zone Management program is administered by the State of Hawaii through the Office of State Planning (OSP). As part of this program, counties within the State of Hawaii are responsible for designating Special Management Areas (SMAs) and for developing the rules governing the SMA Use Permit process. The City and County of Honolulu is authorized to administer the SMA Use Permit process for the island of Oahu. Because the proposed action is located within the SMA, it is subject to the rules and regulations of the SMA.

7.1.3.5 Shoreline Setbacks

Shoreline setbacks are established to prohibit construction within the shoreline areas. Shoreline setbacks range from 20 to 40 feet from the certified shoreline, which is defined generally as the upper wash of the waves, or mean higher high water, and certified by the Board of Land and Natural Resources. At the proposed action site, the shoreline setback is 40 feet. The proposed action may require realignment of utility lines within the 40-foot shoreline setback area. A variance, therefore, will be required from the City and County of Honolulu to start the proposed improvements.

7.1.4 Community: Kaneohe Bay Master Plan Task Force

The Kaneohe Bay Master Plan Task Force was established to develop a comprehensive master plan for Kaneohe Bay. The overall goals of the Kaneohe Bay Master Plan are to: preserve and protect the unique natural resources of Kaneohe Bay for the continued use and enjoyment of the public and future generations; resolve conflict among various uses of the bay, including the public, anglers, and commercial ocean recreation operations; and assess the environmental and ecological impacts of activities on the bay and in the watershed. Specific recommendations have been developed to attain or maintain the identified goals of the plan and are focused on the following areas: proposed state land use district changes, public open space and access, water quality control, water quality monitoring, erosion and sedimentation control, education, streams, and golf courses. Of these land use recommendations, none is expected to affect the proposed action. Environmental regulations that may affect the proposed action are presented in Section 7.2.

7.2 ENVIRONMENTAL REGULATIONS/POLICIES

Environmental regulations that apply to the proposed project are presented in the following sections.

7.2.1 Environmental Review Requirements

7.2.1.1 National Environmental Policy Act Environmental Review

The National Environmental Policy Act (NEPA) was enacted in 1969 and requires that consideration be made of any potentially adverse environmental effects that could result from proposed federal developments. Perhaps the most significant result of the promulgation of NEPA is that it provides a statutory basis upon which environmental concerns must be evaluated. Because NEPA applies to federal projects, it is not applicable to the proposed project; however, the State environmental review process, patterned after NEPA, will apply and is presented below in Section 7.2.1.2.

7.2.1.2 Chapter 343, HRS, Environmental Review

The State of Hawaii's Environmental Review Process was developed in 1974 to ensure that environmental consequences of proposed actions are considered. Hawaii Revised Statutes (HRS) Chapter 343 defines this review process. As part of this process, an environmental analysis must be conducted to identify any potential impacts (environmental and socioeconomic) that could result from a proposed action initiated by a state, county, or private sector entity requiring State or county approval. Because

the proposed project is initiated by a State agency and will affect State land, HRS Chapter 343 requirements apply.

Public notification and review processes are required under HRS Chapter 343. Public notification is facilitated through the Office of Environmental Quality Control (OEQC).

7.2.2 Protection of Cultural Resources

7.2.2.1 Chapter 6E, HRS, Historic Preservation

Chapter 6E, as it stands in its current amended version, is intended to protect and use historic properties for the benefit of the public. The State Department of Land and Natural Resources (DLNR), acting as the reviewing agency, oversees the historic preservation compliance process. Existence of historic sites is first determined, after which DLNR can request an inventory survey. With the inventory study, the agency can determine the significance of the sites, and working with the developing agency, design a proper mitigation commitment if the project is allowed to continue. Because Coconut Island may have been used by Hawaiian royalty and by the military during World War II, an archaeological study was conducted.

7.2.2.2 Native American Graves Protection and Repatriation Act

As required, the project will be conducted according to the Native American Graves Protection and Repatriation Act (NAGPRA). Passed by Congress and signed into law in 1990, NAGPRA is intended to protect native American (including native Hawaiian) burial sites. NAGPRA sets guidelines for the removal and subsequent repatriation of human remains and associated burial objects on federal, Indian, and native Hawaiian lands. NAGPRA requires consultation with native Hawaiian organizations, including the Office of Hawaiian Affairs, Hui Malama I Na Kupuna 'O Hawaii Nei, and the Oahu Burial Council (State Historic Preservation Division, DLNR) if Hawaiian burials are encountered.

7.2.3 Protection of Endangered Species

7.2.3.1 Endangered Species Act

The Endangered Species Act of 1973 requires that actions not jeopardize the continued existence of endangered and threatened plant and animal species. The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over endangered and threatened terrestrial flora, terrestrial fauna, and birds. The National Marine Fisheries Service (NMFS) has jurisdiction over marine mammals and fish. The two agencies share responsibility for listed (endangered or threatened) sea turtles.

Under Section 7 of the Act, these agencies must be consulted when proposed federal actions may affect listed species or their habitat, or jeopardize the continued existence of species proposed to be added to the list. Because a Department of the Army permit is not required for this project, Section 7 consultation is not applicable.

No endemic or endangered birds were found on Coconut Island, but it is possible that three endangered species may occasionally visit the area. These are the short-eared owl (pueo, or *Asio flammeus sandwichensis*), black-necked stilt (*Himantopus mexicanus knudseni*), and the Hawaiian duck (Koloa, or *Anas wyvilliana*).

One threatened species, the green sea turtle, is known to frequent Kaneohe Bay and, on infrequent occasions, the lagoons surrounding Coconut Island. There are no known nesting sites being used by the turtles in Kaneohe Bay or the lagoons.

7.2.3.2 Marine Mammal Protection Act

The endangered humpback whale and Hawaiian monk seal are protected under the Marine Mammal Protection Act of 1972. The humpback whale is not known to enter the confines of the two lagoons and its presence is unlikely in the bay. Sightings of monk seals around Coconut Island have occurred in December of 1994 and April of 1995. No sightings were made prior to these dates. The presence of these seals may be the result of a recent capture and release program and not a normal migratory pattern. Coconut Island is not known to be a natural habitat for the monk seal.

7.2.4 Protection of Water Resources

7.2.4.1 Clean Water Act

Section 404 CWA Discharges in Navigable Waters of the U.S.

The federal Clean Water Act contains many regulatory programs to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. One such program, detailed in Section 404 of the Act, limits the discharge of dredged or fill material into surface waters. Approvals for such work in surface waters must be obtained through the U.S. Army Corps of Engineers in the form of a Section 404 permit.

The proposed project is not expected to result in the discharge of dredged or fill material in waters around the island. Therefore, the proposed project will not be subject to the provisions set forth in the Section 404 permit process.

Section 401 Water Quality Certification

The federal Clean Water Act and HRS Chapter 342D, along with their supporting rules (HAR Title 11, Chapter 54), require that a Water Quality Certification be obtained to support federal permits or approvals for which proposed construction or operation may result in discharges to state waters, e.g., Section 404 permit from the U.S. Army Corps of Engineers. Applications should be filed with the Clean Water Branch of the State Department of Health at least 180 days before the date the Water Quality Certification is needed. Because the proposed project will not result in discharges to state waters during construction and will not need a Section 404 permit, a Section 401 Water Quality Certification will not be required.

Section 402 NPDES Permit (individual and general)

Discharge of pollutants into surface waters of the U.S. are controlled under the National Pollutant Discharge Elimination System (NPDES) program, pursuant to Section 402 of the Clean Water Act. This program is administered by the State of Hawaii Department of Health under HAR Title 11, Chapter 55 Water Pollution Control (Oct. 29, 1992). This chapter requires submission of an NPDES application or a Notice of Intent (NOI) for NPDES General Permit coverage, for discharges of regulated pollutants, or for substantially altering the quality of any discharge, or for substantially increasing the quantity of discharge.

The State NPDES General Permit program does not allow discharges into Class AA waters such as Kaneohe Bay. Any discharges associated with construction activities such as dewatering or hydrotesting must be prevented from entering the east and west lagoons.

During the operation of the marine laboratories, the salt water system will maintain its current capacity to continuously pump salt water into two 1,000-gallon tanks, and will discharge the effluent saltwater into the east lagoon. The effluent, which contains fish excreta and residue nutrients from fish food, will continue to contribute to the varying levels of nutrients at the discharge point. However, because the facility will produce less than 45,454 harvest weight kilograms per year (approximately 100,000 pounds) of aquatic animals, such a discharge has been excluded from the NPDES permit requirements for a concentrated aquatic animal production facility as defined in 40 CFR Section 122.24.

7.2.4.2 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of navigable waters of the United States and alterations or modifications of the course, location, condition, or capacity of any port, harbor or refuge, or enclosure within the

limits of any breakwater or of the channel of any navigable water without a permit from the U.S. Army Corps of Engineers. Because the proposed project calls for no action in existing navigable waters, a permit will not be required from the U.S. Army Corps of Engineers.

7.2.4.3 Marine Protection, Research, and Sanctuaries Act

The Marine Protection, Research, and Sanctuaries Act enacted in 1972 regulates the dumping of all types of materials into ocean waters that would adversely affect the marine environment, ecological systems, economic potentialities, or human health, welfare, or amenities. When construction is regulated by other federal or state laws, this Act does not apply to the construction of any fixed structure or the intentional placement of any device in ocean waters for a purpose other than disposal. Since any disposal of materials that may occur as a result of the proposed project is already regulated by the Clean Water Act, there will be no additional permits required under this Act.

7.2.4.4 Kaneohe Bay Master Plan Task Force

As discussed in Section 7.1.4., the Kaneohe Bay Master Plan Task Force was established to develop a comprehensive master plan for Kaneohe Bay. Results of this master plan include recommendations concerning land use planning and environmental planning. The environmental recommendations that could affect the proposed project are presented below.

Water Quality Control Recommendations: Sixteen water quality control recommendations were identified in the Kaneohe Bay Master Plan. These recommendations provided for improvements and controls in the wastewater lines. Because these recommendations are directed to City and County of Honolulu agencies and no changes in the existing wastewater lines supporting the HIMB laboratory facility are planned for the proposed project, none of the recommendations will directly affect the proposed project.

Erosion and Sedimentation Control Recommendations: Four recommendations are identified in the Master Plan. These recommendations are directed to agencies that can provide technical information and/or enforcement in support of controlling erosion and sediments.

The proposed project will be consistent with the recommendations proposed above. Measures to minimize erosion and sediments into the surrounding waters of Coconut Island have been planned and incorporated into the construction design. Such measures include the use of sedimentation basins, minimization of graded areas, and immediate replanting of exposed dirt areas.

7.2.5 Protection of Air Quality

7.2.5.1 Clean Air Act

The federal Clean Air Act (CAA) was first promulgated in 1963 and presents a framework of air quality standards and emission control provisions for controlling air pollution. Since then, amendments have been made to the CAA to increase federal involvement.

The federal Clean Air Act Amendments (CAAA) of 1990 set forth new initiatives in an effort to achieve the overall goal of attaining compliance with the National Ambient Air Quality Standards (NAAQS). Such requirements included establishing timelines for EPA to develop regulations concerning acid rain, toxic air pollutants, and motor vehicle pollutants, and for states to implement these regulations.

The CAAA requires that states submit State Implementation Plans (SIPs) to show how attainment or maintenance of NAAQS will be met and requires that an approved operating permit program be implemented. The State of Hawaii DOH has established an approved operating permit program, detailed in HAR Title 11, Chapter 60.1 (Air Pollution Controls) that encompasses the requirements set forth in the CAAA. Such requirements include demonstrating compliance with the following emission control strategies:

- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAPS);
- Prevention of Significant Deterioration (PSD).

Because the proposed action will emit airborne emissions, these emissions must be quantified and verified for operating permit applicability. At this time, it is not expected that an operating permit will be required for the anticipated airborne emissions at the proposed project site because emissions from the proposed laboratory hood vent and the proposed back-up diesel generator are expected to be exempt from operating permit requirements.

7.2.6 Hazardous Waste Regulation

7.2.6.1 RCRA

The Resource Conservation and Recovery Act (RCRA) was developed to provide "cradle-to-grave" control of hazardous waste by imposing requirements on generators and transporters of hazardous waste and upon owners and operators of treatment, storage, and disposal (TSD) facilities. RCRA encourages source reduction, technology treatment, and secure disposal of hazardous waste. General regulations for hazardous waste

management can be found in 40 CFR 260. Requirements relating to TSD facilities are not applicable to the project, because HIMB does not qualify as such a facility.

Regulations pertaining to hazardous waste generators are outlined in 40 CFR 262. The project may generate and store small quantities of hazardous waste, related both to construction and facility operations. Requirements may include: applying for an EPA identification number using EPA Form 8700-12, properly manifesting all waste, properly packaging, labeling, marking, and placarding waste in accordance with applicable Department of Transportation regulations. Accumulation times, storage requirements, and recordkeeping requirements are also specified. In addition, specific RCRA requirements exist which are dependent upon monthly accumulation of hazardous waste. Special requirements exists for generators of: less than 100 kilograms (220 pounds) per month; between 100 and 1,000 kilograms (200-2,200 pounds) per month; and greater than 1,000 kilograms (2,200 pounds) of waste per month. Monthly accumulation amounts must be monitored and specific RCRA requirements adhered to that pertain to actual monthly accumulated quantities.

7.2.6.2 Hawaii Revised Statutes 342J

The State DOH promulgated new hazardous waste rules implementing HRS 342J, effective on June 18, 1994. The state rules can be found in HAR Title 11. Standards applicable to generators of hazardous waste can be found in Chapter 11-262. DOH continues to seek delegation from the EPA to manage the hazardous waste program. Passage of Title 11 brings the State one step closer to obtaining authorization for the purpose of gaining federal authorization to implement the RCRA Hazardous Waste Program. At this time Hawaii is not authorized to administer RCRA; however, authorization is anticipated to occur in the near future.

7.2.7 Requirements for Construction Activities

The following City and County of Honolulu permits are associated with construction activities and are expected to be required for the proposed action:

- Grubbing, Grading, and Stockpiling Permit from the Department of Public Works;
- Building Permits from the Department of Building;
- Sewer Connection Approval from the Department of Wastewater Management
- Potable Water Allocation from the Department of Land and Natural Resources and the Board of Water Supply

7.3 SUMMARY OF LAND USE AND ENVIRONMENTAL PERMITS AND APPROVALS

Federal, State, and City and County land use and environmental permits and approvals are discussed above. Those that are required for the proposed project are summarized in Table 7-2. While this list is comprehensive, it is not intended to be exhaustive of all required permits and agency approvals; the design consultant and construction contractor will be responsible for identifying and obtaining the necessary construction permits and approvals, and HIMB will be responsible for obtaining the necessary material usage permits, such as those required under RCRA.

Table 7-2 Summary of Required Land Use and Environmental Permits and Approvals (Construction Permits and Approvals Not Included)

Type	Permit/Approval	Administering Agency
Land Use	**STATE OF HAWAII**	
	Conservation District Use Permit	Board of Land and Natural Resources
	Revocable Permit for Use of State Lands	Board of Land and Natural Resources
	Airport Zoning Permit	Department of Transportation
	CITY AND COUNTY OF HONOLULU	
	Special Management Area Use Permit	Department of Land Utilization/City Council
	Shoreline Setback Variance	Department of Land Utilization/City Council
Environmental	**STATE OF HAWAII**	
	Chapter 6E, HRS, Historic Preservation	Department of Land and Natural Resources
	Chapter 343, HRS, Environmental Review	Office of Environmental Quality Control

CHAPTER EIGHT
CONTEXTUAL ISSUES

8.1 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The construction and operation of the proposed action involve the use of land in the sensitive ecosystem of Kaneohe Bay. However, the short-term use of facilities on Coconut Island by HIMB has long-term benefits to the community and to the preservation of the Kaneohe Bay ecosystem.

The Kaneohe Bay Master Plan (KBMP) outlines in its introduction the goals of preserving and protecting the unique natural resources of the bay for the continued enjoyment of the general public and assessing the environmental and ecological impacts of activities on the bay (KBMP Task Force, 1992). These objectives are both goals of HIMB in its research on marine biology and biodiversity. HIMB is committed to conducting research on Kaneohe Bay that will aid in the preservation of this valuable resource by providing information on the environment of the region. The Master Plan acknowledges HIMB's role in continuing the future planning and management of Kaneohe Bay and coordinating research activities (KBMP Task Force, 1992)

This EIS describes proposed mitigation for potential environmental effects that could be caused by the proposed action. The proposed action supports HIMB's commitment to the study of Kaneohe Bay.

8.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Construction and operation of the proposed action will result in the irreversible and irretrievable commitment of certain natural and fiscal resources. Major resource commitments include the land on which the facilities will be constructed as well as money, construction materials, manpower and energy.

Since the new facilities will expand and replace existing facilities, none of the improvements constitute an absolutely irretrievable commitment of land. Since this proposed action is part of the UH system, a project of its type would normally require a commitment of public fiscal resources. However, the funds for this project are being derived from private funding, and no public funds will be committed to the construction. The educational and research benefits of the project for the State actually constitute a positive impact on resources.

8.3 GOVERNMENTAL POLICY CONSIDERATIONS

As indicated in Chapter 7, the proposed action is substantially consistent with the applicable provisions of the Hawaii State Plan, State Functional Plans, County General Plan, County zoning, Special Management Areas guidelines, and pertinent federal and State environmental regulations. Certain aspects of the project will require permits for work in environmentally sensitive areas. This EIS provides the supporting information for the required permit applications.

No significant adverse effects that cannot be mitigated are expected to result from the construction and operation of the marine laboratory and support facilities. The benefits derived from the project are consistent with government policies that have encouraged the development of research and educational facilities in appropriate areas. Through the University of Hawaii, the State provides continuing support for the efforts of HIMB on Coconut Island, and the promotion of the facility as a world-class marine research institution.

8.4 UNRESOLVED ISSUES

During preliminary meetings and correspondences with government agencies, community leaders, and special interest groups, issues were raised and addressed—some of which still remain unresolved. These pending issues are expected to be resolved without undue difficulty through mitigation measures. The following are the primary issues that still remain unresolved.

8.4.1 Transportation Improvements

When the new marine laboratory is completed and in operation, additional HIMB staff may be commuting to the Lilupuna Road parking lot for transport to Coconut Island. This will create additional demand for parking at the pier, which is currently at capacity. As a proposed mitigation measure, a shuttle service will be organized to pick up HIMB workers at a central pickup area in Kaneohe and transport them to the pier. A trial run using this plan was implemented from the Windward Mall a few years ago, but lack of interest by the shuttle users resulted in only limited success of the program.

A more elaborate and organized system will be reimplemented. This will require the selection of an appropriate parking and pickup point. The availability and conditions of use of an appropriate pickup site need to be determined.

During the final project design stage, HIMB administration will select a site in Kaneohe town with input from staff. Windward Mall parking will again be considered as a possible central pick up area. Negotiations will be initiated with the parking lot owner for a short-

term use agreement. The availability and conditions of use will be determined during this period. After the program is implemented, a follow-up evaluation will be conducted to determine if a long-term agreement is warranted.

8.4.2 Relocation into New Facilities

Once the new marine laboratory, wet laboratory annex, and maintenance building are completed, operations from approximately 12 existing buildings spread over the island will transfer to the new facility. Demolition of three of the existing buildings will begin immediately to make way for the new facilities. Transfer of the remaining operations is dependent on research activities and is not known at this time. The abandoned buildings may remain as future storage space or be demolished. These issues will be of concern to the DLNR, which has jurisdictional review of existing and future uses on the State land.

State funds have recently been allocated for the preparation of a master plan for Coconut Island. Upon release of these funds by the Governor, HIMB will prepare a complete inventory of facilities on the island and develop a comprehensive program on spacial and facility usage. This program should determine what facilities will require expansion, demolition or more efficient use. As partial landowner of Coconut Island, DLNR will receive a copy of the master plan for review.

8.4.3 Wastewater Connection

Under DWM's current moratorium, HIMB's new facility will not be able to connect with the City's sewer system. This situation must be resolved with the approval of the DWM before a building permit can be issued. To mitigate the situation, low-flow devices will be used in the new facilities and some retrofitting will be done on the existing facilities so the average current flow from Coconut Island is maintained.

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CHAPTER TEN
ORGANIZATIONS AND INDIVIDUALS INVOLVED IN THE PREPARATION OF THE EIS

This Environmental Impact Statement was prepared for the Hawaii Institute of Marine Biology by Belt Collins Hawaii with input provided by subconsultants. The following were involved:

Belt Collins Hawaii

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John Goody	-	Principle in Charge
Glen Koyama	-	Contributor/ Project Manager
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Amy Sheridan	-	Contributor/ Environmental Scientist
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Larry Agena	-	Contributor/ Civil Engineer
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Leland Lee	-	Contributor/ Sanitation Engineer
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Diane Yamamoto	-	Graphic Designer
Lynn Fukuhara	-	Word Processor

Subconsultants

Darby & Associates	-	Environmental Noise Assessment
Oceanit Laboratories, Inc.	-	Marine Environmental Assessment
Char & Associates	-	Botanical Survey
Phillip L. Bruner	-	Avifaunal & Feral Mammal Survey
International Archaeological Research Institute, Inc.	-	Archaeological Survey
Community Resources, Inc.	-	Socioeconomic Impact
Ernest K. Hirata & Assoc., Inc.	-	Soil Survey
Kajioka Okada Yamachi, Architects	-	Architecture
Ferris & Hamig Hawaii	-	Mechanical Engineering
ECS, Inc.	-	Electrical Engineering
Sato & Associates	-	Structural Engineering
Fletcher Pacific	-	Construction Contracting

CHAPTER ELEVEN
CONSULTED PARTIES AND COMMENTS ON THE EIS PREPARATION NOTICE

The notice of availability of the Environmental Impact Statement Preparation Notice (EISPN) for the Hawaii Institute of Marine Biology Proposed Marine Laboratory and Support Facilities was published in the *OEQC Bulletin* by the Office of Environmental Quality Control on July 23, 1994. The agencies and organizations listed below were sent a copy of the EISPN with a transmittal letter requesting comments. The asterisk (*) indicates the agencies and organizations that responded. A copy of the EISPN, comment letters from consulted parties, and our responses to them are reproduced and attached.

Federal Agencies

Department of the Air Force, Hickam Air Force Base, Hawaii
* Department of the Army, Army Engineer Division, Honolulu
Department of Commerce, National Marine Fisheries Service
Department of the Interior, Fish and Wildlife Service
Department of the Interior, Geological Survey, Water Resources Division
Department of the Navy, Marine Corps Base Hawaii, Kaneohe Bay
* Department of Transportion, Coast Guard

State Agencies

Office of State Planning
* Department of Accounting and General Services
Department of Health, Office of Environmental Quality Control
* Department of Health, Clean Water Branch
* Department of Health, Clean Air Branch
* Department of Health, Solid and Hazardous Waste Branch
Department of Land and Natural Resources, Aquatic Resources Division
* Department of Land and Natural Resources, State Historic Preservation Division
Department of Land and Natural Resources, Office of Conservation and Environmental Affairs
* Department of Land and Natural Resources, Land Management Division
Department of Land and Natural Resources, State Parks Division
* Department of Land and Natural Resources, Division of Boating and Ocean Recreation
* Department of Transportation, Harbors Division
University of Hawaii at Manoa, Environmental Center

State Legislators
Senator Stanley T. Koki
Senator Mike McCartney
Representative Cynthia Thielen
Representative Terrance W.H. Tom

City and County of Honolulu
* Office of the Mayor
* Fire Department
* Department of Land Utilization
* Planning Department
* Police Department
* Department of Public Works
* Department of Transportation Services
* Department of Wastewater Management
* Board of Water Supply
Councilmember Steve Holmes
Oahu Civil Defense Agency
* Kaneohe Neighborhood Board #30

Others
Hawaiian Electric Company, Inc.
GTE Hawaiian Telephone Company
* Hachidai USA, Inc.
Friends of Heeia State Park
Outdoor Circle
Historic Hawaii Foundation

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

PROPOSED MARINE LABORATORY AND SUPPORT FACILITIES

Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Proposing Agency

Hawaii Institute of Marine Biology
School of Ocean and Earth Science and Technology
University of Hawaii at Manoa

Accepting Authority

Office of the Governor
State of Hawaii
Honolulu, Hawaii

EIS Consultant and Point of Contact:

Belt Collins Hawaii
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406
(808) 521-5361

July 1994

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1. AGENCY PROPOSING THE ACTION

The agency proposing this action is the Hawaii Institute of Marine Biology of the School of Ocean and Earth Science and Technology, University of Hawaii at Manoa (UH).

2. ACCEPTING AUTHORITY

The proposed action involves the use of State and Conservation District designated lands, as well as the Shoreline Setback Area and Special Management Area. It is therefore subject to the Chapter 343, HRS, Environmental Review Process. Considering the potential impacts that may result from the proposed action, the proposing agency has determined that preparation of an Environmental Impact Statement is warranted and thus provides this Environmental Impact Statement Preparation Notice (EISPN). On behalf of the Governor of the State of Hawaii, the Office of Environmental Quality Control will be the accepting authority for the Environmental Impact Statement (EIS).

3. AGENCIES CONSULTED

HIMB has consulted the following agencies in preparing this Environmental Impact Statement Preparation Notice:

- Office of Environmental Quality Control, State of Hawaii
- Office of State Planning, State of Hawaii
- Department of Land and Natural Resources, State of Hawaii
- Department of Land Utilization, City and County of Honolulu
- U.S. Army Corps of Engineers

4. GENERAL DESCRIPTION OF THE PROPOSED ACTION

4.1 Objectives of Proposed Action

The existing facilities, located on Moku O Loe (Coconut) Island in Kaneohe Bay (as shown in Figures 1 and 2), serve as the aquaculture research center for Hawaii Institute of Marine Biology. Over the years, gradual increases in research and educational needs have resulted in a shortage of facilities. Therefore, HIMB is proposing an expansion of its existing facilities to meet those demands as well as to maintain its role as a world leader in tropical food production (aquaculture) research and training.

The Hawaii Institute of Marine Biology (HIMB), School of Ocean and Earth Science and Technology, is engaged in ocean science and technology studies with a special focus on two aspects of near-shore tropical marine biology, biodiversity and biotechnology. The focus of biodiversity at HIMB includes studies on coastal ecology and management (with emphasis on coral reef

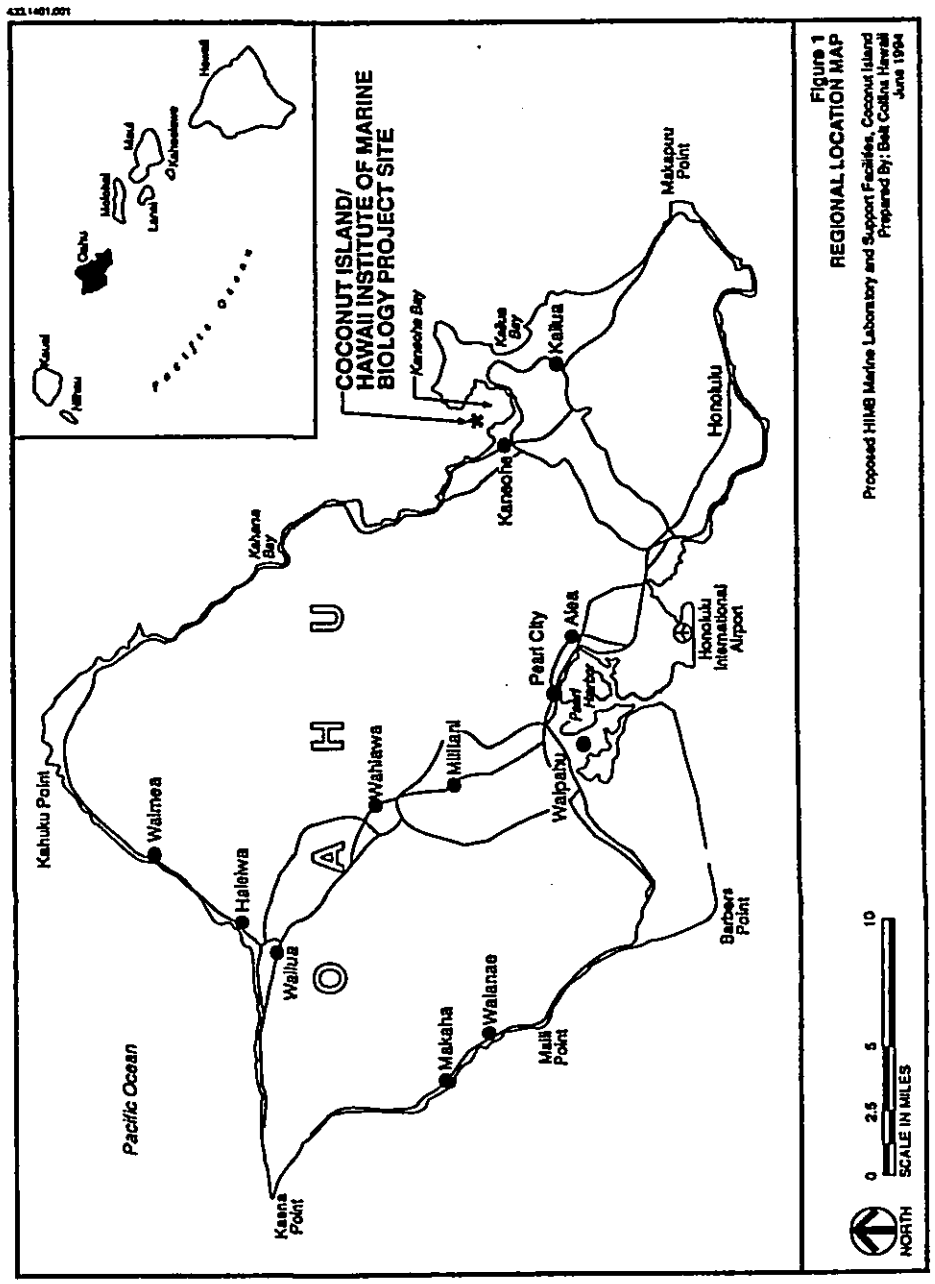
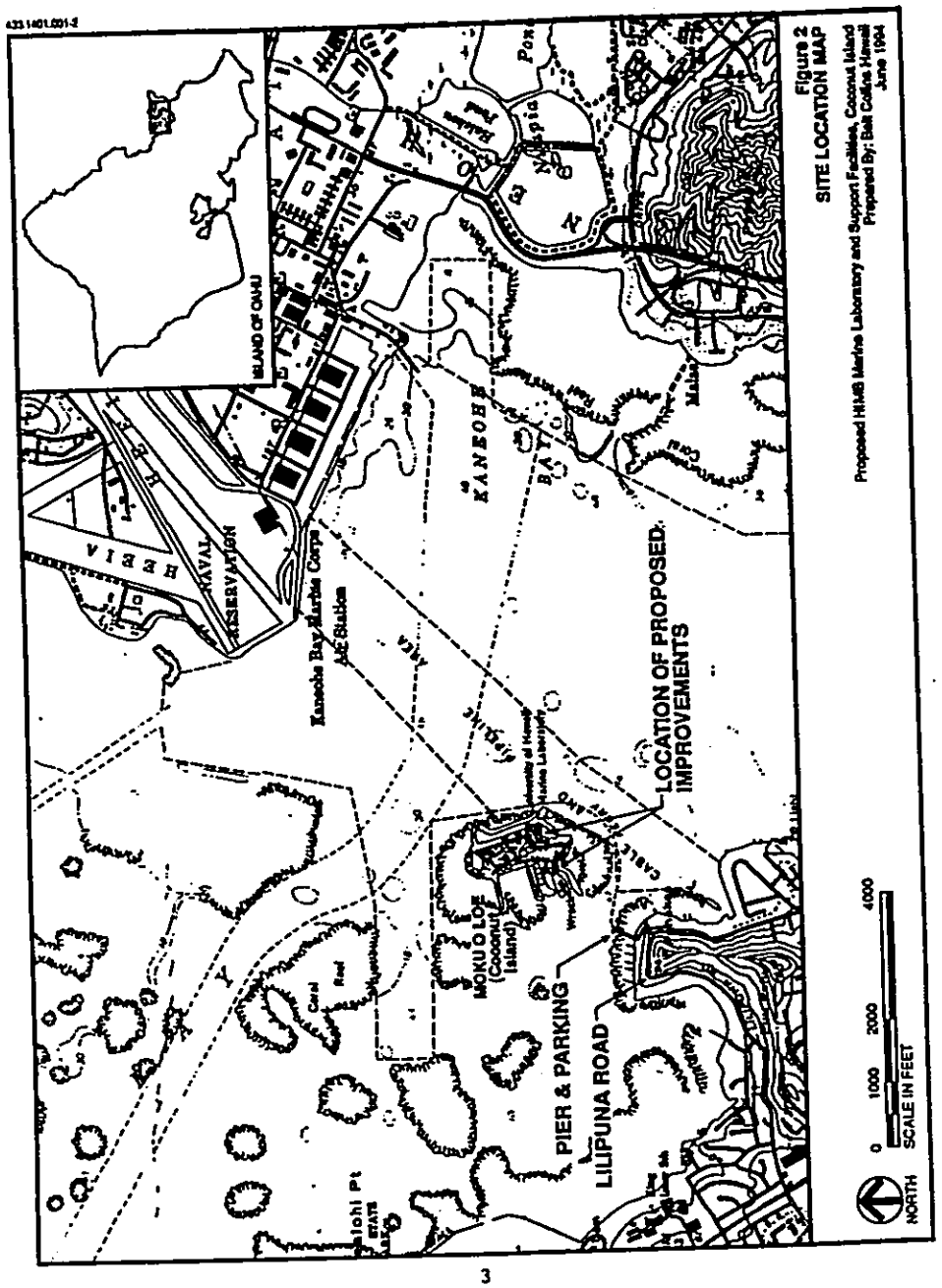


Figure 1
REGIONAL LOCATION MAP
Proposed HIMB Marine Laboratory and Support Facilities, Coconut Island
Prepared By: Belt Collins Hawaii
June 1994



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ecosystems), conservation biology, evolution and environmental adaptation. Exploring the unique marine biological resources of the tropics, research in biotechnology applies molecular biology and other advanced technologies toward problems of conservation biology, environmental remediation, fisheries biology, aquaculture, human biology and medicine.

In meeting the global challenge of increased food production demand, the Hawaii Institute of Marine Biology has become a leader in the field of aquaculture. Such a role requires HIMB to attract top researchers in biotechnology, animal physiology, and fish nutrition; to develop new techniques in the rapidly expanding field of biotechnology; and to training superior researchers and production specialists. As the principal educational institution in the tropical pacific, HIMB has a unique opportunity to support graduate education leading to M.S. and Ph.D. degrees in its areas of special focus in tropical marine biology.

4.2 Description of Proposed Action

The proposed action consists of four components: 1) demolition of four (4) existing buildings; 2) replacement or repair of existing seawalls; 3) construction of a new three-story laboratory building; and 4) relocation and expansion of an existing maintenance building. A map showing the proposed expansion is included as Figure 3.

4.2.1 Demolition

One existing lab building, a lunch room, and an existing maintenance shop will be demolished (Figure 3) to make way for the new Marine Laboratory Building. The "Old Boat House" will be demolished to accommodate the replacement maintenance building.

4.2.2 Seawall Repair

Seawalls adjacent to the proposed buildings will be repaired or replaced, as needed, to protect the new building structures.

4.2.3 New Marine Laboratory Building

The new three-story Marine Laboratory Building would occupy a site of approximately 7,000 square feet within the existing HIMB grounds. The building would contain an instructional classroom/conference room and a fish physiology laboratory on the ground floor, a computer/library room on the second floor, and various special use laboratories and research spaces on all floors. Including other supporting facilities such as a lunch room, a kitchen, rest rooms, utility and storage rooms, the new laboratory building's total floor area would be approximately 20,900 square feet.

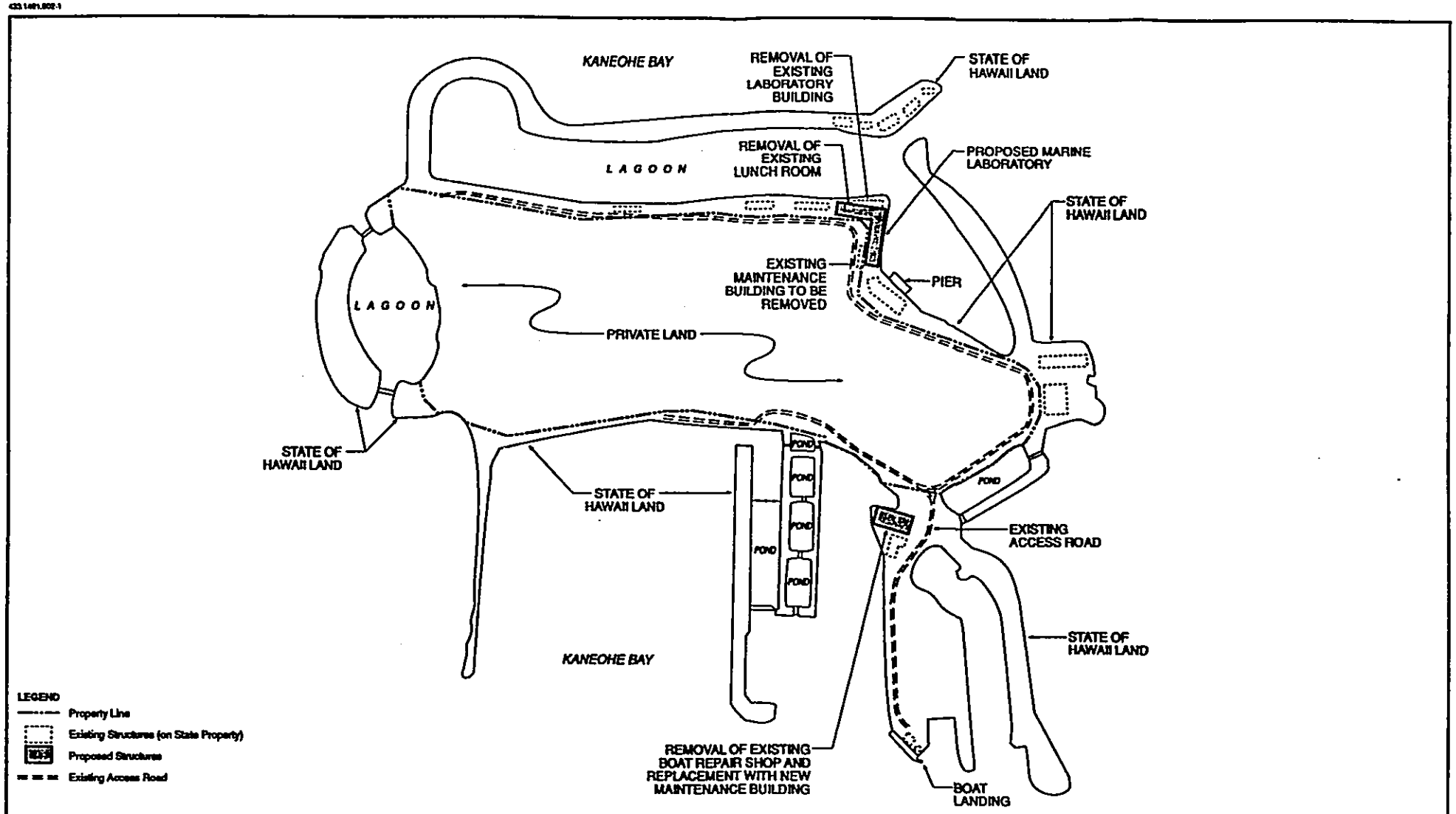


Figure 3
SITE PLAN

Proposed HIMB Marine Laboratory and Support Facilities, Coconut Island
Prepared By: Belt Collins Hawaii
June 1994

4.2.4 Maintenance Building Replacement

The new maintenance building would contain approximately 4,700 square feet and would be comprised of shops for plumbing, metal work, wood work, refrigeration and air conditioning, painting and fiberglass, internal combustion and electric motor repair, as well as a security office. The maintenance building would also contain a tool room and a material storage room. It would have the same footprint as that of the Old Boat House.

5. ALTERNATIVES CONSIDERED

Alternative development schemes were evaluated in order to determine a final concept plan for the proposed project. The alternative development schemes identified different building locations, building designs and construction methodologies. Factors affecting the determination included HIMB's future operational needs, its functional and spatial requirements for the new facilities, and the potential environmental consequences of the proposed project. In preparation of the EIS, the final concept plan for the new marine laboratory and support facilities will be further assessed in relation to alternatives.

6. SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT

6.1 Physiography

Coconut Island is an approximately 23-acre island located in the southern portion of Kaneohe Bay, on the windward side of Oahu (Figure 1). At its closest point, the island is approximately 0.4 mile northeast of the shoreline at Kaneohe. It is surrounded by an approximately 64-acre coral reef marine sanctuary for scientific research.

The center part of the island is elevated and well landscaped, with elevations ranging from about 10 to 40 feet above the mean sea level. The slope ranges up to approximately 53 percent. The steep slopes on the island are covered with heavy vegetation and are not likely to be subject to significant erosion hazard during rainstorms. This central part of the island comprises the original land around which dredged material was later deposited. The soils of the original land belong to the Alleluia Series (U.S. Department of Agriculture, Soil Conservation Service, 1972).

The peripheral areas of the island are composed of material dredged during the 1930s and comprise essentially the state-owned portion of the island. On the north and east end of the island, breakwaters were built to form two lagoons. The northern lagoon was used as a swimming pool, and the eastern lagoon is occupied by HIMB for its research operations. On the west, the fringing reef was dredged, fill land, piers ,and tidal ponds were built. These areas are being used by HIMB.

6.2 Climate

The median annual rainfall is nearly fifty-nine (59) inches. The median monthly rainfall varies from a low of about two (2) inches from May through September, to a high of about seven (7) inches in December and January (DLNR, 1986).

6.3 Biological Environment

6.3.1 Terrestrial Flora and Fauna

Pacific golden plover frequent the island on a seasonal basis. A number of bird species, some protected, forage and nest in the portions of Kaneohe Bay near the island, including the endangered Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*) (USFWS, 1978), and a variety of migratory birds.

The island's flora includes a variety of specimens, differing dramatically in size, coverage, and density. Species present include Palm, Kukui, Hale Koa, Norfolk Pine, Banyan, Banana, Ti, Ironwood, Milo, Mock Orange, Croton, etc. (Lai 1991). No protected species exist on the island. The project area will be surveyed to assess the potential impacts of project activities on existing species of both plants and animals.

6.3.2 Marine Flora and Fauna

The marine community around the island is an important resource for research and conservation. Thus, a coral reef marine sanctuary zone around Coconut Island was established for scientific research. A marine survey will be conducted to determine the baseline of marine resources in the project area and assess the potential impacts that may result from the proposed action.

6.4 Water Quality

Sections of Kaneohe Bay are subject to various pollutants such as sediments, bacteria, nutrients, heavy metals, and hydrocarbons. Shoreline waters frequently exceed water quality standards for turbidity, fecal coliform, phosphorus, and nitrogen (DOH, 1990, and Lai, 1991). Such excesses were attributed to sewage discharge and construction related runoff. Urban runoff continues to be the major source of pollution to the bay.

There is little historical water quality data for the waters immediately surrounding Coconut Island. Water quality will be tested in the project area as a baseline against which to measure potential impacts from project construction. The impacts of the HIMB operations, such as salt water intake and discharge, on water quality, will also be evaluated.

6.5 Air Quality

Existing air quality is good in windward Oahu. No significant air pollutants occur at the project site. Construction dust and emissions from heavy machinery resulting from project construction activities may affect air quality. These will be assessed along with potential impacts from operational sources, such as ventilation hoods in laboratories and exhaust from generators at the proposed HIMB facilities.

6.6 Noise Environment

At present, Coconut Island is subject to noise from aviation operations at the Marine Corps Base Hawaii (MCB-Hawaii), for which project design mitigation may be necessary. Noise may also be generated from construction and operation of the new facilities. An environmental noise study will be conducted to measure the existing acoustical environment and to assess the probable noise impacts associated with project related elements including mechanical equipment such as fans, compressors, pumps, and condenser units. Potential noise impacts related to construction activities will also be assessed. Additionally, the noise study will consider the character of the changing aircraft operations at MCB-Hawaii and its impact on the proposed facility.

6.7 Historical and Archaeological Resources

Coconut Island may have been used by Hawaiian royalty since the 1870s and 1880s (Devaney, et. al., 1982). However, use was confined to the original 12.5 acres of elevated land, which falls outside of the state property and in areas unlikely to be disturbed by construction.

During World War II (1941-45), the military used certain areas within the state property for rest and relaxation (R&R). Thus, there may be historical features left by the military. Construction areas, therefore, will be subject to an archaeological study. Such a study will consist initially of a reconnaissance survey and recommendations for potential post-survey work. Additional studies will be conducted as required by the State Historic Preservation Division.

6.8 Land Use and Ownership

The interior of the island (essentially the original 12.5 acres of land) and the parking lot and pier on Lilipuna Road are owned by Hachidai, USA, Inc. The remaining area (16.3 acres, 6.15 of which are underwater) that surrounds the private land and consisting of land created by fill in the 1930s, is owned by the State of Hawaii. Since 1951, HIMB has added numerous improvements to the island, including storage sheds, housing quarters, maintenance shops, and laboratory, boating, classroom and administration facilities. Figure 3 shows the location of the state land and its existing primary buildings.

6.9 Infrastructure

Water, sewer, electricity, and telephone services to the island are provided by lines which run under Kaneohe Bay from the Lilipuna Road property to the island. These facilities are shared by both HIMB and Hachidai, Inc. The utility lines under Kaneohe Bay (off-island portion) would not require improvement as a result of the proposed expansion by HIMB. The on-island water, sewer, electricity, and telephone systems would require improvement to serve the proposed facilities.

Access to the island is by boat from a pier on the Lilipuna Road property. Boat landing and berthing facilities are located in two inlets at the southwest corner of the island, and in a lagoon at the HIMB main laboratory facility on the east side of the island (Figure 3). Land access to the HIMB main laboratory facility from the southwest boat landing facility is by a dirt/gravel road that runs along the private/state property line on the southern and eastern portions of the island as shown in Figure 3.

7. REQUIRED LAND USE AND ENVIRONMENTAL APPROVALS

7.1 State and County Land Use Designations

The state and county land use designations for Coconut Island and Lilipuna Road property are listed in Table 1.

Table 1. State and County Land Use Designations

LAND USE DESIGNATION	COCONUT ISLAND	LILIPUNA ROAD PROPERTY
State Land Use District	Conservation, General Subzone	Urban
County Development Plan	Preservation	Residential
County Zoning	P-1 Restricted	R-10 Residential
County Special Management Area	Within Special Management Area	Within Special Management Area

In addition, the reef surrounding Coconut Island (approximately 64 acres) is located in the Protective Subzone of the Conservation District, and the waters of Kaneohe Bay are located within the Resource Subzone of the Conservation District.

7.2 Required Permits and Approvals

As listed in Table 2, the proposed project will or may require several permits and approvals from various federal, state, or city agencies.

Table 2. Permit / Approvals Required for HIMB Expansion at Coconut Island

PERMIT/APPROVAL	APPROVING AGENCY
Department of the Army Permit (Section 404)	U.S. Army Corps of Engineers
Conservation District Use Permit	Hawaii Board of Land and Natural Resources
Use of State Lands Authorization	Hawaii Board of Land and Natural Resources
Federal Consistency with Coastal Zone Management	Hawaii Office of State Planning
Section 401 Water Quality Certification	Hawaii State Department of Health
Shoreline Setback Variance	Honolulu City Council
Special Management Area Use Permit	Honolulu City Council

8. SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS

The proposed facility at Coconut Island will have potential short-term effects (primarily from construction activities) and potential long-term effects from the operations of the new facilities. These potential impacts can be mitigated.

8.1 Construction Phase

In the short term, impacts to the environment during construction would occur both on and off Coconut Island. These potential impacts include:

- Navigation. Mobilizing material and equipment to and from the construction site may affect navigation in Kaneohe Bay. Cranes and pile drivers may pose a potential obstruction to air navigation.

- Marine Environment. Heavy equipment and construction material would be transported from Lilipuna Road Property or other access points on Kaneohe shore to Coconut Island by using either large or small barges. Also, construction debris or waste disposal would be transported off-island. Transportation through the marine sanctuary zone surrounding Coconut Island could potentially affect water quality, marine flora and marine fauna.

  Movement of equipment and materials or construction waste may also require improvements to existing roads on the island. During heavy rainfall, surface runoff would occur. Thus, such improvements would be required to protect water quality in the bay.

  In addition, seawall repair or replacement could potentially result in sedimentation and destruction of coral heads around the island.

  Finally, handling of building materials, such as those used in concrete batching, could create runoff and affect water quality in the bay.

- Air Quality. Construction dust and emissions from heavy machinery may affect air quality.

- Noise. Mobilizing materials and equipment, repairing or replacing seawalls and constructing buildings may affect the noise environment of the island, as well as the areas in Kaneohe where construction material may be staged.

- Traffic. Construction workers may temporarily increase the need for parking facilities on Lilipuna Road and the surrounding neighborhood. Mitigative measures will be recommended to accommodate such an increase.

- Socio-economic. Planning and construction phases of the project will provide job opportunities and increased community spending.

8.2 Operational Phase

In the long term, potential impacts involved with the operations of the new permanent facilities on Coconut Island would include:

- Land Use. Land use issues regarding the new laboratory include compatibility with existing land use, property line, and shoreline setbacks, conservation district use and airport accident potential zones.

- Population. Completion of the proposed facilities will increase the population on Coconut Island and result in increased research activity. The peak daytime staff of HIMB may increase by about 10 to 12 people. In addition, HIMB will hold more conferences, which could occasionally increase the daytime population by as much as approximately 50 persons. The population of graduate students temporarily living on the island is not expected to increase.

- Infrastructure. Fire service, potable water, electrical power and telephone services, disposal of laboratory and domestic wastewater and solid waste may require on-island infrastructure improvements.

- Traffic. The addition of a new laboratory facility on the island will increase the number of faculty and staff on the island. This increase would affect traffic on Lilipuna Road, parking on the Lilipuna Road parking lot and boat service to the island. Mitigative measures will be proposed to reduce any significant adverse impacts.

- Navigation. Building height could have a potential impact on air navigation from Marine Corps Base Hawaii (MCB-Hawaii).

HIMB currently uses a variety of hazardous materials and petroleum products in its laboratories and facility operations. The proposed new laboratory will increase the use of these materials, which require safe transportation and disposal off-island.

- Aesthetics. Building height and location could potentially affect the visual character of the island as well as the views of Kaneohe Bay from public viewpoints around Kaneohe and the MCB-Hawaii.

- Biological Impacts. HIMB uses a number of larval species in its laboratories on the island, and occasionally uses alien species. The addition of a new laboratory would increase the use of these species, with the potential for release into the surrounding environment.

- Water Quality Impacts. HIMB currently uses saltwater from Kaneohe Bay in its research and returns this water to the bay. The expanded facilities would increase this water usage. In addition, transfer and storage of petroleum products used for vessels and generators poses potential for release into the marine waters.

- Air Quality Impacts. HIMB scientists use chemicals in laboratories under flume hoods which vent to the exterior environment. The addition of laboratory space on the island would increase the release of fumes, with potential to affect air quality.

9. PROPOSED MITIGATIVE MEASURES

Preparation of an EIS will provide a mechanism for the identification of potential impacts and mitigation measures needed to offset potentially significant negative effects.

10. AGENCIES TO BE CONSULTED

During the EIS review process, the following federal, state and county agencies will be consulted:

Federal Agencies

- Department of Army, Army Corps of Engineers, Honolulu District
- Department of Commerce, National Marine Fisheries Service
- Department of the Interior, Fish and Wildlife Service
- Department of the Interior, Geological Survey, Water Resources Division
- Department of Transportation, U.S. Coast Guard
- Commanding Officer, Marine Corps Base Hawaii

State Agencies

- Office of the Governor, Office of State Planning
- Department of Health, Clean Water Branch
- Department of Health, Clean Air Branch
- Department of Health, Solid and Hazardous Waste Branch
- Department of Land and Natural Resources, Aquatic Resources Division
- Department of Land and Natural Resources, Historic Preservation Division
- Department of Land and Natural Resources, Office of Conservation and Environmental Affairs.
- Department of Land and Natural Resources, Land Management Division
- Department of Land and Natural Resources, State Parks Division
- Department of Land and Natural Resources, Boating and Ocean Recreation Division
- Department of Transportation, Harbors Division
- Office of Environmental Quality Control
- University of Hawaii at Manoa, Environmental Center
- Department of Accounting and General Services

State Legislature

- Stanley T. Koki, District 24
- Mike McCartney, District 23

City and County of Honolulu Agencies

- Office of the Mayor
- Department of Land Utilization
- Planning Department
- Department of Public Works
- Department of Transportation Services
- Department of Wastewater Management
- Fire Department
- Police Department
- Board of Water Supply
- Councilmember Steve Holmes, 2nd District
- Kaneohe Neighborhood Board #30
- Civil Defense Agency

Others

- Hawaii Electric Company
- GTE Hawaiian Telephone Company
- Hachidai USA, Inc.
- Friends of Heeia State Park

11. DETERMINATION

The extent of the cumulative effects of anticipated environmental consequences resulting from the construction of the new facilities prompts the need for a detailed analysis of the proposed project. Many of the impacts summarized above will require individual, detailed studies of traffic, marine water quality, marine biota, flora and fauna, archaeology, noise, air quality and socio-economic issues. Therefore, the Hawaii Institute of Marine Biology intends to prepare an environmental impact statement for this project.

12. REFERENCES

The studies listed below have been used to provide background data in making this determination:

Devaney, Dennis, Marion Kelly, Polly Jae Lee and Lee S. Motteler (1982). *Kaneohe, A History of Change*, Bess Press.

Hawaii State Department of Health (1990). *Hawaii's Assessment of Nonpoint Source Pollution Water Quality Problems. Pg. V-9 to V-10.*

Hawaii State Department of Land and Natural Resources (1986). Rainfall Atlas of Hawaii.

Hawaii Institute of Marine Biology (1991). Edwin W. Pauley Marine Laboratory: A Proposal.

Helfrich, P. and Fredholm, G. (1992). *Conceptual Master Plan for Coconut Island.* Hawaii Institute of Marine Biology, School of Ocean and Earth Science and Technology, University of Hawaii.

Lai, D. T. (1991). *Moku O Loe Redevelopment.* Hawaii Institute of Marine Biology.

The United States Department of Agriculture (1972). *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

U.S. Fish and Wildlife Service (1978). *Hawaiian Water Birds Recovery Plan.*

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

August 18, 1994

REPLY TO ATTENTION OF

Planning Division

Mr. Glen T. Koyama
Belt Collins
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice for the Hawaii Institute of Marine Biology, Marine Laboratory and Support Facilities, Coconut Island, Oahu. The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

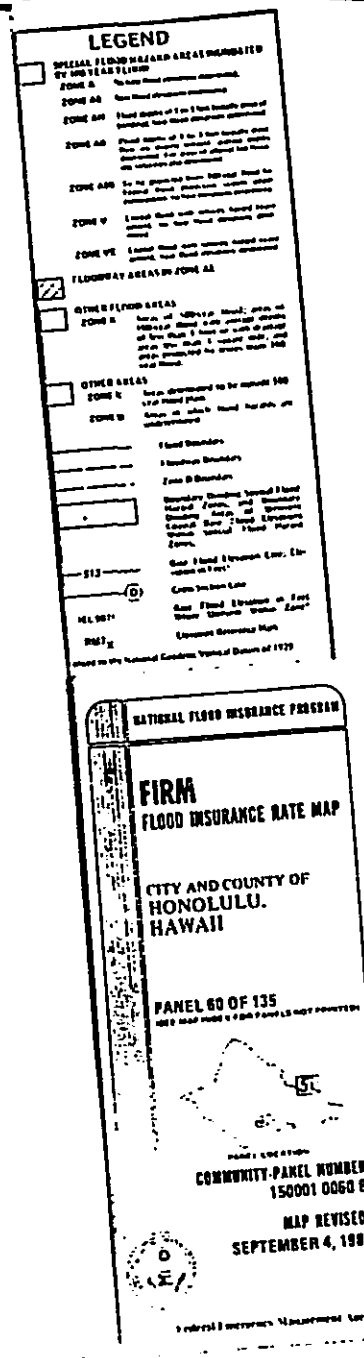
a. If the seawall repair and replacement involve fill or excavation below the mean high water line, a DA permit will be required. Please contact our Operations Division at 438-9258 for further information and refer to file number PO94-067.

b. According to the enclosed Federal Emergency Management Agency's Flood Insurance Rate Map panel number 150001 0060B dated September 4, 1987, the site is located in Zone X (unshaded; areas determined to be outside the 500-year floodplain).

Sincerely,

Ray H. Jyo, P.E.
Director of Engineering

Enclosure



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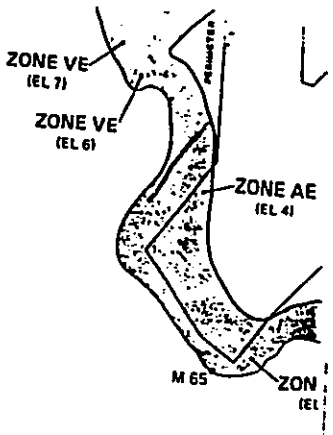

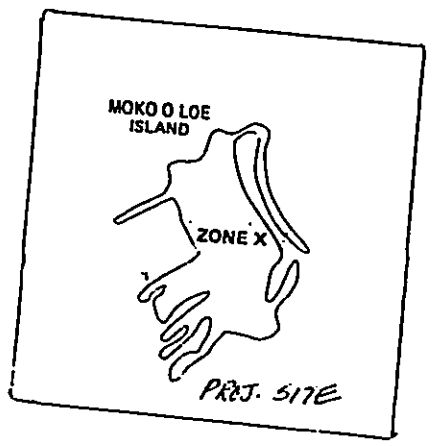

KAN

BELT COLLINS
HAWAII

September 11, 1995
95P-408

Mr. Ray H. Jyo, P. E.
Director or Engineering
Planning Division
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Dear Mr. Jyo:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 18, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. The concerns outlined in your letter will be addressed in the Draft EIS, a copy of which will be sent to you when it becomes available.

Also, we will soon be submitting to you the necessary Department of the Army permit application for the seawall repair.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 599-7819
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U. S. Department of Transportation

United States Coast Guard

Commander (dpl)
Fourteenth Coast Guard District

Prince Kalanianaole Fed Bldg
300 Ala Moana Blvd
Honolulu, HI 96850-4982
Phone: (808) 541-2126

16502
19 Aug ...

Bert Collins Hawaii, LTD.
Attn: Mr. Glen T. Koyama
680 Ala Moana Blvd.
Honolulu, HI 96813-5406

Gentlemen:

As requested in your letter of July 26, 1994, I have reviewed the Environmental Impact Statement Preparation Notice (EISPN) for the Hawaii Institute of Marine Biology (HIMB), University of Hawaii at Manoa's proposed Marine Laboratory and Support Facilities project on Coconut Island. The Coast Guard has no objection to HIMB's proposal or the scope of the project. However, I require that HIMB contact my Aids to Navigation (AtoN) office at least two weeks prior to the start of the project so the information regarding the repair or replacement of the seawall can be published in the Local Notice to Mariners (LNM). Further, HIMB should also inform the AtoN office of any other action which interferes with vessel traffic or established aids to navigation. The Aids to Navigation office can be reached at (808) 541-2315.

If you require further assistance or have any questions, please contact LT Susan Papuga at (808) 541-2268.

Sincerely,

J. H. HEINZ
Captain, U. S. Coast Guard
Chief of Staff

Copy: CCGD14(oan)

BELT COLLINS
HAWAII

September 11, 1995
95P-406

Captain J. H. Heinz
Chief of Staff
U.S. Coast Guard
U.S. Department of Transportation
Prince Kalanianaole Federal Building
300 Ala Moana Boulevard
Honolulu, Hawaii 96850-4982

Dear Captain Heinz:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 19, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. As required, your Aids to Navigation office will be notified by the contractor prior to project construction. A copy of the Draft EIS will be sent to you when it becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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JOHN WAIHEE
GOVERNOR

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

ROBERT P. TAKUSHI
COMPTROLLER

LLOYD I. UMEBASAMI
DEPUTY COMPTROLLER

LETTER NO. (P)1766.4

AUG 23 1994

Belt Collins Hawaii
680 Ala Moana Boulevard
First Floor
Honolulu, Hawaii 96813-5406

Attention: Mr. Glenn T. Koyama

Gentlemen:

Subject: Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
EIS Preparation Notice

Thank you for the opportunity to review the subject document. The proposed project will have no impact on our facilities. Therefore, we have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,

GORDON MATSUOKA
State Public Works Engineer

RY:jy

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BELT COLLINS
H A W A I I

September 11, 1995
95P-413

Mr. Gordon M. Matsuoka
State Public Works Engineer
Dept. of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Matsuoka:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated August 23, 1994 regarding the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. We have recorded that you have no comments or objections regarding the proposed project, and we appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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JOHN WAIHEE
GOVERNOR OF HAWAII

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

RECEIVED
'94 AUG -4 P 2:15

Peter A. Sylonsky, Ph.D.
DIRECTOR OF HEALTH

File

In reply, please refer to:
File: EMO/CWB

August 1, 1994

C0801EC

Mr. Glen T. Koyama
Belt Collins Hawaii
680 Ala Moana Boulevard
Honolulu, HI 96813-5406

Dear Mr. Koyama:

Subject: **Environmental Impact Statement (EIS) Preparation Notice For Hawaii Institute of Marine Biology, Marine Laboratory and Support Facility**

Thank you for the opportunity to review and comment on the subject proposal. The following are our concerns and comments:

1. The project calls for seawall repair or reconstruction but there is no description of the proposed work. We recommend that the draft EIS should include the dimension, location and the design of the seawall. The draft EIS should also discuss the Best Management Practices (BMP) to be implemented before, during and after the seawall construction. And, if applicable, adequate mitigative measures should also be part of the draft EIS.

2. Please identify the location of the intake as well as the outfall for the seawater system. The draft EIS should briefly describe the seawater system operations. Representative intake water and effluent samples should be collected to properly evaluate the potential impact from the operation of the seawater system.

3. The domestic sewage collection and disposal practices should also be discussed.

4. The BMP proposed for other structure construction should also be discussed. For example, site specific storm water pollution control plan to isolate construction activity, to control the soil erosion and minimize the silt transport into Kaneohe Bay.

Should you have any questions, please contact Mr. Edward Chen, Engineering Section of the Clean Water Branch, at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

EC:sa

BELT COLLINS
HAWAII

September 11, 1995
95P-409

Mr. Denis R. Lau, P.E., Chief
Clean Water Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Lau:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 1, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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JOHN WAIHEE
GOVERNOR OF HAWAII

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

PETER A. SYBINSKY, Ph. D.
JOHN C. LEWIN, M.D., M.P.H.
DIRECTOR OF HEALTH

In reply, please refer to:
EMD-CAB

August 8, 1994

94-257 CAB

Mr. Glen T. Koyama
BELT COLLINS HAWAII LTD.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

This is in response to your letter dated July 26, 1994, which request our review and comment to Hawaii Institute of Marine Biology, Marine Laboratory and Support Facilities, Environmental Impact Statement (EIS) Preparation Notice.

Air Pollution

Control of Fugitive Dust:

There is a significant potential for fugitive dust during the construction, demolition, and renovation activities. Fugitive dust may have a negative impact on the water quality of the surrounding bay and possibly nearby coastal lands. Implementation of adequate dust control measures during all phases of construction is warranted. Construction activities must comply with provisions of Chapter 11-60.1, Hawaii Administrative Rules, section 11-60.1-33 on Fugitive Dust.

Contractor should provide adequate means to control dust from road areas and during the various phases of construction activities, including but not limited to:

a. planning the different phases of construction, focusing on minimizing the amount of dust generating materials and activities, centralizing material transfer points and onsite vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;

b. providing an adequate water source at site prior to startup of construction activities;

c. landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;

d. control of dust from project entrances and access ways;

e. providing adequate dust control measures during weekends, after hours, and prior to daily startup of construction activities;

Control of Miscellaneous Emissions:

As indicated in section G.5, there is a possibility of emissions from ventilation hoods and exhaust from generators. These impacts should be addressed with a focus on pollution prevention and waste minimization in the daily operations and procedures of the laboratory.

Control of Air Toxics:

As a project that will entail demolition and renovation activity, the Federal Register, 40 CFR Part 61, National Emission Standard for Hazardous Air Pollutants, Asbestos NESHAP Revision; Final Rule, November 20, 1990, would require inspection to all affected areas to determine whether asbestos is present.

In 1986, Congress enacted the Asbestos Hazard Emergency Response Act (AHERA, or TSCA Title II) which mandated a regulatory program to address asbestos hazards in schools. A part of AHERA (Section 2-6; 15 U.S.C. 2646) dealt with the mandatory training and accreditation of persons who perform certain types of asbestos-related work in schools. Subsequently, in 1990, Congress enacted ASHARA (Pub. L. 101-637), which amended AHERA and extended the training and accreditation requirements to persons performing such work in public and commercial buildings.

To comply with the ASHARA requirements, the inspector, management planner, project designer, abatement supervisor, and abatement worker must have an active AHERA certificate of training from an accredited training provider.

Under the NESHAP's regulation, the project would be required to file an Asbestos Demolition/Renovation notification 10 working days prior to demolition of each building or the disturbance of regulated asbestos-containing material. All regulated quantities and types of asbestos-containing materials would be subject to emission control, proper collection, containerizing, and disposal at a permitted landfill.

The State of Hawaii, Department of Commerce and Consumer Affairs, requires that any contractor that disturbs friable asbestos-containing material must obtain an asbestos abatement license.

The State of Hawaii, Department of Labor and Industrial Relations, Occupational Safety & Health Division, requires other additional measures to protect employees working with asbestos.

If you have any further questions on asbestos, please contact Mr. Robert H. Lopes at 586-4200.

Sincerely,

Wilfred K. Nagamine

WILFRED K. NAGAMINE, P.E.
Manager, Clean Air Branch

RL/RT:jm

BELT COLLINS
HAWAII

September 11, 1995
95P-414

Mr. Wilfred K. Nagamine, P.E., Manager
Clean Air Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Nagamine:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 8, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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JOHN WAIHEE
GOVERNOR OF HAWAII

RECEIVED
'94 AUG 15 A 8:36

STATE OF HAWAII
DEPARTMENT OF HEALTH
ENVIRONMENTAL MANAGEMENT DIVISION
SOLID AND HAZARDOUS WASTE BRANCH
P. O. BOX 3378
HONOLULU, HAWAII 96801

PETER A. SYBINSKY, PH.D
DIRECTOR OF HEALTH

In reply, please refer to:
EMO / SHW

U0849RS

August 9, 1994

Mr. Glen T. Koyama
Belt Collins Hawaii LTD.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Proposed Marine Laboratory and Support Facilities Located at Coconut Island, Oahu, Hawaii

We have reviewed the Environmental Impact Statement (EIS) Preparation Notice and have the following comments:

If the proposed construction involves new installation and/or removal of existing underground storage tanks (USTs), these USTs may be regulated in accordance with the technical standards and financial responsibility regulations of 40 CFR Part 280. These regulations include requirements for:

a) Design, construction, installation, and notification;
b) General operating requirements;
c) Release detection;
d) Release reporting, investigation, and confirmation;
e) Release response and corrective action;
f) Changes-in-service and closure; and
g) Financial responsibility.

Owners of newly installed USTs must notify our UST section of the existence of such USTs within 30 days of installation. The installation of UST systems containing flammable and combustible liquids is also subject to regulation by the Country Fire Departments. In this case, the Honolulu County Fire Department should be contacted regarding county requirements that govern the UST systems.

If you have any questions, please call Ms. Rebecca H. Sciulli of our UST Section at 586-4226.

Sincerely,

Steve Y.K. Chang, P.E., MANAGER
Solid and Hazardous Waste Branch

SYKC:RS:cys

c: Russ Beckwith, OUST, U.S. EPA, San Francisco

BELT COLLINS
H A W A I I

September 11, 1995
95P-400

Mr. Steve Y.K. Chang, P.E., Manager
Solid and Hazardous Waste Branch
Environmental Management Division
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Chang:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 9, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. The proposed project will not involve the installation or removal of existing underground storage tanks. A copy of the Draft EIS will be sent to you for further comments when it becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

August 4, 1994

EDITH AIKAU, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCE

DEPUTIES

JOHN P. KEPPELER II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

LOG NO: 12330
DOC NO: 9408TD02

Dear Mr. Koyama:

SUBJECT: **Environmental Impact Statement Preparation Notice (EISPN), Hawaii Institute of Marine Biology Marine Laboratory and Support Facilities**
He'eia, Ko'olaupoko, O'ahu
TMK: 4-6-1: 51

Thank you for the opportunity to review this EISPN. The environmental impact statement will contain a report on archaeological survey of lands affected by the proposed project. We look forward to reviewing this report.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

TD jk

BELT COLLINS
H A W A I I

September 11, 1995
95P-407

Don Hibbard, Ph.D., Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Dr. Hibbard:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated August 4, 1994 regarding the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. A copy of the Draft EIS, which includes the archaeological survey, will be sent to you when it becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 531-7819
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JOHN WAIHEE
GOVERNOR OF HAWAII

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

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REP:OCEA:DKP

FILE NO.: 95-061
DOC. ID.: 4854

AUG 26 1994

RECEIVED
1994 AUG 29 P 12:22

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN): Hawaii Institute of Marine Biology - Marine Laboratory and Support Facilities, Moku O Loe (Coconut) Island, Kaneohe, Oahu

We have reviewed the application information for the subject project transmitted by your memorandum dated July 26, 1994, and have the following comments:

Office of Conservation and Environmental Affairs

The Office of Conservation and Environmental Affairs (OCEA) notes that there are a number of existing Conservation District Use Permits (CDUP) for uses at this facility. OCEA recommends that these permits be researched and discussed/disclosed in some detail in the upcoming Draft EIS.

Division of Aquatic Resources

The Division of Aquatic Resources (DAR) comments that they have no preliminary objections to the expansion of Hawaii Institute of Marine Biology (HIMB) facilities on state-owned land. DAR supports the expansion of HIMB facilities to support marine research and education. The EISPN does note potential impacts to the marine environment from the construction phase and the increased use of the island by researchers and students. Final comments on the project will be reserved until mitigative measures proposed in the draft EIS are reviewed.

Division of Land Management

The Division of Land Management (DLM) comments that they have reviewed the subject EISPN for the subject project and have been receiving reports from the Conservation Resources Enforcement Division that dumping and tree cutting is on-going at the island. DLM respectfully requests that HIMB take measures to prevent such activities within their area of operation. DLM also finds that the project has no significant or detrimental impact to State-owned land surrounding or near the project site.

We will forward our Historic Preservation Division comments as soon as they become available.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to call Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

KEITH W. AHUE

BELT COLLINS
H A W A I I

September 12, 1995
95P-390

Mr. Mike Wilson
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Wilson:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's comments of August 26, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. Your comments have been noted and will be addressed in the Draft EIS.

In addition to addressing the requirement for a Conservation District Use Application in the Draft EIS, we will discuss in detail existing Conservation District Use Permits in the CDUA that will be filed for the proposed project.

Also, we have contacted the Hawaii Institute of Marine Biology of the reported dumping and tree cutting occurring on the island, and have informed them that the Division of Land Management is requesting they take measures to prevent such activities within their area of operation.

A copy of the Draft EIS will be sent to you when it becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 531-7819
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JOHN WAIHEE
GOVERNOR OF HAWAII

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

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

October 5, 1994

OD-94-418

Mr. Glen T. Koyama
Belt, Collins Hawaii, Ltd.
680 Ala Moana Blvd.
1st Floor
Honolulu, Hawaii 96813

Dear Mr. Koyama:

Subject: EIS Prep Notice, University of Hawaii, General Lease No. S-5325, Coconut Island, Kaneohe, Koolaupoko, Oahu, TMK: 4-6-01:51

We have received your EIS Prep Notice for demolition work, seawall repair and new construction of laboratory and maintenance buildings on Coconut Island, Kaneohe. The work is for the Hawaii Institute of Marine Biology of the University of Hawaii.

Thank you for the opportunity to comment on this work. The Department of Land and Natural Resources under General Lease No. S-5325 has issued a general lease to the University of Hawaii on December 10, 1989 for 16.270 acres at this site for a marine biology facility.

We were able to inspect this leasehold on August 8, 1994. We found that the management of the leasehold lacked an adequate debris and rubbish disposal function. This was primarily due to the absence of an adequate boat or landing craft owned by the University that could transport the rubbish and debris off of the Island regularly. This resulted in the stockpiling of junk and debris at two locations that is a definite problem the University has to contend with. We also notice that one of the seawalls had been temporarily fixed by machinery parts. This is unacceptable.

The maintenance supervisor reported that the lack of funds have prevented them from doing adequate seawall repair and from effectively removing the trash and debris from the Island. He reported that they would acquire a landing craft within a month which would be capable of removing the trash and mechanical debris.

We also noticed that over fifteen (15) trees had been cut down on the leasehold to make room for marine tanks. Also, approximately eight (8) trees were cut within the leasehold along one of the seawalls. This island is zoned Conservation. No trees can be removed unless a Conservation District Use Application (CDUA) is processed.

We also noticed large piles of vegetation rubbish was stockpiled on one section of the Island. We are not sure who piled it there, but it presented a health hazard, where rodents could gather. We also noticed six (6) old used electrical transformers stored at one site.

We received assurances by the maintenance supervisor that the regular and effective removal of the rubbish and debris would take place as soon as their newly acquired landing craft is in operation.

We have serious concerns over the maintenance of this leasehold and will be following up with the University on the maintenance process. This area is zoned Conservation. All construction must take place through the CDUA process. We will withhold approval of any construction plans for the site as is required by the terms of General Lease No. S-5325 until an effective landing craft that can haul in equipment such as a medium sized front end loader is owned by the University of Hawaii and is in operation on a regular basis at Coconut Island and until all of the rubbish and debris and equipment seawall pieces are cleared off the leasehold.

Thank you for the opportunity to comment. Should you have any questions, please call us at 587-0433.

Very truly yours,

Cecil Santos

CECIL SANTOS
Oahu District Land Agent

cc: Mr. M. Nekoba
Mr. L. Landgraf

BELT COLLINS
H A W A I I

September 12, 1995
95P-416

Mr. Cecil Santos
Oahu District Land Agent
Department of Land and Natural Resources
Division of Land Management
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Santos:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Since receiving your letter of October 5, 1994, HIMB has acquired a Landing Craft Utility (LCU) to assist in the disposal of debris and rubbish from the island, as well as to provide construction equipment and materials transport for the new marine laboratory facility. HIMB has already removed a substantial amount of rubbish and is continuing its cleanup efforts to meet with the satisfaction of your agency.

HIMB has also been informed of the reported one-time tree cutting that occurred on the island and that the Division of Land Management is requesting that measures be taken to prevent such activities from happening within its area of operation.

Thank you for your comments regarding the condition of the island, and although your comments were not relevant to the EIS Preparation Notice, we will send you a copy of the Draft EIS for review and comment.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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JOHN WAIHEE
GOVERNOR OF HAWAII

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'94 AUG 29 P 12:21

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF BOATING AND OCEAN RECREATION
333 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

August 25, 1994 BOR-A 0098.95

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Hawaii Institute of Marine Biology Marine Laboratory and Support Facilities Environmental Impact Statement (EIS) Preparation Notice

Thank you for your letter dated July 26, 1994 regarding our wishes to be a consulted party during the EIS process. We do not request to be a separate consulted party, but will have our comments included in the consolidated response from the Department of Land and Natural Resources.

Very truly yours,

David E. Parsons
Administrator

c: Office of Conservation and Environmental Affairs
Division of Aquatic Resources

BELT COLLINS
HAWAII

September 11, 1995
95P-415

Mr. David E. Parsons, Administrator
Division of Boating and Ocean Recreation
Department of Land and Natural Resources
State of Hawaii
333 Queen Street, Suite 300
Honolulu, Hawaii 96813

Dear Mr. Parsons:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 25, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. We have recorded that you do not wish to be a consulted party, and we appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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JOHN WAIHEE
GOVERNOR

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
KAHANI HOLT
GLENN M. OKIMOTO
JOYCE T. OMINE
CALVIN M. TSUDA

IN REPLY REFER TO

RECEIVED
'94 AUG -5 A 8:19

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
79 SO NIMITZ HWY • HONOLULU, HAWAII 96813-4898

August 2, 1994 HAR-EP 2673.95

Mr. Glen T. Koyama
Belt Collins Hawaii
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Hawaii Institute of Biology
Marine Laboratory and Support Facilities
Environmental Impact Statement Preparation Notice
(EISPN)

Thank you for the opportunity to review the EISPN for the proposed Marine Laboratory and Support Facilities at Moku O Loe (Coconut Island), Kaneohe. Since the project has no impact on our facilities, the Harbors Division has no objections and does not wish to participate as a consulted party during the EIS process.

Very truly yours,

Calvin M. Tsuda
Deputy Director for Harbors

c: OEQC

BELT COLLINS
HAWAII

September 11, 1995
95P-419

Mr. Tom Fujikawa, Administrator
Harbors Division
Department of Transportation
State of Hawaii
79 South Nimitz Highway
Honolulu, Hawaii 96813-4898

Dear Mr. Fujikawa:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your division's letter dated August 2, 1994 regarding the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. We have recorded that you have no objections and do not wish to be a consulted party. We appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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OFFICE OF THE MAYOR

CITY AND COUNTY OF HONOLULU

HONOLULU HAWAII 96813 • AREA CODE 808 • 523-4141

JEREMY HARRIS
MAYOR

August 15, 1994

1994 AUG 18 A 8:13

Mr. Glen T. Koyama
Belt Collins Hawaii, Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Thank you for providing the City and County of Honolulu the opportunity to comment on the Environmental Impact Statement Preparation Notice (EISPN), for the Marine Laboratory and Support Facilities proposed for Moku O Loe Island, Kaneohe.

I have asked my Department of Land Utilization to review the EISPN document. They will respond to you directly with their comments.

Sincerely,

JEREMY HARRIS
Mayor

JH:ak

BELT COLLINS
HAWAII

September 11, 1995
95P-404

The Honorable Jeremy Harris
Major of Honolulu
Office of the Major
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Mayor Harris:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated August 15, 1994 regarding the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. We have received comments from and responded to the Department of Land Utilization. We appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

RICHARD SETO MOOK
FIRE CHIEF

ERNEST Y SUEMOTO
FIRE DEPUTY CHIEF

September 28, 1994

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Hawaii Institute of Marine Biology Marine and Laboratory Support Building Environmental Impact Statement (EIS) Preparation Notice - Coconut Island.

We have reviewed the application of the above subject request, and have no objections to the proposal providing the following conditions are complied with prior to approval. Compliance with Article 10 of the Uniform Fire Code should also be made, but not limited to the following:

1. Submit construction plans to the building and fire departments for review and approval prior to commencement of the project.

2. Due to the location of this project and resultant delayed Honolulu Fire Department response; Honolulu Fire Department recommendation is to provide an automatic sprinkler system in accordance with NFPA 13, with a dedicated water supply system.

Should additional information or assistance be required, please call Captain Miles Fonseca of the Fire Prevention Bureau at 523-4186.

Very truly yours,

ERNEST Y. SUEMOTO
Fire Deputy Chief

MF:ms

BELT COLLINS
HAWAII

September 11, 1995
95P-418

Mr. Tony Lopez, Jr., Fire Chief
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Dear Chief Lopez:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's comments of September 28, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL. 808 521-5361 FAX 808 538-7819
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DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

JEREMY HARRIS
MAYOR

DONALD A. CLEGG
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

94-04942(ASK)

August 22, 1994

RECEIVED
1994 AUG 23 A 10:56

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Hawaii Institute of Marine Biology
Environmental Impact Statement Preparation Notice (EISPN)

The Mayor referred your request for comments on the above to this department for comment. The following are our comments.

The Draft Environmental Impact Statement (DEIS) should include the following:

- A description of existing buildings and uses on the site. This information should allow the reader to easily identify impacts attributable to the proposed project, and enable a comparison between existing and future conditions.
- We note that the off-site parking is within R-10 Residential District and is subject to the requirements of the Land Use Ordinance (LUO). The DEIS should describe how the off-site parking use is consistent with the LUO.
- A description of the location and plans for proposed seawalls, and other structures or work to be located within the shoreline setback area. Potential impacts to littoral transport should be disclosed.
- Identify the location of public recreational areas near or within the project area, and disclose whether the proposal might affect access to these resources.
- Describe the proposed method of disposal for solid and liquid wastes.

- Estimates for the cost and phasing of the project.
- A description of visual impacts to views from public viewing vantage points, and proposed mitigation measures.

As stated in the EISPN, the project is subject to the provisions of Chapter 23, ROH, relating to shoreline setbacks, and Chapter 25, ROH, relating to the Special Management Area. A Special Management Area Use Permit and Shoreline Setback Variance are required.

Thank you for the opportunity to review the EISPN. If you have any questions regarding our comments, please contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,

Donald Clegg

DONALD A. CLEGG
Director of Land Utilization

DAC:ak

cc: The Honorable Jeremy Harris, Mayor
City and County of Honolulu

A:koyama.as6
C:koyama.ask

BELT COLLINS
HAWAII

September 11, 1995
95P-401

Mr. Patrick T. Onishi, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Onishi:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's comments of August 22, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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

JEREMY HARRIS
MAYOR

ROBIN FOSTER
CHIEF PLANNING OFFICER

ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

MM 7/94-4082

August 18, 1994

RECEIVED
1994 AUG 20 AM 11:13

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, 1st Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
Environmental Impact Statement (EIS) Preparation Notice

We have reviewed the subject EIS Preparation Notice and have no comments or objections at this time.

Should you have any questions, please contact Mel Murakami of our staff at 527-6020.

Sincerely,

ROBIN FOSTER
Chief Planning Officer

RF:ft

BELT COLLINS
HAWAII

September 11, 1995
95P-402

Ms. Cheryl Soon
Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Soon:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's letter dated August 18, 1994 regarding the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. We have recorded that you have no comments or objections regarding the proposed project, and we appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

JEREMY HARRIS
MAYOR

MICHAEL S. NAKAMURA
CHIEF
HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE BS-LK

August 8, 1994

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard
First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

This is in response to your request for comments on an environmental impact statement preparation notice for the Hawaii Institute of Marine Biology facilities on Coconut Island.

This project is expected to have no significant impact on police services, and we do not wish to be a consulted party during the EIS process. We have no additional comments to make at this time.

Thank you for the opportunity to review this document.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By Eugene Uemura
EUGENE UEMURA
Assistant Chief of Police
Administrative Bureau

BELT COLLINS
H A W A I I

September 11, 1995
95P-420

Mr. Michael S. Nakamura
Police Chief
Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, Hawaii 96813

Dear Chief Nakamura:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's letter dated August 8, 1994 regarding the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same. We have recorded that you have no objections and do not wish to be a consulted party. We appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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

JEREMY HARRIS
MAYOR

KENNETH E. SPRAGUE
DIRECTOR AND CHIEF ENGINEER

ENV 94-196

August 10, 1994

RECEIVED
'94 AUG 11 A 10:26

Mr. Glen T. Koyama
Belt Collins Hawaii
680 Ala Moana Boulevard, 1st Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Environmental Impact Statement Preparation Notice (EISPN) - Marine Laboratory and Support Facilities
Tax Map Key: 4-6-01

We have reviewed the subject EISPN and have the following comment:

Best management practices (BMPs) should be in place during construction to prevent discharge of pollutants into the Class AA waters at Kaneohe Bay.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

KENNETH E. SPRAGUE
Director and Chief Engineer

BELT COLLINS
HAWAII

September 11, 1995
95P-417

Ms. Donna Fay Kiyosaki
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Kiyosaki:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's comment of August 10, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your comment is still applicable. We will address your comment in the Draft EIS and will send you a copy for further review when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

JOSEPH M. MAGALDI JR.
DIRECTOR

AMAR BAPPAL
DEPUTY DIRECTOR

August 15, 1994

Mr. Glen T. Koyama
Belt Collins Hawaii, Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Lilipuna Road-Coconut Island - Kaneohe
Marine Laboratory and Support Facilities
Environmental Impact Statement
Preparation Notice (EISPN)
TMK: 4-6-01: 1 and 51

This is in response to your letter dated July 26, 1994 requesting our comments on the EISPN for the subject project.

The following items should also be addressed in the EISPN:

1. The existing number of off-street parking stalls.

2. The proposed increase in demand for off-street parking due to this project.

3. A proposal on how this increase will be accommodated.

Should you have any questions, please contact Wayne Nakamoto of my staff at 523-4190.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

HAWAIIAN ISLANDS LAND TRUST

BELT COLLINS
HAWAII

September 11, 1995
95P-412

Mr. Charles D. Swanson, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Swanson:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's comments of August 15, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

FELIX B. LIMTIACO
ACTING DIRECTOR

WPP 94-344

August 24, 1994

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

Dear Mr. Koyama:

Subject: Hawaii Institute of Marine Biology--Marine Laboratory and Support Facilities
Environmental Impact Statement Preparation Notice

The Hawaii Institute of Marine Biology facilities on Moku O Loe Island are served by existing municipal wastewater facilities. However, due to a moratorium currently in effect in the Kaneohe area, no additional wastewater flows from these facilities will be allowed into the City's system.

Once the moratorium is lifted, we anticipate that the existing wastewater collection system would be adequate and available to accept additional flows generated from the improvements to the Hawaii Institute of Marine Biology facilities. Sewer capacity reservation for the additional wastewater flows will be contingent on the submittal and approval of a "Sewer Connection Application" form.

We appreciate the opportunity to review and comment on the subject environmental impact statement preparation notice. Should you have any questions, please call Thomas Tamanaha of our Division of Planning and Service Control at 523-4671.

Very truly yours,

FELIX B. LIMTIACO
Acting Director

BELT COLLINS
HAWAII

September 11, 1995
95P-410

Mr. Felix B. Limtiaco, Director
Department of Wastewater Management
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Limtiaco:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 24, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

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

August 18, 1994

JEREMY HARRIS, Mayor

Mr. Glen T. Koyama
Belt, Collins Hawaii, Ltd.
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813

Dear Mr. Koyama:

Subject: Your Letter of July 26, 1994 Regarding the Environmental Impact Statement Preparation Notice (EISPN) for Hawaii Institute of Marine Biology of the School of Ocean and Earth Science and Technology, University of Hawaii at Manoa, TMK: 4-6-001: 051

Thank you for the opportunity to review and comment on the EISPN for the proposed marine laboratory and support facilities at Coconut Island, Kaneohe. We have the following comments:

1. There is one existing 2-inch domestic water meter currently serving the project site.
2. The developer will be required to obtain a water allocation from the State Department of Land and Natural Resources.
3. The availability of water will be confirmed when the building permit application is submitted for our review and approval. If water is made available, the applicant will be required to pay the prevailing Water System Facilities Charges for transmission and daily storage.
4. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

Raymond H. Sato
FOR KAZU HAYASHIDA
Manager and Chief Engineer

RECEIVED
1994 AUG 25 A 11:11

SANDWICH LANDS

BELT COLLINS
HAWAII

September 11, 1995
95P-405

Mr. Raymond Sato
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Sato:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your department's comments of August 18, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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RM SEP -6 A 11:33

44-365 Kaneohe Bay Drive
Kaneohe, Hawaii 96744
August, 1994

Glen T. Koyama
Belt Collins Hawaii Limited
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813

Dear Mr. Koyama,

Thank you for the opportunity to comment on the EISPN for the Hawaii Institute of Marine Biology at Coconut Island in Kaneohe Bay.

The Planning Committee of the Kaneohe Neighborhood Board, chaired by myself, discussed the document which you sent. We have several questions and concerns.

The Board was disappointed that the Institute had not contacted us themselves before this process started in order to alert us to their plans and some of the reasons and need for the new buildings. Since the Institute is located in an important resource in our Kaneohe Community, we would like to know more what is happening there. Some of our questions stem from the fact that we do not know what goes on at present, so we do not know what changes and effects this new building and expansion will have on the community. There was a question about how Kaneohe benefits from having the Institute in our community and what information they have gained and shared with us about our Bay.

A primary concern about the plans for HIMB are in timing. In these times of austerity and cut-backs, we wonder where the money is coming from for this demolition and building. We also question whether this is the proper time to be making plans for the Institute when the future ownership of the interior of the Island is uncertain. If the State again tries to acquire the Island, wouldn't it make more sense to then master plan the whole island?? Does it make sense to make these big plans when the ownership of the parking and access to the Island seems to uncertain and we hear rumors that the Institute no longer will be able to use these facilities?

Our Board and Environmental Committee are extremely concerned about the potential impacts of destruction and construction on Kaneohe Bay. There is a statement in the "Preparation" document (pg. 10) that "seawall repair or replacement could potentially result in sedimentation and destruction of coral heads around the island." This is totally unacceptable. The Kaneohe Bay Task Force was very concerned about the reefs in Kaneohe Bay and much has been implemented to try to preserve them, using some studies from the Institute itself. How can this body even think of jeopardizing the very resources that we always assumed they were studying and protecting?

We understand that nothing is taken off the Island presently. What will be done with construction debris and the added refuse from additional people working on the Island? Exactly what is done with it now? How will construction equipment be transported to the Island? If this is to be on barges, from where will the barges leave and have arrangements been made with those land-owners? What will the traffic impacts be?

Will there be more traffic on Lilipuna Road and through Kaneohe as workers come to the Island? Have the neighbors in the area been consulted?

How does and will noise from the Marine Corps Base Hawaii affect workers and conferences on the Island? Are there plans for sound attenuation in the new buildings? If a study is done on noise, it should not average noise as some of the past AICUZ studies done for the Base have done. This is little help in a situation where individual occurrences are what make the impact.

Thank you again for the opportunity to comment. We look forward to talking with representatives from the Institute, doing more research on the project and to commenting on the EIS itself. The newly formed Kaneohe Bay Regional Council has not met since the study came out, but we hope they will have an opportunity for input.

Sincerely,

Gretchen McGould

Gretchen Gould
Kaneohe Neighborhood Board #30
Vice-Chair, Planning Chair

BELT COLLINS
HAWAII

September 11, 1995
95P-403

Ms. Gretchen Gould
Vice-Chair, Planning Chair
Kaneohe Neighborhood Board #30
44-365 Kaneohe Bay Drive
Kaneohe, Hawaii 96744

Dear Ms. Gould:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving a property transaction settlement. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilities. The development program for the project, however, is still the same and your concerns are still applicable. We will address your concerns in the Draft EIS and will send you a copy for further comments when the draft becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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Kobayashi
Sugita &
Goda
ATTORNEYS·AT·LAW

745 Fort Street, 8th Floor
Honolulu, Hawaii 96813-3689

Telephone: 808-539-8700
Facsimile: 808-539-8799

August 26, 1994

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Boulevard, 1st Fl.
Honolulu, Hawaii 96813

Re: Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
Environmental Impact Statement Preparation Notice

Dear Mr. Koyama:

This firm represents Hachidai USA, Inc. ("Hachidai"), the fee owner of Moku O Loe (Coconut Island) ("Island"). In response to the Environmental Impact Statement Preparation Notice ("EISPN") received on July 28, 1994, Hachidai hereby requests that it be a consulted party in the EIS process for the Hawaii Institute of Marine Biology's ("HIMB") proposed construction project. On that basis, we present the following comments and concerns of Hachidai for your review, which have been numbered to correspond with the respective paragraphs listed in the EISPN.

General Comments:

In 1987, Hachidai USA, Inc. ("Hachidai") purchased the real property identified as Moku O Loe (Coconut Island), TMK: 1-4-6-1-1, ("Island") in Kaneohe Bay and three parcels of real property located at Lilipuna Road described as TMK Nos. 1-4-6-1-15, 1-4-6-1-16, and 1-4-6-1-17 ("Lilipuna Property"). In addition to the real property, Hachidai also purchased several buildings, including the "Old Boat House," and other improvements located on various parts of the Island. The Lilipuna Property currently houses a parking lot owned by Hachidai and used by HIMB.

According to the EISPN, we understand that HIMB proposes to expand its facilities on the Island by demolishing various buildings on the Island, replacing or repairing the existing seawalls, constructing a new laboratory building, and relocating and expanding an existing maintenance building.

Our initial review of the EISPN indicates that HIMB's evaluation of the environmental impacts of its proposed actions were based upon the presumption that Hachidai would allow requisite access to Hachidai's property to allow HIMB's proposed construction on the Island as well as and HIMB's expanded use of the parking lot on Hachidai's Lilipuna Road property. However, Hachidai has not consented to (1) HIMB's proposed demolition of the "Old Boat House" (which was part of the original package deal for Coconut Island that was purchased by Hachidai), (2) construction or expansion that appears to be or be on Hachidai's property, or (3) access to and transit over Hachidai's property for the construction and operation of the proposed laboratory facilities.

As a result, the EISPN (1) evaluates environmental impacts relying on inaccurate assumptions; (2) fails to discuss the environmental impacts resulting from alternative methods to accomplish the construction and expansion should Hachidai not consent to the proposed construction; and (3) fails to consider the impact of the construction on Hachidai as the adjacent landowner as well as the owner of the property on which construction or improvements are being proposed by HIMB.

Following are other comments and concerns with respect to the EISPN and the draft EIS.

1. Demolition (paragraph 4.2.1). HIMB proposes to demolish the "Old Boat House" to accommodate the proposed maintenance building. As indicated above, Hachidai understands that the "Old Boat House" was part of the package deal that Hachidai USA, Inc, purchased in 1987, and that ownership of this building was transferred to Hachidai in 1989. Hachidai has not consented to the demolition of this building, and thus, HIMB will need to evaluate and assess alternative locations for the construction of the Marine Laboratory Building.

In the event Hachidai does consent to the demolition of the boat house, there are various impacts that the draft EIS should evaluate, including, but not limited to:

a. If the "Old Boat House" contains asbestos containing materials, the EIS should cover alternative remediation methods, including the potential release of friable materials and fibers into the environment.

b. If the "Old Boat House" used paint containing lead or biological retardants, the EIS should examine issues pertaining to treatment and remediation.

c. If the boat house was used as a facility to service and repair boats and vessels, there is a probability of usage of solvents, to clean boat surfaces, as well as other chemicals, including fuel and oil. Thus, the EIS should cover and evaluate the necessary removal and remedial work for such solvents and chemicals.

2. Seawall Repairs (paragraph 4.2.2). The EIS should cover the possible impact of side slip transfer of sediments of disturbed bottom material nor issues relating to turbidity. The EIS should contain information concerning and evaluating the impacts of "repair or replacement" and how physical alterations to size, height, material composition, extension or reduction of seawalls will impact upon the Island's ecosystem; for example, if construction technique involves pile driven primary foundations, whether study will be conducted to determine impact upon coral reef substructure as well as impact of low frequency noises generated by the construction activity upon the marine ecosystem as well as flora and fauna of the Island.

3. New Marine Laboratory Building (paragraph 4.2.3). The EIS should cover whether the new construction will take into account the potential of taxing or "overloading" existing utilities on the Island and the impact such construction will have upon Hachidai's co-usage of these same utilities during construction as well as upon completion.

4. Maintenance Building Replacement (paragraph 4.2.4). In conjunction with the discussion in paragraph 1 above, the EIS should propose and evaluate any alternatives for construction of the maintenance building at alternative sites.

5. Alternatives Considered (paragraph 5). The EIS should discuss whether HIMB considered alternative developments which will not require passage over Hachidai's property or which do not require additional usage of Hachidai's rights in the Island and in the Lilipuna Property. The EIS should provide information on what the alternatives were, possible impact of alternatives, and what factors were considered and basis for decision for not selecting alterative development schemes.

6. Terrestrial Flora and Fauna (paragraph 6.3.1). The EIS should evaluate the impact upon the flora and fauna of the entire Island. Per the EISPN, the extent of construction envisioned by HIMB requires the use of multiple construction vehicles ranging in size and load. In order to reach the project area, these vehicles will transit the Island. In transiting the Island, the presence of the construction vehicles will result in increased vehicular traffic, noise, and pollution affecting the

flora and fauna on the Island, and the EIS should evaluate the necessary remedial efforts that will be taken by HIMB.

7. Marine Flora and Fauna (paragraph 6.3.2). Hachidai is concerned that HIMB's marine survey should also consider the impacts of (1) the increased vehicular traffic in the water, and (2) construction site run off. As the construction may result in low frequency geosonics and hydrosonics, the EIS should evaluate the impact upon flora and fauna, including but not limited to, migratory or breeding patterns as well as changes in the ocean water with respect to salinity and turbidity of water.

8. Water Quality (paragraph 6.4). The analysis of the impact of the project construction on water quality should be expanded to also include analysis of the water quality with respect to the whole Island, and more specifically evaluation of the areas surrounding the project. If chemicals will be used in the construction project, water quality should be evaluated to confirm no seepage into the water system has occurred. Clearly, Hachidai will be adversely affected should the water quality of the Island be affected by the construction project.

9. Air Quality (paragraph 6.5). The analysis of the impact of the project construction on air quality should be expanded to also include analysis of the air quality with respect to the whole Island. An analysis of the air quality for the whole Island is necessary given that the winds may carry the construction dust and debris over and onto Hachidai property. Furthermore, air quality should also be evaluated to determine the impact from the increased traffic on Lilipuna Road, increased traffic on the Island as a result of use of the HIMB's facility during and after construction as well as possible emissions due to chemical treatment and remedial/clean-up work.

10. Noise Pollution (paragraph 6.6). The environmental noise study should consider the impact the potential noise pollution will have upon Hachidai's property and not limit the study to the project site. As also stated above, the EIS should evaluate the possible impact of low frequency noise generated by (1) construction equipment, and (2) frequency of shuttles to the Island, upon the ecosystem of the Island.

11. Historical and Archaeological Resources (paragraph 6.7). With respect to historical significance, the EIS should evaluate whether the old fashion railroad train-car trolley system at the "Old Boat House" which was used to transport the vessels onto the shore represents a method of engineering as well

construction unique to its particular time period that is worthy of historical preservation.

12. Infrastructure (paragraph 6.9). The EIS should cover the possible environmental impacts resulting from the proposed increased in infrastructure will have upon the Island. As Hachidai utilizes the same infrastructure, the EIS should evaluate impacts upon Hachidai's usage as well as alternatives should the infrastructure have to be repaired under or relocated to Hachidai's property.

Please note that the boat landing located on the southwest corner of the island discussed in paragraph 6.9 is owned by Hachidai. Therefore, the EIS should discuss alternative landing facilities for HIMB's proposed construction to accommodate the expected increase in people and traffic to the Island.

The EIS should also discuss the impact the increased traffic will have upon the dirt/gravel road owned by Hachidai or mention alternatives that can be utilized by HIMB should Hachidai not allow use of the road.

13. Summary of Anticipated Environmental Impacts (paragraph 8). The EIS should discuss alternatives to the proposed action as well as to discuss the impact the proposed action will have upon Hachidai.

14. Construction Phase (paragraph 8.1).

a. Navigation. The EIS should evaluate the effect upon navigation as well as safety in the waters surrounding the Island due to the increased number of barges and water traffic in the waters.

b. Marine Environment. The EIS should evaluate the impacts upon the marine environments due to necessary improvements to the existing landing docks to accommodate the increased use and tonnage caused by the movement of equipment and materials to the Island.

c. Air Quality. The EIS should cover the impacts from the emissions from the heavy equipment, and also emissions from any additional vehicles brought onto the Island for transportation purposes, such as emissions from any toxic substances used in the construction materials and from the barges and vessels transporting materials to the Island.

d. Noise. The EIS should evaluate effect of the noise generated by pile drivings, the presence of additional workers on the Island and their associated noise, noise from increased traffic.

e. Traffic. Improvements to the parking facilities and surrounding areas may be required to accommodate the increased usage by the construction vehicles. Moreover, the added traffic and vehicles in the parking areas may result in increased traffic accidents, congestion, as well as security problems to the surrounding neighborhoods that should be evaluated in the EIS.

15. Operational Phase (paragraph 8.2).

a. Hazardous Materials. The EIS should evaluate the impacts of the proposed increase in hazardous materials on the Island as well as the possibilities of spills and increases that will adversely impact upon Hachidai's property as well as issues concerning treatment, storage, and removal of the hazardous materials.

b. Aesthetics. The EIS should evaluate the impacts of the proposed construction upon the visual character of the Island as well as the further commercialization of the Island's tropical ambiance.

c. Biological Impacts. Because HIMB's proposed goal to eventually release the larval species on the Island, the EIS should discuss how the release will not detrimentally affect the surrounding environment and Hachidai's property rights.

d. Water Quality Impacts. The water quality on the Island may also be affected should there be a release of the petroleum products into the water system for the Island. The EIS should explain how increased recycling of the saltwater back into the Kaneohe Bay affects the Bay waters and such recycling impacts upon the environment. In addition, the EIS should discuss alternatives to water recycling as well as remedial measures to mitigate water temperature variance problems and alteration of water salinity.

e. Noise. The EIS should cover the effects of the noise generated by the increase in population, increased vehicular traffic, and the expanded HIMB facilities.

16. Proposed Mitigation Measures (paragraph 9). The EIS should list and evaluate all mitigation measures considered

by HIMB in its proposal to be reviewed by all interested parties to HIMB's proposal.

This concludes Hachidai's comments and recommendations on the EISPN and the upcoming draft EIS, and Hachidai looks forward to being involved in the EIS process to make additional comments and recommendations upon review of the draft EIS. If you should have questions or comments regarding the above, please do not hesitate to contact the undersigned.

Very truly yours,

ALAN K. MAEDA
for
KOBAYASHI, SUGITA & GODA

cc: Hachidai USA, Inc.

86835

BELT COLLINS
H A W A I I

September 12, 1995
95P-411

Mr. Alan K. Maeda
Kobayashi, Sugita & Goda
Attorneys at Law
745 Fort Street, 8th Floor
Honolulu, Hawaii 96813-3889

Dear Mr. Maeda:

Environmental Impact Statement Preparation Notice
Proposed Marine Laboratory and Support Facilities,
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your comments of August 26, 1994 in response to the EIS Preparation Notice for the above project. We are now moving forward with our study after a delay in the project involving the settlement of a property transaction. The University of Hawaii has recently announced the purchase of the private portion or remainder of Coconut Island. The new acquisition allows the Hawaii Institute of Marine Biology more design flexibility and refinement opportunities in its proposed marine laboratory and support facilitics. The development program for the project, however, is still the same. The concerns outlined in your letter regarding hazardous waste, air and water quality, and construction impacts will be addressed in the Draft EIS. Surveys of the marine environment, botany, mammals, and archaeology of Coconut Island have also been completed. Other concerns mentioned in your letter regarding property rights now lack relevance due to the sale of Hachidai USA's portion of the island.

Although Hachidai is no longer an owner of the island, a copy of the Draft EIS will be sent to you when it becomes available.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5361 FAX: 808 538-7819
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CHAPTER TWELVE
CONSULTED PARTIES AND THOSE WHO PARTICIPATED IN THE PREPARATION OF THE FINAL EIS

The announcement of the availability of the Draft Environmental Impact Statement (DEIS) for the proposed marine laboratory and support facilities was published in The Environmental Notice by the Office of Environmental Quality Control on September 23, 1995. The agencies, organizations, and individuals listed below were sent copies of the DEIS with a request for comments on the project. Those believed to have an interest in the project or who requested consulted party status were mailed a copy of the report. Parties who replied with comments are marked with an asterisk, and copies of their letters are reproduced herein. If the comments were substantive and required a response, copies of the response letters are also presented on the following pages. Parties that replied with "no comment" statements are marked with a dash line. Those who submitted substantive comments after the November 7, 1995 deadline are indicated with two asterisks; copies of their letters and the responses are included in this chapter.

Federal Agencies

U.S. Environmental Protection Agency
U.S. Army Support Command Hawaii
** Department of the Navy, Naval Base Pearl Harbor
National Resources Conservation Service
* U.S. Army Corps of Engineers
U.S. Coast Guard
Department of the Interior, Fish and Wildlife Services
Department of the Interior, Geological Survey
Department of the Navy, Marine Corps Base Hawaii

State Agencies

** Office of Environmental Quality Control
Department of Agriculture
-- Department of Accounting and General Services, State Public Works Engineer
** Department of Defense
** Department of Health
** Department of Land and Natural Resources
** Department of Land and Natural Resources, State Historic Preservation Division
Department of Business, Economic Development & Tourism
Department of Business, Economic Development & Tourism, State Energy Office

-- Housing Finance and Development Corporation, Department of Budget & Finance
* Department of Transportation
Department of Land and Natural Resources, Division of Boating and Ocean Recreation
* Office of State Planning

City and County of Honolulu Agencies

Office of the Mayor
* Board of Water Supply
-- Building Department
-- Department of Housing and Community Development
* Department of General Planning
** Department of Land Utilization
-- Department of Parks and Recreation
-- Department of Public Works
** Department of Transportation Services
Department of Wastewater Management
* Fire Department
Kaneohe Satellite City Hall

University of Hawaii

* Environmental Center
Marine Programs
Water Resources Research Center

Libraries

State Main Library
State Archives
Legislative Reference Bureau
University of Hawaii, Hamilton Library
Municipal Reference and Records Center
Department of Business, Economic Development & Tourism Library

Regional Libraries

Kaimuki Regional Library
Kaneohe Regional Library
Pearl City Regional Library
Hilo Regional Library

Wailuku Regional Library
Kauai Regional Library

Oahu Libraries

Kailua Library
Waimanalo Community School Library

Non-Government Agencies

American Lung Association
-- Hawaiian Electric Company
* Office of Hawaiian Affairs

List of Consulted Parties

* Kaneohe Neighborhood Board #30
Kobayashi, Sugita & Goda
* Outdoor Circle
* Historic Hawaii Foundation
Councilmember Steve Holmes
* Kaneohe Bay Regional Council
Native Hawaiian Fishermen's Association

News Media

Honolulu Star Bulletin
Honolulu Advertiser
Sun Press

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO
5090P
Ser N42(23)/6831
NOV 13 1995

Mr. Gary Gill
State of Hawaii
Office of Environmental Quality Control
220 South King Street, Fourth Floor
Honolulu, HI 96813

Dear Mr. Gill:

Thank you for the opportunity to review the Draft Environmental Impact Statement for Hawaii Institute of Marine Biology, Marine Laboratory and Support Facilities. The following comment is provided for your use and consideration in preparing the Final Environmental Impact Statement:

Section 4.8.2, p. 4-33. The National Historic Preservation Act, Archaeological Resources Protection Act, and Native American Graves Protection and Repatriation Act compliance requirements must be met in consultation with the State Historic Preservation Officer and native Hawaiian organizations.

If you have any questions, the Navy's point of contact is Mr. Stanford Yuen, Facilities Manager at 474-0439 or by facsimile transmission at 474-2328.

Sincerely,

Stanford B.C. Yuen, P.E.
By direction

Copy to:
Mr. Philip Helfrich, Ph.D.
Hawaiian Insttitue of Marine Biology
Coconut Island
P.O. Box 1346
Kaneohe, HI 96744

Mr. Glen Koyama
Belt Collins Hawaii
680 Ala Moana Boulevard, First Floor
Honolulu, HI 96813

BELT COLLINS
HAWAII

February 22, 1996
96P-104/433.1401

Mr. Stanford B.C. Yuen, P.E.
Department of the Navy
Naval Base Pearl Harbor, Commander
Box 110
Pearl Harbor, HI 96860-5020

Dear Mr. Yuen:

Draft Environmental Impact Statement
Hawaii Institute of Marine Biology
Proposed Marine Laboratory and Support Facilities

Thank you for your letter of November 13, 1995 and your comments regarding the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

We will comply with the requirements of the National Historic Preservation Act, Archaeological Resources Protection Act, and Native American Graves Protection and Repatriation Act in consultation with the State Historic Preservation Division and through the public review process with the Office of Hawaiian Affairs and the Historic Hawaii Foundation.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D.
Roy Yamachi, Kajioka Okada Yamachi Architects

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A. TEL: 808 521-5161 FAX: 808 538 7819
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DEPARTMENT OF THE ARMY
U S ARMY ENGINEER DISTRICT, HONOLULU
FT SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

October 2, 1995

Planning Division

Mr. Gary Gill
State of Hawaii
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (DEIS) for the Marine Laboratory and Support Facilities, Oahu (TMK 4-6-1: 1 and 51). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. The consultant for the Hawaii Institute of Marine Biology has submitted an application to the Corps for a DA permit for the proposed project. The application is currently undergoing review (NW95-068).

b. The flood hazard information provided on page 4-26 of the DEIS is correct.

Sincerely,

Ray H. Jyo, P.E.
Director of Engineering

Copies Furnished:

Dr. Philip Helfrich
PO Box 1346
Kaneohe, Hawaii 96744

Mr. Glen Koyama
680 Ala Moana Boulevard, 1st Floor
Honolulu, Hawaii 96813

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813

November 8, 1995

Dr. Philip Helfrich
P.O. Box 1346
Kaneohe, Hawaii 96744

Dear Dr. Helfrich:

Subject: Draft Environmental Impact Statement for the Marine Laboratory and Support Facilities, Hawaii Institute of Marine Biology

I greatly appreciate the time you took to show my staff and I Moku o Lo'e during the project site visit. Your presentation increased our understanding of the project and answered many of our questions. For the EIS record, the following are our official comments.

1. The Governor, not OEQC, is the accepting authority for this EIS. OEQC will provide a recommendation to the Governor regarding the acceptability of the final EIS. Please make the appropriate changes to page 1-1 of the document.

2. Since Moku o Lo'e was recently acquired by the state, please describe the status of the master plan for the island.

3. In the interim, before the master plan for the island is completed, what is the situation regarding public access? Can anyone enter the island? Are there any limitations? If so, what are the limitations?

4. Why was a hill chosen as the site for the new marine laboratory? How much higher will the new one-story building be in comparison to the existing three-story building? Visibility of the new building is a concern. We commend your efforts in preserving as many trees as possible. We recommend that native trees and plants be used in any landscaping used to reduce the visual impact of the building. We also recommend the use of earth-tone colors in the roof and paint of the building to minimize the visual impact.

5. Will there be any monitoring of water quality during and after construction?

6. A seawall will be replaced in the west lagoon. It is the policy of the State of Hawaii under HRS Chapter 205A to discourage all shoreline hardening that may affect access to, or the configuration of, our island beaches. Any EIS prepared in conjunction with an application to construct a seawall, revetment or similar structure should be accompanied by appropriate justification and detailed studies including, but are not limited to, the following: (The requirements listed below were conceived to examine "typical" shoreline hardening projects. Since your seawall project is unique, we expect that some of the items listed below may not be applicable.)

   a. A Historical Shoreline Analysis of coastal erosion and accretion rates. This should include a description of all movements of the neighboring shoreline over at least the past 30 years. This analysis should be based, at least in part, on aerial photographs available through government agencies and private vendors. The analysis should provide a detailed history of erosion and accretion patterns using all available evidence.

   b. A description of the nature of the effected shoreline, whether sandy, rocky, mud flats or any other configuration. The history and characteristics of adjoining sand dunes and reefs should be included.

   c. Site maps that clearly show the current certified shoreline, previous certified shorelines, the private property line and the location of the proposed structure. Any nearby public access right-of-way should also be depicted.

   d. Beach profiles that extend off shore at appropriate intervals along the beach indicating the width and slope of both the submerged and dry portions of the beach.

   e. An analysis of any existing nearby walls or revetments and their cumulative impacts on the shoreline.

   f. A description of structures and improvements (such as homes or swimming pools) on the subject property, their distance from the property line and shoreline, and how they may be affected by the construction of the proposed hardening project.

g. A wave and storm frequency analysis for the area in question. This should include any relevant coastal processes such as longshore currents and seasonal wave patterns.

h. An analysis that predicts the location of future shorelines with and without the proposed wall at least 30 years into the future or over the expected life of the hardening project.

i. Photos of the site that illustrate past and present conditions and locate the proposed structure.

j. All alternatives to shoreline hardening should be thoroughly researched and analyzed. These alternatives should include beach replenishment, dune-scaping, retreat from the shoreline by moving existing structures inland, and a no action alternative.

The inclusion of this information will help make the EIS complete and meet the requirements of Chapter 343, HRS. Only after thorough study and analysis should any permit for shoreline hardening be considered.

If you have any questions, please call Jeyan Thirugnanam at 586-4185. Mahalo.

Sincerely,

Gary Gill
Director

c: Glen Koyama, Belt Collins Hawaii

BELT COLLINS
HAWAII

February 22, 1996
96P-94/433.1401

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 8, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Comment No. 1: We will make the appropriate revision in the EIS document.

Comment No. 2: The purchase of the privately-owned portion of Coconut Island occurred in August 1995. This allowed HIMB to use the remainder of the island for its operations. Funds for master planning the island were approved by the State Legislature, but have yet to be released by the Governor. Meanwhile, the proposed project for which construction funding was provided by a private donor is obligated to proceed as expeditiously as possible. Planning, site selection, and predesign have already been completed, and the project's design concept and environmental studies are moving through the governmental review process.

Comment No. 3: Coconut Island is occupied by HIMB, a public institution involved with research and educational activities. Although this facility is supported by public funds and the property is owned by the State of Hawaii, access to the island is restricted. As lessee of the island, HIMB is operating under conditions of the lease. Use of the island is restricted to research and education purposes and to visitors with official HIMB business. As the lessee and guardian of the island, HIMB has potential liabilities and thus needs to be cautious with those who have access to the island. Additionally, there are environmentally sensitive areas around the island which require protection. A 64-acre marine life refuge encompasses the island and HIMB is responsible for managing activities in this area.

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The southern tip of the island, which boaters currently use for picnicking, is located at an opening in the protected reef. Use of this portion of the island by picnickers may continue on an informal basis if the users maintain the area in clean condition, respect the natural resources, and do not create a hazard to HIMB vessels which traverse the channel daily.

Comment No. 4: The reason why alternative site 5 was selected for the project is provided in Section 3.2.2.1 of the Draft EIS. The hill site was chosen because it is relatively level and has sufficient space to allow flexibility in design and to allow the construction of a one-story building. The site also allows the new building to be in close proximity to the existing laboratory/administration building and other support facilities, including utilities.

The visual impacts of the project are discussed in Section 4.10 of the Draft EIS. The new one-story structure (excluding the fume hood stacks) will be approximately 8½ feet higher than the existing three-story laboratory/administrative building, a height difference that will be insignificant when viewed from a distance. As stated in Section 4.7.3, native species or Polynesian-introduced plants will be incorporated into the replanting and screening program whenever possible. Off-white and earth-tone colors, as well as colors that match the surrounding environment, will be used on the new buildings to minimize visual impact.

Comment No. 5: Monitoring of water quality both during and after construction will be required through the Clean Water Act Section 404 and Section 401 permits. With construction work no longer being proposed in the lagoon, these permits are not required.

Comment No. 6: Since the seawall replacement is now eliminated from the proposed project, the requirement to provide appropriate "justifications and detailed studies" for the shoreline improvement is inapplicable.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

BENJAMIN J. CAYETANO
GOVERNOR

MAJOR GENERAL EDWARD V. RICHARDSON
DIRECTOR OF CIVIL DEFENSE

ROY C. PRICE, SR.
VICE DIRECTOR OF CIVIL DEFENSE

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

PHONE (808) 733-4300
FAX (808) 733-4287

November 30, 1995

TO: Mr. Gary Gill, Director
Office of Environmental Quality Control

FROM: Roy C. Price, Sr.
Vice Director of Civil Defense

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS): HAWAII INSTITUTE OF MARINE BIOLOGY (HIMB). MARINE LABORATORY AND SUPPORT FACILITIES

State Civil Defense (SCD) appreciates this opportunity to comment on the DEIS by the Office of Environmental Quality Control on the HIMB Marine Laboratory and Support Facilities, Kaneohe, Koolaupoko District, City and County of Honolulu, island of Oahu, Hawaii; TMK: 4-06-01: 1 & 51, First Division.

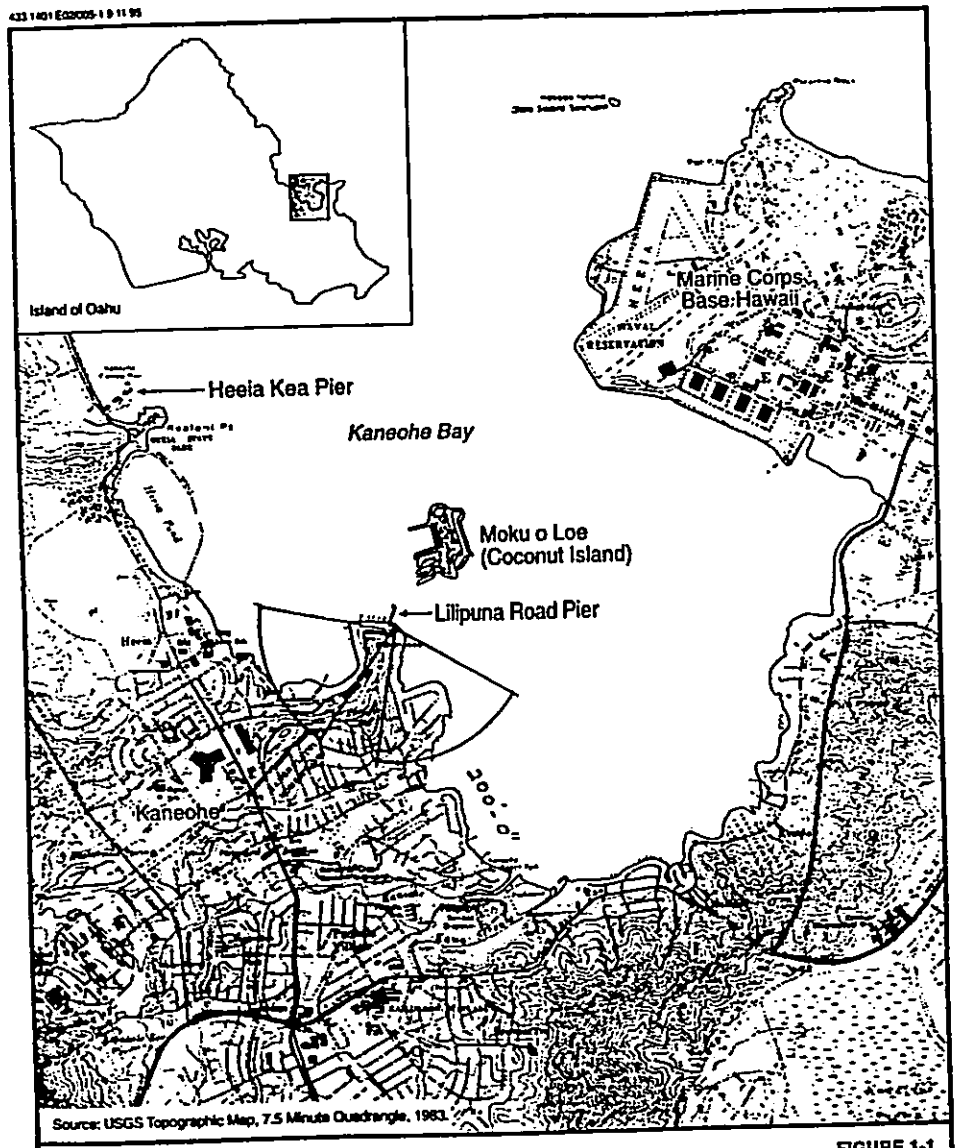
We do not have negative comments specifically directed at the DEIS. However, the proposed area is not covered by an existing civil defense siren warning device. Therefore, SCD proposes that a solar powered Directional Speaker Array siren and a siren simulator and support infrastructure for both devices be purchased and installed by the developer to help alert residents and guests of an impending or actual event that threatens the area. The complete siren installation consists of the siren, siren pole and appropriate grounding. The siren simulator installation consists of a siren simulator, antenna and antenna cable duct (from rooftop to siren simulator location) and a source of 110 volt AC electrical power. A siren simulator is a large, suitcase sized portable miniature siren complete with a built-in battery backup system and is triggered by the same radio system that triggers the existing statewide outdoor civil defense sirens. The siren simulator should be located in any office or facility that is manned on a 24-hour basis or one that is occupied while activities are in progress. The siren should be located near the parking lot as shown in Figure 1-3. Just as fire hydrants, underground/overhead utilities, roads and streets, sidewalks and drainage systems are planned as integral parts of planned developments, so must emergency warning systems be planned for the safety and well-being of its occupants and residents.

CHAPTER FOUR, PARAGRAPH 4.1, PHYSIOGRAPHY AND GEOLOGY, subparagraph 4.1.1, Existing Conditions, describes the island's elevation ranging from 0-55 feet above mean sea level. PARAGRAPH 4.4, MARINE ENVIRONMENT, sub-subparagraph 4.4.1.2, describes depths ranging from 6-10 feet. PARAGRAPH 4.6, NATURAL HAZARDS, subparagraphs 4.6.1, Hurricane and Flood Hazards, and 4.6.2, Earthquakes and Tsunami Hazards, address the types of natural hazards that can affect the project area. The siting, design and construction of project structures must address the impact of the aforementioned natural hazards.

Our SCD planners and technicians are available to discuss this further if there is a requirement. Please have your staff call Mr. Mel Nishihara of my staff at 733-4300.

Enc.

bc: Mr. Glen Koyama
Belt Collins Hawaii
680 Ala Moana Blvd.
Honolulu, Hawaii 96813

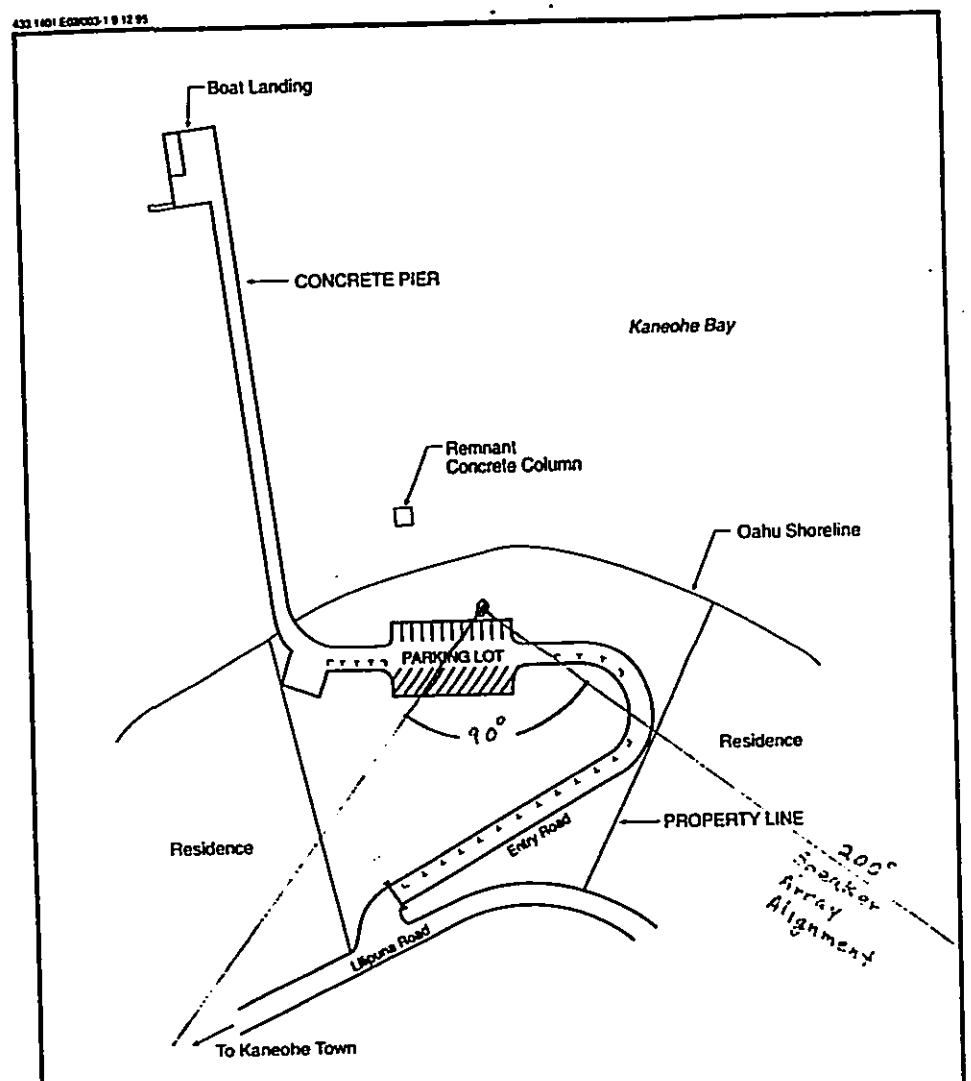


Source: USGS Topographic Map, 7.5 Minute Quadrangle, 1983.

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
September 1995

FIGURE 1-1
LOCATION MAP

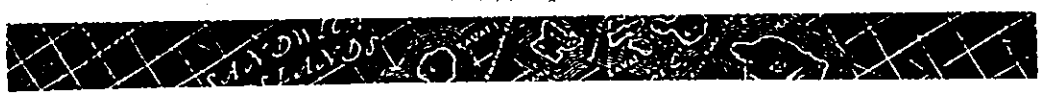


Source: Hawaii Institute of Marine Biology

ENVIRONMENTAL IMPACT STATEMENT
MARINE LABORATORY AND SUPPORT FACILITIES
Hawaii Institute of Marine Biology

Prepared by: Belt Collins Hawaii
September 1995

FIGURE 1-3
LILIPUNA ROAD PIER



BELT COLLINS
H A W A I I

February 22, 1996
96P-93/433.1401

Mr. Roy C. Price, Sr., Vice Director
Office of the Director of Civil Defense
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, Hawaii 96816

Dear Mr. Price:

Draft Environmental Impact Statement –
Hawaii Institute of Marine Biology
Proposed Marine Laboratory and Support Facilities

Thank you for your letter of November 30, 1995 and your comments regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

We appreciate your need for a new solar powered Directional Speaker Array Siren and siren simulator with support infrastructure in the project area. It should be noted that HIMB is not seeking a zoning change and is not proposing development in a new area. HIMB's plans call for expanding an existing facility which has operated on Coconut Island for more than 40 years. No development is being proposed outside of an existing community.

We would be pleased to discuss other options you may have in mind. Meanwhile, if you have any questions regarding the above, please do not hesitate to contact us.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

Glen T. Koyama

cc: Philip Helfrich, Ph.D.
Roy Yamachi, Kajioka Okada Yamachi Architects

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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

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

In reply, please refer to

November 9, 1995 95-180/epo

To: The Honorable Benjamin Cayetano
Governor, State of Hawaii
c/o Director, Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

From: Lawrence Miike
Director of Health

Subject: Draft Environmental Impact Statement (DEIS)
Marine Laboratory and Support Facilities
Hawaii Institute of Marine Biology
Moku o Loe
Kaneohe Bay, Oahu
TMK: 4-6-01: 1 & 51

Thank you for allowing us to review and comment on the subject document. We have the following comments to offer:

Solid Waste

The section of the DEIS that addresses potential environmental impacts and mitigative efforts does not address alternatives to traditional solid waste management. The proposing agency should address all opportunities to incorporate recycling efforts for the waste generated during the demolition, construction, and occupation of the facility.

The Department of Health strongly suggests that the facility address its solid waste management needs well in advance in order to capture economic and environmental benefits from implementing recycling and diversion alternatives. Chapter 342G, Hawaii Revised Statutes, mandates white office paper recycling programs for all State agencies.

Should you have any questions on this matter, please contact Ms. Carrie McCabe of the Office of Solid Waste Management at 586-4240.

Clean Air Branch (CAB)

Demolition Involving the Possible Presence of Asbestos:

As a project that entails demolition and renovation activity, the Federal Register, 40 CFR Part 61, National Emission Standard for Hazardous Air Pollutants (NESHAP), Asbestos NESHAP Revision; Final Rule, November 20, 1990, would require inspections of all affected areas to determine whether asbestos is present.

In 1986, Congress enacted the Asbestos Hazard Emergency Response Act (AHERA, or TSCA Title II) which mandated a regulatory program to address asbestos hazards in schools. A part of AHERA (Section 2-6; 15 U.S.C. 2646) dealt with the mandatory training and accreditation of persons who perform certain types of asbestos-related work in schools.

In 1990, Congress enacted Asbestos School Hazard Abatement Reauthorized Act (ASHARA) (Public Law 101-637), which amended AHERA and extended the training and accreditation requirements to persons performing such work in public and commercial buildings.

To comply with the ASHARA requirements, the inspector, management planner, project designer, abatement supervisor, and abatement worker must have an active AHERA certificate of training from an accredited training provider.

Under the NESHAP's regulation, the project would be required to file an Asbestos Demolition/Renovation notification within ten working days prior to the demolition of each building or the disturbance of regulated asbestos-containing material. All regulated quantities and types of asbestos-containing materials would be subject to emission control, proper collection, containerizing and disposal at a permitted landfill.

The State of Hawaii, Department of Commerce and Consumer Affairs, requires that any contractor that disturbs friable asbestos-containing material must obtain an asbestos abatement license.

The State of Hawaii, Department of Labor and Industrial Relations, Occupational Safety and Health Division, requires additional measures to protect employees working with asbestos.

If you have any questions regarding asbestos removal, please contact Mr. Robert H. Lopes of the CAB, Asbestos Office at 586-4200.

The Honorable Benjamin Cayetano
November 9, 1995
Page 3

Control of Fugitive Dust:

Due to the nature of the project, there is a significant potential for fugitive dust to be generated during the demolition and removal of debris, the construction and the landscaping activities for this project. The close proximity to occupants working at the facility may compound dust problems. Therefore, implementation of adequate dust control measures during all phases of the project is warranted. Construction activities must comply with provisions of Chapter §11-60.1, Hawaii Administrative Rules, section §11-60.1-33 on Fugitive Dust.

The contractor should provide adequate means to control dust from road areas and during the various phases of construction activities. These means include, but not limited to:

a. planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing material transfer points and onsite vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;

b. providing an adequate water source at site prior to startup of construction activities;

c. landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;

d. control of dust from shoulders, project entrances, and access roads; and

e. providing adequate dust control measures during weekends, after hours, and prior to daily startup of construction activities.

If you have any questions regarding fugitive dust, please contact Mr. Timothy Carvalho of the CAB at 586-4200.

c: Hawaii Institute of Marine (P. Hilfrich)
Belt Collins (G. Koyama) ✓
CAB
OSWM

BELT COLLINS
HAWAII

February 22, 1996
96P-96/433.1401

Dr. Lawrence Miike, Director
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Miike:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 9, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Solid Waste

The construction company will prepare a plan for the proper disposal of construction waste during the project's demolition and construction phases. The plan will be part of a Best Management Practices Plan to be reviewed and approved by your department. During the operational phase, HIMB will be responsible for transporting trash off-island. A commercial compactor will be purchased by HIMB to more efficiently store and transport solid waste for disposal. Per Chapter 342G, HRS, white office paper recycling is already part of the administrative operations at HIMB. Funds for preparing a master plan for Coconut Island have been allocated and the development of a solid waste management program utilizing alternative methods will be explored as part of this plan.

Asbestos

All buildings which have not been previously inspected for asbestos will be inspected prior to demolition. As stated in Section 6.8.3.1 of the Draft EIS, if asbestos is found in these structures, it will be handled in accordance with 40 CFR Part 61. All regulated

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quantities and types of asbestos-containing material will be subject to specific emission controls, collection procedures, containment procedures, and disposal as specified by this regulation.

Fugitive Dust

Construction activities on Coconut Island will comply with HAR, Section 11-60.1-33. The specific mitigation measures you mentioned are already incorporated into Section 4.5.3 of the Draft EIS.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

BENJAMIN J. CAYETANO
Governor of Hawaii

Chairperson
MICHAEL D. WILSON
Board of Land and Natural Resources

Deputy Director
GILBERT COLOMA-AGARAN

Aquaculture Development
Aquatic Resources
Boating and Ocean Recreation
Bureau of Conveyances
Conservation and Environmental Affairs
Conservation and Resources Enforcement
Forestry and Wildlife
Historic Preservation
Land Management
State Parks
Water and Land Development

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. Box 621
Honolulu, Hawaii 96809

REF:OCEA:TES

File No.: 96-122

NOV 15 '95

MEMORANDUM

TO: Gary Gill, Director
Office of Environmental Quality Control

FROM: Michael D. Wilson, Chairperson Gilbert S. Coloma-Agaran fr
Department of Land and Natural Resources

SUBJECT: Draft Environmental Impact Statement (DEIS): Marine Laboratory and Support Facilities, Hawaii Institute of Marine Biology (HIMB), Kaneohe Bay, Koolaupoko, Oahu, TMKs: 4-6-01: 1, 51

We have reviewed the DEIS for the subject project received on September 22, 1995, and offer the follow:

Office of Conservation and Environmental Affairs

Our Office of Conservation and Environmental Affairs (OCEA) reiterates its comments made during the Preparation Notice (dated 8/24/94), that the DEIS should disclose the Conservation District Use Permit (CDUP) history for this facility.

Section 7.1.2.2 should be revised to discuss the Board of Land and Natural Resources' (Board) actions on the following CDUPs:

OA-487 Denied on September 28, 1973. This application by HIMB was for proposed improvements to the island's existing sewage treatment system. The Board's denial of this CDUP was based on the proposal's non-compliance with State Health regulations and requirements (see attachments).

OA-687 Issued on October 24, 1975, to the State Department of Accounting and General Services (DAGS), it authorized the construction of a new sewage pumping station and a 4-inch force main connecting to shore. The new force main would to connect the island's sewage system to the existing municipal sewage system. This CDUP involved an area of approximately 4,000 sq./ft. and was subject to six (6) conditions (see attachments).

OA-761 Issued on May 14, 1976, to DAGS, it authorized the replacement and enlargement of the sea water pumping system located on the western side of the island, off of the lagoon and the main laboratory. The replacement system was to provide approximately 400 gal./min. of filtered seawater and involved an area of approximately 1,000 sq./ft. This CDUP was subject to five (5) conditions (see attachments).

OA-1583 Issued on December 2, 1983, to Ms. Barbara J.M. Pauley, it authorized the reconstruction of a small boat pier on the eastern side of the island which had been damaged by Hurricane Iwa. The new floating pier was to occupy an area of approximately 1,380 sq./ft. This CDUP was subject to nine (9) conditions (see attachments).

OA-1607 Issued on January 16, 1984, to DAGS, it authorized the repair and reconstruction of the outer seawall (approx. 1,100 feet) near the entrance of the western lagoon. This CDUP was subject to nine (9) conditions (see attachments).

OA-2134 Issued on September 23, 1988, to the University of Hawaii, Facilities Planning Office for HIMB, this after-the-fact CDUP authorized the replacement of the existing pipeline at the western lagoon. This work involved an area of approximately 4,500 sq./ft. and was subject to six (6) conditions (see attachments).

OA-2340 Issued on June 22, 1990, to Hachidai USA, Inc., it authorized the installation of a freshwater utility line from shore, at the Lilipuna Road dock, to the southwest portion of the island. This CDUP was subject to nine (9) conditions (see attachments).

OCEA also notes that the Final EIS should include a diagram of the project location relative to the Conservation District subzones.

Division of Aquatic Resources

Our Division of Aquatic Resources (DAR) has no objections to the proposed project. DAR supports the expansion of research and educational facilities on Coconut Island as long as adverse effects on the near-shore aquatic environment are minimized. DAR notes that most of the proposed construction is on land and should not adversely impact the marine environment if runoff is controlled. Mitigation measures proposed in the DEIS appear adequate for that purpose. The repair of the seawall will cause some short-term destruction of coral and marine life, but this is acceptable given the long-term benefits of the project and the renewability of marine life in the area.

Division of Land Management

Our Division of Land Management (DLM) has no objections with the construction of the proposed facilities providing they do not exceed two levels. DLM has a serious concern with the debris and rubbish that has accumulated on the island, particularly in the reclaimed areas. This rubbish and debris should be removed satisfactorily to the Department before a CDUP is issued.

We will forward any Historic Preservation Division comments as they become available.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to contact our Office of Conservation and Environment Affairs at 587-0421, should you have any questions.

Attachments

cc: Philip Helfrich, HIMB (w/o attach.)
Glen Koyama, Belt Collins Hawaii (w/attach.)

BELT COLLINS
HAWAII

February 22, 1996
96P-92/433.1401

Mr. Michael D. Wilson, Chairperson
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Wilson:

Draft Environmental Impact Statement
Hawaii Institute of Marine Biology
Proposed Marine Laboratory and Support Facilities

Thank you for your letter of November 15, 1995 and your comments regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

As requested, we will identify and describe the Conservation District Use Permits that have been issued for improvements on Coconut Island. Figure 7.1 in the Draft EIS shows the project location in relationship to the Conservation District Subzones.

Pursuant to the comments from the Division of Land Management, the proposed facility will not exceed two levels in building height. HIMB is cognizant of the visual impact that might be created by construction on the island and has intentionally designed the project to stay beneath the tree line and to maintain a low-profile configuration. HIMB also acknowledges the need to clean up the accumulated debris and rubbish on the island and is currently in the process of removing the solid waste via the cooperation of the the Marine Corps Base Hawaii. When this task is completed, HIMB will make a report to the Land Division.

We trust our response adequately addresses your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D.
Roy Yamachi, Kajioka Okada Yamachi Architects

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

RECEIVED
95 NOV 29 P1:30
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

RICHARD D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

November 24, 1995

Mr. Gary Gill
Office of Environmental Quality Control
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

LOG NO: 15570
DOC NO: 9511tm11
Architecture

Dear Mr. Gill:

SUBJECT: Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
TMK: 4-6-01:001 & 051, Koolaupoko, Oahu

Thank you for transmitting the Draft Environmental Impact Statement for this project. We apologize for the tardiness of these comments. We understand that a master plan will be developed for the entire island and we look forward to working with the Institute of Marine Biology with respect to the many historic resources on the island. Regarding specific information in the Draft, we offer the following comments:

1. We would prefer to see the maintenance shop located at the current maintenance shop location since we believe the boat repair shop is a historically significant resource. However, if it is not feasible to save, we recommend maintaining the railroad tracks and mitigation through Historic American Building Survey standards, i.e., 4 x 5 black and white photographs archivally processed and historical documentation.

2. Section 4.8.4 Mitigation Measures states "None of the historic structures remaining on Coconut Island qualify for consideration as historic sites under any of the established significance criteria. No mitigation is therefore required for buildings that will be cleared for proposed action." As noted above, we believe that the boat repair shop is significant and that there are many more significant structures scattered throughout the island. While we do not expect the historic structures to be inventoried at this point, the historic structures should be addressed in the master plan, and the EIS should note that there are historic structures on the island.

3. Alternative 5 (preferred alternative) of the Marine Laboratories facilities mentions a new service access road and realignment of utility lines that are not indicated on the site plans. These proposed actions should be noted in the EIS as it may impact historic landscaping. Any grading or demolition of walls or removal of landscaping should especially be noted.

4. We believe it is unlikely that burials will be inadvertently discovered during this project and that full-time archaeological monitoring is not needed. However, we do recommend that an archaeologist be available "on call" in the event that subsurface historic sites, including human burials, are discovered.

Thank you for the opportunity to comment. Should you have any questions, please call Tonia Moy at 587-0005.

Aloha,

for DON HIBBARD, Administrator
State Historic Preservation Division

TM:jk

cc: OCEA

BELT COLLINS
HAWAII

February 22, 1996
96P-97/433.1401

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 24, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Historic Structures

The southern portion of Coconut Island was surveyed by an archaeology consultant and none of the structures were found to be historic. The "old boat house" and rail transport system were part of this assessment and were found to be absent of any feature that required preservation. A report of this finding was included in the Draft EIS and submitted for review to the State Historic Preservation Division of the Department of Land and Natural Resources. A letter by the archaeology consultant addressing the comment made by Hachidai USA, Inc. regarding the significance of the old boat house and rail transport system is attached.

Since the old boat house will not be demolished, the rail transport system and winch house will be retained. It should be noted a master plan for Coconut Island will be prepared in the next few years and an archaeological inventory study will be completed for the unsurveyed portion of the island. Results from the survey will be incorporated in

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a management program for HIMB. Meanwhile, the potential presence of any significant archaeological sites on the unsurveyed areas of the island will be noted in the EIS.

Environmental Impacts

The new service access road will be shown in the Final EIS and realignment of utility lines will occur where the new buildings are to be located. Construction of this infrastructure and demolition of old buildings will require grading that may cause some impacts to the immediate area. These impacts, however, will be mitigated. Potential impacts to downslope areas and proposed mitigation measures are outlined in Section 4.3 of the EIS. Potential impacts to the terrestrial biology and proposed mitigation measures are outlined in Section 4.7. These mitigation measures specifically include a replanting program for trees displaced on the new laboratory site. Native plants will be used whenever possible in the replanting program.

Archaeological Monitoring

We appreciate your comments regarding archaeological monitoring and will incorporate them into the Final EIS.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

Attachment: IARII Letter

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
JERRY M. MATSUDA
GLENN M. OKIMOTO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
STP 8.7010

September 25, 1995

TO: The Honorable Benjamin J. Cayetano
Governor, State of Hawaii
c/o Office of Environmental Quality Control

FROM: Kazu Hayashida
Director of Transportation

SUBJECT: HAWAII INSTITUTE OF MARINE BIOLOGY
MARINE LABORATORY AND SUPPORT FACILITIES
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
TMK: 4-6-01: 1 & 51, FIRST DIVISION

Thank you for your transmittal requesting our comments on the subject DEIS.

The subject project is not anticipated to have an adverse impact on our State transportation facilities.

We appreciate the opportunity to provide comments.

OFFICE OF STATE PLANNING

Office of the Governor

MAILING ADDRESS: P.O. BOX 3540, HONOLULU, HAWAII 96811-3540
STREET ADDRESS: 250 SOUTH HOTEL STREET, 4TH FLOOR
TELEPHONE: (808) 587-2846, 587-2880

BENJAMINO J. CAYETANO, Governor

FAX: Director's Office 587-2848
Planning Division 587-2824

Ref. No. C-1483

November 2, 1995

MEMORANDUM

TO: Mr. Gary Gill, Director
Office of Environmental Quality Control

FROM: Gregory G.Y. Pai, Ph.D.
Director

SUBJECT: Draft Environmental Impact Statement (DEIS) - Hawaii Institute of Marine Biology, Marine Laboratory and Support Facilities

We have reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Marine Laboratory and Support Facilities at the Hawaii Institute of Marine Biology and have the following comments.

We note that the application addresses only seven of the ten CZM objectives. Act 259, SLH, 1993, and Act 104, SLH 1995, added Public Participation, Beach Protection, and Marine Resources to the CZM objectives and policies. Project conformance with these objectives and their supporting policies should be incorporated into the EIS.

Our CZM Program is responsible for the protection and preservation of valuable coastal ecosystems, including reefs, from disruption and to minimize adverse impacts on all coastal ecosystems. The Program is also responsible for further developing and carrying out Hawaii's Coral Reef Initiative (CRI). In this respect, we are concerned about the possible transplanting of corals, as was mentioned in conjunction with the seawall replacement and the landing site for the former military landing craft utility (LCU). We are also concerned with the potential negative impact on the coral reefs due to the grounding and anchoring of the LCU, and non-point source pollution from accidental discharges. Caution should be exercised throughout the construction process.

The work of the Marine Laboratory and Support Facilities promises to enhance many of the recommendations of the Kaneohe Bay Master Plan, especially the research methods, monitoring of nutrients and toxins, environmental conditions, and maintaining this data in a central database that is accessible to the public and updated. We encourage coordination on all phases of this project with the Kaneohe Bay Regional Council.

Thank you for the opportunity to comment. If you have any questions regarding our comments, please contact Claire Cappelle of our Coastal Zone Management Program at 587-2880.

cc: Hawaii Institute of Marine Biology
✓Belt Collins Hawaii

BELT COLLINS

H A W A I I

February 22, 1996
96P-95/433.1401

Mr. Gregory G.Y. Pai, Ph.D., Director
Office of State Planning
Office of the Governor
P.O. Box 3540
Honolulu, Hawaii 96811-3540

Dear Dr. Pai:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 2, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows: The three new CZM objectives will be added to the Final EIS in Section 7.1.1.1. Regarding your concerns about possible damage to the coral reef, we do not anticipate this adverse impact occurring since the seawall replacement is no longer contemplated for the proposed project. The LCU will not likely affect coral habitat since the reef is far beneath the water surface at the landing site. Sections 4.4.2.1 and 4.4.2.2 in the Draft EIS discuss other construction impacts, and that a spill prevention and control plan will be provided by the contractor. Caution will be exercised throughout the construction process.

Finally, we have received comments from the Kaneohe Bay Regional Council regarding the Draft EIS, and they are being included in the public review process.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

2153 KALAKAUA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96815-1606 U.S.A. TEL 808 521-5361 FAX 808 537-2819
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BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

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October 10, 1995

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street
Fourth Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Draft Environmental Impact Statement (EIS) for the Proposed Hawaii Institute of Marine Biology Marine Laboratory and Support Facilities Project, TMK: 4-6-1: 1 and 51, Koolaupoko, Oahu, Hawaii

Thank you for the opportunity to review the Draft EIS for the proposed Marine Laboratory and Support Facilities project. Our previous comments, which have been included in Chapter 11, are adequately addressed in the document.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Hawaii Institute of Marine Biology
Belt Collins Hawaii

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

JEREMY HARRIS
MAYOR

CHERYL D. SOON
CHIEF PLANNING OFFICER

CAROL TAKAMATSU
DEPUTY CHIEF PLANNING OFFICER

MH 9/95-1959

November 1, 1995

Mr. Glen T. Koyama
Belt Collins Hawaii
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813

Dear Mr. Koyama:

Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
Draft Environmental Impact Statement

Thank you for the opportunity to review the subject Draft Environmental Impact Statement. We have no objections to the Hawaii Institute of Marine Biology's proposed expansion of existing facilities to meet research and educational demands. We appreciate your goal to maintain your role as a leader in tropical food production (aquaculture) and marine biotechnological research and training.

Should there be any questions, please contact Matthew Higashida of our staff at 527-6056.

Sincerely,

CHERYL D. SOON
Chief Planning Officer

CDS:js

cc: Hawaii Institute of Marine Biology
Office of Environmental Quality Control

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

JEREMY HARRIS
MAYOR

PATRICK T. ONISHI
DIRECTOR

LUPEETA K.C. CHEE
DEPUTY DIRECTOR

95-06766(ASK)

November 27, 1995

Mr. Glen Koyama
Belt Collins Hawaii
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813

Dear Mr. Koyama:

Draft Environmental Impact Statement (DEIS) for
Marine Laboratory and Support Facilities at
Tax Map Keys: 4-6-01: 01 and 51, Coconut Island, Kaneohe, Oahu

Thank you for the opportunity to review and comment on the subject proposal. We have the following comments:

1. Public Access

The current and future policy regarding public access to the island for recreational use should be clarified. Page 6-24 of the DEIS indicates that the southern tip of the island is used by boaters for picnicking. Will this type of access and use be allowed to continue?

Providing public access for coastal recreational activities is an important objective of the State and County Coastal Zone Management (CZM) laws. In view of the relatively small area that is actively used or occupied by the Hawaii Institute of Marine Biology (HIMB), the rationale to entirely prohibit public access to recreational opportunities at Coconut Island should be justified.

2. Impacts to Heeia Boat Harbor

The Final Environmental Impact Statement (FEIS) should describe in greater detail how public recreation and commercial ocean operations will be impacted by the use of Heeia Boat Harbor for construction staging. A pier site plan showing the 3,500 square-foot transfer, staging, construction docking and relocated wash down and parking areas should be included.

What type of permit, if any, is required for the use of Heeia Pier for construction activities?

3. Hazardous Materials

Are there any underground storage tanks which are regulated by the State Department of Health on the island? What is the status of these tanks relative to current State and Federal regulations and use? What will become of these tanks in the future?

4. Solid Waste

Please explain the ability of HIMB to adequately dispose of solid waste. In their October 5, 1994 letter, the State Department of Land and Natural Resources noted that the existing waste disposal program was inadequate. Ardis Shaw-Kim of our staff saw what appeared to be a large stockpile of debris and trash during a recent visit to the island. What is the status of the existing solid waste stockpiles on the island?

The DEIS indicates that the current disposal system, which has been improved with the addition of a new transport vessel, will adequately handle solid waste disposal. Does this system provide for the disposal of green waste? In addition to obtaining a commercial trash compactor, we recommend that HIMB establish a program to reduce the volumes of solid waste generated.

5. Lilipuna Road

Are any improvements or changes proposed for the Lilipuna Road property (Tax Map Keys: 4-6-01: parcels 15, 16, and 17)?

6. Unresolved issues

Additional information regarding the future use or demolition of the existing buildings should be provided.

The alternative section should discuss the alternative of utilizing some of the existing facilities, such as the three-story administration/laboratory building and constructing additions to fulfill space and facility needs.

7. Ecosystem

The FEIS should include a discussion of the use and possession of alien larval species and methods to prevent introduction of these species into the bay.

8. Water Quality

What are the volumes and quality of the existing discharge water?

9. Other

Table 2-1, "List of Primary HIMB Buildings and Their Use" should refer to Figure 1-4, "Existing Land Use" for building numbers.

10. Special Management Area Use Permit (SMP)

The following is to be submitted as part of the SMP application:

a. A current certified shoreline survey. We recommend that our office be contacted regarding this requirement.

b. A site plan identifying work or structures (as defined in Chapter 23, Revised Ordinances of Honolulu) that will occupy the 40-foot shoreline setback area. The shoreline and shoreline setback should also be shown on this plan. You may wish to modify Figure 2-6 to meet this requirement.

Page 4-16 indicates that there may be some modification of the landing craft utility landing site. These modifications should be described.

c. An estimate for the amount of excavation and fill and land areas that will be involved.

d. A comparison between existing and proposed floor areas.

Should you have any questions regarding this letter, please call Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,

PATRICK T. ONISHI
Director of Land Utilization

PTO:am

cc: Mayor's Office

A:hjob.ltr
G:hjob.ltr

BELT COLLINS
HAWAII

February 22, 1996
96P-91/433.1401

Mr. Patrick T. Onishi, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Onishi:

Draft Environmental Impact Statement
Hawaii Institute of Marine Biology
Proposed Marine Laboratory and Support Facilities

Thank you for your letter of November 27, 1995 and your comments regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

The following is our response to your comments on the Draft EIS.

Public Access

Coconut Island is occupied by the Hawaii Institute of Marine Biology, a University of Hawaii facility involved in marine biology research and educational activities. Although the facility is supported by public funds and the property is owned by the State of Hawaii, access to the island is restricted. As lessee of the property, HIMB is operating under conditions of the lease. Use of the island is restricted to "marine biology facility" purposes and to visitors with official HIMB business. Consequently, as the lessee and guardian of the island, HIMB is potentially liable for any negligence or adverse incidents occurring on the premises and thus needs to exercise caution regarding public access. Additionally, Coconut Island is surrounded by a 64-acre marine laboratory refuge. This resource-sensitive coral reef requires protective management, and HIMB is the caretaker.

680 ALA MOANA BOULEVARD, FIRST FLOOR, HONOLULU, HAWAII 96813-5406 U.S.A., TEL: 808 521-5161 FAX: 808 538-7819
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The southern tip of the island, which boaters currently use for picnicking, is located at an opening in the protected reef. Use of this portion of the island by picnickers may be informally allowed to continue if the users maintain the area in a clean condition, respect the natural resources, and do not create a hazard to HIMB vessels which traverse the channel daily.

Impacts to Heeia Kea Boat Harbor

The Final EIS will provide more information on the anticipated impacts from construction mobilization on the existing commercial and recreational uses at the Heeia Kea Pier. Use of the pier will require approval from Heeia Kea Pier harbor master and the Division of Boating and Ocean Recreation of the Department of Land and Natural Resources. Preliminary discussions on the use of the pier have already taken place with the harbor master and accommodations for the project mobilization apparently can be made.

Hazardous Material

There are no underground storage tanks within the HIMB complex. On the former privately-owned portion of the island, two underground tanks were found and removed in the summer of 1995. Necessary notification to the Department of Health and Honolulu Fire Department was made before the removal procedures were undertaken.

Solid Waste

A 30-foot utility/personnel marine craft is currently used to transport solid waste via a dumpster from Coconut Island to Heeia Kea Pier where an independent contractor then hauls the waste to a public disposal site. This operation accommodates the regular disposal of solid waste from the island.

Clean up of bulky items and major landscape maintenance material is done on an as-needed basis but on occassion has fallen behind due to a lack of proper facilities. HIMB has recently acquired a Landing Craft Utility (LCU) from a military surplus sale. The 115-foot vessel is capable of hauling large, heavy loads. In response to DLNR's recent request regarding the removal of accummulated rubbish on the island, HIMB has acted in a conscientious manner to clean up the rubbish, including green waste, and is expected to report its effort to DLNR upon completion. It is HIMB's intent that subsequent cleanups be more frequent.

The suggestion of establishing a program to reduce the amount of generated solid waste on Coconut Island is an HIMB administrative decision that calls for an evaluation of the island's entire existing operation. An assessment of an improved solid waste

management procedure would appropriately be part of HIMB's master plan, which is anticipated to be initiated and completed within a few years.

Lilipuna Road

When the project was first conceived, the Lilipuna Road property was under private ownership and HIMB had only an access easement over the parking lot and pier. Acquisition of the privately-owned portion of the island and pier occurred after funding was committed to the project's design and construction. No funds were designated for the Lilipuna Road property. Consequently, no plans were prepared to improve the parking and pier site.

Unresolved Issues

As described in Section 1.4 of the Draft EIS, there are 18 buildings within the HIMB complex. Operations in seven of those buildings will be relocated to the new marine lab structure. Five structures that currently accommodate repair, maintenance and storage operations will be relocated to the proposed maintenance building. As discussed in Section 2.5.3 of the Draft EIS, only 3 of the 12 buildings are scheduled for immediate demolition. The remaining 9 structures have no immediate schedule for demolition because the transfer of their operations to the new marine lab is dependent upon the nature and progress of their current research activities and outcome of the island's master plan. Additionally, demolition of structures is an expense which may be dependent on the availability of funds.

Use of the existing buildings, such as the main administration/laboratory building, for expansion activities was not a consideration, because they were already in full use. Also, additions to existing facilities would not have been feasible, considering the need to consolidate a number of existing spaces for efficiency purposes.

Ecosystem

Information on the use of alien larval species and the method to prevent their introduction into the bay is provided in Section 4.4.2.2 of the DEIS.

Water Quality

As provided in Section 4.4.2.2 of the DEIS, water that is being discharged from the laboratories consists of freshwater and saltwater effluent from the research tanks. Freshwater effluent accounts for as much as 150,000 gallons or more per day and saltwater effluent amounts to about 4,200 to 6,300 gpd of the discharge. Although the amount of nutrients added to the tanks is not excessive, the combination of nutrients from fish food and fish excreta from the tanks may be contributing to varying levels of nutrients in the lagoon at the discharge point. Detrimental effects from this discharge

have not been detected in water quality evaluations. The volume of water used by the new wet lab will remain at similar levels as the volume used in the existing tank shelter which it replaces.

In view of the high freshwater demand on the island, HIMB is reassessing its water useage and considering various recycling procedures, including the application of recycled water for landscaping. A significant savings in freshwater use is anticipated.

Existing Land Use

We will correct Table 2-1 to refer to Figure 1-4, "Existing Land" for building numbers.

Special Management Area Use Permit

An application for a Special Management Area Use Permit will be filed with the Department of Land Utilization and will include all required information.

We trust the above responds to the questions and concerns raised in your letter. We look forward to your favorable support of this project.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D.
Roy Yamachi, Kajioka Okada Yamachi Architects

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

CHARLES O. SWANSON
DIRECTOR

November 15, 1995

9/95-04569R

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Draft Environmental Impact Statement (DEIS)
Hawaii Institute of Marine Biology (HIMB)
Marine Laboratory and Support Facilities

This is in response to your September 1995 request for comments on the subject DEIS.

We are concerned about the heightened potential for congestion on Lilipuna Road. Vehicles attempting to enter the facility may queue on Lilipuna Road due to the inadequate "reserve" space at the entrance for queuing of vehicles and the single-lane movement from the security gate to the vehicular turnaround at the end of the parking area, a distance of more than 500 feet.

DLU will be notified by copy of this letter of our concern on the internal traffic circulation and parking design.

In terms of the apparent shortage of parking stalls for commuters to Coconut Island, the HIMB would need to enforce the current parking arrangement and management plan, measures which are cited in Section 6.2.3, Mitigation Measures. A shuttle service to accommodate classes and visitor groups could also be re-established as an alternative to increasing the parking capacity at the site.

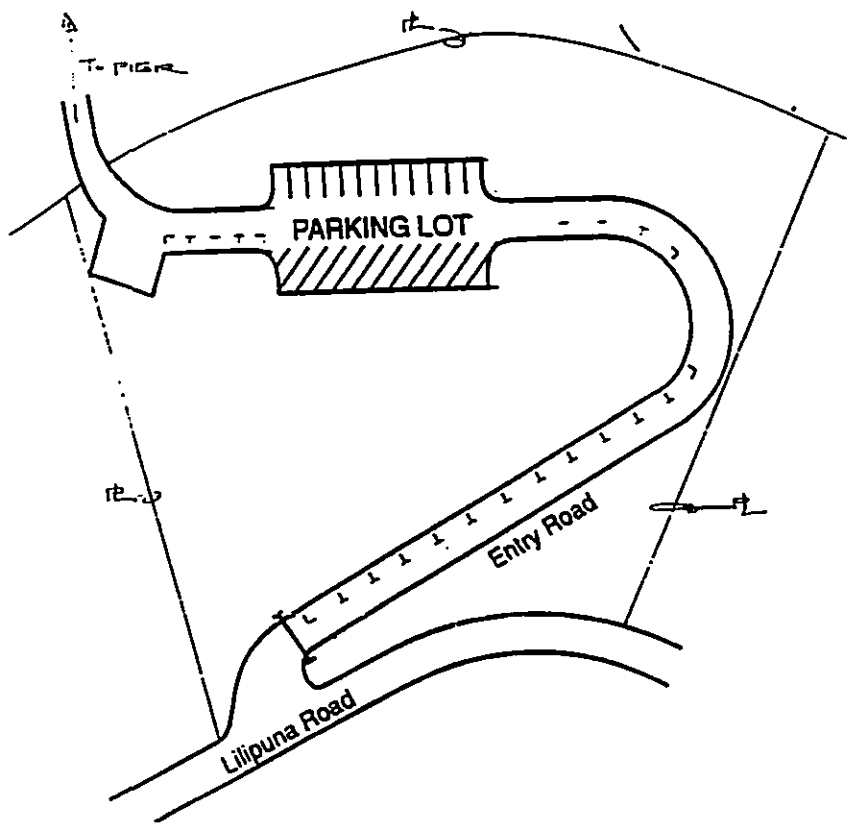
Thank you for providing us the opportunity to comment on the DEIS.

Respectfully,

for CHARLES O. SWANSON
Director

Enclosure

cc: Department of Land Utilization
Hawaii Institute of Marine Biology
Belt Collins Hawaii



BELT COLLINS
HAWAII

February 22, 1996
96P-98/433.1401

Mr. Charles O. Swanson, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Blvd., Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Swanson:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 15, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows: The most feasible and likely near-term solution for the parking situation at HIMB is the use of a shuttle service from a common parking area in Kaneohe town. There would be regularly scheduled runs between the common parking area and the Lilipuna Road pier. Special runs for conferences or seminars would also be provided. This parking program will require periodic evaluation by HIMB to assure its success. The Final EIS will describe this program as the preferred solution for HIMB.

Long-term parking needs will be considered in a master plan for the entire island. This plan is scheduled to be prepared in the next few years.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

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FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

1995 OCT -2 P 3:31

JEREMY HARRIS
MAYOR

ANTHONY J. LOPEZ JR.
FIRE CHIEF

ARTHUR LEONARDO
FIRE DEPUTY CHIEF

October 27, 1995

Mr. Gary Gill
Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Draft Environmental Impact Statement
Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
Tax Map Key Numbers: 4-6-01: 1 & 51, First Division

We have reviewed the subject material provided and have the following comments.

Currently, fire protection is provided by engine companies from the Kaneohe and Aikahi Fire Stations, with ladder support from the Kaneohe Fire Station. Coconut Island personnel provide a shuttle for transporting fire personnel and equipment from the Lilipuna Road pier. Additional transportation to the island is available from the Kaneohe Marine Corps Air Station. In the event that transportation cannot be provided from these locations, Fire Alarm Bureau will dispatch the nearest available rescue boat.

The Honolulu Fire Department is concerned with any new construction at this location due to the limited fire protection equipment available, difficult response route, and the restricted water supply. Building plans must be submitted to the fire department for review, comment, and approval to alleviate the potential hazards.

Should you have any questions, please call Assistant Chief Arthur Ugalde of our Administrative Services Bureau at 831-7774.

Very truly yours,

ANTHONY J. LOPEZ, JR.
Fire Chief

AJL/PHG:ay

cc: Hawaii Institute of Marine Biology
Belt Collins Hawaii

BELT COLLINS
H A W A I I

February 22, 1996
96P-90/433.1401

Mr. Anthony J. Lopez, Jr., Fire Chief
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H-425
Honolulu, Hawaii 96819-1869

Dear Mr. Lopez:

Draft Environmental Impact Statement
Hawaii Institute of Marine Biology
Proposed Marine Laboratory and Support Facilities

Thank you for your letter of October 27, 1995 and your comments regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

The information you provided on the available fire protection service to Coconut Island will be included in the Final EIS. Additionally, we will submit building plans to your department for review and approval before commencing with any construction work on the project.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D.
Roy Yamachi, Kajioka Okada Yamachi Architects

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University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

November 7, 1995
RE:0665

Governor Benjamin Cayetano
c/o Office of Environmental Quality Control
220 South King Street
Honolulu, Hawaii 96813

Dear Governor Cayetano:

Draft Environmental Impact Statement (EIS)
Hawaii Institute of Marine Biology
Marine Laboratory and Support Facilities
Kaneohe, Oahu

The Hawaii Institute of Marine Biology (HIMB) of the School of Ocean and Earth Science Technology, University of Hawaii at Manoa, is proposing to expand its existing research and educational facilities on Moku O Loe (Coconut Island) in Kaneohe Bay, Oahu. Plans call for a new marine laboratory facility that would include space for general research and special purpose laboratories, instructional classroom/conference room, saltwater tanks, library/computer room, storage rooms and accessory facilities. The new complex, which will have a total floor area of 21,000 square feet, will be located on the island's eastern lagoon and on a hill adjacent to HIMB's existing three-story administration/laboratory building. In addition to the new facilities, HIMB is proposing to replace the existing concrete seawall that lines and supports the shoreline fronting the replacement maintenance building. The new marine lab building will result in some increase in faculty, staff and student/researcher population on the island.

This review was completed with the assistance of Paul Jokiel, HIMB; John Stimson, Zoology; and Tom Hawley, Environmental Center.

Our reviewers have pointed out several errors and omissions in this draft EIS which seem to originate from a series of rapid changes in the direction of the project over the last one to two years. Many revisions have been made to the plan and the draft EIS apparently has not kept pace. This draft EIS contains elements from several prior planning stages which have been abandoned or modified in response to developments that led to the

purchase of the island by the University of Hawaii. It is our sincere hope that these errors and inconsistencies will be resolved and included in the final EIS.

Coconut Island Master Plan

At the outset, the recent acquisition of the private portion of Coconut Island led to the appropriation of $300,000 for development of a new University of Hawaii master plan for Coconut Island. We question the wisdom of proceeding with the construction of new laboratory buildings prior to initiation of the new master plan, and we are particularly concerned about plans to demolish a potentially very useful boat house in order to build a new shop in an area removed from the rest of the laboratory. The plan in the current EIS calls for the existing shop, which remains fully functional, to be torn down and the land left vacant. Given the central functional role of shop facilities, it would seem advisable to wait for the completion of a master plan for the entire island before demolishing and replacing the existing shop.

Structure Repair and Replacement

Our reviewers also note that at present, all of the skiffs are operated from the lagoon adjacent to the existing shop. This pattern of use will continue. Sheds for the bulldozer, cranes, forklifts, etc. are being built on the northwest side of the island which is far from the proposed new shop site. Appendix E on structures does not include information on the boat house and shop, but instead gives details on two other buildings that have nothing to do with the proposed project. There are no plans whatsoever to tear down the student housing (TMK 4-6-01-52:2, page 23). The "monkey house" shown in poor condition (TMK 4-6-01-1, pg. 18) is not relevant to this draft EIS. The final EIS must substitute descriptions of the boat house and existing shop and delete the irrelevant information on the two other buildings. We do agree with the August, 1994 letter from Hachidai USA, Inc. (Chapter 11, Consulted Parties), that the marine railway, transfer table and boathouse are unique features that should be preserved. Further, this building is potentially very useful in the future with minimal repair.

Two lunchrooms are proposed, one in the lab for scientists and one in the shop for support staff. Our reviewers point out, however, that the Australian Institute of Marine Science built a single lunchroom in order to improve scientist-support staff interaction. This plan has worked out extremely well, and we suggest that HIMB could learn from their experience.

With its emphasis on field research, HIMB also has a need for a covered area to repair and paint hulls. If other University of Hawaii water activities eventually occur at Coconut Island, there could be a need for the existing boathouse to store the boats. At present, there are usually HIMB boats under hull repair (scraping hull, bottom painting,

fiberglass repair) and several stored in open air at any given time. Shop forces generally must work in the open air and boat hulls litter the areas in front of the laboratory. Why not use the boathouse for this activity?

Freshwater Use, Sewer Service and Fire Protection

Our reviewers note that the draft EIS misrepresents fresh water use and discharge and fire protection. The document states in Section 6.4.1 that HIMB currently uses 115,000 gallons per day (gpd), (1992 figure, prior to the installation of larger lines). After contacting the Board of Water Supply, however, our reviewers learned that HIMB is currently using over 167,000 gpd (May-Sept, 1995), so a projected future use of 117,500 gpd (Section 6.4.2) after construction of the new building can be achieved only by reducing present water use by 40%. Perhaps this represents HIMB water use resulting from acquisition of the private part of the island. Either way, the draft EIS fails to note where all this water goes. Clearly, part of it goes into the sewer system. The document leaves us guessing, however, as to what happens to the rest and where it is discharged.

The draft EIS also notes (1.7.9 and 6.5) that HIMB is currently under a sewer moratorium by the City Department of Wastewater Management and will allow new projects that only generate 1,200 gpd. In the past few years, increased activity at HIMB has apparently increased water use by 40 times the 1200 gpd value. These questions must be resolved in the final EIS. Our reviewers also note that the present sewage system at Coconut Island has been suffering from chronic failure of the sump pump. The draft EIS, however, includes no mention of any plans to improve this situation. Has the problem been solved? Similarly, the last paragraph in Section 2.5.1 states that saltwater discharge from tanks in the new laboratory will go into HIMB's existing sumps, yet our reviewers are unaware of any sumps in that area. This needs to be clarified in the final EIS.

HIMB is drawing 167,000 gpd through a 6 inch main (HIMB is listed in the top 50 water users on Oahu) and yet the draft EIS says that installation of an automatic sprinkler system in the new building is not feasible (Section 1.7.11). Our reviewers expressed confusion about this claim and we question whether the Honolulu Fire Department has been consulted specifically on this issue. Booster pumps and cutoffs to other parts of the island in the event of a fire might be an option. Fire is a great threat at Coconut Island, and a sprinkler system should be mandatory to protect life and the new buildings.

Roads

The draft EIS is also unclear as to where the roads to the new building will be located. They are not shown on any plans in the draft EIS. Issues concerning the type of roads, grading, drainage and storm water runoff to the Marine Reserve all are left unattended. Similarly, lack of information on the road up the steep slope to the site of the

new marine lab, especially whether or not it will be paved, is a major omission from this draft EIS. It is unclear whether construction of a road to this site is part of the construction costs. If no road is to be built, use of a "graded and stabilized" dirt road (pg. 4-17) by heavy equipment will generate a lot of erosion and siltation in the south-pond, South Lagoon and West Lagoon. Also, the meaning of the term "stabilized" is not clear. Does this stabilization of roads include the road from the landing site to the wet lab facility?

Questions concerning the use of heavy equipment on the roads, and whether the roads can withstand such equipment must be addressed. Especially during rainy periods, the frequent movement of heavy equipment between the West Lagoon landing site and the wet lab site, or around each construction site will generate a lot of mud and make roads virtually impassible. There may even be damage to the sewer line beneath the road bordering the south-end pond. Our reviewers point out that the road from the boat house to the main building is slipping downslope and that the rock retaining wall has moved several feet. Road building itself can have serious environmental consequences and should therefore be addressed explicitly in the final EIS. There should also be archaeological monitoring of any areas graded for new roads. Though surface features were removed during the 1930's, our reviewers point out that there were many Hawaiian graves on Coconut Island. Similarly, Section 4.8.2.2 includes no mention of the registered burial in the area of the new building and possibly in the path of the road. What is the plan for this burial site?

Our reviewers suggest that to reduce road use, perhaps materials for the wet lab site should be landed via smaller vessels at the site. Materials could be off-loaded with a small crane. Even without construction traffic, heavy rains sometimes fill the East Lagoon with turbid water and silt. Field studies are in progress in some lagoons and on the reef flats surrounding the island which could be jeopardized by construction activity. We question whether the construction of sediment basins discussed on page 4-5 is part of this construction plan. Where will they be located? Are they permanent or only intended for the duration of this project? Similarly, will the settling tanks mentioned on page 2-15 of the draft EIS be required of the contractor? If not, why not?

We note that the location of the maintenance building on the West Lagoon means that additional vehicular traffic will be generated on the island's south-end road. The road is dirt (silt-clay, pg. 4-3) not carbonate, and there has been significant erosion of this road and its embankment support. It would seem that this road should be paved for construction and because it will receive heavier use after construction is completed (due to the separation of the lab and the maintenance facilities).

Parking

Our reviewers also note that parking at HIMB is totally inadequate at present. During construction, it will most likely become much worse, as building inspectors, architects and construction personnel park in the area before boating to the island. We agree with the letter from the Department of Transportation and from the Kaneohe Neighborhood Board that expresses concern about off-street parking. When the lot is full, people will most probably park along Lilipuna, which can create traffic hazards due to the narrow shoulders and tight curves. Parking after completion of the project will most likely be heavier than at present due to increases in staff. A similar problem will likely arise during the anticipated group sessions of "50 or more people" (Section 2-2). Given these potential problems, the parking assessment included in Section 1.7.6 of the draft EIS should be substantially revised and improved for the final EIS.

Various infrastructural issues are also inadequately covered in this draft EIS. Major support beams under Lilipuna dock are crumbling. The draft EIS includes no plans to improve this dock or any indication as to whether the problem has already been solved. Further, the LCU site (p. 4-16) is eroding at a fast pace. Are there plans for stabilizing this area of the shoreline? If so, they need to be included in the final EIS.

Seawall Replacement

Our reviewers also expressed concern about replacement of the seawalls. On page 4-15, it is not clear exactly how the walls will be replaced. Will new sheet metal seawall material be pounded in just outside the existing failing seawalls? This would appear to be the most suitable technique as there would be no disturbance to the existing wall and fill. If, on the other hand, the existing wall and fill are first removed, it will create more sedimentation. Our reviewers also question whether the contractor will be required to use the silt curtains referred to in Table 1-1 on page 1-14. The draft EIS should also include information as to what metals will be used in seawall construction. Will there be any heavy metals toxic to marine organisms?

Biological Impacts

Section 4.4.1.4 on page 4-15 also contains some errors. In spite of what this section indicates, our reviewers point out that Monk seals have been observed in the lagoons of Coconut Island on many occasions in the past year. Similarly, the conclusion on page 4-15 that turbidity plumes should not affect the dolphin pens seems unjustified. The flows on ebb and flood tides in the East lagoon are recorded for an unspecified wind condition and the associated tide charts do not have a depth scale so one cannot determine whether the current measurements were made during spring or neap tides. Our reviewers point out that the increments indicated by the lines on the tide charts are not feet because if they were,

the indicated tide range would be greater than the maximum range in Hawaii. Turbidity plumes will also affect the good robust coral growth along the south edge of the West Lagoon.

Construction Materials

Information regarding materials to be used on the metal of the buildings is also missing. Will there be paints containing heavy metals? The draft EIS should also specify the materials to be used in the construction of the lab roof. Will it contain heavy metals? On the issue of construction materials more generally, the draft EIS gives little or no attention to the use of alternative building materials which would be free of rust and corrosion. Metal fittings and construction material are a problem at a marine lab. Not only do they add to maintenance costs, but the corrosion of the metal can contaminate aquaria beneath the corroding parts and affect the performance of experiments.

Thank you for this opportunity to comment.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: Belt Collins
HIMB
Roger Fujioka
Paul Jokiel
John Stimson
Tom Hawley

BELT COLLINS
HAWAII

February 22, 1996
96P-89/433.1401

Dr. John T. Harrison
Environmental Center
University of Hawaii at Manoa
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Dr. Harrison:

Draft Environmental Impact Statement
Hawaii Institute of Marine Biology
Proposed Marine Laboratory and Support Facilities

Thank you for your letter of November 7, 1995 and your comments regarding the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house, which occupies the original site, will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

We will address your November 7th comments in the order they appeared in your letter.

Master Plan

The University of Hawaii Foundation, through a private donation, acquired the privately-owned portion of Coconut Island on August 30, 1995. The land is now being leased to the University of Hawaii for the Hawaii Institute of Marine Biology's (HIMB) use. The proposed project is consistent with the purpose of this lease.

As a result of the purchase, HIMB now has the opportunity to use any part of the island for its operation. To prepare HIMB to make best use of the island, a long-range comprehensive plan is needed. Funding for a master plan has been approved by the State Legislature, but has yet to be released by the Governor. Meanwhile, the proposed marine laboratory, which already has committed funding, is on a development schedule that was established about four years ago. As an independent and privately-funded project, the new facility is obligated to the donor to move forward as expeditiously as

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possible. Site selection and predesign have been completed using sound planning practices, and the project's design concept and environmental studies are currently in the governmental review process.

The proposed project has undergone several design revisions and refinements over the past year. The most notable occurred after the private land acquisition. The original concept called for use of the fill-land portion of the island, which was the only area initially available for use. With the private land purchase, the remainder of the island was made available. This allowed HIMB to revise its plan and take advantage of a more suitable site inland of the existing administration/laboratory building. It also moves the main portion of the new facility away from the edge of the water where there would be less consequential adverse construction effects on the lagoon. The larger site will also allow for a single-story building to be constructed. This would minimize the visual impact on the surrounding bay.

Sections 2.5.2, 2.5.3, and 3.2.2.2 of the EIS describe the need for a new maintenance building and the reasons the new site was selected. Engineering cost studies indicate that the existing maintenance shop should be kept essentially in place, at least temporarily. The building's maintenance operation will be relocated, as planned, to the new maintenance building. A specific schedule for the demolition of the old maintenance building will be developed during the island's master plan preparation stage, if a reuse is not feasible.

Structure Repair and Replacement

The proposed project considers the current and future needs of HIMB. The existing lab complex around the East Lagoon functions as the core for HIMB's research and educational operations. The old boat house on the West Lagoon will remain and continue to accommodate limited boat repairs and maintenance. The new maintenance building will accommodate all other boat repairs and maintenance, as well as repair and maintenance of the island's land-based facilities. The new facility is intended to make existing and future operations more efficient, and to separate potentially incompatible operations.

Skiffs and other small boats can continue to operate from the East Lagoon where HIMB has its main research and laboratory facilities. But repair and maintenance work will be more suitable on the west side of the island where ample room is available to operate and maintenance activities, which could generate loud noises and fugitive emissions, will not interfere with research activities. Additionally, most of the facilities, which accommodate access to the sea, are already in place in the West and South Lagoons. This would make the proposed maintenance building appropriate on the west side of the island.

Project Design

Appendix E of the Draft EIS contains the 1994 and 1995 archaeological reports for the project site. It describes the two buildings ("monkey house" and lunch room) and student housing unit in detail, because they are in the project area and may be affected by the proposed development. Attached is a letter by the archaeology consultant with an explanation of the two buildings' inclusion in the report.

The existing maintenance shop, which is less than 50 years old, does not qualify as "historic" under State historic preservation guidelines. As an accessory and non-historic building, a detailed description was not included in the archaeological report.

A detailed description of the old boat house is provided in Appendix E of the Final EIS which contains an updated 1996 archaeological report. Notably, the "old boat house" and rail system were assessed by the consultant for historic significance and were found to be absent of any feature that requires preservation. A report of this finding was included in the Draft EIS and submitted to the State Historic Preservation Division of the Department of Land and Natural Resources for review. Although the rail transport system has been assessed as neither unique nor historically significant, HIMB will retain the transport, as well as the old boat house. This was made possible because the proposed maintenance building will now be located on a new site.

Although two lunch rooms are being proposed, their use by different HIMB staff members will not be exclusive; the two facilities will be opened to all employees. The provision of a lunchroom in the new maintenance building is for the convenience of the shop workers who may take breaks during ongoing jobs and would prefer to be near their work area. Restrooms in the new maintenance building will also be provided to serve the entire west side of the island.

The new maintenance building will provide improved accommodations for servicing the skiffs and other small boats at HIMB. There will be better equipment to remove vessels from the water and better work areas for repair and maintenance, including covered work areas, improved lighting and ventilation, more storage area, and better equipped hazardous waste disposal systems.

Water Use

The 167,000 gallons per day which was reported to you by the Board of Water Supply would represent the total use by HIMB and the former private section of the island. Water that serves HIMB is used for various purposes. Some water is used for research and laboratory work and is disposed of in the lagoon, if uncontaminated, or a filter sump or the sewer system, if it is potentially polluted. Some water is used for domestic purposes in the dining room, kitchen, restrooms, outdoor equipment washdown areas, and guest residences and is disposed of in the sanitary sewer. Some

water is used for landscape irrigation. The increase in water use after 1992 would come from any of the above demands. The projected increase in usage from the proposed project is still estimated to be approximately 2,500 gpd over the current use.

In view of the high freshwater demand on the island, HIMB is reassessing its water useage and considering various recycling procedures, including the application of recycled water for landscaping. A significant savings in freshwater use is anticipated.

Sewer Services

The City's sewer moratorium has been in effect since the 1980s and applies only to new development. Existing facilities are grandfathered and are not affected. However, when additions are made to existing development, the new restrictions are applied. As discussed earlier, an increase in water usage does not necessarily correspond to a 1:1 increase in sewage generation. The proposed project will include the use of low-flow devices in the new buildings and retrofitting of low-flow devices in some of the existing buildings to maintain a flow rate from the island that is within the allowable limit.

The alleged, chronic sump pump failure is a maintenance problem that is administrative in nature and not a function of the proposed project. Recent engineering studies have not revealed a history of sewage outages as a result of the pump which, notably, has a backup system.

The existing sand filter sump is located on the south side of the saltwater tank shelter approximately 9 feet from the lagoon. A removable lid covers the box-shaped structure.

Fire Protection

Although water appears to be supplied to Coconut Island in sufficient quantities for consumption, the required volume-pressure for fire flow protection is not sufficient to meet fire code requirements. There is inadequate pressure in the existing 6-inch line to provide sufficient flow to higher elevations on the island. Thus, an automatic sprinkler system would be inadequate for the proposed project.

There are several measures that can contribute to a solution and a preferred solution is being proposed for the project. The new buildings will be constructed of fire-proof or fire-retardant materials and designed to meet fire protection specifications for a one-hour structure. These building elements will slow the spread of fire and contain it to a limited area. They will also meet fire code requirements given the inadequacy of water pressure. Additionally, use of portable firefighting equipment is sufficient for these types of building material. Other fire fighting measures may be needed for added protection and will be reviewed periodically by the Honolulu Fire Department. Garden hoses are available in the event smaller fires occur around the HIMB complex. In the

future, HIMB's master plan will address the need for a reservoir on a high point on the island to improve the overall firefighting capacity at the research complex.

Roads

A short access road will be developed with the new marine laboratory. It will be constructed of concrete for durability and suitability on sloped land. It will have less environmental effect than asphaltic concrete which could result in oil contamination on downslope areas.

The new access road will curve up the west bank of the new lab site and enter the complex from the north. Figure 1-5 of the Draft EIS will be modified to show the proposed alignment. The steepest segment of the road will be approximately 10 percent, thus grading will be required. Soil tests have been conducted and construction techniques, such as compacting, matting, and hydroseeding will be used to stabilize the slope. Runoff from the access road will flow into sedimentation basins so no increase in runoff to the adjacent lagoons will result. The cost of the road is included in the construction budget described in the Draft EIS.

The existing dirt road around the south end of the island will be improved and used for construction of the new wet lab building. A portion of the road bordering the "south-end pond" will be built up with suitable aggregate to allow equipment to traverse that leg of the road where sewer lines may be damaged. A compatible non-toxic soil stabilizer will be used on the other segments of the road which are susceptible to muddy conditions. The extent of stabilization could occur from the old boat house to the wet lab site. If the existing road conditions become a major adversity, an existing driveway around the far north end of the island may be used as an alternative.

Small, light-weight construction equipment is expected to be used in the construction of the wet lab building. This should reduce the impact on the south dirt road. The contractor will ultimately determine the type of equipment to be used for construction and decide if the access road will require support adjacent to the "south-end pond." It should be noted, the contractor will be liable for any damage to the road or adjacent pond.

The larger, heavier equipment will be used for construction of the main laboratory which is located on the hill above the old boat house. The narrow dirt road on the south end of the island would not be impacted by the main lab construction.

An archaeological study of the project site was conducted in 1994 and 1995. HIMB will comply with the recommended archaeological monitoring of construction activities involving excavation in the interior, non-landfill portion of the project area. This will include site preparation and earthwork for road construction and building

foundations. According to the State Historic Preservation Division, full-time monitoring is not needed, but an archaeologist should be available on an "on call" basis.

In a follow-up survey to the original archaeological study, a possible burial site was located near the proposed marine laboratory facility. Current plans call for preserving the site and providing a landscape buffer around it. As a result of this treatment, the Oahu Island Burial Council which operates under Chapter 6E of the Hawaii Revised Statutes will not be required to review the proposed action. We have received comments from the Historic Hawaii Foundation and the Office of Hawaiian Affairs regarding the project, and our response is included in the correspondence section of the Final EIS.

Use of HIMB's newly acquired Landing Craft Utility (LCU) to bring material and equipment directly into the East Lagoon was explored and determined unfeasible because of maneuverability limitations. Smaller vessels would not be able to handle the material and equipment load required for the wet lab construction.

During construction, erosion and sediment control measures will be employed to reduce or prevent runoff into the lagoon. The measures will include installation of small earth berms, small drainage channels and runoff/sedimentation pits. These measures are temporary and will be removed once construction is completed. The contractor will be required to implement these measures as part of a Best Management Practices (BMP) plan as approved by the State Department of Health. Settling tanks for concrete truck rinsate, and reuse of rinsate in concrete mixing, will be part of the BMP plan.

The access road around the south end of the island may require permanent improvements for the long term, but this issue is not part of the proposed action and will be included in a master plan for the island which, as described above, will be prepared at a later date.

Parking

Parking is a concern and solutions are being sought. Section 6.2.1.3 of the Draft EIS addresses the potential impact of the project on HIMB's Lilipuna Road parking and evaluates a number of potential solutions. The most feasible solution and the one that will be described in the Final EIS as the proposed solution involves the use of a shuttle service from a common parking area in Kaneohe town. There would be regularly scheduled runs between the common parking area and the Lilipuna Road pier. Special runs for conferences or seminars would also be provided.

A specific site for the common parking has not yet been selected. Negotiations with the owner of the selected site will be required and the parking and shuttle program will need to be established. The parking program will require periodic evaluation by HIMB to assure its success.

Long-term solutions will be required as HIMB continues to expand. A master plan for the island will be prepared in the next couple of years and will investigate the overall parking condition at Coconut Island and Lilipuna Road pier property.

Construction Methodology

The Lilipuna Road pier is a concrete structure that is slowly deteriorating from years of extensive use. During construction, it will experience increased use, but the loads will not be significantly more than those at present. Repairs to the pier are a maintenance problem that will be addressed as part of the ongoing administrative operations at HIMB.

The LCU landing site is temporary and will be restored to its previous condition once construction is completed. In the long term, the existing seawall adjacent to the LCU landing site will be evaluated for its structural soundness and repaired or improved, if necessary, as part of the master plan for the island.

Seawall Replacement

After receiving public comment on the project and after further consideration of alternatives, HIMB has chosen to use a different site for the proposed maintenance building. The attached map shows the new building location. It is situated in the center of the peninsula and away from the lagoon. Consequently, the partially collapsed seawall at the original site will no longer require replacement and is not part of the current project.

Biological Impacts

Sightings of monk seals around Coconut Island have occurred in December of 1994 and March and April of 1995. No sightings were made prior to these dates. The presence of these seals may be the result of a recent capture and release program and not a normal migratory pattern. Coconut Island is not known to be a natural habitat for the monk seal.

Since the seawall will now remain in place, turbidity plumes will not be generated and impact the porpoise pens in the West Lagoon.

Winds were about 10 mph from the northeast on the day the drogues were released in the East Lagoon. The effects of wind were determined to be negligible due to the shelter provided by thick shrubbery growing on the east peninsula and the land mass of Coconut Island on the west side. Bathymetry of the lagoon bottom is provided in Figure 4-2 of the DEIS. Combining depth information and current directions on the same chart would have made the figure look untidy and confusing. The scale on the tide chart in Figure 4-3 will be corrected in the Final EIS.

The coral on the south edge of the West Lagoon is not expected to be impacted by the proposed maintenance building construction. No work is planned in the water that could generate turbidity plumes.

Construction Material

The steel framing for the building will be coated to resist corrosion and the exterior paint for the building walls will be non-toxic. The new laboratory roof will consist of aluminum panels with shop precoated fluoropolymer coating, Kynar 500. Finishes on the roof material will not contain substances, such as heavy metals, that can harm human health and the environment.

We thank you for your comments and hope our response has adequately addressed your concerns. The final EIS is being prepared and will be submitted shortly to the Office of Environmental Quality Control for review and publication. At the same time, a copy of the final EIS will be sent to you.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D.
Roy Yamachi, Kajioka Okada Yamachi Architects

Attachments:
1. IARII Letter
2. Maintenance Building Site Plan

STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPIOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 586-3777
FAX (808) 586-3799

October 25, 1995

Mr. Gary Gill, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawai'i 96813

Re: Draft Environmental Impact Statement - Marine Laboratory and support Facilities, Hawai'i Institute of Marine Biology, Moku o Lo'e, Kane'ohe Bay, O'ahu, Hawai'i

Dear Sir:

Thank you for the opportunity to review the above-referenced Draft Environmental Impact Statement (DEIS). The Office of Hawaiian Affairs (OHA) has the following comments.

Alternative 5, which would allow for single story construction on the interior of the island, is the most preferable plan. This configuration should help mitigate construction impacts on the lagoon and the waters of the bay. In addition it will keep the view plane from the mainland less obstructed.

The final EIS could be made stronger by providing detailed information on how silt from construction will be kept from polluting the bay. We agree that steel materials are preferable to concrete construction, however, the final EIS should provide more information on how fragments of these materials will be kept out of the bays waters.

Also, the DEIS acknowledges that parking for people traveling to the island is currently a problem. It also recognizes that construction of a meeting facility able to hold fifty people could exacerbate the problem. Unfortunately, the DEIS does not offer any concrete solutions. The parking situation and its potential impact on the community should not be ignored. All potential solutions should be considered in the final EIS and a preferred plan proposed. The lack of parking is as much a concern for area residents as are construction impacts.

If you have any question or need any additional information, please contact Linda Delaney, Land and Natural Resources Officer or Lynn Lee, EIS Planner at 594-1888.

Sincerely,

Linda M. Colburn
Acting Administrator

cc: Clayton H.W. Hee, Chairperson
Board of Trustees

Peter Nottage, Chairperson
Kane'ohe Bay Regional Council

Gretchen Gould
Kane'ohe Neighborhood Board

Glenn Koyama
Belt Collins Hawai'i

BELT COLLINS
HAWAII

February 22, 1996
96P-99/433.1401

Ms. Linda M. Colburn
Acting Administrator
Office of Hawaiian Affairs
State of Hawaii
771 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813-5249

Dear Ms. Colburn:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated October 25, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenance building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Mitigation for Construction

Non-point source runoff from construction will be controlled by erosion and sediment control measures that are to be implemented through contract specifications. The measures would include installation of drainage swales and small earth berms to contain and settle turbid runoff. These measures are temporary and will be removed once construction is completed. The contractor will be required to implement these measures as part of a Best Management Practices (BMP) plan as approved by the State Department of Health. The contractor will also exercise good housekeeping procedures in material handling and maintenance areas to prevent accumulation of potential pollutants on the ground.

Parking Concerns

We acknowledge that parking and transportation impacts are a concern for area residents. Many possible mitigation measures to address these problems at the Lilipuna

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Road and Heeia Kea Piers are discussed in Section 6.2.3. A preferred solution for the parking situation will be described in the Final EIS. This preferred alternative will include some or all of the mitigation measures outlined in the Draft EIS. The most feasible near-term solution involves the use of a shuttle service from a common parking area in Kaneohe town. There would be regularly scheduled runs between the common parking area and the Lilipuna Road pier. Special runs for conferences or seminars would also be provided. This parking program will require periodic evaluation by HIMB to assure its success. A long-term solution will be addressed in a development master plan to be prepared in the near future for Coconut Island.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

44-365 Kaneohe Bay Drive
Kaneohe, Hawaii 96744
November, 1995

Glen T. Koyama
Belt Collins Hawaii Limited
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813

Dear Mr. Koyama,

Thank you for the opportunity to comment on the Draft EIS for the proposed Marine Laboratory and Support Facilities, Hawaii Institute of Marine Biology at Coconut Island in Kaneohe Bay.

As a participant in the comments for the preparation document and as a member of the Planning Committee of the Kaneohe Neighborhood Board and appointed member of the Kaneohe Bay Regional Council, I have garnered the following comments and concerns.

Alternate 5 seems the very obvious and, in fact, only real choice of alternatives for buildings. It utilizes the newly acquired interior of the Island and keeps buildings to a one-story height, thereby impacting the visual planes the least and keeping costs down.

Rebuilding the boat maintenance facilities at the present location not only uses the best location, but would hopefully include preservation of the wonderful, historic boat haul-out and turntable.

Of course a primary concern ot the community would be traffic interuption both in the building phases and afterward with the expansion of the faculty and added participants when conferences occur.

The Lilipuna Road parking operation needs to be more fully addressed and I assume the contractor has realized that this is not a possible site from which construction equipment be sent over to the Island.

He'eia Kea, though not so unwieldy a road, is still a very busy facility and it would be important that movements of large equipment and workers be coordinated with local users. There is also inadequate parking there. Where in the community will workers park and how will they be transported to Heeia Kea?

I would like to see MCBH again approached to cooperate in this endeavor, as they have impacted the facility for years and will continue to with their overflights. As H-3 leads right onto the Base, local Kaneohe town traffic would receive very little impact if vehicles stayed on H-3 and equipment and workers were transported from the Marine Base to the Island.

Water meter figures for the Island are astronomical. Certainly these do not reflect actual usage. This problem needs to be addressed before anything else proceeds. If there is leakage, it should be repaired immediately.

Plantings should be native or non-water using plants so that water usage and maintainance can be kept to a minimum. Though perhaps not a subject for this particular document, the public should be concerned about costs of water, sewage (which is measured by water usage), and upkeep of the Island.

Has solar water heating been incorporated into building plans?

Though we understand that accumulated garbage is now being taken off the Island, the fact remains that this problem has not been properly addressed in the past and hazardess wastes such as batteries were left sitting for years. The Island is a small ecosystem in the middle of a small ecosystem, so a real PLAN for regular garbage disposal, including an alternative in case the boat breaks down, is essential. Do present plans cover construction debris and the added refuse from additional people working on the Island?

How does and will noise from the Marine Corps Base Hawaii affect workers and conferences on the Island? Are there plans for sound attenuation in the new buildings? If a study is done on noise, it should not average noise as the past AICUZ studies done for the Base have done. Averaging is of little help in a situation where individual occurrences are what make the impact.

The Community and entire state will be proud to have a world class Marine facility in the very special place that is Kaneohe Bay. We would hope that much of the research that goes on will address the things that go on in that Bay. In that light, we are delighted that the Institute for a Sustainable Future will be included in the facility. We hope that ongong studies at HIMB will be useful to and shared with the community to help us take care and strengthen the resource that we have in our backyards. For example, we would hope a laboratory will be included where studies of the Kaneohe Bay turtles and their very mysterious growths could occur. As I understand it, that research is going on at another Facility. It would seem more appropriate at an expanded and world-class facility on Coconut Island.

Thank you again for the opportunity to comment.

Sincerely,

Gretchen M. Gould
member, Kaneohe Neighborhood Board
and Kaneohe Bay Regional Council

BELT COLLINS
HAWAII

February 22, 1996
96P-101/433.1401

Ms. Gretchen M. Gould
Member
Kaneohe Neighborhood Board #30
44-365 Kaneohe Bay Drive
Kaneohe, Hawaii 96744

Dear Ms. Gould:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Boat Maintenance Facilities

The southern portion of Coconut Island was surveyed by an archaeology consultant and none of the structures were found to be historic. The "old boat house" and rail transport system were part of this assessment and were found to be absent of any feature that required preservation. A report of this finding was included in the Draft EIS and submitted for review to the State Historic Preservation Division of the Department of Land and Natural Resources. As we have noted above, the new maintenance building location will not require demolition of the old boat house. The associated transport system and winch house will also be retained.

Transportation and Pier Usage

Ground transportation issues, including parking and road congestion, are discussed in Section 6.2. Because community traffic interruption is a concern, many possible measures have been suggested to mitigate traffic and parking problems at both Lilipuna Road and Heeia Kea Piers in the construction and operation phases of the proposed

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action (see Section 6.2.3). You are correct that large construction equipment will not be sent from Lilipuna Road Pier, but rather from Heeia Kea Pier. The contractor will coordinate use of the pier with the harbor master. The impact from construction staging on public recreation and commercial use of Heeia Kea Pier will be discussed in more detail in Section 6.1.1.4 of the Final EIS. The majority of construction workers will not be transported from Heeia Kea to Coconut Island, rather, a shuttle boat will ferry the workers from the Lilipuna Road Pier.

Use of Marine Corps Base Hawaii

The Hawaii Institute of Marine Biology is continuing to pursue the use of MCBH Kaneohe Bay for construction staging. This request is still under consideration by the base authorities. Pending this resolution, HIMB is planning to use Heeia Kea Pier during construction.

Fresh Water Use

A major portion of the potable water consumed on the island is used in freshwater research tanks which require constant recharge. Other uses of water on the island include landscape irrigation, and domestic consumption (e.g., in the dining room, kitchen, restrooms, outdoor equipment washdown areas, and guest residences). The costs of water are a concern, and in this case the water is being used largely to support research, which is an integral function of HIMB. As discussed in Section 4.7.3, native species or Polynesian-introduced plants will be incorporated into the replanting program whenever possible, in accordance with Hawaii Revised Statutes, Chapter 103-24.6 (Act 73 of 1992 Legislative Session).

Solar Water Heating

Solar water heating has not been incorporated into the building plan. This type of system did not fit in the project budget, but will have high priority in the future master plan for the island.

Solid Waste Removal

Section 6.8 of the Draft EIS addresses plans for hazardous materials and solid waste removal from Coconut Island. They include a description of the proper disposal of construction waste during the demolition and construction phases. The plans will be part of a Best Management Practices Plan to be reviewed and approved by the State Department of Health. The current disposal system for domestic solid waste at HIMB will be adequate during the operational phase, even with an increase in the number of HIMB staff. Solid waste generated by operations on the island is collected by HIMB maintenance personnel and transported off-island for disposal in Oahu's solid waste stream. A commercial compactor will be purchased by HIMB to more efficiently store

and transport solid waste for disposal. HIMB owns more than one transport vessel, thus an emergency backup vessel is available should the main vessel require dry dock time or repair.

Acoustical Environment

Section 4.9.4 of the Draft EIS discusses mitigation measures for the acoustical environment. Noise generated from the MCBH has been taken into consideration, and HIMB buildings will be designed to sufficiently attenuate external noise. The new building will be constructed to attenuate exterior noise to no more than 52 dB within the building. Aircraft noise projected in Ldn was used to develop design criteria for the proposed building's acoustical insulation. This 24-hour averaged sound level was determined by the Federal Interagency Committee on Noise (FICON) to be the most appropriate noise metric to use when evaluating noise impacts on populations and land-use compatibility in the general vicinity of airports.

HIMB Research

HIMB conducts numerous studies on Pacific marine life and is a world leader in this field. Local marine life, as you have identified, has presence in and relationship to the Pacific region. Many of the studies done at HIMB have the potential to benefit the local environment.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

THE OUTDOOR CIRCLE
1110 University Ave., #406 • Honolulu, HI 96826
Phone: 808-943-9658 Fax: 808-955-7364

November 6, 1995

Mr. Gary Gill
Office of Environmental Quality Control
State of Hawai'i
220 South King Street, 4th Floor
Honolulu, HI 96813

RE: Draft Environmental Impact Statement
Hawai'i Institute of Marine Biology
Marine Laboratory and Support Facilities

Dear Mr. Gill:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the above referenced facility. The Outdoor Circle has reviewed this statement carefully and has the following comments:

According to the Environmental Impact Statement Preparatory notice, the building height and location could potentially affect the visual character of the island as well as the views of Kaneohe Bay from public viewpoints around Kaneohe and the Marine Corp Base. Not addressed in this EIS are the views seen from the water. There are no plans stated to mitigate this impact using building materials or color for blending into the site.

The newly acquired portion of Coconut Island is lush and beautiful. The Outdoor Circle is concerned with the present conditions on the State owned property. The flora has not been maintained, hazardous materials have been allowed to seep into the ground, and solid waste continues to be dumped. There is no indication that this will stop after the State controls the entire island. In addition, more details must be given on plans to relocate and replant trees that will be displaced when the island is developed. The EIS only offers sketchy plans for some replanting of natives in accordance with Act 73.

The Circle understands that private funds have been used to purchase the remaining property from Hachidai. However, one of our concerns is regarding ongoing maintenance. We understand the previous owner paid at least $250,000 per year to maintain their side of the island. State and University funding is already stressed, where will the money be coming from?

Plans for solid waste disposal remain troublesome. We are concerned about an increase in incidents of grounding and/or anchoring of the landing craft used for the removal of construction debris and solid waste on the natural environment. Reefs will surely be damaged, causing irreparable loss to animal life. The study of coral reefs is pertinent to the work of HIMB. Destroying those reefs through the use of pile drivers during construction as stated in the EIS seems counterproductive.

Once again, thank you for the opportunity to comment. We look forward to receiving your response.

Sincerely,

Carolyn Heinrich
President

Mary Steiner
CEO

cc: Philip Helfrich, Ph.D., HIMB
Glen Koyama, Belt Collins Hawai'i

BELT COLLINS
HAWAII

February 22, 1996
96P-102/433.1401

Ms. Carolyn Heinrich, President
Ms. Mary Steiner, CEO
The Outdoor Circle
1110 University Avenue, #406
Honolulu, Hawaii 96826

Dear Mses. Heinrich and Steiner:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 6, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Visual Impacts

A visual impact assessment was conducted for the proposed action (see Section 4.10 of the Draft EIS) and the results showed that the impact of the proposed one-story building is expected to be minimal due to its low profile and surrounding landscape treatment. Views of the proposed buildings as seen from the water are included in Figures 4-10 and 4-11. Visual impacts will be further mitigated through the preservation/replanting of as much vegetation as possible, and the use of building colors that are earth-tone and off-white in hues or matching of the surrounding environment.

Waste Removal

Normally, heavy trash and outsized debris are removed from the island on a regular basis. However, as you noted, HIMB fell behind in these duties due to a lack of proper facilities and equipment. With the recent acquisition of a Landing Craft Utility (LCU), HIMB now has better capability for removing accumulated refuse from the island. In the past few

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months, HIMB has undertaken a clean-up effort on its property and plans to make this a more routine operation.

Section 6.8 of the Draft EIS addresses current and future plans for hazardous materials and solid waste disposal on Coconut Island. They include a description of the proper disposal of construction waste during the demolition and construction phases. The plans will be part of a Best Management Practices Plan to be reviewed and approved by the State Department of Health. Proper procedures will be used to remove asbestos, if found.

The current disposal system for domestic solid waste at HIMB will be adequate during the operational phase. A commercial compactor will be purchased by HIMB to more efficiently store and transport solid waste for disposal.

Vegetation

Specific plans for the relocation and replanting of major trees will be done during the landscape design stage. This phase of the project occurs when planning permits have been secured and when the project is submitted to the City Building Department for construction plan approval. The design plans, which will also be subject to the approval of the State Department of Land and Natural Resources, will be included in the construction specifications for the project.

Maintenance Monies

The University of Hawaii Foundation purchased the private portion of Coconut Island and is now leasing the land to the University of Hawaii for HIMB's use. Monies for maintenance are expected to come from the University of Hawaii operations and maintenance fund. Although the private owner had a large maintenance expense, HIMB has an existing staff that will take over a significant portion of the maintenance effort on the former private land. This effort should help consolidate maintenance expenses on the island.

Environmental Impacts

The LCU will only be used for new construction and special operations, and will not be used for routine solid waste disposal. A smaller transport vessel operating from the east lagoon is responsible for that task. The LCU will likely not affect coral habitat since the landing site is located at the edge of a deep channel and coral is found in water depths below the vessel's draft. No seawall replacement work is planned in the West Lagoon, therefore the lagoon bottom and coral reef are not expected to be negatively impacted.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

CORRECTION

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

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

Historic Hawai'i Foundation

November 6, 1995

Mr. Gary Gill
Office of Environmental Quality Control
State of Hawaii, 220 South King Street, 4th floor
Honolulu, Hawaii 96813

Dear Mr. Gill: Gary

Re: Draft Environmental Impact Statement comments for Moku o Lo'e: Hawaii Institute of Marine Biology

We have reviewed the above DEIS, and the following questions are in response:

1) Is there a long-range plan for the island? (This was not included in the DEIS.)

2) Where are plans for restoration, maintenance and use of the historic core and buildings on Moku o Lo'e? (This was not included in the DEIS.)

3) Where in the DEIS is the historic core documented?

4) Where is the description of the impact to the fragile environment of three-story new construction? (This was not included in the DEIS.)

5) The "old Boat House" is a very significant historic resource and is in working condition. Why demolish this valuable structure to built on top of it?

6) Are there plans to widen the road around the island? Are there plans to cut down any trees or vegetation? (This was not included in the DEIS.)

Archaeological and Native Hawaiian concerns: Because there is a great deal of history pertaining to the Native Hawaiian people, and ancient burials and re-burials on Moku o Lo'e, have Native Hawaiian consultants and stewards been invited to become involved in the planning process? (This was not included in the DEIS.)

Recommendation: Moku o Lo'e is a precious heritage resource to the people of Hawai'i. Because so much of the history fabric is still intact, and because the small island is vulnerable to the slightest new construction or physical change, we recommend that a Community Advisory Committee be immediately established to work with the developer on future plans for the island.

Respectfully,

Dion Magni Coschigano
Acting Executive Director

OEQC/Gary Gill letter/page two

cc: Gov. Benjamin Cayetano
Mayor Jeremy Harris
Michael Wilson, DLRN
Don Hibbard, SHPD/DLNR
Tonia Moy, SHPD/DLNR
Clayton Hee, OHA
Linda Colburn, OHA
Philip Helfrich, Hawaii Institute of Marine Biology
Glen, Koyama, Belt Collins Hawaii
Chatt G. Wright, HHF Chairman
Ralph Portmore, HHF Trustee
Eric Minuth, HHF Trustee
HHF Preservation Committee members

BELT COLLINS
HAWAII

February 22, 1996
96P-103/433.1401

Mr. Dion-Magrit Coschigano
Acting Executive Director
Historic Hawaii Foundation
P.O. Box 1658
Honolulu, Hawaii 96806

Dear Mr. Coschigano:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 6, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments on the Draft EIS is as follows:

Long-Range Planning

A master plan for the island will be prepared incorporating existing and future uses. It will be a long-term guide encompassing a comprehensive development program for the entire island. Funding for the plan has not yet been released by the Governor. The proposed project, for which privately-donated funds for construction have been committed, will proceed as planned.

Historic Structures

The southern portion of Moku o Lo'e was surveyed by an archaeology consultant and none of the structures were found to be historic. The central and northern sections of the island where Christian Holmes developed his residential facilities were not surveyed because they were not in the proposed project area.

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Construction Impacts

Prior to acquisition of the central part of the island, a three-story building was necessary to accommodate the planned facilities in a small project area. However, with the purchase of the privately-owned portion of the island in August of 1995, more site options became available, and now a one-story building is being proposed. Environmental impacts from construction of the new one-story building are discussed in Chapter 4 of the Draft EIS.

Old Boat House

The "old boat house" and rail transport system were part of the archaeological assessment and were found to be absent of any feature that required preservation. A report of this finding was included in the Draft EIS (see Appendix E) and submitted for review to the State Historic Preservation Division of the Department of Land and Natural Resources.

The old maintenance building is not adequate to meet the future needs of HIMB. The new maintenance building will provide improved accommodations for servicing HIMB boats, and provide needed separation between incompatible types of land uses. With a new maintenance building site, HIMB will retain and maintain the existing old boat house and transport rail system. These facilities will continue to provide limited boat repair and maintenance services.

Roads and Vegetation

There are no plans to widen the road around the island. Section 4.7.3 of the Draft EIS discusses mitigation measures for trees that will be displaced during the construction of the proposed marine laboratory. Many of the large trees will be kept intact and some of the smaller displaced trees will be replanted as part of the new landscape plan. Whenever possible, native species or Polynesian-introduced plants will be incorporated into the replanting program.

Archaeological and Native Hawaiian Concerns

Many of the improvements will be on fill land where cultural deposits are not expected to be present. The hill area behind the existing laboratory/administration building was surveyed by an archaeology consultant and a long-time occupant of Moku o Lo'e, and from the survey a possible archaeological feature or burial was located near the proposed marine laboratory facility. In the project's review process, the Office of Hawaiian Affairs and the State Historic Preservation Division have been consulted.

Recommendation for Community Advisory Committee

An advisory committee will be organized to provide guidance for the master plan development of Coconut Island. It is anticipated the committee will be set up by the University of Hawaii sometime this year.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

KANEOHE BAY REGIONAL COUNCIL

November 5, 1995
Mr. Glen Koyama
Belt Collins Hawaii Ltd.
680 Ala Moana Blvd.
Honolulu Hawaii 96813-5406

Re: Draft EIS for Proposed Marine Laboratory and Support Facilities
Hawaii Institute of Marine Biology

Dear Mr.Koyama,
The purpose of the Kaneohe Bay Regional Council is ti implement the recommendations of the Kaneohe Bay Master Plan Task Force related to ocean use activities and facilitate cooperation between those parties involved with ocean use activities. In this light we heartily endorse the existence and work of the HIMB. We DO have certain specific recommendations regarding the proposed project:

1. Potable water use (existing) seems inordinately high and we want to see either justification or an explanation: e.g. leaks in the water main. We, as lay persons, cannot see how 3 1.2 million gallons of month of fresh water are necessary to studies relating to salt water! Please explain.
2. Among Pending Issues we urge that potential differences be worked out in advance for use of Heeia Kea Pier as a marshaling yard. We suggest another attempt be made to secure the use of MCBH.
3. We strongly support Alternative 5 which allows for all one-story structures, and keeps all buildings at the South end of the island.
4. While not addressed in the EIS we would recommend that all buildings be painted to present an unobtrusive appearance: unlike those existing low buildings on the Easter point of the East lagoon.
5. We firmly believe that any activities of the HIMB should benefit Kaneohe Bay and Hawaii as Kaneohe Bay benefits the HIMB. We further believe that studies should concentrate on Local Marine Life such as corals, sharks, turtles, dolphins, mahimahi, e.g.
6. The institution has a BAD track record in Waste Management. We trust these new facilities will create a sense of responsibility on the part of the personnel.

Respectfully submitted.

Peter B. Nottage
Chairman Pro Tem

BELT COLLINS
HAWAII

February 22, 1996
96P-100/433.1401

Mr. Peter B. Nottage
Chairman Pro Tem
Kaneohe Bay Regional Council
44-001 Nohokai Place
Kaneohe, Hawaii 96744

Dear Mr. Nottage:

Environmental Impact Statement
Proposed Marine Laboratory and Support Facilities
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Thank you for your letter dated November 5, 1995 regarding the Draft EIS for the proposed marine laboratory and support facilities. Since completing the Draft EIS and receiving public comments on the document, HIMB has modified the location of its new maintenace building site. It is now being proposed approximately 200 feet to the west of the original site in the center of the peninsula and away from the lagoon. The old boat house which occupies the original site will remain and will not be demolished. The adjacent seawall which was proposed for replacement will be left intact. The new maintenance building will be in the general area of one of the alternative sites reviewed in the Draft EIS and will be identified in the Final EIS as the current proposed site.

Our response to your comments is as follows:

Fresh Water Use

A major portion of the potable water that is consumed on the island is used in freshwater research tanks, which require constant recharge. Other uses of water on the island include landscape irrigation, and domestic consumption (e.g., in the dining room, kitchen, restrooms, outdoor equipment washdown areas, and guest residences). HIMB is currently reviewing recycling options as a way to reduce the use of freshwater on the island.

Construction Staging

Scheduling to prevent conflicts will be worked out in advance regarding the use of Heeia Kea Pier as a marshaling yard. The Hawaii Institute of Marine Biology has recontinued a dialog with Marine Corps Base Hawaii regarding use of the base for construction staging, which to date has not produced an agreement. Lacking permission from MCBH, HIMB's current plan is to use Heeia Kea Pier for construction staging.

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Visibility

Your suggestion that buildings be painted to present an unobtrusive appearance has been incorporated into the Final EIS. Possible colors for the new building will include earth-tone and off-white hues and colors that match the surrounding environment.

HIMB Research

HIMB conducts numerous studies on Pacific marine life and is a world leader in this field. Local marine life, as you have identified, has presence in and relationship to the Pacific region. Many of the studies done in the Pacific will therefore benefit the local environment.

Waste Removal

Waste is normally removed from the island on a routine basis. However, as you noted, HIMB fell behind in these duties due to a lack of proper facilities and equipment. With the recent acquisition of a Landing Craft Utility, HIMB now has better capability for removing outsized debris, and has since removed accumulated refuse from the island.

Section 6.8 of the Draft EIS addresses current and future plans for hazardous materials and solid waste disposal on Coconut Island. It includes a description of construction waste disposal during the project's demolition and construction phases. Proper procedures will be used to remove asbestos, if found.

The current disposal system at HIMB will be adequate for domestic solid waste during the operational phase. A commercial compactor will be purchased by HIMB to more efficiently store and transport solid waste for disposal.

We trust our response has adequately addressed your concerns.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Philip Helfrich, Ph.D., HIMB
Roy Yamachi, Kajioka Okada Yamachi Architects

Appendix A

Marine Environmental Assessment for the Proposed Marine Laboratory and Support Facilities, Moku O Loe (Coconut) Island, Kaneohe, Hawaii, July 21, 1995

Oceanit Laboratories, Inc.
environmental & coastal engineering services • research & development

MARINE ENVIRONMENTAL ASSESSMENT

for the

PROPOSED MARINE LABORATORY AND SUPPORT FACILITIES

Moku O Loe (Coconut) Island, Kaneohe, Hawaii

Prepared for:
Kajioka Okada Yamachi Architects

July 1995

1100 Alakea Building • 1100 Alakea Street, 31st Floor • Honolulu, Hawaii 96813
TELEX: 7431404 • MCI: OCEANIT • TEL: (808) 531-3017 • FAX: (808) 531-3177

EXECUTIVE SUMMARY

Oceanit Laboratories, Inc. (OLI) was contracted to complete an Environmental Assessment (EA) of the marine environment surrounding the proposed Marine Laboratory and Support Facilities on Moku O Loe (Coconut) Island. Lagoon circulation, water quality, and marine life data were collected and analyzed.

The objectives of this study were to investigate and assess physical, chemical, and biological properties of the lagoons around the proposed construction sites and determine potential impacts.

Field measurements and observations were conducted and historical literature was reviewed to determine existing environmental conditions of the laboratory and maintenance lagoons adjacent to each development. Measurements and observations were made between July and August 1994. Drogues were used to observe currents and circulation under flood and ebb tides with prevailing trade wind conditions. Water quality monitoring was performed in situ and samples were collected and analyzed in the laboratory. Marine life surveys were conducted at each site.

Circulation currents in the laboratory lagoon and maintenance lagoon during field measurements were found to vary in speed from 1 to 7.7 ft/m and 1.6 to 16.5 ft/m, respectively. Flow velocities and directions were found to be generally self contained within the laboratory lagoon with smaller velocities recorded at the south end of the lagoon. This is probably the result of a small channel mouth that keeps circulation contained in the lagoon. The maintenance lagoon displayed a higher degree of circulation pattern probably due to a wider channel mouth.

Water quality results indicate that both lagoons were in relatively good condition and fall generally within State Department of Health (DOH) water quality standards. The laboratory lagoon did register several low levels of dissolved oxygen at three stations. Several reasons may account for this including: diurnal effects or lower photosynthetic oxygen produced during the night. Also, the presence of a greater number of oxygen consuming organisms due to poorer circulation and a higher residence time at the south end of the lagoon.

Results from the biological and benthic habitat investigations showed that marine life is both abundant and diverse in most areas of each lagoon. There were no rare, endangered or threatened species identified within or near the project area. The Green Sea Turtle (Chelonia mydas) is the only federally threatened species known to be sighted within the confines of the lagoons. However, it does not utilize the lagoons as nesting sites, as it prefers white sand beaches. Species covered under the Marine Mammals Protection Act, such as the humpback whale and Hawaiian monk seal are not known to enter the confines of either lagoon. Both lagoon bottoms adjacent to the project site were covered with two species of coral; Montipora verrucosa and Porites compressa. Along with abundant coral growth, Bay oysters, carpet anemones and sponges were noted in the laboratory lagoon. The substrate was also covered with sea worms. Fourteen species of fish were identified. Although similar diversity of biota were noted in the maintenance lagoon, fewer filter feeders, large fish and sea worms were counted.

Direct impacts from construction to the maintenance lagoon include pile driving to install the new seawall and possible discharge of construction materials, either from accidental spillage and/or fugitive dust emissions. The major impact is expected to be from turbidity plumes created from installation of the seawall, which may affect the coral reef habitat in the lagoon. The seawall type recommended for the maintenance building site is steel sheet pile. Mitigative measures to reduce turbidity plumes are either a silt curtain or coffer dam. Other mitigation measures include transplanting those coral heads which are within one to two meters from the seawall area. Other impacts to the coral reef habitat may possibly result from the landing or anchoring of the construction barge. Strict precautions should be taken to prevent offshore benthic habitats from contact with the barge or Landing Craft Utility.

Direct impacts to the laboratory lagoon include possible discharge of construction materials into the water, accidental fuel spills from gas or oil driven equipment, and settlement of airborne fugitive dust onto the lagoon's surface. The wet lab annex is not anticipated to impact the existing seawall at the laboratory lagoon.

Indirect construction related impacts to either lagoon include siltation by runoff from unprotected ground.

Construction will be supported by a Landing Craft Utility (LCU 1466 CLASS). Potential docking sites for craft landing have been identified in and around the maintenance lagoon: Several factors have been considered in securing the vessel for unloading purposes, such as wind direction, tidal fluctuation, slope of the landing site, and presence of coral reefs. Construction materials will be unloaded with a crane located on-shore.

Potential impacts from anchoring and unloading construction material from the LCU include:

a) modification of shoreline to prepare docking area;
b) possible direct damage to coral reefs or other benthic fauna from LCU, grounding, and/or generation of silt plumes;
c) temporary restriction of boat traffic in and out of the maintenance lagoon.

Possible impacts to the marine environment from transport and storage of construction materials include:

a) accidental spillage into Kaneohe Bay of materials during loading, unloading and transport,
b) fugitive dust emissions from construction materials settling onto Kaneohe Bay, and
c) runoff from construction storage areas as a result of spillage combined with rain storm occurrence.

Mitigation measures during LCU operation include:

a) Restoring the LCU landing area on Coconut Island to its previous condition after transportation of construction materials is completed.

b) Transplanting of coral heads in case they may come into contact with the LCU in the maintenance lagoon.

c) Providing berms between construction storage areas and shorelines to protect lagoons from possible construction spillage and runoff.

d) Cleaning construction storage areas on a regular basis of debris and rubbish.

e) Storing liquids and cement as far back as possible from the shoreline to maximize containment from possible spillage.

MARINE ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MARINE LABORATORY AND SUPPORT FACILITIES
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

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MARINE ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MARINE LABORATORY AND SUPPORT FACILITIES
Moku O Loe (Coconut) Island, Kaneohe, Hawaii

I. INTRODUCTION

A. BACKGROUND

Oceanit Laboratories, Inc. (OLI) was contracted to complete an Environmental Assessment (EA) of the marine environment near the proposed Marine Laboratory and Support Facilities on Moku O Loe (Coconut) Island. Lagoon circulation, water quality, and marine life data were collected and analyzed. Numerous studies conducted around Kaneohe Bay and Coconut Island were also reviewed. The results of these investigations and analyses are presented in the following chapters.

B. OBJECTIVES

The objectives of this study are to:

a) Investigate and assess physical properties, mainly water circulation, in the area around the proposed developments.

b) Investigate and assess chemical properties, mainly water quality, in the lagoons surrounding the proposed developments.

c) Investigate biological aspects by surveying marine life and coral reefs in the lagoons around the proposed developments.

d) Assess impacts from the proposed seawall repair/replacement options.

e) Assess the probable short-term impacts from construction activities to the affected marine environment.

f) Assess the long-term impacts from operation and maintenance of the proposed facilities to the affected marine environment.

C. DESCRIPTION OF THE PROPOSED ACTION

The Hawaii Institute of Marine Biology (HIMB) of the School of Ocean and Earth Sciences and Technology, University of Hawaii at Manoa (UH) operates a marine research facility located on Coconut Island (see Figure 1). Increased demand for research and educational programs has necessitated an expansion of existing facilities. Three complexes are proposed. The first is a new Marine Laboratory facility, which will contain one building and be located inland on a hill. Impacts to the marine environment are not anticipated as this building is set back a minimum

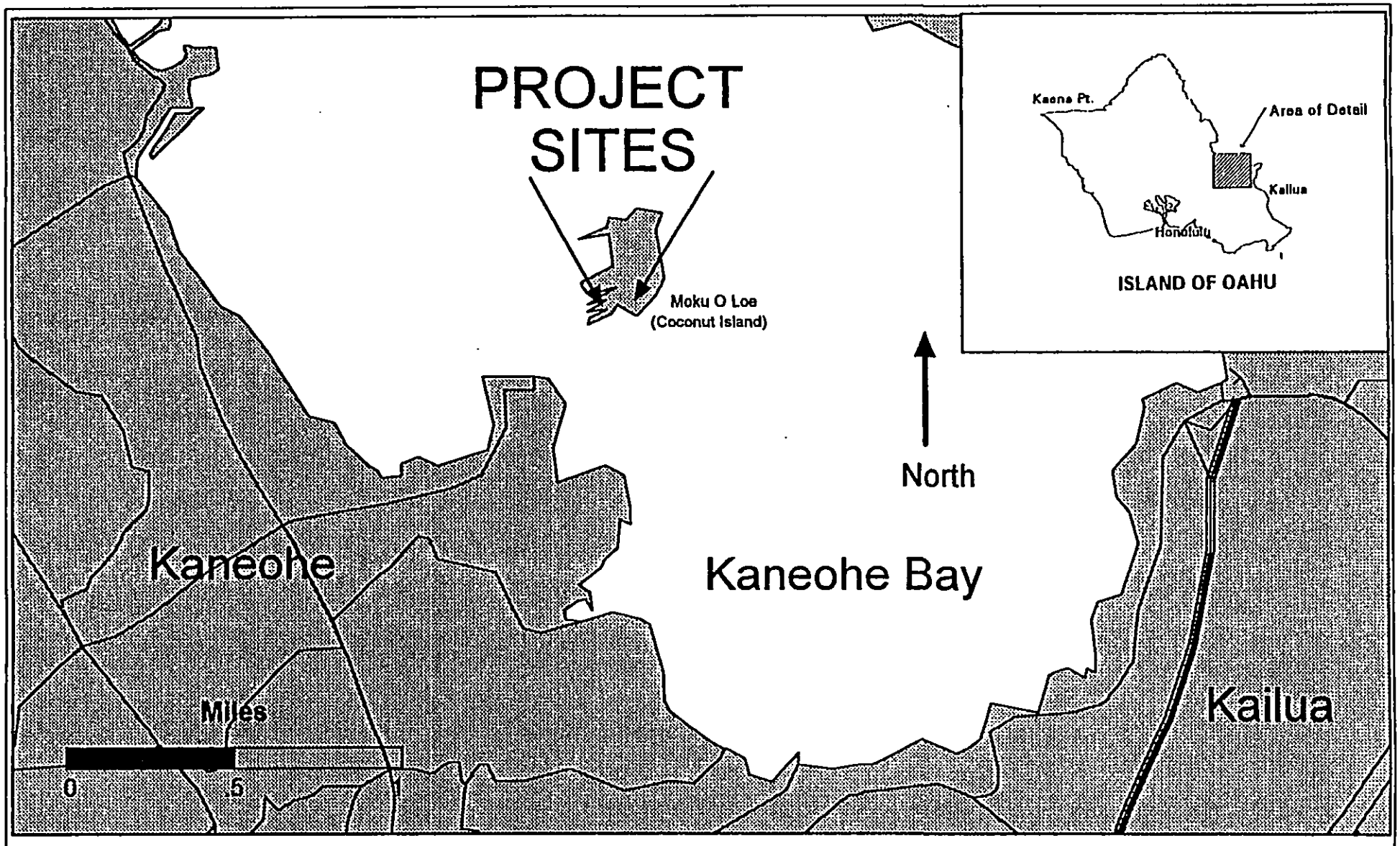

FIGURE 1. SITE LOCATION MAP

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of 51 feet from the shoreline. The second building will be located east of the existing marine laboratory/administration building adjacent to the east lagoon. It will contain the pelagic fish research activities of the new facility. This new facility will replace an existing wet lab facility and existing maintenance building at the same site. The third complex is the new maintenance building located at the southwest lagoon of the island. It will occupy the footprint of the "Old Boat House" site. The new maintenance building will replace the existing maintenance facility, which sits at the pelagic fish research site.

Since a portion of the project will require construction near the water and on the shoreline, this assessment addresses those impacts affecting the marine environment adjacent to the proposed pelagic fish research annex and maintenance building. The proposed Marine Laboratory will not be discussed further in this report as it is set back from the shoreline.

The pelagic fish research annex, hereafter referred to as the wet lab annex, will be equipped as a wet laboratory with spaces for large salt water tanks for experimentation and a special laboratory area. The building will be one-story in height and have a floor area of approximately 3,024 square feet. Salt water will be supplied to the wet lab annex for use in experiments. Currently, salt water is supplied from four intakes, two of which are backup, located on the reef off the east shore of the laboratory lagoon. The water is pumped from this location at the rate of 450 gallons per hour, as needed, under the lagoon into two 1000-gallon tanks located adjacent to the administration building. Salt water is subsequently discharged to the wet lab annex and through three existing 4-inch drain pipes back into the lagoon. No new net addition in the amount of salt water flow is expected in the new wet lab annex than what is presently discharged.

The maintenance building will be comprised of shops for plumbing, metal work, wood work, refrigeration and air conditioning, painting and fiberglass, internal combustion and electric motor repair, and a security office. It will also contain a tool room and a material storage room. The new maintenance building will contain a floor area of approximately 4,336 square feet. Operations at the maintenance building will center on boat and boat motor repair and maintenance, as well as fabrication of materials to be used in research. The proposed building plans to utilize the existing boat ramp system adjacent to the existing old boat house for dry docking boats.

Construction activities at the wet lab annex site will consist of the demolition of the existing maintenance building, the existing wet lab/aquarium shed, and an existing lunch room building. The existing Old Boat House will be demolished for development of the new maintenance building. Existing seawalls at the maintenance building site will be repaired and/or replaced, as needed, to protect and support the new structure (see Figure 2). New seawalls are planned to be constructed as part of the proposed project at the maintenance building site only.

D. GENERAL SITE CONDITIONS

Coconut Island is located approximately 1/2 mile off the northeastern coast of the Island of Oahu in Kaneohe Bay (see Figure 1). Kaneohe Bay is the largest sheltered body of water in the Hawaiian Islands. The watershed of Kaneohe Bay has an area of approximately 46.6 square kilometers, encompasses approximately 11,360 acres at mean sea level, is about 8 miles long and 2.6 miles wide (Army District Engineer, 1975). Its climate is considered semi-tropical. The yearly range of water temperatures is approximately 19.5 - 27.8 degrees centigrade. Overall, the principal use of Kaneohe Bay is recreation, such as boating, sailing, fishing, and diving (Smith, Chave & Kam, 1973). The perimeter of Coconut Island was created by dredging and is owned by the State of Hawaii. The HIMB facilities are located on State owned land along the southern portion of the island (see Figure 2). The interior of the island is being purchased by a private donor and leased to the State for use by HIMB (Helfrich, pers. communication, 1995).

As a result of dredging and filling during the 1930's to 1941, the shoreline of the island was reshaped into a series of lagoons and ponds (Helfrich, pers. communication, 1994). Immediately surrounding the island offshore is a coral reef structure which helps protect the island during storm conditions. Outside the reef, depths rapidly increase to about 40 feet matching the average depth of Kaneohe Bay proper. According to the 1975 Master Plan for Coconut Island, the land fill areas have less than 5 percent slope while the original island has slopes which vary from less than 5 percent to greater than 30 percent.

The wet lab annex site abuts a lagoon that is situated along the entire eastern side of the island, hereafter referred to as the laboratory lagoon. The laboratory lagoon is man-made with dredged coral material serving as a seawall along its outer, eastern boundary (see Figure 3). The only ingress/egress to the lagoon is a boat channel approximately 40 feet wide, positioned at the southeastern corner. The entire lagoon has an area of approximately 5.0 acres (Ishimoto, 1964). The seawall along the east side of the project site was built in the mid-1980's and is in good condition. However, the seawall along the south side is much older and has eroded and crumbled over the years. Just beyond the south side seawall, a concrete platform serves as a ferry embarkation/debarkation for the HIMB faculty, staff and students.

The maintenance building site abuts a lagoon on the west side of the island, hereafter referred to as the maintenance lagoon. Along the lagoon's northern side, opposite the project site, are four semi-enclosed ponds. The mouth of the lagoon is approximately 250 feet wide allowing for efficient circulation of water throughout. Just seaward of the entrance and west of the semi-enclosed ponds are a series of moored dolphin pens. The existing building on the project site's north side stands out to the edge of a cast concrete vertical seawall that is separating from its foundation. The existing seawall on the east side is in disrepair and has crumbled (see Figure 4). According to the soils report pertaining to the seawall base, the top 3 to 5 feet of soil is fill material, followed by a 13-foot layer of loose silty sand, and then medium stiff silty clay. The bearing capacity is 1,000 to 1,500 psf (Hirata, 1994). Several vessels are docked at floating

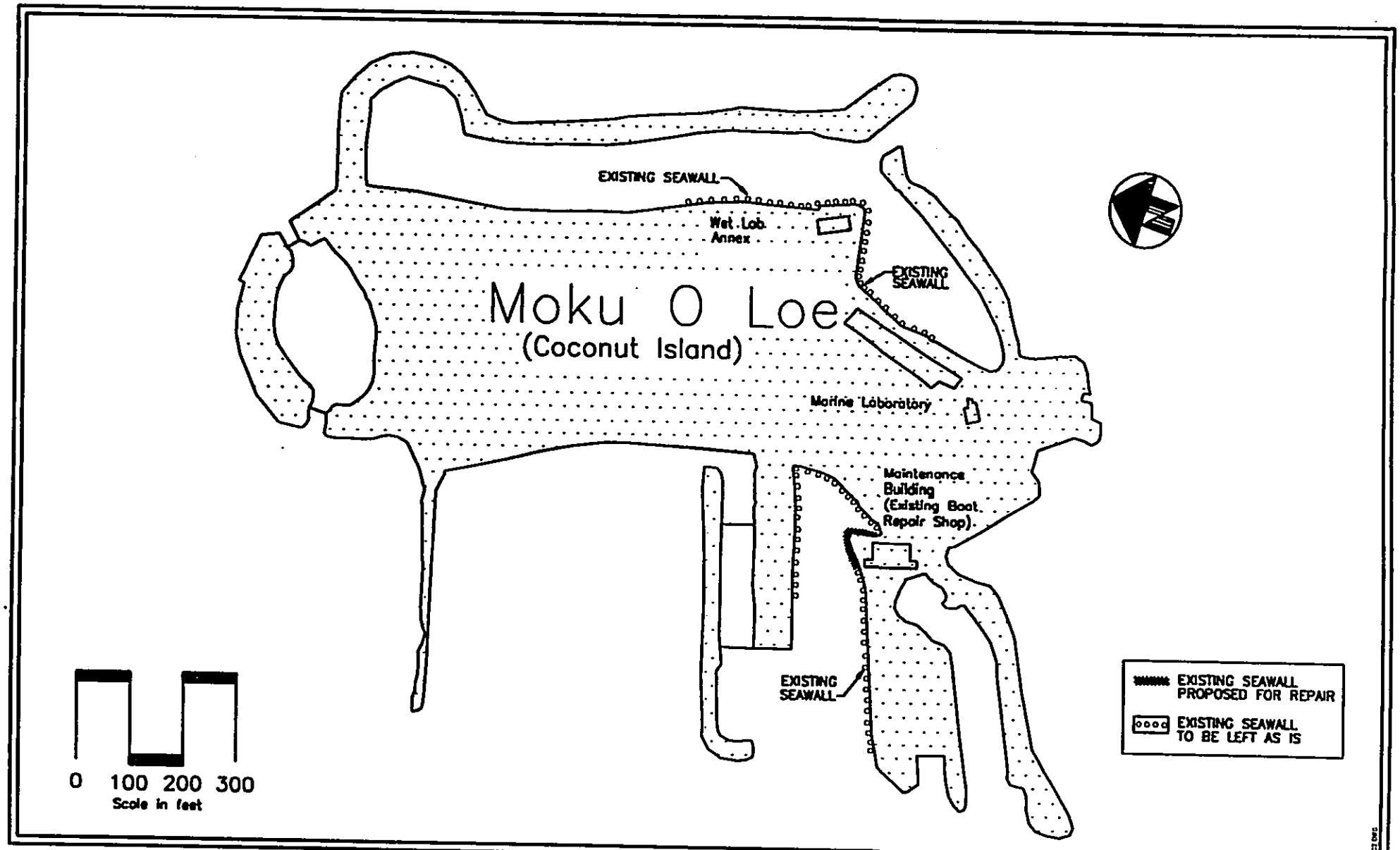

FIGURE 2 PROJECT SITES

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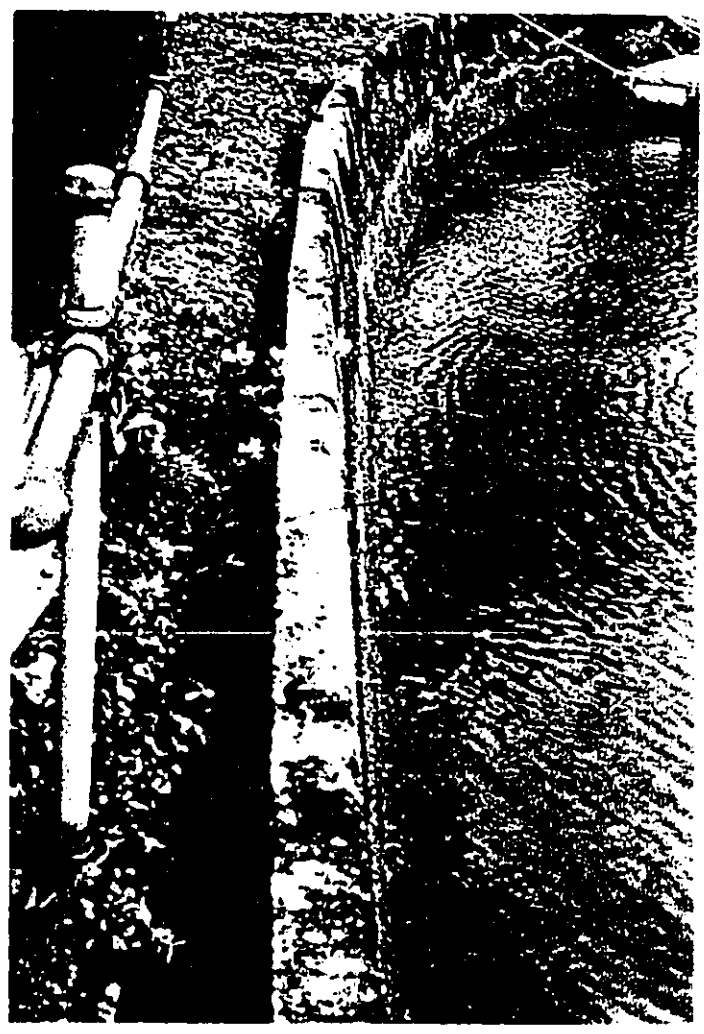
(A) SOUTHWEST-SIDE OF SEAWALL

(B) SOUTH-SIDE CENTER OF SEAWALL

FIGURE 3. WET LAB ANNEX PHOTOGRAPHS

(A) EAST-SIDE



(B) NORTH-SIDE

FIGURE 4. MAINTENANCE BUILDING PHOTOGRAPHS

piers at the east end of the lagoon. Between the floating piers and the project site, boats may be hauled on land via a marine railway. Boat traffic is considerably less inside the maintenance lagoon, as it is not used by island commuters.

In 1981, the waters around Coconut Island were declared a Hawaii marine laboratory refuge, pursuant to Hawaii Revised Statutes, Section 188-36. The refuge extends "from the high watermark on the island to 25 feet beyond the outer edges of the reef in any direction." No taking of any marine life is allowed within the preserve except by University of Hawaii personnel or students for scientific study.

E. ACKNOWLEDGEMENTS

OLI would like to acknowledge contributions made in preparation of this study by the following: Dr. Patrick K. Sullivan, Ms. Robin Anawalt, Dr. Nengjia Wang, Dr. Dayananda Vithanage, Mr. David Takeyama, Mr. Robert Bourke, Dr. Warren Bucher, Mr. Ron Chinn, Mr. Ed Duncan, Ms. Tomoko Moulton, Mr. Min Chen, Ms. Lori Kahikina, and Mr. Val Bueno.

II. METHODOLOGY

A. CIRCULATION

Water circulation was measured by tracking drogues. Drogues are trackable floating objects with underwater sails, approximately 30 inches square, that are suspended at a specific depth beneath a float. The drogue drifts with the currents, and its position is tracked, using survey equipment (transits), as a function of time. The path of the drogue is plotted on a map, its speed calculated from distance traveled and time elapsed. Drogues were tracked on separate occasions in both the laboratory lagoon and the maintenance lagoon. Tidal data was obtained from a NOAA tide gauge located in the maintenance lagoon.

B. BATHYMETRY (Reef Depth Contours)

Bathymetry (a measurement of reef depth contours) in the vicinity of the project site was determined based on bathymetric charts produced by previous studies (Group Architects Collaborative, 1975 and Ishimoto, 1964). Bathymetric charts were used to assist in the estimation of lagoon circulation for both project sites (see Figure 8). In addition, limited depth measurements were made during the biological surveys.

C. WATER QUALITY

Initial water quality measurements of surface and bottom waters were made at nine locations around Coconut Island (see Figure 5). These sample locations are listed as follows:

TABLE 1.
STATION LOCATIONS

STATION NUMBER	LOCATION
Station 1	Maintenance Lagoon
Station 2	Mouth of Maintenance Lagoon
Station 3	Adjacent Lagoon South of Maintenance Lagoon
Station 4	Bridge at Laboratory Lagoon
Station 5 & 6	Laboratory Lagoon
Station 7	South Side of Laboratory Lagoon
Station 8	Kaneohe Bay Side of Laboratory Channel
Station 9	North End of Laboratory Lagoon

Station locations were selected to yield a representative characterization of the water chemistry and physical processes within both lagoons of Coconut Island, adjacent to the proposed

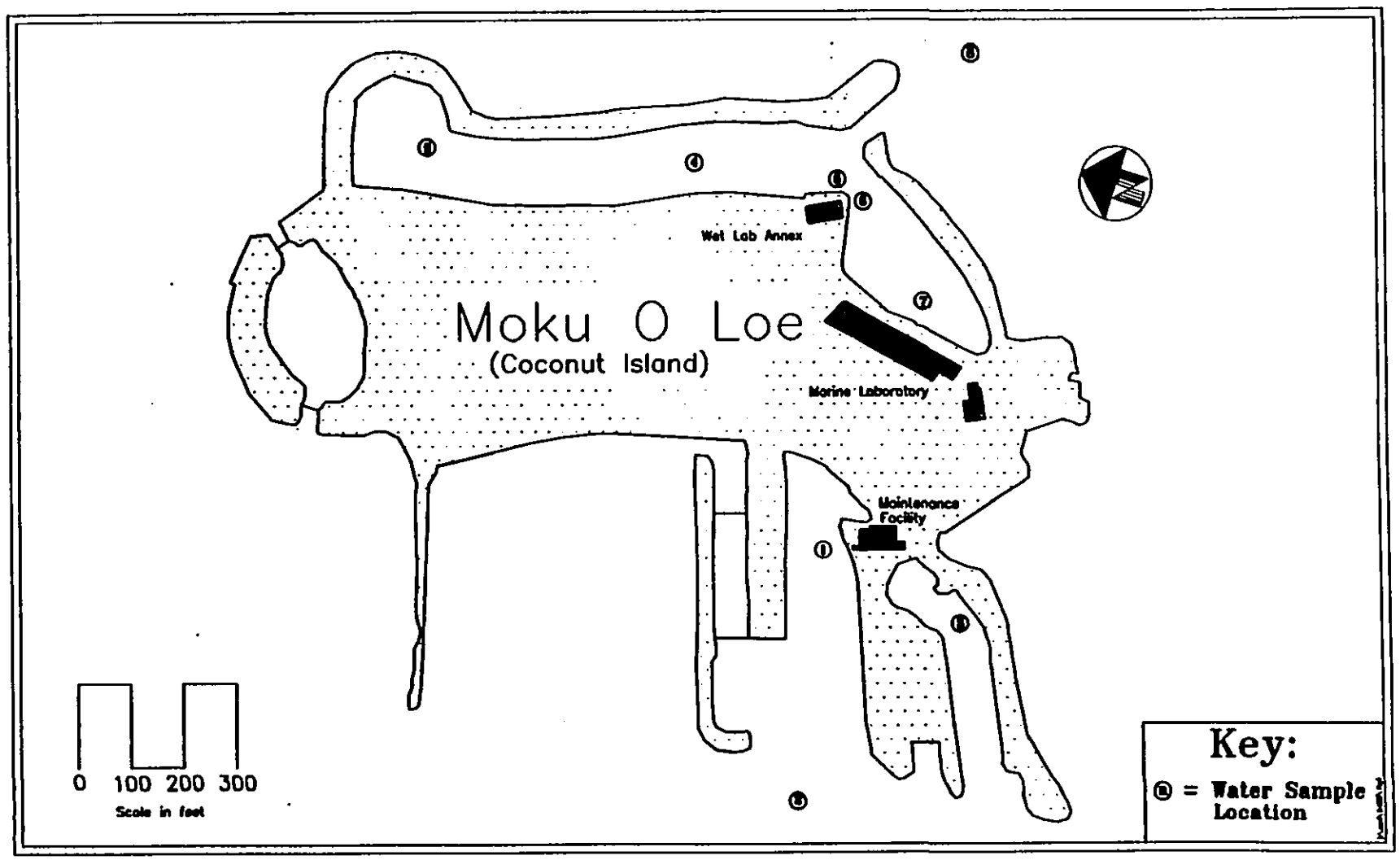


FIGURE 5. WATER QUALITY SAMPLING STATIONS

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developments, and in the nearshore and offshore areas. Measurements made included temperature, pH, salinity, dissolved oxygen, nutrients (total phosphorus and total nitrogen), chlorophyll a, and turbidity.

Temperature and salinity measurements provide information on water structure and indicate the existence of vertical stratification of the water column and the amount of fresh water entering the lagoons. pH is a measure of the acidity and alkalinity of the lagoon water solution. Dissolved oxygen is a measure of free, atmospheric oxygen in the water. Nutrients indicate biological activity in the lagoon's waters. The nutrients with greatest effect on productivity are nitrogen and phosphorus. Chlorophyll a is the primary photosynthetic pigment found in living plants. It is measured to estimate the phytoplankton biomass in marine waters. Turbidity is a measure of the light scattering properties of the water and is a convenient measurement of water clarity.

Temperature, pH, salinity, and dissolved oxygen measurements were performed in situ using a Hydrolab 3 Water Quality Multiprobe logger. The Hydrolab instrument bundles the following sensors:

a) temperature measurements were recorded with a thermistor, no calibration required;

b) pH measurements used an ionic strength reference electrode that was calibrated, prior to field measurements, using two standard buffer solutions;

c) salinity measurements were calculated and calibrated from specific conductance of a standard potassium chloride solution;

d) dissolved oxygen was measured using a rebuildable polarographic teflon membrane and the probe was calibrated in saturated water.

Nutrient measurements included total nitrogen and total phosphorus. Samples collected from the lagoons around Cocomut Island were kept on ice in a dark cooler prior to analysis. Analyses were performed on a Technicon AutoAnalyzer II. Chlorophyll a samples were laboratory analyzed using a spectrophotometer following methods outlined by Strickland and Parsons (1972).

Turbidity measurements were performed with a Turner Model 40 Nephelometer. Calibration was performed using a Turner standard calibration cell of 2 nephelometric turbidity units. Calibration was periodically checked.

D. MARINE BIOLOGY

Field investigations were conducted to characterize the biological conditions of both lagoons adjacent to the proposed project sites. Both surveys included underwater observations, photographs and transect data.

Each 4-meter wide transect consisted of a meter tape laid along the substrate across the channel perpendicular to the shore. Fish counts were made within two meters on either side of the line. Fish were identified to species where possible. Using this technique only large, open water species were identified while cryptic, small or species hiding within the reef matrix were not identified. All large obvious invertebrates and coral reefs within the 4-meter wide transect were also recorded on the data sheet. A stainless steel quadrant frame measuring 40 X 60 centimeters (0.24 m^2) was laid over the transect line at intervals of five meters to estimate percent coverage of benthic species. When possible photographs were taken of each quadrant (35 mm Nikonos at d=22 cm and 80 cm). General topography and close up detail photographs were taken in the vicinity of each transect as documentation. Substrate type along the transect line at 0.5 meter intervals was identified and classified according to the following categories shown in Appendix B.

III. RESULTS/DESCRIPTION OF MARINE ENVIRONMENT

A. CIRCULATION

Circulation inside both project site lagoons was determined by tracking the drift of current drogues. The drogues measured currents at a depth of approximately 7 to 10 feet. Measurements were made during both flood, slack and ebb tides. Drogue paths are shown in Figures 6 and 7.

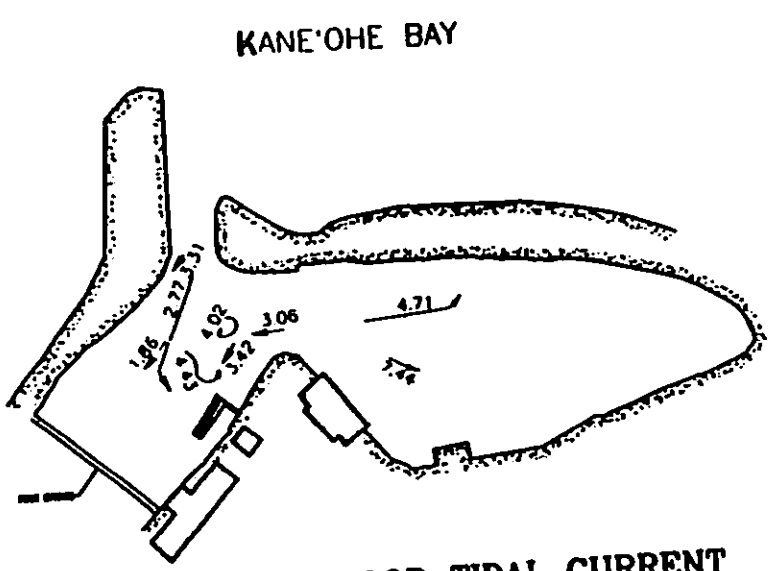
1. Laboratory Lagoon

Drogues were released and tracked in the laboratory lagoon on August 2, 1994. Winds were about 10 mph from the northeast. The effects of wind were determined to be negligible due to the shelter provided by thick shrubbery growing on the east peninsula and the land mass of Coconut Island on the west side. Data was taken between 10 am and 4 pm. According to the tidal curve as shown in Figure 6, the time interval between 10 am to 1 pm was a flood tide (incoming) and from 1 pm to 4 pm an ebb tide (outgoing).

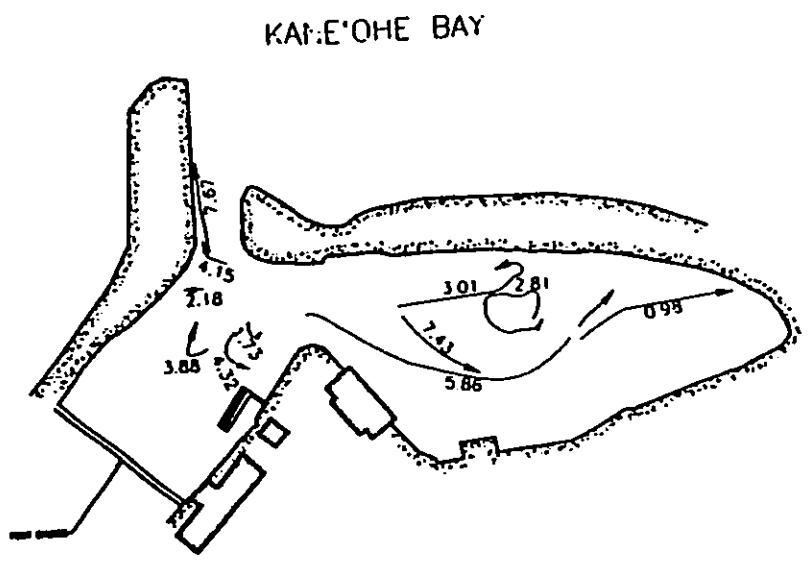
The average flood current nearest the project site point of the proposed wet lab annex was 3.2 feet per minute (ft/m), moving toward the footbridge; 3.3 ft/m at the entrance channel, moving inward; and 6.1 ft/m at the south portion of the lagoon, moving southward. Two small gyres were observed in front of the project site point. This flow may have the capacity to carry construction turbidity plumes to the footbridge, around the point, and to the south portion of the lagoon.

The ebb current moved out of the lagoon toward the channel entrance at an average speed of 5.9 ft/m. At the northern portion of the lagoon, toward the footbridge, the outgoing ebb current averaged 4.0 ft/m. Midway in the southern portion of the lagoon, the current was stronger with a maximum speed of 7.4 ft/m, moving toward the shore and decelerating to about 1.0 ft/m at the south tip of the lagoon. This study confirms the assumption that water moves from the project site point to the lagoon's south side. From here the current curves around to the east side peninsula and eventually moves into the channel out to Kaneohe Bay.

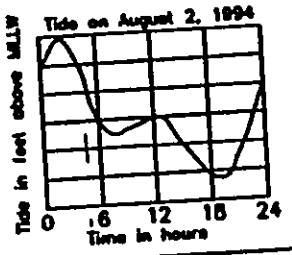
Like the drogue study by Ishimoto (1964), both flood and ebb currents displayed similar patterns. However, our study showed much smaller (about 1/2 the speed of Ishimoto's study) current velocities at the northern and southern portions of the lagoons. At the channel entrance, both studies displayed comparable results. However, it may be postulated that most construction plumes may be contained inside the lagoon, due to the lower velocities measured by the drogues.

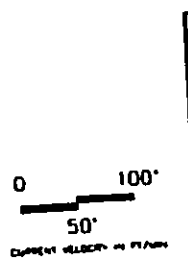


FLOOD TIDAL CURRENT
11:00–14:00



EBB TIDAL CURRENT
14:00–16:30





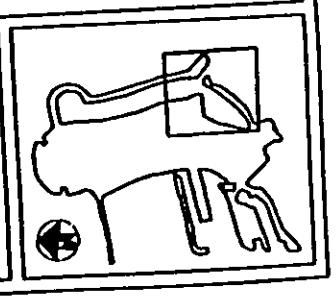


FIGURE 6. DROGUE STUDY AT LABORATORY LAGOON

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2. Maintenance Lagoon

Drogues were tracked at the maintenance lagoon on July 20, 1994. Winds were about 10 mph from the northeast. Due to the leeward position of the lagoon to the island, wind effect on drogues was considered small from inside the lagoon. However, wind effect was probably greater toward the mouth of the lagoon. Data was taken between 11 am and 4:30 pm. According to the tidal curve as shown on Figure 7, the time interval from 11 am to 2 pm was a flood tide and from 2 pm to 4:30 pm an ebb tide.

The flood current at the maintenance lagoon was 4.3 ft/m on average. The flood current came from either the adjacent northern lagoon or the northwest portion of the maintenance lagoon. It split into two streams at the northern end of the maintenance lagoon mouth, with one current moving toward the inner lagoon and one current moving into Kaneohe Bay. Near the southern bank of the lagoon next to the project site, a clockwise gyre was recorded. The gyre supported an assumption that the flood current divided and moved in two directions; into the lagoon and out to Kaneohe Bay.

The ebb current, in general, moved out of the lagoon. However, off the banks of the project site, it flowed in the opposite direction with an average speed of 1.7 ft/m. It is possible that a return bottom flow existed at this end of the lagoon. This flow may have the capability to carry construction turbidity plumes to the mouth of the lagoon and beyond.

B. BATHYMETRY

The depth of the lagoons at the laboratory site and the maintenance building sites were determined with the aid of two bathymetric charts (Group Architects Collaborative, 1975 and Ishimoto, 1964). Results shown in Figure 8 are referenced from Group Architects Collaborative.

C. WATER QUALITY

Kaneohe Bay is identified as class AA by the Hawaii State Department of Health (DOH). According the State's Water Quality Plan, the objective is to keep class AA waters "in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions." It is generally recognized that water quality within the bay does not meet the state AA standards. Kaneohe Bay is classified as a "water quality limited segment" with stricter standards applied to runoff in the bay. The State of Hawaii water quality standards were designed such that compliance or non-compliance is dependent on the results of multiple samples taken over time. It was also designed so that the natural variations in the water quality would be statistically balanced to describe a water quality condition based on samples collected during a variety of environmental conditions.

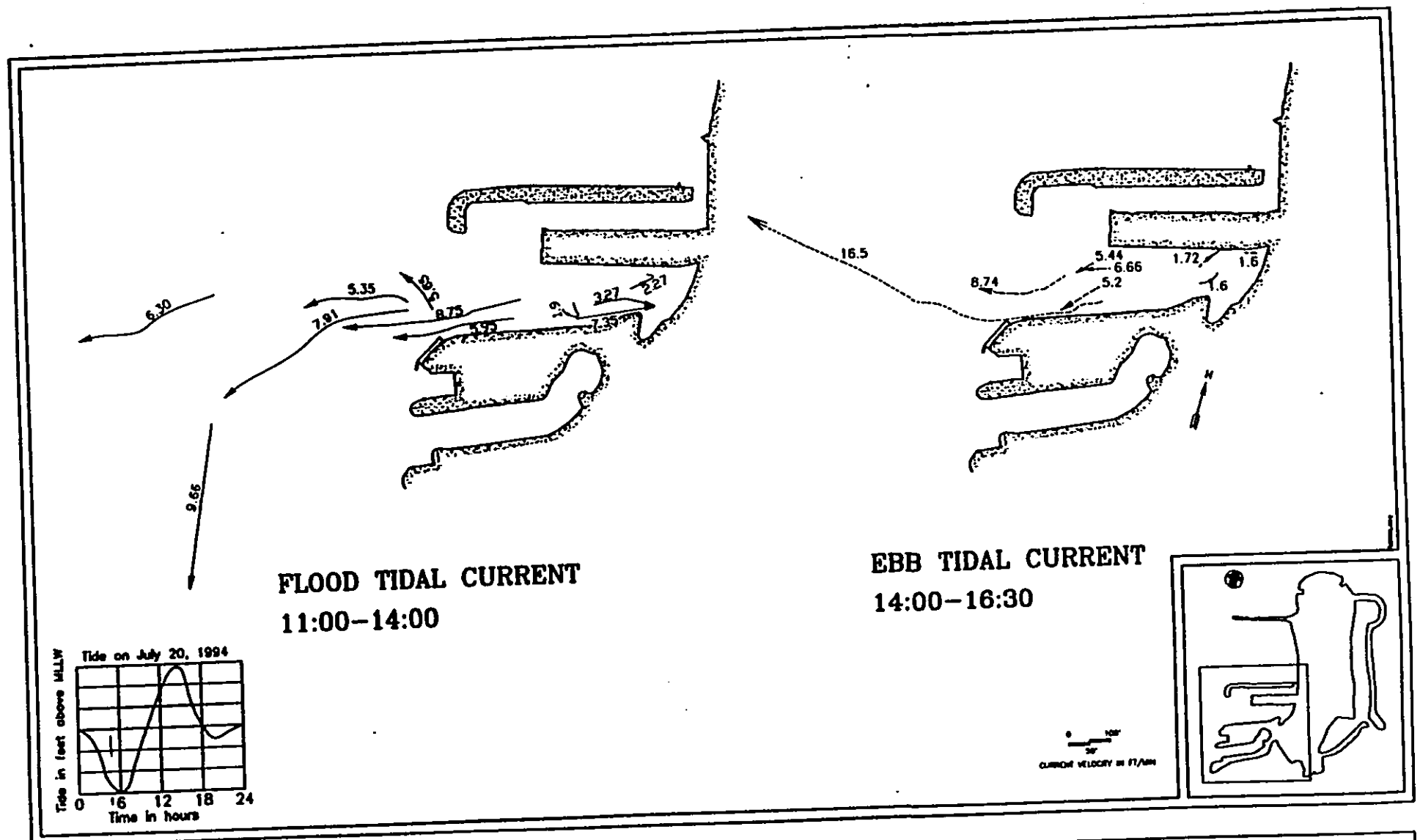

FIGURE 7. DROGUE STUDY AT MAINTENANCE LAGOON

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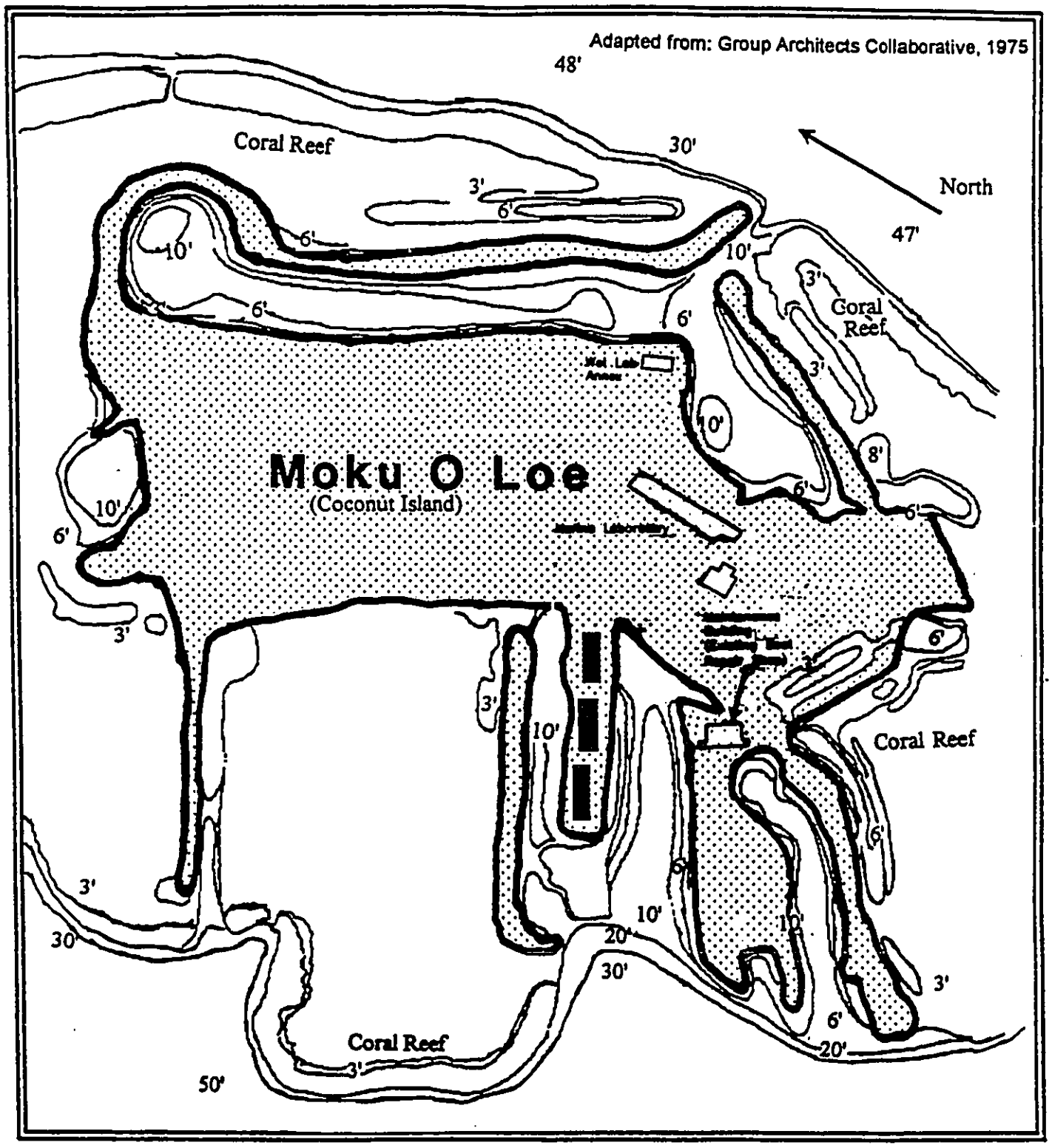

FIGURE 8. BATHYMETRY AROUND COCONUT ISLAND

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In general, results indicate that the nearshore coastal waters around the proposed developments have water quality values approximately within those identified by DOH for a "wet" embayment. "Wet" criteria apply when the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day. "Dry" criteria apply when the average fresh water inflow from the land is less than one percent of the embayment volume per day. Figure 9 shows the wet and dry embayment standards compared to other water body types such as Pearl Harbor and estuaries. Data collected as applied to the chart in Figure 9 is sparse; additional data should be collected to increase statistical certainty and more accurately represent seasonal variations and other conditions that cause changes in water quality parameters.

A summary of the water quality test results are given in Tables 2 through 5. Data from field measurements and collections are provided in the appendix.

SUMMARY OF RESULTS
WATER QUALITY DATA

TABLE 2.
MAINTENANCE LAGOON
WATER QUALITY DATA
GEOMETRIC MEAN VALUES

STATION NUMBER	TEMP. (C)	pH (units)	SALINITY (ppt)	DO (mg/l)
1-Surface	27.38	7.98	34.6	5.72
1-Bottom	27.00	8.11	34.3	5.28
2-Surface	26.57	8.19	33.7	5.99
3-Surface	27.11	8.16	34.3	5.77

TABLE 3.
LABORATORY LAGOON
WATER QUALITY DATA
GEOMETRIC MEAN VALUES

STATION NUMBER	TEMP. (C)	pH (units)	SALINITY (ppt)	DO (mg/l)
4-Surface	27.34	8.08	34.2	6.10
5-Surface	26.92	8.10	32.4	5.69
6-Surface	27.00	8.09	32.5	5.68
6-Bottom	26.80	8.17	33.9	6.77
7-Surface	26.33	8.01	32.5	4.70
8-Surface	26.81	8.20	34.2	6.16
9-Surface	27.06	8.07	34.4	4.84

TABLE 4.
MAINTENANCE LAGOON-NUTRIENT AND TURBIDITY DATA

STATION NUMBER	TN (ug/l)	TP (ug/l)	Chl. a (ug/l)	Turb. (NTU)
1-Surface	186	17	0.61	0.73
1-Bottom	154	18	0.68	1.46
2-Surface	144	17	0.60	0.65
3-Surface	154	16	0.91	1.49
Embayment Dry DOH Standard	150	20	0.50	0.40
Embayment Wet DOH Standard	200	25	1.50	1.50

TABLE 5.
LABORATORY LAGOON-NUTRIENT AND TURBIDITY DATA

STATION NUMBER	TN (ug/l)	TP (ug/l)	Chl. a (ug/l)	Turb. (NTU)
4-Surface	168	19	1.14	0.95
5-Surface	189	18	0.77	1.22
6-Bottom	158	11	1.31	0.99
7-Surface	231	22	1.92	1.37
8-Surface	151	10	0.86	2.44
9-Surface	N/A	N/A	N/A	1.24
Embayment Dry DOH Standard	150	20	0.50	0.40
Embayment Wet DOH Standard	200	25	1.50	1.50

1. Laboratory Lagoon

Turbidity is a measure of light scattering properties of water and is a convenient measurement of water clarity at varying depths. It typically indicates the presence of suspended sediments, although it is also influenced by biological activity which may affect the nearshore area to the project site. Turbidity measurements at stations 4 through 9 ranged from 0.67 to 2.51 NTUs. The highest value was taken outside the channel in Kaneohe Bay. The lowest reading was taken at station 4 at the footbridge. Looking at Figure 9, all other turbidity values were generally within state standards for embayments.

Temperature values ranged from 26.7 deg-C to 28.2 deg-C. The coolest values were found at station 8, located outside the lagoon channel in Kaneohe Bay. Refer to the graphs in Appendix A for fluctuations in water parameter data over a 24-hour period for the laboratory lagoon.

Salinity measurements varied from 31.0 to 34.8 parts per thousand (ppt). The lower salinities occurred nearest to the effluent in the laboratory lagoon from the fresh water experiment tanks. pH ranged from 8.08 to 8.18 units, which indicates an equilibrium state for all laboratory lagoon stations.

Dissolved oxygen (DO) values ranged from 4.70 to 6.55 milligrams per liter (mg/l). The low DO levels were recorded at the south tip of the lagoon (station 7), and at the north end of the lagoon (station 9). These results indicate some portions of the lagoon are, at times, poorly oxygenated. As shown in Appendix A (wet lab annex site) decreased levels of DO occurred during early morning hours, which indicates the lack of photosynthetic production of oxygen during the night. Most fish cannot survive at less than 2 mg/l of DO (Wetzel, 1975). The higher DO levels were recorded at the bottom of station 6, near the project site point, and station 8, outside the channel in Kaneohe Bay, which are within the normal range to support oxygen consuming organisms.

Nitrogen and phosphorus are the nutrients that most influence productivity in seawater. The availability of these nutrients generally increases shoreward due to terrigenous influences. Total nitrogen (TN) values varied from 151 ug/l to 231 ug/l. Looking at Figure 9, the highest TN value was recorded at the south side of the laboratory lagoon (station 7), which, according to the drogue study, experienced slower circulation and became more stagnant towards the tip. All other values were between the wet and dry state embayment standards. Total phosphorus (TP) varied from 10 ug/l to 22 ug/l, which was below state standards for wet embayments.

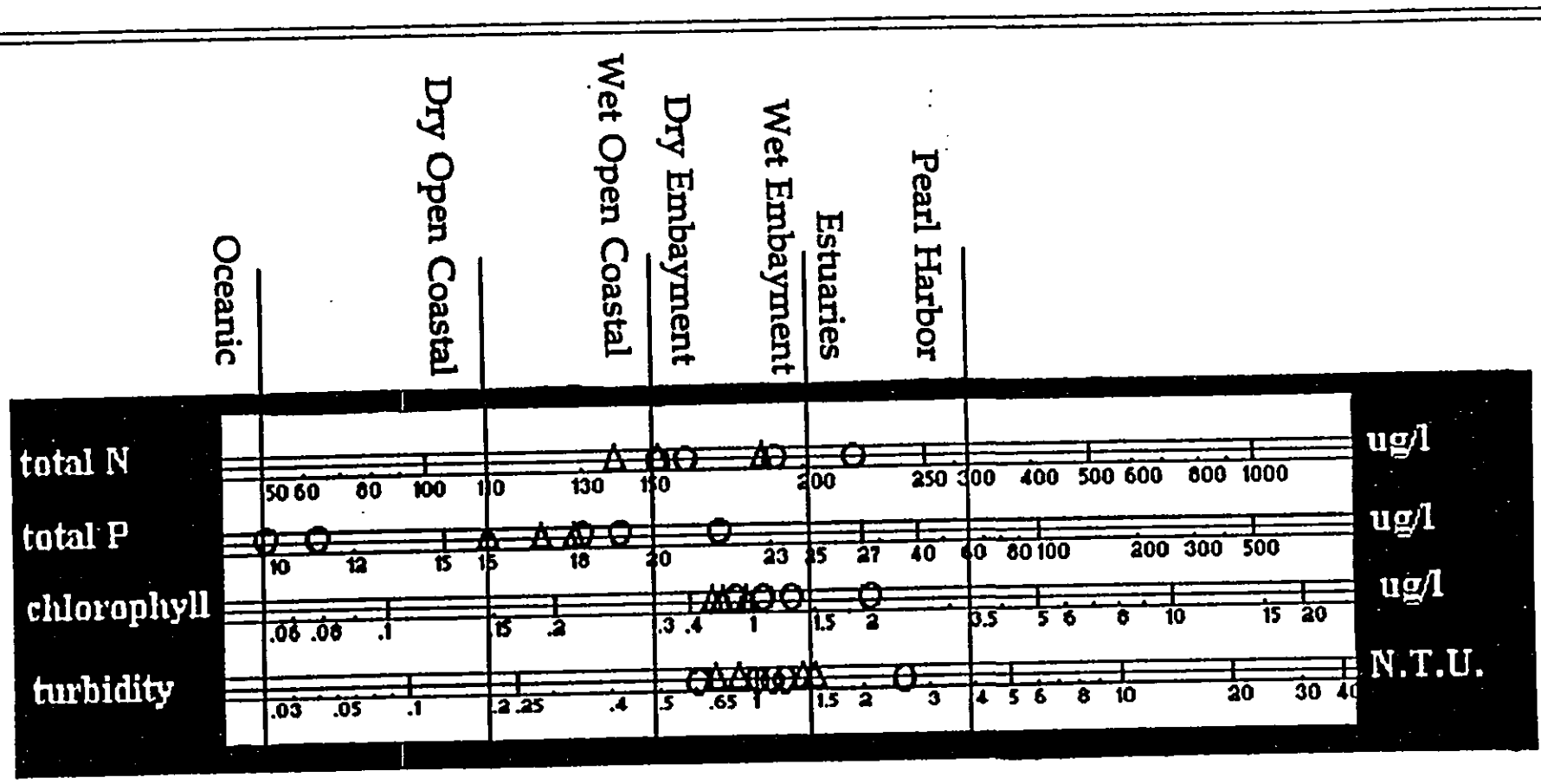
Chlorophyll a is the primary photosynthetic pigment of living plants. Its measurement typically indicates phytoplankton biomass in marine waters. Chlorophyll a measurements ranged from 0.77 ug/l to 1.92 ug/l. Although one reading, recorded at the south end of the lagoon (station 7), was higher than the state standard for wet embayments, all other readings indicated that biomass residence times were within the normal range set by DOH.

As mentioned in the previous paragraphs, the south end of the laboratory lagoon (station 7), revealed comparatively lower levels of DO (4.2 to 5.04 mg/l), the highest TN value (231 ug/l), the highest TP value (22 ug/l), and the highest chlorophyll a value (1.92 ug/l). Such readings may indicate a greater number of oxygen consuming organisms exist at station 7 along with poor circulation and a higher residence time. These nutrient values, however, along with other values recorded inside the laboratory lagoon, were not high enough to indicate the occurrence of eutrophication or algae blooms.

2. Maintenance Lagoon

Turbidity measurements at stations 1 through 3 ranged from 0.52 to 1.52 NTU, indicating that the lagoon may contain less light scattering substances at the time of sampling, relative to the laboratory lagoon.

Temperature values ranged 26.57 deg-C to 27.39 deg-C. These values are consistent with the laboratory lagoon temperatures.



Δ = Maintenance Lagoon Site
O = Laboratory Lagoon Site

FIGURE 9. WATER QUALITY READING COMPARED TO STATE STANDARDS

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Salinity measurements varied from 33.7 to 34.8 parts per thousand. Results do not indicate significant amounts of fresh water or stratification occurrence at any of the maintenance lagoon stations. pH ranged from 7.96 to 8.20 units, which demonstrates an equilibrium state at all stations.

Dissolved oxygen values ranged from 5.21 to 6.03 mg/l. Although these values do not include any late night or early morning readings, the results indicate a fairly well oxygenated environment within the lagoon.

TN values varied from 144 ug/l to 186 ug/l. TP varied from 16 ug/l to 18 ug/l. Figure 9 shows all TN readings within the state standards for embayments. TP readings were below state standards for dry embayments. Results indicate there is no evidence of eutrophication (algal blooms) occurrence in the maintenance lagoon.

Chlorophyll a measurements ranged from 0.60 ug/l to 0.91 ug/l, which is between the state water quality standards for dry and wet embayments. Results generally indicate that residence time of biomass is within normal range for DOH standards.

D. MARINE BIOLOGY

In general, live corals, predominately Porites compressa and Montipora verrucosa, occupy a band around the periphery of Coconut Island from the lower low tide level down to a depth of 10 to 25 feet (Richmond & Rogers, 1986). Figure 11 shows the extent of coral reef growth around the project sites. No endangered or threatened species were noted during the survey. Green sea turtles (Chelonia mydas), a federally threatened species covered under the Endangered Species Act, have been known to enter the lagoons on infrequent occasions. Nesting sites are not utilized in the lagoon areas as the turtles prefer white sand beaches. Waterbirds listed as endangered and known to enter the lagoons are the Koloa (Hawaiian Duck [Anas wyvilliana]) and the Black-necked Stilt (Himantopus mexicanus knudseni) (Brunner, 1994). Species covered under the Marine Mammals Protection Act, such as the humpback whale and Hawaiian monk seal are not known to enter the confines of either lagoon. Appendix B lists all species of fish, corals, invertebrates, and algae found in each transect.

1. Laboratory Lagoon

On July 27, 1994, a single transect was laid from the project site point to the opposite shore at the heading of approximately 100 degrees from true north. The far shore was reached at 22 meters. The transect crossed a shallow intertidal and subtidal area near the base of the proposed laboratory seawall, down a coral slope, across the lagoon bottom, and up the rubble slope of the far channel edge to the opposite seawall (see Figure 10). The substrate at both ends of the transect was strewn with rocks and rubble from the crumbling seawall and miscellaneous litter from the past 40 years.

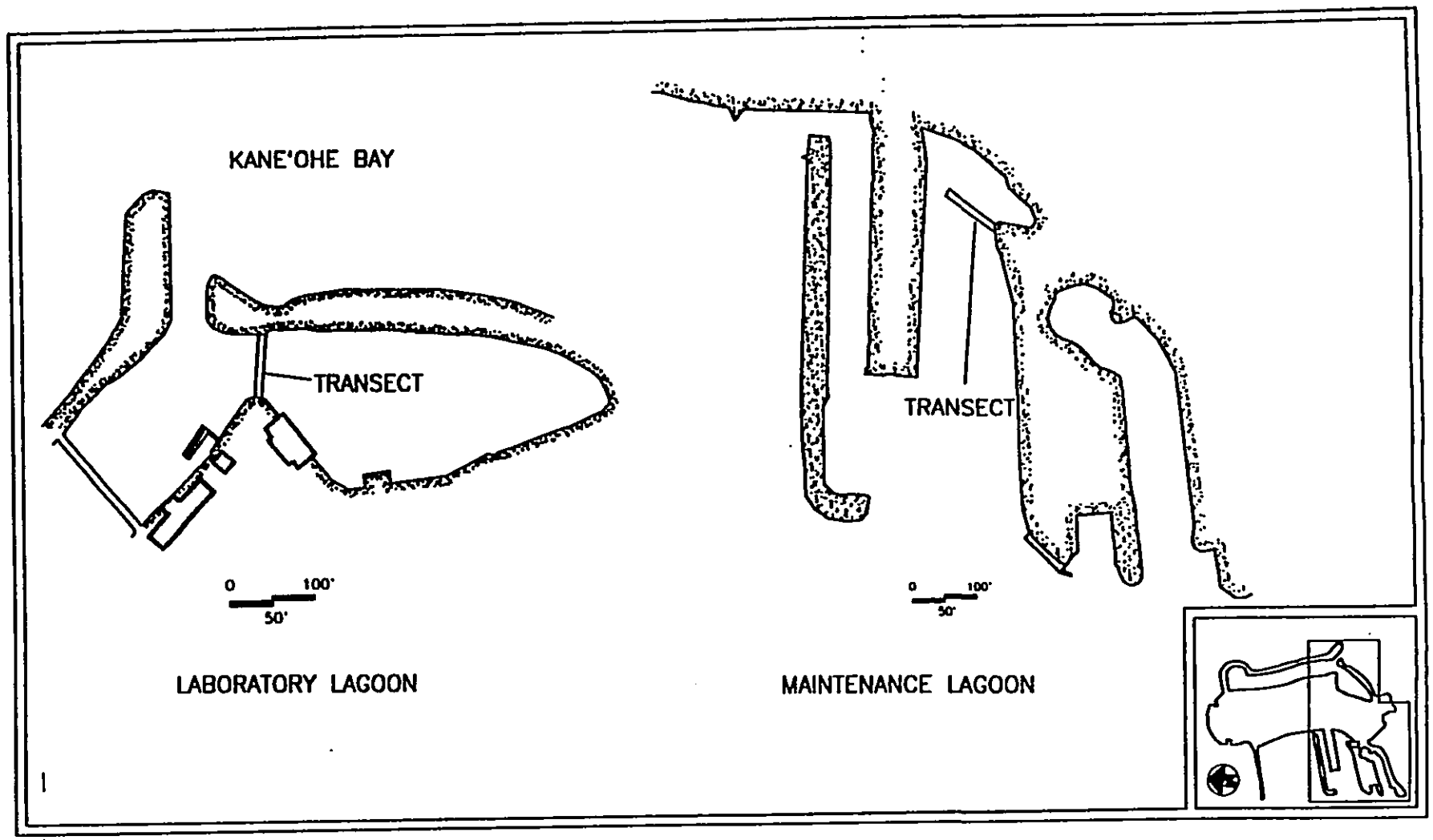

FIGURE 10. TRANSECT LOCATIONS

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Coral growth in the project side of the lagoon was plentiful where the hard substrate along the edged slopes has enabled corals to gain a foothold. Dominate species included finger coral (Porites compressa) and montipora (Montipora verrucosa). One to two meters from the seawall, finger coral colonies were dominate, covering a majority of the substrate. The finger corals, some up to one meter in diameter, have grown onto 6 to 8-inch PVC pipelines, crossing the lagoon floor. The four pipelines run parallel to the shoreline and have worn away coral colonies in some areas and have been overgrown by coral in other areas. Further down the slope Montipora verrucosa becomes more dominant accounting for almost half the coral coverage. Montipora is known to be a hardy species and resistant to contaminates. However, it is uncertain how montipora would sustain construction impacts of seawall installation. At a yearly growth rate of 2.5 cm, these coral heads are estimated to be about 25 years old. Refer to Figure 11 for a map of the coral reef locations around the project site. Refer to Appendix B for cross sections of the transect.

Near the project site, the lagoon receives fresh water effluent through drainage pipes from the facility's experimental aquaculture tanks. These conditions have supported a habitat of filter feeders, such as Bay oysters (probably Ostrea hanleyana) and small carpet anemones (Palythoa vestitus with some Zoanthus sp.). Numerous small sponges, hydroid colonies, and tunicates were noted in shallow areas and on floating docks.

The floor of the lagoon was primarily soft, sandy mud with a profusion of burrow holes. The primary bottom covering was a large algae (Padina sp.). Bubble algae (Dictyospheria cavernosa) occurred in protected areas of the lower intertidal, which is also associated with finger coral colonies around the base of the channel. Clear spaces of open substrate were covered with a diffuse fine algae mat containing such species as Dictyota acutiloba, Acanthophora spicifera, D. bartayresii, and Hypnea sp., which were kept close cropped by grazing herbivorous fish. Eighteen sea worms (Ophiodesoma spectabilis) were counted in the 88 square meter transect. The sea worm resembles a colorful, soft bodied sea cucumber and occurs on all substrate types. In addition, fifty-seven feather duster worms (Sabellastarte sanctijosephi) were counted in 18 square meters along the coral covered slope of the lagoon.

Fish seen within the transect included one saddleback butterfly fish (Chaetodon ephippium), one blenny (Cirripectes vanderbilti), two one-spot damsels (Dascyllus albisella), one sergeant major (Abudefduf abdominalis), and approximately one hundred small nehu (Stolephorous purpureus). Outside the transect, fish noted included an 18-inch barracuda (Sphyraena barracuda), a school of goatfish (Mulloides flavolineatus), several species of surgeon fish (Acanthurus sp.), small parrot fish (Scarus perspicillatus), moorish idols (Zanclus cornutus), two species of butterfly fish (C. miliaris, C. lunula), and abundant sergeant majors (A. abdominalis).

At the footbridge and beyond towards the far northern end of the lagoon, it was noted that underwater visibility was reduced to two to five meters. This condition indicated decreased tidal flow and water exchange, while coral reef populations decreased to near zero within 5 to 10 meters on the other side of the footbridge. Also, fish species on the other side of the footbridge appeared to be limited primarily to mullet, barracuda and nehu.

2. Maintenance Lagoon

On July 27, 1994, a transect was measured across the lagoon beginning at the project site seawall to the opposite bank at a heading of approximately 240 degrees from true north (see Figure 10). The transect was placed over a coral covered slope to the lagoon bottom, across the sand/mud lagoon floor, up the opposite coral covered slope, and ended on a shallow back-reef sand flat. Water depth at the project site's existing seawall was approximately one meter, which has allowed corals colonies (Porites compressa and occasional small Pocillipora damicornis) to grow to the seawall base and from the side of the wall itself. The slope from the seawall base to the lagoon bottom was 95 percent covered with colonies of finger coral (Porites compressa). The bottom of the maintenance lagoon channel was noted as being a flat mud and sand substrate with coral growth prevalent along the channel edge slope. Refer to Figure 11 for a map of coral sites around the project site.

Fewer filter feeding organisms were noted at this site compared to the laboratory lagoon. From the seawall to the lower edge of the reef, seventeen feather duster worms were visible in a 12 meter area (approximately 1.5/m^2 as compared to 3.1/m^2). Fewer sea worms were present, only seven Ophiodesoma spectabilis was noted within the transect.

Neither large fish or nehu were found in the transect. Although many of the same species were noted in the laboratory lagoon transect, fewer fish were counted at the maintenance lagoon transect. Fish species noted outside the transect included moorish idols (Zanclus cornutus), yellow tangs (Zebrasoma flavescens), seargent majors (Abudefduf abdominalis), damsel fish (Dascyllus and Chromis sp.), and weke (Mulloides Flavolineatus). Refer to Appendix B for a cross section of the transect.

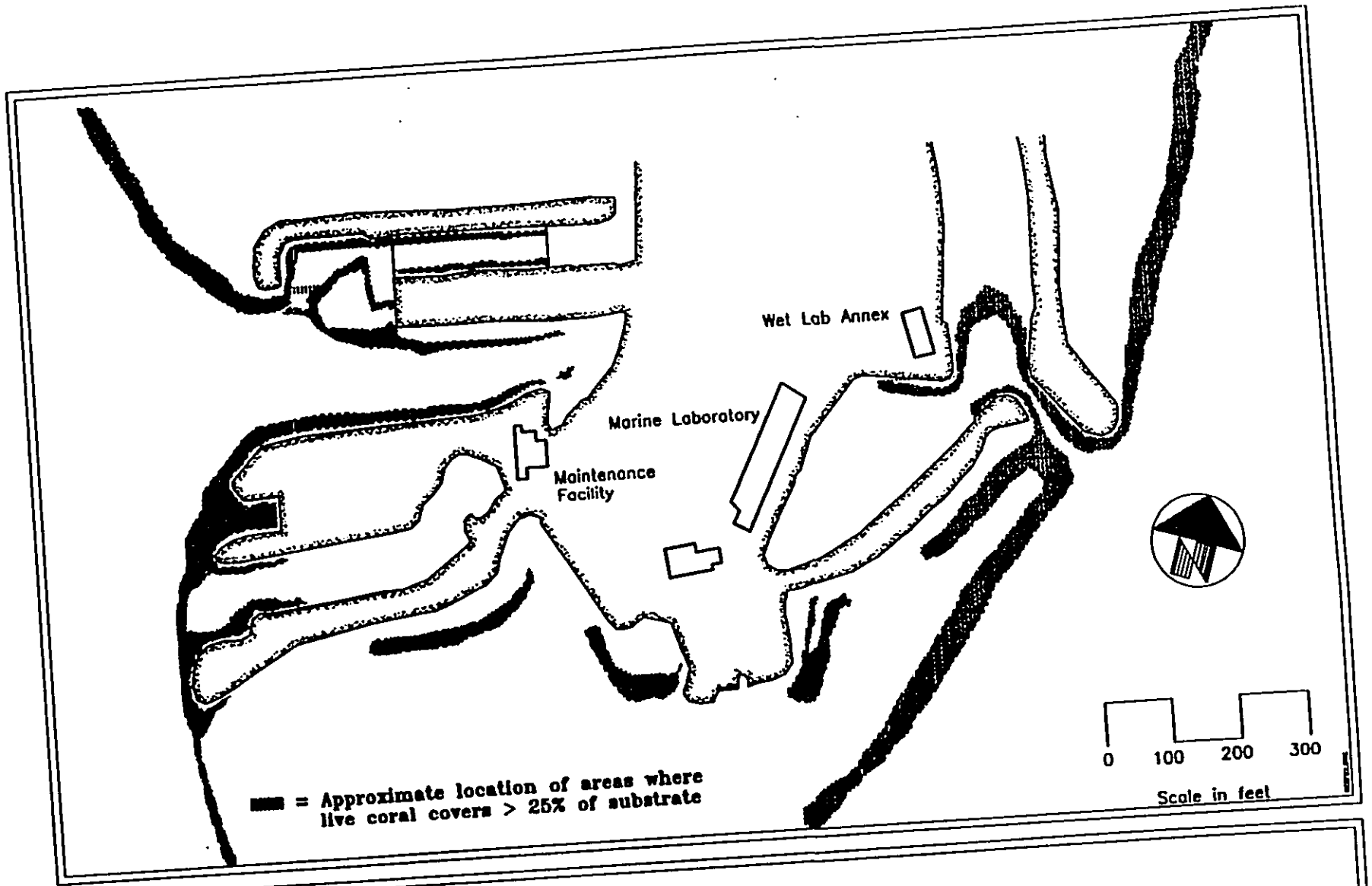

FIGURE 11. CORAL REEF LOCATIONS

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IV. DISCUSSION AND IMPACTS OF PROPOSED ACTION

Analyses of the Coconut Island lagoons' physical, chemical and marine biological environment indicate the lagoons have no major environmental problems and is not expected to develop any in the long-term due to the proposed developments. The physical, chemical and biological factors that influence the lagoons were evaluated by both field and analytical work. While these studies were not comprehensive, results were sufficient to make both qualitative and limited quantitative estimates of the effect from development activity. The discussion presented in the following paragraphs summarizes the existing conditions and potential impacts determined by the study.

A. CIRCULATION

Circulation patterns in both lagoons may carry construction turbidity plumes around the confines of the lagoon. The degree to which a plume may drift into Kaneohe Bay depends on construction trenching methods, tide flows, and mitigative measures taken. Of the options considered for seawall conceptual design, steel sheet pile is least likely to generate a damaging turbidity plume.

Other physical factors such as waves and tides were considered. Wave penetration into both lagoons is of small scale and not expected to be a major concern for project modifications. The mean tide around Coconut Island is 1.1 feet above Mean Lower Low Water (MLLW). The mean tidal range between MLLW and Mean Higher High Water is 2.2 feet. Consideration should be given to construction techniques employed inside the lagoon and the timing of flood and ebb tides.

B. WATER QUALITY

An embayment is referred to as water confined by land and physically protected with restricted openings to open coastal waters whereby the ratio of total bay volume to the cross-sectional entrance area is seven hundred to one or greater. Kaneohe Bay is defined by "Hawaii Administrative Rules, Title 11, Chapter 54" as an embayment. Therefore, water quality standards used for comparison purposes are those defined for embayments. The "wet" criteria applies when the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day; "dry" criteria refers to less than one percent of embayment volume per day.

Water quality data was obtained to determine general site characteristics and to look for conditions that might require further consideration with respect to impacts from proposed construction and development activities. Because of the relatively large area in comparison to the number of stations monitored, statistical analysis of results is limited. For purposes of viewing water quality data with respect to state standards, log-normal graphs were prepared (see Appendix A).

Results for the laboratory lagoon data indicate that within the 95% confidence interval, chlorophyll a, total nitrogen (TN), total phosphorous (TP), and turbidity are within or otherwise indistinguishable from existing State of Hawaii Department of Health (DOH) criteria for wet and dry coastal embayments.

Results from the maintenance lagoon show that within the 95% confidence interval, chlorophyll a, TN, TP, and turbidity values are indistinguishable from DOH standards for an embayment. Construction impacts to both lagoons will consist primarily of an increase in turbidity with possible increases in TN and TP. Because the maintenance lagoon is comparatively "cleaner" than the laboratory lagoon, maintenance lagoon water quality values may register greater fluctuations during construction. Turbidity plumes are recommended to be contained by either a silt curtain or coffer dam.

C. MARINE BIOLOGY

Marine impacts to biota from the proposed actions are projected to be confined within the lagoon systems. Primary impacts will be from construction of the new seawall in the maintenance lagoon which may destroy corals and invertebrates from within 1-2 meters of the seawall. A silt curtain or coffer dam is recommended to contain silt plumes within the lagoon. How resistant the coral may be to silt plumes generated by construction activities depends on the type of seawall installed and the intensity of the plume generated. Although Montipora is a hardier species of coral, a determination cannot be made as to its resistance to construction plumes without further study. No known nesting sites of the Green Sea Turtle were found in either lagoon, so no mitigation measures are proposed. No other threatened or endangered species are known to frequent the lagoon areas with the exception of resident waterbirds, such as the Koloa (Hawaiian Duck) and the Black-necked Stilt (Brunner, 1994).

Indirect impacts may occur due to fugitive airborne dust from project site construction that may settle on the lagoon surface, temporarily increasing turbidity and decreasing photosynthetic absorption rates of biota. Mitigation measures for these impacts are listed in the last section of this chapter.

Shoreline construction is often associated with outbreaks of a fish poison known as ciguatera. The causative agent, a dinoflagellate (Gambierdiscus toxicus), may cause poisoning to occur when sufficient population levels are growing on benthic algae. The poisonous diatom is passed on to feeding herbivorous fish and concentrated in predatory fish. Theoretically, large offshore construction projects disturb the environment and may promote a population increase in the diatom. The proposed project on Coconut Island, however, is of small scale and the incidence of ciguatera poisoning from Kaneohe Bay is very low (Hokama, pers. communication, 1994). Therefore, the probability of an outbreak of ciguatera around Coconut Island from project construction is considered very unlikely.

D. SHORT-TERM CONSTRUCTION IMPACTS

Direct impacts from construction to the maintenance lagoon include pile driving to install the new seawall and possible discharge of construction materials either from accidental spillage and/or fugitive dust emissions. The major impact will be turbidity plumes created from installation of the new seawall, which may affect the coral reef habitat in the maintenance lagoon. Additional impacts may occur from the grounding and/or anchoring of the Landing Craft Utility (LCU 1466 CLASS). The LCU is approximately 31 feet wide, 115 feet long, and has a draft of 1 foot at the bow and 4 feet at the stern. The LCU is proposed to dock at one of several locations within the maintenance lagoon. The preferred docking location is 300 feet west of the proposed maintenance building site where the LCU proposes to anchor itself bow first on the shoreline. A crane located on-shore will unload construction materials off the LCU and onto the island.

Indirect construction related impacts include siltation by runoff from unprotected ground, accidental fuel spills from gas or oil driven equipment, and settlement of airborne fugitive dust onto the lagoons' surface.

1. Wet Lab Annex Site

The proposed foundation for the wet lab annex is not anticipated to have an impact on the existing seawall as the proposed building is set back a minimum of 10 feet from the shoreline. Repair options for the eroded portion of the seawall are not part of this project.

2. Maintenance Building Site

According to the results of the soils report by Hirata (1994), the seawall recommended for the maintenance building site consists of steel sheet piles (see Figure 12). Due to the absence of hard substrate, the piles can be driven into the layer of medium stiff silty clay. Anti-corrosion measures are suggested for steel sheet piles. The length of the wall as proposed is approximately 98 feet (see Figure 13).

Mitigative measures to reduce turbidity plumes that may damage coral reefs are the coffer dam and silt curtain. Independent tieback of steel sheet piles is recommended.

3. Construction Landing Sites and Material Storage Areas

Construction of both projects will be supported by a LCU. Several potential sites for landing the craft have been identified within the vicinity of the maintenance lagoon. Several factors are being considered to ground and/or anchor the vessel for unloading purposes, such as wind direction, tidal fluctuation, slope of the landing site, and presence of coral reefs. The preferred location for landing the LCU is approximately 300 feet

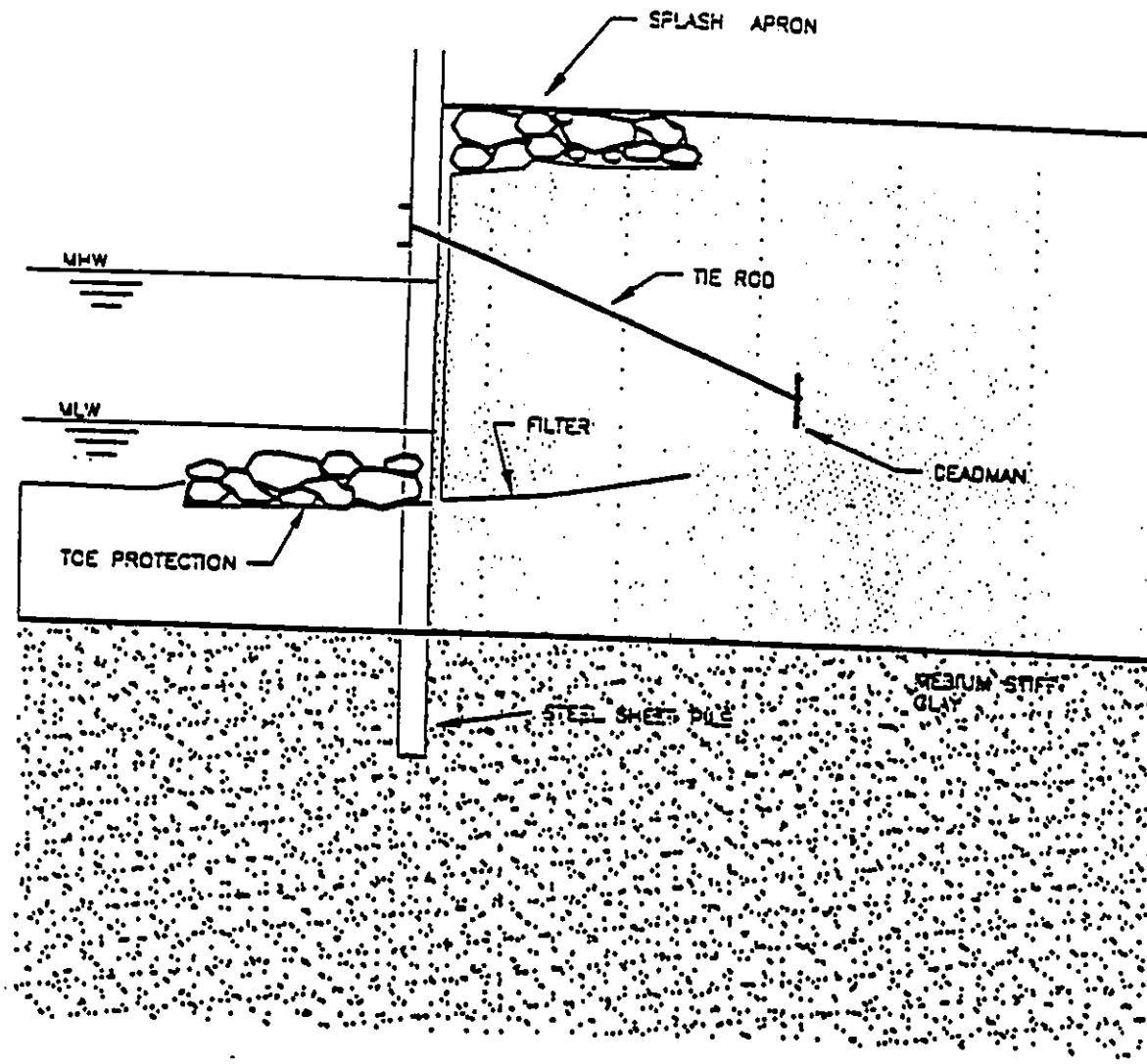

FIGURE 12 STEEL SHEET PILE

MARINE LABORATORY AND SUPPORT FACILITIES

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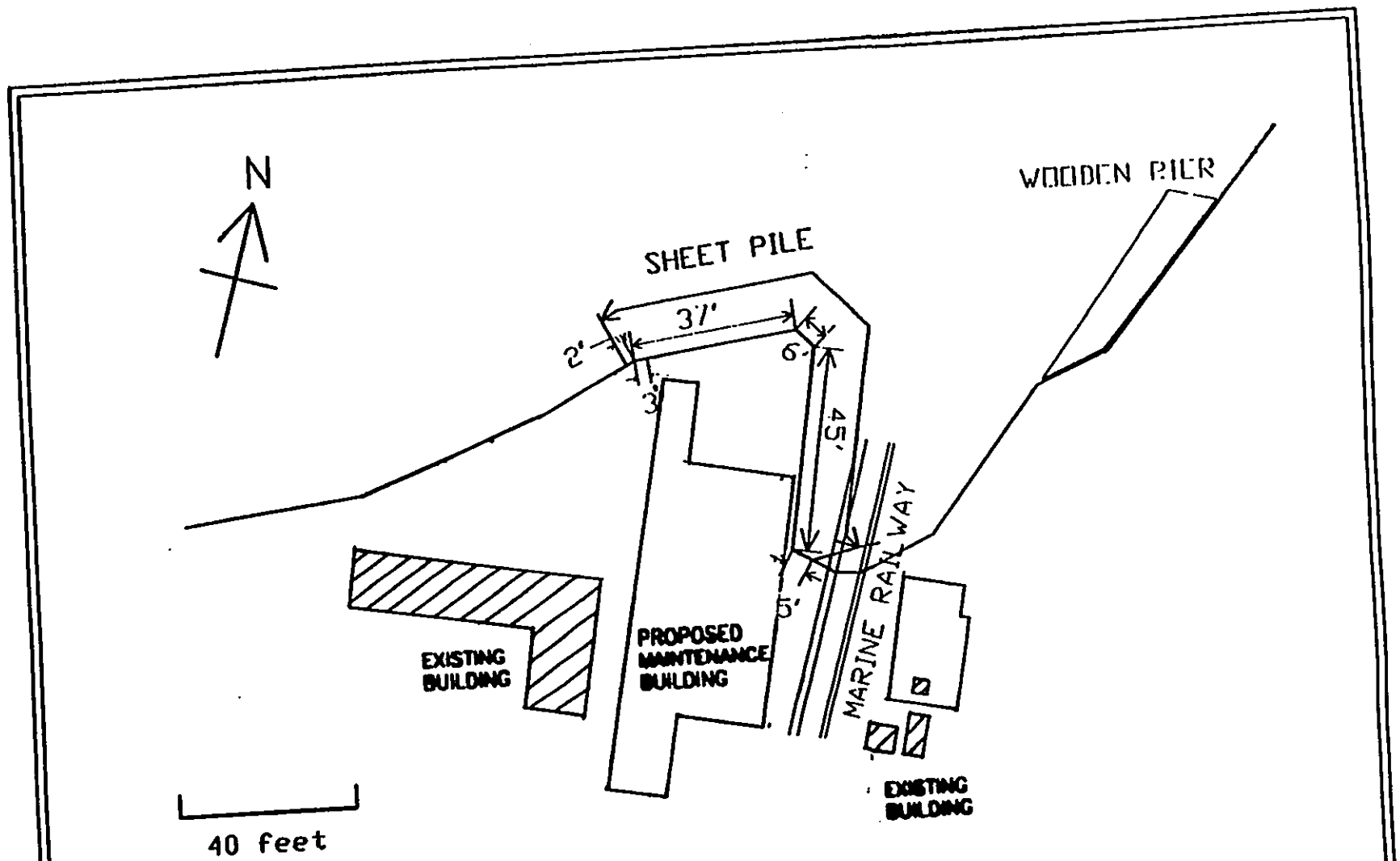

FIGURE 13 CONCEPTUAL PLAN FOR SEAWALL DESIGN AT MAINTENANCE BUILDING SITE

Marine Laboratory and Support Facilities

west of the maintenance building site, where the shoreline is composed of an earthen bank.

Slight modifications to the shoreline will occur while earthwork compaction takes place to fit the LCU for landing purposes. Small silt plumes will be generated as the LCU anchors itself onto the shoreline. Coral reefs existing in the proposed landing area are not anticipated to come in contact with the LCU, if appropriate precautions are taken during approach and landing.

Potential impacts from anchoring and unloading construction materials from the LCU include;

a) modification of shoreline to prepare landing area,
b) possible damage to coral reefs and other benthic fauna from LCU grounding and/or generation of silt plumes, and
c) temporary restriction of boat traffic in and out of the maintenance lagoon.

Staging of the LCU is proposed at Heeia Kea State Park pier. An alternative staging site is from the Marine Corps Base. Construction materials will be loaded onto the LCU and transported across Kaneohe Bay to the Coconut Island unloading platform in the maintenance lagoon. Once on Coconut Island, construction materials will be taken to one of three construction storage areas;

a) just inland from the LCU landing area,
b) approximately 60 feet inland behind the Marine Laboratory site, and
c) adjacent to the wet lab annex of the laboratory lagoon.

Land routes to the construction sites consist of an existing one lane gravel road to the wet lab annex site and a new road to the Marine Laboratory site that will be graded and stabilized for transportation of construction materials.

Possible impacts to the marine environment from transport and storage of construction materials include:

a) accidental spillage into Kaneohe Bay of materials during loading, unloading and transport,
b) fugitive dust emission from construction materials settling onto Kaneohe Bay, and
c) runoff from construction storage areas as a result of spillage combined with rain storm occurrence.

E. LONG-TERM IMPACTS

Indirect impacts from operation of the Marine Laboratory facility are primarily associated with the increase in research activity and an increase in long-term boat traffic in and out of the laboratory lagoon. This may induce increased wake erosion to seawalls. Any nutrient, chemical or fresh water discharge is expected to be contained within the confines of the wet lab annex and will not enter the lagoon.

Long-term impacts from the salt water disposal pipes into the laboratory lagoon are expected to be negligible as no net addition in the amount of flow is expected than what is presently discharged.

At the maintenance lagoon, increased nutrient loads are not anticipated. Any accidental spills, container leakage and disposal of miscellaneous materials will be contained within the confines of the new building.

F. MITIGATION MEASURES

To assure that the proposed project does not adversely affect the coastal/marine environment, the following measures could be taken during construction of the Marine Laboratory and Support Facilities:

- Installation of a silt curtain or coffer dam is recommended to contain sediment plumes during repair/replacement of seawall. Sediment that settles within the silt curtain should be removed prior to removing the curtain.

- Transplanting of coral heads in case they come into contact with the LCU in the maintenance lagoon or during the new seawall construction.

- The construction storage areas should be cleaned on a regular periodic basis of debris and rubbish that may collect.

- After transport of construction materials is completed, measures should be taken to restore the LCU landing area on Coconut Island as much as possible to its previous condition.

- Berms are recommended in the storage areas around construction materials which could flow or be carried by storm water to the shoreline.

- Liquids and cement should be stored as far back as possible from the shoreline to maximize containment from accidental spillage.

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APPENDIX A

WATER QUALITY DATA

July 20, 1994

MAINTENANCE BUILDING SITE

Location	Time	Temp (C)	pH	Salin. (ppt)	DO (mg/L)
Station 1 Surface	15:18.31	27.39	7.96	34.6	5.82
	15:20.34	27.38	8.00	34.6	5.82
	avg.	27.38	7.98	34.6	5.72
	geo. mean	27.38	7.98	34.6	5.72
	std. dev.	0.01	0.03	0.0	0.14
Bottom	15:33.33	26.99	8.11	34.3	5.36
	15:34.34	27.01	8.11	34.3	5.21
	avg.	27.00	8.11	34.3	5.28
	geo. mean	27.00	8.11	34.3	5.28
	std. dev.	0.01	0.00	0.0	0.13
Station 2 Surface	16:18.27	26.58	8.19	33.7	5.96
	16:19.00	26.57	8.20	33.7	6.03
	avg.	26.58	8.20	33.7	6.00
	geo. mean	26.57	8.19	33.7	5.99
	std. dev.	0.03	0.01	0.0	0.05
Station 3 Surface	16:16.27	27.13	8.16	34.4	5.81
	16:19.00	27.10	8.16	34.3	5.73
	avg.	27.12	8.16	34.4	5.77
	geo. mean	27.11	8.16	34.3	5.77
	std. dev.	0.02	0.00	0.1	0.04

July 27, 1994

WET LAB ANNEX SITE

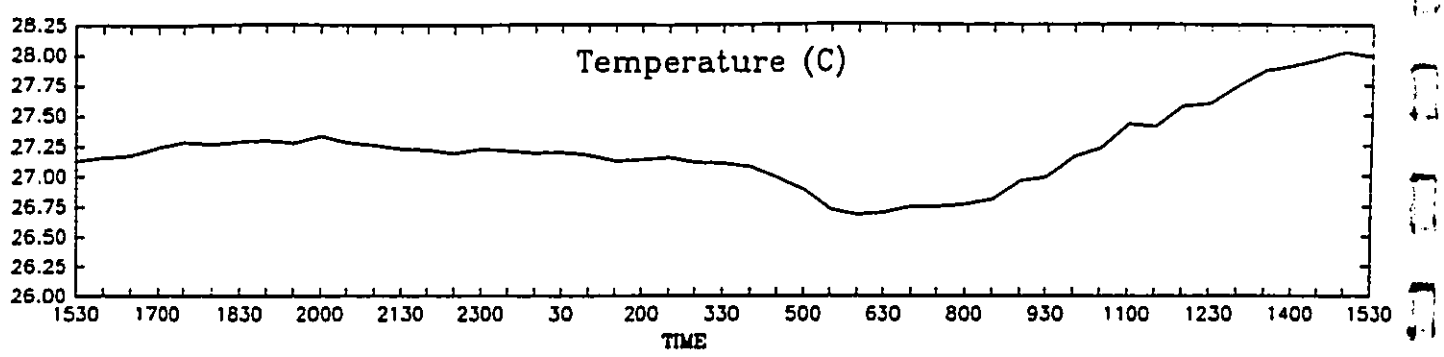
Location	Time	Temp (C)	pH	Salin. (ppt)	DO (mg/L)
Station 4 Surface	11:10.00	27.33	8.09	34.1	6.20
	11:10.10	27.34	8.09	34.2	6.18
	11:10.20	27.36	8.08	34.2	6.07
	11:10.30	27.35	8.08	34.2	5.94
	[illegible]				
Station 5 Surface	11:45.00	26.80	8.08	31.1	5.94
	11:45.10	26.87	8.09	31.8	5.79
	11:45.20	26.86	8.09	31.8	5.84
	11:45.30	26.87	8.09	31.5	5.83
	11:45.40	26.80	8.10	31.0	5.72
	11:47.10	26.99	8.10	32.4	5.70
	11:47.20	26.90	8.10	32.3	5.65
	11:47.30	26.99	8.11	33.7	5.58
	11:47.40	27.10	8.10	33.2	5.52
	11:47.50	26.99	8.10	32.8	5.45
	11:48.00	27.10	8.11	33.7	5.52
	11:48.10	26.81	8.14	33.8	5.73
	[illegible]				

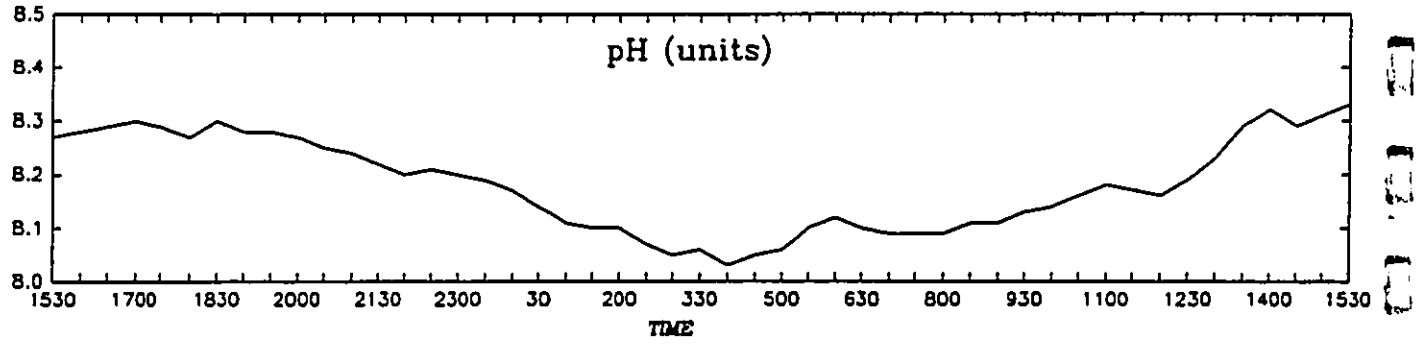
Location	Time	Temp (C)	pH	Salin. (ppt)	DO (mg/L)
Station 6 Surface	11:45.50	26.93	8.08	33.2	5.68
	11:46.00	27.06	8.10	33.2	5.61
	11:46.10	27.08	8.09	32.7	5.54
	11:46.20	26.94	8.10	32.0	5.62
	11:46.30	26.96	8.09	32.1	5.72
	11:46.40	27.01	8.10	32.3	5.69
	11:46.50	26.91	8.10	31.9	5.80
	11:47.00	27.13	8.10	32.8	5.80
	avg.	27.00	8.10	32.5	5.68
	geo.mean	27.00	8.09	32.5	5.68
	std. dev.	0.08	0.01	0.5	0.09
Station 6 Bottom	11:48.20	26.71	8.15	33.8	6.36
	11:48.30	26.75	8.15	33.8	6.45
	11:48.40	26.80	8.17	33.9	6.64
	11:48.50	26.73	8.18	33.9	6.90
	11:49.00	26.73	8.18	33.9	6.90
	11:49.10	26.77	8.18	33.9	6.97
	11:49.20	26.79	8.18	33.9	6.96
	11:49.30	26.75	8.18	33.9	6.95
	11:49.40	26.78	8.18	33.9	6.87
	11:49.50	27.16	8.14	34.0	6.69
	avg.	26.80	8.17	33.9	6.77
	geo.mean	26.80	8.17	33.9	6.77
	std. dev.	0.12	0.02	0.1	0.22
Station 7 Surface	8:05.00	26.55	7.98	32.8	5.02
	8:06.00	26.56	8.01	32.8	4.57
	8:07.00	26.57	8.01	32.7	4.20
	8:08.00	26.16	8.02	31.9	4.77
	8:09.00	25.84	8.03	31.1	5.04
	avg.	26.34	8.01	32.26	4.72
	geo. mean	26.32	8.01	32.25	4.71
	std. dev.	0.29	0.02	0.75	0.38
Station 8 Surface	17:18.57	26.80	8.19	34.2	6.34
	17:19.53	26.81	8.20	34.2	6.03
	17:22.05	26.82	8.20	34.2	6.12
	avg.	26.81	8.20	34.2	6.16
	geo. mean	26.81	8.20	34.2	6.16
	std. dev.	0.01	0.00	0.0	0.16
Station 8 Top	8:22.00	27.24	8.09	34.2	5.70
	8:23.00	26.89	8.06	34.1	3.98
	avg.	27.07	8.08	34.1	4.84
	geo. mean	27.06	8.08	34.1	4.76
	std. dev.	0.25	0.02	0.1	1.22

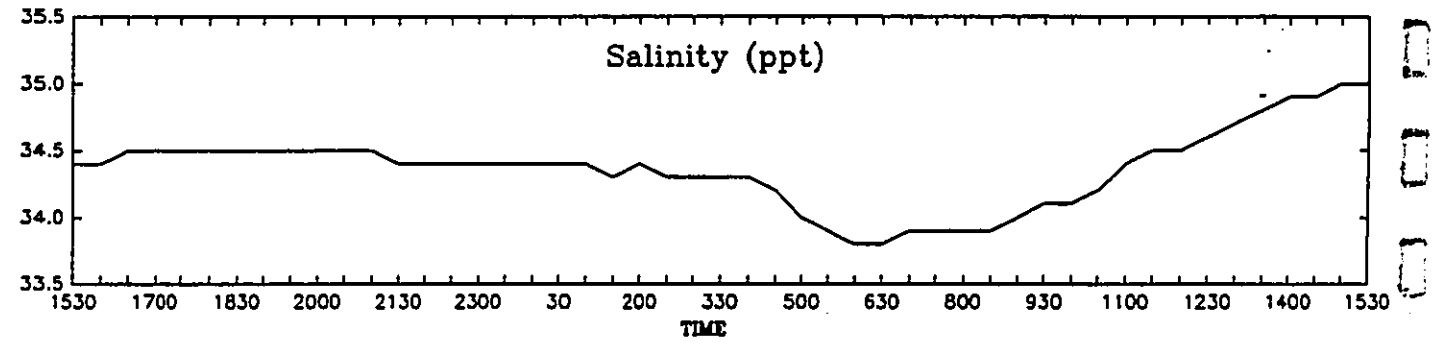
Coconut Island Laboratory Lagoon

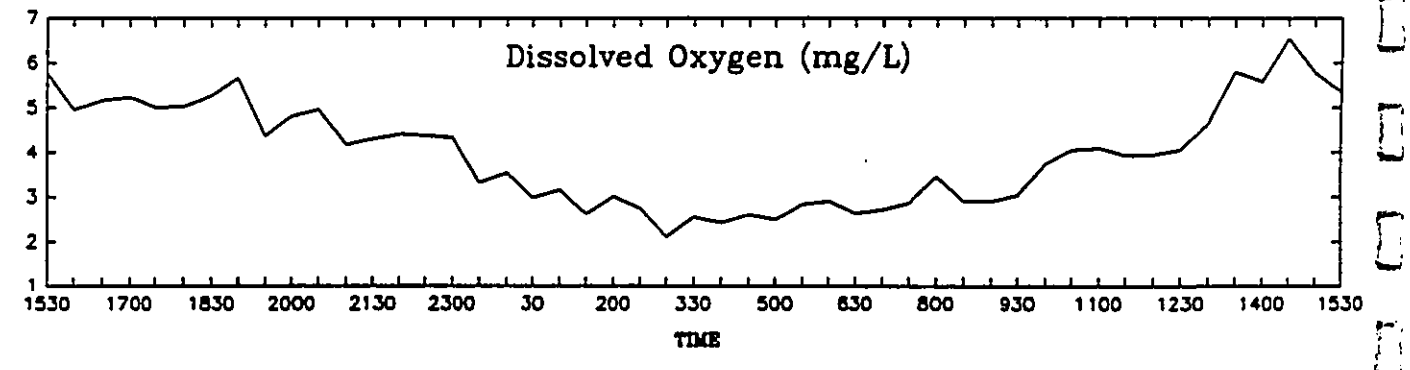
Center Bridge Walkway Depth = 5 feet

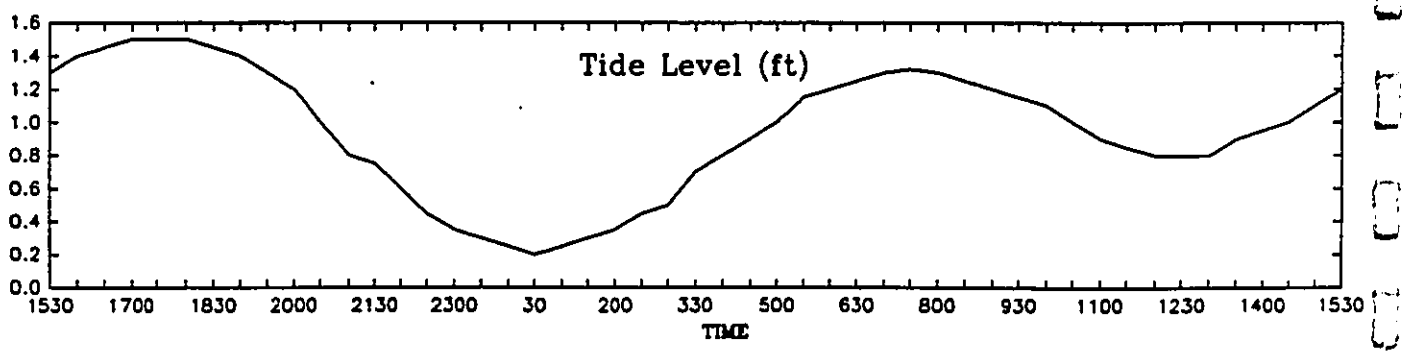
July 27/28, 1994







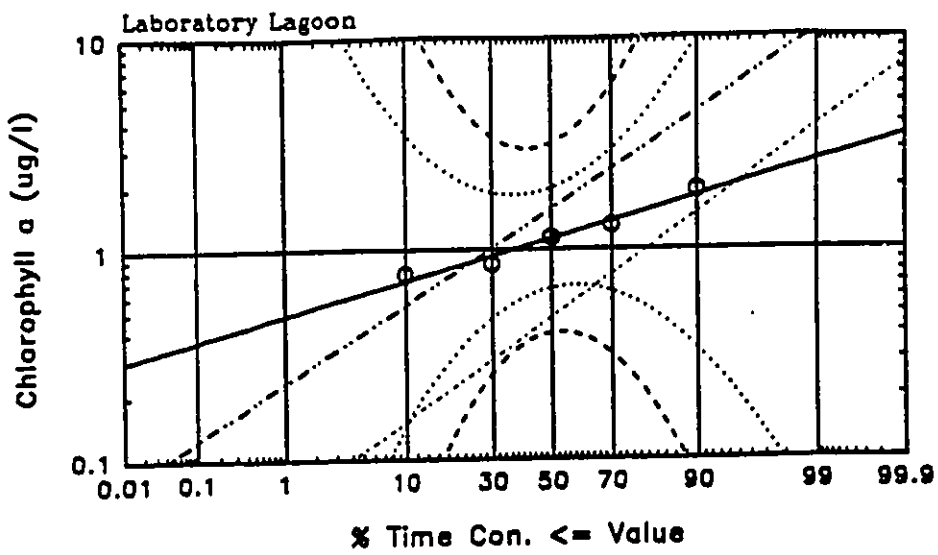


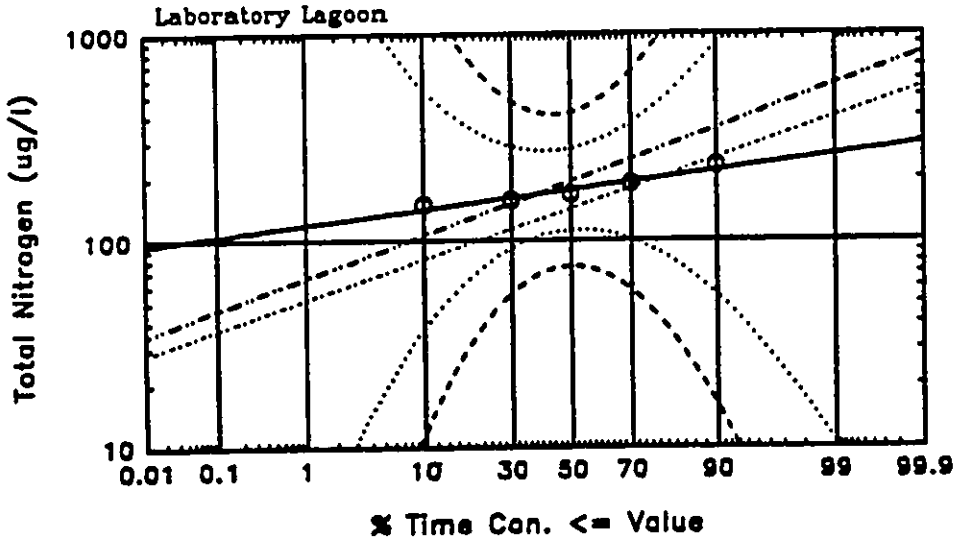


Turbidity (NTU) Coconut Island
July 21, 1994

Station	First Reading	Second Reading	Average
1-Surface	0.54	0.91	0.73
1-Bottom	1.45	1.46	1.46
2-Surface	0.62	0.67	0.65
3-Surface	1.45	1.52	1.49
4-Surface	1.04	0.85	0.95
5-Surface	1.17	1.27	1.22
6-Bottom	0.94	1.03	0.99
7-Surface	1.31	1.43	1.37
8-Surface	2.51	2.37	2.44
9-Surface	1.14	1.17	1.16

The first four readings were taken at the maintenance lagoon, while the last five readings were taken at the laboratory lagoon. The measurements were performed with a Turner Model 40 Nephelometer.





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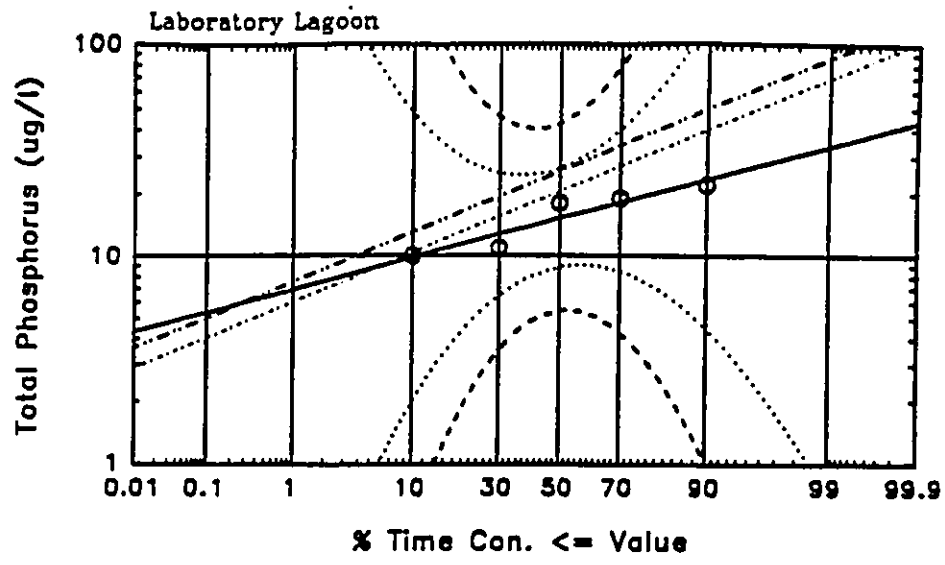
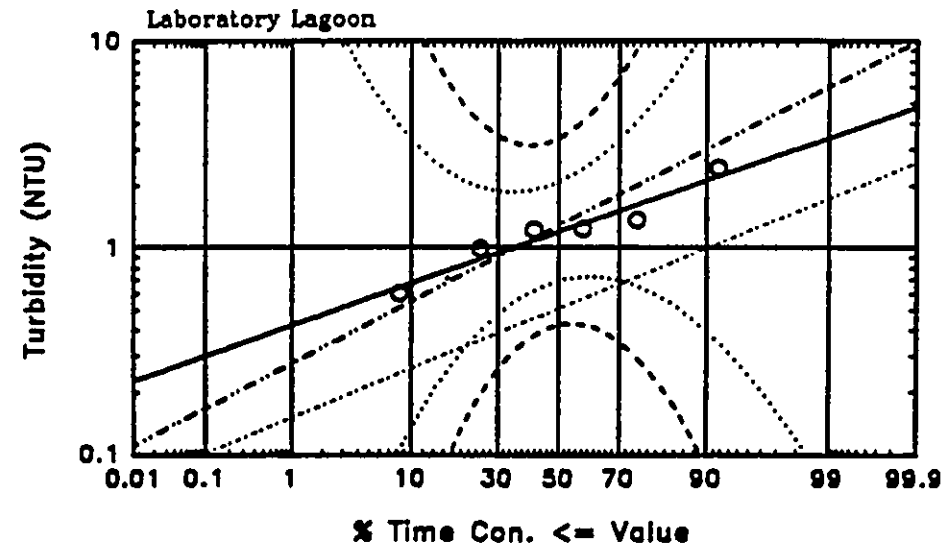
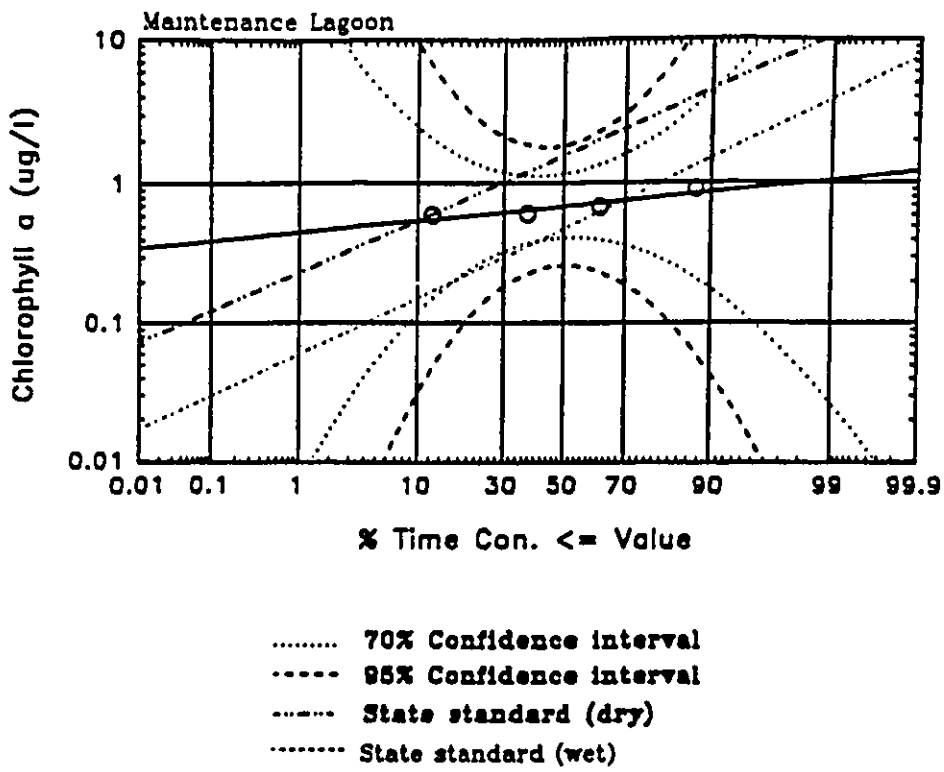
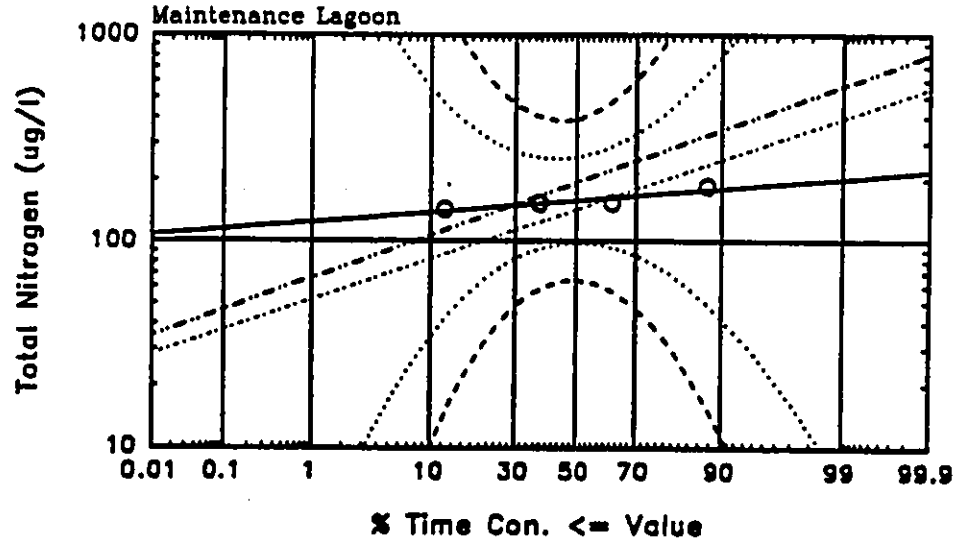




Oceanit Laboratories, Inc.





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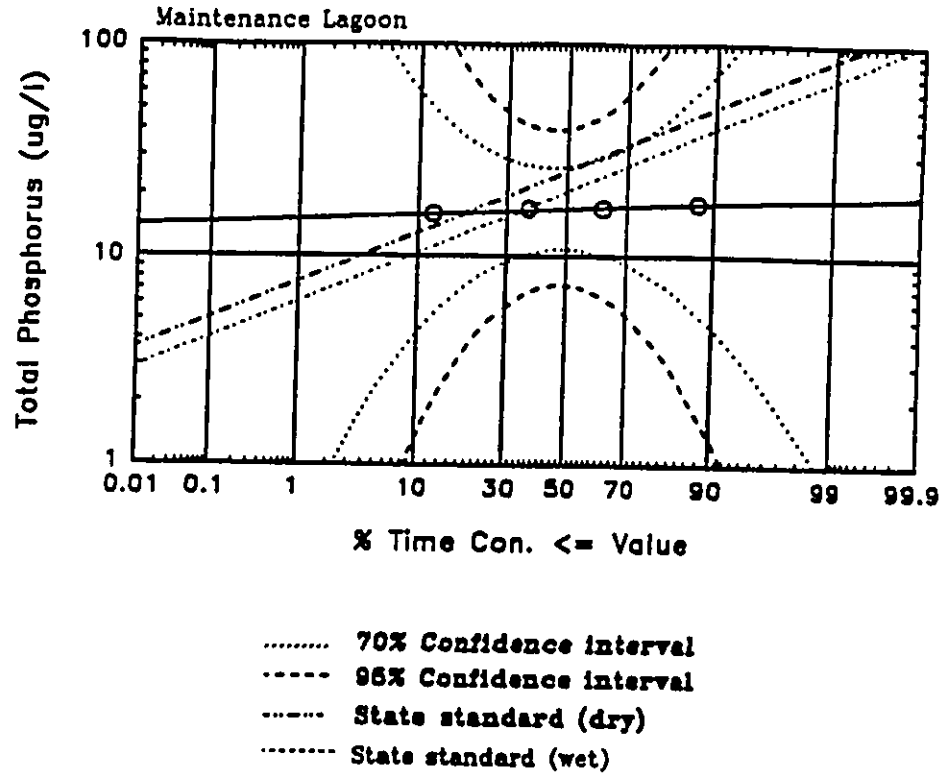

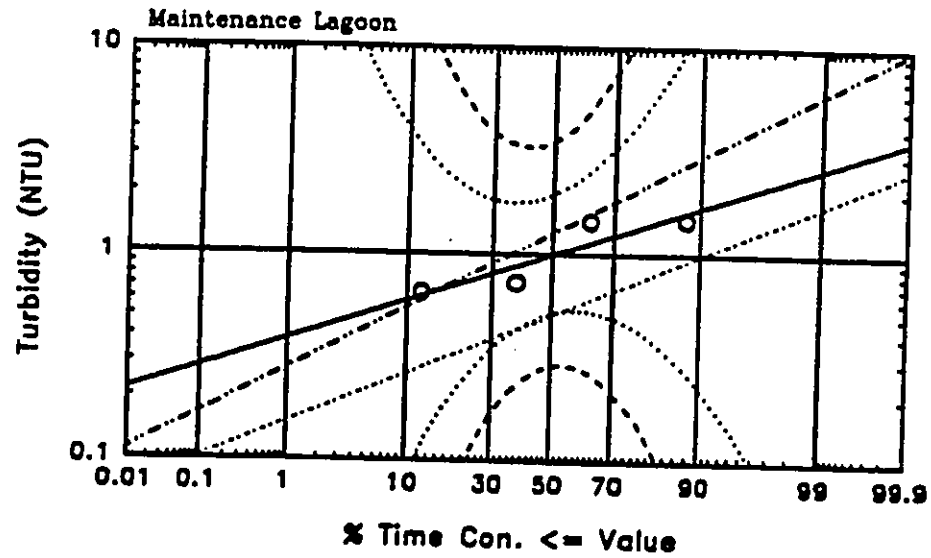

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APPENDIX B

BIOLOGICAL TRANSECT RESULTS

Oceanit Laboratories, Inc.
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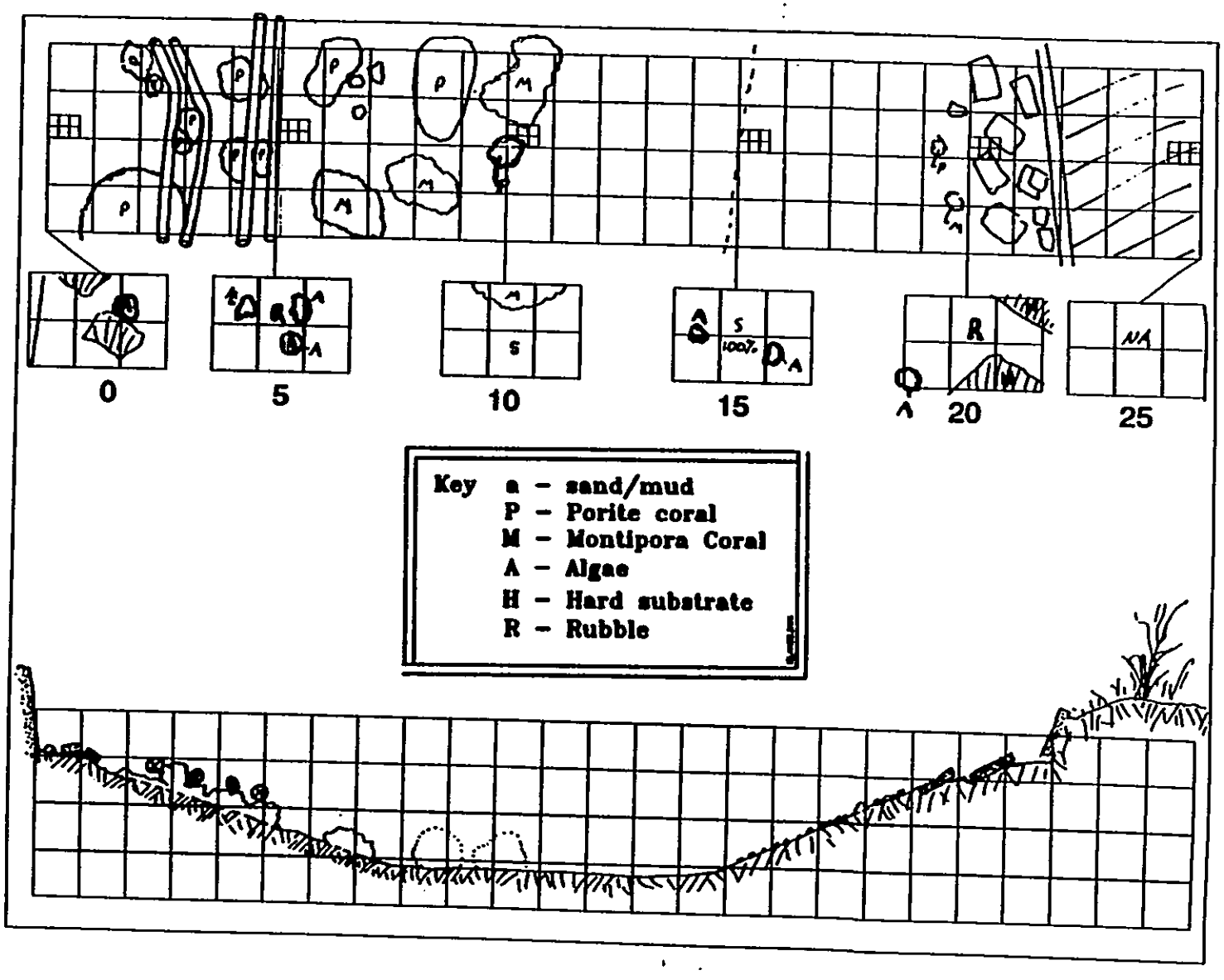
SPECIES	A*	B*	C*	D*	
FISH	LAB.		MAINT.		
Abudefduf abdominalis (Mamano)	1	x	0	x	
Cirripectes vanderbilti	1	x	0		
Dascyllus albisella (Alo'ilo'i)	2	x	0	x	
Stolephorous purpureus (Nehu)	100	x	0		
Acanthurus sp.	0	x	0		
Mulloides flavolineatus (Weke)	0	x	0	x	
Scarus perspicillatus (Uhu)	0	x	0		
Sphyraena barracuda (Kaku)	0	x	0		
Zanclus cornutus (Kihikihi)	0	x	0	x	
Zebrasoma flavescens ('Api)	0	x	0	x	
Mugil cephalus ('Ama'ama)	0	x	0		
Chaetodon miliaris (Lauhau)	0	x	0		
C. lunula (Kikakapu)	0	x	0		
C. ephippium (Kikakapu)	1	x	0		
CORALS					
Porites compressa	common	x	dominant	x	
Pocillipora damicornis	rare	x	rare	x	
Montipora verrucosa	common	x	rare	x	
INVERTEBRATES					
Ophiodesoma spectabilis	18	x	7	x	
Ostrea hanleyana	NQ	x	NQ	x	
Palythoa vestitus	NQ	x	0		
Sabellastarte sanctijosephi	57/18m^2	x	17/12m^2	x	
Zoanthus sp.	NQ	x	0		
ALGAE					
Dictyospheria cavernosa	NQ	x	NQ	x	
Dictyota acutiloba	NQ	x	0		
Dictyota bartayresii	NQ	x	0		
Hypnea sp.	NQ	x	0		
Padina australis	NQ	x	NQ	x	
Acanthophora spicifera	NQ	x	NQ	x	
Gracilaria salicornia	NQ		NQ	x	
PERCENT COVER	Touch	By quadrat	Touch	By quadrat	
Sand / mud	43	37	49	51	
Rock / consolidated coral	20 **	8	2	0	
Live coral	6	5	38	39	
Algae	8	5	0	1	
Rubble	24	48	12	8	

* Columns A and C represent species within the transect boundaries.
Columns B and D indicate qualitative presence of species noted in or near the transect

** Includes 3 touch points on PVC pipes

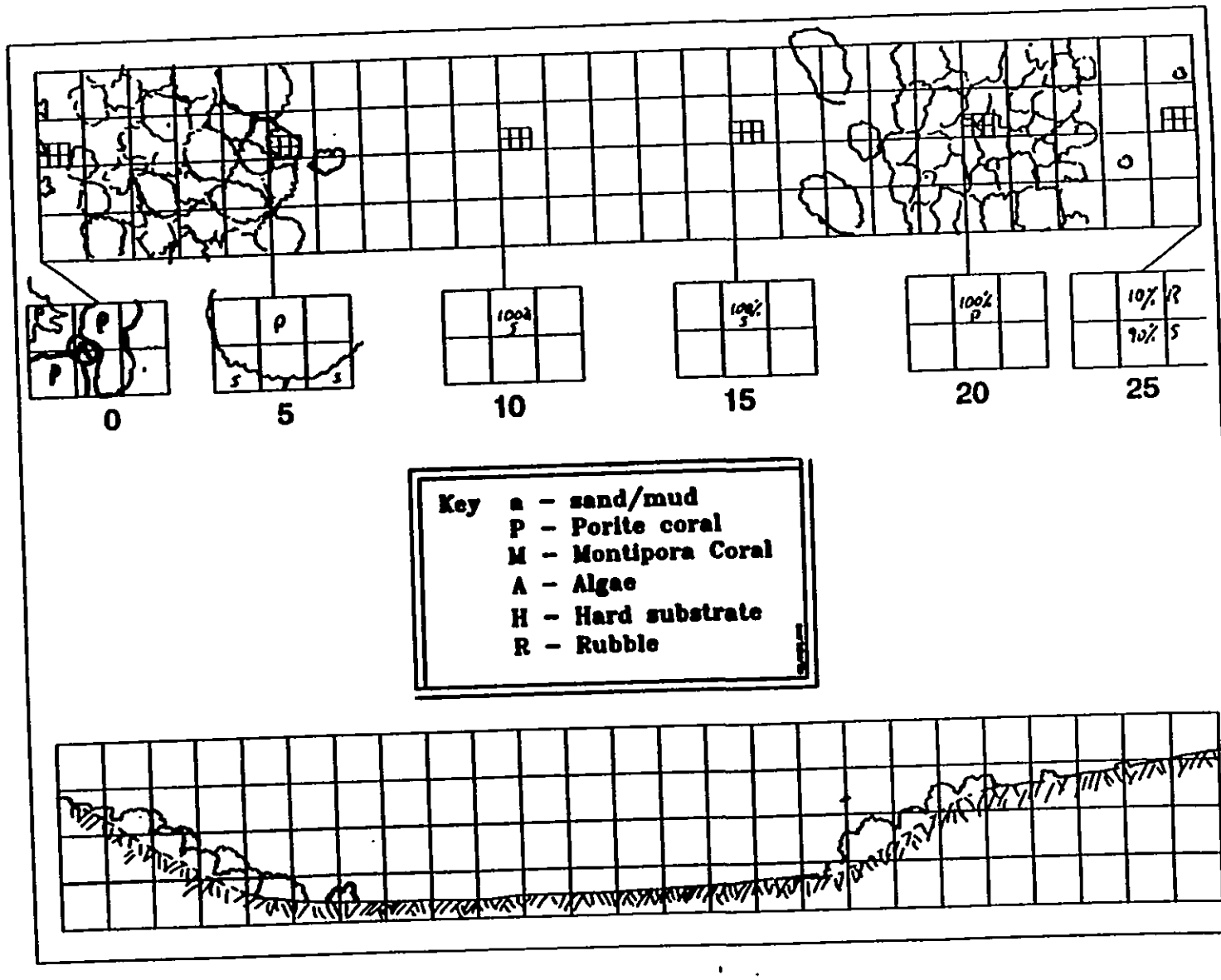
NQ Present but not quantified within transect

TRANSECT CROSS SECTIONS



Laboratory Lagoon

TRANSECT CROSS SECTIONS



Maintenance Lagoon

Appendix B

Construction Phase Exhaust Emissions

Appendix B

Construction Phase Exhaust Emissions

		CARBON MONOXIDE		EXHAUST ROG		NITROGEN OXIDES		SULFUR OXIDES		PARTICULATES	
Equipment	No. of Days Used Per Year	Emission Rate (lb/d)	Emission Rate (lb/yr)	Emission Rate (lb/d)	Emission Rate (lb/yr)	Emission Rate (lb/d)	Emission Rate (lb/yr)	Emission Rate (lb/d)	Emission Rate (lb/yr)	Emission Rate (lb/d)	Emission Rate (lb/yr)
25-Ton Grove Hydraulic Crane	200	9.45	1890	3.15	630	24.15	4830	2.10	420	1.58	315
Boom Truck with Flat-bed	200	10.76	2153	1.15	230	25.00	4999	2.72	545	1.54	307
Wheeled Backhoe/Loader	90	3.43	309	1.50	135	11.34	1021	1.09	98	1.03	93
Concrete Mixer (3-cubic yard)	90	4.05	365	0.91	82	10.15	913	0.86	77	0.83	75
Vibratory hammer (small)	90	1.25	113	0.19	17	1.38	124	1.38	124	0.09	8
Compressor/generator	260	5.40	1404	1.22	316	13.53	3517	1.14	297	1.11	289
Service Truck	260	1.79	466	0.19	50	4.17	1083	0.45	118	0.26	67
LCU 165 bhp	20	2.46	49	1.75	35	3.52	70	NA	0	NA	0
325 bhp	20	2.00	40	1.92	38	11.44	229	NA	0	NA	0
Generator	20	0.60	12	1.79	36	10.44	209	0.57	11	NA	0
Total Emissions (lbs/yr)		41.21	6801	13.77	1570	115.11	16995	10.32	1691	6.44	1154
Total Emissions (tons/yr)			3.4		0.8		8.5		0.8		0.6

Appendix B
Construction Phase Exhaust Emissions
(Continued)

Source: Unless otherwise noted, emission factors were obtained from U.S. EPA, "Compilation of Emission Factors: Volume II - Mobile Sources," September 1985.
Emission (lb/d) = (No. used) * (time (hr/d)) * (emission factor (lb/hr))
If maximum rated capacity provided, with the exception of LCU, the following equation is used:
Emission (lb/d) = (No. used) * (time (hr/d)) * (max. rated capacity (hp)) * (% load/100) * (emission factor (lb/hr))

(a) 350 hp crane assumed. Percent load assumed for equipment of same size used at other project sites. Source of crane emission factors: South Coast Air Quality Management, "CEQA Air Quality Handbook," April 1993.
(b) "Off-highway truck" emission factor used.
(c) "Wheeled loader" emission factor used.
(d) "Miscellaneous" emission factor used.
(e) Trenching machine emission factor used. Source: South Coast Air Quality Management, "CEQA Air Quality Handbook," April 1993.
(f) Information regarding LCU provided by HIMB (memo from R. T. Horii, Jr. to Brigadier General R. F. Vercauteren, 23 August 1994).
Three engines are used to propel the Landing Craft, Utility (LCU). Two additional diesel generators are used to provide electricity for auxillary functions.
Speed = 12.0 km/hr

Other assumptions for LCU:

2 engines of 325 bhp and 1 engine of 165 bhp size
200 hp emission factors used for 165 bhp engine; 300 hp emission factors used for 325 bhp engines.
34 gal/hr consumed is assumed to be equally apportioned between 3 propulsion engines; therefore, 11.3 gallons/engine assumed.
One round trip per day.
Length of round trip travel = 18 km (estimated: between Kaneohe Harbor and Coconut Island Harbor)
Time of travel = (18km)/(12.0 km/hr) = 1.5 hr
Number of hours generator used for auxillary power = 5.5 hours

Propulsion engine emissions:
Emission (lb/d) = (No. used) x (time of travel (hr)) x (gallons of fuel consumed/hr) x (emission factor (lb/1000 gallons of fuel))
= (No. used) x ((1.5 hrd) x (11.3 gallons/hr/engine) x (emission factor (lb/1000 gallons of fuel))

Engines for auxillary power:
Emission (lb/d) = (No. used) x (time (hr/d)) x ((9.59 x 10 - 5) x 1000 gallons of fuel/kwh) x (rated output (kw)) x (emission factor (lb/1000 gallons fuel)) where 9.59x10-5 x 1000 gallons of fuel/kwh is a conversion factor used to relate fuel consumption to kwh

(Source: Souza, A.F., "A Study of Emissions from Coast Guard Cutters," February 1973)
75 % load emission factor assumed

Appendix C

Botanical Survey, HIMB Expansion at Coconut Island,
Additional Studies, July 1995

Botanical Survey, HIMB Expansion at Coconut Island,
Ko'olau Poko District, Island of Oahu, July 1994

CHAR & ASSOCIATES
Botanical/Environmental Consultants
4471 Puu Panini Ave.
Honolulu, Hawaii 96816
(808) 734-7828

July 1995

BOTANICAL SURVEY
HIMB EXPANSION AT COCONUT ISLAND
ADDITIONAL STUDIES

INTRODUCTION

The original field studies and botanical report for the proposed expansion of the Hawai'i Institute of Marine Biology (HIMB) at Coconut Island, or Moku Lo'e, were undertaken in June and July 1994 (Char 1994). Since that time, the State has been able to acquire additional property on the island. Two new buildings and appurtenant facilities are planned for this additional site.

Field studies to assess the botanical resources on this additional site were conducted on 20 June 1995. The primary objectives of the survey were to: 1) provide a general description of the vegetation; 2) inventory the flora; 3) search for threatened and endangered species as well as rare and vulnerable plants; and 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

SURVEY METHODS

Prior to undertaking the field survey, a search was made of the pertinent literature to familiarize the principal investigator with other studies conducted in the general area. A topographic map and site plans were studied to familiarize the principal investigator with the topography, boundaries, existing structures,

and various plantings.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, disturbances, drainage, topography, exposure, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium, and for comparison with the taxonomic literature.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species checklist, especially of the weedy, annual plants.

DESCRIPTION OF THE VEGETATION

The plant names used in the following discussion follow Wagner et al. (1990) for the naturalized species and St. John (1973) for the ornamental plants. A list of the plants found during the field survey is presented at the end of the report. Only a cursory study was made of the maintained area around the existing residence.

The majority of the project site was landscaped at one time and there are many scattered remnants of plantings and small groves of trees. Most of the site, however, is now overgrown with weedy scrub vegetation composed of koa-haole shrubs (Leucaena leucocephala), clumps of sour grass (Digitaria insularis), and dense, sprawling mats of Chinese violet (Asystasia gangetica). In some places, huehue haole (Passiflora suberosa), a weedy passionflower with small, round dark purple fruits, is locally common.

A grove of very large trees of an Elaeodendron species is found on the southern end of the property near some old chicken coops. Scattered in among the large Elaeodendron trees are a few smaller trees of pink tecoma (Tabebuia pentaphylla), milo (Thespesia populnea), and macadamia nut (Macadamia integrifolia). Along the eastern perimeter is a line of ironwood trees (Casuarina equisetifolia) with scattered milo.

Various fruit trees are frequently encountered on the property including a number of citrus such as orange (Citrus sinensis), lime (Citrus aurantifolia), and tangerine (Citrus reticulata), as well as mango (Mangifera indica), lychee (Litchi chinensis), tamarind (Tamarindus indica), and macadamia nut. Small groves of coconut (Cocos nucifera) and date palm (Phoenix sp.) are scattered here and there. Behind the existing frame structure, there is a small planting with pickle tree or bilimbi (Averrhoa bilimbi), 'ulu or breadfruit (Artocarpus altilis), and star apple or cainito (Chrysophyllum cainito).

DISCUSSION AND RECOMMENDATIONS

Coconut Island has been greatly disturbed in the past with much of the island consisting of fill land. Today, there are no remnants of the original native vegetation left. The vegetation presently found on the island consists almost exclusively of introduced or alien species, many of them ornamental, landscape plants. The botanical study (Char 1994) for the HIMB expansion site recorded a total of 87 plant species; 91% of the plants inventoried were introduced. All of the native plants found during that survey and the present survey are indigenous, that is, they are native to the Hawaiian Islands and also elsewhere throughout the Pacific and the tropics. No listed, proposed or candidate threatened and endangered species (U.S. Fish and Wildlife Service 1994) were found during the earlier study or

the current study. No plants considered rare or vulnerable (Wagner et al. 1990) were found.

The proposed additional development should not have a significant negative impact on the botanical resources. The majority of the plants can be found cultivated or naturalized throughout the Hawaiian Islands and elsewhere.

The buildings proposed for the site will displace some of the trees, however, the majority of the larger specimens will be preserved in situ and incorporated into the landscape plans. These existing plantings will provide some visual bufferring or screening of the proposed buildings.

It is recommended that some of the smaller trees which would be displaced by the buildings be transplanted and "reused" for landscaping the grounds of the new facilities. It is also recommended that more native species and Polynesian heritage plants be used in the landscaping. These could include more plantings of milo, kou (Cordia subcordata), kamani (Calophyllum inophyllum), loulu (Pritchardia spp.), naio (Myoporum sandwicensis), ma'o or the Hawaiian cotton (Gossypium tomentosum), etc. A horticulturist familiar with using native and Polynesian plants for landscaping should be consulted. "Act 73" which was passed by the Hawai'i legislature in 1991 mandates that any new or renovated landscapings for facilities developed with State funds incorporate native Hawaiian plants wherever and whenever possible.

PLANT SPECIES LIST -- HIMB, Additional Studies

A checklist of the vascular plant species encountered during the field studies is presented below. The species are arranged alphabetically by families within each of four groups: Ferns, Gymnosperms, Monocots, and Dicots. The taxonomy and nomenclature of the Ferns follow Lamoureux (1988); the Gymnosperms follow St. John (1973); and the flowering plants, Monocots and Dicots, are in accordance with Wagner et al. (1990) for the naturalized species and St. John (1973) for the ornamental plants.

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

I = indigenous = native to the Hawaiian Islands and also elsewhere throughout the Pacific and/or tropics.

P = Polynesian = plants originally of Polynesian introduction prior to Western contact (Cook's discovery of the islands in 1778); not native.

X = introduced or alien = all those plants brought to the islands by humans, intentionally or accidentally, after Western contact; not native.

Scientific name	Common name	Status
FERNS		
POLYPODIACEAE (Common Fern Family)		
Phymatosorus scolopendria (Burm.) Pic-Ser.	laua'e, lauwa'e	X
GYMNOSPERMS (Conifers)		
ARAUCARIACEAE (Araucaria Family)		
Agathis robusta (C. Moore ex F. Muell.) F.M. Bailey	Queensland kauri	X
Araucaria columnaris (Forst. f.) Hook.	Cook pine	X
FLOWERING PLANTS		
MONOCOTS		
ARECACEAE (Palm Family)		
Cocos nucifera L.	coconut, niu	P
Livistona chinensis (Jacq.) R. Br. ex Mart.	Chinese fan palm, fountain palm	X
Phoenix sp.	date palm	X
CYPERACEAE (Sedge Family)		
Cyperus gracilis R. Br.	McCoy grass	X
POACEAE (Grass Family)		
Chloris barbata (L.) Sw.	swollen fingergrass, mau'ulei	X
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X
Digitaria insularis (L.) Mez ex Ekman	sour grass	X
Eleusine indica (L.) Gaertn.	wiregrass, goosegrass	X
Panicum maximum Jacq.	Guinea grass	X
Paspalum conjugatum Bergius	Hilo grass, mau'u Hilo	X
Stenotaphrum secundatum (Walt.) Ktze.	buffalo grass, St. Augustine grass	X
Zoysia tenuifolia Willd. ex Trin.	Japanese lawngrass	X

Scientific name	Common name	Status
DICOTS		
ACANTHACEAE (Acanthus Family)		
Asystasia gangetica (L.) T. Anderson	Chinese violet	X
Barleria cristata L.	Philippine violet	X
ANACARDIACEAE (Mango Family)		
Mangifera indica L.	mango, manako	X
Schinus terebinthifolius Raddi	Christmas berry, wilelaiki	X
APOCYNACEAE (Dogbane Family)		
Cascabela thevetia (L.) Lippold	be-still tree, nohomalie	X
ASTERACEAE (Daisy Family)		
Bidens pilosa L.	Spanish needle, beggar's tick, ki, ki nehe	X
Calyptocarpus vialis Less.	hierba del cabello	X
Conyza bonariensis (L.) Cronq.	hairy horseweed	X
Pluchea symphytifolia (Mill.) Gillis	pluchea, sour bush	X
Tridax procumbens L.	coatbuttons	X
Wedelia trilobata (L.) Hitchc.	wedelia	X
BIGNONIACEAE (Bignonia Family)		
Tabebuia pentaphylla (L.) Hemsl.	pink tecoma	X
CASUARINACEAE (Ironwood Family)		
Casuarina equisetifolia L.	ironwood, paina	X
CELASTRACEAE (Bittersweet Family)		
Elaeodendron sp.		X
CUCURBITACEAE (Squash Family)		
Coccinia grandis (L.) Voight	ivy gourd, coccinia	X
EUPHORBIACEAE (Spurge Family)		
Chamaesyce hirta (L.) Millsp.	hairy spurge	X

Scientific name	Common name	Status
FABACEAE (Pea Family)		
Desmanthus virgatus (L.) Willd.	virgate mimosa	X
Desmodium incanum DC.	Spanish clover, ka'imi	X
Leucaena leucocephala (Lam.) de Wit	koa-haole	X
Pterocarpus indicus Willd.	narra	X
Samanea saman (Jacq.) Merr.	monkeypod	X
Tamarindus indica L.	tamarind	X
MALVACEAE (Mallow Family)		
Malvastrum coromandelianum (L.) Garcke	false mallow, hauuoi	X
Thespesia populnea (L.) Sol. ex Correa	milo	I?
MORACEAE (Mulberry Family)		
Artocarpus altilis (Parkins. ex Z) Fosb.	breadfruit, 'ulu	P
Ficus microcarpa L.f.	Chinese banyan	X
OXALIDACEAE (Wood Sorrel Family)		
Averrhoa bilimbi L.	bilimbi	X
PASSIFLORACEAE (Passion Flower Family)		
Passiflora suberosa L.	huehue haole	X
PLUMBAGINACEAE (Leadwort Family)		
Plumbago auriculata Lam.	blue plumbago	X
POLYGONACEAE (Buckwheat Family)		
Antigonon leptopus Hook. & Arnott	Mexican creeper, chain-of-hearts	X
PROTEACEAE (Protea Family)		
Grevillea robusta A. Cunn.	silk oak, silver oak, 'oka-kilika	X
Macadamia integrifolia Maiden & Betche	macadamia nut, Queensland nut	X

Scientific name	Common name	Status
RUTACEAE (Rue Family)		
Citrus aurantifolia (Christm.) Swingle	lime	X
Citrus reticulata Blanco	tangerine	X
Citrus sinensis (L.) Osbeck	orange	X
Murraya paniculata (L.) Jack	mock orange	X
SAPINDACEAE (Soapberry Family)		
Litchi chinensis Sonn.	litchi, lychee	X
SAPOTACEAE (Sapodilla Family)		
Chrysophyllum cainito L.	star apple, cainito	X
VERBENACEAE (Verbena Family)		
Stachytarpheta urticifolia (Salisb.) Sims	nettle-leaved vervain, owi, oi	X

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BOTANICAL SURVEY
HIMB EXPANSION AT COCONUT ISLAND
KO'OLAU POKO DISTRICT, ISLAND OF O'AHU

by

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BOTANICAL SURVEY
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INTRODUCTION

The Hawai'i Institute of Marine Biology (HIMB) is located on Coconut Island, or Moku o Lo'e, in the southern portion of Kane-'ohe Bay, windward O'ahu. The HIMB facilities are found on the peripheral areas of the island on fill land; the material for the fill was dredged from the fringing reef during the 1930's. The proposed expansion project will involve the demolition of three existing buildings; replacement or repair of existing seawalls; construction of a new three-story laboratory building; and relocation and expansion of an existing maintenance building.

Field studies to assess the botanical resources found on the sites proposed for the new buildings as well as other areas to be impacted by the construction activities were conducted on 09 June 1994. The primary objectives of the field studies were to: 1) describe the major vegetation types; 2) inventory the flora; 3) search for threatened and endangered species as well as rare and vulnerable plants; and 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Topographic maps and site plan maps were studied to familiarize

the principal investigator with terrain characteristics, access, boundaries, reference points, and the locations of existing structures.

The sites for the new buildings were surveyed as well as the areas to be impacted during the construction; these included the proposed docking area, the proposed storage area for construction materials and debris from the demolished buildings, and the existing roads which would be used during the expansion project. A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, topography, exposure, drainage, disturbance, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium, and for comparison with the most recent taxonomic literature.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual plants.

DESCRIPTION OF THE VEGETATION

A discussion of the vegetation found on the areas that will be impacted by the expansion is presented below. A list of the plants found during the studies is given in the species checklist at the end of the report. The list includes those plants naturalized on the sites, and does not include ornamental specimens grown in containers, planters, pots, etc.

New Marine Laboratory Building Site

This site supports an existing maintenance building, lunch room, and laboratory building which will be removed. The area around

the buildings supports a lawn of zoysia (Zoysia tenuifolia) and a small grove of coconut trees (Cocos nucifera), 40 to 50 ft. tall. A few rows of spider lily (Crinum asiaticum) can also be found in the lawn area. Near the shoreline and seawalls there is a mixed ground cover composed of Spanish clover (Desmodium incanum), Bermuda grass (Cynodon dactylon), and wedelia (Wedelia trilobata) with scattered clumps of Indian pluchea shrubs (Pluchea indica), sea grape (Coccoloba uvifera), and small ironwood trees (Casuarina equisetifolia). At the water's edge, there are a few saplings of mangrove (Rhizophora mangle), 1 to 3 ft. tall.

New Maintenance Building Site

This site supports an existing boat repair shop which will be removed for the proposed new maintenance building. The substrate on this site is mostly crushed coralline material with only a very thin layer of soil in some places. The ground cover is a mixture of Bermuda grass and a varied assortment of weedy species which include Spanish clover, bitter herb (Centaurium erythraea), chili clover (Desmodium sandwicense), Alysicarpus vaginalis, common sandbur (Cenchrus echinatus), crabgrass (Digitaria adscendens), hairy horseweed (Conyza bonariensis), etc. Where it is shaded and the ground is moist, plants such as the whisk fern (Psilotum nudum), lauwa'e fern (Phymatosorus scolopendria), oriental hawksbeard (Youngia japonica), and artillary plant (Pilea microphylla) are found. Nostoc, a blue-green algae, forms lumpy patches on the areas with coralline rubble.

A few coconut trees are found near the boat repair shop. Other woody components include a few small shrubs of koa-haole (Leucaena leucocephala), Indian pluchea, milo saplings (Thespesia populnea), ironwood saplings, and sea grape. Along the water's edge, a few small mangove trees and low mats of pickleweed (Batis maritima) are found.

Proposed Docking Area

This site is located south of the boat repair shop and will be used for unloading building materials and construction equipment. The vegetation on this area consists of a lawn composed primarily of buffalo grass or St. Augustine grass (Stenotaphrum secundatum) as well as some of the weedy species found on the lawn of the nearby boat repair shop. Five coconut trees and a dense stand of ironwood trees are also found in the area.

Proposed Storage Site

This site is located on the small peninsula between the boat landing and the boat repair shop. The site will be used for storing construction material as well as parts of the demolished buildings which will later be removed from the island.

The peninsula is partially landscaped around the boat landing and a portion of the access road. There are planter boxes and pots with several hybrid ti leaf cultivars, bamboo, dumb cane, hybrid croton, variegated spider plant, etc. Two large stone rings contain Chinese banyan trees (Ficus microcarpa), about 20 ft. tall, and shrubs of caricature plant (Graptophyllum pictum). Coconut trees and a few pruned ironwood trees are found near the boat landing. A large pile of rubbish, mostly lawn trimmings and old wood, is also found on the peninsula. The pile supports a dense tangled mat of ivy gourd vine (Coccinia grandis), and several landscape specimens which have established themselves here; these include taro vine (Epipremnum pinnatum), papaya (Carica papaya), be-still-tree (Cascabela thevetia), gunpowder tree (Trema orientalis), and young coconut trees.

The infrequently maintained areas support a weedy mix of grasses, herbs, and shrubs. The most commonly observed grasses are swollen

finger grass (Chloris barbata), pitted beardgrass (Bothriochloa pertusa), Bermuda grass, and Indian dropseed (Sporobolus indicus). Commonly observed herbaceous species include bitter herb, hairy spurge (Chamaesyce hirta), Spanish needle (Bidens pilosa), Jamaica vervain (Stachytarpheta jamaicensis), and buttonweed (Spermacoce assurgens). Indian pluchea shrubs form rounded clumps, 3 to 6 ft. tall, along the seawall. Small stands of mangrove are found along the water's edge, but are especially numerous south of the boat landing.

Existing Access Road

The roadbed of the existing access road consists of crushed coral. Most of the weedy species found on the other sites also occur alongside the road. A few species can tolerate compacted substrates as well as vehicular and pedestrian traffic and, thus, can grow on the road itself. These include Indian dropseed, Bermuda grass, and wiregrass (Eleusine indica).

DISCUSSION AND RECOMMENDATIONS

The areas that will be impacted by the proposed HIMB expansion are dominated by introduced or alien species. Of a total of 87 species inventoried during the field survey, 79 (91%) are introduced; 2 (2%) are originally of Polynesian introduction; and 6 (7%) are native. All the native species are indigenous, that is, they are native to the Hawaiian Islands and also elsewhere. No endemic species (i.e., native only to the Hawaiian Islands) were found. None of the plants is a listed, proposed, or candidate threatened and endangered species (U.S. Fish and Wildlife Service 1989, 1990, 1994). The HIMB expansion sites as well as the rest of the island have been so greatly disturbed in the past that there are no sensitive native plant-dominated communities remaining on the island.

In summary, there is little of botanical interest on the sites that will be impacted by the proposed HIMB expansion. There are no botanical reasons to impose any restrictions, impediments, or conditions to the proposed expansion plans. No recommendations are offered at this time.

PLANT SPECIES LIST -- HIMB, Coconut Island

A checklist of all those vascular plant species inventoried on the project site during the field studies is presented below. The species are arranged alphabetically by families within each of three groups: Ferns and Fern Allies, Monocots, and Dicots. The taxonomy and nomenclature of the Ferns and Fern Allies follow Lamoureux (1988); the flowering plants, Monocots and Dicots, are in accordance with Wagner et al. (1990).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

I = indigenous = native to the Hawaiian Islands and also elsewhere throughout the Pacific.

P = Polynesian = plants originally of Polynesian introduction prior to Western contact (Cook's discovery of the islands in 1778); not native.

X = introduced or alien = all those plants brought to the by humans, intentionally or accidentally, after Western contact; not native.

Scientific name	Common name	Status
FERNS & FERN ALLIES		
NEPHROLEPIDACEAE (Sword Fern Family)		
Nephrolepis multiflora (Roxb.) Jarrett ex Morton	hairy sword fern	X
POLYPODIACEAE (Common Fern Family)		
Phymatosorus scolopendria (Burm.) Pic.-Ser.	laua'e, lauwa'e	X
PSILOTACEAE (Whisk Fern Family)		
Psilotum nudum (L.) Beauv.	moa, pipi	I
FLOWERING PLANTS		
MONOCOTS		
ARECACEAE (Palm Family)		
Cocos nucifera L.	coconut, niu	P
CYPERACEAE (Sedge Family)		
Cyperus gracilis R. Br.	McCoy grass	X
Cyperus rotundus L.	nutgrass, nut sedge	X
Fimbristylis cymosa R. Br.		I
Pycreus polystachyos (Rottb.) P. Beauv.		I
LILIACEAE (Lily Family)		
Crinum asiaticum L.	spider lily	X
POACEAE (Grass Family)		
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	X
Cenchrus echinatus L.	common sandbur, 'ume'alu	X
Chloris barbata (L.) Sw.	swollen fingergrass, mau'ulei	X
Chloris divaricata R. Br.	stargrass	X
Chloris radiata (L.) Sw.	radiate fingergrass	X
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X
Digitaria adscendens (Kunth) Henr.	crabgrass	X
Digitaria insularis (L.) Mez ex Ekman	sour grass	X
Digitaria radicosa (Persl.) Miq.		X
Eleusine indica (L.) Gaertn.	wiregrass, goosegrass	X
Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult.	lovegrass	X

Scientific name	Common name	Status
Eragrostis sp.		X
Panicum maximum Jacq.	Guinea grass	X
Paspalum conjugatum Bergius	Hilo grass, mau'u Hilo	X
Setaria verticillata (L.) P. Beauv.	bristly foxtail	X
Sporobolus indicus (L.) R. Br.	Indian dropseed, rattail grass	X
Sporobolus pyramidatus (Lam.) Hitchc.		X
Stenotaphrum secundatum (Walt.) Ktze.	buffalo grass, St. Augustine grass	X
Zoysia tenuifolia Willd. ex Trin.	Japanese lawngrass	X
DICOTS		
ACANTHACEAE (Acanthus Family)		
Asystasia gangetica (L.) T. Anderson	Chinese violet	X
ANACARDIACEAE (Mango Family)		
Schinus terebinthifolius Raddi	Christmas berry, wilelaiki	X
APIACEAE (Parsley Family)		
Centella asiatica (L.) Urb.	Asiatic pennywort, pohe kula	X
APOCYNACEAE (Periwinkle Family)		
Cascabella thevetia (L.) Lippold	be-still-tree	X
ARALIACEAE (Ginseng Family)		
Schefflera actinophylla (Endl.) Harms	octopus tree, umbrella tree	X
ASTERACEAE (Daisy Family)		
Bidens pilosa L.	Spanish needle, beggar's tick, ki, ki nehe	X
Calyptocarpus vialis Less.	hierba del cabello	X
Conyza bonariensis (L.) Cronq.	hairy horseweed, ilioha	X
Conyza canadensis var. pusilla (Nutt.) Cronq.	horseweed, lani wela	X
Cotula australis (Sieber ex Spreng.) J.D. Hook.	Australian brass buttons	X

Scientific name	Common name	Status
Eclipta alba (L.) Hassk.	false daisy	X
Emilia fosbergii Nicolson	pualele	X
Pluchea indica (L.) Less.	Indian pluchea	X
Pluchea symphytifolia (Mill.) Gillis	pluchea, sour bush	X
Sonchus oleraceus L.	sow thistle, pua-lele	X
Synedrella nodiflora (L.) Gaertn.	nodeweed	X
Tridax procumbens L.	coatbuttons	X
Vernonia cinerea var. parviflora (Reinw.) DC.	little ironweed	X
Wedelia trilobata (L.) Hitchc.	wedelia	X
Youngia japonica (L.) DC.	oriental hawksbeard	X
BATIDACEAE (Saltwort Family)		
Batis maritima L.	pickleweed	X
CARICACEAE (Papaya Family)		
Carica papaya L.	papaya, mikana	X
CARYOPHYLLACEAE (Pink Family)		
Spergularia marina (L.) Griseb.	saltmarsh sand spurry	X
CASUARINACEAE (Ironwood Family)		
Casuarina equisetifolia L.	ironwood, paina	X
COMBRETACEAE (Terminalia Family)		
Conocarpus erectus L.	buttonwood	X
CUCURBITACEAE (Squash Family)		
Coccinia grandis (L.) Voight	ivy gourd, coccinia	X
EUPHORBIACEAE (Spurge Family)		
Chamaesyce hirta (L.) Millsp.	hairy spurge	X
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	X
Chamaesyce prostrata (Aiton) Small	prostrate spurge	X
FABACEAE (Pea Family)		
Alysicarpus vaginalis (L.) DC.	alysicarpus	X
Canavalia cathartica Thouars	mauna-loa	X
Chamaecrista nictitans (L.) Moench	partridge pea, lauki	X
Desmanthus virgatus (L.) Willd.	virgate mimosa	X
Desmodium incanum DC.	Spanish clover, ka'imi	X
Desmodium sandwicense E. Mey.	Spanish clover, chili clover	X
Leucaena leucocephala (Lam.) de Wit	koa-haole, ekoa	X

Scientific name	Common name	Status
GENTIANACEAE (Gentian Family)		
Centaurium erythraea Raf.	bitter herb	X
MALVACEAE (Mallow Family)		
Hibiscus tiliaceus L.	hau	I?
Malvastrum coromandelianum (L.) Garcke	false mallow, hauuoi	X
Thespesia populnea (L.) Sol. ex Correa	milo	I?
MORACEAE (Mulberry Family)		
Ficus microcarpa L.f.	Chinese banyan	X
NYCTAGINACEAE (Four-o'clock Family)		
Boerhavia coccinea Mill.	red-flowered boerhavia	X
Bougainvillea spectabilis Willd.	purple bougainvillea	X
OXALIDACEAE (Wood Sorrel Family)		
Oxalis corniculata L.	yellow wood sorrel, 'ihi	P?
PASSIFLORACEAE (Passion Flower Family)		
Passiflora suberosa L.	huehue haole	X
PLANTAGINACEAE (Plantain Family)		
Plantago lanceolata L.	narrow-leaved plantain	X
Plantago major L.	broad-leaved plantain, laukahi	X
POLYGONACEAE (Buckwheat Family)		
Antigonon leptopus Hook. & Arnott	Mexican creeper, chain-of-hearts	X
Coccoloba uvifera (L.) L.	sea grape	X
PORTULACACEAE (Purslane Family)		
Portulaca oleracea L.	pigweed, common purslane	X
Portulaca pilosa L.	'ihi	X
PRIMULACEAE (Primrose Family)		
Anagallis arvensis L.	scarlet pimpernel	X
RHIZOPHORACEAE (Mangrove Family)		
Rhizophora mangle L.	American mangrove, red mangrove	X
RUBIACEAE (Coffee Family)		
Spermacoce assurgens Ruiz & Pav.	buttonweed	X

Scientific name	Common name	Status
SOLANACEAE (Tomato Family)		
Solanum americanum Mill.	popolo	I?
ULMACEAE (Elm Family)		
Trema orientalis (L.) Blume	gunpowder tree, charcoal tree	X
URTICACEAE (Nettle Family)		
Pilea microphylla (L.) Liemb.	artillary plant	X
VERBENACEAE (Verbena Family)		
Stachytarpheta jamaicensis (L.) Vahl	Jamaica vervain, owi, oi	X
Stachytarpheta urticifolia (Salisb.) Sims	nettle-leaved vervain, owi, oi	X

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Appendix D

Avifaunal and Feral Mammal Survey of Coconut Island, Kaneohe Bay, Oahu, June 15, 1994

AVIFAUNAL AND FERAL MAMMAL SURVEY OF COCONUT ISLAND, KANEOHE BAY, OAHU

Prepared for

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by

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15 June 1994

INTRODUCTION

The purpose of this report is to summarize the findings of a one day (9 June 1994) bird and mammal field survey of Coconut Island, Kaneohe Bay, Oahu (Fig. 1). Also included are references to pertinent literature.

The objectives of this field survey were to:

1- Note what bird and mammal species were observed on and near those sites proposed for a Hawaii Institute of Marine Biology expansion project.

2- Establish a baseline on relative abundance of birds in the area surveyed.

3- Note the presence or likely occurrence of any native fauna, particularly any that are considered "Endangered" or "Threatened".

4- Locate those resources most important to native wildlife.

GENERAL SITE DESCRIPTION

Figure One shows the area investigated by this faunal survey. Habitats on the property include: shoreline and intertidal zone; second growth exotic forest; residential/parklands and urbanized sites.

Weather during the field survey was clear and warm. Winds were from the east at 10-15 mph.

STUDY METHODS

The property was surveyed by walking all existing roads and trails. Field observations were made with binoculars and by listening for vocalizations. At various locations in all habitats eight minute census counts were made of all birds seen or heard (Fig. 1, Table 1). Published data of birds known from similar habitats on Oahu were reviewed in order to acquire a more complete picture of the possible species that might be expected in this region (Pratt et al. 1987; Hawaii Audubon Society 1993; Tanino 1994). Data on feral mammals were limited to visual observations, no trapping was attempted.

Scientific names used in this report follow those given in Hawaii's Birds (Hawaii Audubon Society 1993) Field Guide to the

Birds of Hawaii and the Tropical Pacific (Pratt et al. 1987) and Mammal Species of the World (Honacki et al. 1982).

RESULTS

Resident Endemic (Native) Land Birds:

No native, resident land birds were observed on the survey. One species which may occasionally occur in this area is the Short-eared Owl or Pueo (Asio flammeus sandwichensis). The Pueo is listed as an endangered species on Oahu by the State of Hawaii Division of Forestry and Wildlife. They forage over open fields and forest habitat in both coastal and inland regions of Oahu. This species is active at dawn and dusk. The introduced Common Barn Owl (Tyto alba) is nocturnal and is often mistakenly reported as Pueo by those unfamiliar with identification marks that distinguish these two species of owls.

Resident Waterbirds:

Two Black-crowned Night Heron (Auku'u) (Nycticorax nycticorax) were recorded on the survey. This is the only native waterbird in Hawaii that is not listed as endangered. Auku'u forage in a wide variety of wetland habitats (Hawaii Audubon Society 1993).

A pair of Koloa (Hawaiian Duck) (Anas wyvilliana) were observed flying from Oahu out to Coconut Island. This endangered species does not show the strong sexual dimorphism of its close relative the Mallard (Anas platyrhynchos). They do, however, readily hybridize with feral Mallards and many of the Koloa on Oahu may in fact be hybrids. Five Mallards were also seen on this survey near the Coconut Island shuttle boat dock.

One other species of warterbird which may utilize the shallow intertidal zone at low tide is the endangered Black-necked Stilt (Himantopus mexicanus knudseni). No stilt were recorded on this survey but they do occur in several wetlands nearby and likely forage along the shoreline of Coconut Island on occasion.

Seabirds:

No seabirds were observed on the island. Eight Brown Noddy (Anous stolidus) were seen foraging offshore. The Black Noddy (Anous minutus) is also common in Kaneohe Bay but were not observed on this survey.

Nearby areas such as Kupapa Island, Ulupa'u Head and Moku Manu support several nesting species of seabirds. Coconut Island may be less desirable nesting habitat due to greater human disturbance.

Migratory Birds:

Migratory ducks and shorebirds regularly visit Hawaii each

year. No migratory ducks were accounted for on this field survey. Northern Shoveler (Anas clypeata) and Northern Pintail (Anas acuta) are the two most common migrant ducks on Oahu and may occur in the protected bays during the winter months.

No migratory shorebirds were observed on the survey. This result was not totally unexpected given the time of year of this survey. Migratory shorebirds depart Hawaii in late April and early May for their arctic breeding ground. A few birds, usually juveniles, oversummer on Oahu. The extensive intertidal zone surrounding Coconut Island likely supports all four of the common migratory shorebirds seen in Hawaii: Pacific Golden-Plover (Pluvialis fulva); Wandering Tattler (Heteroscelus incanus); Ruddy Turnstone (Arenaria interpres) and Sanderling (Calidris alba). Other less common species may also utilize the exposed reef flats at low tide. Pacific Golden-Plover are the most abundant migratory species in Hawaii. Long term studies have examined many aspects of their behavioral ecology (Johnson et al. 1981, 1989, 1993; Johnson and Johnson 1983; Bruner 1993). Plover establish and maintain life-long non-breeding territories on lawns and other open habitats. It is likely that the lawn areas on private sections of Coconut Island support territorial plover from August through late April.

Exotic (Introduced) Birds:

A total of 14 species of exotic birds were recorded during the field survey (Table 1). Pratt et al. (1987); Hawaii Audubon Society (1993) and Tanino (1994) confirm that this array of introduced birds would be expected in this area. The Helmeted Guineafowl (Numida meleagris) must be a deliberate introduction. Other species known from this region and which could occur on Coconut Island include: Barn Owl (Tyto alba) White-rumped Shama (Copsychus malabaricus); Chestnut Mannikin (Lonchura malacca) and Japanese Bush-warbler (Cettia diphone).

Feral Mammal:

No Small Indian Mongoose (Herpestes auropunctatus) were observed on the island. Evidence of rats was noted at several localities. Mice undoubtedly also occur on the island. No trapping was conducted in order to assess the relative abundance of feral mammals.

Oahu records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) are relatively rare (Tomich 1986; Kepler and Scott 1990). Data on the bat's distribution and behavior are limited. They are known to roost solitarily in trees and occur in upland forests as well as in coastal habitats. This species is insectivorous and forages at dusk. No bats were seen on the survey.

DISCUSSION AND CONCLUSIONS

This field survey was necessarily brief and thus can provide only a limited perspective of the wildlife which utilize the area. The number and relative abundance of each species may vary throughout the year due to available food resources and reproductive success. Exotic species sometimes prosper only to later disappear or become a less significant part of the ecosystem (Williams 1987; Moulton et al 1990). Long term census data could provide a more comprehensive view of the bird and mammal populations at this site. The following comments summarize the findings and conclusions of this survey.

1- An area larger than the actual proposed development sites was surveyed. The mobility of birds requires that nearby areas be examined in order to gain a more realistic view of species abundance and diversity. All habitat types on the island were sampled. Census data were taken at several localities (Fig. 1).

2- The only native resident waterbirds recorded on the survey were the Black-crowned Night Heron. Black-necked Stilt may also forage on the island. The stilt and Koloa are listed as endangered.

3- No migratory ducks or shorebirds were found on the survey. During the months of August through April the four common migratory

shorebirds: Wandering Tattler, Ruddy Turnstone, Sanderling and Pacific Golden-Plover would be expected to utilize the intertidal reef flats at low tide. Plover may also have winter territories on the lawns and along some of the roads around the island.

4- The only seabird seen flying over the property was the Brown Noddy Tern. Several other species may be seen foraging offshore.

5- Fourteen species of introduced birds were tallied on the survey. An additional four exotic species may also occur on occasion in this area. None of these introduced species are listed as endangered.

6- No native mammals were found on the survey. Evidence of rats and perhaps also mice were noted. No mongoose were seen.

7- Coconut Island provides a variety of habitats for birds. The most important area for native birds is the shoreline and the exposed reef flats at low tide. Night Heron and migratory shorebirds as well as perhaps the endangered Black-necked Stilt may take advantage of this resource for foraging.

8- The proposed development should pose no threat to the present bird populations on the island.

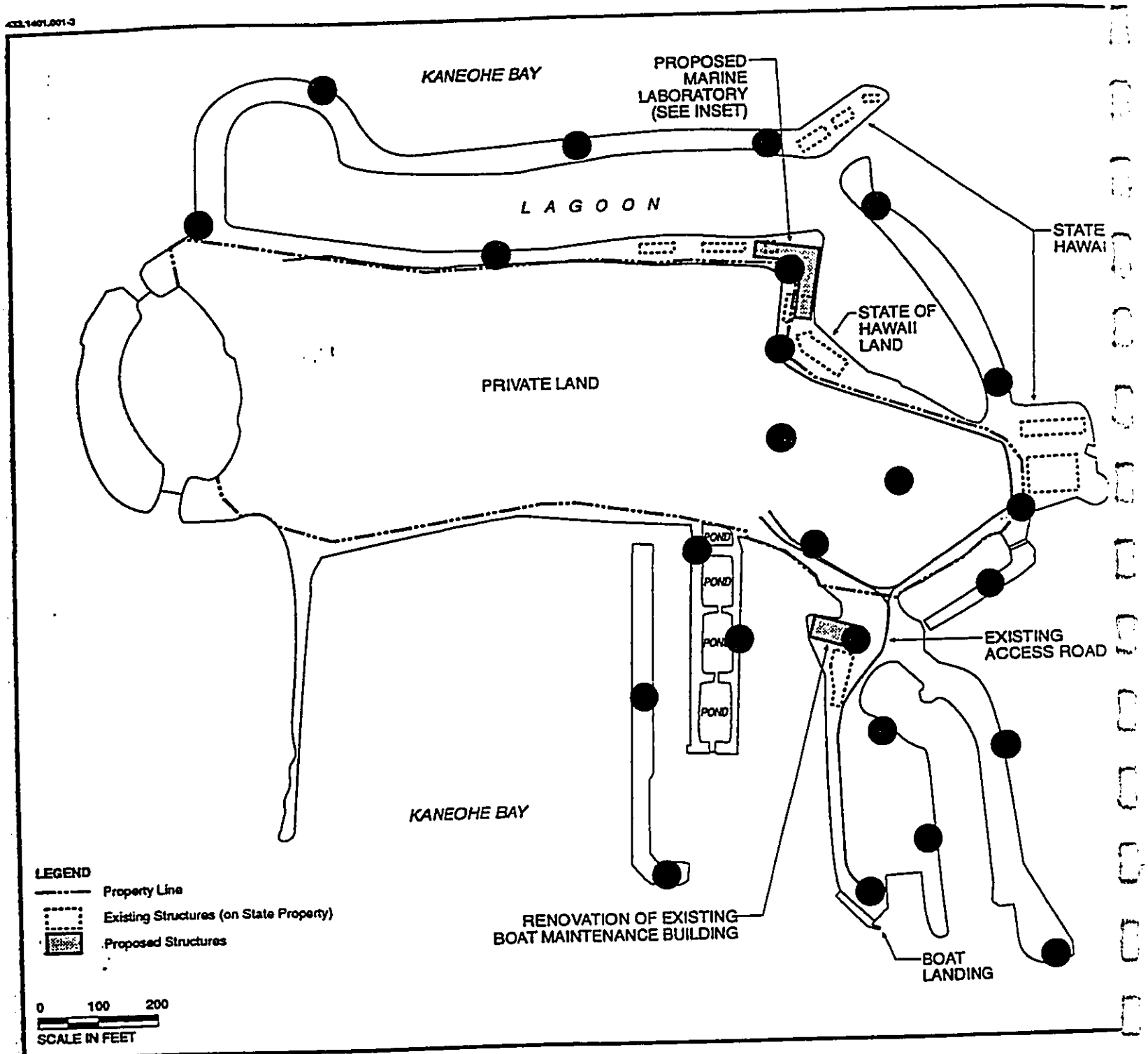

Fig. 1. Location of faunal (bird & mammal) survey with census stations shown as solid circles.

TABLE

Introduced birds recorded at Coconut Island, Kaneohe, Oahu.

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE*
Mallard	Anas platyrhynchos	R = 5
Cattle Egret	Bubulcus ibis	C = 9
Helmeted Guineafowl	Numida meleagris	R = 1
Spotted Dove	Streptopelia chinensis	A =12
Zebra Dove	Geopelia striata	C = 8
Common Myna	Acridotheres tristis	A =13
Red-vented Bulbul	Pycnonotus cafer	A =20
Northern Cardinal	Cardinalis cardinalis	U = 2
Red-crested Cardinal	Paroaria coronata	C = 6
Japanese White-eye	Zosterops japonicus	C = 7
House Finch	Carpodacus mexicanus	A =14
House Sparrow	Passer domesticus	R = 6
Java Sparrow	Padda oryzivora	R = 3
Nutmeg Mannikin	Lonchura punctulata	U = 4

*(see page 12 for key to Table 1)

KEY TO TABLE 1

Relative abundance = Number of birds tallied on census stations in appropriate habitat.

A = abundant (10 or more per census station)

C = common (5-9 per census station)

U = uncommon (1-4 per census station)

R = recorded (seen on survey on only one occasion or not on census stations)

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Appendix E

Archaeological Study of the Proposed Hawai'i Institute of Marine Biology Expansion at Moku O Lo'e (Coconut Island), Kane'ohe, O'ahu, Hawaii
1996

Archaeological Study of the Proposed Hawai'i Institute of Marine Biology Expansion at Moku O Lo'e (Coconut Island), Kane'ohe, O'ahu, Hawaii
1994

ARCHAEOLOGICAL STUDY OF THE PROPOSED HAWAI'I INSTITUTE OF MARINE BIOLOGY EXPANSION AT MOKU O LO'E (COCONUT ISLAND), KANE'OHE, O'AHU, HAWAI'I

by

Conrad Erkelens

for

Belt Collins Hawaii

International Archaeological Research Institute, Inc.
Honolulu, Hawai'i

1996

Introduction

An archaeological investigation involving a literature search and a baseline survey was conducted to identify archaeological resources that may be impacted by the proposed expansion of the Hawai'i Institute of Marine Biology (HIMB). The present facility is located at Moku O Lo'e (also known as Coconut Island), in Kane'ohe Bay on the windward, east coast of O'ahu, Hawai'i (Fig. 1). This survey was conducted under contract to Belt Collins Hawaii who will incorporate the findings from this report into the EIS documentation addressing the proposed project.

Potential impacts to historic resources from this development include those posed by the operation of the buildings, the short term impacts from construction, transportation and storage of construction materials, and the disposal of demolition and construction waste. The proposed expansion of HIMB consists of five tasks that are the subject of this EIS review. These tasks are:

1) The demolition of three existing buildings including the Maintenance Building, Shark Laboratory (or Saltwater Tank Shelter), and Lunch Room.

2) Construction of a new marine laboratory building.

3) Construction of a new structure housing the Pelagic Fish Research Annex.

4) Construction of a new maintenance facility near the Old Boat House.

5) Construction of an access road on the hill top location of the new marine laboratory.

The present perimeter of the island was constructed from the placement of dredge spoils as landfill during the late 1930s. This landfilled area is owned by the State of Hawai'i while the interior of the island is privately owned. Ownership for the remainder of the project area is currently being litigated.

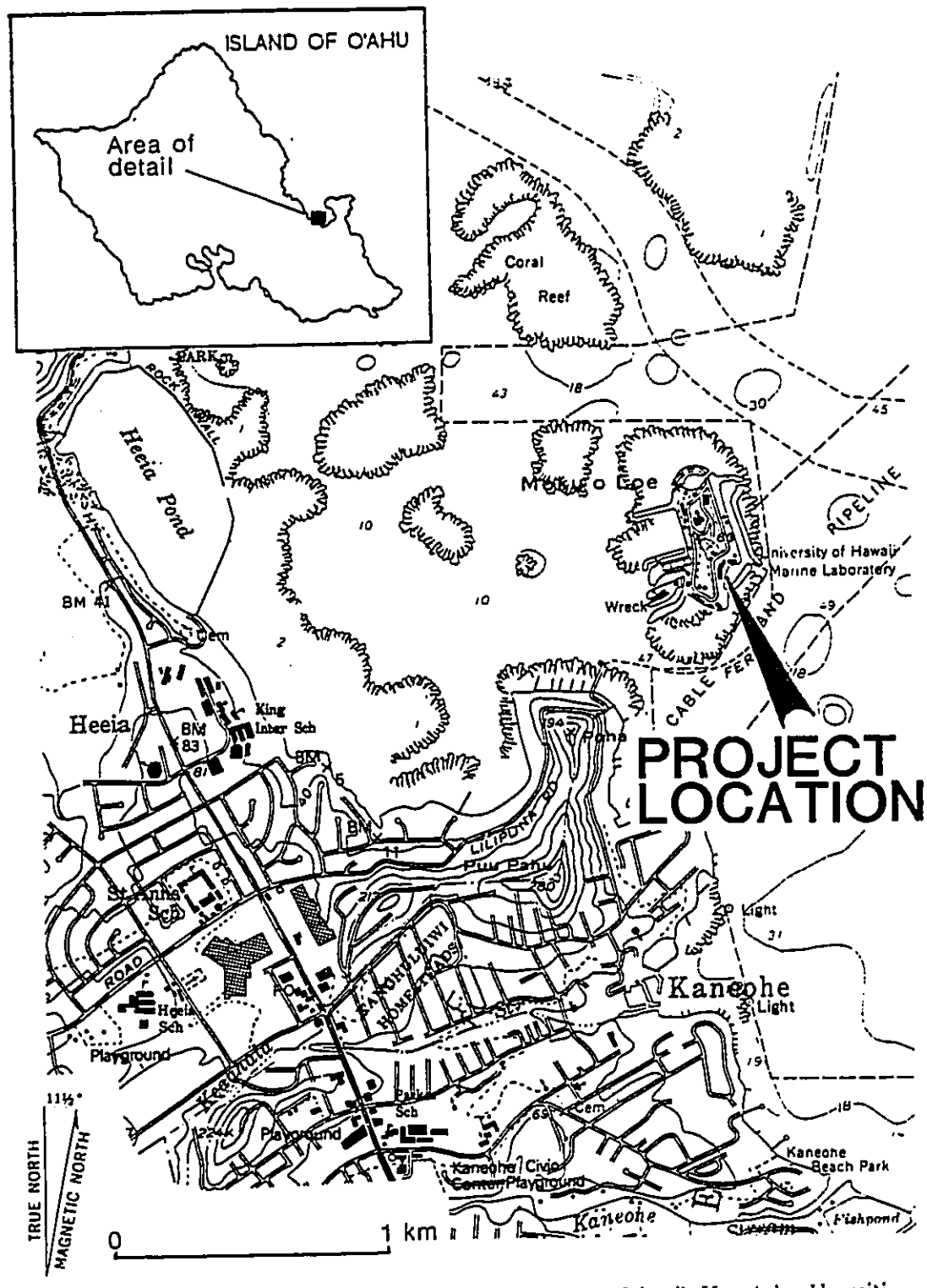

Figure 1. USGS map of project area, Moku O Lo'e (Coconut Island), Kane'ohe. Hawai'i.

Setting

Moku O Lo'e is a volcanic island located approximately 650 m (0.4 mi) from the nearest shoreline in Kane'ohe Bay. It was created following the cessation of the Ko'olau volcanic activity when vents formed at a number of locations along the windward coast of O'ahu (Macdonald and Abbott 1970:366-367). Moku O Lo'e may be one of those vents. although geologists have not specifically studied this island. Its present land area is approximately 8.7 ha (21.9 acre), although the size and shape of the island have undergone dramatic modification since the mid-1930s. These changes (discussed more fully in a later section of this report) include the addition of approximately 3.8 ha (9.4 acre) of coral and sand from dredge spoils to the perimeter of the original 5.1 ha (12.5 acre) volcanic island and extensive grading of the elevated interior. The dredge and fill operation resulted in the creation of two large enclosed lagoons, six large ponds, and four peninsulas projecting from the western shore of the island.

The prior dimensions and topography of the island are indicated by a late nineteenth century map (Jackson 1882). This map depicts a volcanic crater forming the island's highest elevation, approximately 12 m (40 ft) above seal level. The majority of the island is composed of soil described as Alaeloa silty clay (Foote et al. 1972) that has weathered from basic igneous rock. This soil is characterized as presenting a severe erosion hazard in steep topography (Foote et al. 1972:26). Lateritic sediment and saprolitic rock were noted on the east side of the island where erosion along the road cut had partially exposed the strata underlying the surface soil and sediment.

Median annual rainfall on the island is approximately 1,250 mm (50 in) (Giambella et al. 1986:73), which is adequate for the cultivation of most Hawaiian dryland cultigens. However, there are no sources of fresh water on the island. This constraint suggests that Hawaiian habitation of the island would probably have been on only a temporary basis.

The vegetation in the early 1900s was described as lantana and dense guava with coconut trees along the shore (Honolulu Advertiser 1937e:13; 1937f:13). Most of the previous vegetation was removed from the island when it was landscaped in the 1930s. The present vegetation on the island is dominated by coconut (*Cocus nucifera*), *milo* (*Thespesia populnea*), *hala* (*Pandanus odoratissimus*) banyan (*Ficus* sp.), mangrove (*Rizophora mangle*), ironwood (*Casuarina equisetifolia*), mango (*Mangifera indica*), oleander (*Nerium indicum* sp.), and various ornamental shrubs and grasses.

History

The island Moku O Lo'e is mentioned in only one recorded oral account dating from the pre-European era. This citation from a morality tale appearing in the Hawaiian Ethnological Notebook, (Sterling and Summers 1987:206) suggests the island was known as Moku O Lo'e in reference to a female named Lo'e who lived there. Given the lack of water on the island it is doubtful that the island was ever inhabited permanently. which calls into question the historical accuracy of information provided by this story. An alternative meaning for the name of the island was provided by Fred Beckley, "Hawaiian scholar and authority," who was quoted as translating Moku O Lo'e as meaning "the island of the split" (Honolulu Advertiser 1937f:13).

Other references suggest an alternative interpretation for the name of the island. Pukui and Elbert recorded that the Hawaiian word *lo'e* referred to the curve of a fishhook (1986:209). Sterling and Summers (1978:192) cite a 1964 magazine article (Paginawan 1964) concerning the use of Moku O Lo'e as a lookout used by fishermen to signal the location of fish schools. During the mid-nineteenth century land awards of the Great Mahele (cf. Chinen 1958), the area around Moku O Lo'e was claimed as part of the "He'eia Fishery", indicating the waters around the island were a valuable subsistence resource. Given the use of offshore islands as temporary camps for fishermen, the location of an encompassing fishery, and the name relationship to an aspect of fishhook design, it is probable that the name of the island is associated with fishing.

During the Great Mahele, Moku O Lo'e was designated as Crown Land and was included with He'eia *ahupua'a* and fishery in an award (LCA 10613, *apana* 1) to Abenera Paki, the father of Bernice Bishop (cf. Kame'eleihiwa 1992:267). Given the status of the award as Crown Land to an *ali'i* (chief), there is no Land Court testimony relating to mid-nineteenth century land use for this parcel (*apana*). Later court records indicate that no one had permanently resided on Moku O Lo'e since at least 1884 (Honolulu Advertiser 1937d:2). The island was, however, occasionally used for special purposes. A *luau* in honor of Queen Emma took place on Moku O Lo'e in 1884 (Honolulu Advertiser 1937b:13). Sheep were pastured on the island from 1897 to 1899 but were said to have been run off by large rats that inhabited the island (Advertiser 1937c:3).

The island passed through a variety of owners from the late-nineteenth century to the late 1920s. There are no records documenting the use of the island during that period. In 1926 Chris Holmes, the heir to the Fleischmann's Yeast fortune, arrived in the Hawaiian islands. By 1928 he had sub-leased Moku O Lo'e from the He'eia Land Company (Honolulu Advertiser 1937a) and by 1933 Holmes had leased the island directly from Bishop Estate (Star Bulletin 1933:1). In 1936, Holmes expressed an interest in purchasing Moku O Lo'e. prompting a Land Court Application (Ld. Ct. App. 1134) to secure title to the island (Moriki 1976:6). A group of three Hawaiians contested the claim with the resulting court case lasting from January 5 to January 28, 1937. Much of the subsequent published material concerning the history of the island has been based upon quotes from the perjured testimony from the three Hawaiian claimants who claimed to have lived on the island for a number of years.

These individuals were later indicted for that testimony which was characterized as "imaginary" by the presiding judge (cf. Advertiser 1937f:13).

By 1935 Chris Holmes had accomplished a complete transformation of Moku O Lo'e, which was subsequently referred to as "Coconut Island" in the daily newspapers. The transformation of the island undertaken by Holmes included the dredging of channels and the addition of 3.8 ha (9.44 acres) of land creating two large enclosed lagoons, six large ponds, and four peninsulas projecting from the southwestern shore of the island (Fig. 2). In addition, the entire island was graded. This was followed by the importation of numerous ornamental plants for landscaping, and the construction of numerous buildings, docks, and roads.

During this period of extensive landscaping and construction associated with Chris Holmes' tenure, numerous shallow, unmarked human burials were encountered. Informants suggest that from approximately the mid-nineteenth to the early twentieth century, Moku O Lo'e was used by nearby residents (who had limited finances) as a place to inter their deceased (Lester Zukeran[1] pers. comm., 1994). One possible burial is located within the project area (Fig. 3).

The majority of the terraforming undertaken by Chris Holmes was completed by 1935 as indicated by the date in relief on the concrete lighthouse located on the boat landing peninsula that was created from landfill. The ownership of this and other landfilled areas would become problematic in 1955 when the Territorial Tax Commissioner realized the added 3.8 ha (9.44 acres) of land did not show on tax maps and that subsequent real property taxes had not been paid (Star Bulletin 1955:16).

Following the death of Chris Holmes in 1944, the military leased the island for a rest and recreation center from 1945 to 1948 (Honolulu Advertiser 1945:3). Two of the structures constructed by the military in 1945 remain standing and are presently being used by HIMB. In 1947 the lagoons, ponds, and a portion of the landfilled perimeter of the island were donated to the establishment of the Hawai'i Marine Laboratory in a joint venture between the University of Hawai'i and the University of California (Honolulu Advertiser 1947:6). The Main Laboratory building constructed in the 1940s burned in 1961. It was subsequently replaced and the laboratory reopened in 1966.

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[1] Mr. Zukeran was employed by Chris Holmes as caretaker from 1937-1941 and returned to the island as caretaker from 1947-1982.

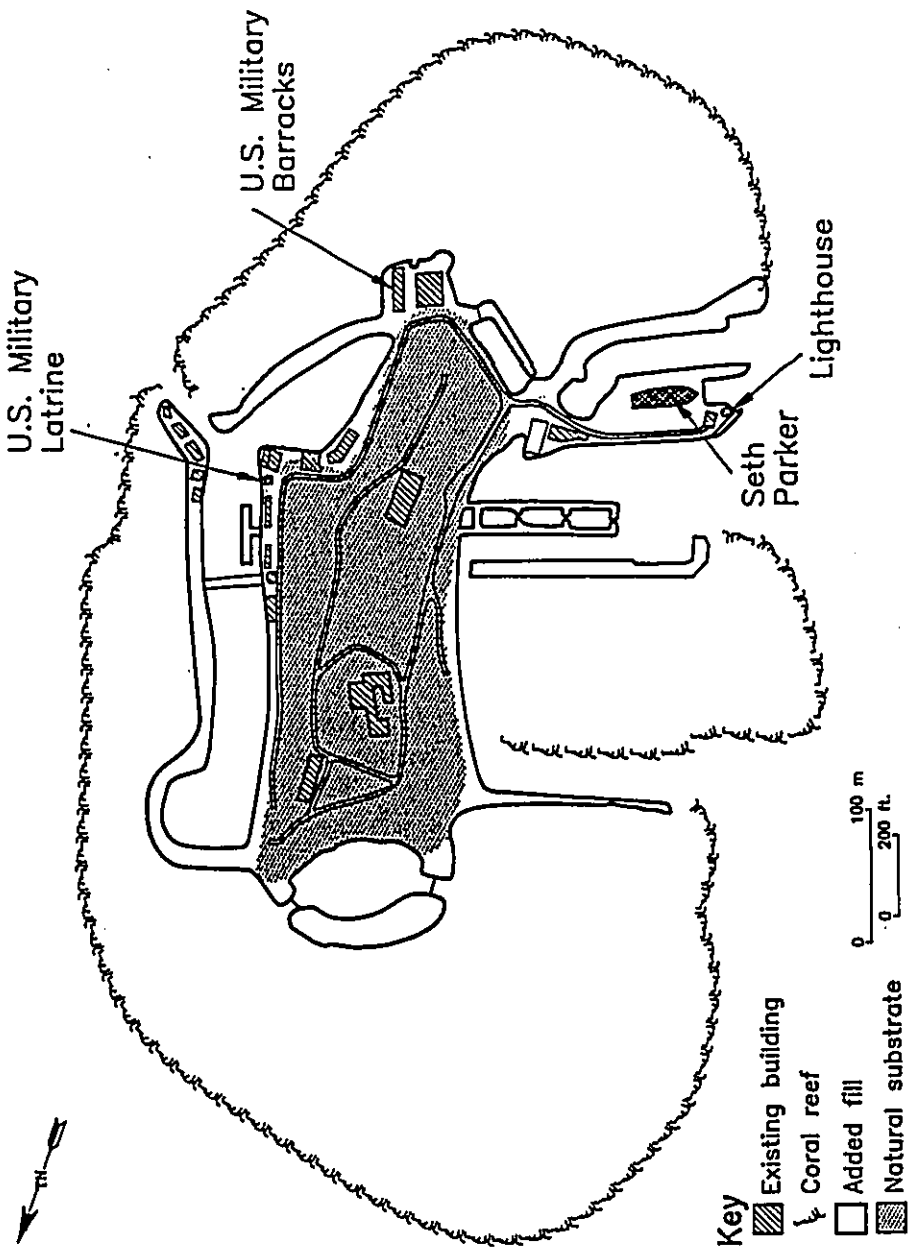
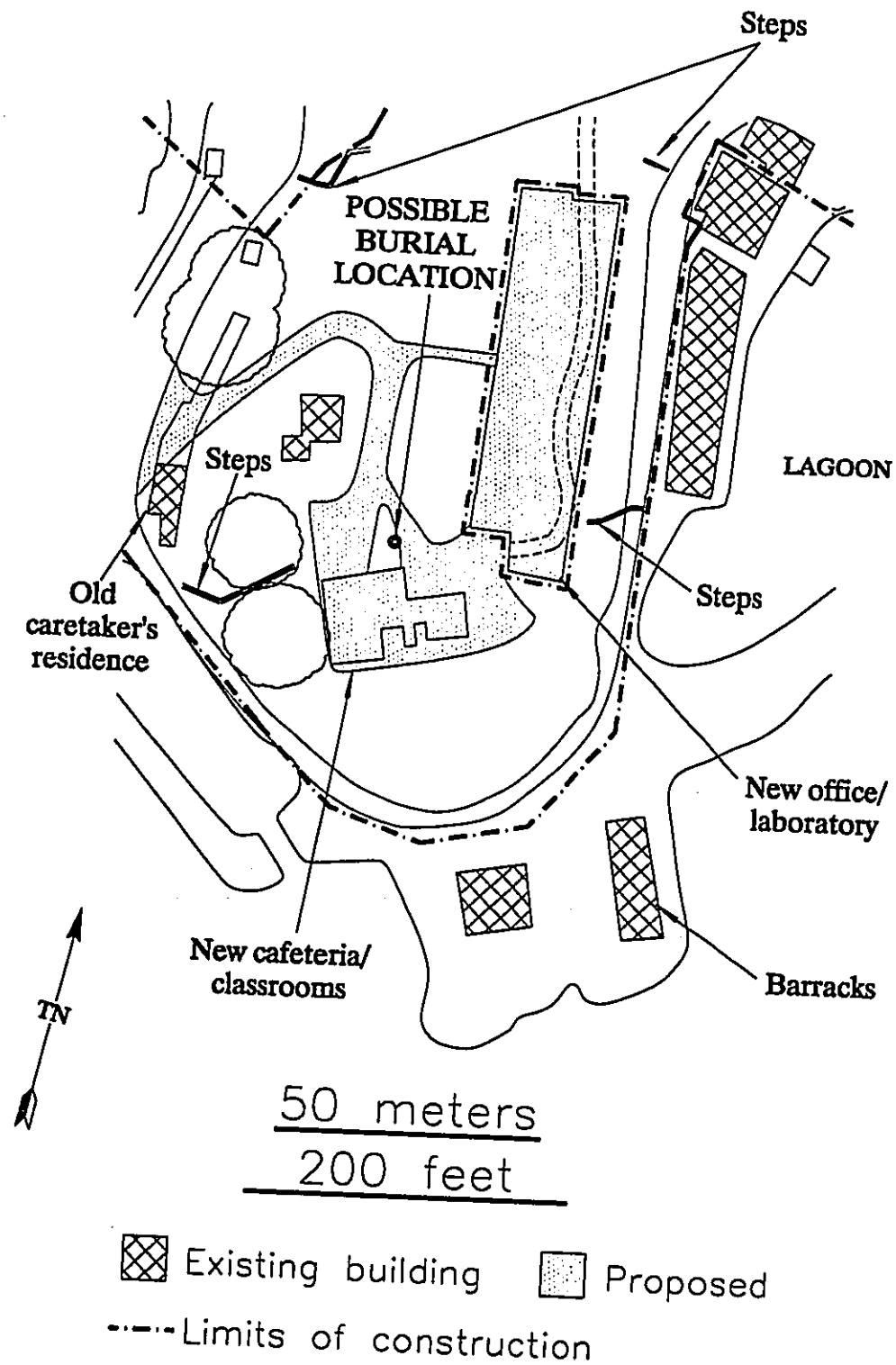


Figure 2. Map of Moku O Lo'e (Coconut Island) showing original island land area, as taken from Jackson (1882), overlaid on the present land boundaries.


Steps
POSSIBLE BURIAL LOCATION
Steps
LAGOON
Steps
Old caretaker's residence
New office/ laboratory
New cafeteria/ classrooms
Barracks
TN
50 meters
200 feet
Existing building
Proposed
Limits of construction

Predicted occurrence of archaeological sites

Because there are no sources of freshwater on Moku O Lo'e, it is unlikely that permanent habitation took place on the island. Any previous use by Hawaiians was probably limited to the temporary occupation camps of fishermen or as a burial area similar to nearby Kapapa Island from which eight burials and various artifacts were removed in 1952 (Sterling and Summers 1978:196-197). Four known burial locations are present on Moku O Lo'e. During the 1930s, most of the island's vegetation was removed and the extensive terraforming and landscaping took place. Therefore, it is highly unlikely that archaeological features would be visible on the present surface of the island's interior areas. Archaeological resources should not exist in areas of 1930s landfill where the new Pelagic Fish Research Annex, maintenance facility, and landing craft ramp are proposed to be located.

Subsurface testing has not previously been undertaken. Therefore, the possible presence of human burials or significant subsurface archaeological deposits such as hearths or middens cannot be dismissed.

Survey Methods

Two separate surveys and one field check were undertaken by Conrad Erkelens, M.A., of the International Archaeological Research Institute, Inc. Survey consisted of a pedestrian transect survey during which the project area was walked in line-abreast transects by the archaeologist. Separation between transects was determined by visibility of the ground surface and but did not exceed a maximum of 5 m intervals.

Archaeological surface features were to be prominently marked with flagging tape or located on a map so as to identify their location. A brief description of the archaeological remains would be recorded citing date, material, and method of construction, probable functions, and feature metric attributes such as length, width, height and area. Photographs would be taken of each feature to further document the visible archaeological remains.

Survey Results

On June 23, 1994, all landfilled areas along the southern half of the island were surveyed. These areas are composed of coral and coral sand dredge spoils, creating fill areas approximately 1.5 m in height above sea level. The shoreline is defined by concrete seawalls over a majority of this added land. The excavation of four 30-40 cm deep postholes adjacent to the turtle tanks was observed. This provided an examination of the stratigraphy consisting of approximately 5 cm of terriginous silty clay sediment overlying the fill of coral and coral sand.

As expected, no archaeological sites were located in the landfilled areas adjacent to the shoreline. The only potential area of concern lies at the southwestern shore of the island,

where the road crosses onto a portion of the original land surface. Construction vehicles may need to use this road to transport material from the proposed landing site to the new pelagic fish research annex building site. However, given the presence of a subsurface sewer line, the steep topography, and the previous disturbance caused by the roadcut into the hillside, it is unlikely there are subsurface archaeological deposits at that location.

During this survey, large cobbles and gravel comprised of glassy fine grained basalt were noted eroding from the fill to the east of the present maintenance building. Volcanic glass and basalt were used by Hawaiians in the manufacture of flaked tools. However, none of the observed material had been flaked or appeared to be artifactual. Since this particular material was found within fill, it may not have originated on the island. However, if it is from the island, one cannot be certain this basalt could have been used by Hawaiians to manufacture tools since it may not have been present on the surface prior to the mid-1930s.

The second period of fieldwork took place a year later on June 2, 1995. This fieldwork involved a pedestrian survey of the island's interior, upper elevation and slope areas in the southern portion of the island within the limits of construction. Within the limits of construction are the proposed location for two structures housing the cafeteria/classrooms, a new office/laboratory building, and a new access road leading to the dock area. The northern extent of this second survey was an east-west line drawn through the southeastern third of the tennis court. The present southern limit of the maintained landscaping is approximately 35 m north of this line.

Observation of an existing road-cut opposite the main laboratory building indicated sediments in the first 50-75 cm are comprised of lateritic sediments containing highly weathered saprolitic basalt. Basalt gravel, and occasional dense basalt cobbles and boulders were also noted on the surface. Numerous beer bottles and other late twentieth century trash litter much of the surface. One WWII (1941-1945) era beer bottle was noted but not collected.

It was apparent that the entire interior area of the island was previously mechanically graded. Evidence of grading can be seen in the unnaturally smooth, rolling terrain having steep near vertical drops at the edge of the upper elevations. In addition, concrete drainage culverts at the foot and mid slope areas surrounding the island's interior indicate modification to these intermediate slope areas. The western slope of the island was more heavily graded and landscaped since this hillside bordered the basalt curbed "driveway" leading from the dock to the main house.

Although it is not presently maintained, the southern portion of the island's interior had been landscaped. An extensive network of waterlines throughout this portion of the interior is evidence of a concern for adequate watering of the plantings (see Dunn 1962). Three sets of concrete steps accessing this area also indicate past use of this area. Landscaped vegetation in the interior area includes coconut, banyan, mango, ornamental palms, birch, eucalyptus, ironwood, cactus, and hibiscus.

In the southwestern corner of the island adjacent to the old caretaker's house was a 10 m diameter dump consisting mainly of household trash. This structure was built after 1962 and the trash in the adjacent dump appears to post date that year.

A concrete foundation measuring 12.4 m x 3.5 m was located to the east of the trash dump. Numerous large, abandoned, and collapsing wooden bird coops are also present in this area. The structure that existed on this foundation appears to have served as a pen for small animals. In the 1930s Chris Holmes kept various zoo animals including monkeys, game birds, and an elephant on the island. This foundation and the nearby bird coops probably date to that period. Because of the association with Chris Holmes who was a celebrity of note in Hawai'i in the time period between his tenure on the island beginning in 1928 until his death in 1944, this foundation qualifies for consideration as a historic site under established significance criteria.

There is a collapsing wooden structure located adjacent to the road at the southwestern corner of the island that was commonly called the "Monkey House" (Photo 1). This structure is a single wall construction board and batten clad wooden building. The structure was placed on posts set on a concrete slab foundation. A flight of wooden steps provided entrance to the front door. The half hipped, front gabled roof was asphalt shingled with extended eves and open rafters. Approximately two-thirds of this roof has collapsed and the structure is unsafe to enter. Sometime during the past, the original windows were replaced with modern single-pane sliding windows. No other modifications to the structure were noted. Additional documentation for this structure is included in the appendix. Because of its age and association with Chris Holmes, it therefore qualifies for consideration as a historic site under established significance criteria[2].

There are two structures remaining from the use of the island as a rest area for military personnel from 1945 to 1948. (Honolulu Advertiser 1945; 1947). Both structures have asphalt shingle roofing and are single wall construction board and batten clad wooden buildings.

The structure that previously served as a military latrine is in poor condition with visible evidence of dry rot along the facia (Photo 2). The structure was built on a concrete slab foundation. Sections of the interior and exterior walls have been replaced as the need arose in a patchwork, piecemeal fashion. This building is now used as a lunch room and is scheduled to be demolished to make room for the proposed Pelagic Fish Research Annex.

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2 Hawaii Revised Statutes Chapter 6E states any site in excess of 50 years old or having any of the following should be considered significant.
Criterion "a" - associated with events making an important contribution to the broad patterns of Hawaii's history.
Criterion "b" - associated with the lives of persons important in Hawaii's past.
Criterion "c" - embody the distinctive characteristics of a type, period, or method of construction.
Criterion "d" - have yielded or be likely to yield information important for research of prehistory or history.

Photo 1. Collapsing wooden structure, ca. the late 1930s.

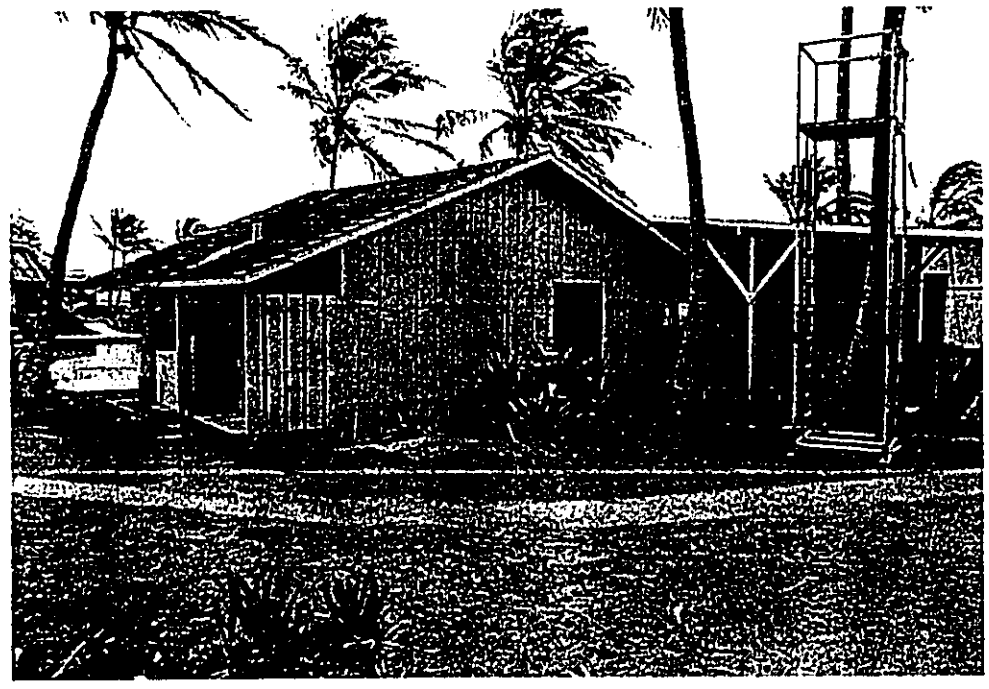

Photo 2. Structure previously used as a military latrine.

The other military structure was a barracks. It is in similar condition to the present lunch room building. The barracks is a one story structure with a linear "shotgun" elevation. The roof is hipped with a ridge. Windows are single hung sash operation. The barracks building is currently used to house visiting students and the State caretaker. Although it is located within the project area, it is not scheduled to be impacted from the planned development.

These WWII era buildings, built and used by the military in the late 1940s, qualify for consideration as significant historic resources (see Appendix) due to their age and association with WWII as a historical event.

Adjacent to the boat landing is an area that appears to be an overgrown compost pile. Beneath this pile is the sunken wreck of the vessel "Seth Parker," a four masted schooner. A photograph of the vessel taken in 1938 appears in a publication by Scott (1968:732). The remains of the rotting hull extending above water are presently visible at various locations along its length (Photo 3). The vessel exceeds 50 years in age and was associated with Chris Holmes and therefore qualifies for consideration as a historic site under established significance criteria.

* * * * *

Photo 3. Visible ribs of the Seth Parker, 1994.

Opposite the remnants of the Seth Parker is a drydock and ways commonly called the old boat house. The main structure is a large, open, high roofed metal shed used to shelter boats during their repair. It was constructed sometime around 1935 following completion of the dredge-fill operation that created the land area it was built upon. The old boat house, railway, and winch shed are over 50 years old and were built and used by Chris Holmes.

Recommendations

Three structures and one feature (the old boat house, the "Monkey House", the lunch room, and a concrete foundation) are located in the project area. The old boat house, Monkey House, and concrete foundation can be considered a significant historical sites due to their association with Chris Holmes. The old boat house is an example of an open, metal frame shed, suggesting it has minimal architectural importance. The significance of the associated marine railway, transfer table, and winch shed is also minimal since other better examples exist at Ala Wai, Tuna Packers, and Ke'ehi Lagoon on O'ahu. This site will not be impacted by the proposed development. Given the limited significance of this structure, adequate documentation is provided by this report.

The collapsing structure commonly called the Monkey House and concrete foundation can be considered a significant historical sites due to their association with Chris Holmes. However, given their present condition and lack of historical integrity from repairs and demolition, it is recommended that impacts from development be mitigated through documentation. Given the limited significance of these structures, adequate documentation is provided by this report.

The lunch room can be considered a significant historical sites due to is association with the events of WWII. However, given the previous modifications altering its integrity and its present poor condition it is therefore recommended that impacts from development be mitigated through documentation. In light of this structure's limited significance, adequate documentation is provided by this report.

The sunken wreck of the vessel "Seth Parker" will be impacted by the proposed development. Because of its association with Chris Holmes the vessel can be considered a significant historical site. Given the wreck's poor integrity and limited interpretative value, it is recommended that the current level of documentation (e.g. Scott 1968) provides adequate mitigation of those impacts.

There should be no impacts to historic resources or archaeological sites from the transportation and storage of construction materials, or the disposal of demolition and construction waste. The proposed construction of a Pelagic Fish Research Annex and a landing craft dock/ramp will not impact any known archaeological sites. There is no potential for the presence of subsurface archaeological remains within these landfilled areas. Therefore, no further archaeological investigation or subsequent archaeological construction monitoring of the landfilled areas is recommended.

Given the recent history of the island, it is unlikely that intact archaeological surface remains are present on any interior portion of Moku O Lo'e. However, subsurface testing for archaeological deposits and features has not been undertaken. It is probable that Moku O Lo'e was used repeatedly as a location to inter human burials. It is also probable that prehistoric temporary use of the island resulted in the deposition of materials in hearths, middens, or lithic workshop areas that now form significant subsurface archaeological deposits.

Grading associated with landscaping of the island in the mid to late 1930s probably involved both cut and fill operations. It is therefore possible that portions of the original island surface lie intact beneath various depths of displaced fill. Consequently, although the island's interior has been extensively terraformed, one cannot be dismiss the possibility that human burials or subsurface archaeological deposits are present and may potentially be impacted by proposed construction of the cafeteria, new offices, and associated access road.

It is therefore recommended that archaeological monitoring be undertaken during preliminary grubbing, grading, and construction excavations taking place in the interior, non-landfill portions of the project area. Specifically this would include monitoring of construction excavations associated with preparation of areas for the cafeteria, new offices, and access road in the interior upper elevations of the island. The purpose of this monitoring would be to further evaluate the likely presence of archaeological deposits or additional burials within the project area and to insure proper treatment of inadvertently discovered human remains if encountered.

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APPENDIX: HISTORIC STRUCTURE DOCUMENTATION

Site # --
TMK 4-6-01-1

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: Monkey House
2. Historic Name: na
3. Street or rural address: Coconut Island
   City: Kane'ohe Zip: 96744 County: Honolulu
4. Present Owner, if known: presently in litigation
   Address if different from above: na
5. Ownership is: Private
6. Present Use: none Original Use: dwelling
   Other Past Uses: na

DESCRIPTION

7. Physical Appearance:
   Style: massed plan, side gabled, half hipped
   Primary Exterior Building Material: wood, board and batten
   Additional Materials: concrete slab
   Roof: side gabled, 1/2 hipped, low slope
   Roofing Material: asphalt shingles
   Roof Trim: exposed rafters, overhanging eaves
   Porch: 1 entry porch
   Door: flush
   Other Features: na
8. Approximate Property Size: na, (part of island)
9. The feature: is altered and collapsing
10. Surroundings: partially landscaped, shoreline
11. The structure was: on its original site
12. Year of initial construction 1935, this date is estimated.
13. Architect (if known): --
14. Builder (if known): --
15. Related features: none.

16. Date of attached photograph: 1995.

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated:
    No architectural significance. Associated with Chris Holmes, 1935-1948.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

    Books: na.

CREDITS

Date form prepared 6/02/1995 By (name): Conrad Erkelens
Address: 949 McCully St., Suite 5 City: Hon. Zip: 96826
Phone: (808) 946-2548 Organization: International Archaeological Research Institute, Inc.

STATE USE ONLY:

Site # --
TMK 4-6-01-51:1

HISTORIC RESOURCES INVENTORY

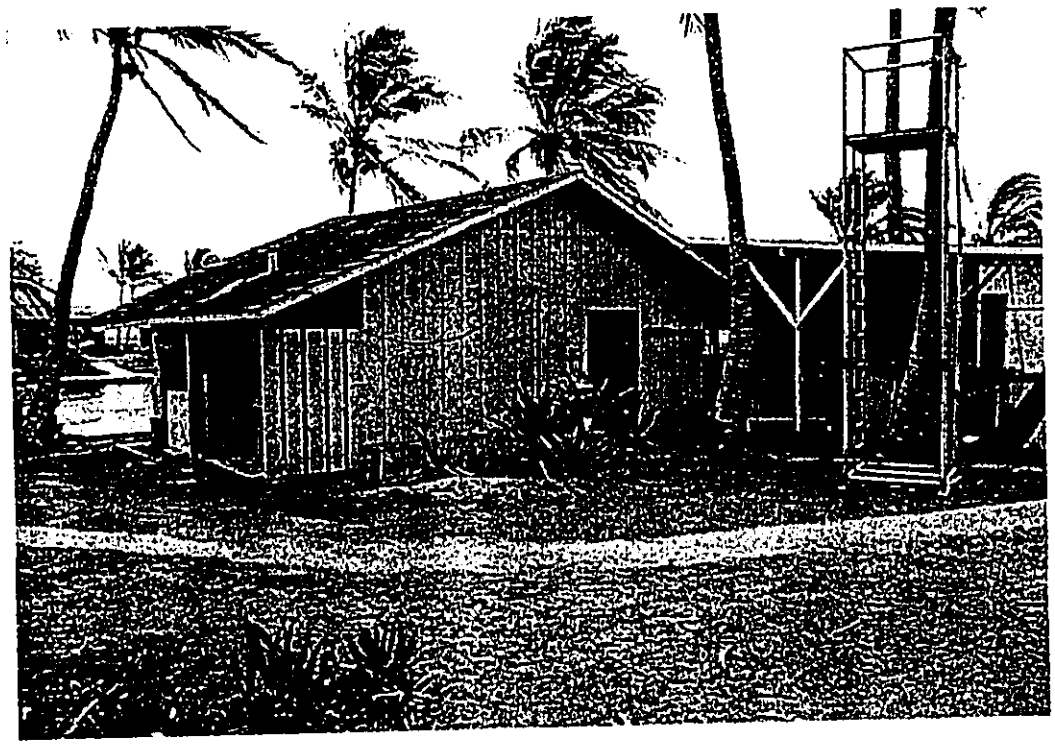
IDENTIFICATION

1. Common Name: the lunch room
2. Historic Name: the latrine
3. Street or rural address: Coconut Island
   City: Kane'ohe Zip: 96744 County: Honolulu
4. Present Owner, if known: State of Hawai'i
   Address if different from above: na
5. Ownership is: Public
6. Present Use: lunch room Original Use: latrine
   Other Past Uses: na

DESCRIPTION

7. Physical Appearance:
   Style: massed plan four unit, front gabled
   Primary Exterior Building Material: wood, board and batten
   Additional Materials: concrete slab
   Roof: front gabled, low slope
   Roofing Material: asphalt shingles
   Roof Trim: overhanging eaves, enclosed rafters, no soffit
   Porch: none
   Door: screen
   Other Features: na
8. Approximate Property Size: na, (part of island)
9. The feature: is altered and has extensive dry rot
10. Surroundings: partially landscaped, shoreline
11. The structure was: on its original site
12. Year of initial construction 1945, this date is factual.
13. Architect (if known): =
14. Builder (if known): =
15. Related features: none.

16. Date of attached photograph: 1994.



SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated:
    No architectural significance. Associated with the military use of the island from 1945-1948.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

    Article: Honolulu Advertiser, January 20, 1945, p.3.

CREDITS

Date form prepared 6/02/1995 By (name): Conrad Erkelens
Address: 949 McCully St., Suite 5 City: Hon. Zip: 96826
Phone: (808) 946-2548 Organization: International Archaeological Research Institute, Inc.

STATE USE ONLY:

Site # --
TMK 4-6-01-51:2

HISTORIC RESOURCES INVENTORY

IDENTIFICATION

1. Common Name: student housing
2. Historic Name: barracks
3. Street or rural address: Coconut Island
   City: Kane'ohe Zip: 96744 County: Honolulu
4. Present Owner, if known: State of Hawai'i
   Address if different from above: na
5. Ownership is: Public
6. Present Use: dwelling Original Use: dwelling
   Other Past Uses: none

DESCRIPTION

7. Physical Appearance:
   Style: linear "shotgun", hipped roof
   Primary Exterior Building Material: wood, board and batten
   Additional Materials: concrete footings with wooden post foundation
   Roof: low slope, hipped with ridge, simple
   Roofing Material: asphalt shingles
   Roof Trim: overhanging eaves, enclosed rafters, no soffit
   Porch: 1 side main entry porch
   Door: screen
   Other Features: na
8. Approximate Property Size: na, (part of island)
9. The feature: is altered
10. Surroundings: partially landscaped, shoreline
11. The structure was: on its original site
12. Year of initial construction 1945, this date is factual.
13. Architect (if known): =
14. Builder (if known): =
15. Related features: none.

16. Date of attached photograph: 1994.

SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated:

    No architectural significance. Associated with the military use of the island from 1945-1948.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

    Article: Honolulu Advertiser, January 20, 1945, p.3.

CREDITS

Date form prepared 6/02/1995 By (name): Conrad Erkelens
Address: 949 McCully St., Suite 5 City: Hon. Zip: 96826
Phone: (808) 946-2548 Organization: International Archaeological Research Institute, Inc.

STATE USE ONLY:

Site # --
TMK 4-6-01-51:2

HISTORIC RESOURCES INVENTORY

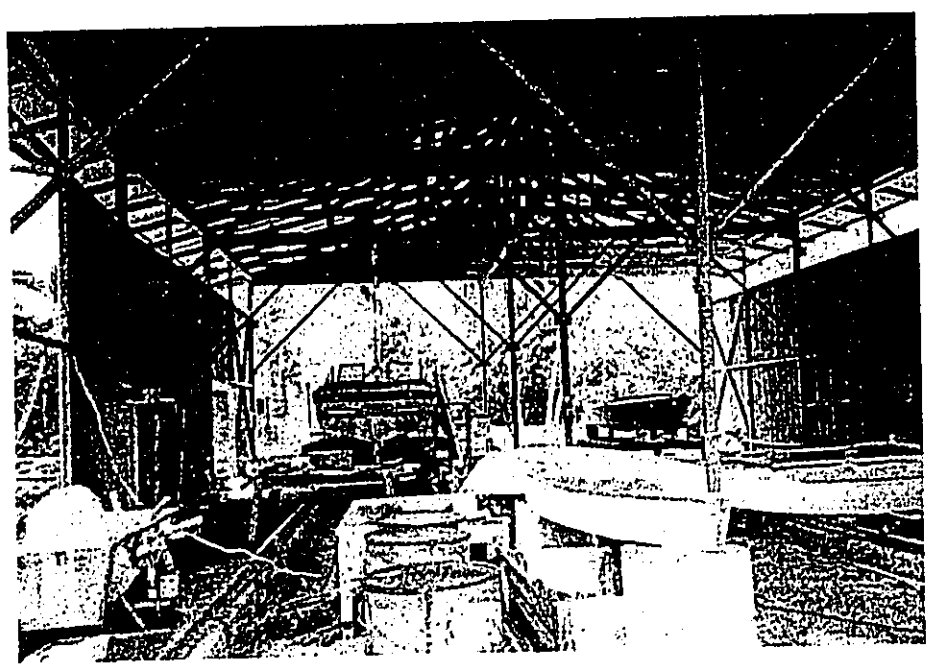
IDENTIFICATION

1. Common Name: boat repair shop
2. Historic Name: boat repair shop
3. Street or rural address: Coconut Island
   City: Kane'ohe Zip: 96744 County: Honolulu
4. Present Owner, if known: State of Hawai'i
   Address if different from above: na
5. Ownership is: Public
6. Present Use: work area Original Use: work area
   Other Past Uses: none

DESCRIPTION

7. Physical Appearance:
   Style: open shed, partially enclosed
   Primary Exterior Building Material: steel, wood, board and batten
   Additional Materials: concrete footings with steel pipe post foundation
   Roof: low slope, front gabled
   Roofing Material: corrugated steel panels
   Roof Trim: overhanging eaves, exposed rafters, no soffit
   Porch: na
   Door: na
   Other Features: adjacent boat slip railway
8. Approximate Property Size: na, (part of island)
9. The feature: is altered
10. Surroundings: partially landscaped, shoreline
11. The structure was: on its original site
12. Year of initial construction 1935, this date is estimated.
13. Architect (if known): --
14. Builder (if known): --
15. Related features: none.

16. Date of attached photograph: 1994.



SIGNIFICANCE

17. Briefly state historical and/or architectural importance (include dates, events, and persons associated:

    Associated with Chris Holmes, heir to Fleischmann's Yeast Co., who was the subject of numerous newspaper articles from the 1928 until his death in 1944. The structure is an example of an open shed, suggesting minimal importance. The significance of the marine railways is minimal since other better examples exist at Ala Wai, Tuna Packers, and Ke'ehi Lagoon on O'ahu.

18. Sources: List books, documents, surveys, personal interviews, and their dates:

    Article: Honolulu Advertiser, January 20, 1945, p.3.

CREDITS

Date form prepared 6/02/1995 By (name): Conrad Erkelens
Address: 949 McCully St., Suite 5 City: Hon. Zip: 96826
Phone: (808) 946-2548 Organization: International Archaeological Research Institute, Inc.

STATE USE ONLY:

ARCHAEOLOGICAL STUDY OF THE PROPOSED HAWAI'I INSTITUTE OF MARINE BIOLOGY EXPANSION AT MOKU O LO'E (COCONUT ISLAND), KANE'OHE, O'AHU, HAWAI'I

by

Conrad Erkelens, M.A.

for

Belt Collins Hawaii

INTERNATIONAL ARCHAEOLOGICAL RESEARCH INSTITUTE, INC.

HONOLULU, HAWAI'I

1994

Introduction

An archaeological investigation involving a literature search and a baseline survey was conducted to identify archaeological resources that may be impacted by the proposed expansion of the Hawai'i Institute of Marine Biology (HIMB). The present facility is located at Moku O Lo'e (also known as Coconut Island), in Kane'ohe Bay on the windward, east coast of O'ahu, Hawai'i (Fig. 1). This survey was conducted under contract to Belt Collins Hawaii who will incorporate the findings from this report into the EIS documentation addressing the proposed project.

Potential impacts to historic resources from this development include those posed by the operation of the buildings, the short term impacts from construction, transportation and storage of construction materials, and the disposal of demolition and construction waste. The proposed expansion of HIMB consists of four tasks that are the subject of this EIS review. The four are:

1) The replacement or repair of the existing seawalls prior to the start of demolition or construction.

2) The demolition of four existing buildings including the Old Boat House, Maintenance Building, Shark Laboratory, and Lunch Room.

3) Construction of a new three story Marine Laboratory Building.

4) Construction of a new Maintenance Building at the previous site of the Old Boat House.

The present perimeter of the island was constructed from the placement of dredge spoils as landfill during the 1930s. This landfilled area is owned by the State of Hawai'i while the interior of the island is privately owned. All construction and demolition activities will take place on the State owned portion of the island. Encroachment on the privately owned portion of the island will occur only at the southern end where the road circling the island crosses the privately owned land boundary.

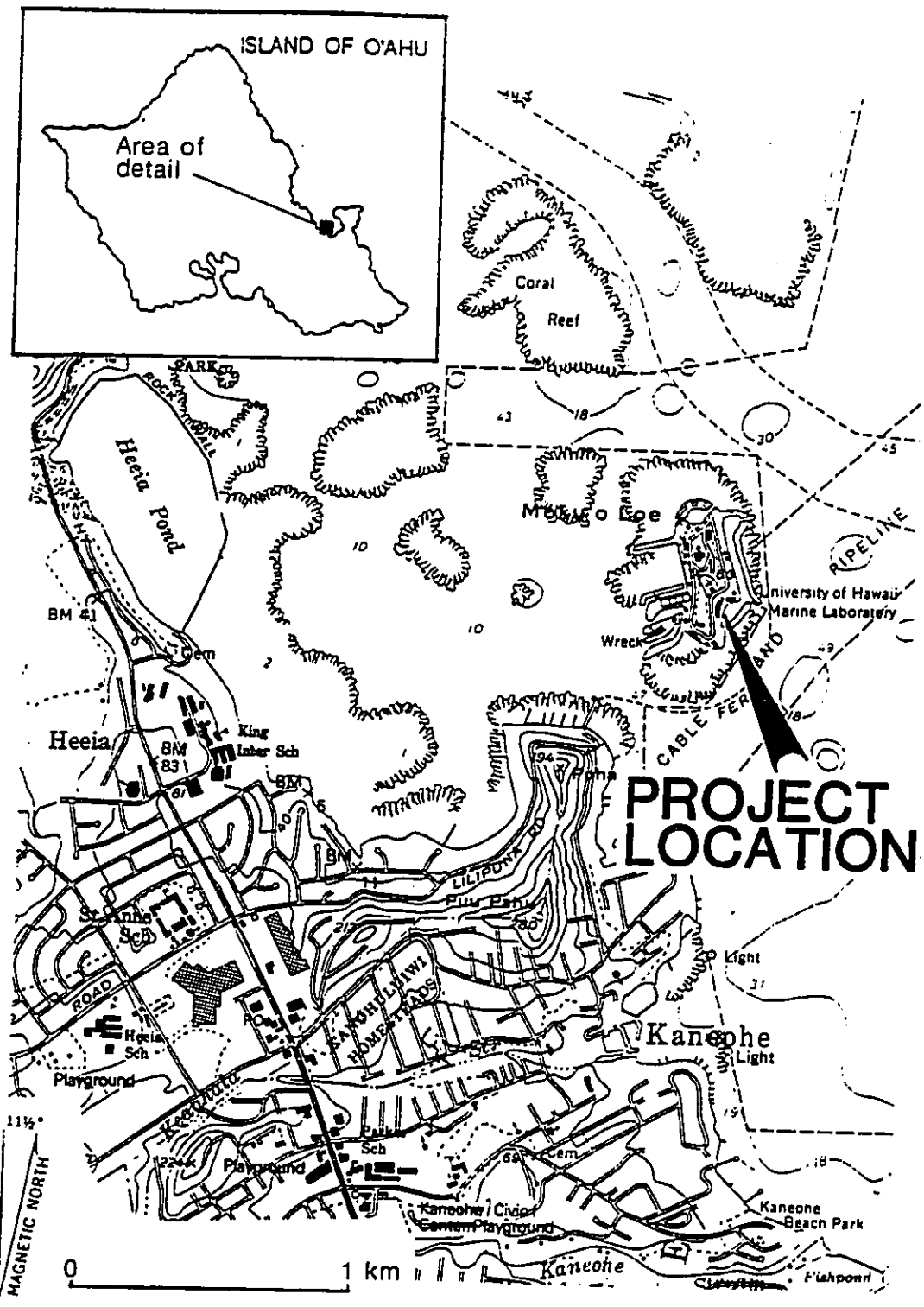


Figure 1. USGS map of project area. Moku O Lo'e (Coconut Island), Kane'ohe, Hawai'i.

Setting

Moku O Lo'e is a volcanic island located approximately 650 m (0.4 mi) from the nearest shoreline in Kane'ohe Bay. It was created following the cessation of the Ko'olau volcanic activity when vents formed at a number of locations along the windward coast of O'ahu (Macdonald and Abbott 1970:366-367). Moku O Lo'e may be one of those vents, although geologists have not specifically studied this island. Its present land area is approximately 8.7 ha (21.9 acre), although the size and shape of the island have undergone dramatic modification since the mid-1930s. These changes (discussed more fully in a later section of this report) include the addition of approximately 3.8 ha (9.4 acre) of coral and sand from dredge spoils to the perimeter of the original 5.1 ha (12.5 acre) volcanic island. The dredge and fill operation resulted in the creation of two large enclosed lagoons, six large ponds, and four peninsulas projecting from the western shore of the island.

The prior dimensions and topography of the island are indicated by a late nineteenth century map (Jackson 1882). This map depicts a volcanic crater forming the island's highest elevation, approximately 12 m (40 ft) above seal level. Volcanic glass is present on the island and was collected during fieldwork. This volcanic glass could have been exploited by Hawaiians as a source for material used to manufacture flaked tools; however, given the extensive earth-moving landscaping during the 1930s, we cannot be certain that the volcanic glass was exposed prior to that time. The majority of the island is composed of soil described as Alaeloa silty clay (Foote et al. 1972) that has weathered from basic igneous rock. This soil is characterized as presenting a severe erosion hazard in steep topography (Foote et al. 1972:26). Lateritic sediment and saprolitic rock were noted on the east side of the island where erosion along the road cut had partially exposed the strata underlying the surface soil and sediment.

Median annual rainfall on the island is approximately 1,250 mm (50 in) (Giambella et al. 1986:73), which is adequate for the cultivation of most Hawaiian dryland cultigens. However, there are no sources of fresh water on the island. This constraint suggests that Hawaiian habitation of the island would probably have been on only a temporary basis.

The vegetation in the early 1900s was described as lantana and dense guava with coconut trees along the shore (Honolulu Advertiser 1937e:13; 1937f:13). Most of the previous vegetation was removed from the island when it was landscaped in the 1930s. The present vegetation on the island is dominated by coconut (*Cocus nucifera*), *milo* (*Thespesia populnea*), *hala* (*Pandanus odoratissimus*) banyan (*Ficus* sp.), mangrove (*Rizophora mangle*), ironwood (*Casuarina equisetifolia*), mango (*Mangifera indica*), oleander (*Nerium indicum* sp.), and various ornamental shrubs and grasses.

History

The island Moku O Lo'e is mentioned in only one recorded oral account dating from the pre-European era. This citation from a morality tale appearing in the Hawaiian Ethnological Notebook, (Sterling and Summers 1987:206) suggests the island was known as Moku O Lo'e in reference to a female named Lo'e who lived there. Given the lack of water on the island it is doubtful that the island was ever inhabited permanently, which calls into question the historical accuracy of information provided by this story. An alternative meaning for the name of the island was provided by Fred Beckley, "Hawaiian scholar and authority," who was quoted as translating Moku O Lo'e as meaning "the island of the split" (Honolulu Advertiser 1937f:13).

Other references suggest an alternative interpretation for the name of the island. Pukui and Elbert recorded that the Hawaiian word *lo'e* referred to the curve of a fishhook (1986:209). Sterling and Summers (1978:192) cite a 1964 magazine article (Paginawan 1964) concerning the use of Moku O Lo'e as a lookout used by fishermen to signal the location of fish schools. During the mid-nineteenth century land awards of the Great Mahele (cf. Chinen 1958), the area around Moku O Lo'e was claimed as the "He'eia Fishery", indicating the waters around the island were a valuable subsistence resource. Given the use of offshore islands as temporary camps for fishermen, the location of an encompassing fishery, and the name relationship to an aspect of fishhook design, it is probable that the name of the island is associated with fishing.

During the Great Mahele, Moku O Lo'e was designated as Crown Land and was included with He'eia *ahupua'a* and fishery in an award (LCA 10613, *apana* 1) to Abenera Paki, the father of Bernice Bishop (cf. Kame'eleihiwa 1992:267). Given the status of the award as Crown Land to an *ali'i* (chief), there is no Land Court testimony relating to mid-nineteenth century land use for this parcel (*apana*). Later court records indicate that no one had permanently resided on Moku O Lo'e since at least 1884 (Honolulu Advertiser 1937d:2). Occasionally, however, the island was put to use. A *luau* in honor of Queen Emma took place on Moku O Lo'e in 1884 (Honolulu Advertiser 1937b:13). Sheep were pastured on the island from 1897 to 1899 but were said to have been run off by large rats that inhabited the island (Advertiser 1937c:3).

The island passed through a variety of owners from the late-nineteenth century to the late 1920s. There are no records documenting the use of the island during that period. In 1926 Chris Holmes, the heir to the Fleshman's Yeast fortune, arrived in the islands. By 1928 he had sub-leased Moku O Lo'e from the He'eia Land Company (Honolulu Advertiser 1937a) and by 1933 Holmes had leased the island directly from Bishop Estate (Star Bulletin 1933:1). In 1936 Holmes expressed an interest in purchasing Moku O Lo'e, prompting a Land Court Application (Ld. Ct. App. 1134) to secure title to the island (Moriki 1976:6). A group of three Hawaiians contested the claim with the resulting court case lasting from January 5 to January 28, 1937. Much of the subsequent published material concerning the history of the island quoted (out of context) the perjured testimony from the three Hawaiian claimants who claimed to have lived on the island for a number of years. These individuals

were later indicted for that testimony which was characterized as "imaginary" by the presiding judge (cf. Advertiser 1937f:13).

By 1935 Chris Holmes had accomplished a complete transformation of Moku O Lo'e, which was subsequently referred to as "Coconut Island" in the daily newspapers. The transformation of the island undertaken by Holmes included the dredging of channels and the addition of 3.8 ha (9.44 acres) of land creating two large enclosed lagoons, six large ponds, and four peninsulas projecting from the southwestern shore of the island (Fig. 2). This was followed by the importation of numerous ornamental plants for landscaping, and the construction of numerous buildings. The date for the completion of this terraforming is established by the concrete lighthouse dated 1935 (numbers in relief on the structure) located on the peninsula of filled land at the boat landing. This documents the approximate time period for the end of the dredge and filling operations that created the State land upon which the HIMB now sits. The ownership of the landfill would become problematic in 1955 when the Territorial Tax Commissioner realized the added 3.8 ha (9.44 acres) of land did not show on tax maps and that subsequent real property taxes had not been paid (Star Bulletin 1955:16).

Following the death of Chris Holmes in 1944, the military leased the island for a rest and recreation center from 1945 to 1948 (Honolulu Advertiser 1945:3). Two of the structures constructed by the military in 1945 remain standing and are presently being used by HIMB. In 1947 the lagoons, ponds, and a portion of the landfilled perimeter of the island were donated to the establishment of the Hawai'i Marine Laboratory in a joint venture between the University of Hawai'i and the University of California (Honolulu Advertiser 1947:6). The Main Laboratory building constructed in the 1940s burned in 1961. It was subsequently replaced and the laboratory reopened in 1966. It is the replacement of the laboratory building, constructed in the mid-1960s, which is the main focus of the proposed expansion.

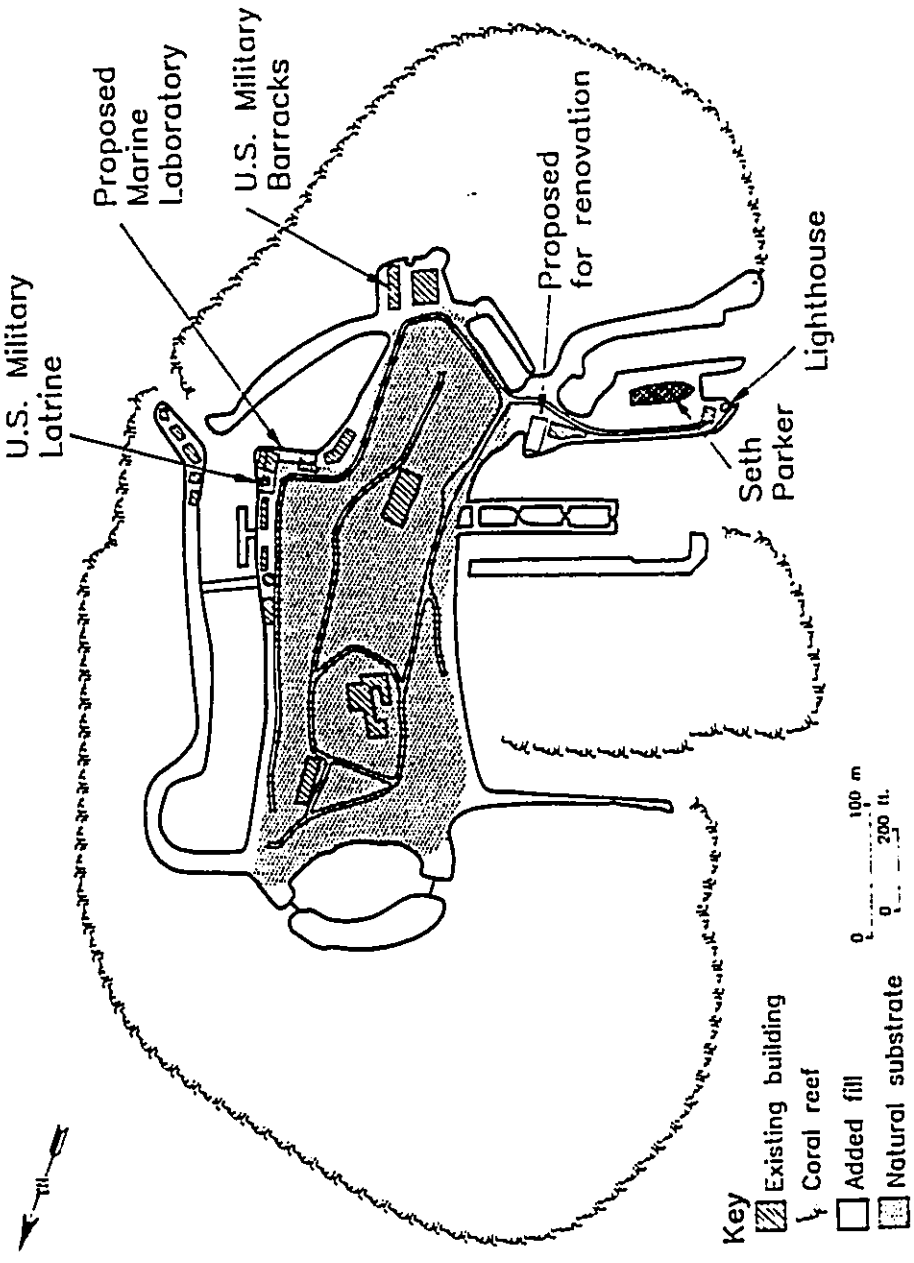


Figure 2. Map of Moku O Lo'e (Coconut Island) showing original island land area. as taken from Jackson (1882). overlaid on the present land boundaries.

Predicted occurrence of archaeological sites

Because there are no sources of freshwater on Moku O Lo'e, it is unlikely that permanent habitation took place on the island. Any previous use by Hawaiians was probably limited to the temporary occupation camps of fishermen. During the 1930s, most of the island's vegetation was removed and the extensive terraforming and landscaping took place. Therefore, given the environmental conditions and recent history of the island, it is highly unlikely that archaeological resources are present on Moku O Lo'e. In regard to the specific project area, all construction is proposed to take place in areas of landfill that were created in the early 1930s. There should be no archaeological resources present in the areas to be impacted by construction activities.

Survey Results

A reconnaissance survey by Conrad Erkelens, M.A., of all landfilled areas along the southern and southwestern portion of the island and in areas encompassing the locations for the proposed structures took place on June 23, 1994. These areas are composed of coral and coral sand dredge spoils, creating fill areas approximately 1.5 m in height above sea level. The shoreline is defined by concrete seawalls over a majority of this added land. The excavation of four 30-40 cm deep postholes adjacent to the turtle tanks was observed. This provided an examination of the stratigraphy consisting of approximately 5 cm of terriginous silty clay sediment overlying the fill of coral and coral sand.

As expected, no archaeological sites were located in the surveyed areas or adjacent to any of the proposed construction areas. The only potential area of concern lies at the southwestern corner of the island, where the road crosses onto private land and a portion of the original land surface. Construction vehicles may need to use this road to transport material from the proposed landing site to the new laboratory building site. However, given the presence of a subsurface sewer line, the steep topography, and the previous disturbance caused by the roadcut into the hillside, it is unlikely there are subsurface archaeological deposits at that location.

During the survey, the presence of large nodules of volcanic glass was noted eroding from the fill to the east of the present maintenance building. Since this material was found within the fill it may not have originated on the island. If it is local, given the documented dramatic changes to the island, it is uncertain if this material could have been used by Hawaiians since it may not have been was present on the surface prior to the 1930s. Volcanic glass was used by Hawaiians in the manufacture of flaked tools. However, none of the observed volcanic glass had been flaked and none was artifactual.

Historic sites

There are two structures remaining from the use of the island as a rest area for military personnel from 1945 to 1948. Both have asphalt shingle roofing and are single wall construction wooden buildings set upon concrete slab foundations. The previous military latrine building is in poor condition with visible evidence of dry rot along the eaves. Sections of the walls have been replaced in the past in a piecemeal fashion as the need arose. This building is now used as a lunch room and will be demolished to make room for the proposed new Marine Laboratory Building. The other military structure was a barracks. It is in similar condition to the present lunch room building. The barracks building is currently used to house visiting students and the State caretaker and is not scheduled to be impacted from the planned development. Neither of these buildings used by the military in the 1940s retains any of the criteria that would qualify them for consideration as significant historic resources.

Adjacent to the boat landing is an area that appears to be an overgrown compost pile. Beneath this pile is the sunken wreck of the vessel "Seth Parker," a four masted schooner. A photograph of the vessel taken in 1938 appears in a publication by Scott (1968:732). The remains of the rotting hull extending above water are presently visible at various locations along its length. The vessel does not qualify for consideration as a historic site under any of the established significance criteria.

The old boat house is a large, open, high roofed metal shed used to shelter boats during their repair. It was constructed sometime around 1935, after the completion of the landfill operation that created the area it was built upon. This structure is scheduled for demolition and replacement by a new maintenance building in the proposed expansion project. The present old boat house structure does not qualify for consideration as significant historic resource under the established significance criteria.

Recommendations

Given the history of the island, it is unlikely that intact archaeological remains are present on any portion of Moku O Lo'e. The proposed expansion of HIMB on State property in landfilled areas will not impact any known archaeological sites or historic resources. The proposed repair of the seawalls, which will occur in areas of landfill, will not impact any historic resources. There is no potential for the presence of subsurface archaeological remains within the proposed construction areas. Therefore, no further archaeological investigation or subsequent archaeological construction monitoring is recommended.

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Appendix F

Environmental Noise Assessment, New Laboratory Building, Moku O Loe (Coconut Island), Oahu, Hawaii, July 1994

D.L. ADAMS ASSOCIATES, LTD.
dba
DARBY
& ASSOCIATES
ACOUSTICAL CONSULTANTS

#94-17

ENVIRONMENTAL NOISE ASSESSMENT
NEW LABORATORY BUILDING
MOKU O LOE (COCONUT ISLAND)
OAHU, HAWAII

July, 1994

Prepared for
BELT COLLINS HAWAII
Honolulu, Hawaii

PALI PALMS PLAZA • 970 NO. KALAHEO AVENUE • SUITE A-311
KAILUA, HAWAII 96734 • (808) 254-3318 • FAX (808) 254-5295

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1. SUMMARY

The proposed project consists of the demolition of three existing buildings, replacement or repair of existing seawalls and the construction of a new three-story laboratory building and a new maintenance building at the Hawaii Institute of Marine Biology (HIMB) on Coconut Island. The existing daytime acoustical environment at the property line between hIMB property and privately-owned land on Coconut Island varies from approximately 44 dBA to 72 dBA. The higher levels were associated with human activities and equipment at the HIMB facilities.

Because of limited land-side parking, no significant increase is expected on Lilipuna Road. Therefore, traffic due to the project is not expected to have a significant noise impact on noise sensitive residential areas along Lilipuna Road in Kaneohe Town.

Noise produced by equipment, i.e, pumps, compressors, an emergency generator, building air conditioning and ventilating equipment, etc. is expected to cause noise impact at the nearby property line of the privately-owned portion of the island. Noise mitigation for this equipment will be required.

Construction noise will impact the privately-owned portion of the island and, potentially, the nearest on-shore residential properties in the Pohakea area of Kaneohe. A construction noise permit should be obtained from the State Department of Health. This permit limits the days and the hours of the day when construction noise is allowed.

Based on the current and projected complement of aircraft, no noise impact on the project is anticipated due to aircraft operations at the Marine Corps Base Hawaii, Kaneohe Bay.

2. PROJECT DESCRIPTION

2.1 Location of Project

The University of Hawaii's Hawaii Institute of Marine Biology (HIMB) is located on Moku o Loe (Coconut Island) in the southern portion of Kaneohe Bay, on Windward Oahu, as shown on the map of Figure 1. It is approximately 0.4 mile northeast of the closest shoreline at Kaneohe.

The central part of Coconut Island is privately owned and zoned Preservation (P-1). The peripheral areas of the island, consisting of material dredged during the 1930's, essentially comprise the state-owned portion of the island. On the west side of the island, the fringing reef was dredged and piers were built on filled land. The HIMB utilizes these piers and fill land for operating its research facilities as illustrated in Figure 2.

2.2 Proposed Action

The proposed action consists of four components: 1) demolition of three existing buildings; 2) replacement or repair of existing seawalls; 3) construction of a new three-story laboratory building; and 4) relocation and expansion of an existing maintenance building. The proposed facility expansion is shown in Figure 2.

2.2.1 Demolition

One existing lab building and an existing maintenance shop will be demolished (Figure 2) to make way for the new Marine Laboratory Building. The "Old Boat House" will be demolished to accommodate the replacement maintenance building. Existing seawalls in the area of the demolished structures will be repaired before the start of construction of the new buildings.

2.2.2 Seawall Repair

Seawalls adjacent to the proposed buildings will be repaired or replaced, as needed, to protect the new structures.

2.2.3 New Marine Laboratory Building

The new three-story Marine Laboratory Building would occupy a site of approximately 7,200 square feet within the existing HIMB grounds. The building would contain a conference room on the first floor, a computer library on the second floor, and various special use labs and research spaces on all floors. Including other supporting facilities such as a lunch room, a kitchen, rest rooms, utility and storage rooms, the new laboratory building's total floor area would be approximately 21,600 square feet.

2.2.4 Maintenance Building Replacement

The new maintenance building would contain approximately 4,700 square feet and would comprise of shops for plumbing, metal work, wood work, refrigeration and air conditioning repair, painting and fiberglass work, internal combustion and electric motor repair, and for SCUBA equipment. The maintenance building would also contain a tool room and a material storage room. It would occupy the footprint of the Old Boat House site. A small visitor reception and security office would be constructed next to the new maintenance building.

3.0 NOISE STANDARDS, REGULATIONS, AND GUIDELINES

Various local and federal agencies specify guidelines and standards in assessing environmental noise and set noise limits as a function of land use.

3.1 State Department of Health

DOH specifies allowable property line noise levels that shall not be exceeded for more than 10% of the time during any 20-minute period [Reference 1]. These are enforced for any location at or beyond the property line. The specified noise limits vary depending on the land use and time of day as shown in Figure 3. DOH also specifies the following with respect to adjacent zoning:

> "Where the allowable noise level between two adjacent zoning districts differ, the lower allowable noise level shall be used. For example, the allowable noise level for the residential district shall be used at the property line between residential and business districts."

3.2 City and County of Honolulu Land Use Ordinance (LUO)

The Department of Land Utilization specifies maximum allowable levels at the property line [Reference 2]. The LUO criteria differ from those of the DOH in that they use octave band sound levels rather than A-weighted levels and no temporal factor is involved. The specific octave band levels are shown in Figure 4. LUO noise regulations are theoretically enforced by the Building Department; however, since this Department does not have noise measurement capability, noise complaints are usually handled by the DOH.

3.3 U.S. Federal Highway Administration

The Federal Highway Administration (FHWA) has established a set of design goals for traffic noise exposure [Reference 3]. The FHWA defines four land use categories and assigns corresponding maximum hourly equivalent sound levels, Leq. For example, Category B, defined as picnic and recreation areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals, has a corresponding maximum exterior Leq of 67 dBA and a maximum interior Leq of 52 dBA. These limits are viewed as design goals, and all projects which are developed to meet these limits are deemed in conformance with the FHWA noise standards.

3.4 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has identified a range of yearly day-night equivalent sound levels, Ldn, sufficient to protect public health and welfare from the effects of environmental noise [Reference 4]. The EPA has established a goal to reduce exterior environmental noise to an Ldn not exceeding 65 dB and a future goal to further reduce exterior environmental noise to an Ldn not exceeding 55 dB. Additionally, the EPA states that to protect against hearing damage, one's 24-hour equivalent sound level exposure, Leq, at the ear should not exceed 70 dB,. The EPA emphasizes that these goals are not intended as regulations as it has no authority to regulate noise levels,

but rather these goals are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

4. EXISTING ACOUSTICAL ENVIRONMENT

4.1 Ambient Noise Measurements

Short term, i.e., 5 to 6 minutes, average ambient noise level measurements were taken at selected locations between the hours of 2:40 p.m. and 3:54 p.m. on June 23, 1994 to assess the existing acoustical environment.

Noise level measurement locations are shown in Figure 5. The measured noise levels, i.e, the equivalent sound level (Leq), the minimum sound level (Lmin), and the maximum sound level (Lmax) for the time duration indicated are given in Table 1. No fixed or rotary wing aircraft operations were audibly detected during these measurements, except at Location 5, but the noise of several small watercraft were observed as noted.

5. POTENTIAL NOISE IMPACT DUE TO PROJECT

5.1 Additional Traffic Generated by the Project

The HIMB on Coconut Island currently employs 34 full-time and 47 part-time employees. Very seldom are all employees on the island at the same time. Approximately twelve new staff positions are anticipated with the new facilities. Access to the HIMB Coconut Island facilities is via the Lilipuna Road Pier and by water to the boat landing on the west side of the island.

Parking at the Lilipuna Road Pier is limited, i.e., approximately 50 parking stalls. There are no parking spaces along Lilipuna Road in the vicinity of the pier road. The proposed action does not include expansion of the parking area. A park-and-ride shuttle service is being contemplated to transport visitors, employees and students by bus or van from one of the nearby Kaneohe shopping centers to the pier. For these reasons, no significant increase in traffic on Lilipuna Road is anticipated. Therefore, no significant increase in traffic noise along Lilipuna Road is expected.

5.2 Potential Project Equipment Noise

The proposed new maintenance building on the west side of the island will be naturally ventilated, although the security office and visitor reception area are likely to be air conditioned. The use of hand and power tools in the maintenance shop is likely to produce levels which exceed the DOH allowable and LUO maximum levels at the nearby property line of the privately owned land.

It is anticipated that approximately 75% of the proposed laboratory building will be air conditioned. In addition, an emergency generator is to be located near the lab building. Pumps, compressors, and other equipment required for the lab's research activities are also likely to be located in the vicinity of the lab. Because of the close proximity of this building to the property line, it is highly probable that without noise mitigation this equipment will produce levels that exceed the DOH and LUO allowable levels.

5.3 Construction Noise

Development of the project will involve demolition, excavation, grading, and the construction of the new buildings. In addition, it is anticipated that building materials and construction equipment will be transported by boat from Heeia Kea Boat Harbor to the west side of the island where raw materials will be stockpiled. The various construction phases of the project may generate significant amounts of noise, which may impact the adjacent, privately-owned, preservation land and, potentially, the nearby residential area of Pohakea in Kaneohe.

The construction-generated noise levels are dependent upon the methods employed during each stage of the construction process. It is anticipated that demolition, clearing of vegetation, and grading will take approximately three months. The use of a vibrating hammer to drive sheet piles for seawall repair and replacement is also anticipated. The construction of the proposed lab and maintenance buildings is expected to be slab-on-grade, steel frame, and concrete masonry units (EMU).

Typical ranges of construction equipment noise are shown in Figure 6. Earth moving equipment, such as bulldozers and diesel engine powered trucks and frontend loaders, as well as the vibrating hammer, will probably produce the highest noise levels. Blasting is not anticipated during this construction.

6. POTENTIAL NOISE IMPACT ON PROJECT

6.1 Aircraft Noise Impact

The 1983 Air Installation Compatible Use Zones (AICUZ) study for Kaneohe Marine Corps Base Hawaii (KMCBH), formerly named the Marine Corps Air Station (MCAS) Kaneohe Bay, was updated in 1990 [Reference 5]. However, the complement of aircraft based there has changed significantly since the AICUZ study update in 1990. The major change was that the two squadrons of FA-18 aircraft were reassigned. Except for infrequent transient, fixed wing jet aircraft operations at the Base's airfield, it is used primarily for the rotary wing aircraft squadrons stationed there. Table 2, based on information dated June 3, 1994, is the Air Marine Corps Facilities Support Requirements up to the year 2000. Figure 7, taken from Reference 5, shows selected rotary-wing flight tracks relative to Coconut Island. However, the noise contours of the 1990 AICUZ study update are no longer valid, because the FA-18 squadrons are

no longer based at KMCBH. The AICUZ study has not been updated since this change occurred, but it is estimated the project site is well outside the Ldn 55 noise contour based on the current and foreseeable future aircraft operations. No significant aircraft noise impact exists for the project.

7. NOISE MITIGATION

7.1 Mitigation of Construction Noise

In cases where construction noise exceeds, or is expected to exceed, the DOH's "allowable" property line limits, a permit must be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, etc. which emit noise levels in excess of the "allowable" limits. In accordance with Reference 1, required permit conditions for construction activities are:

> "No permit shall allow construction activities creating excessive noise...before 7:00 am and after 6:00 pm of the same day."
>
> "No permit shall allow construction activities which emit noise in excess of ninety-five dB(A)...except between 9:00 am and 5:30 pm of the same day."
>
> "No permit shall allow construction activities which exceed the allowable noise levels on Sundays and on...[certain] holidays. Activities exceeding ninety-five dB(A) shall [also] be prohibited on Saturdays."

In addition, construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must be equipped with mufflers. Also, construction vehicles using traffic-ways must satisfy the DOH's vehicular noise requirements [Reference 6].

7.2 Mitigation of Project Noise

Because of the close proximity of the proposed new buildings to the property line of the privately-owned land on Coconut Island, the noise produced by air conditioning and ventilating equipment of the new laboratory and maintenance buildings may require mitigation. This can be accomplished with appropriately placed and properly constructed noise barrier screens or walls for rooftop and on-grade equipment, and/or the use of silencers and acoustical boots for air discharge and air intake elements. Pumps and compressors should be placed on the makai side of structures when possible or enclosed in sound attenuating enclosures. The emergency generator noise can be mitigated through the use of a "hospital-grade" exhaust silencer and an acoustical enclosure.

Noise produced by the repair and maintenance activities in the new maintenance building is not expected to be continuous. However, it is

conceivable that there may be periods of activity when high noise levels are produced for extended periods of time, e.g., during a woodworking project. Noise mitigation can be achieved by:

1. Eliminating openings in the east wall of the maintenance building, e.g., windows, doors, ventilation jalousies, etc.;

2. Confining noise producing activities to the interior of the building;

3. Using power tools, e.g., saws, routers, sanders, etc., only in the daytime and only in a totally enclosed room within the building;

4. Installing sound absorbing material, e.g., fiberglass insulation on interior ceiling and wall surfaces of those areas of the building where noisy activities will take place;

5. Installing through-the-wall silencers or acoustical louvers in all ventilation aperatures of those portions of the building that will be naturally ventilated; and

6. Employing a ductless, split-type air conditioning system for the maintenance office which typically produces less noise than conventional air conditioner units.

REFERENCES:

1. *Community Noise Control for Oahu*, Department of Health, State of Hawaii, Chapter 43, Title II, Administrative Rules, November 6, 1981.

2. *Land Use Ordinance*, Section 3.100 Noise Regulations, Department of Land Utilization, City and County of Honolulu, December, 1991.

3. *Federal Highway Administration Procedures for Abatement of Highway Traffic Noise*, U.S. Department of Transportation, Title 23, Chapter 1, Sub-chapter J, CFR Part 772, June 19, 1973; Revised 47 FR 29654, July 8, 1982.

4. *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.

5. *Air Installations Compatible Use Zones Update MCAS Kaneohe Bay, Hawaii*, Department of the navy, Pacific Division, Naval Facilities Engineering Command, Facilities Planning Department, November, 1990.

6. *Vehicular Noise Control for Oahu*, Chapter 42, Title 11, Administrative Rules, Department of Health, State of Hawaii, November 6, 1981.

TABLE 1

AMBIENT NOISE MEASUREMENTS
(Between 2:40 p.m. and 3:54 p.m. on June 23, 1994)

Measurement Location	Length of Measurement (m:s)	Leq (dBA)	Lmin (dBA)	Lmax (dBA)	Comments
1	6:11	62.5	60.8	67.5	Pump noise, Boston Whaler passby (slow), 3-wheel ATV passby on road (twice).
2	4:06	55.8	50.8	69.3	Water lapping, fork lift operating approx. 50 feet away, voices, tool box dropped.
3	0:40	71.5	-	-	Steady noise of exhausting air near hatchery tanks.
4	8:23	43.8	38.5	55.0	Birds, distant voices, distant outboard motor.
5	3:06	47.6	44.0	63.3	Birds, occassional car passby on Lilipuna Road, distant military helicopter, surf noise.
6	3:59	60.5	41.5	74.5	Sliding gate noise, gate warning signal, 4 automobile passbys on Lilipuna Road, birds, 1 pickup truck and 1 automobile exited through gate.

TABLE 2

AIR MARINE CORPS FACILITIES
SUPPORT REQUIREMENTS
KANEOHE MARINE CORPS BASE HAWAII
(UP TO YEAR 2000)

Type of Aircraft	No. of Aircraft
CH-53B	38
SH60	10
C20G	2
DP-3	2
C-130 Hercules	4
H-65	4

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FIGURE 1 - VICINITY MAP KANEOHE BAY

SCALE: 1" = 1 MILE

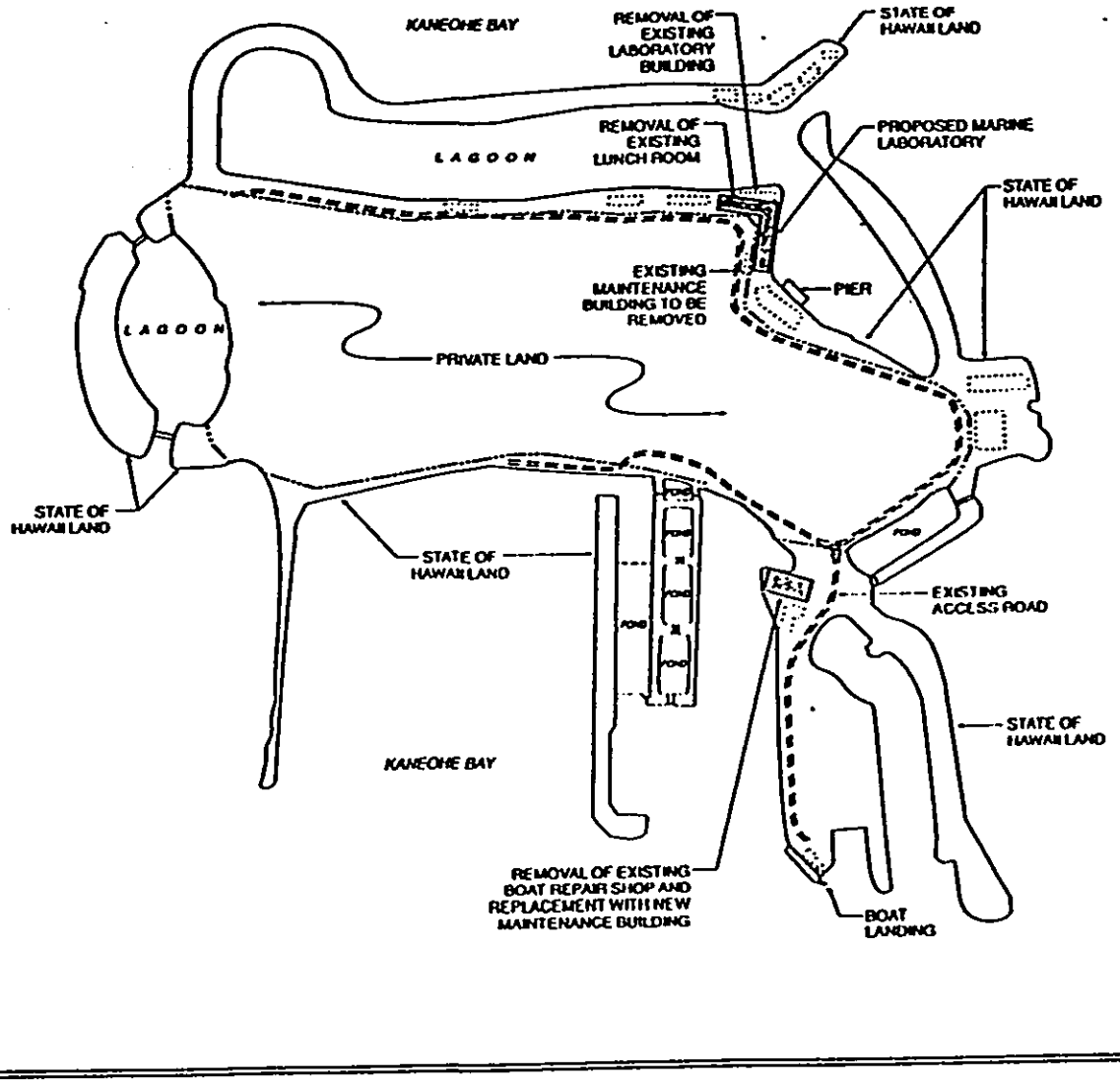

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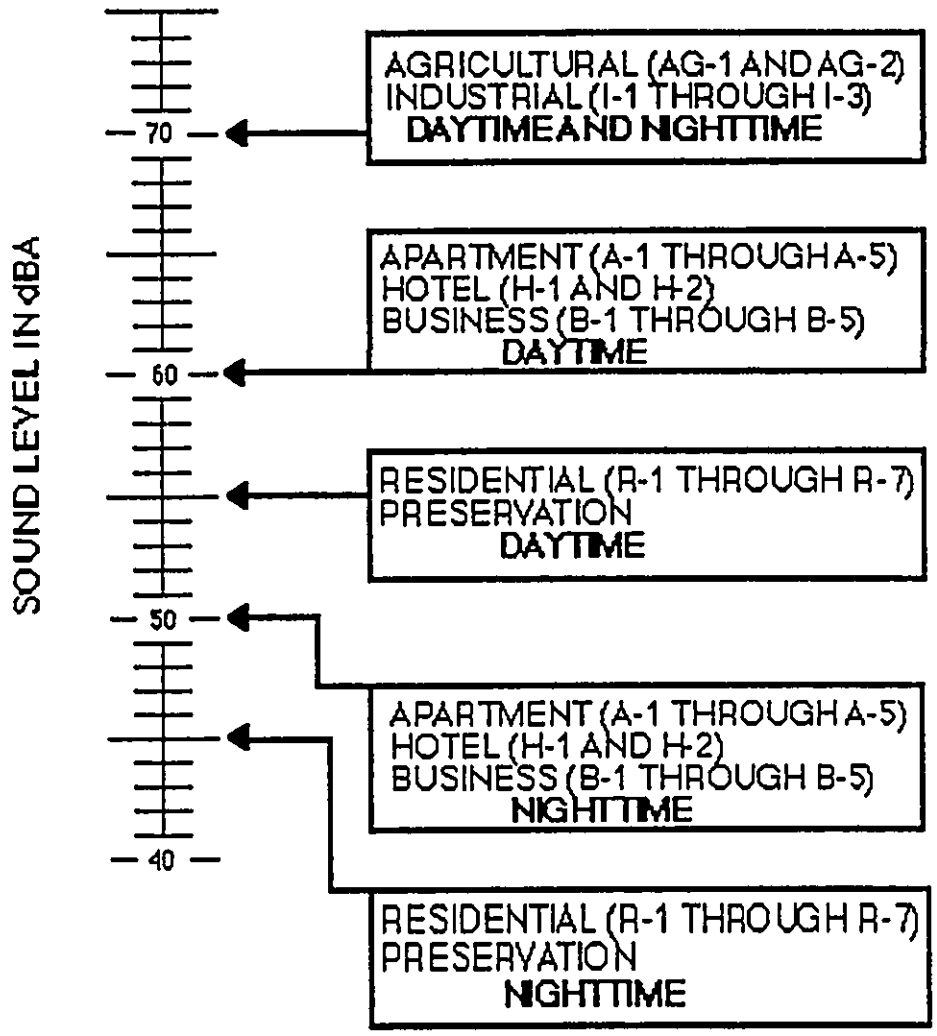
FIGURE 2 - COCONUT ISLAND EXISTING AND PROPOSED HAWAII INSTITUE OF MARINE BIOLOGY FACILITIES



NOTE: LEVELS INDICATED BY ZONING DISTRICT ARE THE "ALLOWABLE" LEVELS THAT SHALL NOT BE EXCEEDED FOR MORE THAN TEN PERCENT OF THE TIME WITHIN ANY TWENTY MINUTE PERIOD DURING THE TIME PERIOD SHOWN (DAYTIME: 7:00 A.M. TO 10:00 P.M., NIGHTTIME: 10:00 P.M. TO 7:00 A.M.)

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FIGURE 3 - ALLOWABLE NOISE LEVELS FOR VARIOUS ZONING DISTRICTS ON OAHU

SOURCE: REFERENCE 1

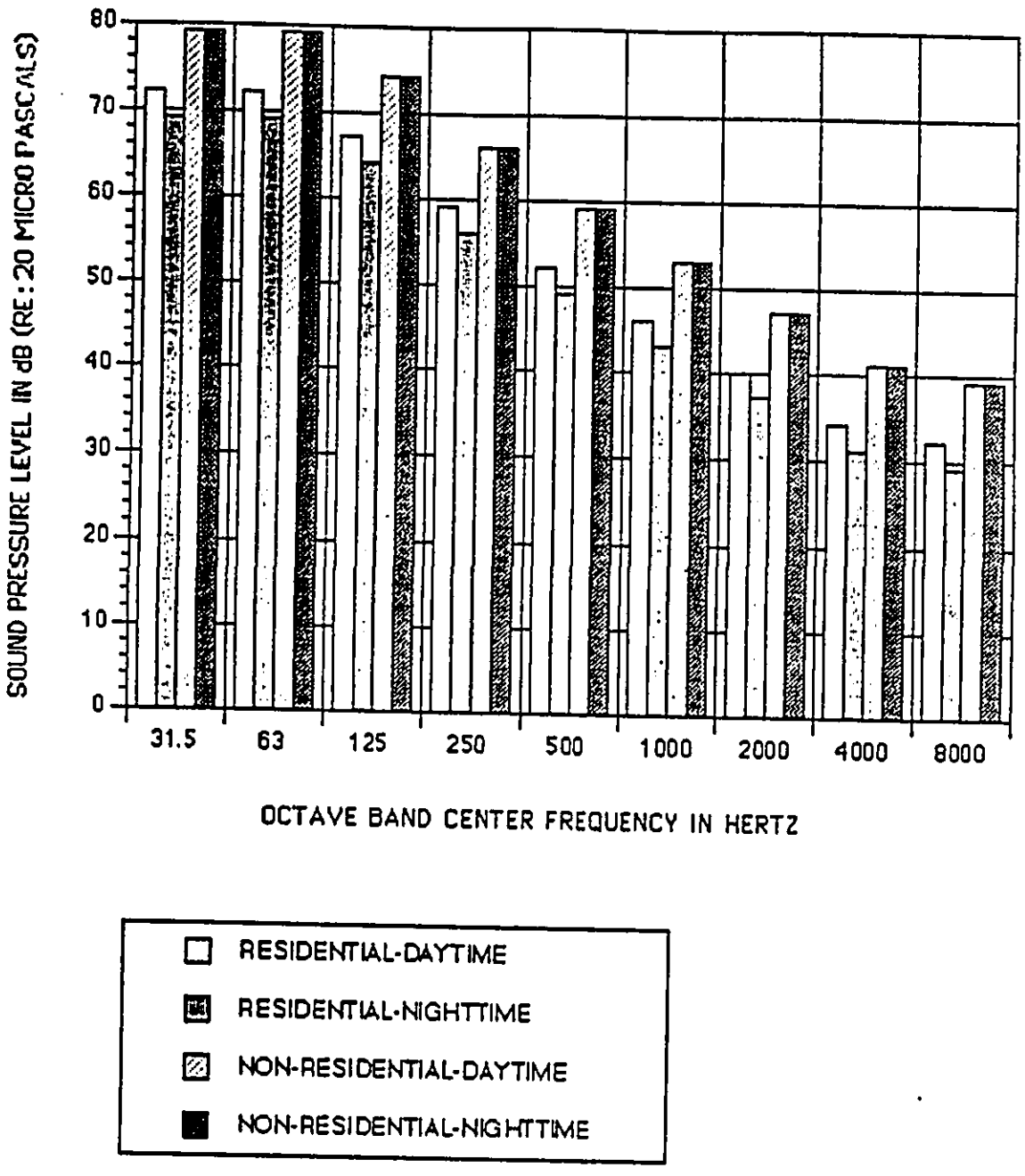

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FIGURE 4 - MAXIMUM OCTAVE BAND SOUND PRESSURE LEVELS THAT SHALL NOT BE EXCEEDED IN ACCORDANCE WITH CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE

SOURCE: REFERENCE 2

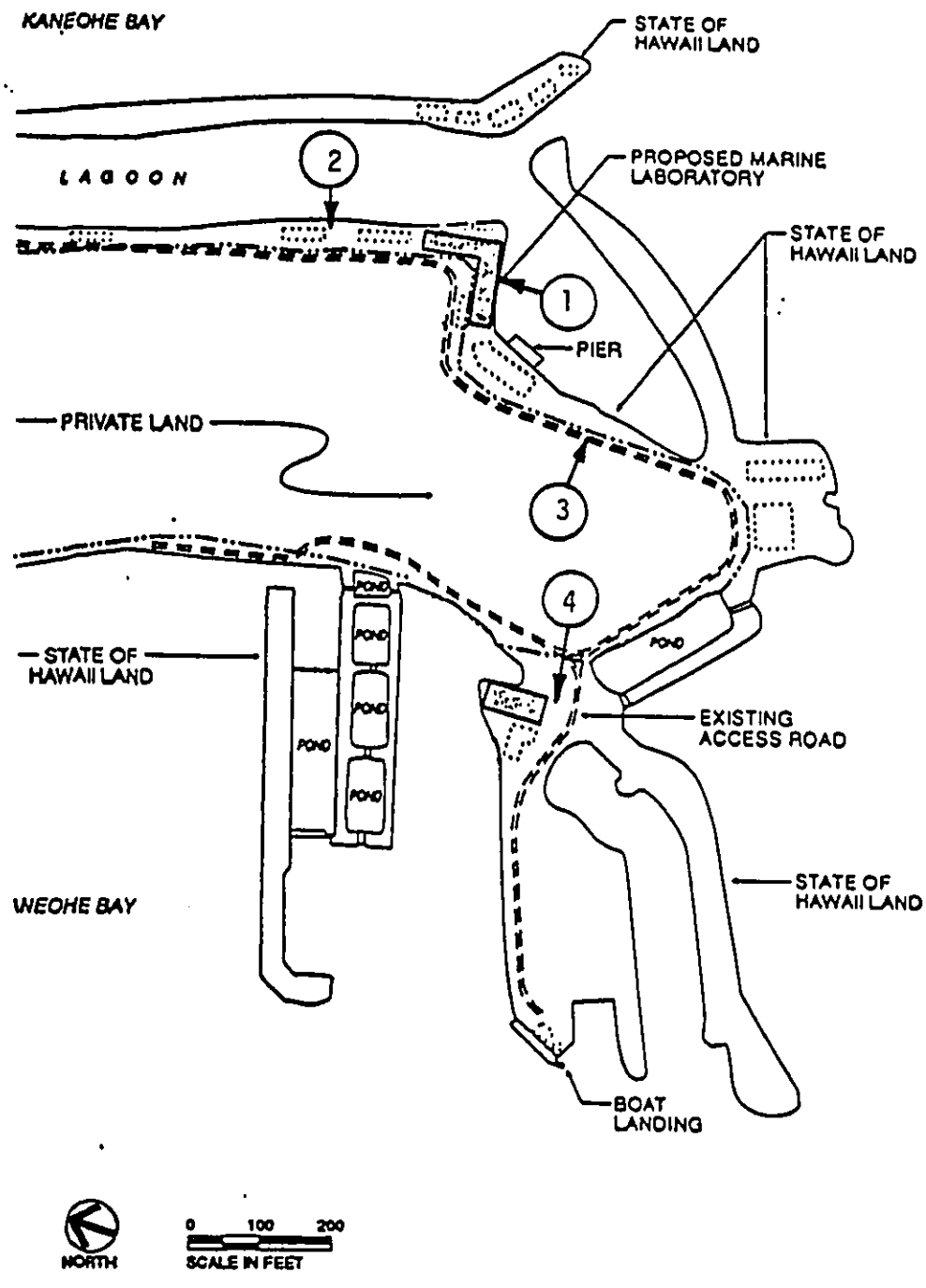

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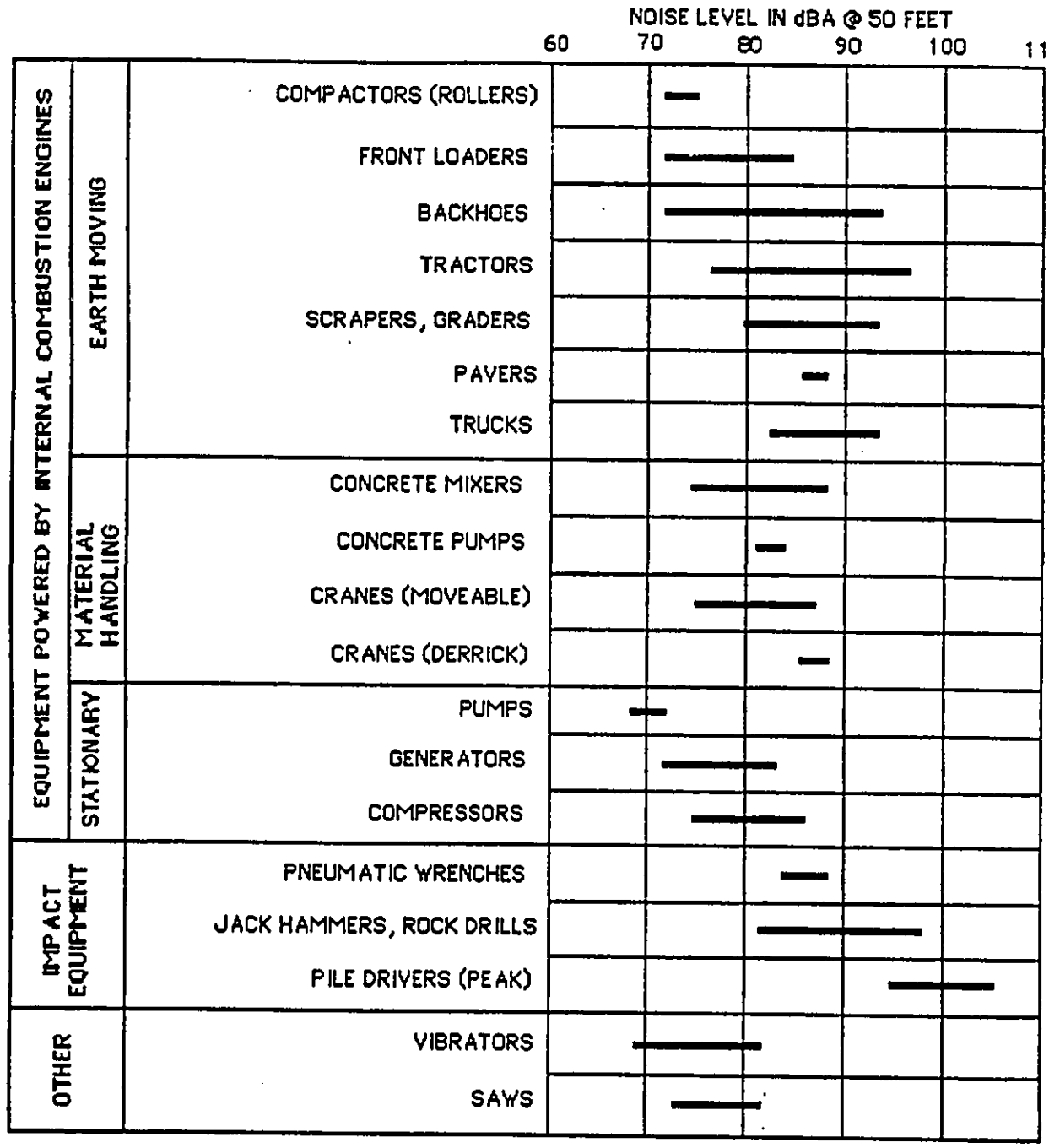
FIGURE 5 - NOISE MEASUREMENT LOCATIONS



NOTE: BASED ON AVAILABLE DATA SAMPLES

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FIGURE 6 - TYPICAL SOUND LEVELS FROM CONSTRUCTION EQUIPMENT

SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY, 1972

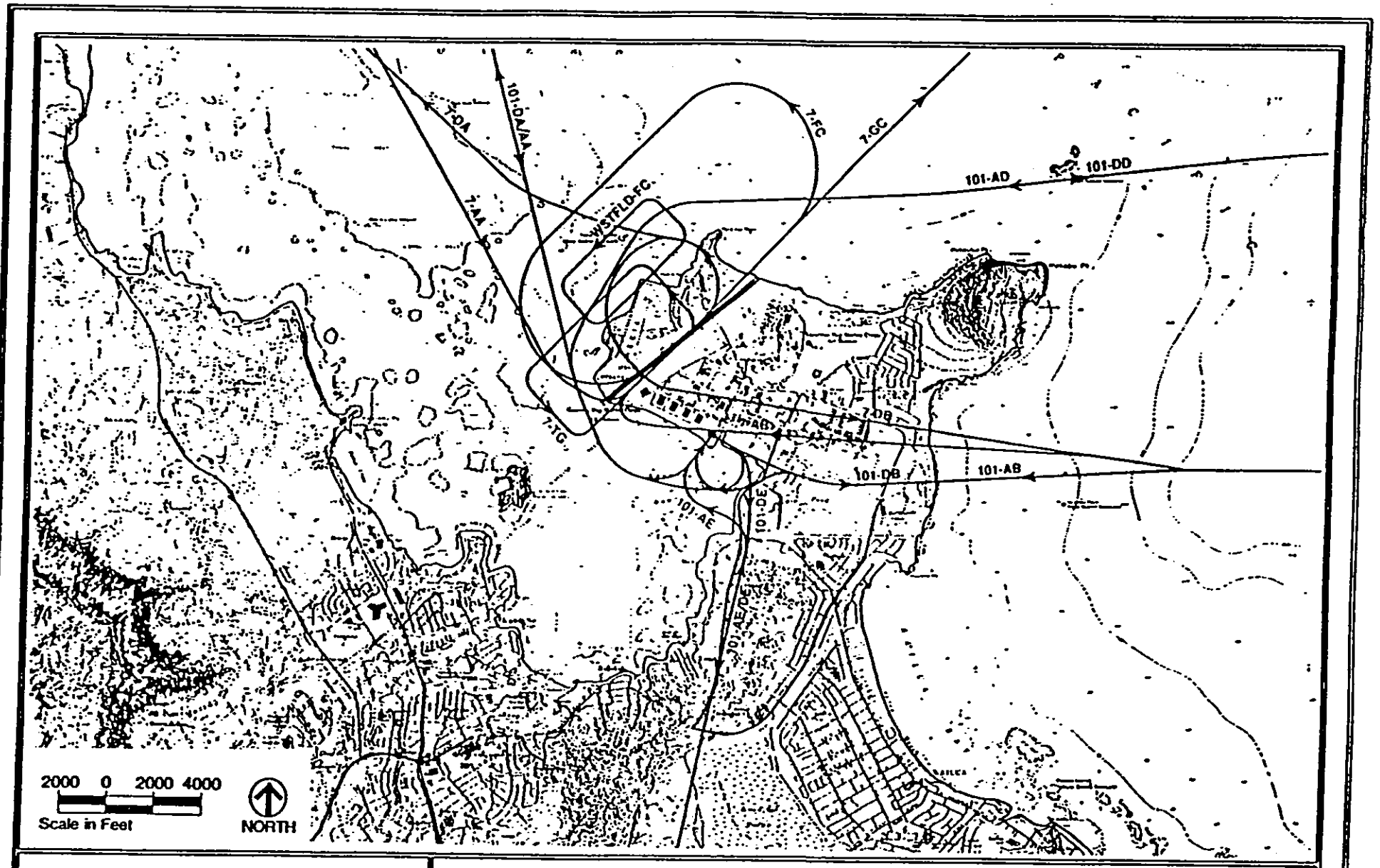

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FIGURE 7 - SELECTED ROTARY-WING FLIGHT TRACKS FROM KMCBH

SOURCE: REFERENCE 5

Appendix G

Socio-Economic Impact of the Proposed Expansion of Facilities at Coconut Island, September 1994

SOCIO-ECONOMIC IMPACT OF THE PROPOSED EXPANSION OF FACILITIES AT COCONUT ISLAND

September 1994

Prepared for:

Hawaii Institute of Marine Biology
Belt Collins Hawaii

Prepared by:

Community Resources, Inc.

EXECUTIVE SUMMARY

The Hawaii Institute of Marine Biology (HIMB) is proposing to expand facilities on Coconut Island in Kane`ohe Bay. A new marine laboratory building would house research laboratories, offices, a classroom, and a library. Also, an existing maintenance building will be relocated and expanded.

This report provides an assessment of social and economic impacts of the project. Quantifiable impacts include:

- **Construction Employment and Income.** Construction would support about 49 person-years of direct employment and another 96 person-years in indirect and induced jobs. Workforce income associated with construction would total $5 million.

- **Operations Employment and Income.** The project does not include funding for new operations at HIMB. It responds to existing needs for new and expanded research space. However, the additional space will make it possible for HIMB to support up to three additional research teams. Operations employment due to the project could range from zero to 15 direct jobs. Were operations to expand to the new capacity made possible by the project, HIMB operations would support an additional nine indirect and induced jobs elsewhere. An estimated $0.6 million in annual wages would be paid to direct, indirect, and induced operational workers if operations expanded to capacity.

- **Population and Housing** impacts would be minimal.

- **Impacts on Government Revenues** would include more than $0.6 million in State revenues associated with construction. Little or no City and County revenues, and little or no government costs would arise due to the project.

- **Spin-offs for Hawaii's Ocean Economy.** There is no guarantee that new research will result in new services and products for Hawaii's aquaculture industry. Indeed, research is the largest single component of the industry. However, using State projections of possible future growth in aquaculture, it is reasonable to hope that new applied research could yield spin-offs valued at 100% to 319% of the investment in research funding. From this analysis, it appears that new research at HIMB could help to support other services and production valued up to $1.1 million annually.

Social impacts on the surrounding community vary according to the location of the affected neighbors:

- The project is likely to exacerbate existing concerns and points of disagreement between HIMB and Hachidai, owner of the rest of Coconut Island. Issues include boundaries and use of Hachidai's pier area on the mainland. New impacts on Hachidai are expected to be minimal, once questions of legal rights and responsibilities are settled.

- Additional traffic to and from HIMB could cause difficulties for residents of Lilipuna Road (on Pohakea Point), who already are affected when HIMB staff and students park along the road. A shuttle system, bringing people from a central location to the pier, could limit or lower this potential impact.

- The project will be visible from Marine Corps Base Kane'ohe Bay and some residential areas along the bay. Since the Marine Laboratory will be similar in height to the existing main building, little change in view impacts is expected.

CONTENTS

CONTENTS (continued)

APPENDICES

LIST OF EXHIBITS

Section I
INTRODUCTION

PROJECT DESCRIPTION

The **Hawaii Institute of Marine Biology** (HIMB) of the School of Ocean and Earth Science and Technology, University of Hawaii at Manoa proposes an expansion of its existing facilities on Moku o Loe (Coconut) Island.

As shown in Exhibit 1 on the next page, the proposed HIMB expansion includes four major elements:

1. A new three-story Marine Laboratory Building, on about 7,000 square feet of land. This will be connected to the existing main building by walkways between the respective second and third floors.

   Besides support facilities, the Marine Laboratory Building would contain laboratories, research areas, a library, and a combination classroom/conference room.

2. Replacement of the boat repair shop with a new maintenance building — the improved building would be around 4,700 square feet.

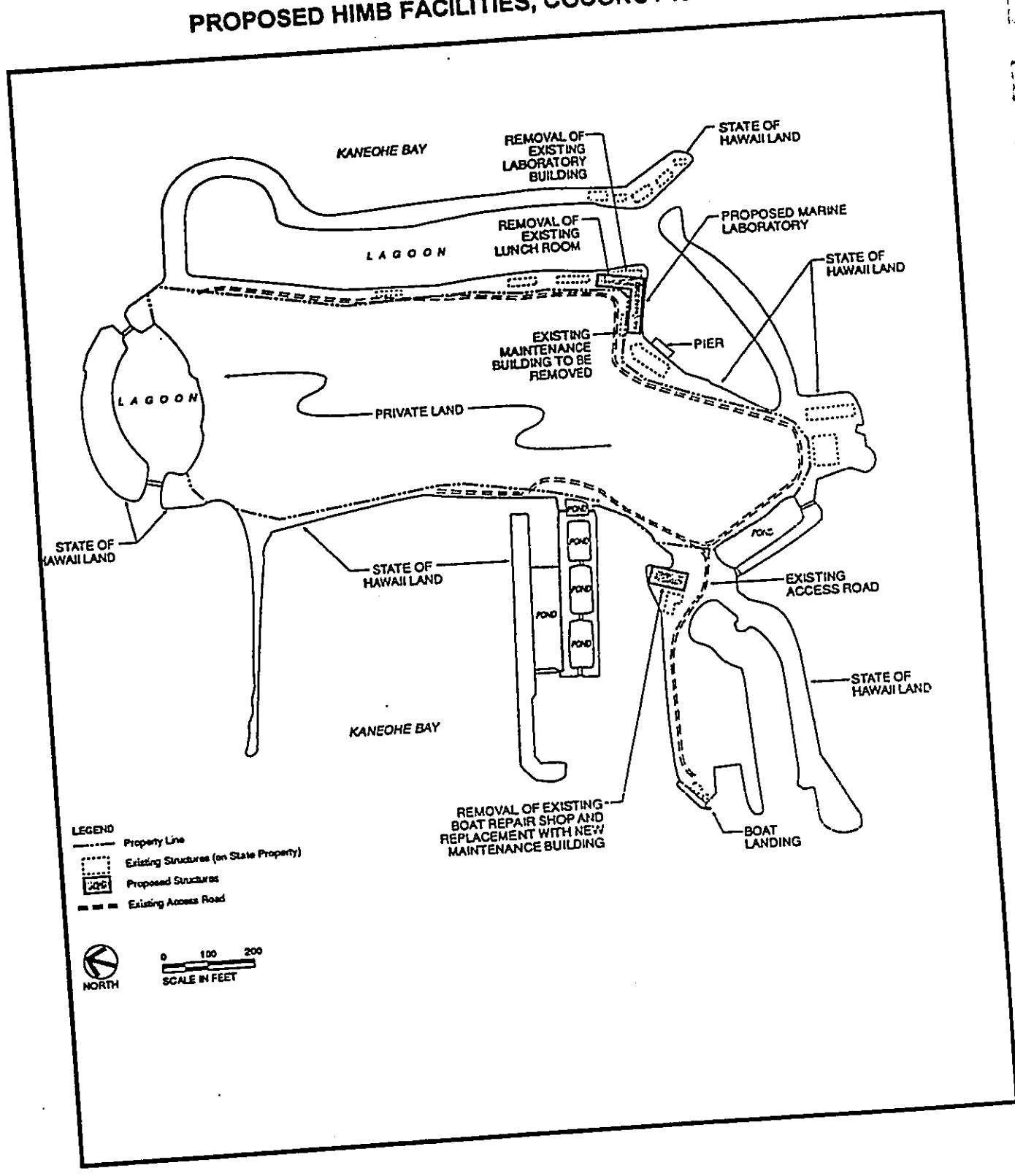
3. Demolition of four existing buildings — a lab, a lunch room, and a maintenance shop to provide space for the new Marine Laboratory Building, and the boat repair shop to make way for the new maintenance building.

4. Replacement or repair of existing seawalls, as needed.

PURPOSE AND SCOPE OF THIS REPORT

HIMB has contracted the firm of Belt Collins Hawaii to prepare the Environmental Impact Statement (EIS) for this project. Belt Collins Hawaii has, in turn, enlisted several subcontractors to author various sections of the report. **Community Resources, Inc.** (CRI) will assess in this report potential social and economic impacts of HIMB's proposed project.

Exhibit 1
PROPOSED HIMB FACILITIES, COCONUT ISLAND

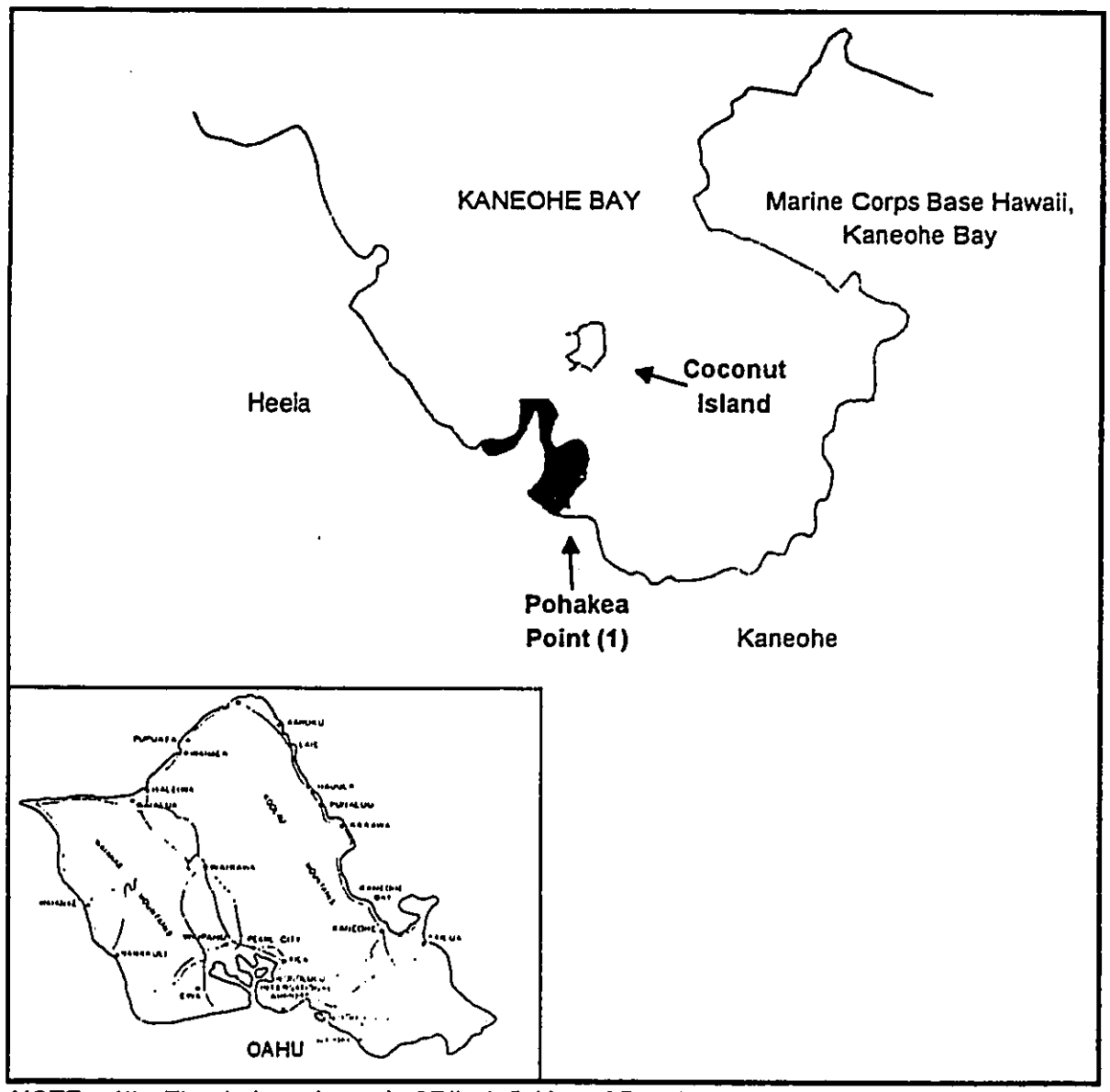


COCONUT ISLAND SIA

STUDY AREAS

Coconut Island is relatively isolated from the rest of the City & County of Honolulu. This report also considers five other study areas, in light of the potential impacts of HIMB operations: Pohakea Point, Kane`ohe Bay, Koolaupoko Development Plan Area, the City & County of Honolulu, and the State of Hawaii.

Exhibit 2
COCONUT ISLAND AND POHAKEA POINT



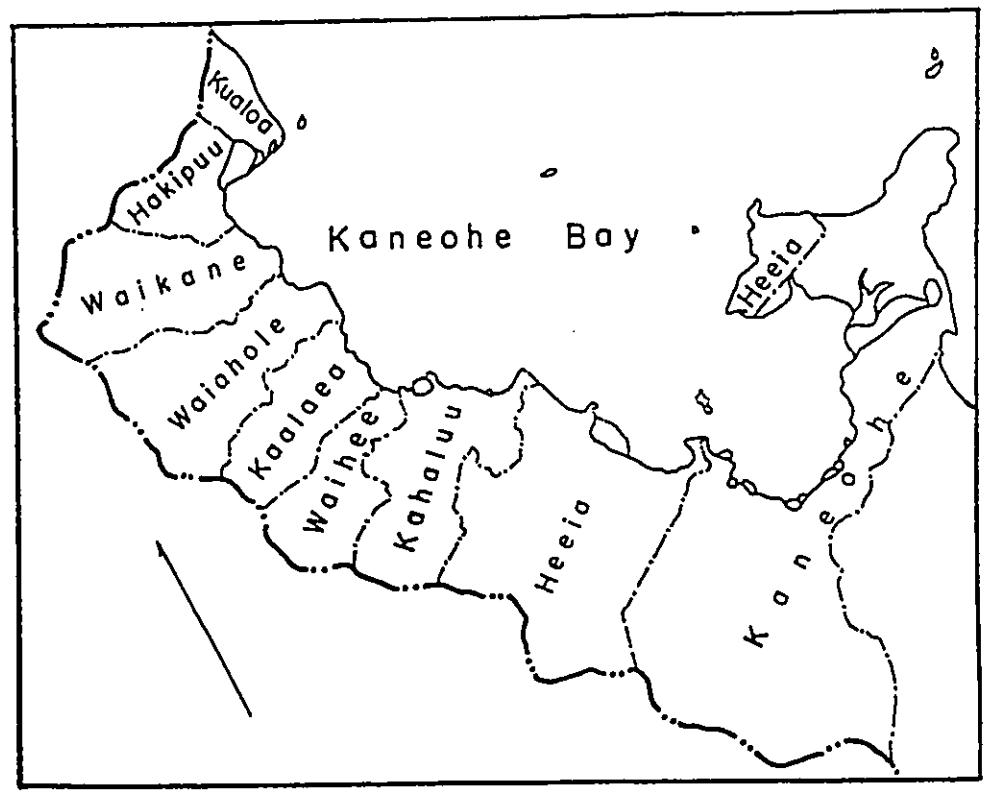
NOTE: (1) The darkened area is CRI's definition of Pohakea Point.

- **Pohakea Point.** This is the nearest neighborhood to Coconut Island. Some Pohakea Point residents can see the 1.5-acre pier and parking lot site that serves the island, as well as some HIMB facilities on the island itself. Traffic to and from the island travels via the Pohakea Point portion of Lilipuna Road.

  For this study, Pohakea Point is defined as Blocks 101, 103, and 104 of Census Tract 105.06, and Block 213 of Census Tract 105.05, based on 1990 Census boundaries (shown in Exhibit 2 on previous page).

- **Kane`ohe Bay.** The surface area of the Bay covers approximately 11,000 acres of water. Often included in discussions of the Bay area are nine bordering *ahupua`a* — Kualoa, Hakipuu, Waikane, Waiahole, Kaalaea, Waihe`e, Kahalu`u, He`eia, and Kane`ohe. Kane`ohe Bay area stakeholders include residents and boaters who may enjoy views of Coconut Island, people active in fishing and recreational use of the Bay, and the administration of the Marine Corps base at Mokapu.

Exhibit 3
KANE`OHE BAY AND ITS ADJACENT *AHUPUA`A*



SOURCE: Devaney, 1976.

- **Ko`olaupoko Development Plan Area.** Coconut Island and the entire Kane`ohe Bay region in the City's Ko`olaupoko DP area, which stretches from Kualoa in the northwest to Waimanalo in the southeast.

  The DP area is also coterminous with the Ko`olaupoko Census Division.

- **The City & County of Honolulu and the State of Hawaii.** These are discussed in two ways in this report. Census and other data for smaller areas are placed in the context of County and State data for comparative purposes. Next, some impacts of HIMB operations affect the County and State as a whole, rather than particular neighborhoods.

Section II
EXISTING CONDITIONS AND ANTICIPATED TRENDS

COCONUT ISLAND

Coconut Island is located in the *ahupua`a* of He`eia, in Kane`ohe Bay about 1,500 feet off Pohakea Point. Coconut Island is one of five islands within Kane`ohe Bay. It is a designated Hawaii Marine Laboratory Refuge. The refuge consists of surrounding reefs and Bay waters, extending from the island's high-water mark to 25 feet beyond the outer edges of the reef. Removal of aquatic life from the refuge is prohibited, except for authorized University of Hawaii affiliates for scientific purposes.

The island currently covers some 28.8 acres of filled land and small lagoons. In the 1930s, only the central 12.5 acres of island stood above sea-level. The island's owner at the time, Christian Holmes, erected several residential and recreational buildings, and proceeded upon an extensive dredging and landscaping program which eventually doubled the island's total acreage.

After the Second World War, the island was acquired by Edwin Pauley, a wealthy and influential figure in American politics. Pauley continued to entertain many of his famous associates on the island, despite his retirement from public life. He held the original central 12.5-acre parcel until his death in 1983.

HIMB

The University of Hawaii first established a small marine laboratory at Waikiki in 1920. In 1948, Edwin Pauley invited the University to base a marine research facility on Coconut Island. Within two years, the Hawaii Marine Laboratory (HML) had a field station and living accommodations on the island, while continuing operations at its Waikiki branch. (The Waikiki branch of the HML later relocated to the Waikiki Aquarium in 1955.)

The 1961 destruction of HML's principal laboratory building by fire led to an examination of the mission of Coconut Island, as well as an examination of land ownership. The State Attorney General determined that all the dredged land on the island was owned by the State. This ruling, along with financial support from the National Science Foundation, the State of Hawaii, and Edwin Pauley himself, prompted the construction of a three-story replacement laboratory in 1963 and a heightened commitment to ongoing research at the island. About this time 12 new research positions boosted the Coconut Island staff.

As a consequence of HML's expanded role, the operation became a full-fledged research institute of the University of Hawaii. The new institute was named the Hawaii Institute of Marine Biology (HIMB). Over the ensuing three decades, HIMB distinguished itself by creating a highly respected marine research facility. In the mid-eighties, HIMB became a part of the University's School of Ocean and Earth Science and Technology.

Recently, the Naval Ocean Systems Center (NOSC) facility at Kane`ohe Bay was partially disbanded and relocated to San Diego. Several researchers from NOSC's Marine Mammal Research Program opted to relocate to Coconut Island with their research animals. This program was incorporated with HIMB only last year.

The State-owned portion of Coconut Island is administered by the Department of Land and Natural Resources (DLNR). Current HIMB facilities at Coconut Island sit on parcels leased from the DLNR. HIMB buildings include six laboratories/offices, three housing units, and four maintenance/support buildings.

HIMB's daytime population on Coconut Island numbers about 20 staff members, and anywhere from 30 to 50 students and visitors. At night, temporary residents (comprised of both staff members and students) and visitors can include as many as 34 persons.

HIMB also operates the Mariculture Research and Training Center (MRTC) at Hakipuu, as well as a few facilities at the Manoa campus.

Hachidai Property

Following Edwin Pauley's death in 1983, his Coconut Island property was offered for sale. In 1987, the entire 12.5-acre estate along with the Lilipuna Road parking lot and pier was purchased for $8.5 million by Hachidai USA, Inc., a Japanese corporation. Hachidai uses the property for occasional company meetings and entertainment.

The Hachidai lands are maintained by a staff of four. A resident caretaker and his family live in the main compound. The main compound encompasses a banquet room, a guest house, and a kitchen building. A cottage lies to the south of the main compound, and several guest lodges are located to the compound's west.

Other buildings on the site include a bowling alley, a small beach house near the northern swimming lagoon, a lookout gazebo on the high point of the island, and a modest caretaker's house which is utilized by HIMB as a student dormitory.

While Hachidai's property includes three waterfront strips, only one of these ocean access points is used by the company for ferrying and mooring vessels. The Lilipuna Road parking lot and pier remains under Hachidai ownership, even though used by both Hachidai and HIMB.

KANE`OHE BAY

Community Description

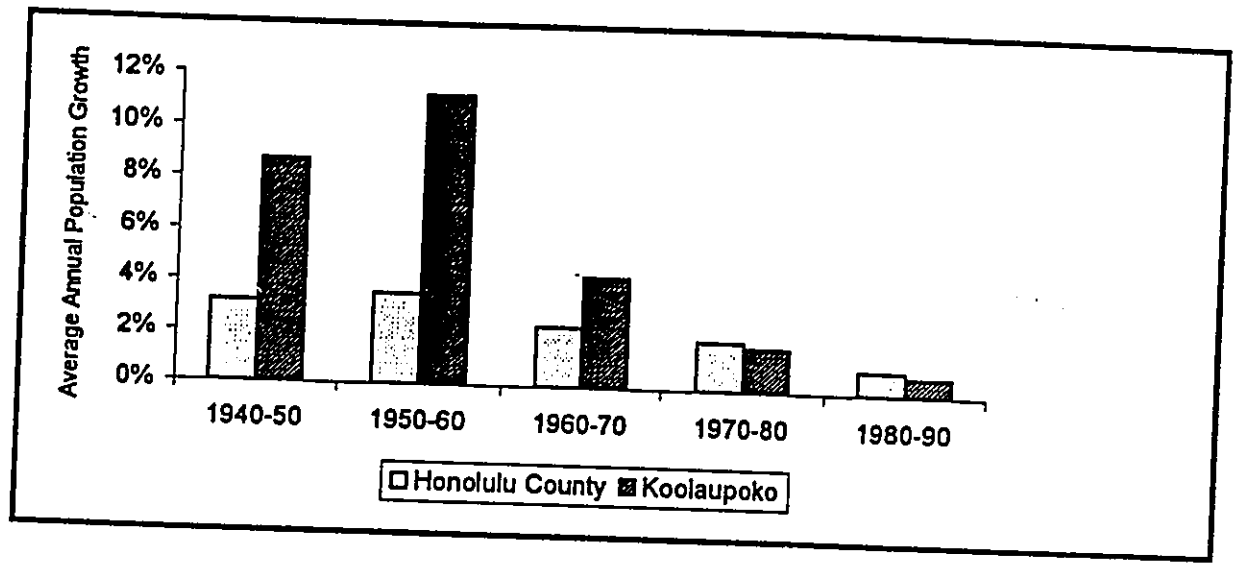
In pre-European times, the environs of Kane`ohe Bay were extremely rich in cultivated crops and fish. For many centuries Kane`ohe Bay ranked as one of O`ahu's most well-populated regions. However, introduced western diseases in the nineteenth century contributed to a drastic population decrease. The population numbered only between two and three thousand until about 1920.

The heavy rainfall of the region was particularly suited to taro production, and for many years this was Kane`ohe Bay's principal crop. Starting in the 1880s, the region embarked upon several experiments in large-scale plantation agriculture: sugar was attempted but never thrived; rice was briefly successful until it was supplanted by pineapple in the first decade of this century. When pineapple declined in the area after 1925, cattle ranching became more widespread. Ironically, the Waiahole Ditch Tunnel (built in 1916) tapped water from the windward Koolau range and provided Central O`ahu with large quantities of water which enabled that region to become agriculturally more productive than Kane`ohe Bay. Recent decades have seen a return to small-scale diversified agriculture intermingled with residential uses of the land.

The Bay itself has undergone many modifications over the years. Last century, some 30 fishponds lined the shoreline. Many were filled to provide extra land for housing and roads. Extensive military dredging and filling occurred in the 1930s when the Mokapu Peninsula was expanded and various channels were cleared. Dredging reached its zenith during World War II when the Kane`ohe Naval Air Station (now the Marine Corps Base Hawaii, Kane`ohe Bay) was constructed at Mokapu.

Another major change in the Bay area was the urbanization of Kane`ohe in the 1940s and 1950s. Kane`ohe, He`eia, and Kahalu`u now contain large suburbs which basically serve as bedroom communities for Honolulu commuters. Kane`ohe Town is the regional commercial center, but shopping centers can also be found in He`eia and Kahalu`u. Exhibit 4 on the following page graphs the rapid population growth of the entire Ko`olaupoko DP Area (which includes Kane`ohe Bay).

Exhibit 4
KO`OLAUPOKO AVERAGE ANNUAL POPULATION GROWTH, 1940-1990



The rest of Kane`ohe Bay from Waihe`e to Kualoa remains sparsely settled, with large agricultural tracts, although there is increasing urban sprawl along Kamehameha Highway.

Exhibit 5
POHAKEA POINT POPULATION AND HOUSING, 1990

	Honolulu County	Pohakea Point
POPULATION	836,231	793
ETHNICITY		
Caucasian	32%	45%
Asian or Pacific Islander	63%	51%
Other	5%	4%
AGE		
Less than 18 years	24%	22%
65 or more years	11%	14%
HOUSEHOLDS	265,304	253
TENURE		
Owner-occupied	52%	68%
Renter-occupied	48%	32%
CROWDED HOUSEHOLDS (1)	16%	8%
HOUSING COSTS		
Mean Value	$312,624	$381,875
Mean Contract Rent	$655	$876

NOTE: (1) Defined as households with 1.01 or more persons per room.

SOURCE: U.S. Bureau of the Census, 1992.

Pohakea Point is geographically the nearest community to Coconut Island. The Point has several upscale homes which afford terraced views of Kane`ohe Bay, although only some Pohakea Point residents are actually able to see Coconut Island. As shown in Exhibit 5 on the previous page, nearly 800 persons lived along the Lilipuna Road portion of the Point in 1990. Pohakea Point had a more Caucasian, somewhat older population than the island average.

Almost all of Pohakea's 268 housing units were single-family in 1990. The homeownership rate was high, even though housing costs were noticeably higher in Pohakea than for the County in general. Not surprisingly, the incidence of crowded households in Pohakea Point was half the County rate.

Kane`ohe Bay Fisheries

Kane`ohe Bay is one of the largest and most diverse fisheries on O`ahu. It is the only barrier reef in the Hawaiian islands, and the northernmost barrier reef in the world. There are three inshore to offshore zones within the Bay — a fringing reef, a lagoon zone in which there are patch reefs, and a barrier reef (Smith, 1993).

Types of Fisheries and Activities. The Bay is a popular fishing area for commercial, subsistence, bait, and recreational fishers. It contains inshore fishery habitats for lobsters, crabs, and octopus. This estuary environment also serves as a feeding and spawning ground for native fishes like the *nehu* (Hawaiian anchovy) and the *'ama'ama* (mullet). Other estuary fishes include *akule* (Bigeye Scad), *weke* and *moana* (goatfish), and trevallies. *Tako*, or day octopus, accounts for the largest catch taken by active fishing methods. In addition, invertebrate sea creatures have been increasingly harvested from reefs for commercial sale by aquarium collectors.

Netfishing, and gill and cast netting are most prevalent in the North Bay; and trolling, spearing, and pole-and-line fishing are most common in the Central Bay (Smith, 1992). Spear fishing typically occurs along the outer reef areas, and crab netting occurs along the fringing nearshore reefs. The South Bay encompasses most of the shoreline and thus offers a diversity of activities, including:

- Collecting invertebrates such as sea anemones and featherduster worms for pet stores;
- Pier-throw netting, torch fishing, trapping, crabbing, *limu*-gathering; and
- Sport diving, vessel anchorage, and canoe-paddling.

Although fishing is prohibited at Coconut Island itself, fisheries in adjacent waters include gill netting, trapping, and troll-bottom fishing. Pole-and-line fishing are also popular at nearby Lilipuna Pier.

Human Influence on the Bay. The urbanization of Kane`ohe watersheds, channeling of streams, dredging in the Bay, increased marine use, and other human activities have contributed to sedimentation and decreased flow of freshwater in Kane`ohe Bay. Seasonal floods also damage the coral reefs. Many people who frequently fish the Bay perceive that there has been a substantial decline in certain fish species over many years, though the causes for this decline are uncertain.

In an attempt to specify water quality management objectives, the State Department of Health classified waters inside the Bay as Class AA waters. These waters are to remain in their current condition with an absolute minimum of pollution or change in water quality due to human activity. Wherever possible, the natural character of the area should be protected (DLNR, 1994a).

Non-consumptive uses of marine fisheries resources in the Bay include snorkeling and SCUBA diving tours to observe reef life. However, inexperienced divers sometimes trample corals and contribute to the destruction of the reef habitat. This results in more night fishing so fishers can avoid conflicts with daytime commercial recreational pursuits.

Kane`ohe Bay Master Plan

Kane`ohe Bay has undergone extensive study in recent decades. One of the most comprehensive research efforts was the Kane`ohe Bay Master Plan produced by a Legislature-appointed task force in 1992. After more than a year's work, the task force managed to garner extensive public participation, along with input from representatives of various private and government interest groups.

The Master Plan was an attempt to bring together all stakeholders in the Bay to develop a consensus on preserving and using shared resources. Specific recommendations fall under three headings: (a) Land Use; (b) Water Use; and (c) Long Range Planning. Some of the Water Use and Planning recommendations are especially relevant to HIMB, Coconut Island, and the waters around the island.

Water Use Recommendations

- Establish a Kane`ohe Bay Fishing Panel, consisting of Kane`ohe fishers, other residents, and fishery specialists;
- Impose speed limits in certain areas of the Bay and ban private recreational thrill-craft;
- Create two new mooring areas for large boats, and expand an existing area; and
- Limit commercial recreation activities.

Long-Range Planning Recommendations

- Begin a research program coordinated by HIMB on Coconut Island:
  - Determine levels of pollutant input into the Bay and their causes,
  - Determine the impacts of fishing and water quality degradation on fish abundance,
  - Evaluate the impacts of recreational use of the Bay, and
  - Evaluate fish restocking and habitat enhancement;
- Form a Kane`ohe Bay Council comprised of government agency and community members;
- Convene an annual review by the State on the status of all implementing actions of the Kane`ohe Bay Master Plan;
- Preserve fishponds for education, food production, fish restocking, and wildlife habitat, with particular focus on protecting traditional Hawaiian uses of the Bay;
- Urge the Federal government to provide public access to surfing sites on Mokapu Peninsula, and to return jurisdiction of the Nu`upia Pond complex to the State's Office of Hawaiian Affairs; and
- Convene a new task force in 1998 to study programs and progress in management of the Bay.

Neighborhood Board Interviews

Interviews with key members of the Kane`ohe and Kahalu`u Neighborhood Boards were conducted in the latter part of August 1994. (See Appendix B for a list of persons interviewed for this report.) Interviewees were asked to identify issues and concerns in general, as well as those specifically related to the proposed HIMB expansion.

General Issues and Concerns. Those interviewed expressed strong concern for protection of Kane`ohe Bay while maintaining quality of life for area residents. Other water resources in the region, such as freshwater streams and the Waiahole Ditch, also need protection. Specific concerns about the Kane`ohe Bay region include:

- Infrastructure development — especially sewers — in the region is seen as lagging behind other developments.
- The need to use Kane`ohe Bay is recognized, but it must be balanced by protection of the Bay environment.
- The return of freshwater from the Waiahole Ditch to Kahalu`u streams is sought largely in support of farming. Furthermore, increased stream flow may reduce the Bay's salinity and restore fish life.
- Channeling steams that run into the Bay destroys stream ecosystems and increases sedimentation in the Bay.
- The "country" character of Kahalu`u is valued. Possible steps to preserve it include preventing Kane`ohe-like development, restoring Kane`ohe Bay, and leaving Waihe`e Stream unchanneled.

Non-Project HIMB Issues and Concerns. Interviewees generally support HIMB research because they feel that HIMB has often proved a positive influence on the Kane`ohe Bay environment. However, HIMB is perceived as being isolated from community affairs. Major themes of community interviewees' comments included:

- Community Involvement: Some recognized HIMB as supporting the effort to regain Waiahole Ditch water, while other thought HIMB had little involvement in the region's affairs.
- Environmental Concern: Some expressed concern that HIMB experiments and disposal of wastes (including fresh water) not affect the Bay ecology.

- Links with Local Institutions: Some thought HIMB should have ties with Windward Community College, the Hawaii Loa campus of Hawaii Pacific University, and with Marine Corps Base Hawaii.

- Access: HIMB cannot assure continued access to the island, since Hachidai owns the Lilipuna Road parking lot and pier.

Project-Specific Issues and Concerns. The project's construction phase is the main point of concern for the Neighborhood Board members interviewed. They worry that construction may harm the environment. Increased parking and traffic are also considered possible problems related to the project. Detailed project-specific concerns include:

Concerns about Proposed Facilities

- The new facilities could benefit the State by bringing recognition of Hawaii's leading role in marine sciences.

Concerns about Planning and Development

- Expansion could be premature at this point because land ownership questions on Coconut Island remain: (a) HIMB is a Department of Land and Natural Resources tenant; (b) the State may negotiate the purchase of the entire island (in which case the island should be master planned); and (c) Hachidai may not want HIMB as a neighbor.

- Disappointment about the lack of project publicity — a community presentation would have been preferable to a mailed preparation notice.

Concerns about Construction

- Construction could produce unchecked run-off into the Bay, as well as the destruction of coral heads.

- Construction noise could affect people and laboratory animals.

Concerns about Long-Term Off-Site Impacts

- Replacement of seawalls could damage the reef.

- The new facility's operations could increase sedimentation.

- The third-story of the new facility could create a negative visual impact.

- Activities in the new maintenance building could impact water quality.
- Coconut Island's infrastructure could be inadequate to handle more people and uses. Sewage and waste disposal problems might occur.
- Any increase in traffic and parking on Lilipuna Road must be adequately handled. HIMB should investigate the feasibility of a ferry operation from He`eia Pier if parking becomes a problem in the future.
- The project could spur more ground transportation on Coconut Island. This is of particular concern if fuel has to be barged there.

Section III
SOCIO-ECONOMIC IMPACTS

IMPACTS OF NEW HIMB RESEARCH ON THE OCEAN ECONOMY

This section provides a brief overview of research at HIMB in order to estimate the added capacity associated with the project, and hence the potential for spin-off impacts on the rest of Hawaii's ocean science-based economy.

Recent and Current Research Activity at HIMB

HIMB research at Coconut Island over the last few years has covered a wide range of marine life, including fish, shrimp, coral, and algae. (See Appendix A for detailed information on HIMB grants and research topics from January 1987 to August 1994.) Research topics range from fish chemistry to coral reef ecology, with research aimed at applied practical ends as well as purely scientific questions.

As shown in Exhibit 6 on the following page, HIMB grant awards since 1987 have totaled $8.15 million, approximately two-thirds of which come from Federal sources. Except for a particularly boom year in 1989, the value of grants has been steadily on the rise since 1987. Exhibit 6 also shows that biotechnology-related research makes up the bulk of recent and current research at HIMB.

Grants normally include "indirect costs" — funds to cover institutional overhead and/or contributions that make projects possible. HIMB indirect costs can vary substantially from grant to grant, but amount to roughly 13% for total grants from January 1987 to August 1994. The funds for indirect costs go equally to the University's SOEST and the State General Fund.

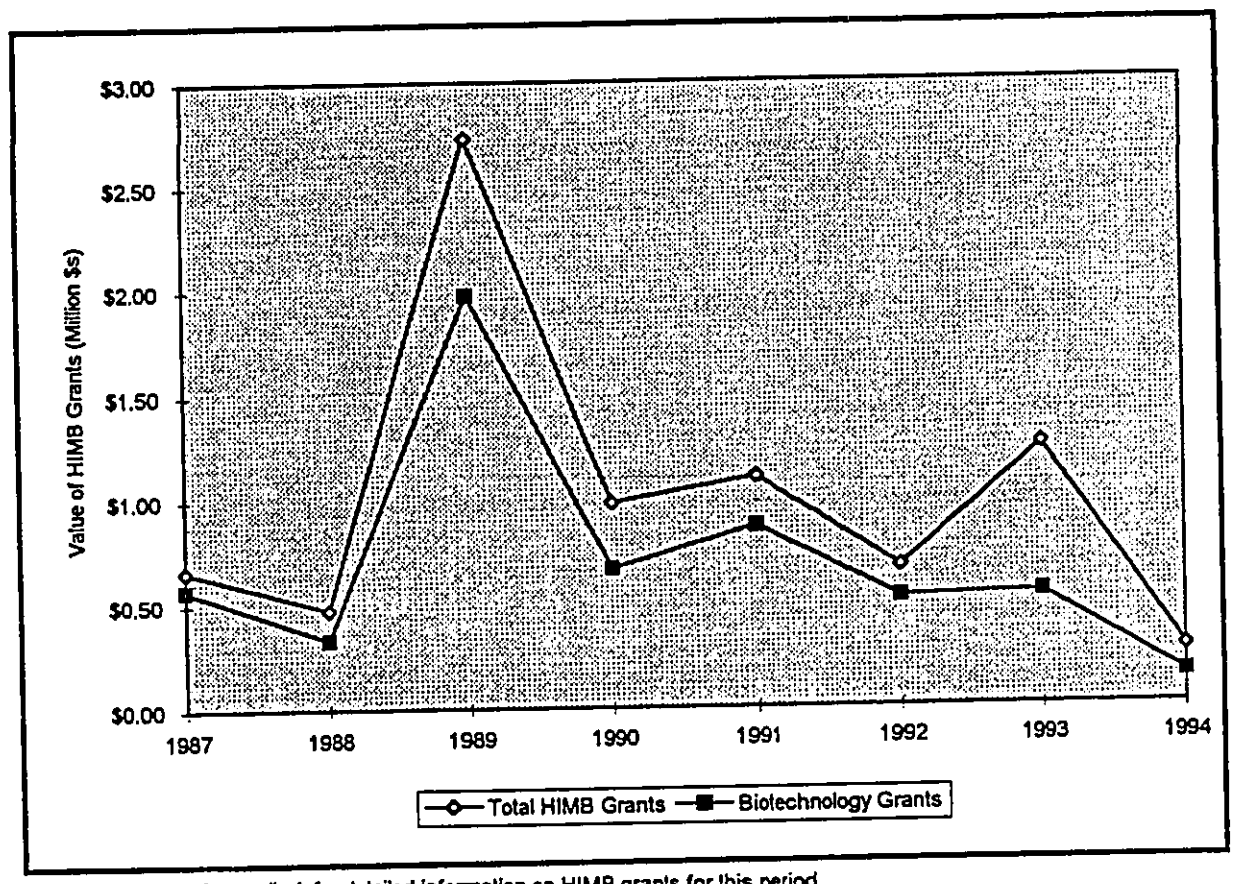
Proposed Growth of Operations

The project will provide new space at HIMB for research, computing and library facilities, and for support activities. Currently, no new funds have been earmarked for new operations.

Some expansion of research activity at HIMB is likely **apart from the project**. The institute is conducting a search for a new Director. A biologist of stature capable of taking on the post of Director would be actively involved in research, and hence would bring to the Institute research grants supporting part of the Director's salary, and salaries or stipends for about three additional research staff.

Exhibit 6
VALUE OF HIMB GRANTS, JANUARY 1987 TO AUGUST 1994 (1)

	Value (Million $s)								
	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
TOTAL HIMB GRANTS	0.66	0.48	2.73	0.98	1.10	0.67	1.25	0.27	8.15
Federal	0.52	0.33	1.86	0.60	0.51	0.53	0.81	0.27	5.42
State of Hawaii & Private	0.14	0.15	0.87	0.38	0.59	0.14	0.44	0.01	2.72
BIOTECHNOLOGY GRANTS	0.57	0.33	1.98	0.67	0.87	0.52	0.54	0.14	5.62



NOTE: (1) See Appendix A for detailed information on HIMB grants for this period.

SOURCE: HIMB files.

The proposed new marine laboratory building would provide a major expansion of research activities at HIMB:

- Almost half of the building's total floor area of 20,900 square feet will be devoted to laboratories and research space on all floors;

- The building will contain a classroom/conference room and a fish physiology laboratory on the ground floor, and a computer/library room on the second floor; and

- The new building will also include support facilities such as a lunch room and kitchen, rest rooms, and utility and storage space.

With the project, HIMB researchers could relocate their activities to new quarters. The immediate result would be less crowding. Over time, improved facilities could justify more ambitious or larger-scale projects. Additional facilities could also allow the institute to attract researchers on a short-term basis from other sites. Such researchers would be funded by their own grants, and would pay "bench fees" for the use of facilities at HIMB. Hence it is quite possible for the volume of research at Coconut Island to increase with the project even without new operational funds or positions approved by the University of Hawaii.

Assuming that the new Director would need at least one special laboratory and research module, construction of the project would still create space for three additional research groups. (It is likely that existing research projects would move to the new facility, freeing up space elsewhere.) **The project hence creates a capacity for research by three new teams.**

Sectoral Organization of Aquaculture in Hawaii

Hawaii has an active service sector in aquaculture but limited production of saleable materials. The service sector has accounted for about two-thirds of the industry over the past few years. Major components of the service sector are:

- **Research:** amounting to 79% of the sector in 1992 (Hawaii Department of Land and Natural Resources, Aquaculture Development Program, 1993a);

- **Training:** 5% of the service sector in 1992; and

- **Consulting:** 16% of the sector in 1992.

Research funds amounted to 179% of the value of aquaculture products from Hawaii sold in 1992. This is in line with trends over several years, as shown in Exhibit 7 on the next page. That exhibit shows research funds as 148% of the value of local production for the period 1987 through 1992.

Exhibit 7
ESTIMATED VALUE OF HAWAII'S AQUACULTURE ECONOMY, 1987-1992

	Value (Million $s)						
	1987	1988	1989	1990	1991	1992	Share, 1987-1992
TOTAL INDUSTRY	$16.51	$18.29	$20.68	$23.16	$21.78	$23.38	$123.80
Production	$6.20	$5.56	$6.84	$9.24	$6.88	$7.13	34%
Services	$10.31	$12.73	$13.84	$13.92	$14.90	$16.25	66%
SERVICE SECTOR SEGMENTS	$10.31	$12.73	$13.94	$12.90	$14.89	$16.25	$81.02
Research	$6.61	$9.20	$11.94	$9.51	$11.86	$12.78	76%
Training	$0.38	$1.67	$0.17	$0.55	$0.36	$0.85	5%
Consulting	$3.32	$1.85	$1.84	$2.83	$2.68	$2.63	19%
Federal	$5.24	$6.46	$10.63	$7.37	$8.51	$10.61	60%
State Funding	$1.30	$1.79	$1.94	$1.80	$2.63	$3.03	15%
Other	$3.77	$4.48	$1.27	$4.76	$3.75	$2.61	25%
OUT-OF-STATE FUNDS (1)	$9.01	$10.94	$11.90	$12.12	$12.27	$13.22	$69.46
OUT-OF-STATE GRANTS AT HIMB (2)	$0.52	$0.33	$1.86	$0.60	$0.51	$0.53	$4.35
Biotechnology/Aquaculture (3)	$0.43	$0.23	$1.77	$0.51	$0.43	$0.38	86%
Share of Out-of-State Aquaculture Research Funds	4.8%	2.1%	14.9%	4.2%	3.5%	2.9%	7%

NOTES: (1) Calculated here by adding "Federal" and "Other" from "SERVICE SECTOR SEGMENTS."
(2) Listed by calendar year in which grant began -- actual spending may occur over several years.
(3) Classified by Community Resources, Inc. after discussion with Dr. Philip Helfrich, HIMB and Yara Lamadrid-Rose, Information Specialist, Aquaculture Development Program, DLNR.

SOURCES: Hawaii State Department of Business, Economic Development and Tourism, 1992; Hawaii State Department of Land & Natural Resources, Aquaculture Development Program, 1989, 1991, 1992, 1993a, 1994; HIMB files.

Hawaii has succeeded in developing a base of personnel and facilities for an active program in biotechnology/aquaculture, with centers at University of Hawaii sites and the Oceanic Institute. Since Hawaii is a center of knowledge, it supports a small but active group of aquaculture consultants. However, the small scale of aquaculture production in Hawaii suggests that knowledge does not automatically or easily translate into a prosperous industry. Reasons mentioned for relatively little production include: (a) high costs in Hawaii; (b) the small size of the local market; and (c) lack of entrepreneurial interest; and (d) limited venture capital.

Were industry growth to continue at the same pace as recently, the value of Hawaii's aquacultural activities would amount to some $41 million in the year 2000. A much more optimistic forecast is for $129 million in annual industry value (Hawaii Department of Land and Natural Resources [DLNR], Aquaculture Development Program, 1993b). This last forecast depends on the availability of venture capital and the success of various industry firms' business plans. Fields in which successful development could occur in Hawaii include:

- Production of food items for niche markets (e.g., shrimp for luxury markets);
- Production of food additives and food-related products (e.g., spirulina and beta carotene); and
- Production of materials for pharmaceuticals and for pharmaceutical research.

Equally, research and consulting based in Hawaii could be crucial to increases in the supply of food fish worldwide. Research leading to higher larval survival rates for food fish or improved feeds could significantly contribute to the world's food supply. Still, large-scale production of fish such as tilapia and catfish for export from Hawaii is unlikely, since labor and land costs are much lower elsewhere.

These factors are likely to keep the production sector in Hawaii small. As a result of Hawaii's distinctive economy:

- **Research is** both a major part of the local aquaculture industry and **likely to be crucial to any new production and service activities** that may emerge; but
- By the same token, **growth of aquaculture in Hawaii** — whether or not Hawaii makes major contributions to aquaculture around the world — **is likely to be modest.**

Potential for Research "Spin-offs"

Promising new research could attract training funds, and could translate into both local production and consulting to producers elsewhere. Over time, however, Hawaii-trained personnel may compete with Hawaii consultants or simply not need their services. Again, it is unlikely that new research would support new local production on a major scale.

Any particular new research could well have no spin-offs. Equally, some new research could lead to much-needed new products, and eventually to income for Hawaii from patents and consulting, if perhaps not major local production. Over time, some benefits for the State economy overall are not unlikely. If the extremes of success and failure are ruled out, a preliminary estimate of the range of potential spin-off value associated with new research can be derived from current activity in the industry and projections for growth, as shown in Exhibit 8.

Exhibit 8
ESTIMATED RANGE OF GROWTH IN AQUACULTURE AND BIOTECHNOLOGY ASSOCIATED WITH NEW RESEARCH

A: INDUSTRY IN THE YEAR 2000	Value (Million $s)
Growth at Historical Rates	
Production	$14.0
Service	$27.0
Research (1)	$20.5
"Aggressive" Growth Projection	
Production	$70.0
Service	$59.0
Research (2)	$30.8

B: RELATION BETWEEN RESEARCH SPENDING AND THE REST OF THE INDUSTRY	For Every Dollar Spent on Research:
Growth at Historical Rates	
Production	$0.68
Service (Other than Research)	$0.32
Total Associated Spending	$1.00
"Aggressive" Growth Projection	
Production	$2.27
Service (Other than Research)	$0.92
Total Associated Spending	$3.19

NOTES: All sector-level estimates from DLNR 1993b. Estimates for research developed by CRI partly on the basis of analysis in that volume.

(1) Breakout of research spending according to historical share, 1987 to 1992, as shown in Exhibit 7.

(2) Research funding levels in "aggressive" scenario assumed by CRI to be 150% of funding expected according to historical trend.

In other words, it is quite possible that new research funds could support other activities in Hawaii valued at about 100% of the investment in new research, based on recent experience.

An optimistic estimate of the upper range of impact on the industry as a whole can be generated assuming (a) research funding will likely grow faster than at historical rates but (b) other components of the industry would grow to the upper level projected for the year 2000. In that case, research would be associated with new activities valued at about 319% of new research funding. (Even in this "aggressive" scenario, research would still constitute 24% of all aquaculture/biotechnology in Hawaii — far more than in any corporate balance sheet.)

Application of Ratios to HIMB Expansion

The project does not include or guarantee any funds for maintenance or new research. Such funds would come if new facilities help researchers expand the number and complexity of their projects and help HIMB attract researchers with their own grants to support their work.

The new research space in the project could house from zero to three new research teams. In calendar years 1987 to 1993, HIMB researchers in biotechnology attracted $4.92 million. (1994 dollars) in research funds from out of state. The average annual amount attracted to Hawaii per HIMB biotechnology research team was $0.12 million (1994 dollars):

	Year Grant Started						
	1987	1988	1989	1990	1991	1992	1993
BIOTECHNOLOGY RESEARCH TEAMS	4	5	7	7	5	8	6
OUT-OF-STATE GRANTS (Million 1994 $s)							
Biotechnology	0.62	0.31	2.27	0.61	0.48	0.40	0.22
Per Team	0.16	0.06	0.32	0.09	0.10	0.05	0.04

Annual Average per Team, 1987 to 1993: 0.12

NOTE: Community Resources, Inc. identified grants as having actual or potential application to biotechnology, based on input from Dr. Philip Helfrich of HIMB and Yara Lamadrid-Rose, Information Specialist, Aquaculture Development Program, DLNR. A "team" was identified for each principal investigator bringing in more than $5,000 worth of grant funds in any year.

The above estimate of research teams' grants can be combined with estimates of future capacity spin-offs:

Range	New Research Teams	Annual Grants	Spin-off for Hawaii	
			Low	High
Low	0	$0.00	$0.00	$0.00
High	3	$0.35	$0.35	$1.11

The project gives HIMB the **capacity of attracting up to $0.35 million in new research grants annually**, which could in turn lead to **spin-offs valued as high as $1.11 annually**. In light of the uncertainty that any spin-off impact will occur, this potential impact is not included in the estimates of employment, income, and government revenues in the following sections.

DIRECT, INDIRECT, AND INDUCED ECONOMIC IMPACTS

Employment and Income

Any project can have three sorts of impact (apart from the spin-off impacts discussed above) on the regional economy:

- **Direct employment and income**: Construction and operations involve new jobs and hence new salaries for project workers. Construction jobs associated with a particular project are short-term; operations jobs are usually permanent jobs.

- **Indirect employment and income**: These are created when a new operation (or construction firms building a new project) buy materials and services elsewhere in the regional economy in the course of work on or for a project.

- **Induced employment and income**: These consist of the impacts of spending by workers in direct and indirect jobs, who support others in the region as they spend their pay.

Construction Impacts. Construction of the project would involve about 49 person-years of direct employment and another 96 person-years of indirect and induced jobs, as shown in Exhibit 9 on the following page. Incomes from construction-related jobs would total some $5 million (1994 dollars).

Exhibit 9
CONSTRUCTION EMPLOYMENT AND INCOME, HIMB PROJECT

	PROJECT IMPACT
CONSTRUCTION SPENDING (Million $s)	$6.5
DIRECT CONSTRUCTION EMPLOYMENT (1)	
Total Jobs (person-years)	49
Average Number of Construction Workers On-Site (2)	20
Income (Thousand $s) (3)	$2,407.7
INDIRECT & INDUCED CONSTRUCTION EMPLOYMENT (4)	
Total Jobs (person-years)	96
Income (Thousand $s) (3)	$2,601.4

NOTES: (1) Estimate based on average ratio between construction put in place in Hawaii in 1993 and construction workforce, lowered slightly (to 7.5 jobs per million dollars) to allow for the high cost of transport on this project.

(2) Number of workers on-site changes from phase to phase in any construction project. The average used here (80% of the workforce) is a rule of thumb for the industry. To estimate the daily population, CRI assumed that the construction period would last two years.

(3) Estimated using average statewide heavy construction earnings (for direct jobs) and the average earnings, all industries (for indirect jobs). 1992 data were used and adjusted to 1994 data in proportion with change in the Consumer Price Index for Honolulu.

(4) Estimated from employment multipliers for Heavy Construction, DBEDT Input-Output Model for Hawaii.

SOURCES: Bank of Hawaii, 1994; Unpublished tables, Hawaii State Department of Business, Economic Development, and Tourism, 1994; Hawaii State Department of Labor & Industrial Relations, 1993.

Operations Impacts. Most of the 50 or so existing HIMB jobs result from scientific research teams — that is, a principal investigator aided by a technician and graduate students. Most of the non-research positions are administrative, providing clerical and organizational support for the research teams. The

remaining jobs are ferry and boat operators or custodial. Almost three-quarters of the existing staff income of $1,424,800 is State-funded; the rest depends on outside funding:

Exhibit 10
OPERATIONS EMPLOYMENT AND INCOME, HIMB PROJECT

	EXISTING JOBS (1)	FUTURE ADDITIONAL JOBS		
		Growth Without Project	Project Impact: Low Range (2)	Project Impact: High Range (3)
DIRECT OPERATIONS EMPLOYMENT				
Total Jobs (annual full-time equivalents)	50	4	0	15
Research:	N/A	1	0	3
Principal Investigator	N/A	3	0	8
Technicians and Graduate Students	N/A	0	0	2
Education/Library	N/A	0	0	1
Administrative	N/A	0	0	1
Custodial				
Income, (Thousand $s) (4)	$1,424.8	N/A	$0.0	$392.8
INDIRECT OPERATIONS EMPLOYMENT ASSOCIATED WITH PROJECT (5)				
Total Jobs (annual full-time equivalents)	N/A	N/A	0	9
Income, (Thousand $s) (4)	N/A	N/A	$0.0	$239.6
TOTAL DIRECT & INDIRECT OPERATIONS EMPLOYMENT ASSOCIATED WITH PROJECT				
Total Jobs (annual full-time equivalents)	N/A	N/A	0	23
Income, (Thousand $s) (4)	N/A	N/A	$0.0	$632.3

NOTES: (1) Based on estimates supplied by HIMB fiscal office, August 1994.
(2) Estimated on basis of funding currently associated with project.
(3) Estimated on basis of building capacity and Institute needs.
(4) Estimated using average earnings, all industries. 1992 data were used and adjusted to 1994 data in proportion with change in the Consumer Price Index for Honolulu.
(5) Estimated from State Input-Output employment multipliers for "Other Industries." Excludes job-creation due to training and impacts on Hawaii's aquaculture industry.

SOURCES: Hawaii State Department of Labor & Industrial Relations, 1993.

The project itself would create no additional operational jobs, but it would establish a **capacity** for growth at HIMB. As shown in Exhibit 10 on the previous page, the project's operations impact could range from no impact to full capacity. With operations at full capacity, an additional 15 direct jobs could be housed at the new marine laboratory. These direct jobs in turn could support some nine indirect and induced jobs.

New income in Hawaii for direct, indirect, and induced jobs associated with operations at **full capacity** could total over $0.6 million annually. (Because marine research involves skilled professional salaries, fellowships, internships, and student stipends — a very wide range of pay levels — incomes have been estimated as, on average, equal to the average wage of Hawaii workers.)

Population and Housing Impacts.

Population. The combined population impact of the new Marine Laboratory Building on Coconut Island would be minimal. No accommodations are provided in the new facility. Hence, no additional staff or any visitors are expected to stay overnight on the island. However, the peak daytime staff on island may increase by about ten persons.

Occasional conferences held in the new building could temporarily increase the daytime population by as many as 50 persons. Since existing accommodation space is extremely limited, none of these conference visitors would be able to remain on island overnight.

The number of graduate students temporarily living on Coconut Island is anticipated to remain the same.

Housing. There could be a small increase in housing demand from workers associated with project operations when and if operations reach capacity. In the event that new operations research is largely performed by visiting scholars, about ten workers and their dependents would need to find short-term housing. This would be a small impact on the local rental market, should University facilities not be available.

Impacts on Government Revenues and Costs

The project will have little or no impact on government revenues and costs.

The project will not add to City and County revenues. As a State facility, HIMB does not pay property taxes, the major source of income for the City and

County. The project will have little or no population impact. Hence there should be little or no increase in fees, fines and population-based revenues accruing to Honolulu.

Equally, the City and County will not incur new costs to serve additional people. (Even if the project comes to support new workers and their families, these people — visiting marine biologists, for example — seem unlikely to demand or need much in the way of City and County services.)

The State of Hawaii will gain some revenue, at least from construction. As Exhibit 11 shows, more than $600,000 in construction-related spending will eventually become State revenues. State costs associated with the project are expected to be minimal, just as City and County costs are.

Exhibit 11
STATE REVENUES ASSOCIATED WITH PROJECT CONSTRUCTION

	Revenues (Thousand $s)
EXCISE TAXES	
Construction Spending (1)	$260.0
Construction-Related Workforce Spending (2)	$152.6
CORPORATE INCOME TAX (3)	
Construction	$16.3
PERSONAL INCOME TAX (4)	
Construction-Related Workforce Incomes	$202.4
TOTAL	$631.2

NOTES: (1) Calculated at 4% of direct construction spending.
(2) Calculated at 4% of workforce income spent on taxable items. Disposable income estimated from 1988-1989 U.S. Bureau of Labor Statistics Survey.
(3) Calculated at 0.25% of construction spending, from 1989-1990 data on business receipts and corporate income taxes collected.
(4) Calculated at 4.04% of wages.

SOURCES: Hawaii State Department of Business, Economic Development and Tourism, 1992; Hawaii Department of Taxation, 1992; Tax Foundation of Hawaii, 1991, 1992.

POTENTIAL IMPACTS ON THE SURROUNDING COMMUNITY

Tangible impacts on the surrounding community are expected to be slight, once the construction phase of the project is complete. HIMB operations on Coconut Island have largely been aloof from the day-to-day affairs of nearby communities, due mainly to the island's isolation and its restricted access.

Neighboring Hachidai would conceivably be the most affected by any project on the island. Coconut Island is small enough that even minor changes can appear to encroach on Hachidai's enjoyment of its property.

Visibility

View impacts from the project are considered to be minor. On island, Hachidai's views from its property should not be directly affected, but the company does have questions about the overall visual character of the island. Hachidai is particularly worried about what it terms "the *further commercialization* of the Island's tropical ambiance" (Maeda, 1994).

As for Pohakea Point residents, however, replacement of the maintenance building will occur on the island's western side and will be visible to some. On the island's eastern side, the new three-story Marine Laboratory Building will be seen from a distance from certain vantage points, including: the eastern portion of the Bay, Marine Corps Base Hawaii, and parts of Kane`ohe Bay Drive. Presence of a new building may be a cause of concern for some people viewing Coconut Island from these areas, but the new building will be about the same height as the existing HIMB headquarters and will hence not change views appreciably.

Impacts on Neighbors

Hachidai Property. While the project's population impact will be small, we note that even incremental changes can complicate any use of a small area by two very different types of land users. Coconut Island's case is particularly sensitive because: (a) Hachidai's property is residential and HIMB's property is used for intensive scientific research; (b) Hachidai is almost entirely encircled by HIMB, while HIMB is forced to maximize the use of its thin strips of dredged land; and (c) Hachidai's owner is a foreign, absentee landholder unavailable for immediate consultation regarding Coconut Island issues.

There are several existing points of disagreement between Hachidai and HIMB, including:

- Uncertainties about property boundaries and building ownership;

- Use of the Lilipuna Road parking lot and pier (owned by Hachidai, but recently gated by HIMB);

- Different priorities in standards of property maintenance and upkeep (e.g., attention to trimmed lawns or to highly cleaned discharge waters); and

- Waste disposal problems.

The project may affect these existing differences in two important ways:

1. *Questions of ownership could be raised.* The new Marine Laboratory will be located along the property line, historically a point of uncertainty. Similarly, the island's perimeter road is partially on Hachidai property — how much and precisely which portions are debatable — and Hachidai refuses access to, and transit over, its property for either the construction or operation of the new laboratory (Maeda, 1994).

   Also, the replacement maintenance building involves demolition of the existing boat repair shop, a building which Hachidai claims to own and has not consented to destroying (Maeda, 1994).

   Hachidai is also calling for alternative landing facilities to the island, since it claims ownership of the existing southwest corner boat landing near the lighthouse.

2. *More users of Hachidai's parking lot and pier.* The increased use of the parking area above the pier — which is already often full — by HIMB personnel could constrain Hachidai's use of its own property. This would heighten the need for a systematic approach to transporting people to the island.

   One solution would be to shuttle daytime users of HIMB facilities from a convenient site in Kane`ohe, reserving limited parking space at the pier for core, full-time staff and persons who temporarily live on island.

While the project may exacerbate existing conditions, new impacts of the project upon Hachidai should be minimal:

1. *HIMB's repair of part of the seawall encircling the island.* This would limit further ocean erosion of the island, presumably protecting Hachidai property in the process. Hachidai, however, has expressed concern over possible environmental and animal damage due to seawall repairs.

2. *Infrastructure improvements.* Water, sewer, electricity, and telephone lines to Coconut Island are shared by both HIMB and Hachidai. The project entails improvement to these systems, which should result in some minor benefit to Hachidai. Again, Hachidai harbors concerns about overloading the existing infrastructure.

Pohakea Point. Traffic along Lilipuna Road has been the main impact of HIMB's Coconut Island operation on Pohakea Point. This is bound to increase since the new building will be able to house more daytime staff and students. This could be alleviated with the above-mentioned shuttle operation.

Fishers and Other Kane`ohe Bay Users. Nighttime pole-and-line fishers from the Lilipuna Road pier may find their fishing moderately disrupted during the construction phase of the project, but other fishers and fisheries in the vicinity should not be affected by the project (DLNR, 1994b).

However, construction debris and run-off would have to be carefully monitored, since further sedimentation into Kane`ohe Bay would create an adverse impact.

Marine Corps Base Hawaii, Kane`ohe Bay. Historically, large-scale building materials have been transported to Coconut Island from Marine Corps Base Hawaii access points. Permission to use the Base as a staging area during the construction phase of this project is being sought from Brigadier General Vercauteren, commanding officer of Marine Corps Base Hawaii, Kane`ohe Bay.

APPENDIX A:

HIMB GRANTS, JANUARY 1987

TO AUGUST 1994

Appendix A
HIMB GRANTS, JANUARY 1997 TO AUGUST 1994

PRINCIPAL INVESTIGATOR	GRANT TITLE	GRANT SOURCE		BIOTECH?	GRANT START
		Agency Name	Out-of-State?		
Brick, Robert	22964, Mass Cul Methods Mahi	DLNR		Yes	87
Brick, Robert	World Aquaculture Soc Travel Award SS1527	US TDP	Yes	Yes	87
Brock, Richard	Enhancing Juv Fish Recruit..Coral Reef Fisheries	NOAA/Sea Grant	Yes	Yes	87
Fast, Arlo	Marine Shrimp Pond Dynamics	NOAA/Sea Grant	Yes	Yes	87
Grau, E. Gordon	Feeds Technology Research: Sensory, Hormonal, and Nutrition	NOAA/Sea Grant	Yes	Yes	87
Grau, E. Gordon	Mechanisms Mediating...Prolactin Secretion...Teleost Fish	NSF	Yes	Yes	87
Grau, E. Gordon	Finfish and Shrimp Feeds Research	DLNR		Yes	87
Helfrich, Philip	Effects of Human Disturb...Johnston Atoll Lagoon Biota	US Fish & Wild.	Yes		87
Helfrich, Philip	Kaneohe Bay Research Record	NOAA/Sea Grant	Yes		87
Helfrich, Philip	9609 Thyroid Hormone St-Fish	OI	Yes	Yes	87
Holland, Kim	Feeding & Energetics Telemetry of Free-Swimming Tuna	NOAA/Sea Grant	Yes	Yes	87
Holland, Kim	Behav. Yellowfin Tuna..Prey Odors & Amino Acid & Nucleotide..	Umami Mfg/Japan	Yes	Yes	87
Losey, George	Kaneohe Bay Research Record	NOAA/Sea Grant	Yes		87
Parrish, James	Sources of Direct Trophic Support for Commercial Bottomfish	NOAA/Sea Grant	Yes		87
Szyper, James	CRSP-Pond Dynamics (off)	USAID	Yes	Yes	87
Brock, Richard	Enhancing Juvenile Fish Recruitment...Coral Reef Fisheries	NOAA/Sea Grant	Yes	Yes	88
Fast, Arlo	Marine Shrimp Pond Dynamics	DLNR		Yes	88
Grau, E. Gordon	Biomedical Research Support Grant Award	BRSG	Yes	Yes	88
Grau, E. Gordon	Feed Tech Research: Sensory,Hormonal & Nutritional Aspects	NOAA/Sea Grant	Yes	Yes	88
Grau, E. Gordon	Feed Tech Res Prog I: Sensory,Hormonal & Nutri Aspects	DLNR/ADP		Yes	88
Helfrich, Philip	Fisheries Resource Assessment Training Workshop	USAID	Yes		88
Helfrich, Philip	Hawaiian Fishery Species		Yes		88
Holland, Kim	Feed & Energetics Telemetry of Free-Swimming Tuna	NOAA/Sea Grant	Yes	Yes	88
Jokiel, Paul	Heeia State Park Marine Research	DLNR			88
Parrish, James	Expanded Analysis of Community Trophic Models for Hawn Fish	USFWS	Yes		88
Parrish, James	Direct Tropic Support for Commer Bottomfish @ Penguin Bank	NOAA/Sea Grant	Yes		88
Szyper J.Brick R	Marine Shrimp Pond Dynamics	NOAA/Sea Grant	Yes	Yes	88
Szyper, James	Development of Cage Culture Technology	NOAA/Sea Grant	Yes	Yes	88
Szyper, James	Rearing Requirements for Juvenile Mahimahi	NOAA/Sea Grant	Yes	Yes	88
Szyper, James	Hands on Education & Practical Examination	ADP			88
Szyper, James	Rearing Requirements for Juvenile Mahimahi	NOAA/Sea Grant	Yes	Yes	88
Szyper, James	Net Pen Culture of Fish		Yes	Yes	88
Grau, E. Gordon	HIMB Generator Installation	State General			88
Atkinson, Marlin	Net Organic Production & Material Trans...Model Estuary	NOAA/Sea Grant	Yes		89
Atkinson, Marlin	Solid State Potentiostatic Oxygen Sensor for CTDs	NSF	Yes	Yes	89
Brock, Richard	Techniques to Enhance..Recruit..Juv Fishes..Adult Habitat	NOAA/Sea Grant	Yes	Yes	89
Brock, Richard	Impact of Fishing on Coral Reef Fish Community Structure	NOAA/Sea Grant	Yes		89
Clarke, Thomas	R/MR-34 Egg and Larval Mot	NOAA/Sea Grant	Yes	Yes	89
Clarke, Thomas	R/MR-35 Rep Bio of Carangids	NOAA/Sea Grant	Yes	Yes	89
Dollar, Steven	Model, Impacts of Nonpoint Source Pollution .. In Hawaii	NOAA/Sea Grant	Yes		89
Grau, E. Gordon	Maintenance Contract for Research Equipment	ORA/BRSG	Yes		89
Grau, E. Gordon	Feed Tech Res II, Sensory,Hormonal & Nutritional Aspects	NOAA/Sea Grant	Yes	Yes	89
Grau, E. Gordon	Feed Tech Res II: Sensory,Hormonal & Nutritional Aspects	DLNR/ADP		Yes	89
Helfrich, Philip	Fisheries Resource Assessment Workshop	USDA	Yes		89
Helfrich, Philip	Christmas Island/Kaneohe Bay Development	UHF			89
Helfrich, Philip	MHI/MRI	DLNR/Aq Res			89
Holland, Kim	Momements, Vertical Dist. & Feed Behav...Yellowfin Tuna	NOAA/Sea Grant	Yes	Yes	89
Losey, George	Predoc Godwin Fellowship (Incl $3000 other & 0 Grad Dv)	NIMH	Yes		89
Smith, Stephen	Tomales Bay, CA: LMER site ...Biogeo Reac. in Estuaries	NSF	Yes	Yes	89
Smith, Stephen	OCE88-16709 Tomales Bay Macro	NSF	Yes	Yes	89
Smith, Stephen	Effects of Sewage Discharge on the Estero Americano	NOAA/Sea Grant	Yes		89
Szyper, James	Indicators of Sublethal Stress in Mahimahi	NOAA/Sea Grant	Yes	Yes	89
Szyper, James	Pond Water Quality Mgt Tech	NOAA/Sea Grant	Yes	Yes	89
Szyper, James	Marine Shrimp Pond Dynamics	DLNR		Yes	89
Szyper, James	Pond Quality Management	ADP		Yes	89
Szyper, James	Indicators of Sublethal Stress in Juvenile & Adult Mahimahi	DLNR		Yes	89
Parrish, James	Nearshore Fishery Resources	DLNR			89
Parrish, James	Hawaii Cooperative Fishery Research	DLNR			89
Atkinson, Marlin	Mass Balance Analysis of Nutrient Fluxes ... Pohnpei	USDA	Yes		90
Atkinson, Marlin	Yr23 R/MR-37 Net Organic Prod & Matl Trans in Model Estuary	NOAA/Sea Grant	Yes		90
Atkinson, Marlin	YR22 R/MR-40PD Mass Balance Analysis of Nutrient	NOAA/Sea Grant	Yes		90
Brock, Richard	Study of the Impact of Fishing on Coral Reef Fish Comm Struc	NOAA/Sea Grant	Yes	Yes	90
Brock, Richard	Tech to Enhance the Recruit of Juv Fishes to Adult Habitat	NOAA/Sea Grant	Yes	Yes	90
Brown, Christopher	R/AQ-55PD Non-invas Method to Improve Larv Surv in Mar Ornam	NOAA/Sea Grant	Yes	Yes	90
Brown, Christopher	Biochem aspects of larval feeding by discus fish	URC		Yes	90
Clarke, Thomas	YR23 R/MR-36 Egg & Larval Mortality of the Hawn Anchovy	NOAA/Sea Grant	Yes	Yes	90
Clarke, Thomas	YR23 R/MR-35 Reproductive Biology of Hawn Pelagic Carangids	NOAA/Sea Grant	Yes	Yes	90

PRINCIPAL INVESTIGATOR	GRANT TITLE	GRANT SOURCE		BIOTECH?	GRANT START
		Agency Name	Out-of-State?		
Dollar, Steven	Assess Nonpoint Source Pollution...off Maui, HI	Dept Health			90
Dollar, Steven	YR23 R/MR-36 Impacts of Nonpoint Source Pollution to Mar Ecosys in HI	NOAA/Sea Grant	Yes		90
Fast, Arlo	Comp Econ Analysis...Marine Shrimp Culture & Fishing	ORA/URC		Yes	90
Grau, E. Gordon	Mech Mediating Control of Prolactin Secretion...Teleost Fish	NSF	Yes	Yes	90
Grau, E. Gordon	Biomedical Research Support Grant Award	BSRG	Yes	Yes	90
Grau, E. Gordon	Feeds Tech Res (Phase 2): Sensory,Hormonal & Nutri Aspects	NOAA/Sea Grant	Yes	Yes	90
Grau, E. Gordon	Feeds Tech Res (Phase 2): Sensory,Hormonal & Nutri Aspects	DLNR/ADP		Yes	90
Helfrich, Philip	Center for Applied Aquaculture	DLNR			90
Helfrich, Philip	Aquaculture Educational Facility	Oceanic Inst			90
Holland, Kim	YR23 R/MR-39 Movement,Vertical Distrib & Feed Behav of...Tuna	Sea Grant	Yes	Yes	90
Hunter, Cynthia	N00173 Antifoul Test Arrays	DNR	Yes		90
Jokiel, Paul	Appl of high resol radiographic tech to Scleractian Taxonomy	HI Bishop Res I		Yes	90
Jokiel, Paul	Geographic Dispersal of Reef Corals	Natl Geo Soc	Yes		90
Losey, George	Predoc Godwin Fellowship (incl $2700 other & $300 Grad Div)	NIMH	Yes		90
Parrish, James	Workshop-Intro Aquatic Organisms	USFWS	Yes		90
Parrish, James	Hawaiian Stream Studies	Univ of Alaska	Yes		90
Szyper, James	Indicators of Sublethal Stress	NOAA/Sea Grant	Yes	Yes	90
Szyper, James	Improvements of Pond Water Quality	NOAA/Sea Grant	Yes	Yes	90
Szyper, James	Indicators of Sublethal Stress in Juvenile and Adult Mahi	DLNR/ADP		Yes	90
Szyper, James	Improvement of Pond Water Quality Management Technology	DLNR/ADP		Yes	90
Atkinson, Marlin	Net Organic Prod'n & Matenal Transport in Model Estuary	Sea Grant	Yes		90
Szyper, James	CRSP-Thailand	USAID/OSU	Yes	Yes	90
Atkinson, Shannon	Behavior Mod of the Male Hawaiian Monk Seal	NOAA/Sea Grant	Yes		91
Brown, Christopher	HI & Guam as SPF aquaculture stock centers	CTSA,OI	Yes	Yes	91
Brown, Christopher	Lipid & fatty acid req of marine shrimp	NOAA/Sea Grant	Yes	Yes	91
Brown, Christopher	Non-Invasive Hormone Treat for Enchanc. of Larval Production	NOAA/Sea Grant	Yes	Yes	91
Brown, Christopher	Culture Requirements of larval Hawn endemic freshwater Gobies	DLNR/Aq Res		Yes	91
Brown, Christopher	Large Scale Research, Training & Demo. Facility, Planning Proj	OCEANIT/DLNR			91
Brown, Christopher	Emergency Flood Damage Assist/Hatchery Demo Proj	DLNR/ADP		Yes	91
Brown, Christopher	Non-inves Hormone Treat for Promo of Larval Growth & Survival	DLNR/ADP		Yes	91
Brown, Christopher	Lipid & Fatty Acid Requirements of Marine Shrimp	DLNR/ADP		Yes	91
Grau, E. Gordon	Mech Mediating Control of Prolactin Secretion in Teleost Fish	NSF	Yes	Yes	91
Grau, E. Gordon	MARC Predoc Fellow Santana (incl $3000 other & $0 Grad Div)	NIH/NIGMS	Yes	Yes	91
Grau, E. Gordon	Maintenance of Research Equipment at HIMB	ORA/BRSG	Yes		91
Grau/Atkinson, S.	Behavior Modification of the Male Hawn Monk Seal	NOAA/Sea Grant	Yes		91
Grau, E. Gordon	Feeds Technology Research (Phase 3)	NOAA/Sea Grant	Yes	Yes	91
Grau, E. Gordon	HI-China Aquacul Res & Info Exchange	NOAA/Sea Grant	Yes	Yes	91
Grau, E. Gordon	Maintenance of Research Equipment at HIMB	ORA/BRSG	Yes		91
Grau, E. Gordon	Feeds Tech Res (Phase 3): Sensory,Hormonal & Nutri Aspects	DLNR/ADP		Yes	91
Helfrich, Philip	Research Facilities Improv. at Point Laboratory, HIMB	NSF	Yes		91
Helfrich, Philip	Kaneohe Bay Task Force - Fishing Survey	State Planning			91
Helfrich, Philip	Master Plan for Coconut Island	UH/Proj Dev			91
Holland, Kim	Determ of Causes of Burnt Tuna & Reasons for Diff	NOAA/Sea Grant	Yes	Yes	91
Hunter, Cynthia	Long-term Monitoring and Management Res on Coral Reefs	DLNR/AR			91
Kinzie, Robert	Impact of Enhncd UV-B Radiation on Prim Productivi	NOAA/Sea Grant	Yes	Yes	91
Losey, George	Predoc Godwin Fellowship (incl $2700 other & $300 Grad Div)	NIMH	Yes		91
Szyper, James	Practical Propagation & Growout Systems of Ornamental Fish	DLNR/ADP		Yes	91
Brown, Christopher	Cult. Req. of larval Hawn endemic frshwtr Gobies	DLNR/Aq Res		Yes	91
Grau, E. Gordon	Mech Mediating Control of Prolactin Secretion in Teleost Fish	NSF	Yes	Yes	91
Atkinson, Marlin	Calibr. Stability of Two New Ox2 for CTD's	NSF	Yes	Yes	92
Atkinson, Shannon	Repro Aspects of Male Aggr in Hawn Monk Seals	Sea Grant	Yes		92
Brown, Christopher	US-Japan Seminar:New Approaches to Dev Endocrinology	NSF	Yes	Yes	92
Brown, Christopher	Lipid & Fatty Acid Requirements of Marine Shrimp	Sea Grant	Yes	Yes	92
Brown, Christopher	Non-Invasive Hormone Treat for Promo of Larval G & S	DLNR/ADP		Yes	92
Brown, Christopher	Non-Invasive Hormone Treat for Promo of Larval G & S	Sea Grant	Yes	Yes	92
Fast, Arlo	Travel Award: Third Asian Fisheries Forum-Singapore	URC/UH		Yes	92
Grau/Atkinson, S.	Behavioral Modification of the Male Hawn Monk Seal II	Sea Grant	Yes		92
Grau, E. Gordon	Feeds Technology Research (Phase 3)	Sea Grant	Yes	Yes	92
Grau, E. Gordon	Feeds Technology Research (Phase 3)	DLNR/ADP		Yes	92
Helfrich, Philip	Fisheries Research & Fisheries Mgmt. Assistance	NOAA/Pac Reg Fi	Yes		92
Holland, Kim	Fishing Aggregating Devices	U Rhode Island	Yes	Yes	92
Holland, Kim	Determination of the Causes of Burnt Tuna	Sea Grant	Yes	Yes	92
Jokiel, Paul	Eval of Nearshore Coral Reef Resources...Isl of Kahoolawe	NOAA	Yes		92
Kinzie, Robert	Impact of Enhncd UV-B Radiation on Prim Productivity II	Sea Grant	Yes	Yes	92
Losey, George	Ecologic Relation btwn Turtles,Cleaner Fish & Fibro Disease	NMFS	Yes		92
Reese, Ernst	Using Indicator Species...Coral Reef Sanc & Res-Ka	DeptComm/NOAA	Yes		92
Szyper, James	Devl & Demo of Practical Propagation ...Ornamental Fish	DLNR/ADP		Yes	92

PRINCIPAL INVESTIGATOR	GRANT TITLE	GRANT SOURCE		BIOTECH?	GRANT START
		Agency Name	Out-of-State?		
Brown, Christopher	Yr2. Explor study of HI & Guam as aquac stock centers	CTSA/OI	Yes	Yes	92
Grau, E. Gordon	Endocrine Manipulation of Fish Growth ..in U.S. and China	Sea Grant	Yes	Yes	92
Hunter, Cynthia	Dev of Curric & Train..Volunteer Monitoring of Coral Reefs	EPA	Yes		92
Losey, George	Turtle, Fish and Fibropapilloma disease	USDC	Yes	Yes	92
Atkinson, Martin	Nutrient Uptake Kinetics of Coral Reefs	Sea Grant	Yes		93
Brown, Christopher	Non-Invasive Hormone Treat for Enhanc. of Larval Prod	Sea Grant	Yes	Yes	93
Brown, Christopher	Lipid & Fatty Acid Req. of Marine Shrimp (yr2)	DLNR/ADP		Yes	93
Losey, George	Effects of Anesthesia on the Chemical Senses	NSF	Yes	Yes	93
Thomas, Florence	Friction Coefficients & Roughness of Coral Reef Comm	NSF	Yes		93
Atkinson, Martin	Nutrient Uptake Kinetics of Coral Reefs	Sea Grant	Yes		93
Atkinson, Martin	Nutrient Uptake Kinetics of Coral Reefs	Sea Grant	Yes		93
Atkinson, Shannon	Feeding Ecology of the Hawaiian Monk Seal	Dolphin Quest	Yes		93
Atkinson, Shannon	Repro Aspects of Male Aggr in Hawn Monk Seals	Sea Grant	Yes		93
Atkinson, Shannon	Histological Analysis of Reprod. Tissue of Female HI Monk Seals	Sea Grant	Yes		93
Atkinson, Shannon	Develop't of an Assay to Monitor Cortisol Level in Cetaceans	Sea Grant	Yes		93
Atkinson, Shannon	Reprod. Aspects of Male Agression in Hawn Monk Seals	Sea Grant	Yes		93
Brown, Christopher	Non-Invasive Hormone Treat for Enhanc. of Larval Prod	Sea Grant	Yes	Yes	93
Brown, Christopher	Non-Invasive Hormone Treat for Enhanced Larval Prod	DLNR/ADP		Yes	93
Clarke, Thomas	Dev of Commer Aqua for Softshell & Red-Eared Slider Turtles in HI	Sea Grant	Yes	Yes	93
Clarke, Thomas	Dev. of Comm. Aqua-Cult. Tech for chinese Soft-Shell Turtle	DLNR/ADP		Yes	93
Fast, Arlo	Controlled Reprod. & Intensive Culture Snake-Fish Hawaii	DLNR/ADP		Yes	93
Grau, E. Gordon	Feeds Tech Res:..Feed Add to Prom Growth in Tilapia (Egypt)	USAID/CRSP	Yes	Yes	93
Grau, E. Gordon	Pauley Pagen Marine Laboratory-Helfrich salary	UHF13-7840			93
Grau, E. Gordon	Feeds Technology Research	Sea Grant	Yes	Yes	93
Grau, E. Gordon	Growth Promoters and Ornamental Fish	DLNR/ADP		Yes	93
Grau, E. Gordon	Fish Feeds Technology Research	DLNR/ADP		Yes	93
Grau, E. Gordon	Feeds Technology Research (ON-CAMPUS)	Sea Grant	Yes	Yes	93
Grau, E. Gordon	Feeds Technology Research (OFFICE)	Sea Grant	Yes	Yes	93
Grau, E. Gordon	Growth Promoters	Sea Grant	Yes	Yes	93
Grau, E. Gordon	Rel of Prolactin & Growth Hormones to mediators...Euryhaline	Sea Grant	Yes	Yes	93
Grau, E. Gordon	Novel Non-steroid method to induce sex reversal:Monosex Tilapia	Sea Grant	Yes	Yes	93
Holland, Kim	Movem't of Tiger Sharks around Densely Populated Coastlines	DLNR/AR			93
Holland, Kim	Inv. of Bio. Mov't & Habitat Usage of Food & Game Fish...	DLNR/AR			93
Holland, Kim	Movem't of Tiger Sharks around Densely Populated Coastlines	Sea Grant	Yes		93
Hopkins, Kevin	Feeds Tech Res:...Feed Add to Prom Growth in Tilapia (Egypt)	USAID/CRSP	Yes	Yes	93
Kinzie, Robert	Effect of Flow Regimes on Productivity in Hawn Streams	DLNR/AR		Yes	93
Losey, George	Dolphin Echolocation: Cognitive & Perpetual Procs. Model	ONR	Yes		93
Losey, George	Underwater Echolocation for Object Recognition	ORINCON CORP	Yes		93
Atkinson, Martin	Nutrient Uptake Kinetics of Coral Reefs	Sea Grant	Yes		94
Brown, Christopher	Seed Money Award (ORA)	UH/ORA		Yes	94
Brown, Christopher	YR. 2 Dev't of Threadfin Production Technology	USDA/CTSA	Yes	Yes	94
Brown, Christopher	Non-Invasive Hormone Treatmts for Enhancmnt of Larval Prod'n	Sea Grant	Yes	Yes	94
Grau, E. Gordon	Growth Promoter and Ornamental Fish	Sea Grant	Yes	Yes	94
Grau, E. Gordon	Feeds Technology Research (ON CAMPUS)	Sea Grant	Yes	Yes	94
Grau, E. Gordon	Feeds Technology Research (OFF CAMPUS)	Sea Grant	Yes	Yes	94
Holland, Kim	Short & Medium Term Movem'ts of Tiger Sharks	Sea Grant	Yes		94
Jokiel, Paul	Wkshop on Meas. of UV Rad. on Trop Coastal Ecosystems	Sea Grant	Yes		94
Losey, George	Dolphin Echolocation: Cognitive & Perpetual Procs. Model	ONR	Yes		94

APPENDIX B:

LIST OF PERSONS INTERVIEWED

Appendix B
LIST OF PERSONS INTERVIEWED

Annette Chang	Fiscal Officer, HIMB
Gretchen Gould	Planning Committee Chair, Kane`ohe Neighborhood Board
Dr. Philip Helfrich	Coconut Island Development Coordinator, HIMB
Jack Huizingh	Manager, Seed Capital Program, University of Hawaii-Manoa Office of Technology Transfer and Economic Development
Yara Lamadrid-Rose	Information Specialist, Acquaculture Development Program, DLNR
Dick Longfield	Business Manager, SOEST, University of Hawaii-Manoa
Amy Luerson	Chair, Kahalu`u Neighborhood Board Board Member, Kualoa He`eia Ecumenical Youth (KEY) Project Staff, Hui Ulu, Mea Ai
Elaine Murphy	Chair, Kane`ohe Neighborhood Board
Kimberly Smith	Division of Aquatic Resources, DLNR Coordinator, Main Hawaiian Islands Marine Resources Investigation
Leonard Young	Aquaculture Specialist, Aquaculture Development Program, DLNR

APPENDIX C:

REFERENCES

Appendix C
REFERENCES

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Appendix H

Hawaii Institute of Marine Biology, Proposed Marine Laboratory and Support Facilities, Traffic Questionnaire

HAWAII INSTITUTE OF MARINE BIOLOGY
PROPOSED MARINE LABORATORY AND SUPPORT FACILITIES

TRAFFIC QUESTIONNAIRE

Thank you for taking your time to fill out this questionnaire. The purpose of this questionnaire is to determine the current traffic pattern for people commuting to the existing facilities at Coconut Island and to determine acceptable methods of mitigating the increased traffic expected from the proposed marine laboratory and support facilities. Yours suggestions and comments are important, and may be used to implement a new parking program.

1. How do you commute to the parking lot off of Lilipuna Road (i.e. drive/carpool with ____ other HIMB faculty or staff/dropped-off/walk/bicycle/other)?
   Resident - 1 / Drive - 23-1/2 / Walk - 1-1/2 / Carpool - 1

2. What are your commuting patterns within 1 mile of the parking lot (i.e. travel Lilipuna Road from Haiku Road intersection with Kamehameha Highway, travel Lilipuna Road from Kahuhipa Street intersection with Kamehameha Highway, other)?
   Haiku Road Intersection - 6 / Kahuhipa Street Intersection - 10 / Both - 4

3. What are your estimated arrival/departure times to/from the parking lot?

DAY	ARRIVAL TIME										
Monday	2	1	3	1	3	1	2	5	2	2	2	
Tuesday	2	1	3	1	3	1	2	4	2	2	2	
Wednesday	2	1	3	1	2	1	2	6	2	2	2	
Thursday	2	1	3	1	2	1	2	6	2	2	2	
Friday	2	1	3	1	3	1	2	4	1	2	2	
Saturday								1			1	2
Sunday											1	
	6:00	6:20	6:30	6:45	7:00	7:30	7:45	8:00	8:30	9:00	10:00	11:00

DEPARTURE TIME						
	1	1	14	7	1	
	1	2	11	8	1	
	2	1	12	8	1	
	1	2	12	8	1	
	1	1	12	7	1	
	2			2		
1						
12:00	2:00	3:30	4:00	5:00	6:00	

4. Would you be willing to join a carpool to get to work? Yes or No
   Yes - 8 / No - 11

5. Would you be willing to use a shuttle service from an off-site central parking area to the parking lot? Yes or No
   Yes - 14 / No - 11

6. What types of improvements can you suggest to improve traffic along Lilipuna Road?
   No traffic Problem - 9
   Encourage Bicycle or Motorcycle Use / Install bike rack
   Wider Roads
   Improve Parking Lot

7. Are there other methods to reduce traffic on Lilipuna Road that you are willing to implement (i.e. staggered work hours, etc.)?
   Staggered Work Hours - 5

(SEE OVER)

HAWAII INSTITUTE OF MARINE BIOLOGY
PROPOSED MARINE LABORATORY AND SUPPORT FACILITIES

TRAFFIC QUESTIONNAIRE

8. What types of physical improvements can you suggest to improve parking at the lot off of Lilipuna Road?

More Parking Space / Widen Lot - 14
Enforce Parking Regulations - 5
Automatic Gate
Double Park State Vehicles
Double Park Resident Vehicles
Pay for Parking like Manoa
Assign Stalls / Control Parking

9. Are there other methods to improve parking at the lot off of Lilipuna Road that you are willing to implement (i.e. carpool from a central parking area, etc.)?

Staff and Civil Service Workers with Regular Hours should Carpool - 3
Shuttle Service - 3
Provide Bike Rack - 2

10. Do you have any other comments or suggestions regarding traffic or parking for the facilities?

Purchase Lot and Develop Parking
Hire Someone to Watch the Lot
Light Parking Lot

PLEASE RETURN TO DR. PHILIP HELFRICH BY FRIDAY - JULY 1, 1994

Please staple additional sheets to this form as needed for your responses or comments. If you have any questions or comments regarding this questionnaire, please direct your inquiries to Mr. Alan Kato at Belt Collins Hawaii, phone number 521-5361.