FINAL ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT

ACQUISITION OF LAND AND IMPROVEMENTS FOR THE EXPANSION OF KAHULUI COMMERCIAL HARBOR

District of Wailuku, County of Maui
Tax Map Key: 3-7-10: 001 and 3-7-10: 036

Proposing Agency:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
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This document is prepared pursuant to Chapter 343, HRS and the Administrative Rules, Title 11, Chapter 200 of the Hawaii Department of Health.

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FOR THE DEVELOPMENT OF KAHULUI HARBOR

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1.0 INTRODUCTION

This Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) has been prepared to analyze the potential environmental impacts of the proposed use of State funds for the acquisition of improved land at Kahului Harbor, Maui, from Alexander & Baldwin Properties, Incorporated (A&B). The A&B property consists of two adjacent parcels and is depicted on the charts in Appendix A. This Final EA and FONSI has been prepared in accordance with the provisions of Hawaii Revised Statutes (HRS) Chapter 343, Section 5(a)(1) and Chapter 200 of Title 11, Sections 11-200-5, Hawaii Administrative Rules (HAR). A description of the proposed action, the affected environment, the alternatives considered, the proposed mitigation measures and the preliminary determinations based on the information presented herein and the reasons supporting those determinations are provided. The information contained herein has been compiled from the *Final Environmental Assessment and Finding of No Significant Impact, 2025 Master Plan Improvements, Kahului Commercial Harbor* (Edward K. Noda and Associates, Inc., November 2005), *A Counseling Report Covering An Evaluation of the Fee Simple Interest in The Land and Improvements Located at 55 Kaahumanu Avenue, Kahului, Island of Maui, State of Hawaii* (ACM Consultants, October 10, 2005), *A Counseling Report Covering an Evaluation of the Fee Simple Interest in the Land and Improvements Located at 101 Kaahumanu Avenue, Kahului, Island of Maui, State of Hawaii* (ACM Consultants, October 10, 2005), discussions with other agencies and affected parties, and generally available information regarding the area and its environmental characteristics.

1.1 DESCRIPTION OF THE PROPOSED ACTION

The State of Hawaii Department of Transportation Harbors Division intends to utilize State funds to purchase two privately owned A&B parcels and the improvements thereon. Both parcels are located adjacent to and south of Kahului Commercial Harbor, on Kaahumanu Avenue, between Wharf Street and Hobron Avenue. See Appendix A, Location Maps.

The parcels are necessary for the future expansion of Kahului Commercial Harbor, which is faced with congested and crowded operating conditions. The continuing growth of cargo volumes and passenger operations necessitate the acquisition of these parcels. **Curtailment of Kahului Commercial Harbor's expansion will result in delays in maritime deliveries, restrictions in operations (e.g., termination of Less-Than-Container-Load or LCL cargo[1]), and the creation of unsafe operating environments. While full redevelopment of the A&B land will be scheduled subsequent to purchase of the property, development of appropriate long-range plans and proper environmental analysis of these plans, minor projects may be implemented within the property to provide space for the inter-island cargo carrier's full range of existing cargo services, including its LCL cargo operations. These minor projects will be prudently selected from those contained in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation* (Amended, November 15, 2000).**

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[1] An inter-island cargo carrier currently conducts LCL cargo operations within its Kahului Commercial Harbor terminal. As these LCL operations require a disproportionate amount of space, the inter-island cargo carrier desires to terminate its LCL operations and make room for increasing containerized cargo volumes. The individuals and small businesses that constitute the LCL cargo consignors are concerned that the termination of the service will detrimentally impact their shipping costs.

The proposed land acquisition is entirely consistent with the *Kahului Commercial Harbor 2025 Master Plan*, (DOT Harbors Division, September 2000). Page VI-3 of the Master Plan states, "As inter-island cargo operations outgrow the available acreage, the Harbors Division will work with Alexander & Baldwin Properties, Inc. to acquire the necessary acreage."

1.2 SUMMARY OF MAJOR IMPACTS AND MITIGATION

Description of the Economic and Social Characteristics of the Proposed Action

The proposed land acquisition is necessary for the preservation and enhancement of Kahului Commercial Harbor as the Island of Maui's only marine cargo port. It is clearly recognized that Hawaii, as an island State, is almost totally dependent on ocean surface transportation. Approximately 80 percent of the goods required to keep the Hawaiian economy functioning are imported, and 98 percent of these imported goods are delivered by ship (Lee & Olive, 1994). Adequate land for harbor operations is critical for a sound maritime industrial base and Maui's continued economic growth.

The economic and social characteristics of the proposed project are positive in that it will enable the Harbors Division to proceed with its *Kahului Commercial Harbor 2025 Master Plan* and ensure Maui's economic stability.

2.0 DESCRIPTION OF PROPERTY

2.1 GENERAL LOCATION

The two parcels that the Harbors Division proposes to acquire are located immediately to the south of Kahului Commercial Harbor. Kahului Commercial Harbor lies on Kahului Bay, and is located on the northern shore of the isthmus connecting East and West Maui (see Appendix A, Location Maps). Kahului Commercial Harbor occupies the eastern area of Kahului Bay and is approximately bordered by the east breakwater, Hobron Avenue, Kaahumanu Avenue and Puunene Avenue. Kahului Commercial Harbor is Maui's sole commercial port. Maui's commercial center naturally surrounds this critical maritime transportation facility.

Kahului Commercial Harbor is the busiest, deep-draft, neighbor island, commercial harbor and is one of ten (10) State-managed commercial harbors in Hawaii. The Harbors Division is responsible for the control, management, use and regulation of commercial harbors and their improvement as stated under HRS Chapter 266. The Harbors Division will include the two A&B parcels in the upcoming *Kahului Commercial Harbor 2030 Master Plan* project. The master plan's task force will decide on the best use of the two parcels. Once the 2030 master plan is completed and approved, the Harbors Division will commence with the HRS Chapter 343 assessment of the plan's projects and their cumulative environmental impacts. **Full redevelopment of the parcels will be scheduled after the completion of this environmental analysis. Interim measures may be implemented within the properties to assist the inter-island cargo carrier in continuing its full range of existing cargo services, including the LCL cargo operations. These interim measures will consist of minor projects that produce no significant events, fall within the exemptions granted to the State Department of Transportation and that are exempt from the Chapter 343 process.**

2.2 HISTORY

Early development at Kahului Bay started in 1863 with the construction of the first western building - a warehouse near the beach. In 1879, to facilitate the loading and unloading of goods and passengers, the first small landing was constructed in Kahului Bay. After the Bubonic Plague of 1900, the rebuilding of Kahului town coincided with the evolution of Kahului Bay into a full-scale commercial harbor. The development of the harbor began in earnest under the leadership of Henry Baldwin. During this time, the railroad and harbor depended on each other to provide service to the merchants and the sugar cane plantations. By 1910, the harbor had an 1,800-foot breakwater on the east side, a 40-foot tall lighthouse, a new 200-foot pile-and-timber pier, "Claudine Wharf," and the turning basin had been dredged.

The development of Kahului Commercial Harbor has continued to meet Maui's maritime demand. Pier 1 was initially 500 feet in length and was constructed between 1921 and 1924, along with a pier shed that was 374 feet long. Subsequent construction lengthened Pier 1 to 929 feet. Currently (2003), Pier 1C has been constructed, and Pier 1 increased to a length of 1,658 feet. The first 627 feet of Pier 2 was constructed in 1927 at the location of the old "Claudine Wharf," and extended in 1929 to 894 feet.

By the 1930s, the turning basin was dredged to a depth of 35 feet with a maximum width of 1,455 feet. In 1931, the west breakwater was completed. Currently, the harbor basin is 2,050 feet wide and 2,400 feet long with a depth of 35 feet. The entrance channel is 660 feet wide and has a depth of 40 feet.

To evaluate the existing and future needs at the harbor and to achieve its goals, the Harbors Division undertook the *2010 Master Plan for Kahului Harbor*. This master plan was reviewed and updated in November 1994, and published as the *Master Plan Update for Kahului Harbor*. Typically, the Harbors Division targets a five-year schedule in reviewing and updating its master plans. The current 2025 master plan serves as the latest update to the 2010 master plan, and also provides a long-range guide for the development of Kahului Commercial Harbor.

2.3 LAND OWNERSHIP

The two parcels are owned by A&B (Alexander & Baldwin Properties, Inc.). A&B has contracted ACM Consultants to appraise both parcels. The total appraised value of the land and improvements is $4,549,600.00. **The State of Hawaii Department of Transportation has contracted an appraiser to conduct the evaluation for an objective determination of the value of the two A&B parcels. This appraisal will provide a basis for the Harbors Division's negotiations with A&B on the purchase price of the properties.**

2.4 EXISTING USES AND FACILITIES

The following are descriptions of the parcels being considered for purchase.

Tax Map Key: Division II, Zone 3, Section 7, Plat 10, Parcel 036.
Street Address: 101 Kaahumanu Avenue, Kahului, Hawaii 96732

Owner of Record: A&B Properties, Inc.

Real Property Tax Assessments: $2,009,300 (land); $379,0000 (building).

Size and Shape: Approximately 2.16 acres or 94,002 square feet, generally rectangular in shape.

Topography and Soil Condition: Generally level with street grade. Presumed to have stable soil conditions.

Access: Directly from Kaahumanu Avenue as well as Wharf Street.

Flood Status: Zone V23 (coastal high hazard area), Zone A-4 (areas of 100-year flood with base flood elevations and flood hazard factors determined), Zone C (areas of minimal flooding).

Utilities: All public utilities are available along Kaahumanu Avenue.

State Land Use Classification: Urban District.
Zoning: M-2 Heavy Industrial District.

Wailuku-Kahului Community Plan: Heavy Industrial.

Other: Located with the Special Management Area.

Improvements: Three detached single-story retail/office structures. The original railroad building was constructed circa 1923. The other two railroad annexes were constructed much later (circa 1955) and are connected by concrete walkways to the 1923 railroad building. The buildings are of concrete block construction on a concrete slab foundation with approximately 6,935 square feet of leasable areas. The units range in size from 168 to 2,567 square feet. The buildings are separated by a landscaped courtyard and connected by concrete walkways. Parking is situated on the north, west and east sides of the buildings. The improvements were observed to be of sound construction quality and in average condition due to renovations and regular maintenance through the years. Most of the interior improvements were made by tenants and were observed to be of average construction quality and condition.

Summary of Tenant Leases:

1. Carl Incerto – Office. 1,194 square feet. Lease period: 5/01/03 – 5/30/08.
2. Four Star Mortgage Corp. – Office. 2,567 square feet. Lease period: 6/01/03 – 7/31/06.
3. Linda Austin – Office. 336 square feet. Lease period: 4/01/04 – 3/31/07.
4. John Schweiner – Officer. 1,101 square feet. Lease period: 9/01/03 – 8/31/06.
5. CB Richard Ellis, Hawaii, Inc. – Office. 305 square feet. Lease period: 7/01/03 –

6/30/06.

6. Boskoff Construction, Inc. – Office. 200 square feet. Lease period: 3/01/04 – 5/31/06.
7. Roger & Lisa Strong – Office. 728 square feet. Lease period: 9/01/02 – 9/30/07
8. Boskoff Construction, Inc. – Office. 336 square feet. Lease period: 3/01/04 – 5/31/06.
9. Roger & Lisa Strong – Office. 168 square feet. Lease period: 9/01/02 – 9/30/07.

Tax Map Key: Division II, Zone 3, Section 7, Plat 10, Parcel 001.

Street Address: 55 Kaahumanu Avenue, Kahului, Hawaii 96732

Owner of Record: A&B Properties, Inc.

Real Property Tax Assessments: $1,612,700 (land); $548,600 (building).

Size and Shape: Approximately 1.8 acres or 78,364 square feet, generally rectangular in shape.

Topography and Soil Condition: Generally level with street grade. Presumed to have stable soil conditions.

Access: Directly from Kaahumanu Avenue as well as from Wharf Street.

Flood Status: Zone V23 (coastal high hazard area), Zone A-4 (areas of 100-year flood with base flood elevations and flood hazard factors determined), Zone C (areas of minimal flooding).

Utilities: All public utilities are available along Kaahumanu Avenue.

State Land Use Classification: Urban District.

Zoning: M-2 Heavy Industrial District.

Wailuku-Kahului Community Plan: Heavy Industrial.

Other: Located within the Special Management Area.

Improvements: Presently improved with a two-story retail/office structure, which is commonly known as the "Old Kahului Store". The original part of the building constructed circa 1904. Subsequent portions of this building were constructed in 1916 and 1979. The building is of wood-frame construction on a concrete slab foundation with approximately 16,982 square feet of leasable area. Units A through L are all ground floor units, although some units have mezzanine space. Unit M is a second floor office, and Units No. 1 through 4 are small storage bays. The retail/office spaces range in size from 854 to 5, 011 square feet. The storage bays are 179 to 228 square feet with minimal improvements. Parking is situated on the north side of the building with access from Kaahumanu Avenue. The improvements were observed to be of sound construction quality and in average condition. The improvements were renovated a few years ago and the property has been regularly maintained since.

Summary of Tenant Leases:

1. Joel & Heidi Stuart – Retail. 1,042 square feet. Lease period: 12/01/04-1/31/07 with two-year option.
2. Lightning Bolt Maui, Inc. – Retail. 1,919 square feet. Lease period: 5/01/04-4/30/07.
3. Scott & Amber Emerzian – Retail. 854 square feet. Lease period: 11/01/04-10/31/07.
4. Fabric Mart – Retail. 5.011 square feet. Lease period: 5/01/02-4/30/05 with two-year lease option.
5. Island Beauty Supply, LLC – Retail/Office. Lease period: 5/15/00-5/14/07.
6. Gary Guenther – Office. 1,608 square feet. Month-to-month licensing agreement.
7. LF & Sons Landscape Maintenance – Storage. 228 square feet. Month-to-month licensing agreement.
8. Joel & Heidi Stuart – Storage. 202 square feet. Month-to-month licensing agreement.
9. Lightning Bolt Maui, Inc. – Storage. 179 square feet. Month-to-month licensing agreement.
10. Charles Buckingham – Storage. 136 square feet. Month-to-month licensing agreement.
11. Global Travel Center – Pad. 5,000 square feet. Lease period: 7/01/05-2/28/07.

2.5 SURROUNDING LAND USES

Kahului Commercial Harbor is located in an urbanized, industrial setting and surrounded by the towns of Kahului and Wailuku, the centers of Maui's commerce, light industry, and government. Kahului and Wailuku are home to approximately 37,600 residents, which equates to 37 percent of Maui's total population[2].

The east side of the harbor currently encompasses approximately 50 acres of land. It is the operational portion of the harbor, including three major berthing structures with storage areas, warehouses, harbor offices, and tenant buildings. All of the commercial maritime activities occur on the east side.

Bordering the commercial harbor on the east is the Maui Electric Company power plant, various petroleum storage facilities, and commercial ventures. The main access through this area is via Hobron Avenue. Commercial facilities, including two large shopping complexes (Maui Mall and the Kaahumanu Shopping Center) are to the south along Kaahumanu Avenue. Wharf Street serves as an access to the commercial harbor from Kaahumanu Avenue. Land uses to the west of Puunene Avenue include various commercial activities, canoe *hale* and hotels. Hoaloa Beach, which is partially located on Harbors Division property, neighbors Pier 2 to the west and is used for various recreational activities. The Harbor Lights residential condominium is situated along Kahului Beach Road and south of the harbor area. The Kanaha Pond Wildlife Sanctuary is a Conservation area and is about ½ mile east of the harbor area.

The State Land Use designation for the two A&B parcels and the area immediately surrounding the harbor is Urban. The two A&B parcels and the commercial harbor are within the Wailuku-Kahului Community Plan's heavy industrial district as well as the Special Management Area.

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[2] U.S. Census, 2000, State of Hawaii Data Book 2001, Department of Business, Economic Development and Tourism.

3.0 DESCRIPTION OF THE PROPOSED PROJECT

3.1 DESCRIPTION OF THE PROPOSED ACTION

The Harbors Division proposes to use State funds to acquire privately owned A&B lands and the improvements thereon. The properties consist of two adjoining parcels, located adjacent to and south of Kahului Commercial Harbor between Hobron Avenue and Wharf Street, and identified as TMK: Division II, Zone 3, Section 7, Plat 10, Parcel 001 and Division II, Zone 3, Section 7, Plat 10, Parcel 036. The total land area of both parcels is approximately 3.96 acres.

The affected property is needed to relieve Kahului Commercial Harbor's congested conditions, which are caused by the continual growth of Maui's maritime operations. The two parcels are viewed as critical expansion lands to support Maui's burgeoning cargo handling operations in Kahului Commercial Harbor.

The proposed land acquisition is one of the few limited options available for Kahului Commercial Harbor expansion and is entirely consistent with the *Kahului Commercial Harbor 2025 Master Plan*.

The Harbors Division will initially retain use of both the Old Kahului Store and the Kahului Railroad Building in their present use as commercial retail and office spaces. The future disposition of the buildings will be considered under the *Kahului Commercial Harbor 2030 Master Plan* project that is scheduled to take place in the fall of 2006. The master planning effort will invite participation by representatives from the County of Maui, State and Federal government services, the maritime industry, associated businesses and associations, community organizations and concerned individuals. The goal of the planning effort will be the development of long-range recommendations of the 2030 master plan, including the future use of the property sought for acquisition.

The *Kahului Commercial Harbor 2030 Master Plan* will assist in determining whether the buildings can be used and incorporated in a manner that will serve the needs of Kahului Commercial Harbor's maritime activities.

The *Kahului Commercial Harbor 2030 Master Plan* is scheduled to begin within the next seven weeks. The 2030 master plan's task force will invite a wide range of representatives from government service, the maritime industry, private enterprise, recreational, cultural and community organizations. Invitations will be extended to the Mayor of Maui, the Maui Mayor's environmental advisor, the Maui County Transportation Department, the Maui County Planning Department, the Maui County Public Works Department, the Maui County Council, the Governor's Office, Maui State legislators, Maui's congressional representatives, the State DOT Airports, Highways and Harbors Divisions and Statewide Transportation Planning Office, the State Department of Land & Natural Resources, the State Department of Agriculture, the State Department of Health, the State Department of Business, Economic Development & Tourism, the Public Utilities Commission, the United States Army Corps of Engineers, the United States Environmental Protection Agency, the

United States Customs and Border Protection, Na Kai Ewalu, Maui Canoe Club, Maui Tomorrow, the Sierra Club, the Kahului Harbor Coalition, the Maui Mall Association, the Maui Chamber of Commerce, the Maui Visitors Bureau, the Friends of Haleakala National Park, Alexander & Baldwin, Hawaiian Commercial & Sugar Company, Matson, Horizon Lines, Young Brothers., Sause Brothers, Hawaii Pilots Association, Hawaiian Tug & Barge Company, Maui Petroleum, Chevron, Aloha Petroleum, Tesoro, Norwegian Cruise Lines, the Hawaii Superferry, Kahului Trucking and Storage, Maui Electric Company, Hawaiian Cement, Grace Pacific Corporation, Hawaii Farm Bureau Federation, etc.

The process will be initiated with a public scoping meeting to acquaint and familiarize participants with a general background on the issues pertinent to Kahului Commercial Harbor's long-range requirements and the process that will be observed for formulation of the plan. Areas for consideration should include the maritime industry's operational requirements, anticipated growth and development for Maui County, environmental concerns, recreational and cultural concerns transportation demands, traffic congestion, and the County's overall economic outlook.

Following the scoping meeting, the 2030 master plan task force will convene in plenary session(s). Participants will be asked to engage in discussion of issues that they feel affect the harbor and brainstorm ideas to address the commercial harbor's long-term needs. The group will be asked to reduce their ideas into the preferred scenario and provide a number of viable alternatives. To accomplish this task, the task force must consider the feasibility of the alternatives, identify potential obstacles to the options and prioritize the alternatives. The task force's recommendations will be presented to the Governor for approval. The approved 2030 master plan will serve as the long-range development guide for the Kahului Commercial Harbor. The recommendations will address the future requirements of the overseas cargo, inter-island cargo, liquid bulk cargo, dry bulk cargo, neobulk cargo and the handling of passenger operations.

The 2030 Master Plan's recommendations will be subsequently reviewed through the Hawaii Revised Statutes (HRS) Chapter 343 environmental analysis. Any potential impacts to air quality, water quality, endangered species, recreational activities, cultural practices, historic properties and structures, viewplanes, social considerations, power supply, public services (fire, police, emergency medical, health, schools, parks, wastewater, solid waste, flood plains, etc.) will be identified, analyzed and the proper mitigation measures defined.

The planning effort should include consideration on the requirements of all aspects of operation by the inter-island barge service operator. Expansion opportunities will need to consider options for such growth, the impact and effect on current or adjoining tenants, and the state of the operator to continue engaging in LCL service based on both requirements to conduct such activity at Kahului and at other ports in the state. In order to accommodate the LCL service, sufficient space must also be available in Honolulu and other ports as the service is dependent on the availability of space throughout the state. Once the Chapter 343 environmental analysis is completed, cost estimates for the individual development projects will be developed and the projects will be prioritized and included in the Harbors Division's budget. As funds become available, the high priority projects will be scheduled for design and construction. In the interim, minor projects such

as those contained in the *Comprehensive Exemption List for the State Department of Transportation,* Amended, November 15, 2000, may be implemented to provide the inter-island cargo carrier with the requisite space for continuance of its full range of cargo services, including its LCL cargo operations.

3.2 BACKGROUND

The *Kahului Commercial Harbor 2025 Master Plan* provides a long-range guide for the development of the commercial harbor. The plan is based on the knowledge and experience of the maritime operators, their anticipation of future trends, various statistical analyses, as well as the input of other non-commercial users of the commercial harbor. The master plan, the cargo projections, the berthing analysis and the spatial analysis indicate that Kahului Commercial Harbor's limited maritime lands will be unable to satisfactorily process the volume of cargo being shipped through its terminals. The maritime operators, particularly the State's only inter-island cargo carrier, affirm the need for additional cargo yard acreage. The operators view the need for expansion as an immediate requirement as Kahului Commercial Harbor already lacks sufficient space for the increasing levels of activity.

Pursuant to Hawaii Administrative Rules 19-41-4, "*Delegation of authority. The chief, harbors division, district managers, and the harbor masters are the designated representatives of the department and of its director and as such are delegated full authority to administer the rules of the department and to establish procedures necessary for the efficient and safe operation of the harbors within their respective jurisdictions*." The Harbors Division's Deputy Director, Administrator (Chief) and Maui District Manager are in full agreement that additional operating areas must be acquired to provide the operators with sorely needed terminal acreage.

3.3 PURPOSE AND NEED

The proposed land acquisition will offer additional terminal space for more efficient, economical and safer maritime operations. The additional acreage provided by the proposed land acquisition will assist the Harbors Division in addressing existing and forecast maritime demands. The *Kahului Commercial Harbor 2025 Master Plan* emphasizes the following objectives:

- Plan the proper development of Kahului Commercial Harbor[3], thereby facilitating maritime shipments of the essential commodities required by Maui County;

- Optimize the utilization of land and water resources committed to marine cargo and passenger operations in an economically responsible manner;

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[3] As defined in the Hawaii Revised Statutes Chapter 266-1, a commercial harbor "*means a harbor or off-shore mooring facility which is primarily for the movement of commercial cargo, passenger and fishing vessels entering, leaving or traveling within the State, and facilities and supporting services for loading, off-loading, and handling of cargo, passengers and vessels.*" Similarly, under Hawaii Administrative Rule 19-41-2 a State commercial harbor "*means a harbor under the jurisdiction of the department which has been designated for trade and other commercial activity....*"

- Provide terminals, other harbor resources, and access to these facilities in locations within Kahului Bay and other locations in a manner that best relates to and serves Maui in an efficient, safe and secure manner; and

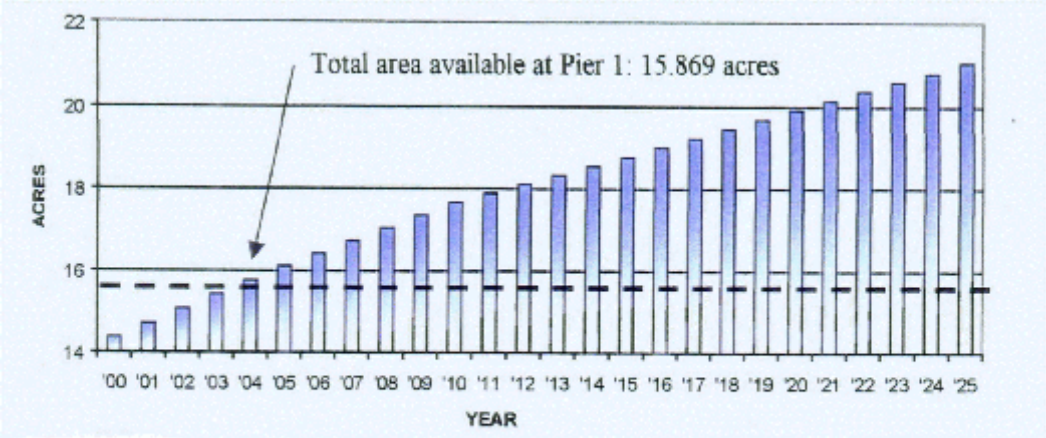
- Minimize the impact on environmental quality and recreational opportunities contiguous with the Harbor.

3.4 FORECAST

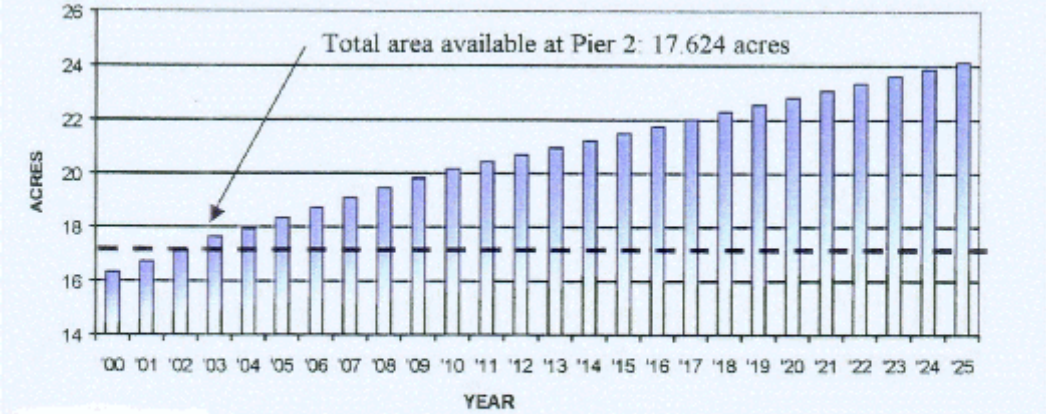
The forecast analysis in the 2025 master plan is based on a number of statistical studies that establish a method of quantifying the requirements for future cargo facilities. The two facilities that were analyzed for their operational capacities are the container yards and the berths. Strong correlations between the annual weight of all cargo shipped to and from Maui and the per-capita Gross State Product were established and used to project the future cargo volumes, the cargo yard acreages and the pier frontage necessary to support the projected cargo volumes.

The container yard analysis is based on a standardized container size that is reported in Twenty-Foot-Equivalent-Units (TEU). Therefore, a twenty-foot long container would be represented as one TEU, a twenty-four foot container would be equivalent to 1.2 TEU, a forty-foot container would be equivalent to 2 TEUs, etc. The number of TEUs is then used to projected storage volumes and areas. The 2025 master plan estimates Pier 1's current container storage requirement as 15.9 acres and Pier 2's current container storage requirement as 17.6 acres. The storage yard projections are shown on the following graphs. An additional 3.7-acre overflow storage yard is located at the corner of Hobron Avenue and Kaahumanu Avenue, and is typically used for automobile storage.

The spatial requirements for the projected cargo volumes were determined by the application of commonly used port-planning formulae. The forecast overseas cargo volumes require container yard space of 21 acres by the year 2025, and the projected inter-island cargo volumes will require over 24 acres by 2025. Based on the projected cargo volumes and the existing size of the cargo yards, both overseas and inter-island cargo yards have exceeded their capacities. The additional container yard capacity provided by the overflow space marginally delays the need for maritime land expansion. While alternate measures (e.g., relocating break-bulk cargo activities to off-dock locations; closing internal roadways and converting the roadway to cargo yard; relocating cement storage facilities to the outskirts of Harbors Division property) may aid in addressing the need for harbor space, the measures require significant time and finances to implement, and these measures alone will not satisfy the long-term spatial requirements of the terminal operators. The acquisition of the two A&B parcels is thus viewed as a necessary and immediate requirement.



Pier 1 Overseas Cargo Yard Acreage Requirement Projections



Pier 2 Inter-Island Cargo Yard Acreage Requirement Projections

3.5 ALTERNATIVES

Preferred Alternative. The preferred alternative is the purchase of the two A&B parcels. The purchase of these two parcels, which are adjacent to Kahului Commercial Harbor's cargo yards, enables the Harbors Division to plan the future development of these parcels. The Harbors Division anticipates starting the Kahului Commercial Harbor 2030 Master Plan in the summer of 2006. Successful completion of the proposed property purchase will allow the Harbors Division to include these parcels as maritime expansion lands in the 2030 Master Plan. Once the 2030 Master Plan is completed, the Harbors Division will process the HRS Chapter 343 environmental analysis. **Full redevelopment of the properties will be scheduled after completion of the environmental analysis. Maritime operators will then be able to occupy the newly developed lots. Operational efficiencies, safety and reasonable commodity costs will thus be maintained. Interim measures (minor projects with little or no probability of significant environmental impacts) may be implemented to address the inter-island cargo carrier's critical spatial requirements and enable the carrier's continuance of its full range of cargo existing services, including its LCL cargo operations.**

Second Harbor Alternative.

The U.S. Army Corps of Engineers investigated the potential development of six alternatives for the *Maui Second Commercial Harbor, Navigation Study* (1995). The study found that none of the proposed sites could be developed at an acceptable benefit-to-cost (B/C) ratio (i.e., greater than 1.0), which prohibits the Corps of Engineers' participation in the funding and construction of a second commercial harbor on Maui's coastline.

The results of the B/C ratio analysis are shown in Table 3-1 and include the impacts of a 23-day and 39-day closure of Kahului Commercial Harbor.

If the Harbors Division must undertake the financing and construction of a second commercial harbor without assistance from the Corps of Engineers, the project is expected to require many decades to complete. Even with the Corps of Engineers' help, such a project would require between ten to twenty years to finish.

TABLE 3-1
BENEFIT-TO-COST RESULTS FOR SECOND MAUI HARBOR

SITE	B/C WITH 23-DAY CLOSURE	B/C WITH 39-DAY CLOSURE
Hata Bay Breakwater Harbor	0.08	0.16
Maalaea Pier	0.38	0.50
Ukumehame Pier	0.50	0.71
Olowalu Pier	0.50	0.71
Olowalu Dock & Turning Basin	0.39	0.56
Olowalu Dredged Harbor	0.27	0.38

From an environmental viewpoint, the anticipated environmental impacts of constructing and operating a second commercial harbor may prove massive. As stated in the study, "*Based on the July 1990 biological opinion, a proposed commercial harbor development in west Maui is likely to result in a jeopardy opinion*[4] *from NMFS* (National Marine Fisheries Service)." The NMFS jeopardy opinion could result in the termination of the second harbor project. The Second Harbor Alternative, therefore, does not meet the purpose of the project, as:

- The Second Harbor Alternative does not facilitate (in the short-term) maritime shipments of the essential commodities required by Maui's residents, businesses and visitors;

- The Second Harbor Alternative does not optimize the utilization of land and water resources committed to marine cargo and passenger operations in an economically responsible manner; and

- The Second Harbor Alternative does not minimize the impacts on environmental quality and recreational opportunities contiguous with the potential second harbor sites.

A second commercial harbor is thus not considered a reasonable or feasible alternative to the proposed acquisition of the two adjoining A&B parcels.

West Breakwater Terminal Alternative

The *Kahului Commercial Harbor 2025 Master Plan* recommended the development of a passenger terminal at Kahului Harbor's west breakwater coral stockpile. The Harbors Division followed Governor Ben Cayetano's September 14, 2000 approval of the master plan with the U.S. Army Corps of Engineers' project that analyzed the feasibility of the planned projects. The ensuing technical study, *Wave Climate and Wave Response, 2025 Plan, Kahului Harbor, Maui, Hawaii,* U.S. Army Corps of Engineers, June 2002, revealed that the proposed terminal on the west breakwater would require extensive new breakwater construction and a large dredging project to permit successful navigation to and from the terminal's berth. An order of magnitude estimate of $182.3 million addresses terminal construction, construction of the breakwater extension system, dredging of the turning basin and berth. Significant impacts to benthic communities, coral reef ecosystems and the harbor surf sites are evident.

The huge financial commitment and the extensive mitigation measures necessary for the completion of the West Breakwater Terminal requires an extremely long-term completion schedule. Because of the time, cost and complexity associated with its development, the West Breakwater Terminal Alternative is not considered a reasonable or feasible alternative to the proposed acquisition of the two adjoining A&B parcels.

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[4] A jeopardy opinion means that the project will jeopardize the continued existence of an endangered species.

3.6 NO-ACTION ALTERNATIVE

The No-Action Alternative is included in the EA and analyzed in accordance with HRS Chapter 343 requirements. The No-Action Alternative assumes that expansion space is not needed to address and alleviate harbor requirements within the short-term future. The forecast growth of shipping traffic, cargo tonnage and passengers will increase irrespective of any expansion of Kahului Commercial Harbor's terminal acreage. Under the No-Action Alternative, the forecast vessel traffic, cargo volumes and passenger counts will be squeezed into the commercial harbor's already constrained facilities. It is predicted that the No-Action Alternative would result in inordinate demand on the existing piers, passenger and cargo terminals, which would, in turn, result in significant delays in the loading and unloading of cargo and passengers. The ships waiting for their berths would be required to anchor offshore or extend their calls at other ports until space to accommodate cargo loads becomes available. These inefficiencies will add to the cost of goods transported into and out of Maui.

The No-Action Alternative will not alleviate congestion within the cargo yards. The cargo yard congestion will only worsen as cargo volumes continue to expand. The No-Action Alternative will also result in stevedores being exposed to dangerous working conditions as the cargo yard congestion and crowded working conditions increase. Without opportunities for harbor expansion, vessels will be delayed at their berths as cargo loads take longer to unload and reload. The lack of sufficient space will result in shipping delays, which would, in turn, cause limitations on essential commodities, leading to inflated costs of goods and products.

The No-Action Alternative is therefore not considered a reasonable or feasible alternative to the proposed acquisition of the two adjoining A&B parcels.

3.7 PROJECT FUNDING

The appraisal conducted by ACM Consultants on October 10, 2005 lists the combined value of both A&B parcels as $4,59,600.00. **The State of Hawaii Department of Transportation has contracted an appraiser for an objective determination of the value of the two A&B parcels. This appraisal will provide a basis for the Harbors Division's negotiations with A&B on the purchase price of the properties.** The proposed project will be financed solely with State of Hawaii funds, either through Harbor Special Funds or from the General Fund. Typically, the DOT Harbors Division funds their operating and capital improvement expenses through the Harbors Special Fund, which is derived from fees collected from commercial harbor operators and tenants.

4.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT, POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.1 CLIMATE

4.1.1 EXISTING CONDITIONS

The climate in the Kahului area is characterized by an equable temperature regime, marked seasonal variation in rainfall, persistent surface winds from the northeast quadrant and the rarity of severe storms. The range of temperatures between August, the warmest month, and January, the coldest month, is 79.2º F to 71.5º F, respectively.

Rainfall is normally relatively light and occurs mostly during the wet season from November through April. Annual rainfall is about 20 inches. Humidity in the Kahului area is usually moderate to high throughout the year.

Northeasterly trade winds dominate the wind pattern in the area of the two A&B parcels and provide excellent ventilation for the area. The trade wind flow is most prevalent during the dry season, while variable winds occur primarily during the wet season. However, trade winds occur more than 50 percent of the time during the wet season.

The normal trade winds, accentuated by the funneling effect of Haleakala and the West Maui Mountains, may attain speeds of up to 40 to 45 miles per hour (mph). Occasional strong southerly (Kona) winds occur with the passage of storms during the winter months.

4.1.2 ALTERNATIVE ANALYSIS

Neither the Preferred Alternative, the Second Harbor Alternative, the West Breakwater Alternative nor the No-Action Alternative will produce any impacts on Maui's climate.

4.2 LAND USE

4.2.1 EXISTING CONDITIONS

The majority of land within the environs of the two A&B parcels is designated Urban by the State Land Use Commission (LUC), with the Kanaha Pond Wildlife Sanctuary being designated as Conservation. The Kanaha Pond Wildlife Sanctuary is located about one-half (½) mile east of the A&B parcels and is owned by the State of Hawaii, Department of Transportation, Airports Division and managed by the State of Hawaii, Department of Land and Natural Resources (DLNR).

The two A&B parcels are located in an urbanized area and are surrounded by the Kahului Commercial Harbor and Kahului town. Both A&B parcels are zoned for Heavy Industrial use by the State LUC. Both parcels are also designated Heavy Industrial in the Wailuku-Kahului Community Plan. The surrounding land uses include the commercial harbor activity and other commercial and light industrial land uses. A residential condominium and two motels are to the south.

4.2.2 ALTERNATIVE ANALYSIS

The Preferred Alternative, the West Breakwater Alternative and the No-Action Alternative do not require a change in land use or zoning. There will be no impacts on land use or zoning as a result of these alternatives.

Dependent on the selected site, the Second Harbor Alternative may require changes in land use and zoning. Such changes will be preceded by full applications of the HRS Chapter 343 environmental analyses.

4.3 AIR QUALITY

4.3.1 EXISTING CONDITIONS

The air quality of a given location is a function of both local meteorology and the amounts of air pollutants emitted from sources in the area. Present air quality in the Kahului area is affected by vehicular emissions, industrial and agricultural activities, and natural processes. The latest emissions inventory for the Island of Maui was conducted in 1980 by the State of Hawaii, Department of Health.

In the vicinity of the two A&B parcels, agriculture continues to be the major source of particulate matter emissions, and the level of emissions has increased by about 25 percent since 1980[5]. Sulfur oxides and nitrogen oxides emissions are primarily generated by electric power plants. Motor vehicles and the agriculture industry are the major sources of carbon monoxide and hydrocarbon emissions.

Significant industrial sources located within a few miles of the two A&B parcels include the Kahului Commercial Harbor to the north, the Puunene Sugar Mill, located about two miles to the southeast; and the Kahului Power Plant neighboring the harbor to the east.

4.3.2 ALTERNATIVE ANALYSIS

Preferred Alternative and No-Action Alternative

As the forecast demand and maritime activity will occur with or without the proposed land acquisition, the proposed purchase of the two A&B parcels will have no significant impacts on air quality in the area.

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[5] *Final Environmental Impact Statement, Kahului Airport Improvements*, Department of Transportation, Airports Division and Federal Aviation Administration, 1990

Second Harbor Alternative and West Breakwater Alternative

Short-Term Construction Impacts

There will be no significant short-term air quality impact due to construction activities for these proposed improvements. Such impacts would be direct and indirect and emanate from two potential sources: fugitive dust from vehicle movement or soil excavation; and exhaust emissions from on-site construction equipment.

Fugitive dust emissions may arise from grading and dirt-moving activities within the project sites. The emission rate for fugitive dust is nearly impossible to estimate accurately because of its elusive nature and because the potential for its generation varies greatly depending upon: the type of soil at the construction site; the amount and type of dirt-disturbing activity taking place; the moisture content of exposed soil in work areas; and the wind speed. The State of Hawaii's Air Pollution Control Regulations require that visible emissions of fugitive dust from construction activity be essentially nil. Adherence to those regulations as recommended will serve to mitigate any potentially significant short-term fugitive dust air quality impacts to a level below the level of significance.

On-site construction equipment (both mobile and stationary) will also emit some air pollutants in the form of engine exhaust. The larger equipment are usually diesel-powered. Nitrogen dioxide emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the ambient air quality standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel-powered equipment, on the other hand, are very low.

Slow-moving construction vehicles traveling on roadways leading to and from the project site could obstruct the normal flow of traffic to such an extent that overall vehicular emissions are increased, but this impact can be mitigated by moving heavy construction equipment during periods of low traffic volume. Likewise, the schedules of commuting construction workers can be adjusted to avoid peak hours in the project vicinity. Thus, the potential short-term air quality impacts from project construction can be mitigated to a level below the level of significance.

Mitigation Measures - Construction Impacts

Although the short-term construction impacts are insignificant, under the State of Hawaii, Air Pollution Control Regulations, visible emissions of fugitive dust from construction activities at the property line are prohibited. Thus, an effective dust control plan for the project construction phase is essential. Construction activities must comply with provisions of Chapter 11-60.1 of the State of Hawaii Administrative Rules, Section 11-60.1-33, on Fugitive Dust. Adequate fugitive dust control can be accomplished by the following measures, as necessary:

- Focus 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;

- Provide an adequate water source at the site, prior to startup of construction activities;

- Control of dust from shoulders, project entrances, and access roads;
- Provide adequate dust control measures during weekends, after hours, and prior to daily startup of construction activities;
- Use of a frequent watering program to prevent bare-dirt surfaces from becoming significant dust generators;
- Limit the area that can be disturbed at any given time;
- Application of chemical soil stabilizers or mulching;
- Construction of wind screens;
- Require that all open-bodied trucks be covered when transporting dirt or dust producing materials;
- Road cleaning or tire washing, as appropriate; and/or
- Paving of parking areas and the establishment of landscaping early in the construction process to limit areas of possible dust production.

4.4 NOISE

4.4.1 EXISTING CONDITIONS

The two A&B parcels adjoin the Kahului Commercial Harbor, which is typically a high ambient noise environment, with operations occurring 24-hours a day and 7-days a week. The commercial harbor operations include heavy vehicle traffic, and the cargo loading and unloading operations that use cranes, lifts and other mechanical equipment, which contribute to the existing noise levels. The surrounding land uses also include the most industrialized portions of Kahului, and the area, therefore, has a high ambient noise level.

4.4.2 ALTERNATIVE ANALYSIS

Preferred Alternative and No-Action Alternative

Neither of these alternatives, will have any significant impacts on the noise characteristics at the two A&B parcels and their environs.

Second Harbor Alternative and West Breakwater Alternative

Short-Term Construction Impacts

There will be short-term noise impacts due to construction activities for these proposed alternatives; however, due to the finite and staged duration of these projects, the impacts will be insignificant.

4.5 SOCIO-ECONOMIC IMPACTS

4.5.1 EXISTING CONDITIONS

The two A&B parcels are part of Maui's industrial district in Kahului. The various tenants that occupy the parcels' structures utilize the sites for retail, office and storage operations. The tenants include: Joel & Heidi Stuart (retail); Lightning Bolt Maui, Inc. (retail); Scott & Amber Emerzian (retail); Fabric Mart (retail); Island Beauty Supply, LLC (retail/0ffice); Gary Guenther (office); LF & Sons Landscape Maintenance (storage); Joel & Heidi Stuart (storage); Lightning Bolt Maui, Inc. (storage); Charles Buckingham (storage); Global Travel Center (pad); Carl Incerto (office); Four Star Mortgage Corp. (office); Linda Austin (office); John Schweiner (office); CB Richard Ellis, Hawaii, Inc. (office); Boskoff Construction, Inc. (office); Roger & Lisa Strong (office); and Boskoff Construction, Inc. (office); Roger & Lisa Strong (office). The broad mix of tenants is fairly typical of the variety of operations evident within the Kahului industrial district.

4.5.2 ALTERNATIVE ANALYSIS

Preferred Alternative.

The DOT Harbors Division proposes the acquisition of the two A&B parcels for Kahului Commercial Harbor incorporation. Once the acquisition is completed, the Harbors Division will start the Kahului Commercial Harbor 2030 Master Plan to determine the best development options for the two parcels. Following the master plan's completion and the Governor's approval of the master plan, the Harbors Division will process the HRS Chapter 343 EA/EIS for the master plan. The two parcels will then be developed for their planned purposes. **Unanticipated burgeoning of maritime operations is causing an inter-island cargo carrier to consider terminating its LCL cargo operations. Interim measures may be implemented to create the critical, requisite space to accommodate the carrier's full range of existing cargo services, including these LCL operations. These interim measures will consist of minor projects with little or no probability of significant environmental impacts and that are contained in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation,* Amended, November 15, 2000.**

As the State Department of Transportation Harbors Division commits to honoring the terms of all existing leases in place at the time of purchase and will not redevelop the properties until the expiration of the last lease date, no socio-economic impacts are anticipated.

Second Harbor Alternative.

Various socio-economic impacts (including loss of recreational sites, increased traffic, additional business opportunities, increased development, and loss of scenery) are anticipated, dependent on the selected site of the second commercial harbor.

West Breakwater Terminal Alternative.

The site of the West Breakwater Terminal is the dredged coral spoils stockpile at Kahului Harbor's western breakwater. The State Department of Land & Natural Resources operates and maintains a recreational boat ramp there. Recreational fishing occurs along the stockpile's shoreline. While development of the West Breakwater Terminal will preserve the DLNR recreational boating facilities, shoreline fishing will not be allowed at the terminal due to U.S. Coast Guard maritime security regulations.

No-Action Alternative.

The existing mix of retail, office and storage operations will likely continue if the two parcels remain under A&B ownership, Kahului Commercial Harbor's maritime operations will experience continued and worsening congestion, constrained working conditions and delays or even unavailability of essential commodities (food, clothing, building materials, cars and fuel). Negative socio-economic impacts are anticipated unless Kahului Commercial Harbor's constrained operating acreage is expanded to alleviate congestion and crowding.

The No-Action Alternative also limits the capacity and capability of the Harbor to accommodate future needs. The absence of additional expansion space will result in delays in the unloading and loading of cargo and passengers and increase the costs of goods in Maui. As all bulk shipments of petroleum products for Maui County arrive by ship, the fuel barges' petroleum products operations could experience extreme inefficiencies. These inefficiencies would translate to even higher fuel costs – a significant economic impact.

In 1997, the *Economic Impact of Hawaii's Harbors* showed that if the port-economy were reduced to one-percent (1%) annually (whether by lack of infrastructure or investment), the effects would be:

- Sales and employment of the major harbor industries would be limited by 23.4%, i.e. would reach only 76.6% of the level anticipated for the year 2020;
- The Gross State Product would be curtailed by 2.1%; and
- Employment would be lowered by 0.5%.

4.6 GEOLOGIC AND GROUNDWATER CONDITIONS

4.6.1 EXISTING CONDITIONS

Geologically, the Island of Maui is characterized as East and West Maui, with East Maui dominated by Haleakala Volcano. The West Maui area, which includes the saddle isthmus between Haleakala, the West Maui Mountains and the Kahului/Wailuku areas, is distinguished by Iao Needle in Iao Valley. There are five major geologic units on West Maui: (i) Pliocene and Pleistocene volcanic rocks, including the Wailuku and Honolua volcanic series; (ii) Pleistocene and recent volcanic rocks, including the Lahaina volcanic series; (iii) Pleistocene sediments which include calcareous dunes and consolidated earthy deposits; (iv) recent sediments which include unconsolidated deposits; and (v) historic volcanic rocks.

Typically, the West Maui basalt is thin-bedded a'a and pahoehoe created by quiescent flank eruptions along rift zones. A'a is characterized by a spiny, clinkery surface underlain by a dense core of rock. Pahoehoe has a smooth to billowy surface with a ropy or folded texture. The soils of West Maui, which reach depths of about 20 feet, indicate that the volcanic activity probably stopped in the Pliocene or earliest Pleistocene era.

The two A&B parcels are situated at the northeastern corner of a broad isthmus that joins the two mountains. The underlying geology of the area is a sequence of intercalated volcanics, marine sediments, terrestrial sediments and fill laid on the northwestern flank of Haleakala. The shallow subsurface conditions along the landward side of the area consists of exposed Pleistocene age sand dune deposits formed during a lower stand of the sea. Under the sand dunes lie lava flows and related deposits of the Kula Volcanic Series. This volcanic series is characterized as late stage volcanics of andesitic composition that formed thick flows of dense massive basaltic lava. The Kula lava flows are generally mantled by a thin cover of volcanic ash. The base of the stratigraphic section in this area is the Honomanu Volcanic Series basalts of Haleakala. These rocks are primitive theoleitic lavas with the porous and layered structure typical of Hawaiian basalts.

The physiography of the area is characterized as being relatively flat with an average slope of less then 0.5 percent from south to north. The current ground surface elevations range from sea level at the coast to about 13 feet mean sea level (msl) along Maui Beach Road.

Earthquakes with epicenters on or near the Island of Hawaii originate from both volcanic and tectonic activity. Most of the volcanically related earthquakes are associated within the underground movement of magma and are relatively small. These earthquakes originate from the Molokai Seismic Zone, which includes the islands of Maui and Hawaii. The Molokai Fracture Zone is a series of fractures in the sea floor that stretch from the Hawaiian Islands to Baja California. Most of the fracture zone is seismically inactive, but significant earthquakes are associated with the portion near Hawaii.

Data on earthquakes recorded on Maui during historical times indicate that two large quakes in the Molokai Fracture Zone and the Ka'u earthquake of 1871 probably produced earthquakes in East Maui. Haleakala Crater is considered to be a dormant volcano. The potential earthquake damage to existing and proposed structures would be minimized by following the Uniform Building Code and other applicable rules and regulations. Presently, the two parcels are in seismic Zone 2B as established by the Uniform Building Code (UBC).[6]

Ground Water Hydrology: The site overlies sediments of the Maui Isthmus and Kula Basalts which form a "caprock" or confining layer over the underlying basal aquifer in Honomanu Basalts. This confinement results in artesian conditions in the aquifer. Generally, Kanaha Pond is an expression of these artesian conditions resulting from leakage through the caprock.

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[6] The Uniform Building Code categorizes the United States in to various zones from 1 to 4. These zones are assigned a "seismic zone factor" which is used to compute the seismic design loads on structures. The "seismic zone factor" is related to the intensity of seismic activity in the region.

The aquifer in Honomanu Basalt contains fresh water and is utilized in some locales by the Maui Department of Water Supply as a drinking water resource. In the region of the site, the basal aquifer is located at a depth of about 100 feet below the ground surface. At this depth, the potential of contamination from surface activities is low.

There are no public drinking water wells within several miles of the two A&B parcels. The nearest wells are situated at locations that are either across gradient of or in distinctly separate geohydrologic formations from the property and are hydrologically isolated by the caprock that underlies the area.

The two A&B parcels and adjacent properties are situated makai (downgradient) of the Underground Injection Control Line in this area of Maui. Based on available Hawaii State Department of Health records, there are several known injection well facilities within a radius of approximately one (1) mile from the harbor. These wells are used for the disposal of municipal wastewater and storm runoff into the caprock formation. The wastewater wells are situated across gradient, and, the majority of the storm water wells are situated upgradient of the two A&B parcels.

4.6.2 MARINE ENVIRONMENT

The two A&B parcels are located inland of Kahului Commercial Harbor. The proposed acquisition of the two parcels will produce no impacts on Kahului Commercial Harbor's marine environment. The following is provided as a depiction of the harbor's marine environment as it pertains to the environmental impacts of the West Breakwater Terminal Alternative.

Kahului Harbor, a fan-shaped basin at the head of Kahului Bay, is bounded on both the east and northwest by long breakwaters protected with boulders and concrete armor units. The sand shoreline at the head of Kahului Harbor between Pier 2 and the shore along Kahului Beach Road is known as Hoaloa Beach and transitions to Kahului Beach. The beach is composed of brown, detrital sand and is broken by several boulder jetties built to retard erosion. Much of the southwest shoreline between the extreme south corner of the harbor and the coral fill area is a beach of gravel to boulder size rubble (See Appendix C). A sand channel entering Kahului Bay is believed to be a relic feature representing the ancient drainage course of Waikapu Stream.

Much of the southern and southwestern perimeter of the harbor is fringed by a shallow reef shelf, which extends a few hundred feet offshore. Beyond the reef edge, the dredged harbor bottom is a terrace of silty-sand and limestone rubble dipping gradually seaward to depths of over 50 feet (15 m) beyond the Harbor entrance. Off the sand beach west of Pier 2 is a sand bottom extending to a depth of 10 feet (3 m). From a depth of 10 feet, there are consolidated rock formations pocketed by sand, and at the seaward edge of this formation, the depth drops to the dredged basin forming the eastern portions of the harbor.

Between Piers 1 and 2 the bathymetry is the shallowest at the Pier 1 boathouse and along Pier 3 with depths ranging from 5 feet to 18 feet. The bathymetry increases eastward toward the turning basin to a depth of approximately 30 feet until the end of Pier 2 with deeper areas of approximately 35 feet near Pier 1. The majority of the bottom is covered with fine silt and mud with a few rock out-crops. Soil investigations at the corner of Piers 2 and 3 show the underlying

substrate to be coarse-grained soils to a depth of about 35 feet below sea level. Similarly, the soil boring for the construction of Pier 3 bulkhead (near the north end of the current Pier 3), shows that the soil from approximately 15 feet to 50 feet below the water surface consists of coarse-grained soils such as loose clayey-silty sand and coral deposits.

Sand bottom occurs at depths greater than 30 feet (9 m) outside the mouth of Kahului Harbor. The west breakwater overlies an irregular reef whose margin is about 15 feet (5 m) deep. Here, the limestone platform drops a short distance to a sand bottom continuing offshore from a depth of about 20 feet.

The bottom of the harbor basin is comprised of sand and mud. The extensive sandy-mud bottom extends a long distance to the north outside of the harbor mouth. There are fringing reefs for several kilometers on either side of the Harbor, comprised of scoured reef platforms with sparse coral and fish communities.

4.6.3 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative will produce no impacts on the nearby marine environment.

Second Commercial Harbor Alternative

The sites considered for Maui's second commercial harbor are largely undisturbed areas of the island's coastline. The typical commercial harbor construction activities of breakwater construction, entrance channel and turning basin dredging, construction of piers, berths, cargo/passenger terminals and access roadways would produce significant, perhaps even unacceptable, impacts on the sites' marine environment.

West Breakwater Terminal Alternative

The West Breakwater Terminal Alternative requires extensive breakwater construction, extensive dredging of the turning basin and berth. Large acreages of Kahului Bay's reef shelf would be obliterated by the new breakwaters, turning basin and berth.

No-Action Alternative

The No-Action Alternative will not produce any impacts on the marine environment, geological conditions or groundwater.

4.7 WAVE AND CURRENTS

4.7.1 EXISTING CONDITIONS

The two A&B parcels are located inland of the ocean. The proposed acquisition of the two parcels will have no impact of the waves and currents of Kahului Bay. The following is provided as a depiction of the waves and currents that would be affected by the West Breakwater Terminal Alternative.

A wave climate and wave response study was conducted by the U.S. Army Corps of Engineers for the 2025 Master Plan and published in June 2002. Wave data for the harbor were collected from November 1993 to May 1995 outside of the harbor entrance using a directional array gage. The data shows that the harbor is exposed to winds and waves from the north to northeast directions, and is protected from the northwest waves by the northwestern portion of Maui. Large waves generated by intense winter storms in the northern Pacific Ocean and hurricanes attack the harbor. The wave data shows an annual mean significant wave height of approximately 3 feet and a maximum significant wave height of over 8 feet for 1994.

Currents outside of the harbor are predominately tidal driven and travel in the east and west direction. Inside the harbor, the current has a clockwise circulation pattern during flood tide and counter clockwise during ebb tide. A drogue study completed in 2002 (presented in Appendix D) shows that there is generally limited exchange of waters from outside of the harbor. Under strong trade-wind conditions, the surface flow is across the harbor to the west.

4.7.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The proposed acquisition of the two A&B parcels will have no impacts on waves and currents in Kahului Bay.

Second Harbor Alternative

The sites considered for Maui's second commercial harbor are largely undisturbed areas of the island's coastline. The typical commercial harbor construction activities of breakwater construction, entrance channel and turning basin dredging, construction of piers and berths would produce significant, perhaps even unacceptable, impacts on the waves and currents at the potential sites for the second commercial harbor. Such significant alteration of the areas' waves and currents could disrupt sand deposits of the existing beaches.

West Breakwater Terminal Alternative

The West Breakwater Terminal Alternative requires extensive breakwater construction, extensive dredging of the turning basin and berth. The breakwater construction is suggested as a means of attenuating the wave energy that enters the harbor, disrupting the vessel maneuvering, cargo and passenger loading/unloading operations at the proposed West Breakwater Terminal's berth. The wave energy that enters the harbor, however, creates ideal conditions for a significant contingent of recreational surfers within the harbor. The extensive dredging necessary for the West Breakwater Terminal Alternative would further destroy the shallow reef shelf that helps to create the surf. The currents within the harbor would be similarly impacted by the massive dredging, breakwater and pier construction, which may significantly impact the sand deposits at Hoaloha Beach.

No-Action Alternative

The No-Action Alternative will not impact the existing harbor circulation or wave climate.

4.8 WATER QUALITY

4.8.1 EXISTING CONDITIONS

The two A&B parcels are located inland of Kahului Commercial Harbor. The proposed acquisition of the two parcels will produce no impacts on Kahului Commercial Harbor's water quality. The following is provided as a depiction of the harbor's water quality as it pertains to the environmental impacts of the West Breakwater Terminal Alternative.

The State of Hawaii, Department of Health, currently lists Kahului Bay (inshore of the breakwater) as an impaired body of water due to high levels of nutrients and turbidity, under section 303(d) of the Clean Water Act. The impaired status of these waters requires that the Department of Health establish Total Maximum Daily Loads (TMDLs) suggesting how much the existing pollutant loads should be reduced in order to attain water quality standards in the stream and coastal waters.

Water quality sampling of Kahului Harbor was conducted on October 16, 2002, on a rising tide, and on April 15, 2003, during a period of strong trade winds. The results of both sampling days are presented in Appendix C.

Water temperature was generally uniform between near-shore stations and between the surface and 5 meter depths at near-shore stations. Within the harbor, surface waters tended to be 0.3 - 0.7 degrees Celsius (C) cooler than at 5 meters depth, reflecting surface cooling associated with passing rain showers and light trade winds during the first sampling. Shoreline water temperatures were generally 0.3 - 0.5 degrees C warmer than surface harbor waters, probably reflecting solar warming as shoreline samples were collected in the early afternoon.

During the October 2002 sampling, salinity levels were lower than typical for Hawaiian waters, ranging from 29.66 parts per thousand (ppt) at the shoreline station S2 to 34.35 ppt in nearshore samples outside the harbor. Depressed salinity levels reflected the recent input of freshwater by rain and runoff. In the April 2003 study, the water quality conditions at the nearshore stations outside the harbor were typically open coastal in nature, with higher salinity levels (34.14 – 34.89 ppt) than observed during the previous survey. Levels of dissolved nutrients were consequently low and typical of open coastal waters with little groundwater influence.

Samples collected along the shoreline again showed strong influence of groundwater, with the salinity of samples collected within the western part of the harbor (S2 – S6) ranging from 27.2 – 32.59 ppt. Lowest salinities were observed at stations S3 and S4, located in the southwest corner of the harbor. Salinity at station S1, a shoreline station on the northern face of the western breakwater, outside the harbor, was similar to open coastal waters (34.39 ppt), as was salinity (34.67 ppt) at S7, near the base of Pier 1.

Dissolved oxygen concentrations were generally typical of near-shore marine waters, ranging from 4.8 to 6.0 mg/l, values that are greater than 90% saturation at their respective temperatures and salinities. PH levels varied little and were typical of near-shore marine conditions.

Turbidity levels were highly variable between near-shore stations, increasing from west to east.

This reflected visually observed decreases in water clarity due to high surf and resuspended sediments on the western stations and both resuspended sediments and stream-borne sediments discharged during earlier heavy rains to the east. Near-shore turbidity levels ranged from 1.6 to 10.4 NTU. Turbidity levels within the harbor were not different from those in near-shore waters outside the harbor, and ranged from 1.9 to 9.4, with a very high value from a near-bottom sample (37.6 at E1). Turbidity levels at shoreline stations within the harbor (S2 - S7) reflected variable shoreline wave action and build-up of detached macroalgal material. Overall, turbidity levels were highly significantly related to Total Suspended Solids, and showed the same patterns of distribution and concentrations (during April 2003).

Water samples taken during both sampling periods showed a strong influence of groundwater influx to the harbor. Increasing levels of silicate with decreasing salinity reflect the dilution of low silicate near-shore coastal seawater with high silicate groundwater. The data suggests a groundwater source with a somewhat decreased silicate load. In addition, the nitrate + nitrite vs. silicate and phosphate vs. silicate relationships show a strong relation between silicate and other dissolved nutrients, suggesting a common upland source. Only samples located along the western shoreline of the harbor, showed a different nitrogen-to-silicate and phosphorus-to-silicate ratio, suggesting a local source of additional nutrients or localized nutrient uptake.

Chlorophyll levels were generally low and showed no systematic relationship to salinity. Elevated chlorophyll levels were observed at shoreline stations along the coastline of the harbor.

4.8.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The proposed acquisition of the two A&B parcels will not impact the water quality of Kahului Bay.

Second Harbor Alternative

The Second Harbor Alternative will very likely produce significant impacts on the water quality of the selected area. All potential sites for the Second Harbor Alternative are largely undisturbed areas of the island's coastline. Any commercial use of these areas would alter the existing water quality, as large commercial vessels would continuously be utilizing the harbor facilities.

Short-Term Construction Impacts

There is a potential for short-term impacts during construction of the proposed Second Harbor Alternative. These impacts are short-term and are considered to be insignificant. To minimize the impact, the following mitigation measures will be included in the design as applicable.

- Designers shall coordinate with the Department of Health, Environmental Planning Office to attain a no-net increase in pollutant loads.

- Measures such as silt curtains will be used to control and isolate turbidity caused by in-water construction.

- Best Management Practices will be used to control runoff into harbor waters.

Dumping in the harbor is illegal pursuant to HRS Chapter 19-42-127, "Littering or polluting of water prohibited". It is illegal to pollute or discharge either directly or indirectly anything other than clean water into any harbor.

West Breakwater Terminal Alternative

As the West Breakwater Terminal Alternative is only intended to accommodate the maritime facilities necessary for the forecast demand of cargo and passenger activity, no significant long-term impacts to Kahului Bay's water quality is anticipated as a result of this alternative. Short-term impacts resulting from terminal construction activities will be mitigated by the following.

The design of the "in-water" projects will include measures, such as silt curtains and other Best Management Practices, to the extent practical, to minimize the impact of the construction on the water quality of the area. The designers should coordinate with the Department of Health, Environmental Planning Office to attain a no-net increase in pollutant loads. During the dredging operation, the Harbors Division will follow applicable rules and regulations, and the conditions of the U.S. Army Corps of Engineers permit, to further minimize impacts to the environment. With these measures, the construction of the "in-water" projects will have an insignificant impact to the water quality.

Dumping in the harbor is illegal pursuant to HRS Chapter 19-42-127, "Littering or polluting of water prohibited". It is illegal to pollute or discharge either directly or indirectly anything other than clean water into any harbor. The U.S. Coast Guard and the Harbors Division enforce this law. Therefore, there will be no legal dumping and discharge of pollutants in harbor waters due to the maritime demand. There is a spill response team, whose equipment is strategically located within Kahului Commercial Harbor, and which is trained to respond immediately to spills and coordinate its efforts with the U.S. Coast Guard.

No-Action Alternative

The No-Action Alternative will maintain the current water quality in the bay and will not reduce the nutrients or turbidity as stated by the Department of Health. There will be no significant impact on the existing water quality.

4.9 HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

4.9.1 EXISTING CONDITIONS

The archaeological and cultural assessment that was completed for the Kahului Commercial Harbor 2025 Master Plan EA/FONSI is included as Appendix B. Kahului Commercial Harbor has been designated a historic site, Site 50-50-04-2953, in the State of Hawaii, Inventory of Historic Places maintained by the State Historic Preservation Division. While the site is not on the National Register of Historic Places or the Hawaii Register of Historic Places, it is potentially eligible. This site consists of those features and structures of the commercial harbor that were constructed during its main period of development between 1901 and 1931. The historic

importance of this site is its link to the Maui sugar industry's development and the establishment of Kahului as the main commercial center.

The Historic Kahului District is defined in the 1974 statewide inventory as Site 50-50-04-1607. Six structures are specifically listed as contributing elements, the Kahului Railroad roundhouse, shop and office, the First Hawaiian Bank, a school, and the fairgrounds (See Figure 9). Structure #1607, the Kahului Railroad Building sits on one of the A&B parcels desired by the DOT Harbors Division. Any demolition or alteration of this structure may require a review by the Maui County Cultural Resources Commission.

The 2030 master plan's task force will discuss and develop the recommendations for the maritime industry's future use of the buildings on the two A&B properties – the Old Kahului Store and the Kahului Railroad Building. Any historical significance of the buildings must be determined in accordance with the State Historic Preservation Division's guidelines.

John C. Wright surveyed the buildings in 1974 and listed the buildings in the Hawaii Register of Historic Places. The buildings were de-listed in 1980 because of a technicality. The Kahului Railroad Office Building (1923) is one of three structures that constitute the only extant remnants of the Kahului Railroad Company's infrastructure at Kahului Commercial Harbor. The other buildings, the Locomotive Shops and Roundhouse (1929), are not on either of the two properties.

Railroad resources (especially locomotive shops and roundhouses) are rare. Together with the Kahului Railroad Office Building, these buildings constitute the last intact remnant railroad complex in Hawaii. They are all eligible for listing in both the Hawaii Register and the National Register of Historic Places. The Old Kahului Store has been altered and is not eligible for listing in the National Register of Historic Places.

The age and history of the trees on the two parcels are not known at this time. The historical significance and value of these trees will be researched during the Hawaii Revised Statutes (HRS) Chapter 343 environmental analysis of the *Kahului Commercial Harbor 2030 Master Plan.*

The potential for undiscovered subsurface cultural resources in this area is quite low, as the area consists of fill from the dredging efforts that deepened the bay and expanded the harbor. A cultural deposit was revealed in TMK 3-7-8, however, and the State Historic Preservation Division noted the potential for such deposits on TMK 3-7-10:2.

While the current cultural activities in the harbor area include fishing, surfing and canoe paddling, none of these traditional Hawaiian recreational practices occur within the two A&B parcels. The activities occur within the harbor waters, and the two paddling organizations, the Hawaiian Canoe Club (established around 1974) and the Na Kai Ewalu (established around 1972), both have *hale* located outside of the commercial harbor boundaries, in back of Hoaloa Beach. The paddling season usually extends from March to October. The clubs use the water area, which consists of eight (8) lanes, and extends about 1/4 mile from shore, paralleling and passing Pier 2. Recent discussions with the canoe clubs indicate that other canoe organizations have also been using the area, resulting in the year-round use of the canoe facilities.

Shore fishing generally occurs in three areas: Perimeter Road, Hoaloa Beach, and the west breakwater area. Two of the fishing areas, the Perimeter Road and Hoaloa Beach, are near the two A&B parcels. The terrorist attacks of September 11, 2001, however, have prompted the prohibition of fishing along the Perimeter Road at Pier 1. Similar security precautions restrict pole fishing from the piers, and net fishing is prohibited in the commercial harbor. Small recreational boats are launched from the boat ramp on the western side of the harbor. While the majority of the boats leave the harbor, some fishing and fish collecting occurs within the harbor, outside of the security zones. Some of the boats are used as support vessels for the canoe races. The current security rules enforced by the U.S. Coast Guard do not allow unauthorized users to enter the area between Piers 1 and 2 and from the tip of Pier 2 to the tip of the east breakwater. A security zone also extends 300 feet around commercial passenger vessels. The U.S. Coast Guard has the authority to close Kahului Commercial Harbor during elevated maritime security levels.

Surfers have used the western end of the Harbor along the breakwater for many years. It is considered an ideal surf site for residents along the northern shores of Maui. Surfing occurs primarily during winter, and prime surfing conditions produce surf from the breakwater to the beach area (towards the Harbor Lights condominium).

Swimmers and park/beach-goers use the beach. Swimming is infrequent due to the murky waters in the harbor. When the harbor waters clear, however, spear fishing and recreational diving activities occur on the western side of the harbor.

4.9.2 ALTERNATIVE ANALYSIS

Preferred Alternative

This draft EA simply addresses DOT Harbors Division's intended purchase of the two A&B parcels. No demolition or construction activities are being proposed for any structures within these parcels at this time. The DOT Harbors Division will initiate the Kahului Commercial Harbors 2030 Master Plan during the summer of 2006. The two A&B parcels and their recommended maritime use will be added to the master plan. Once the 2030 master plan is completed and approved, the Harbors Division will analyze the environmental impacts of the planned harbor facilities prior to any redevelopment efforts. Historic structure #1607, the Kahului Railroad Building, is sited on the A&B parcel at the corner of Kaahumanu Avenue and Wharf Street. The DOT Harbors Division will take all necessary precautions to preserve this structure in accordance with DLNR State Historic Preservation Division rules. The Harbors Division may also request Maui County Cultural Resources Commission's review of their redevelopment plans for Historic structure #1607.

Second Harbor Alternative

The sites for Maui's second harbor are largely undisturbed areas of the island's coastline. These identified sites have yet to be investigated for their historic, architectural, archaeological or cultural resources. While no significant impacts on historic structures are anticipated, there is a potential for undiscovered subsurface cultural resources at these sites. The second harbor project's designers and contractors should therefore minimize any potential indirect impacts to

the archaeological and cultural resources. Should human remains, prehistoric or historic artifacts, or cultural features (such as trash pits, post holes, or hearths) be encountered in the course of excavation during construction, the contractor(s) shall halt work in the area and contact the SHPD Maui Office in accordance with Section 6e of Chapter 343, Hawaii Revised Statutes. If deemed necessary, a qualified archaeological monitor shall be present at all ground-altering activities. For these projects, a monitoring plan shall be prepared prior to the commencement of construction and a monitoring report submitted to the SHPD at the end of the monitoring period.

Given the second commercial harbor sites' shoreline locations, the impacts on cultural activities (fishing, gathering, surfing, canoe paddling, etc.) could be significant.

West Breakwater Terminal Alternative

As the West Breakwater Terminal Alternative would involve either work in the water (breakwater construction and dredging) or development of the dredged coral stockpile, no impacts on historical, architectural or archaeological resources are anticipated. The proposed breakwater structures, however, would alter the wave energies that enter the harbor and that are responsible for the coveted winter surf conditions. The proposed dredging would severely impact the reef shelf, affecting other cultural (fishing, gathering and diving) activities.

No-Action Alternative

The No-Action Alternative is not expected to produce any impacts on historic, architectural, archaeological or cultural resources.

4.10 BIOTIC COMMUNITIES

4.10.1 EXISTING CONDITIONS

4.10.1.1 FLORA

The area surrounding Kahului Commercial Harbor is already developed and predominantly on filled land. The existing flora consists of landscaped plants and weeds. The landscaped plants and weeds are a mix of introduced and native species, such as beach naupaka, Bermuda grass and tree heliotrope. There are no endangered, threatened or species of concern in the area.

4.10.1.2 FAUNA

As the area surrounding Kahului Commercial Harbor is already developed, the existing fauna is expected to be that found in other similar commercial/industrial areas. There are no endangered, threatened species or species of concern in the area. There have been observations of waterfowl in the drainage way to the west of Pier 2. These sightings were intermittent, and the area is not used as a nesting site by these water birds.

4.10.1.3 MARINE BIOTA

Within Kahului Commercial Harbor, the crab, *Macrophthalmus telescopicus*, is the most conspicuous inhabitant of the silty-sand bottom nearshore between Piers 1 and 2 in the eastern portion of the Harbor. Less common are solitary tunicates and a few small solitary heads of the coral, *Montipora* sp., in poor condition. *Mugil cephalus* (striped mullet), *Selar crumenophthalmus* (big-eyed scad), *Decapterus macarellus* (mackerel scad), *Acanthurus triostegus* (convict tang), *Etrumeus micropus* (herring), *Kuhlia sandvicensis* (Hawaiian flagtail), *Caranx ignobilis* (giant trevally), and *Chanos chanos* (milkfish) are reportedly common within the harbor. A detailed description is presented in Appendix C.

4.10.1.4 NONINDIGENOUS INVASIVE SPECIES (NIS)

4.10.1.4.1 EXISTING CONDITIONS

Nonindigenous species refer to terrestrial and aquatic plants, animals, and microorganisms transported or established outside of their natural range due to the activities of humans, whether done so intentionally or not. An "invasive species" is defined as a species that is: 1) nonindigenous to the ecosystem under consideration, and 2) whose introduction causes or is likely to cause economic or environmental harm, and/or harm to human health (NISC, 2001).

Oceanic islands throughout the world are especially vulnerable to biological invasions. Island ecosystems experience long periods of evolution in isolation from environmental forces faced routinely by plants and animals on continents. Hawaii is the most isolated group of islands in the world, and possesses one of the most highly endemic, fragile, and endangered biotas on earth, containing approximately 40% of the T&E species in the United States (Cox, 1999). Because of its fragile ecosystem introduction of NIS into Hawaii is a paramount environmental concern.

Hawaii's harbors, like other port facilities, have the potential to introduce NIS into the State's environment. There are six primary mechanisms of potential NIS introduction into marine environments. For marine nonnative introductions, the mechanism that is focused on to the greatest extent both in Hawaii and elsewhere, is the international and domestic shipping industry. In the past, research activities and stocking programs were also key mechanisms for marine introductions into Hawaii. Examples of additional potential mechanisms for introduction and transport include fisheries activities, aquaculture, and the water garden and aquarium industries (DLNR, 2003).

Table 8 summarizes potential pathways of NIS introduction and post-introduction dispersal in marine environments.

Table 8
NIS Introduction and Dispersal Pathways
in Marine Environments

Mechanism	Introduction Pathways	Dispersal Pathways
Large Commercial Shipping and Passenger Vessels (cargo vessels, fishing boats towed platforms, cruise ships and ferries)	A) Ballast water and sediments -Planktonic organisms and larvae -Adult organisms B) Vessel hulls, seachests and pipe systems -Fouling organisms - algae, adult fish and invertebrates and larvae released by adult organisms C) Live holding and bait wells -Release of baitfish/invertebrates -Release of sediments -Release of symbiots and pathogens D) Fisheries gear and debris -Fouling organisms on nets and floats	A) Ballast water and sediments -Planktonic organisms -Adult organisms B) Vessel hulls, seachests and pipe systems - Fouling organisms - Release of larvae C) Fishing gear and debris -Fouling and sediments on nets and floats
Recreational Boating	A) Hull fouling and bio fouling on structures besides the hull (e.g., outboard motors) - see above with commercial shipping B) Other factors-livewells, waterlines	A) Hull fouling and bio fouling on structures besides the hull (e.g., outboard motors) B) Other factors -livewells, waterlines
Aquaculture, Aquarium, Water Garden and Other Industries, from Producer to Consumer	A) Accidental release of target organisms from culture/grow-out facilities B) Accidental release of non-target organisms -Epiphytic organisms -Pathogens C) Unauthorized, intentional release of organisms (largely a result of consumers or hobbyists)	A) Inter-island transport of stock B) Unauthorized, intentional release of organisms (largely a result of consumers or hobbyists) C) Unintentional escape
Government Programs and Research	A) Authorized release -Bio-control -Stocking programs B) Un-authorized or unintentional release -Accidental release of experimental target organisms -Release of associated pathogens and symbiots	A) Authorized release of target species -Stocking programs -Bio-control B) Inadvertent release through inter-island transport -Including research activities
Private Sector	A) Live seafood shipments B) Aquarium release C) Release for cultural practices D) Illegal and/or accidental imports -Foreign Cargo, Domestic Cargo -Foreign Passengers, Domestic Passengers -Mail -Private Aircraft and Vessels	A) Live seafood shipments B) Interisland transport of aquarium pets C) Recreational boating (also referred to in recreational Boating above) D) Diving and snorkeling activities
Marine Debris	A) Fouling organisms on abandoned nets and floats	A) Fouling organisms on abandoned nets and floats
Natural Dispersal	Not Applicable	A) Natural Dispersal (passive and active) -once established, many AIS can disperse naturally without the assistance of human activities

Source: DLNR, 2003

Of the mechanisms described above, introduction of NIS as a result of operations associated with Kahului Commercial Harbor occurs via the following pathways:

- Presence in transported cargo shipments
- Release during ballast water discharge from ships
- Attachment to the bottom of ships' hulls (i.e. "hull-growth")

The potential of each of these pathways as they relate to Kahului Commercial Harbor operations is briefly discussed below.

Cargo Operations - Overseas and international containerized cargo is offloaded and inspected at Honolulu Harbor. It is subsequently loaded onto inter-island barges for transport to Kahului Commercial Harbor. Thus, cargo entering and being offloaded at Kahului Commercial Harbor has already been inspected and would be less likely to be carrying stowaway alien species.

Ballast Water Discharge - Ballast water is necessary to increase a ship's manageability and safety and for maximum sailing efficiency and stability. A ship carrying little or no cargo rides high in the water, having less draft than a loaded ship. Ballast water intake allows a ship to ride lower in the water, thus increasing stability and making the vessel less vulnerable to waves and winds, less vulnerable to the bow being slammed when riding over high waves, and less potential for the propeller to raise out of the water. Ballast water is also loaded or discharged to adjust a ship's trim, improve maneuverability, increase propulsion efficiency, reduce hull stress, raise the ship to pass over shallow areas (reduce draft), and lower the ship to get under bridges or cranes (lower air draft).

Ballast water enters a ship through intakes located below the waterline. Depending on the level of the tank relative to the water surface, water may be taken in or discharged either by pumping or by gravitational flow. Ballast water is generally carried in several different compartments on board ships, often in tanks dedicated to that purpose (referred to as "segregated ballast water"). Some tankers carry ballast water in their cargo holds which is referred to as "nonsegregated ballast water," since it is mixed with the contaminants or remnants of the material that was last in that cargo hold.

Ballast capacity can range from several cubic meters in small fishing boats to hundreds of thousands of cubic meters in large cargo carriers. Large tankers can carry an excess of 200,000 m^3 of ballast water and have ballasting discharge rates as high as 15,000 to 20,000 m^3/hour (NRC, 1996). Discharged ballast water often contains marine organisms and sediment that has accumulated in ballast tanks.

Ballast sediment occurs when water containing large amounts of particulate matter (plankton, organic and inorganic detritus) mixed in the water column is pumped into the ballast tanks. These particulates enter the ballast tanks and over time settle to the bottom of the tanks. Ballast sediment is difficult to dispose of Disposal may be done in mid-ocean, but normally is done only when the vessel is in port or dry dock. Sediment in the ballast tanks gets stirred up every time the tanks are refilled and the organisms in the sediment get re-suspended and may be discharged when ballast tanks are emptied.

Hull-Growth - Hull growth or fouling is the attachment of organisms to the hull of ships, barges, floating dry docks, and other floating or submerged surfaces. Organisms found growing on the hulls of ships include microscopic invertebrates, barnacles, algae, mollusks and crustaceans. Hull-growth tends to occur when ships stay at anchor or in harbors for extended periods of time, giving organisms a chance to establish themselves. Alien species may need little time to transfer from host vessels to other vessels and spread to other harbors. However, the amount of time needed for transfer of organisms is a point of conjecture, even among the experts on this subject.

In Hawaii, examples of nonnative species that are considered to have arrived in Hawaii as a result of hull fouling include *Acanthopora spicifera,* which arrived on the hull of a barge from Guam in 1950, and the introduced barnacle *Chthamalus proteus,* which is now present on all of the main islands, except Kahoolawe, which does not receive commercial traffic (DLNR, 2003).

Hull fouling organisms increase drag, resulting in slower speeds and higher fuel consumption. Therefore, it is in the best interest of vessels to keep bio-fouling such as hull-growth to a minimum, as it creates friction which increases fuel cost. Hull-growth on cruise ships is discouraged because the cost of building and maintaining cruise ships prompts owners to keep them in service as much as possible. Also, the expectation of cruise passengers to move frequently from port to port decreases the amount of time in any one harbor where hull-growth might have a chance to occur.

At the present time, the total number of nonnative aquatic species in Hawaii is not known. However, it is clear that the number is large: there are over 343 documented introduced or cryptogenic marine and brackish water species over 50 established introduced inland water species (many more of which were introduced, but are not known to be established), and an additional approximate 300+ introduced aquatic “insects". Additional work is needed to more formally and objectively assess the presence, distribution, life history traits, status, and threat of many of these nonnative aquatic species in Hawaii before all suspected aquatic invasive species can be identified (DLNR, 2003).

While the number of nonnative aquatic species in Hawaii is still being assessed, groups of potential NIS organisms have been identified which can directly impact marine environments. These groups of organisms pose a direct threat to waters of Kahului Commercial Harbor and are briefly discussed below.

Marine Algae - At least 19 species of macroalgae have been intentionally or passively introduced into Hawaii since the mid-1950s. At least five have successfully established and dispersed around the Hawaiian Islands, and are now ecologically dominant in some locations, where they appear to be outcompeting native benthic species These five species are: *Acanthophora spicifera, Gracilaria salicornia, Hypnea musciformis, Eucheuma denticulatum,* and *Kappaphycus* spp. (DLNR, 2003; Smith et al. 2002)

Each of these five algal species has become the dominant component of a number of reef environments, with three of the species, *Gracilaria salicornia, Hypnea musciformis,* and *Kappaphycus* spp., forming extensive, destructive blooms. *G. salicornia* and *Kappaphycus spp*. in particular have been observed in recent surveys to be invading

coral habitat and overgrowing reef building corals in Kane'ohe Bay, the south shore of Oahu including the world famous Waikiki area, and the south shore of Molokai, which harbors some of Hawaii's most intact and expansive coral reef ecosystems. The species *Hypnea musciformis* and *Acanthophora spicifera* have been found in the waters of Kahului Commercial Harbor (University of Hawaii, 2004; DLNR, 2003).

Marine Fish – Thirty-four species of marine fishes have been introduced into Hawaiian waters, and at least twenty of these introduced species have become established. Of those that have become established, thirteen species have been authorized, planned releases and at least seven species were accidental introductions. Potentially, many more cases exist but have gone undocumented in Hawaii (DLNR, 2003; Englund and Eldredge 2001). Between 1955 and 1961, the State of Hawaii introduced eleven species of shallow water snappers and groupers to Oahu and the island of Hawaii as potential food fish. Of these eleven species, three are known to be established in the nearshore reef fisheries of Hawaii: *Lu janus kasmira* (blueline snapper or ta'ape), *Cephalopholis argus* (peacock grouper or roi), and *Lutjanus fulvus* (to'au) (Oda and Parrish 1981).

Marine Invertebrates – Through the Hawaii Biological Survey at the Bishop Museum, 201 marine and brackish water invertebrate species have been identified as introduced to Hawaii, and 86 cryptogenic (not demonstratively native or introduced). In total, this makes up about 7% of the known marine and brackish water invertebrate fauna in the Hawaiian Islands. Of the 287 introduced and cryptogenic species, 248 (87%) have become established, 15 (5%) arrived but failed to become established, 6 (2%) were intercepted, and the population status of 18 species (6%) is unknown (DLNR, 2003).

It has not been determined if the greater number of marine invertebrates have arrived in Hawaii through hull fouling, or through ballast water and sediment. A number of purposeful introductions of commercially important shellfish are also well documented for Hawai'i, including mangrove crab *(Scylla serrata)* from Samoa; oysters *(Crassostrea* spp.) from San Francisco; and littleneck clams *(Tapes japonicum)* from Japan. Ecological impacts are largely unknown for these introductions, but *Crassostrea spp*. is very dominant in Pearl Harbor West Loch and *S. serrata* is common in brackish systems, including mangroves and fishponds, and is a generalist feeder." (Coles et al.1997, 1999a,b).

The majority of the nonnative marine invertebrates in the main Hawaiian Islands have been recorded within harbors, yacht basins, and embayments, and are likely present within Kahului Commercial Harbor. Few nonnative marine invertebrates have been recorded from reef areas outside these habitats, but this may be an artifact of the sampling effort that has focused on these altered habitats. The makeup of the nonnative and cryptogenic marine invertebrate fauna in harbors and yacht basins throughout the main Hawaiian Islands has shown to be quite consistent, and represents roughly 20% of the fauna identified from the surveys (Ibid).

4.10.1.4.2 POTENTIAL IMPACTS

Cargo Operations

The threat of alien species introduction through cargo through Kahului Commercial Harbor exists. However, as previously discussed, this threat is reduced because nearly all of the overseas cargo destined for Hawaii are received and inspected at Honolulu Harbor. Subsequently, cargo is transferred to inter-island vessels rather than foreign vessels and transported to harbors on the Island of Maui and other neighbor islands.

Ballast Water Discharge

As discussed in the previous section, ships' ballast water functions to increase the vessel's manageability and safety and to control its draft, trim (for maximum sailing efficiency), and stability. Ballast water is taken in and discharged by vessels at varying rates and volumes depending on external (weather and sea conditions) and internal (cargo type, vessel design, and load quantity) conditions under which a vessel is sailing. Ships exchanging water from other areas may introduce NIS that can invade and potentially adversely impact marine ecosystems.

The potential diversity of marine biota that can be transported in ballast water is vast. The maximum size range of organisms capable of being taken into a ship depends upon the method of ballasting and the size of the intake screens. Virtually all organisms less than 1 cm in size that are adjacent to the vessel – either swimming naturally, stirred up from bottom sediments, or rubbed off harbor pilings – could be ballasted into the vessel. Such organisms include viruses, bacteria, protozoa, fungi, algae, plants, zooplankton, and fish.

A recent study of marine nonindigenous (i.e., introduced) species in Hawaii concluded the following: "Hawaii is a net importer of bulk cargo and manufactured goods, and therefore receives less ballast water than regions that are net exporters of these items" (Godwin and Eldredge, 2001). The reason for this is because ballast water is taken on in the loading rather than unloading phase of port operations. Cargo vessels entering Kahului Commercial Harbor would be arriving with full loads and would not be carrying ballast water for discharge in or near the harbor. Conversely, cargo vessels would be taking in seawater from the Kahului Bay area in preparation for their exit voyages with a much lighter empty vessel.

Hull-Growth

Hull fouling may be the most underestimated pathway for nonnative introductions. Fouling organisms are divided into two categories: micro- and macro-sessile. Micro-sessile organisms include diatoms, algae, and bacteria. Macro-sessile organisms include mollusks, sea squirts, sponges, sea anemones, bryozoans, tubeworms, polychaetes, and barnacles. Both these categories of organisms can live on the hulls, and distribute propagules to wherever the vessel goes. The loosening and release of hull-growth into receiving waters can occur from natural ocean currents, draft of the vessel, or from rubbing against harbor pilings. Additionally, if a vessel that is fouled with nonnative species runs aground, then it is likely that many of these species will be distributed at the grounding site.

Relative to ballast water discharge, hull-growth is not considered to be as large of a potential threat of NIS introduction because the amount of organisms present in hull-growth is not as numerous, and as discussed in the previous section, most vessels adhere to regularly scheduled hull cleaning activities as a part of their preventive maintenance program.

Furthermore, a recent study notes that "the ports of Honolulu and Barbers Point Harbor are the hubs of commercial maritime shipping activity in Hawaii, and would be the primary receiving areas for marine NIS transported in this pathway" (Godwin and Eldredge, 2001). Neighbor island ports such as Kahului Commercial Harbor are not subject to the same level of threat as that experienced by Honolulu and Kalaeloa Barbers Point Harbors, which are the primary harbor gateways for the State.

4.10.2 PROPOSED MITIGATION MEASURES

The release of NIS, whether from ballast water discharge or hull-growth, into a new coastal environment does not necessarily constitute their successful introduction. An alien species must have the ability to form established populations to complete a successful introduction. Limiting the volumes of ballast water discharge into coastal waters, and in turn the number of potential NIS, would reduce the chances of the successful establishment of reproducing populations in the receiving waters.

Cargo Operations

The U.S. Department of Agriculture (USDA) will continue to inspect agricultural products coming in on vessels, including items passengers may have on board. As needed, they will confiscate illegal agricultural items that could contain alien species. When a foreign cruise ship comes in, the USDA will continue to inspect the ship's stores (food), including agricultural products in the kitchen. If prohibited items are found, they will be sealed in refrigerators.

Ballast Water Discharge and Hull Growth

Regulatory Measures

Until recently, there had been no enforceable laws at either the federal or state level regulating ballast water management (BWM). However, on November 1, 2004 the United States Coast Guard’s (USCG) newly developed Mandatory Ballast Water Management (MBWM) Program took effect.

This final ruling revises 33 CFR Part 151 to implement the requirements of the National Invasive Species Act (NISA). Specifically, subpart D of 33 CFR part 151 has been revised to require a MBWM program for all vessels equipped with ballast water tanks entering U.S. waters.

The MBWM program requires all vessels equipped with ballast water tanks entering U.S. waters after operating beyond the Exclusive Economic Zone (the area encompassing waters extending up to 200 miles from the shoreline a.k.a., the EEZ) to employ at least one of the following ballast water management practices:

- Prior to discharging ballast water in U.S. waters, perform complete ballast water exchange in an area no less than 2,000 nautical miles from any shore.
- Retain ballast water onboard the vessel.
- Prior to the vessel entering U.S. waters, use an alternative environmentally sound method of ballast water management that has been approved by the USCG.

Although the national mandatory BWM program provides vessels with the option of using one of three BWM practices, ballast water exchange is likely to be the most used practice. This is because:

- Some vessels engaged in trade are unlikely to hold their ballast after arriving here from outside the EEZ, as this would mean they would not be able to load their cargo;
- Alternative environmentally sound methods of ballast water management are still being developed, and would likely be of limited availability in the near future.

Therefore, under this rule, the BWM practice of conducting mid-ocean ballast water exchange prior to discharging ballast in U.S. waters would be the practice most used by the majority of vessels.

Mid-ocean ballast water exchange is currently the most practicable method to help prevent the introductions of NIS into U.S. waters. Water in the open ocean contains certain physical, chemical, and biological properties, and organisms that are in ballast water that is exchanged in mid-ocean will not, or are unlikely to survive in an open ocean system. Likewise organisms that are contained in ballast water after a mid-ocean exchange is conducted will not, or are unlikely to survive if introduced into a freshwater or coastal system.

Under the new MBWM program regulations (33 CFR part 151 subpart D), subject vessels will be required to develop and maintain a BWM plan. The BWM plan shall be specific to each vessel and shall fulfill two purposes: (1) Show that there is a BWM strategy for the vessel; and (2) allow any master, or other ship's officer as appropriate, serving on that vessel to understand and follow the BWM strategy for the vessel.

The USCG currently recognizes two feasible methods of conducting ballast water exchange:

1. <u>An empty/refill exchange</u>. The tank (or pair of tanks) is pumped down to the point where the pumps lose suction, and then the tank is pumped back up to the original level, and;
2. <u>A flow-through exchange</u>. Mid-ocean water is pumped into a full tank while the existing coastal or fresh water is pumped or pushed out through another opening. As defined by the Coast Guard, a volume of water equal to three times the ballast tank capacity must be pumped for a flow-through exchange.

Failure to employ at least one of these BWM practices outlined above will result in monetary penalties, unless the vessel is exempt due to safety or voyage

At the present time, efforts by the State of Hawaii to address potential ballast water and hull-fouling NIS introductions are in their early stages. DLNR's Division of Aquatic Resources (DAR) is the designated lead agency for carrying out the prevention and elimination of introduced alien aquatic organisms. DAR recently published the *Aquatic Invasive Species* (AIS) *Management Plan*, which outlines several measures and approaches to move forward efforts in controlling NIS introductions. As part of their management efforts, DNLR-DAR is in the process of developing a MBWM Program for the State of Hawaii to compliment the federal USCG program. The background and status of the State MBWM Program is briefly summarized below:

In 1997, the Alien Aquatic Organism Task Force (AAOTF) was established to address ballast water and hull fouling issues in Hawaii. In December of 1997, the AAOTF submitted a report of its findings and recommendations in the "Report to the Nineteenth Legislature Regular Session of 1998 on Findings of the Alien Aquatic Organism Task Force". AAOTF recommendations included:

- Development of inspection protocols for the U.S. Coast Guard to use when inspecting ballast tanks and hulls.
- Adoption of voluntary ballast water exchange guidelines developed by the International Maritime Organization (IMO).
- Continuation of ongoing studies related to the impacts of nonnative aquatic organisms in Hawaiian waters.
- Inclusion of ballast water and hull fouling issues in DLNR and HDOA education and information programs

In 2001, the Hawaii Coastal Zone Management Program (CZM) awarded DLNR-DAR a contract for their proposal, "Ballast Water and Hull Fouling Alien Aquatic Organism Prevention Program." Under this contract, the AAOTF was re-established, and a temporary coordinator position was created to address ballast water, ballast sediment, and hull fouling issues.

The DLNR-DAR working with the AAOTF, is proposing a comprehensive mandatory ballast water and hull fouling management program for all vessels entering State marine waters. The first component of the management program includes procedures for ballast water exchange, including ballast water discharge, ballast water reporting, and ballast sediment disposal. These aspects are detailed in administrative rules, which have recently been drafted. However, at the present time, additional funding is needed to further develop, implement, and enforce these administrative rules. The second component of the program (hull fouling) still needs to be developed.

The development and implementation of a systematic approach for the prevention of marine species introductions through hull fouling poses complex challenges. The process to develop this component is in its infancy, and much effort will be required to develop this management component and corresponding administrative rules. In this initial stage, the approach would be to target vessels or floating platforms that are not part of the regular vessel arrival pattern. The guidelines for identifying these unique arrivals are being developed at this time through the

AAOTF (DLNR, 2003).

Additionally, as previously discussed, most vessels adhere to regularly scheduled hull cleaning activities as a part of their preventive maintenance program. The State of Hawaii does not currently have a formal program for inspecting hull-growth. During prior consultation with Harbors Division, and DLNR-DAR, it was suggested that the State could consider implementing a program in which either random hull inspections are performed or regular inspections are made at the time a ship enters the harbor.

Regulatory Oversight of NIS in Hawaii

In addition to the measures discussed above, control of NIS introduction into Hawaii would continue to be addressed by existing and future cooperative interagency efforts. For example, Harbors Division and the DOT are participating in committees like the Coordinating Group on Alien Pest Species (CGAPS), and task forces to monitor and resolve the potential introduction of alien pest species. The Harbors Division is committed to cooperating with other regulatory agencies that have jurisdiction and authority on the prevention and control of NIS introductions into Hawaii. Table 9 provides an overview of governmental agencies with responsibilities for control of potential NIS introductions.

Table 9
Regulatory Oversight of NIS Control and Introduction in Hawaii

Agency	Overview of Responsibility
United States Department of Agriculture	Inspection and clearance of agricultural items (plant material and pests) on foreign arriving vessels. Refers some plant pest dispositions to Hawaii Department of Agriculture.
United States Department of the Treasury U.S. Customs Service	Boarding and clearance of foreign arriving vessels, passengers, crew and cargo. Refers plant materials to U.S. Department of Agriculture or State of Hawaii Department of Agriculture and refers animals or animal parts to U.S. Fish and Wildlife Service.
United States Coast Guard*	Jurisdiction over all maritime vessels (commercial, private, foreign, U.S. flag ships). Oversees hazardous materials in transit and assists or refers contraband to other federal or state agencies for disposition.
United States Department of the Interior Fish and Wildlife Service	Inspection and clearance of wildlife (animals and parts) including alien species and protected, threatened or endangered species on foreign arriving vessels.

State of Hawaii Department of Agriculture	Inspection and clearance of agricultural items (animals, microorganisms, plants and plant parts) on domestic arriving vessels. May take appropriate action on foreign arriving items upon referral by federal agency.
State of Hawaii Department of Land and Natural Resources	Jurisdiction over the unintentional introduction of non-native aquatic species in ballast water and hull-fouling organisms (hull-growth) on all arriving vessels.

***Note:** As of March 1, 2003, the U.S. Coast Guard (USCG) became a component of the Department of Homeland Security. As a result the Secretary of Department of Homeland Security assumed all duties once bestowed on the Secretary of Transportation with respect to security measures at U.S. commercial ports.

Technological Measures

Once ballast water has been loaded on board, the ideal mechanism for preventing subsequent introductions of nonindigenous aquatic species is to kill or remove the organisms prior to discharging ballast water overboard. This could be achieved by utilizing onboard chemical, physical, biological, or mechanical treatment technologies. There are numerous promising treatment technologies emerging, a few of which are listed below (IMO, 1996):

- Filtration Systems
- Oxidizing and nonoxidizing biocides
- Thermal techniques
- Electric pulse and pulse plasma techniques
- Ultra violet treatment
- Acoustic systems
- Magnetic Fields
- Deoxygenation
- Biological techniques

Each of the above technologies, whether utilized individually or in combination, would achieve the goal of neutralizing potentially harmful alien species in an environmentally safe manner before they are discharged into receiving waters.

The calls of large overseas vessels, barges and passenger vessels in Kahului Commercial Harbor have the potential to introduce alien pest species through cargo, passengers, ballast water and onboard ships. Some of these alien species may become invasive and harmful to the State. In fact, the State of Hawaii, including Maui County, receives approximately 79 percent of all goods and commodities used in Hawaii through its commercial harbors. Harmful alien pest species include organisms, plants, predators and insects which can: damage native forests, streams and watersheds; compete with and cause the extinction of native flora and fauna; carry diseases that may affect native species, agricultural crops and humans; and interrupt the shipment of local produce (Reference 5). Currently, the prevention of the introduction of alien species to Maui is under the jurisdiction of the: State of Hawaii, Department of Agriculture (HDOA); Hawaii Department of Land and Natural Resources, Division of Aquatic Resources (DLNR-DAR), U.S. Department of Homeland Security (formerly U.S. Customs and U.S. Department of Agriculture); and the State of Hawaii, Department of Health. These agencies monitor, inspect, quarantine and certify cargo from foreign ports and inter-state / intra-state cargo. In addition, the DOT Harbors

Division is participating in the Coordinating Group on Alien Pest Species (CGAPS), and other task forces to monitor and resolve the potential introduction of alien pest species. The Harbors Division will continue to work with these agencies that have jurisdiction and authority on the prevention and control of alien pest species within the commercial harbors.

4.10.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the proposed acquisition of two A&B parcels by the Harbors Division. As there are no endangered or threatened species or species of concern within these parcels, there will be no impact on any listed terrestrial flora or fauna by the proposed acquisition.

Second Harbor Alternative

The sites for Maui's second harbor are largely undisturbed areas of the island's coast. Construction activities associated with commercial harbor development include breakwater construction, dredging of entrance channels, turning basins and berths, construction of piers, wharves, aprons, cargo yards, passenger terminals and roadways. Such construction is expected to produce significant impacts on both terrestrial and marine biota. The seas off of Maui's southern coast are a critical part of the humpback whale's environment and are thus part of the designated Hawaiian Islands Humpback Whale National Marine Sanctuary. Commercial harbor activity in this area may produce significant impacts on Hawaii's humpback whale population.

The Second Commercial Harbor Alternative is envisioned as establishing another commercial harbor at a site that would be separate and possibly quite distant from the existing Kahului Commercial Harbor. Such a distant, separate facility would further exacerbate State and federal governments' limited abilities to monitor and control the spread of invasive species. Additional manpower, equipment and inspection stations would be required for the fulfillment of the mission.

West Breakwater Terminal Alternative

The site for the West Breakwater Terminal is composed of dredged coral spoils from previous harbor dredging efforts. The coral stockpile is not a habitat of any endangered terrestrial flora or fauna. The West Breakwater Terminal, however, would also require extensive breakwater construction, extensive dredging for turning basin expansion as well as dredging for the new terminal's berth. These activities are anticipated to produce significant impacts on marine biota and benthic communities.

No-Action Alternative

The No-Action Alternative is not anticipated to produce any impacts on terrestrial flora or fauna, nor any impacts on marine biota.

4.11 WETLANDS

4.11.1 EXISTING CONDITIONS

The U.S. Army Corps of Engineers has delineated a portion of a nearby, unlined drainage way as a wetland. The delineated wetland is situated to the northwest of the two A&B parcels. The wetland runs through the beach area next to Kahului Commercial Harbor's Pier 2, and is connected and fed by the County's lined drainage channel, which parallels Puunene Avenue. The County of Maui's concrete-lined drainage canal collects water from upland areas and channels the water to the wetland and Kahului Bay. Char & Associates completed its *Botanical Resources Assessment Study* in January 1997. This Assessment does not list any endangered or threatened species in this area. Furthermore, the United States Department of Interior, in correspondence dated October 18, 1996, states that to the best of their knowledge, no endangered or threatened species are within the area. Recent field visits also confirm the absence of endangered or threatened bird species, as neither was encountered during these site inspections.

The County of Maui is considering relocating the drainage canal to a location outside of Kahului Commercial Harbor. The Harbors Division would appreciate the relocation of the drainage canal as the relocation is envisioned as resulting in a gain of terminal acreage for maritime operations.

4.11.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the Harbors Division's acquisition of the two A&B parcels. This alternative will not produce any wetland impacts.

Second Harbor Alternative

The sites considered for development of Maui's second harbor do not contain any designated wetland areas. No wetland impacts are thus expected to result from the construction and operation of a second commercial harbor.

West Breakwater Terminal Alternative

The West Breakwater Terminal would be separated from the current bounds of Kahului Commercial Harbor and the existing wetland area near Pier 2. The West Breakwater Terminal would be constructed on the dredged coral stockpile adjacent to the west breakwater. There are no wetlands at this site. No wetland impacts are anticipated as a result of the pursuit of this alternative.

No-Action Alternative

The No-Action Alternative is not expected to impact the existing wetland area.

4.12 FLOOD PLAINS

4.12.1 EXISTING CONDITIONS

The two A&B parcels are located in the V23 flood zone as delineated in the Flood Insurance Rate Map. The V23 zoning indicates flooding due to wave action (tsunami). Base flood elevations range from 10 feet to 18 feet. All of Kahului Commercial Harbor is similarly located in Zone V23.

4.12.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. The proposed purchase of this property will not produce any impacts on the floodplains in the harbor area. The Harbors Division will comply with all applicable National Flood Insurance Program regulations.

Second Harbor Alternative

All proposed sites for Maui's second commercial harbor lie on the island's coastline. Second harbor construction projects are thus expected to impact the existing floodplains at these sites. The Harbors Division must take all necessary precautions to mitigate these floodplain impacts during the project's design and construction phases.

West Breakwater Terminal Alternative

Although the proposed site for the West Breakwater Terminal is the dredged coral stockpile, which is in the northwest quadrant of the harbor, inside of the breakwater, the Harbors Division must similarly take all necessary precautions to mitigate any floodplain impacts during this alternative's design and construction phases.

No-Action Alternative

The No-Action Alternative will not produce any floodplain impacts.

4.13 ENERGY SUPPLY

4.13.1 EXISTING CONDITIONS

The Maui Electric Company (MECO) supplies electrical energy to the two A&B parcels through overhead lines on Kaahumanu Avenue and Wharf Street. Electrical power is supplied from both the Kahului Substation No. 8 and the Kanaha Substation No. 2.

4.13.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. **Full redevelopment of the two parcels will be scheduled once the Harbors Division completes the property acquisition, the *Kahului Commercial Harbor 2030 Master Plan*, and the HRS 343 environmental analysis for the master plan. The Preferred Alternative is not anticipated to produce any impacts on existing energy supplies. Any interim measures implemented will consist of minor projects with little or no probability of impacts on existing energy supplies.**

Second Harbor Alternative

The proposed sites for the Second Harbor Alternative are largely undisturbed locations of the island's coastline. The design and construction phases of any second commercial harbor project must therefore address the additional energy requirements for the new maritime facility. The new commercial harbor may result in a doubling of the electrical energy requirements that exist with Kahului Commercial Harbor's current operations. An increase in the short-term use of petroleum products and energy consumption is further associated with the construction phase of this alternative.

West Breakwater Terminal Alternative

As with the Second Harbor Alternative, the West Breakwater Terminal Alternative may result in a doubling of Kahului Commercial Harbor's current energy requirements, as the new terminal will replicate the existing operating conditions of Maui's sole commercial harbor. Similarly, the West Breakwater Terminal Alternative will produce an increase in the short-term use of petroleum products and energy consumption during the project's construction phase.

No-Action Alternative

The No-Action Alternative is not anticipated to produce any significant impacts on the island's electrical demand. The Harbors Division predicts continued growth in sea-going vessel traffic, cargo volumes and passenger counts. This growth is an effect of Maui's forecast economic and population growth, and will occur regardless of any expansion of commercial harbor facilities.

4.14 LIGHT EMISSIONS

4.14.1 EXISTING CONDITIONS

The two A&B parcels house three structures. These structures are utilized by a number of retail, office and storage operations. The nature of these businesses is such that no more than the normal light emissions are generated. The two parcels are located in an urbanized area, and a high level of ambient light is expected in such an area. There are significantly more light emissions from the adjacent commercial harbor cargo and passenger terminals, which, due to occasional 24-hour operational requirements, are well illuminated to ensure safe evening working conditions and adequate security during any non-working night hours. Terminal lighting is shielded and directed toward to the ground so as not attract shearwaters and other

night-flying birds. Lower intensity lighting is used for security purposes as well as for navigational aids.

4.14.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. **Full redevelopment of the two parcels will be scheduled once the Harbors Division completes the acquisition, completes the *Kahului Commercial Harbor 2030 Master Plan* with the two parcels included in the recommendations, and completes the HRS 343 environmental analysis for the 2030 master plan. To provide expansion of the space needed by the inter-island cargo carrier for its full range of existing cargo services and permit the continuance of LCL cargo operations, the Harbors Division may implement minor, Chapter 343 exempt projects in the interim. The Preferred Alternative is not expected to produce any additional light emissions or any significant impacts on night-flying birds.**

Second Harbor Alternative

Any second commercial harbor development must account for safe night working conditions, adequate security lighting levels and proper illumination of navigational aids. The operational and security lights will likely be mounted on poles to provide the requisite visibility. Mitigating measures must be incorporated into the design and construction phases of the lighting projects for any second harbor development. These mitigation measures are critical, as any second commercial harbor development will occur on Maui's coastline, where the potential for attracting seabirds is significantly higher. *The Newell's Shearwater Light Attraction Problem* guidelines apply. Measures to minimize any spillover effects of the lighting system include shielding and proper direction. These measures reduce the impacts of harbor lights on adjacent areas. The lighting system must comply with all applicable lighting codes and standards.

West Breakwater Terminal Alternative

The West Breakwater Terminal Alternative must similarly account for safe night working conditions, adequate security lighting levels and proper illumination of navigational aids. The operational and security lights will likely be mounted on poles to provide the requisite visibility. Mitigating measures must be incorporated into the design and construction phases of the lighting projects for any second harbor development. These mitigation measures are critical, as the west breakwater terminal development will occur on the outer reaches of Kahului Bay, where the potential for attracting seabirds is significantly higher. It is recommended that the designers follow the guidelines contained in DLNR's publication, *The Newell's Shearwater Light Attraction Problem*. Measures to minimize any spillover effects of the lighting system include shielding and proper direction. These measures reduce the impacts of harbor lights on adjacent areas. The lighting system must comply with all applicable lighting codes and standards.

No-Action Alternative

No new lighting will be provided and existing light emission levels will remain unchanged.

4.15 WATER SUPPLY

4.15.1 EXISTING CONDITIONS

The County of Maui Department of Water Supply (DWS) administers and operates the water systems on Maui. The Central Water System (CWS), one of five island systems, serves the urban and rural areas of Wailuku-Kahului, Kihei-Makena and the smaller portions of Paia. The CWS draws water from four aquifers: Kahakuloa, Waihee, Waikapu, and Iao. The Iao aquifer supplies the water for the two A&B parcels.

The Iao aquifer has an estimated sustainable yield of 20 mgd. As of July 21, 2003, the state Commission on Water Resource Management (CWRM) designated the Iao aquifer as a Groundwater Management Area. Based on a 12-month moving average from October 2003 to September 2004, the total pumpage was 16.65 mgd (Reference 14).

As noted above, the DWS has estimated that the Iao aquifer has a sustainable yield of 20.1 mgd. DWS has also estimated that the future average demand for all uses will be 30.5 mgd. As the forecast future demand for all uses exceeds the estimated aquifer yield, the County has initiated the development of other water sources in East Maui. The existing water system serving the two A&B parcels is made up of a network of pipelines with diameters ranging between four to eight inches. The system is connected to a 12-inch water main under Kaahumanu Avenue.

4.15.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. **Full redevelopment of the two parcels will be scheduled once the Harbors Division completes the purchase of the properties, the *Kahului Commercial Harbor 2030 Master Plan* with the two parcels included in the recommendations, and the HRS 343 environmental analysis for the 2030 master plan. To provide the requisite space for the inter-island cargo carrier's full range of existing cargo services, including its LCL cargo operations, the Harbors Division may implement minor, Chapter 343 exempt projects in the interim. The Preferred Alternative is not expected to produce any additional demands for water and or any significant impacts on Maui's water supply.**

Second Harbor Alternative

The proposed sites for the Second Harbor Alternative are largely undisturbed locations of the island's coastline. The design and construction phases of any second commercial harbor project must therefore address the additional water requirements for the new maritime facility. The new commercial harbor may result in a doubling of the water requirements that exist with Kahului Commercial Harbor's current operations. To minimize water use in the new commercial harbor, the proposed improvements should be constructed in accordance with sustainable building guidelines. Recommended measures may include the use of water saving devices. An increase in the short-term use of water is further associated with the construction phase of this alternative.

West Breakwater Terminal Alternative

As with the Second Harbor Alternative, the West Breakwater Terminal Alternative may result in a doubling of Kahului Commercial Harbor's current water requirements, as the new terminal will replicate the existing operating conditions of Maui's sole commercial harbor. The West Breakwater Terminal Alternative will similarly produce an increase in short-term water consumption during the project's construction phase.

No-Action Alternative

The water demand will increase in relationship with the forecast passenger demand. The increased water demand, however, is not expected to create any significant impacts on water demand or the supply system.

4.16 SOLID WASTE

4.16.1 EXISTING CONDITIONS

Solid waste from A&B's tenants and operations on its two parcels is collected by a private firm. Garbage and waste materials are transported to the Central Maui Landfill for disposal.

4.16.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative, the acquisition of the two A&B parcels by the Harbors Division **and the implementation of minor, Chapter 343 exempt projects to create space for the inter-island cargo carrier's full range of existing services, including its LCL cargo operations,** will not result in any foreseeable increase in the volume of solid waste generated by the tenants and operations within the two parcels. No solid waste impacts are anticipated to result from the implementation of the Preferred Alternative.

Second Harbor Alternative

As implementation of the Second Harbor Alternative will result in a replication of Kahului Commercial Harbor's operations at a separate, distinct site, this alternative will present the opportunity for a significant increase in the volume of solid waste generated by commercial harbor operations in Maui. Although the composition of the waste is not expected to differ much from the current makeup of waste materials, the additional volume may be of concern.

A short-term increase in waste materials will be generated during the construction of the new commercial harbor. In the design of the proposed improvements, and in accordance with the County of Maui rules, the Contractor will need to submit a plan for construction waste disposal and recycling. Due to the short-term nature of the construction project, the increase in waste materials is not expected to create any significant impacts.

Dredging activities for the second harbor's entrance channel, turning basin and berths will create a large volume of excess material. If the dredged spoils are to be disposed at sea, the disposal

would occur at an Environmental Protection Agency (EPA) designated disposal area. The dredged spoils require testing to insure acceptability of the material prior to ocean disposal. If the dredged spoils do not pass the tests for ocean disposal, the excess material will be transported to an approved landfill site for disposal. Both the dredging and ocean disposal of the spoils require permits issued by the U.S. Army Corps of Engineers. All applicable conditions imposed by the U.S. Army Corps of Engineers will be followed. Proper disposal of the dredged material will ensure that no significant impacts are realized.

Although no demolition projects are anticipated, the contractor(s) will be responsible for proper transport and disposal of any hazardous wastes or asbestos-containing building materials whenever these materials are encountered during demolition activities.

West Breakwater Terminal Alternative

As implementation of the West Breakwater Terminal Alternative will similarly result in a replication of Kahului Commercial Harbor's operations at an alternate site, this alternative will present the opportunity for a significant increase in the volume of solid waste generated by commercial harbor operations in Maui. Although the composition of the waste is not expected to differ much from the current makeup of waste materials, the additional volume may be of concern.

A short-term increase in waste materials will be generated during the construction of the new terminal. In the design of the proposed improvements, and in accordance with the County of Maui rules, the Contractor will need to submit a plan for construction waste disposal and recycling. Due to the short-term nature of the construction project, the increase in waste materials is not expected to create any significant impacts.

Dredging activities for the West Breakwater Terminal's turning basin and berths will create a large volume of excess material. If the dredged spoils are to be disposed at sea, the disposal would occur at an Environmental Protection Agency (EPA) designated disposal area. The dredged spoils require testing to insure acceptability of the material prior to ocean disposal. If the dredged spoils do not pass the tests for ocean disposal, the excess material will be transported to an approved landfill site for disposal. Both the dredging and ocean disposal of the spoils require permits issued by the U.S. Army Corps of Engineers. All applicable conditions imposed by the U.S. Army Corps of Engineers will be followed. Proper disposal of the dredged material will ensure that no significant impacts are realized.

Although no demolition projects are anticipated, the contractor(s) will be responsible for proper transport and disposal of any hazardous wastes or asbestos-containing building materials whenever these materials are encountered during demolition activities.

No-Action Alternative

The No-Action Alternative is not expected to create any significant solid waste impacts. The volume of solid waste generated by commercial harbor operations will increase as will the forecast cargo and passenger counts. The anticipated increase in maritime cargo and passengers is not expected to create significant solid waste impacts.

4.17 WASTEWATER COLLECTION, TREATMENT AND DISPOSAL

4.17.1 EXISTING CONDITIONS

The two A&B parcels are served by the Wailuku-Kahului Wastewater Reclamation Facility (WRF), which is the primary County wastewater treatment facility, located to the east of the Kahului Commercial Harbor. WRF is a secondary, activated-sludge treatment facility that has a design capacity of 7.9 mgd. Effluent is disposed of through eight (8) injection wells located north of the treatment plant. In addition, the plant also has a storage pond available to accommodate peak flows. Because of its location in the tsunami inundation zone and the high maintenance costs resulting from its location near the ocean, the plant is not scheduled to undergo any further expansion at this time.

The major wastewater collector lines are on Wharf Street, Puunene Avenue and along the old Second Street alignment (parallel to Kaahumanu Avenue). The County of Maui has plans to replace the sewer line along the old Second Street alignment with a new force main.

4.17.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. **Full redevelopment of the two parcels will be scheduled once the Harbors Division completes the acquisition, the *Kahului Commercial Harbor 2030 Master Plan* and the 2030 master plan's HRS Chapter 343 environmental analysis. In the interim, the Harbors Division may implement minor, Chapter 343 exempt projects within the parcels to provide additional space for the inter-island cargo carrier's continuance of its full range of existing cargo services that includes its LCL cargo operations.** This alternative is not expected to impact the County of Maui's wastewater collection, treatment and disposal systems.

Second Harbor Alternative

The proposed sites for the Second Harbor Alternative are largely undisturbed locations of the island's coastline. New, nonexistent wastewater infrastructure is necessary for proper functioning of the new harbor. The design and construction phases of any second commercial harbor project must therefore address the additional wastewater requirements for the new maritime facility. The new commercial harbor may result in a doubling of the wastewater requirements that exist with Kahului Commercial Harbor's current operations. To minimize water use and thus wastewater generation in the new commercial harbor, the proposed improvements should be constructed in accordance with sustainable building guidelines. Recommended measures may include the use of water saving devices. An increase in the short-term use of water is further associated with the construction phase of this alternative. Best management practices must be implemented to control construction runoff.

West Breakwater Terminal Alternative

The West Breakwater Terminal Alternative will similarly require new, currently nonexistent wastewater infrastructure for proper functioning of the new terminal. The design and construction phases of the new terminal project must therefore address the additional wastewater requirements for the new maritime facility. The new terminal may result in a doubling of the wastewater requirements that exist with Kahului Commercial Harbor's current operations. To minimize water use and thus wastewater generation in the new terminal, the proposed improvements should be constructed in accordance with sustainable building guidelines. Recommended measures may include the use of water saving devices. An increase in the short-term use of water is further associated with the construction phase of this alternative. Best management practices must be implemented to control construction runoff.

No-Action Alternative

The No-Action Alternative is not expected to create any significant impacts on the County of Maui's wastewater collection, treatment and disposal systems. The volume of wastewater generated by commercial harbor operations will increase as will the forecast cargo and passenger counts. The anticipated increase in maritime cargo and passengers is not expected to significantly raise the volume of wastewater generated by these maritime operations.

4.18 POLICE AND FIRE SERVICES AND PUBLIC SAFETY

4.18.1 EXISTING CONDITIONS

The County of Maui's police services are provided to the Wailuku-Kahului and Central Maui areas from the police station located within the Wailuku Civic Center. The County of Maui's fire services are provided from the Kahului and Wailuku Fire stations, located approximately two and three miles, respectively, from the two A&B parcels.

4.18.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative will not produce any impacts on police, fire or public safety services.

Second Harbor Alternative

Under U.S. Coast Guard regulations, the State's commercial harbors must develop, implement and update Maritime Security (MARSEC) facility security plans as a means of protecting maritime facilities, operators and passengers from terrorist acts. Contract security officers and Harbors Division staff provide the requisite security services during normal operating conditions, MARSEC Level I. During heightened and escalating MARSEC Levels, additional security forces from the State Department of Land & Natural Resources, the State Department of the Attorney General, the State Department of Public Safety and the Maui County Police Department are tasked to report to the commercial harbor. As Maui's commercial harbor is deemed a lower-risk facility and not a prime target of terrorists, the activation of additional security forces will only occur infrequently or rarely. The Second Harbor Alternative will not produce any significant impacts on police, fire or public safety services.

West Breakwater Terminal Alternative

Under U.S. Coast Guard regulations, the State's commercial harbors must develop, implement and update Maritime Security (MARSEC) facility security plans as a means of protecting maritime facilities, operators and passengers from terrorist acts. Contract security officers and Harbors Division staff provide the requisite security services during normal operating conditions, MARSEC Level I. During heightened and escalating MARSEC Levels, additional security forces from the State Department of Land & Natural Resources, the State Department of the Attorney General, the State Department of Public Safety and the Maui County Police Department are tasked to report to the commercial harbor. As Maui's commercial harbor is deemed a lower-risk facility and not a prime target of terrorists, the activation of additional security forces will only occur infrequently or rarely. The West Breakwater Terminal Alternative will not produce any significant impacts on police, fire or public safety services.

No-Action Alternative

The No-Action Alternative will not produce any significant impacts on police, fire and public safety services.

4.19 HEALTH CARE FACILITIES

4.19.1 EXISTING CONDITIONS

Health care and hospital services are provided by Maui Memorial Medical Center, the island's only full service hospital for acute care. Maui Memorial Medical Center is licensed for 196 beds, and is a state hospital being operated by the Hawaii Health Systems Corporation. Other private facilities treat long-term and specialty care patients. Tertiary services are provided on Oahu and/or the mainland. Private clinics, such as Kaiser Clinic and the Maui Medical Group, as well as private physicians, also provide health care services to island residents and visitors.

Maui Memorial Medical Center, as with other state and private health care providers, is subject to insufficient funding, shortages of acute care beds and difficulties in hiring staff. The shortage of acute care beds is critical, with occupancy generally over 90 percent. Visitors to Maui use approximately 5 to 10 percent of the total beds at the hospital.

4.19.2 ALTERNATIVE ANALYSIS

The Preferred Alternative, the Second Harbor Alternative, the West Breakwater Terminal and the No-Action Alternative will not have an impact on Maui's health care system.

4.20 SCHOOLS

4.20.1 EXISTING CONDITIONS

The State Department of Education (DOE) administers the Baldwin educational complex in the Wailuku-Kahului area and Maui High School. These facilities consist of elementary, intermediate and high schools. In 1990, the Baldwin complex had an enrollment of 6,400

students. Projected enrollment for the Baldwin complex for 1996 is 8,358 students. The 1990 total island-wide school capacity was 13,789 students, while total projected enrollment for 1996 is 17,066 students. The DOE projects additional classroom facilities will be required to accommodate the forecast student population. New elementary schools in Wailuku are helping to alleviate some of the shortfall in classrooms.

4.20.2 ALTERNATIVE ANALYSIS

The Preferred Alternative, the Second Harbor Alternative, the West Breakwater Terminal Alternative and the No-Action Alternative will not have an impact on the school system.

4.21 RECREATIONAL FACILITIES

4.21.1 EXISTING CONDITIONS

Most recreational activities in the vicinity of the two A&B parcels are ocean-related and occur along the coastline. The existing beaches, such as Hoaloa Park, are within Kahului Harbor and used for fishing, beachcombing, and canoe paddling. Spear-fishing and fish collecting occur when water conditions allow. An active canoe racecourse is adjacent to Kahului Commercial Harbor's Pier 2, offshore of Hoaloa Park.

Kahului Harbor Park, located on the fill area of the west breakwater, is maintained by the Maui County Department of Parks and Recreation. A small boat ramp is also located near the park. Pole fishermen, surfers and limu pickers generally use this area of the harbor. Swimming is not popular in the harbor due to the murky water conditions and rocky bottom. During the interview process of this study, it was noted that the water appeared cleaner now that Maui Land and Pine is no longer discharging agricultural waste into the harbor. Maui County also owns and maintains Keopuolani Park which is located south of and across the street from Kahului Harbor Park, stretching from Kahului Beach Road to Kaahumanu Avenue.

There are currently conflicts between the canoe paddlers and maritime operations. These existing impacts will continue to worsen as both maritime operations (cargo shipments, luxury cruises, vessel calls, security zones) and the canoe clubs' (Hawaiian Canoe Club, Na Kai Ewalu) memberships increase. Both commercial operations and recreational activities are vying for the same areas of Kahului Commercial Harbor[7].

Part of the canoe paddlers' concerns are that the U.S. Coast Guard maritime security regulations require security zones around specified vessels and terminals, which prohibit recreational access and use of piers, berths, the turning basin and portions of the entrance channel.

[7] Under the Hawaii Revised Statutes Chapter 266-1, a commercial harbor *"means a harbor or off-shore mooring facility which is primarily for the movement of commercial cargo, passenger and fishing vessels entering, leaving or traveling within the State, and facilities and supporting services for loading, off-loading, and handling of cargo, passengers and vessels.*

4.21.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. **The acquisition of the property will produce no impacts on any recreational activities. Similarly, any implementation of minor projects such as those listed in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation,* Amended, November 15, 2000, will not produce any impacts on any recreational activities. These minor projects will provide the requisite space for the inter-island cargo carrier's continuance of its full range of existing cargo services, including its LCL cargo operations.**

Second Harbor Alternative

The potential sites for the Second Harbor Alternative are largely undisturbed areas of Maui's popular coastline. These areas entertain a wide range of recreational activities, including fishing, gathering, diving, snorkeling, surfing, boogie boarding, sailing, boating, water skiing, jet skiing, swimming, sunbathing, beachcombing and picnicking. Development and operation of the proposed second harbor would curtail much of the recreational activity in the area. Such an impact on recreational activities is perceived as being significant.

West Breakwater Alternative

The West Breakwater Terminal Alternative requires extensive breakwater construction, extensive dredging of the turning basin and the berth. The breakwater construction is suggested as a means of attenuating the wave energy that enters the harbor and that would potentially disrupt the vessel maneuvering, cargo and passenger loading/unloading operations at the West Breakwater Terminal's berth. The wave energy that enters the harbor, however, creates ideal conditions for a significant contingent of recreational surfers within the harbor. The extensive dredging necessary for the West Breakwater Terminal Alternative would further destroy the shallow reef shelf that helps to create these surfing conditions. Significant impacts to the coral reef ecosystem within the harbor and the reef ecosystem at the site of the new breakwater are anticipated as a result this alternative. Fish populations may be reduced by these impacts to the coral reef ecosystems. The currents within the harbor would be similarly impacted by the massive dredging, breakwater and pier construction, which, in turn, may significantly impact the sand deposits at Hoaloha Beach. The West Breakwater Terminal Alternative is thus expected to produce significant impacts to the recreational activities in the harbor.

No-Action Alternative

The existing conflicts between maritime operations and recreational activities within Kahului Commercial Harbor will continue and could possibly worsen with the forecast growth of cargo volumes, vessels calls and passenger counts.

4.22 SURFACE TRANSPORTATION SYSTEM

4.22.1 EXISTING CONDITIONS

The major surface streets in the vicinity of the two A&B parcels are Kaahumanu Avenue, Puunene Avenue, Hobron Avenue and Hana Highway. Other surface streets include Wharf Street, Ala Luina Street and Second Street (See Figure 4). Hana Highway and Kaahumanu Avenue function as the major roadways in the area, serving both regional and local vehicular traffic. The following is a brief description of the existing roadways.

- Hobron Avenue. Hobron Avenue is a short two-lane roadway connecting Hana Highway and Kaahumanu Avenue to Kahului Commercial Harbor (through Ala Luina Street). A number of commercial harbor-related vehicles utilize this street, with resultant large volumes of truck traffic. Access to the Hobron Avenue area is awkward, with left-turns into the area permitted via the Hana Highway-Kaahumanu Avenue intersection and left-turns out of the area restricted to the Hobron Avenue-Hana Highway intersection. Right-turns in/out are permitted at both intersections.

- Puunene Avenue. Puunene Avenue is a State roadway that extends from the Kahului Commercial Harbor area south to the Puunene community. In Puunene, it connects to Mokulele Highway to provide access between the Kihei-Wailea area and Kahului. The roadway provides one lane in each direction for most of its length.

- Wharf Street. Wharf Street is a short two-lane roadway that serves as one of the primary entrances to the Kahului Commercial Harbor from Kaahumanu Avenue.

- Ala Luina Street. Ala Luina Street is Kahului Commercial Harbor's internal roadway that links Hobron Avenue and Wharf Street. It is a two-lane roadway that snakes through the commercial harbor connecting Piers 1, 2 and 3 with the external circulation roadways.

- Perimeter Road. The Perimeter Road provides access along the coastline from Hobron Avenue/Ala Luina Street to the container storage yard on Pier 1.

Table 4-1 lists the intersections in the vicinity of the proposed projects and identifies the traffic controls at the present time.

TABLE 4-1
MAJOR INTERSECTIONS NEAR KAHULUI HARBOR

Intersection	Control Device
Hobron Avenue / Ala Luina Street	Stop Sign
Hobron Avenue / Amala Street	Stop Sign
Hobron Avenue / Kaahumanu Avenue	Signalized
Kaahumanu Avenue / Wharf Street	Signalized
Kaahumanu Avenue / Puunene Avenue	Signalized
Kaahumanu Avenue/Maui Beach Hotel & Maui Palms Hotel/Lono Avenue	Signalized

The Maui Long-Range Land Transportation Plan (1997) presents recommendations to the roadway network near the two A&B parcels that should be in place by 2020. These improvements include:

- The widening of Puunene Avenue to four lanes from Kaahumanu Avenue to Mokulele Highway; and

- The widening of Hana Highway to six lanes from Kaahumanu Avenue to Dairy Road.

The analysis of existing ground traffic conditions is presented for the morning and afternoon commute peak hours. The commute peak hours represent the highest traffic volumes on most major roads within the vicinity of the two A&B parcels. The analysis for roadway intersection is based on the *Highway Capacity Manual*, which uses a calculation of a volume capacity ratio and delay to relate to a Level of Service (LOS). The LOS has six levels, A through F, which relate to driving conditions from best to worst. LOS A represents free-flow conditions with no congestion, while LOS F represents severe congestion with stop and go conditions. LOS D is typically considered acceptable peak hour conditions in urban areas.

Past studies have found that the major roadway intersections in the vicinity of this area are operating at a relatively acceptable level of service. In 1994, the Kahului Airport traffic study found that the intersection of Hobron Avenue/Kaahumanu Avenue had a LOS A during the morning peak hour and a LOS B for the afternoon peak hour. This intersection LOS would remain the same even with the 2010 forecast (Airport's traffic study) increase in traffic. A study in 1995 and 1997 found that the Wharf Street/ Kaahumanu Avenue intersection was operating at a LOS A for both morning and afternoon peak hours. The 1995 study also found that the intersection of Puunene Avenue/Kaahumanu Avenue had a LOS B for the morning peak hour and a LOS C for the afternoon peak hour. In 2000, a study of the signalized intersection of Kaahumanu Avenue/Maui Beach Hotel & Maui Palms Hotel Driveway/Lono Avenue operated at LOS B in the morning peak hour and LOS C during the afternoon peak hour.

The results shown in Table 4-2 are from the Hobron Triangle Retail Development (Reference 12) for the intersection at Kaahumanu Avenue and Hobron. The study showed that the intersection peak hour movements occurred from 6:30 a.m. to 8:30 a.m. and from 3:00 p.m. to 5:30 p.m. The survey data was recorded in October 2002.

TABLE 4-2
LEVEL OF SERVICE ANALYSIS FOR
KAAHUMANU AVENUE AND HOBRON AVENUE
(from Hobron Triangle Retail Development)

	Morning Peak Hour			**Afternoon Peak Hour**		
	Volume	**Delay (sec.)**	**LOS[1]**	**Volume**	**Delay (sec)**	**LOS**
Northbound Left, Thru & Right	138	7.5	A	167	8.0	A
Southbound Left, Thru & Right	110	7.6	A	275	7.5	A
Westbound Left, Thru & Right	2	10.2	B	4	11.8	B
Eastbound Left & Thru	106	12.5	B	89	15.7	C
Eastbound Right	13	8.7	A	32	9.9	A

1. Level of Service (LOS) is calculated using the operations method described in the *Highway Capacity Manual*. LOS is based on delay.

The internal roadway, Ala Luina Street, links the internal traffic to Hobron Avenue and to Wharf Street. Congestion within the commercial harbor is localized and dependent on the vessel arrival, type of cargo or passengers, and volume. The major congestion areas are at Pier 1 with the cruise ship traffic and unloading of the overseas cargo vessels, and at Pier 2 during the unloading and loading of the inter-island barge.

4.22.2 ALTERNATIVE ANALYSIS

Preferred Alternative

The Preferred Alternative is the acquisition of the two A&B parcels by the Harbors Division. **The acquisition of the property will produce no impacts on the surface transportation system in the area. Full redevelopment of the two parcels will be scheduled once the Harbors Division completes the acquisition, the *Kahului Commercial Harbor 2030 Master Plan* and the master plan's HRS Chapter 343 environmental analysis. The 2030 master plan will recommend the most advantageous maritime use of the two parcels as well as a permanent berth and operating area for the Hawaii Superferry. The potential impacts of these recommendations will be analyzed in accordance with the tenets of HRS Chapter 343. In the interim, the Harbors Division may implement minor, Chapter 343 exempt projects such as those contained in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation*, Amended, November 15, 2000, to enable the inter-island cargo carrier's continuance of its full range of existing cargo services, including the LCL**

cargo operations. As the minor, Chapter 343 exempt projects simply enable the continuance of existing cargo operations, no new vehicular traffic will be generated by these projects. The implementation of these minor, Chapter 343 exempt projects will not produce any significant impacts on the area's surface transportation system.

Second Harbor Alternative

The Second Harbor Alternative will cause a discernible increase in traffic on the surface transportation system of the selected area. If the site selected for Maui's second commercial harbor is on the island's west side, the traffic impacts may result in a degradation of the existing LOS. The resultant impacts of a second commercial harbor may require an acceleration of traffic mitigation measures (e.g., traffic controls, signalized intersections, stacking lanes, bypasses, overpasses, etc.).

West Breakwater Terminal Alternative

The West Breakwater Terminal Alternative will likewise add commercial harbor vehicle traffic to the surface transportation system near the new terminal. Container trucks, buses, rental cars, personal vehicles and taxis may add to roadway congestion, degrading the existing LOS in the area. Traffic mitigation measures may be required if the surface transportation impacts of the West Breakwater Terminal Alternative are significant.

No-Action Alternative

The No-Action Alternative will not produce any significant impacts on the surface transportation system. The existing problems and congestion will remain. Traffic will increase due to the forecast increase in population, passengers and cargo shipments to Maui.

5.0 DETERMINATION, FINDINGS, AND REASONS SUPPORTING DETERMINATION

The proposed acquisition of the two A&B parcels by the DOT Harbors Division (Preferred Alternative) will not produce any significant environmental impacts. The preparation of an Environmental Impact Statement is therefore not required. The Preferred Alternative is compatible with the existing and future land uses and activities in the area. The DOT Harbors Division will comply with all applicable statutes, ordinances and rules of the Federal and State governments. This document constitutes a Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI). The "Significance Criteria," Section 12 of the Hawaii Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules" were reviewed and analyzed. The following findings are based on a thorough analysis of the potential impacts for the prescribed criteria (italicized).

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The proposed acquisition of the two, fully developed, A&B parcels by the Harbors Division will not involve irrevocable commitments to loss or destruction of any natural or cultural resource.

Both A&B parcels (TMK: 3-7-10:001 and TMK 3-7-10:036) are located in an urbanized, industrial setting and surrounded by the town of Kahului. Kahului is the center of Maui's industrial and commercial operations. The State Land Use designation for the area surrounding the parcels is Urban District, and both parcels are zoned M-2, Heavy Industrial District. The Wailuku-Kahului Community Plan designates Heavy Industrial operations for the area.

Both parcels are fully developed with structural improvements and parking areas. The building on 55 Kaahumanu Avenue is a two-story, wood-frame on concrete-slab structure that was built circa 1904. The three buildings on 101 Kaahumanu Avenue are concrete-block on concrete-slab structures that were built circa 1923. The four buildings house various retail, office and storage operations.

Selection of the Second Harbor Alternative or the West Breakwater Terminal, however, will result in irrevocable commitments to loss or destruction of natural and cultural resources. Undisturbed coastal areas would be dredged, large breakwater structures would cover marine habitats and benthic communities, shorelines would be transformed into piers and terminals, the new commercial harbor or breakwater terminal would become off-limits to cultural activities, and maritime operations would affect Maui's famed ocean water quality.

(2) Curtails the range of beneficial uses of the environment.

The Preferred Alternative will not curtail the range of beneficial uses of the environment. The two A&B parcels are properly zoned and located in designated industrial districts. The properties are fully developed with structural improvements and paved parking areas. The existing retail, office and storage operations will remain in place through their lease periods.

The Second Harbor and West Breakwater Terminal Alternatives, however, will curtail a wide range of beneficial uses of the environment. Significant acreages of submerged and fast lands would be converted from their natural, undisturbed state to maritime facilities. The wide array of recreational and cultural activities occurring in the potential project sites would be affected by the development and operation of the second harbor and the west breakwater terminal. Maritime security regulations may even prohibit cultural practices and the enjoyment of recreational activities in/near the second harbor and west breakwater terminal.

(3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The Preferred Alternative does not conflict with the State's long-term environmental policies or goals and guidelines. The State's environmental policies, goals and guidelines are set forth in Chapter 344, Hawaii Revised Statues, "State Environmental Policy." Two broad policies are espoused - conservation of natural resources and enhancement of the quality of life.

The Preferred Alternative is the acquisition of two A&B parcels by the Harbors Division. With the purchase of these properties, the Harbors Division will begin the *Kahului Commercial Harbor 2030 Master Plan*, which will recommend the appropriate redevelopment of the two parcels for maritime purposes. Once the 2030 master plan is completed, the Harbors Division will process the HRS Chapter 343 environmental analysis of the master plan, which will include the recommendations for maritime redevelopment the two A&B parcels. **The two parcels will be scheduled for full redevelopment once the Chapter 343 environmental analysis is properly completed. The Harbors Division may implement minor projects in the interim to enable the inter-island cargo carrier's continuance of its full range of existing cargo services, including its LCL cargo operations. These minor projects will be carefully selected from the *Comprehensive Exemption List for the State of Hawaii Department of Transportation*, Amended, November 15, 2000. Both parcels are currently fully developed with structural improvements and paved parking areas. The Preferred Alternative will not create any conflicts with the state's policies, goals and guidelines on conservation of natural resources.**

Similarly, the proposed purchase of the two A&B parcels will not detrimentally affect the state's policies, goals and guidelines on enhancement of the quality of life. All existing A&B tenants will remain in their respective units throughout their negotiated lease periods.

Selection of the Second Harbor Alternative or the West Breakwater Terminal Alternative, however, will conflict with the state's policies, goals and guidelines on conservation of natural resources as large acreages of the island's natural coastline and near-shore waters will be impacted by the construction and operation of these alternatives' maritime facilities.

(4) Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.

The Preferred Alternative will not affect the economic welfare, social welfare or cultural practices of the either the community or the State. **The DOT Harbors Division proposes to acquire the two parcels from A&B for commercial harbor expansion purposes. The Harbors Division will subsequently master plan the proper maritime redevelopment of the two parcels and process the HRS Chapter 343 environmental analysis for the master plan and parcel redevelopment prior to initiating the full redevelopment project. In the interim, the Harbors Division may implement minor, Chapter 343 exempt projects such as those contained in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation*, Amended, November 15, 2000, to enable the inter-island cargo carrier's continuance of its full range of existing cargo services, including its LCL cargo operations. The purchase of the two parcels and the implementation of any minor projects will not affect the community's or State's economic welfare, social welfare, or cultural practices. The Harbors Division commits to honoring all leases in place at the time of purchase. No tenants/occupants will be improperly displaced. No cultural practices exist within the current mix of retail, office and storage operations.**

The Second Harbor Alternative and the West Breakwater Terminal Alternative are viewed as projects to enhance the community's and the State's economic and social welfare. Maui's ever increasing demands for food, clothing, building materials, cars and fuel will be satisfied by the expansion of commercial harbor facilities. The development and operation of these alternatives, however, will come at the sacrifice of the cultural activities being practiced at the proposed development sites.

(5) Substantially affects public health.

If pursued, the Preferred Alternative will result in a change of the parcels' ownership from A&B to the State of Hawaii. The two parcels' zoning will not change. Kahului Commercial Harbor's maritime operations are consistent with the parcel's zoning. The Preferred Alternative and maritime expansion into the two parcels will not impact public health or public health facilities.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities.

The Preferred Alternative is not expected to produce any secondary impacts, such as population changes or effects on public facilities. The Harbors Division proposes to acquire the two A&B parcels, which represent a total area of approximately 3.96 acres. The purchase of the property or any expansion of commercial harbor operations into the property will not affect the island's population or impact public facilities (e.g., schools, parks, government offices, etc.).

(7) Involves a substantial degradation of environmental quality.

The Preferred Alternative is the proposed acquisition of two A&B parcels by the Harbors Division and the possible implementation of minor, Chapter 343 exempt projects such as those contained in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation,* Amended, November 15, 2000, for the continuance of the inter-island cargo carrier's full range of existing cargo services, which include LCL cargo operations. The change in ownership from A&B to the State of Hawaii and the implementation of the minor projects will not involve any degradation of environmental quality.

The Second Harbor Alternative and the West Breakwater Terminal Alternative, however, require extensive dredging, breakwater construction, and construction of piers, terminals and roadways. These alternatives' construction projects and maritime operations are expected to substantially degrade the environmental quality at their sites.

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.

The Preferred Alternative is the first step in the process of expanding the operational acreage of Kahului Commercial Harbor. **While the acquisition of the two A&B properties will not produce any environmental impacts, it is possible that the full redevelopment of the two parcels for maritime purposes may create significant environmental impacts. The following will thus be completed prior to the start of the parcels' full redevelopment efforts:**

- The Harbors Division will undertake and complete the *Kahului Commercial Harbor 2030 Master Plan,* which will include the two new parcels and the recommendations for their appropriate maritime redevelopment.
- The Harbors Division will undertake and complete the *Kahului Commercial Harbor 2030 Master Plan* Environmental Assessment/Impact Statement, which will analyze the cumulative impacts of the master plan's recommendations in accordance with the requirements of HRS Chapter 343.

To enable the inter-island cargo carrier's continuance of its full range of existing cargo services, including its LCL cargo operations, the Harbors Division may implement minor, Chapter 343 exempt projects within the two parcels in the interim. These projects will be carefully selected from the *Comprehensive Exemption List for the State of Hawaii Department of Transportation,* Amended, November 15, 2000, and are thus not expected to create any significant environmental impacts.

(9) Substantially affects a rare, threatened, or endangered species, or its habitat.

No rare, threatened, or endangered species or habitats will be affected by the proposed acquisition. The two A&B parcels are located in the island's commercial and industrial district and are fully developed with structural improvements and paved parking areas. There are no rare, threatened or endangered species or habitats within the properties.

The Second Harbor Alternative and the West Breakwater Terminal Alternative are likely to produce significant impacts on rare, threatened and endangered species and habitats. The Corps of Engineers' *Maui Second Commercial Harbor Navigation Study* reported the likelihood of the U.S. Fish & Wildlife Service's filing of a jeopardy opinion against the construction of a second commercial harbor on Maui's south or west coastline. The breakwater construction and dredging of turning basin and berths for the West Breakwater terminal will obliterate large acreages of reef.

(10) Detrimentally affects air or water quality or ambient noise levels.

The Preferred Alternative will not detrimentally affect air or water quality or ambient noise levels. If pursued, the Preferred Alternative will result in a change of the two parcels' ownership, from A&B to the State of Hawaii, and the possible implementation of minor, Chapter 343 exempt projects. As the minor projects are proposed as a means of enabling the inter-island cargo carrier's continuance of its existing cargo operations, no significant impacts on air or water quality are anticipated. The high ambient noise environment of the area will remain.

The Second Harbor Alternative and the West Breakwater Terminal Alternative are likely to produce significant impacts on the air quality, water quality and ambient noise levels in the area. Construction activities may also have the potential to affect air quality, water quality and ambient noise levels on a short-term basis. Engineering controls would be incorporated into the proposed project to minimize the impacts and to ensure regulatory compliance. While proper grading would normally ensure that there would be no runoff, runoff from piers is anticipated. Best management practices will therefore be implemented to the maximum extent practical to control storm-water runoff and to prevent pollutants from discharging off the project site during construction and during maritime operations.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The Preferred Alternative is the proposed acquisition of two A&B parcels that are in Flood Zones V23 (coastal high hazard area), A-4 (areas of 100-year flood with base flood elevations and flood hazard factors determined), and C (areas of minimal flooding). **Should the Harbors Division complete the acquisition of both parcels, the Harbors Division will ensure that the parcels, their structural improvements and any minor projects implemented to enable the inter-island cargo carrier's continuance of its full range of existing cargo services, including its LCL cargo operations, are in compliance with the development standards for flood and tsunami zones.**

The Second Harbor Alternative and the West Breakwater Alternative would create maritime facilities that would be likewise situated in coastal high hazard areas (Zone V23). The projects' design and construction efforts must address compliance with the development standards for flood and tsunami zones.

(12) Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.

The Preferred Alternative is the proposed acquisition of two A&B parcels by the Harbors Division. Both parcels are fully developed with structural improvements and paved parking areas. **The only changes resulting from the implementation of the Preferred Alternative is the change in ownership of the two parcels and the possible implementation of minor projects such as those contained in the *Comprehensive List for the State of Hawaii Department of Transportation,* Amended, November 15, 2000, which will enable the inter-island cargo carriers' continuance of its full range of existing cargo services, including its LCL cargo operations.** There will be no impacts to scenic vistas or viewplanes identified in county or State plans and studies.

The Second Harbor Alternative and the West Breakwater Alternative will place large, industrial harbor facilities on undisturbed areas of Maui's coveted south or west coastline, and a new terminal with large ships and barges berthing at the extremely visible west breakwater of Kahului Commercial Harbor. These alternatives are thus expected to produce substantial impacts on scenic vistas and county/State identified viewplanes.

(13) Requires substantial energy consumption.

The Preferred Alternative will not require substantial energy consumption. **Full redevelopment of the two parcels will follow completion of the Chapter 343, HRS, environmental analysis of the *Kahului Commercial Harbor 2030 Master Plan*. Minor projects may be implemented in the interim to enable the continuance of the inter-island cargo carrier's existing cargo operations. The Harbors Division's purchase of the property and interim implementation of any minor, Chapter 343 exempt projects will thus not significantly add to existing energy requirements.**

The Second Harbor Alternative and the West Breakwater Terminal Alternative, however, would require substantial energy consumption. A significant amount of energy would be required during construction. As these alternatives would replicate the maritime operations at Kahului Commercial Harbor, the additional energy consumption could be significant. Energy-conserving measures should be incorporated into the projects' design and construction phases, as practical.

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9. Letter State of Hawaii, Department of Land and Natural Resources, Historic Preservation Division to International Archaeological Research Institute, Inc., Log No. 2003.1980, Doc. No. 0310MK06.

10. Letter State of Hawaii, Department of Land and Natural Resources, Historic Preservation Division to Department of Transportation, Harbors Division, Log No. 2004.0954, Doc. No. 0403st17, March 31, 2004.

11. State of Hawaii, Department of Transportation, Harbors Division, "*Final Environmental Assessment, Pier 1C Extension, Kahului Commercial Harbor*," January 2000.

12. R.M. Towill Corporation, "*Final Environmental Assessment, Kahului Commercial Harbor, Pier 1C Mooring Dolphin*," March 2004.

13. U.S. Army Corps of Engineers, Honolulu District, "*Maui Second Commercial Harbor Navigation Study*," April 1995.

14. Phillip Rowell and Associates, "*Traffic Impact Assessment for Hobron Triangle Retail Development,"* July 10, 2004.

15. State of Hawaii, Department of Agriculture, Plant Quarantine Branch, "*Kahului Airport Pest Risk Assessment,*" November 2002.

16. USGS, "*Recent Hydrologic Conditions, Iao and Waihee Aquifer Areas, Maui, Hawaii (summary),"* November 2004.

17. Ernest K. Hirata and Associates, Inc, "*Soils Investigation Barge Terminal Improvements Phase IB & II, Kahului Harbor, Kahului, Maui, Hawaii*," November 5, 1997.

18. Walter Lum Associates, Inc., "*Bulkhead and Other Improvements at Kahului Harbor, Maui, Job H.C. 3046, Soil Exploration Report*," December 12, 1975.

7.0 LIST OF AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED

PRE-ASSESSMENT CONSULTATION

The individuals, agencies and organizations listed below were sent correspondence (dated April 27, 2006) requesting their comments. A copy of DOT's April 27, 2006 correspondence follows the listing. The comments received are included in Appendix E.

Matson Navigation Company
Pier 1, Kahului Harbor
Kahului, Hawaii 96732

Young Brothers, Inc.
65 Wharf Street
Kahului, Hawaii 96732

Hawaiian Cement
97-607 Malakole Street
Kapolei, Hawaii 96707

Norwegian Cruise Lines America
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

State Historic Preservation Division
State Department of Land & Natural Resources
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Hawaiian Canoe Club
P.O. Box 5053
Kahului, Hawaii 96732

Na Kai Ewalu
87 Lae Street
Paia, Hawaii 96779

Hawaii SuperFerry
One Waterfront Plaza, Suite 302
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

Alexander & Baldwin Properties, Inc.
822 Bishop Street
Honolulu, Hawaii 96813

Mr. & Mrs. Joel Stuart
55 Kaahumanu Avenue, No. A
Kahului, Hawaii 96732

Lightning Bolt Maui, Inc.
55 Kaahumanu Avenue, No. B
Kahului, Hawaii 96732

Mr. & Mrs. Scott Emerzian
55 Kaahumanu Avenue, No. D
Kahului, Hawaii 96732

Fabric Mart
55 Kaahumanu Avenue, No. D
Kahului, Hawaii 96732

Island Beauty Supply, LLC
55 Kaahumanu Avenue, No. G
Kahului, Hawaii 96732

Mr. Gary Guenther
55 Kaahumanu Avenue, No. M
Kahului, Hawaii 96732

LF & Sons Landscape Maintenance
55 Kaahumanu Avenue, No. 1
Kahului, Hawaii 96732

Mr. Charles Buckingham
55 Kaahumanu Avenue, No. 4
Kahlui, Hawaii 96732

Global Travel Center
55 Kaahumanu Avenue
Kahului, Hawaii 96732

Mr. Carl Incerto
101 Kaahumanu Avenue, No. AA
Kahului, Hawaii 96732

Four Star Mortgage Corp.
101 Kaahumanu Avenue, No. A-B/C
Kahului, Hawaii 96732

Ms. Linda Austin
101 Kaahumanu Avenue, No. B-DE
Kahului, Hawaii 96732

Mr. John Schweiner
101 Kaahumanu Avenue, No. B-FGHI
Kahului, Hawaii 96732

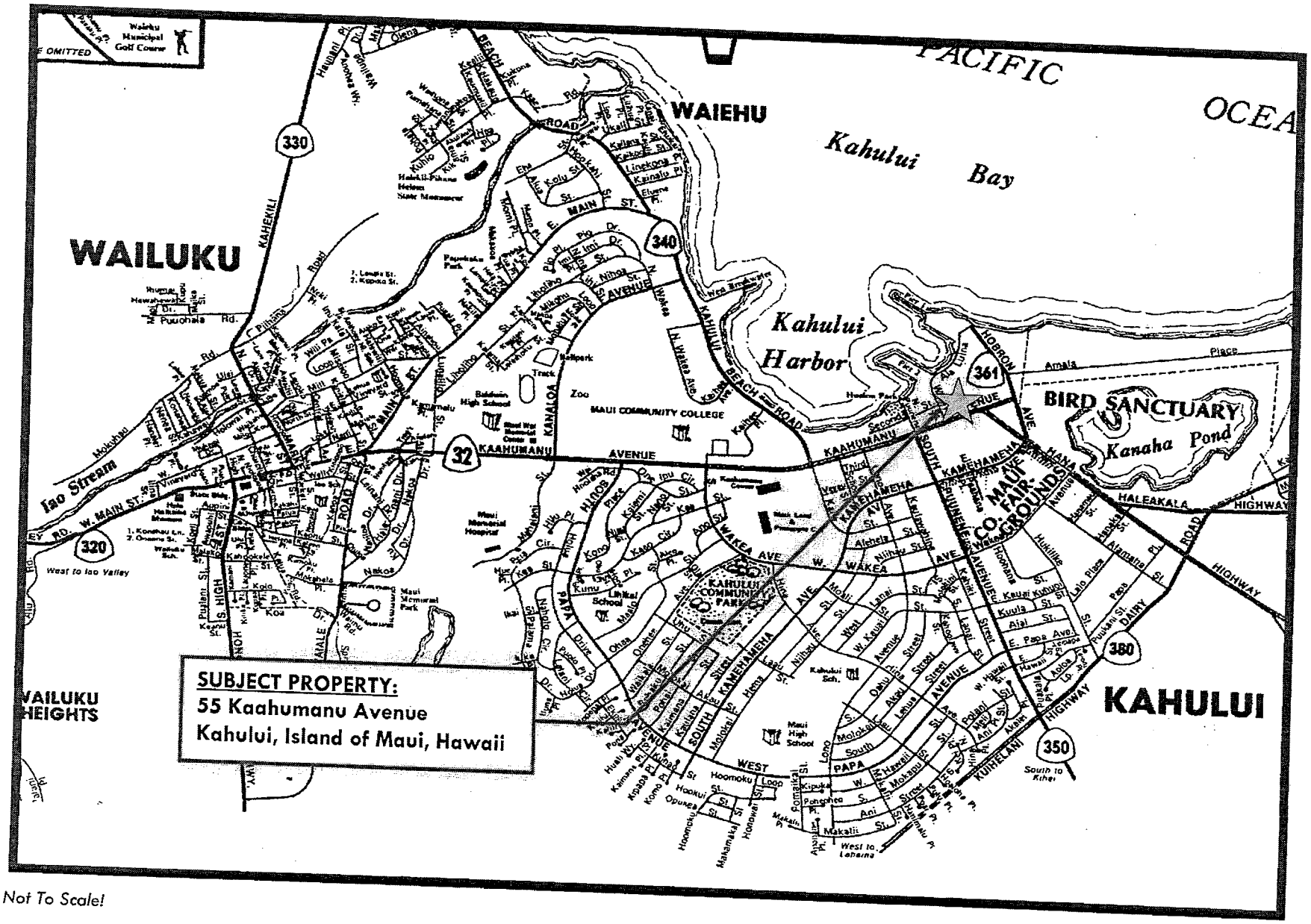
CB Richard Ellis, Hawaii, Inc.
101 Kaahumanu Avenue, No. C-J1
Kahului, Hawaii 96732

Boskoff Construction, Inc.
101 Kaahumanu Avenue, No. C-J1
Kahului, Hawaii 96732

Mr. & Mrs. Roger Strong
101 Kaahumanu Avenue, No. C-K
Kahului, Hawaii 96732

APPENDIX A

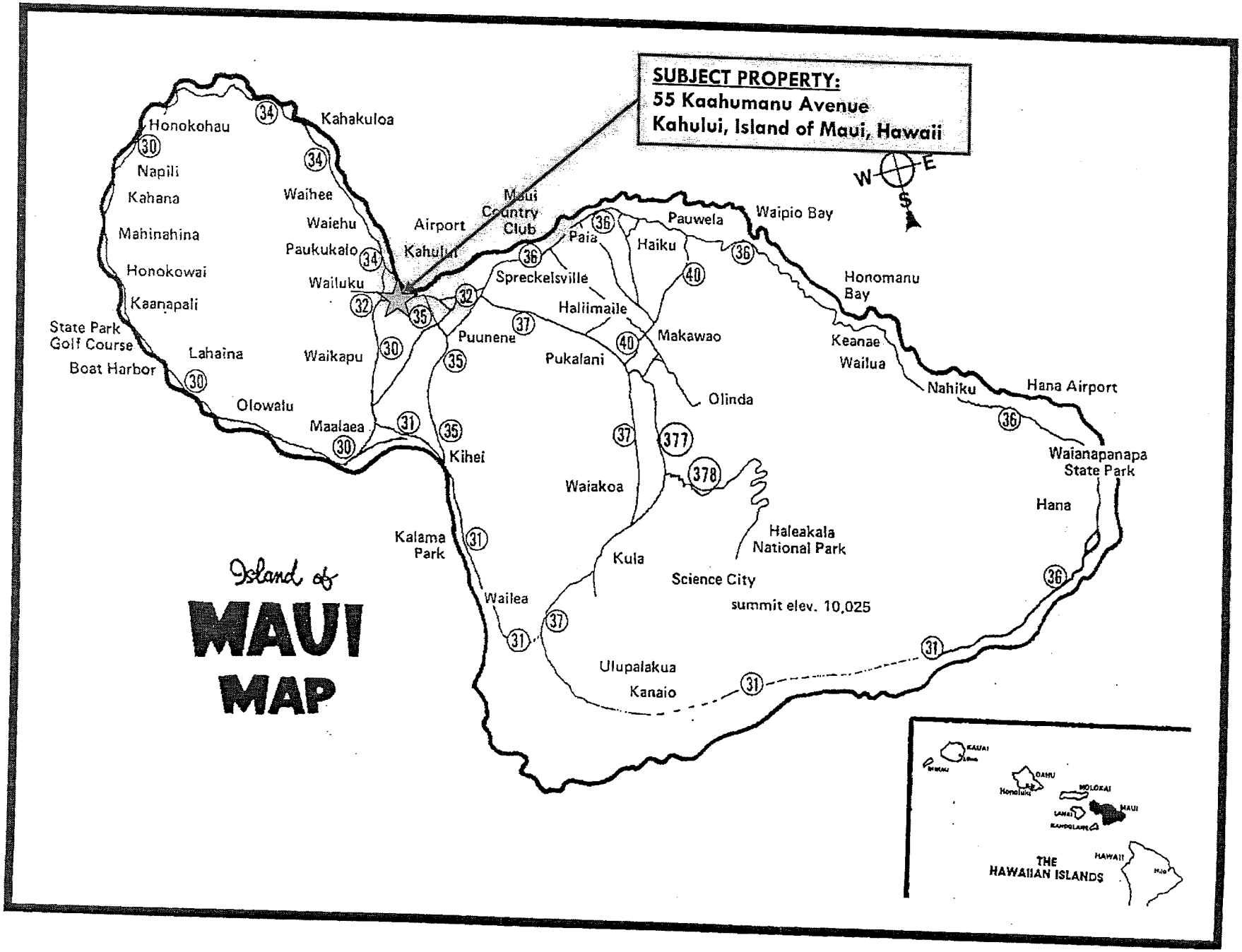
LOCATION MAPS

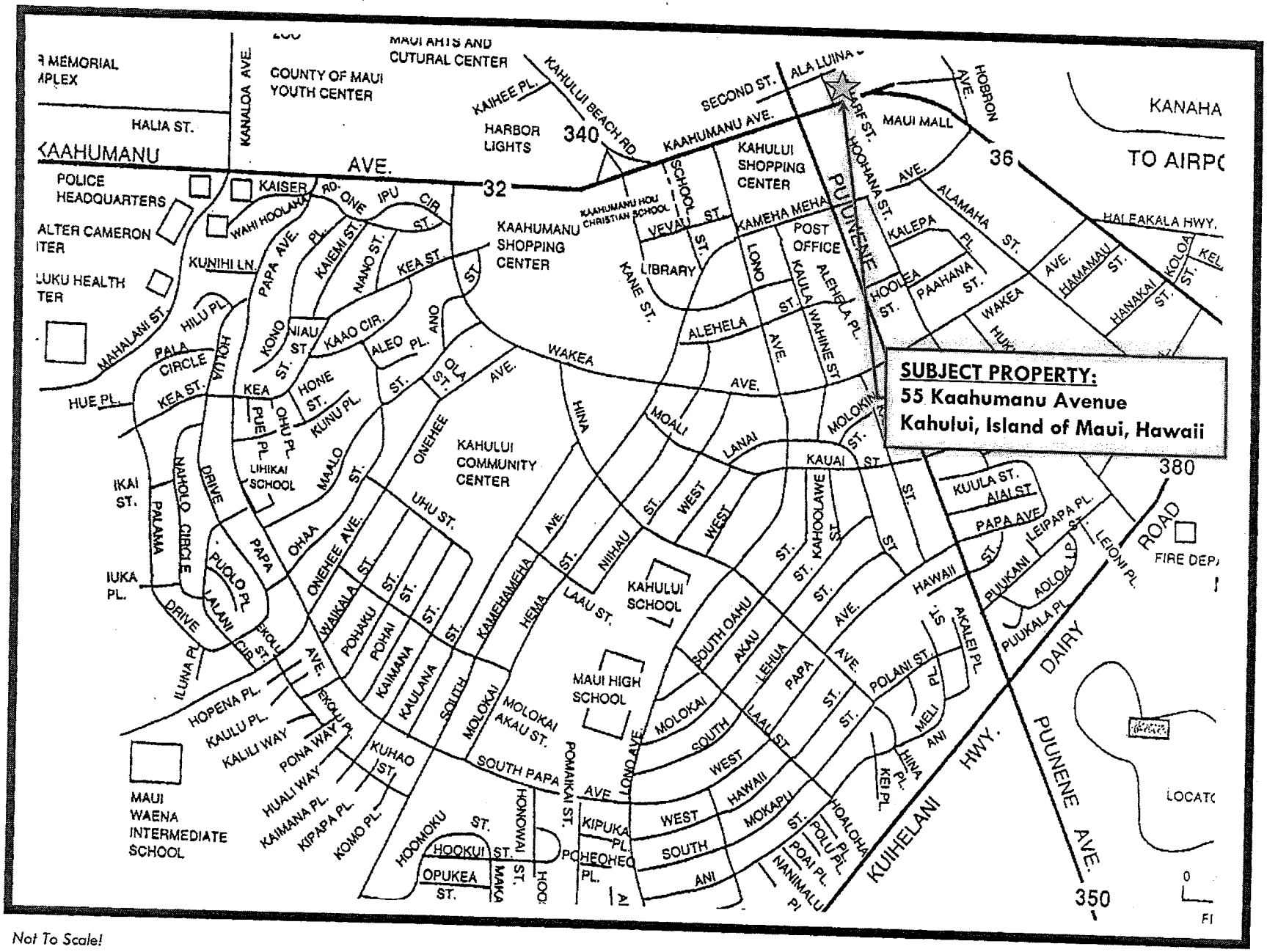


Not To Scale!

LOCATION MAP
55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.


SUBJECT PROPERTY:
55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii
W
E
S
Island of
MAUI
MAP
Honokohau
Napili
Kahana
Mahinahina
Honokowai
Kaanapali
State Park
Golf Course
Boat Harbor
Lahaina
Olowalu
Maalaea
Waikapu
Wailuku
Paukukalo
Waiehu
Waihee
Kahakuloa
Airport
Kahului
Maui
Country
Club
Kihei
Kalama
Park
Wailea
Ulupalakua
Kanaio
Waiakoa
Kula
Paia
Spreckelsville
Haliimaile
Puunene
Pukalani
Makawao
Olinda
Haiku
Pauwela
Waipio Bay
Honomanu
Bay
Keanae
Wailua
Nahiku
Hana Airport
Waianapanapa
State Park
Hana
Haleakala
National Park
Science City
summit elev. 10,025
KAUAI
NIIHAU
OAHU
Honolulu
MOLOKAI
LANAI
KAHOOLAWE
MAUI
HAWAII
Hilo
THE
HAWAIIAN ISLANDS

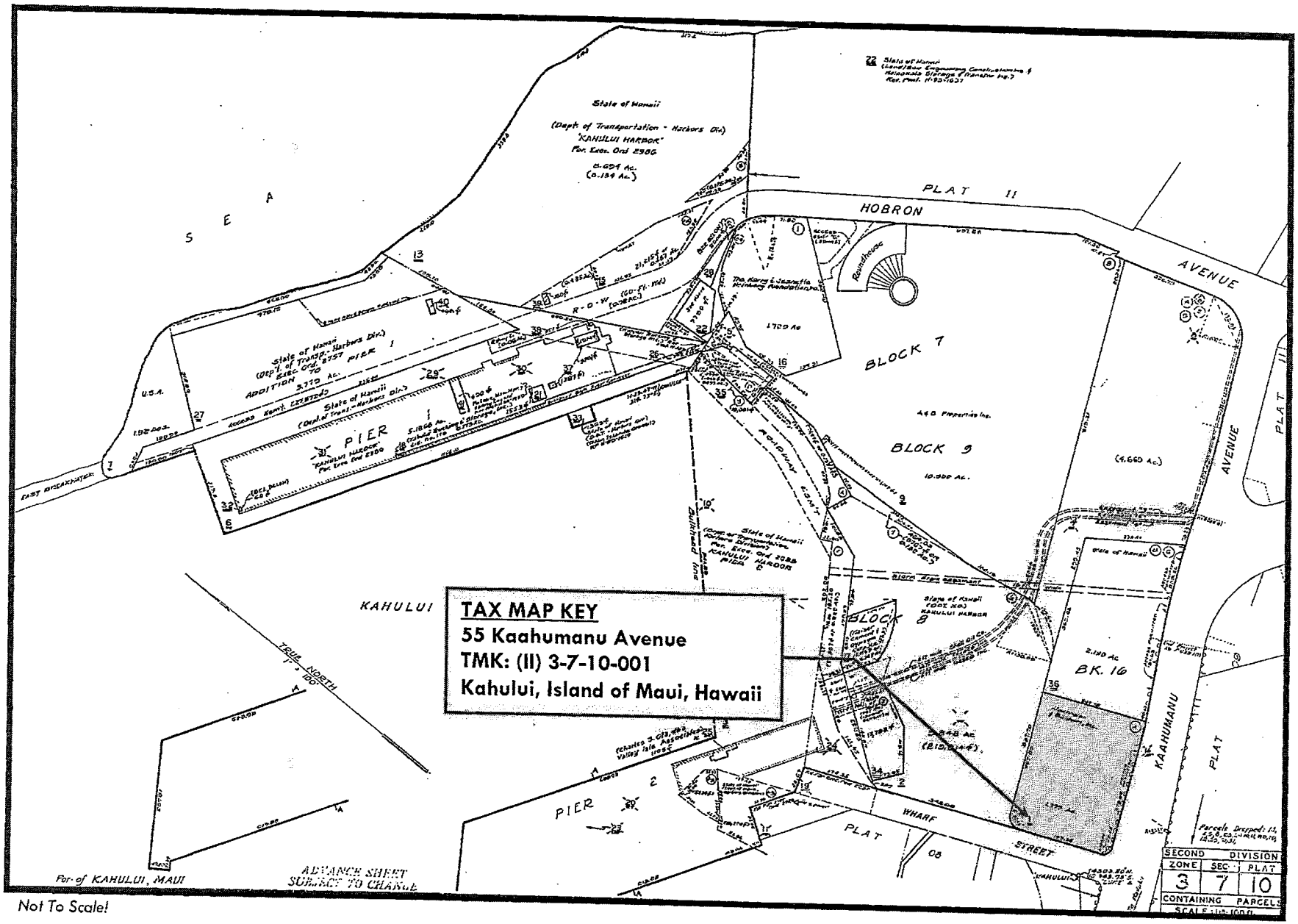


Not To Scale!

NEIGHBORHOOD MAP

55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.

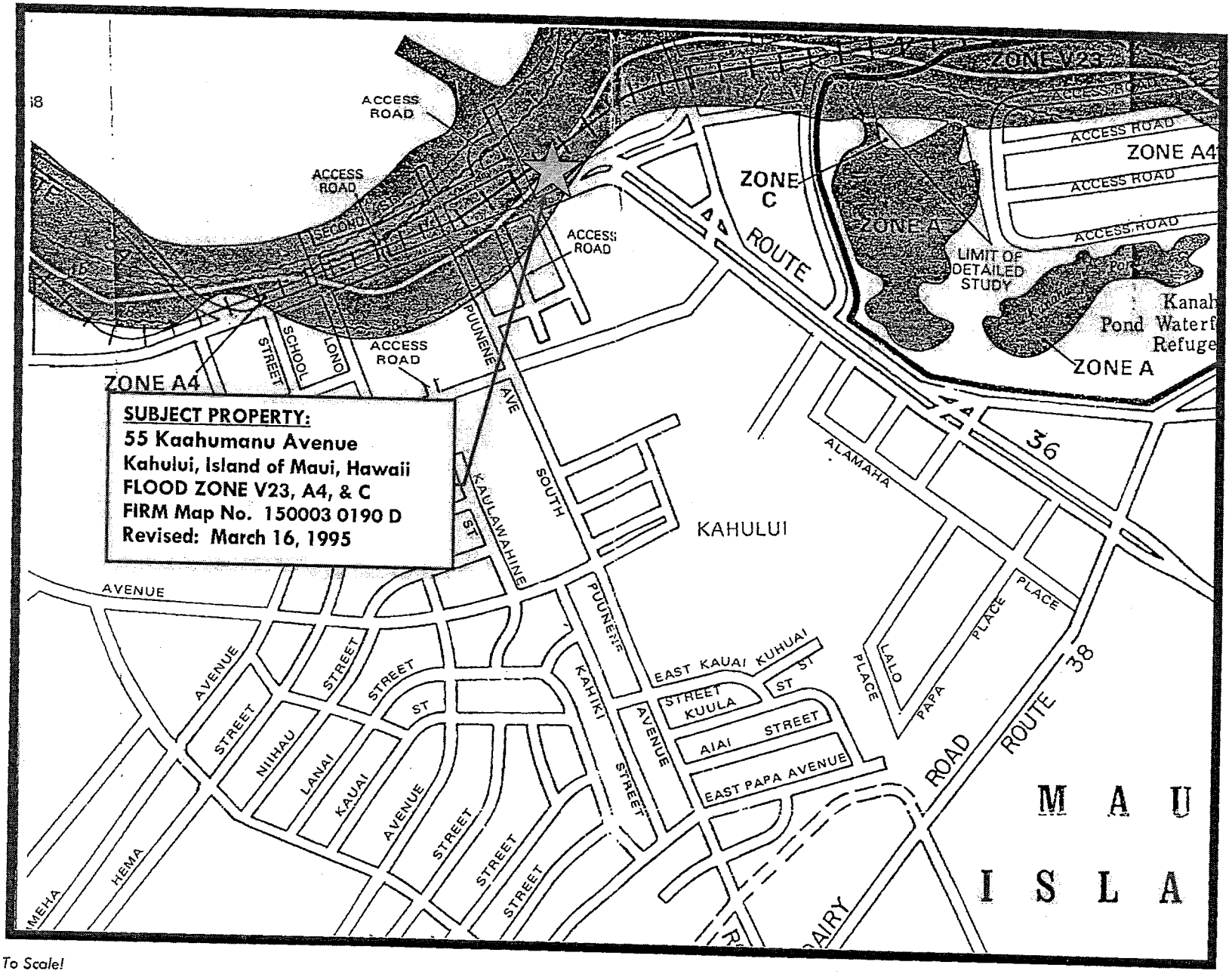


Not To Scale!

TAX MAP KEY

55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.



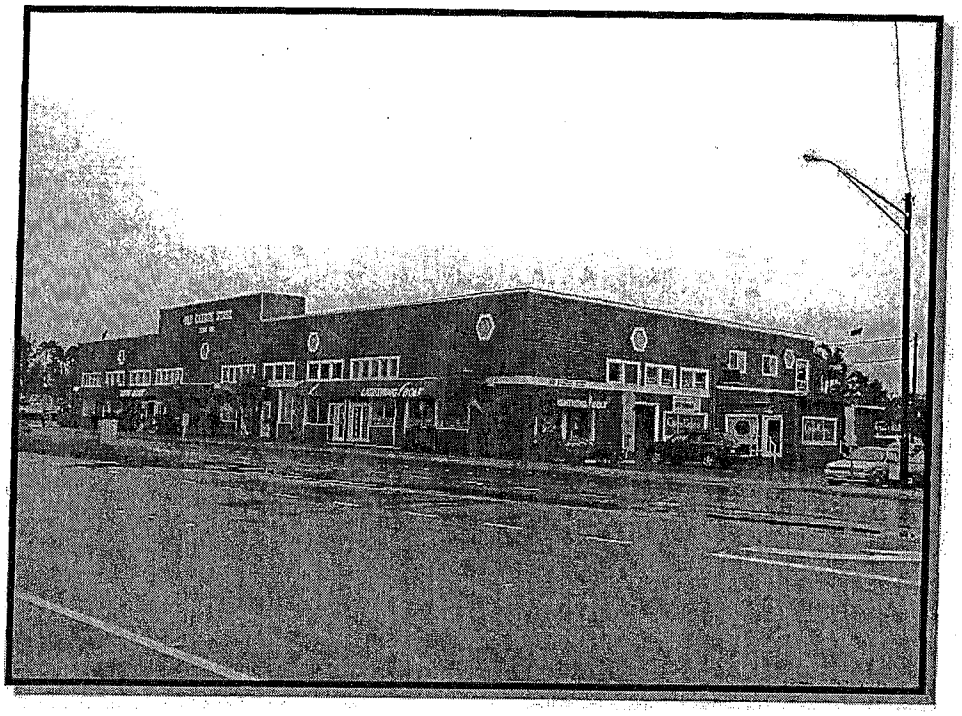
SUBJECT PROPERTY:
55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii
FLOOD ZONE V23, A4, & C
FIRM Map No. 150003 0190 D
Revised: March 16, 1995

Not To Scale!

FLOOD MAP:

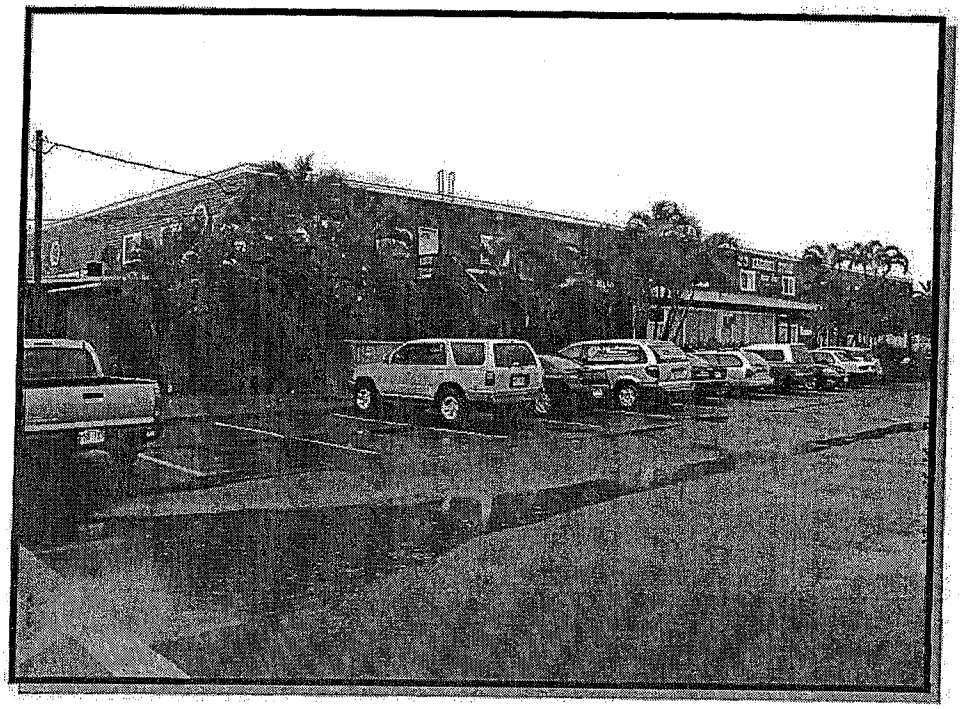
55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.



Photograph No. 1

Overall front view of subject improvements from across Kaahumanu Avenue. Camera facing westerly.



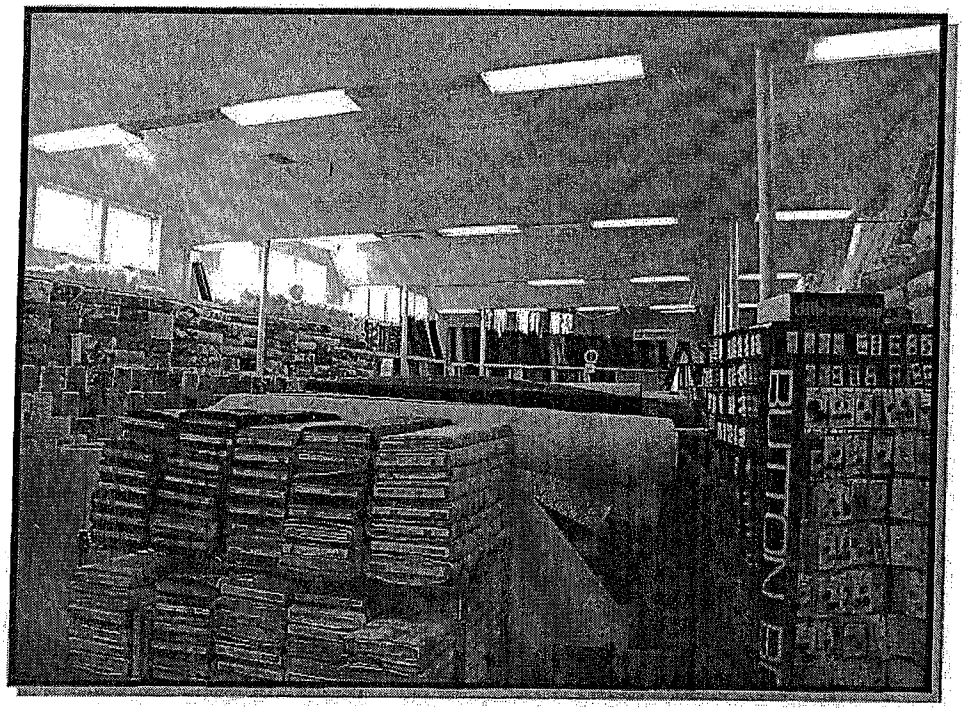
Photograph No. 2

Overall rear view of subject improvements . Camera facing southwesterly.

PHOTOGRAPHS OF THE SUBJECT

55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.
July 2005



Photograph No. 3

Interior view of Units D, E and F occupied by Fabric Mart.

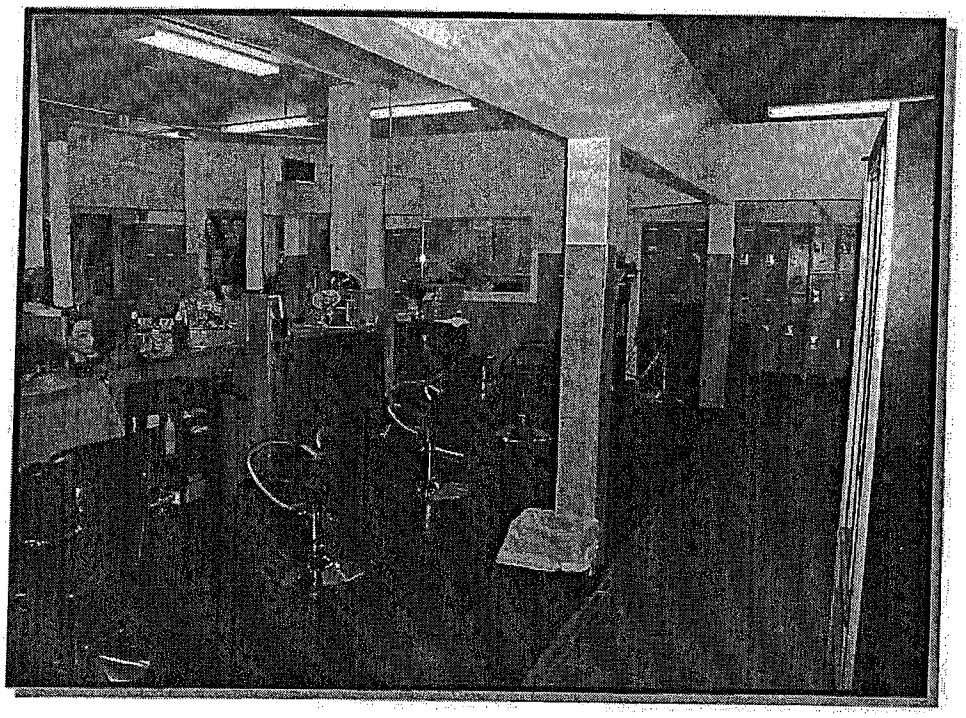
Photograph No. 4

Interior view of Unit B occupied by Lightning Bolt.

PHOTOGRAPHS OF THE SUBJECT

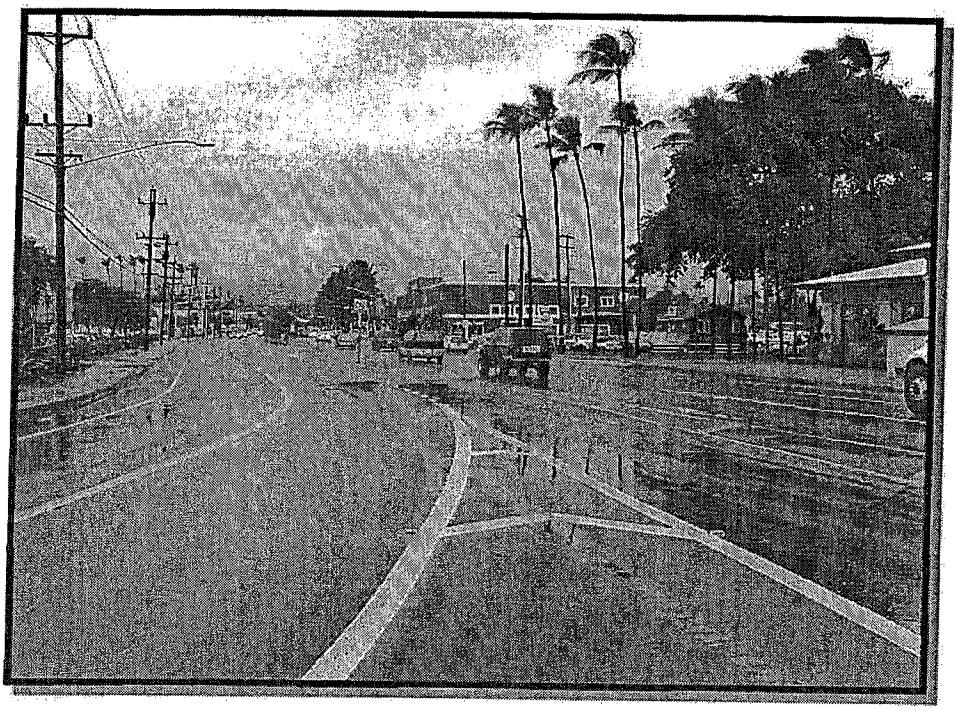
55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.
July 2005



Photograph No. 5

Interior view of Island Beauty Supply.



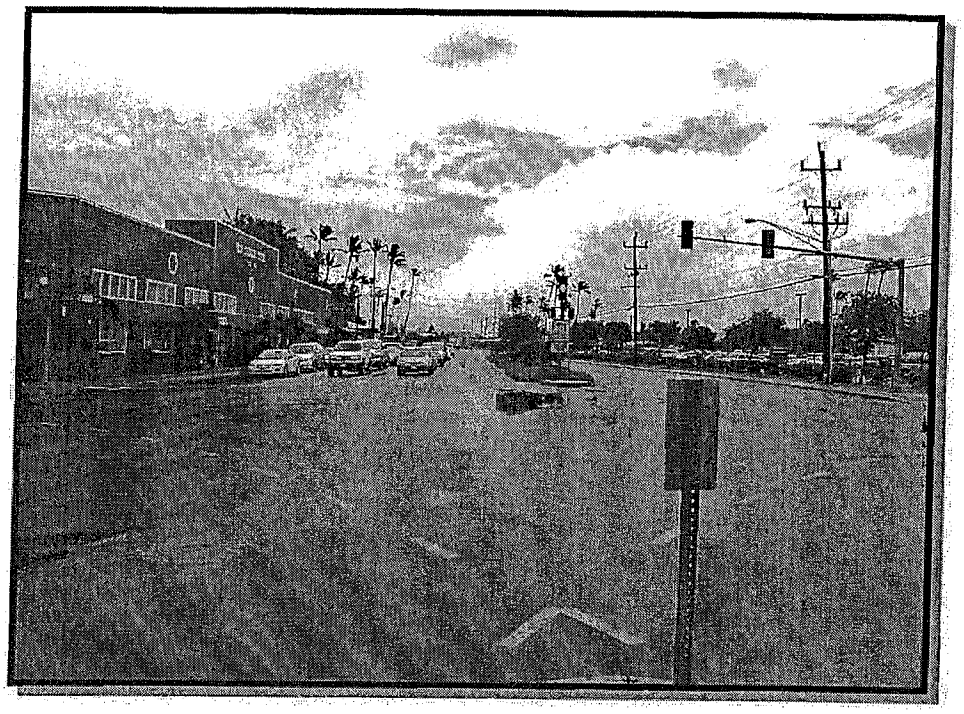
Photograph No. 6

View of Kaahumanu Avenue with subject at right of photo.

PHOTOGRAPHS OF THE SUBJECT

55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.
July 2005



Photograph No. 7

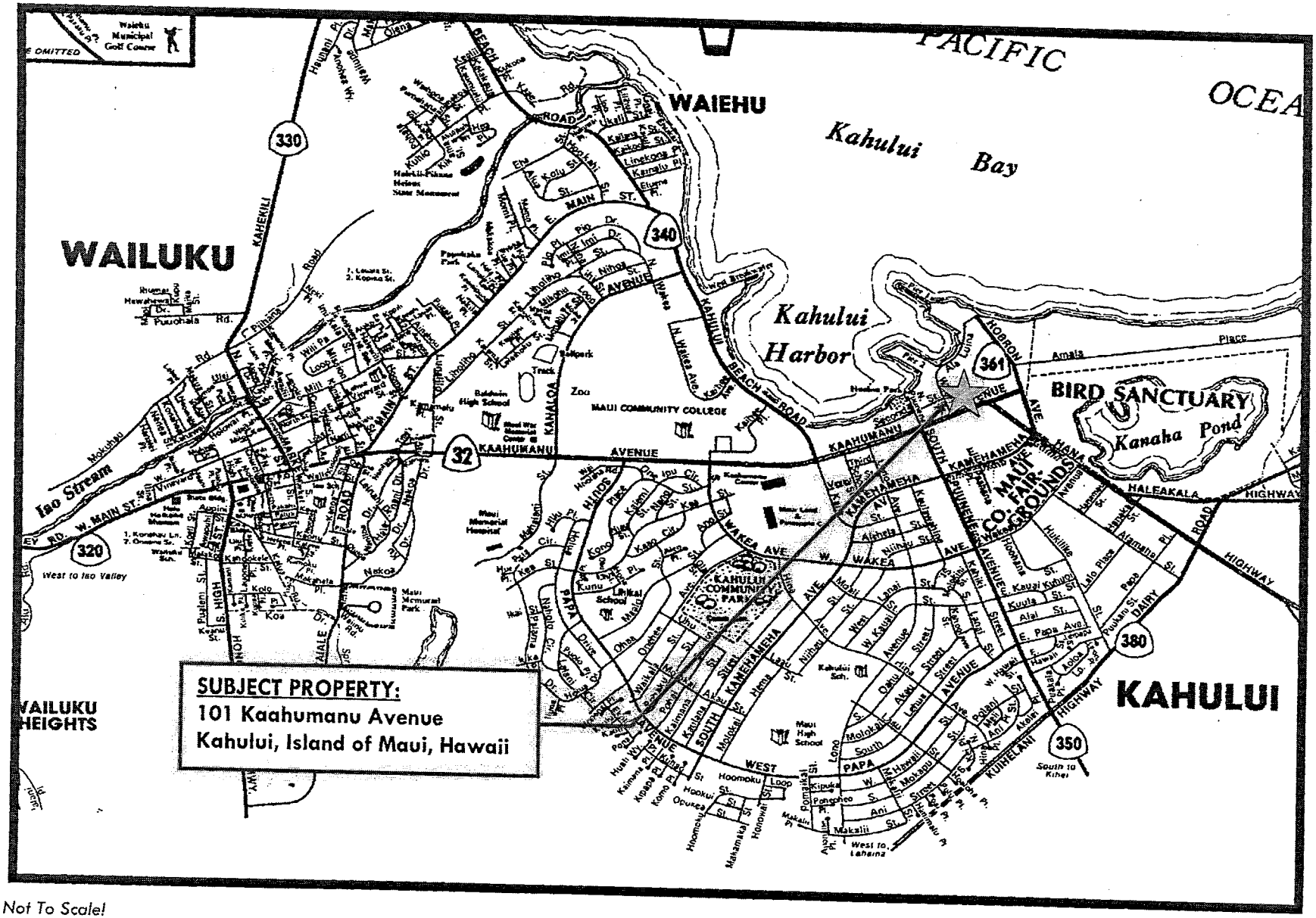
View of Kaahumanu Avenue with subject at left of photo.

Photograph No. 8

PHOTOGRAPHS OF THE SUBJECT

55 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.
July 2005

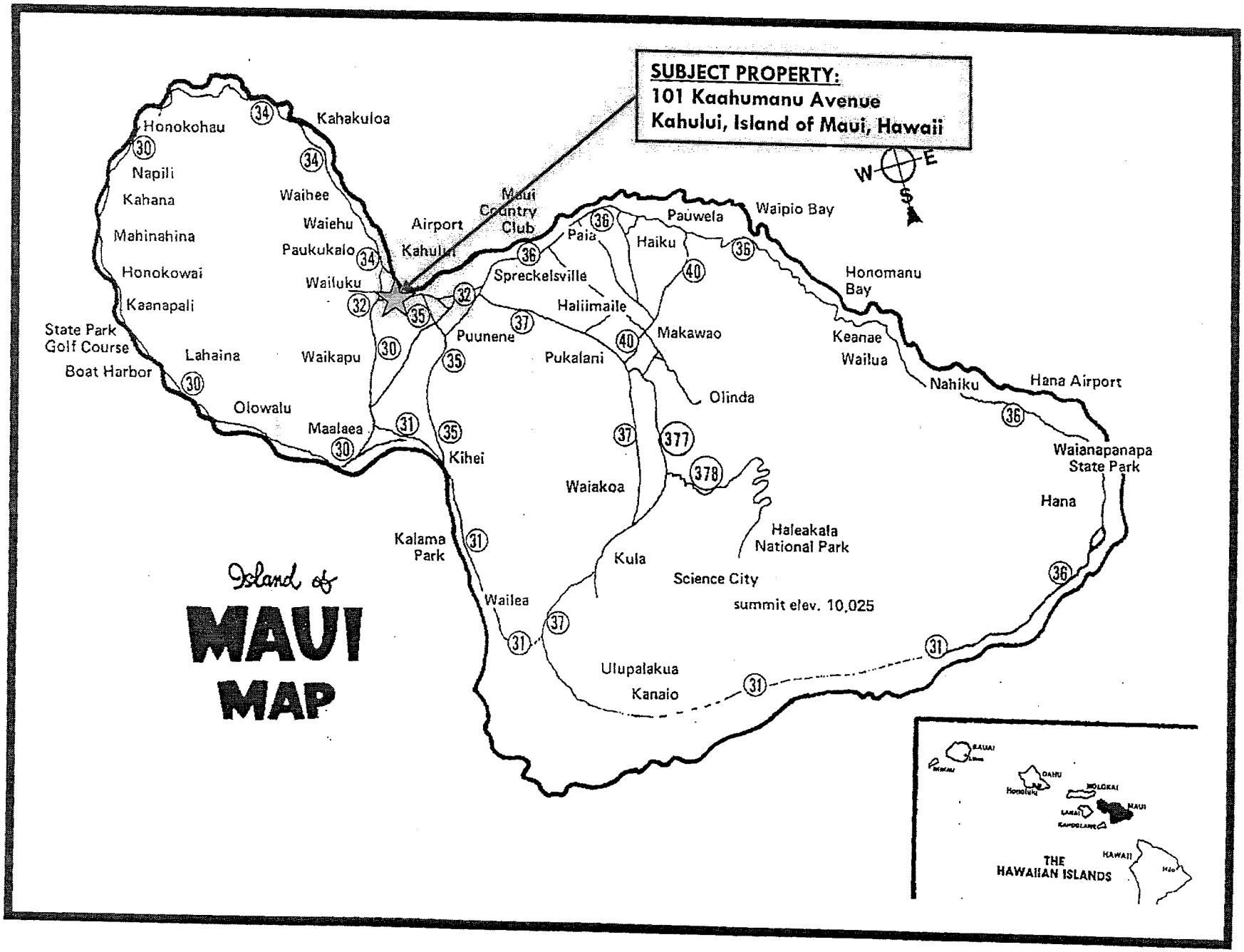


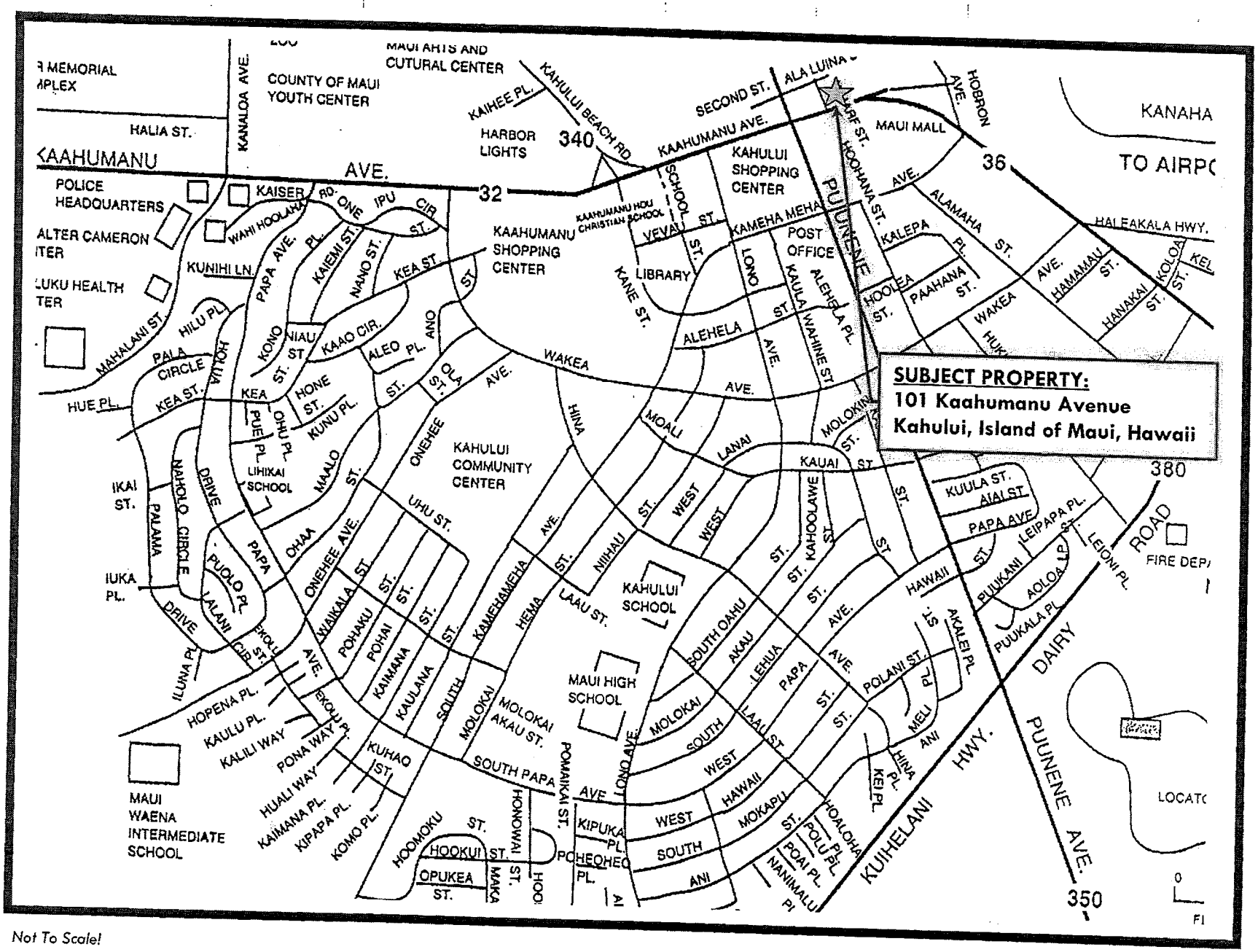
Not To Scale!

LOCATION MAP

101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.


SUBJECT PROPERTY:
101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii
W
E
S
Island of
MAUI
MAP
Honokohau
Napili
Kahana
Mahinahina
Honokowai
Kaanapali
State Park
Golf Course
Boat Harbor
Lahaina
Olowalu
Kahakuloa
Waihee
Waiehu
Paukukalo
Wailuku
Waikapu
Maalaea
Airport
Kahului
Maui
Country
Club
Kihei
Kalama
Park
Wailea
Paia
Spreckelsville
Haliimaile
Puunene
Pukalani
Pauwela
Haiku
Waipio Bay
Honomanu
Bay
Keanae
Wailua
Nahiku
Hana Airport
Waianapanapa
State Park
Hana
Makawao
Olinda
Waiakoa
Kula
Haleakala
National Park
Science City
summit elev. 10,025
Ulupalakua
Kanaio
THE
HAWAIIAN ISLANDS

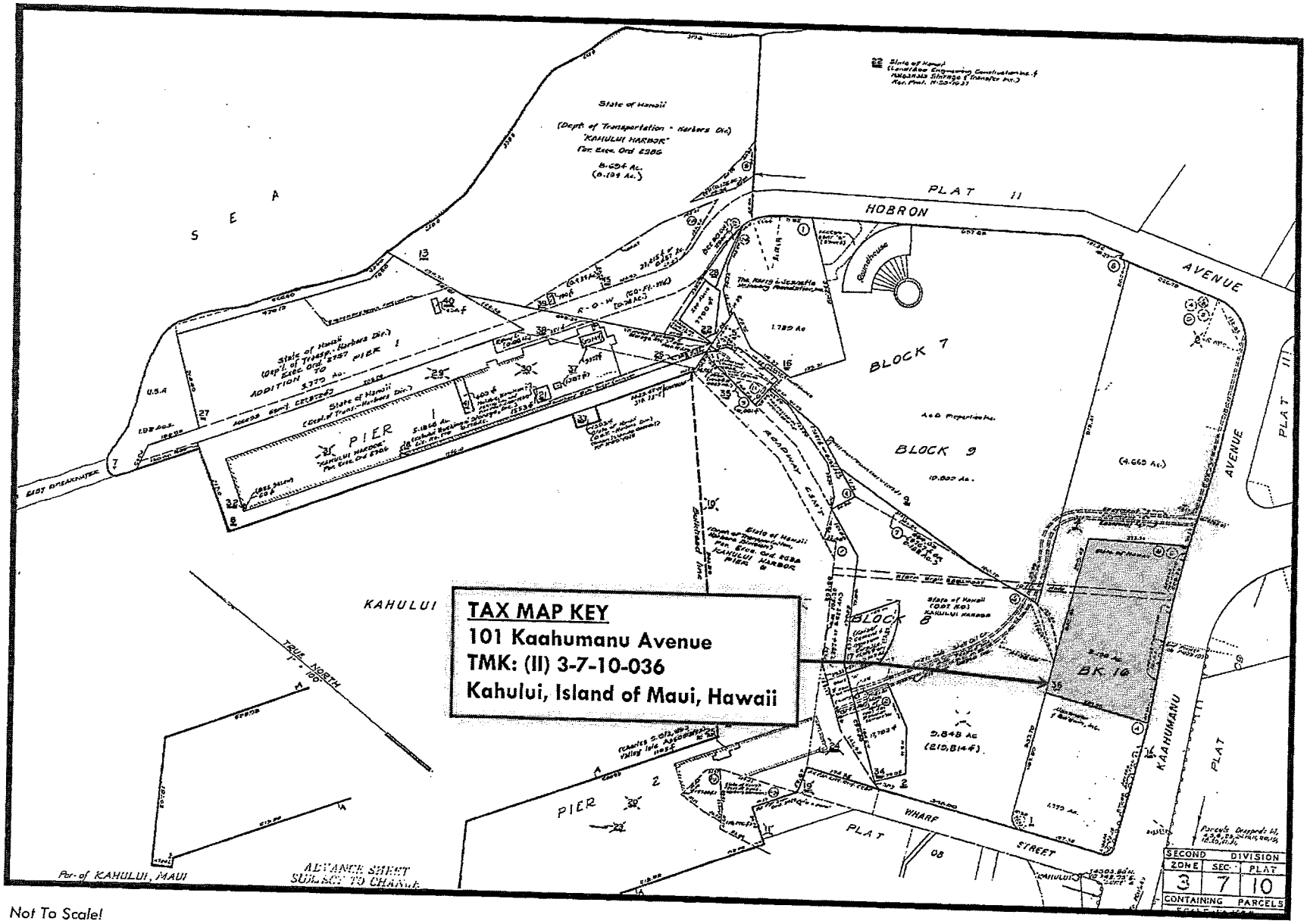


Not To Scale!

NEIGHBORHOOD MAP

101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

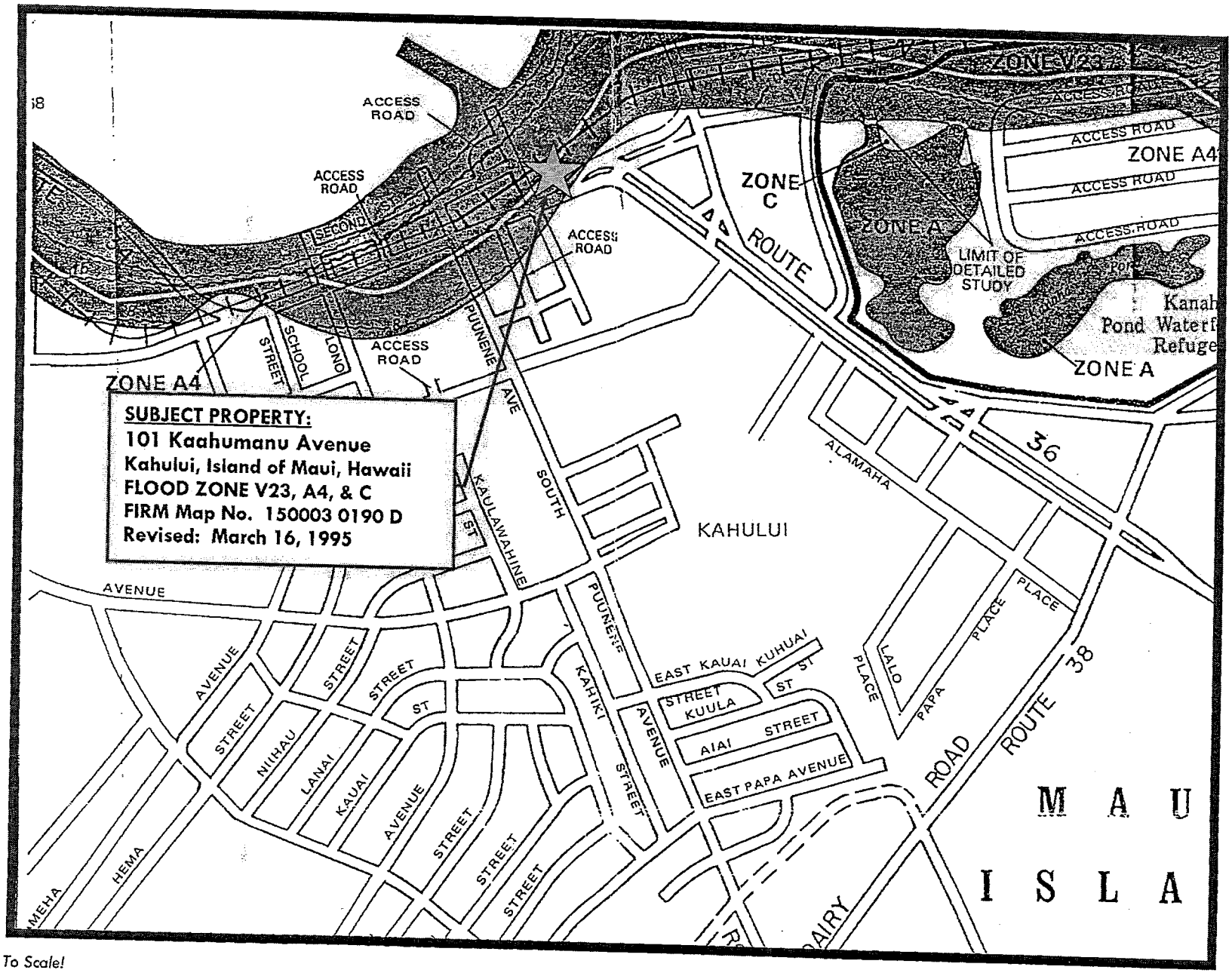
ACM Consultants, Inc.



Not To Scale!

TAX MAP KEY
101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

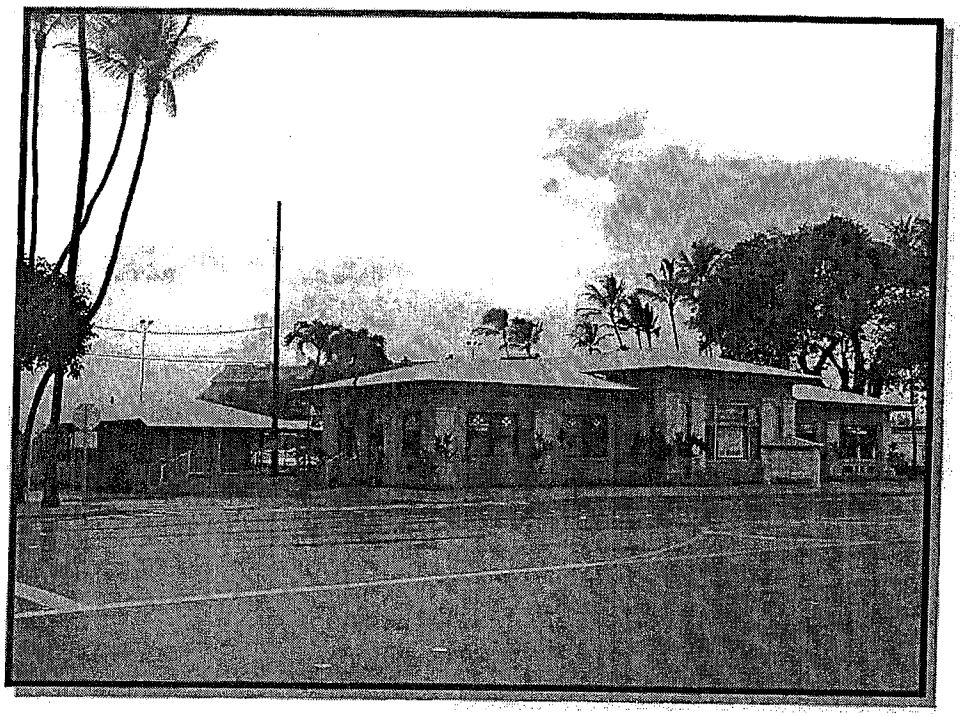
ACM Consultants, Inc.



Not To Scale!

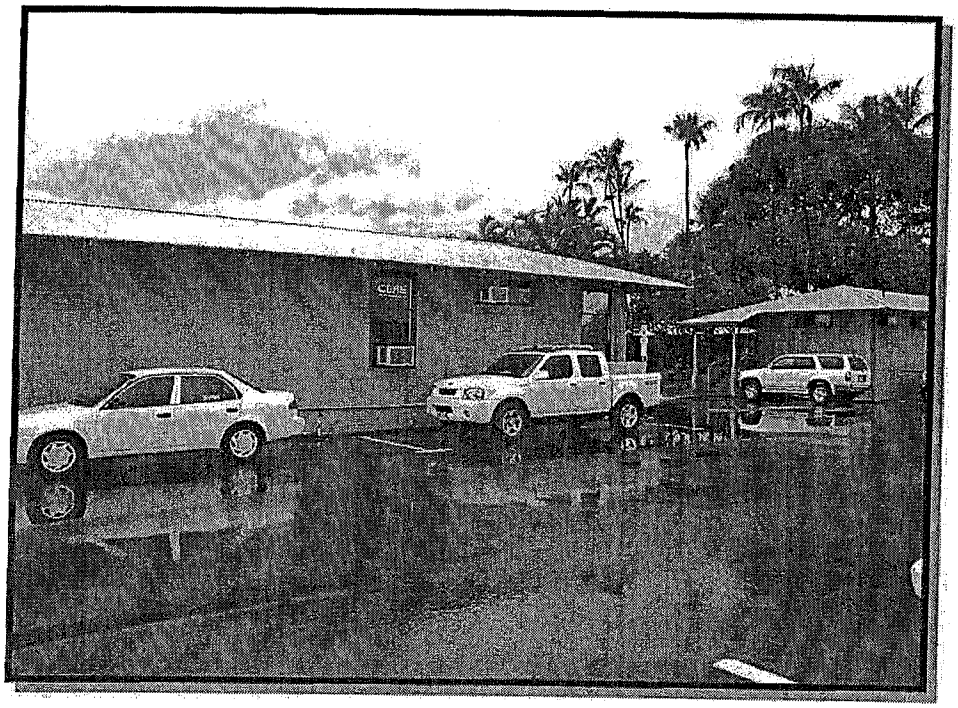
FLOOD MAP:
101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.



Photograph No. 1

Overall front view of subject improvements from across Kaahumanu Avenue. Camera facing northerly.



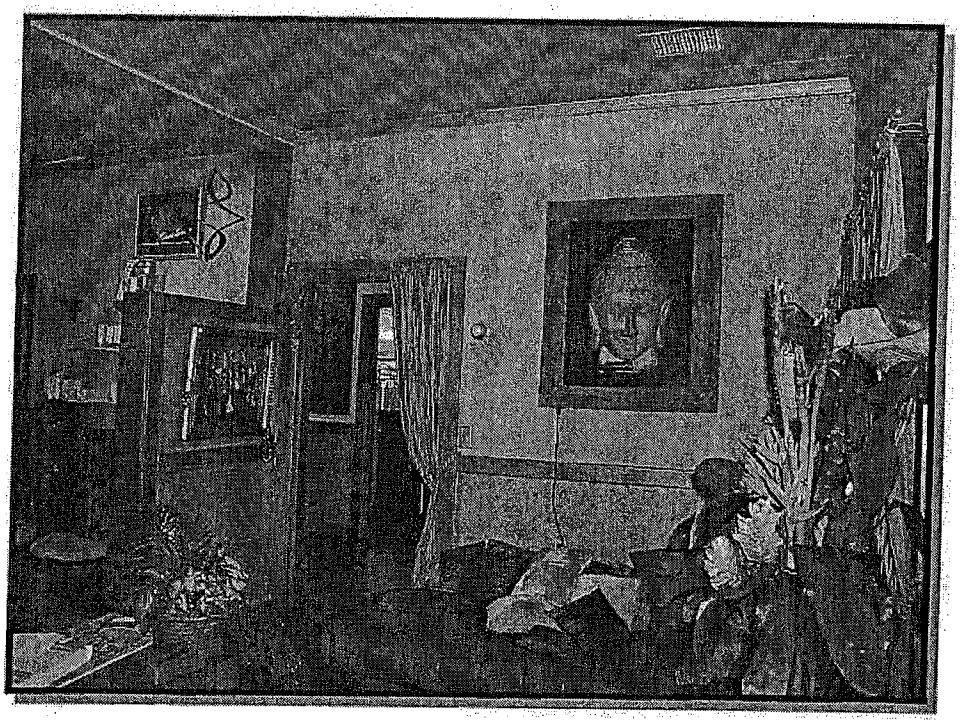
Photograph No. 2

Overall rear view of subject improvements . Camera facing southwesterly.

PHOTOGRAPHS OF THE SUBJECT

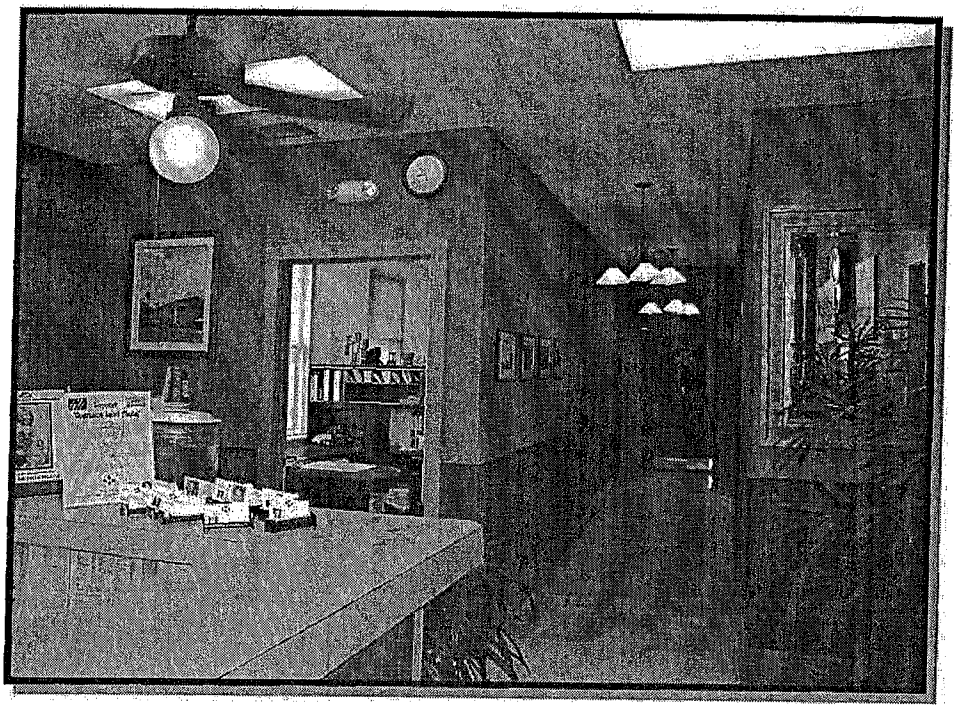
101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.
July 2005



Photograph No. 3

Interior view of Unit A in Building A occupied by Carl Incerto.



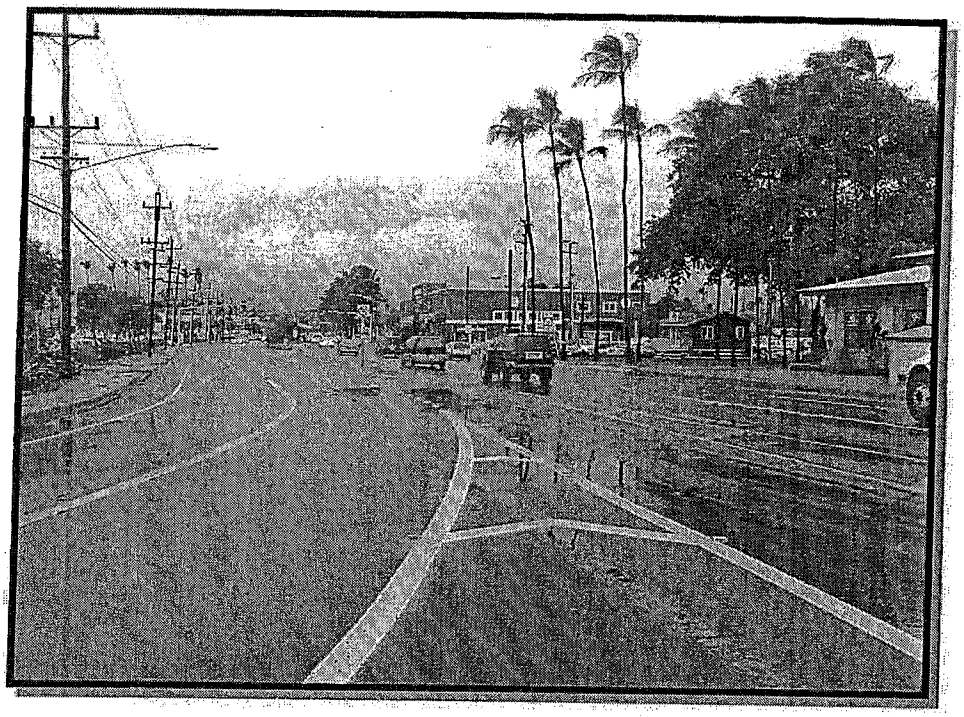
Photograph No. 4

Interior view of Units B and C in Building A occupied by Four Star Mortgage Corp.

PHOTOGRAPHS OF THE SUBJECT

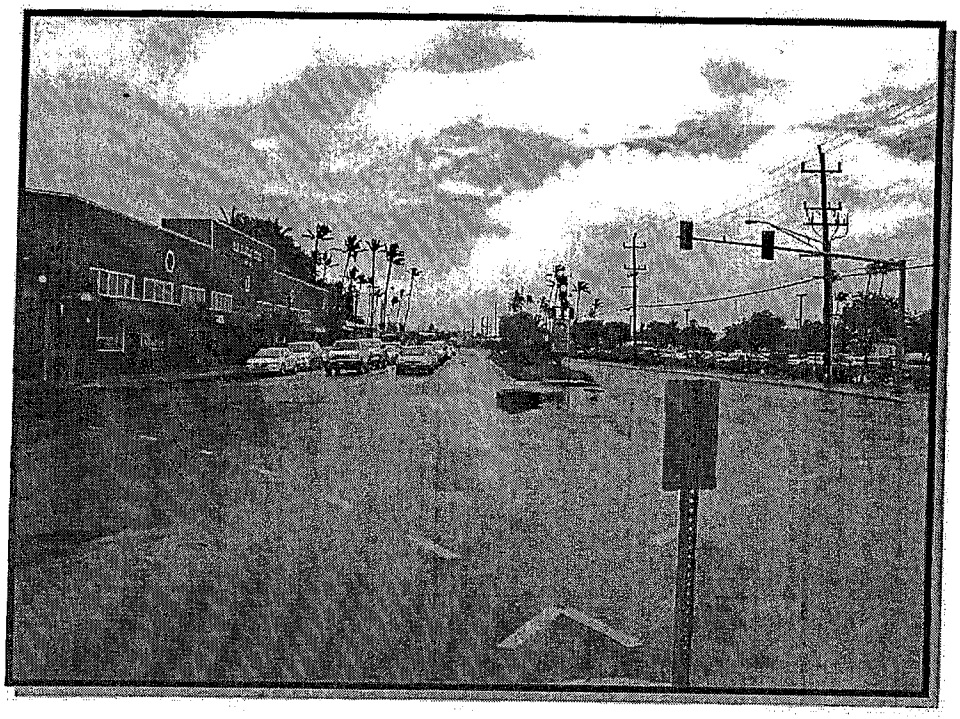
101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

ACM Consultants, Inc.
July 2005



Photograph No. 5

View of Kaahumanu Avenue with subject at right of photo.



Photograph No. 6

View of Kaahumanu Avenue with subject at left of photo (out of view).

PHOTOGRAPHS OF THE SUBJECT

101 Kaahumanu Avenue
Kahului, Island of Maui, Hawaii

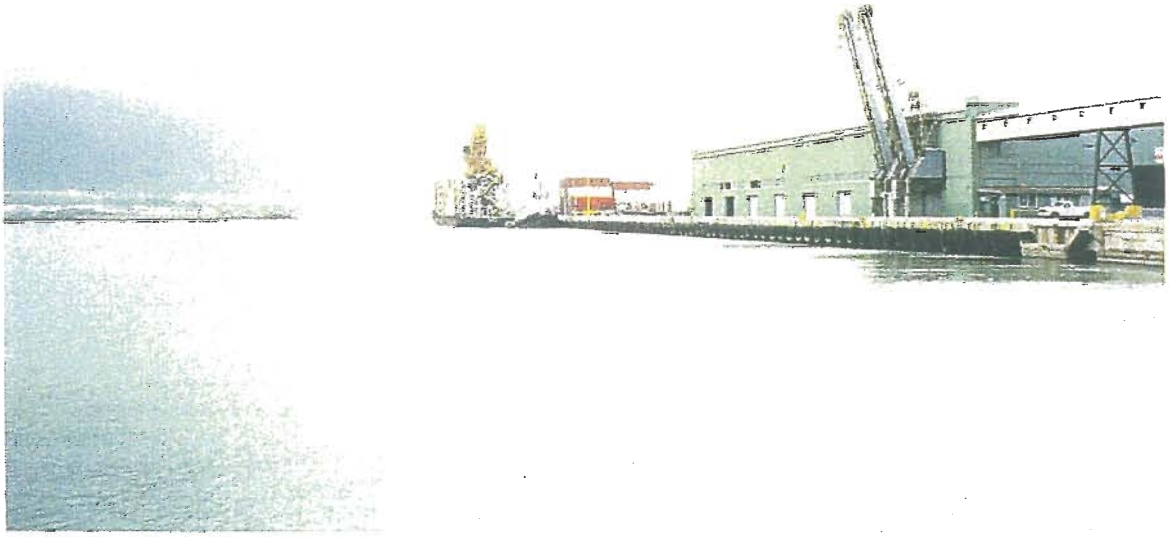
ACM Consultants, Inc.
July 2005

APPENDIX B

ARCHAEOLOGICAL AND CULTURAL IMPACT ASSESSMENT OF CULTURAL RESOURCES AT KAHULUI HARBOR

Archaeological and Cultural Impact Assessment of Cultural Resources at Kahului Harbor

TMK: 3-7-01:21,22, 3-7-10:2,3,6,13,15,21,22,24,26,27,28,30,32,34 & 3-7-08:2,3,4 & 6



by
David J. Welch
Amanda A. Morgan
Coral M. Magnuson
and
Usha K. Prasad

INTERNATIONAL ARCHAEOLOGICAL RESEARCH INSTITUTE, INC.

April 2004

IARII 200216

ARCHAEOLOGICAL AND CULTURAL IMPACT ASSESSMENT OF CULTURAL RESOURCES AT KAHULUI HARBOR

TMK: 3-7-01:21,22, 3-7-10:2,3,6,13,15,21,22,24,26,27,28,30,32,34
& 3-7-08:2,3,4 & 6

by
David J. Welch, Ph.D.
Amanda A. Morgan, M.A.
Coral M. Magnuson, M.A.
International Archaeological Research Institute, Inc.

and
Usha K. Prasad, Ph.D.
Social Research Pacific, Inc.

Prepared for
Edward K. Noda and Associates, Inc.
615 Pi'ikoi Street, Suite 300
Honolulu, Hawai'i 96814

International Archaeological Research Institute, Inc.
2081 Young Street
Honolulu, Hawai'i 96826

April 2004

EXECUTIVE SUMMARY

The State of Hawai'i Department of Transportation Harbors Division has proposed in its Kahului Commercial Harbor 2025 Master Plan a number of improvements to Kahului Harbor at Kahului, Maui. Under contract to Edward K. Noda and Associates, Inc., International Archaeological Research Institute, Inc. (IARII) has prepared an assessment of the potential impacts to cultural resources of proposed harbor improvements. IARII conducted research to identify and evaluate the significance of historic properties at and near the harbor and assess the potential effects of the harbor projects on these properties. Its sub-consultant, Social Research Pacific, Inc., conducted background research and interviews with harbor user groups and Native Hawaiian elders and cultural practitioners to identify traditional cultural practices at the harbor and assess the impact of the harbor improvements to any traditional activities.

Through a review of previous archaeological reports, files at the State Historic Preservation Division (SHPD), and consultations with SHPD staff, IARII identified two recorded historic properties within or near Kahului Harbor. The SHPD has designated Kahului Harbor itself as a historic property (Site 2953). Following detailed archival research concerning the history of the harbor, IARII concluded that the harbor piers and associated features dating to the 1920s should be considered eligible for inclusion in the National Register of Historic Places (NRHP) based on their association with the broad patterns of Kahului history. The development of the harbor was clearly crucial to the development of Kahului as the largest town on the island. However, because the wharves and building sheds are typical of neighbor island harbor facilities and not unique or special, the site is not considered significant for its architectural qualities. While no archaeological sites have been identified in the harbor area, the presence of former beach and backbeach sand deposits beneath portions of the harbor fill and the recovery of cultural materials during previous archaeological testing indicate that there is the potential for the presence of subsurface archaeological deposits and human burials.

Kahului Harbor also falls within or adjacent to the proposed Kahului Historic District (Site 1607). Three historic buildings, the Kahului Railroad office, shop and roundhouse, listed as contributing elements to this District, are located near the harbor. It was determined that improvements to the harbor will not have a significant adverse impact on the architectural characteristics of these buildings or the visual integrity of the buildings and the District.

The cultural impact assessment determined that only the extensions of Piers 1 and 2 would have any impact on groups using the harbor. These would include short-term interruptions of activities during construction. The extension of Pier 2C would result in the loss of two or three canoe lanes used by the harbor canoe groups, but this will not significantly affect their activities, according to most members. The negative impact will be offset in part by the added protection the new pier extension will provide to inexperienced paddlers. Continuing tenant-user meetings will maintain communications between the Harbors Division and canoe groups and insure that they are informed as the projects are implemented.

It is recommended that, with SHPD concurrence, there be an assessment of no significant adverse impact to cultural resources as a result of the implementation of these improvements, with the provision that archaeological monitoring be conducted of disturbance to any areas where there is a potential for subsurface cultural deposits.

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7. Canoe being carried to the beach at Kahului, 1970s 58

I. INTRODUCTION

At the request of Edward K. Noda and Associates, Inc. (EKNA), International Archaeological Research Institute, Inc. (IARII) has prepared this assessment of cultural resources at Kahului Harbor, Kahului, Maui. IARII undertook a background literature review, inventory, and evaluation of historic properties (archaeological resources and historic structures) in the Kahului Harbor area and assessed the potential for as yet undiscovered archaeological resources. Its subconsultant for this project, Social Research Pacific, Inc. (SRP), conducted a study of traditional native Hawaiian cultural places and practices at the harbor and prepared a cultural impact assessment of harbor improvements on these practices and on current uses of the harbor by Hawaiian and other user groups.

These assessments were conducted in connection with preparation of an Environmental Assessment (EA) by EKNA to evaluate the potential environmental effects of several improvements planned for Kahului Harbor under the Kahului Commercial Harbor 2025 Master Plan (Harbors Division 2000). IARII's and SRP's research efforts are presented jointly in this report. This report provides assessments of cultural resources, both historic properties and traditional places and practices, at the harbor and of the potential impact of the proposed projects; and it proposes measures to mitigate any adverse effects.

DEFINITION OF PROJECT

The Kahului Commercial Harbor 2025 Master Plan recommends a number of proposed projects to improve the harbor facilities over the next 25 years. The EA being prepared by EKNA will assess the following improvement projects:

1. extension of Pier 1;
2. construction of Pier 1 comfort stations, water line and sewer line;
3. expansion of Pier 3;
4. construction of a new Pier 4;
5. extension of Pier 2C, to include a passenger terminal;
6. structural paving, construction of access bridge, and installation of utilities at Pu'unēnē Yard.

GEOGRAPHIC LOCATION

Kahului Commercial Harbor is one of ten state-managed commercial harbors in Hawai'i. It is located along the north shore of the island of Maui at the end of the isthmus that lies between the West Maui Mountains and Haleakalā Crater, the two volcanic land masses that comprise the island (Fig. 1). The harbor lies in Kahului Bay, a large indention in the north coastline. Kahului, the largest town and most important commercial center on the island, is inland of the bay. Behind Kahului, sugar cane fields stretch across the entire isthmus to Ma'alaea Bay on the south shore. To the east at the base of Haleakalā lie coastal sand dunes and Kahului Airport, the major airport on the island, with sugar cane fields

stretching up the lower slopes of the mountain behind the airport. To the west is Maui's capital, Wailuku, sitting at the base of the West Maui Mountains.

Kahului Harbor falls within the *ahupua'a* of Wailuku, the largest of the traditional Hawaiian land units that form Wailuku District. This *ahupua'a* stretches from the West Maui Mountains eastward across much of the northern part of the isthmus and ends at the coast, east of Kahului Airport.

Kahului Bay, ringed by sand beaches and sand dunes, forms a natural, partially protected anchorage for ships stopping at Maui. Throughout the 19th century, however, Lahaina remained the main port of call. Then, early in the 20th century, with the filling of some of the coastal land to provide the foundation for harbor structures, the construction of a breakwater into the bay to further protect the anchorage from strong northeastern currents, and the building of piers and wharfs that could accommodate larger ships, Kahului Harbor became the major port on the island and has remained so until the present.

At present, Kahului Harbor has three piers (Fig. 2), all of which provide berths for the vessels that supply vital services and goods for the residents of Maui. Pier 1 also accommodates large cruise vessels carrying international and inter-island passengers.

PROJECT OBJECTIVES AND METHODS

This project involves identification and evaluation of two categories of cultural resources: historic properties and traditional cultural places and practices. The purpose of the project is to identify from historical documentation, previous archaeological research, interviews with native Hawaiians and harbor user group, and a survey of the project area the cultural resources that are present or potentially present, evaluate the significance of these resources, and determine the potential for significant effects to these resources as a result of the proposed projects.

This evaluation is being conducted to meet the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, which requires federal agencies to consider the effects of any undertaking on significant cultural resources. Significant historic properties are those cultural resources that are potentially eligible or determined to be eligible for nomination to the National Register of Historic Places (NRHP), based on the criteria of 36 CFR Part 64, the federal regulations implementing the National Historic Preservation Act (NHPA) or to the State of Hawai'i Register of Historic Places (HRHP), based on the criteria set out in Chapter 343, Hawaii Revised Statutes (HRS). A significant environmental effect is any action that would adversely affect those qualities that make a cultural resource eligible for the NRHP or HRHP.

The cultural impact assessment study was completed to meet Section 106 Consultation requirements of the NHPA (under 36 CFR 800). It also aimed to satisfy the Hawaii State Historic Preservation Division's (SHPD) request for conducting cultural impact assessments. The proposed project aims to meet the goals of the Hawaii State Plan, Chapter 226—Socio-Cultural Advancement in HRS Section 225-20-21; 23-27, of the Hawaii Revised Statues.

Historical and archaeological research previously conducted by IARII and the cultural impact assessment prepared by SRP for the Kahului Airport Improvement environmental impact statement (EIS) provided a baseline of information for the current study. Additional background research for the harbor area involved a search for documents and maps at the University of Hawai'i Hamilton Library Pacific Collection, the Bishop Museum library and archives, the State of Hawai'i Archives, State Survey Office,

Hawaiian Mission Children's Society Library, and the Hawaiian Historical Society, and newspaper articles at the State Library. Reports of archaeological studies in the SHPD library were reviewed.

The IARII archaeologist conducted a one day field visit to Maui, which included survey of the harbor area, recording of the condition of historic buildings near the harbor, and brief archival research at the Maui Historical Society (Bailey Museum) archives in Wailuku.

The SRP oral historian conducting the cultural impact study made several visits to Maui to interview native Hawaiian informants and individuals and organizations who use the harbor. During these visits archival research was conducted at the Maui Historical Society and the Maui News.

ORGANIZATION OF THE REPORT

This report first reviews the traditional oral history of the Kahului Bay area and then the history of the harbor itself from historical sources that document its inception and development, and its importance for the historical development of Kahului and Maui as a whole. This section (Chapter II) provides a historic context in which the importance of the material cultural remains of the Kahului area (the archaeological resources and historic structures), their role and history, and their significance as potential historic properties can be defined and evaluated.

Chapter III reviews the previous research on the historic cultural resources at Kahului Harbor and the nearby region and the results of that research. This summary provides a basis for assessing the potential for buried archaeological sites in the harbor area.

Chapter IV presents SRP's cultural impact study, in which information on traditional land use was gathered from written sources and oral interviews with fishermen and Hawaiian *kūpuna* who have previously used or currently use the project area. The primary emphasis is on interviews with current users of the project area.

Chapter V provides an assessment of the significant cultural resources identified at Kahului Harbor and the potential for discovery of as yet unidentified resources (the Affected Environment) and evaluates the potential impact of the projects on these resources (Environmental Consequences). Measures to mitigate these potential adverse effects are proposed.

Chapter V also summarizes potential cultural impacts from the projects, as well as comments and suggestions offered by user groups, in the context of the state Environmental Council's guidelines for cultural impact assessments and the Hawai'i State Plan for Socio-Cultural Advancement. Based on the interviews, recommendations to minimize the effects of the planned project are offered.

II. KAHULUI HARBOR—HISTORICAL BACKGROUND

During the traditional era, Kahului Bay formed part of Maui's prosperous Na Wai 'Eha region; today it is the site of Hawai'i's second-most-important industrial port. Kahului Harbor's development could be seen as the story of how two key Territorial-era industries, transportation and plantation agriculture, brought each other to prosperity. The port's most rapid expansion took place during the first three decades of the 20th century, but it continues to play a part in Maui's commercial and industrial growth.

During the reign of Kauikeaouli, Kamehameha III, a village of 26 pili grass houses graced the Kahului shoreline. A century and a decade later, a showcase of post-World War II urban planning spread inland from the same shore. Through tidal wave, plague, fire, political upheaval, industrialization, and spasms of civic improvement, Kahului was frequently and energetically reborn. Throughout the process, but especially from 1900-1931, town fathers doggedly built up the harbor—each milestone (a new wharf, a deeper channel) celebrated with one anxious eye on the next pressing need.

Kahului, dwarfed by its neighbor Wailuku and long outshone as a port by Lahaina, grew in the 20th century into the second most important harbor in the Hawaiian Islands, with a port infrastructure that sometimes surpassed even Honolulu's in sophistication. One could see that process as the result of tidal forces of industrial growth, but one could almost as easily see it as the brainchild of one man—Henry Perrine Baldwin, key owner of the Hawaiian Commercial and Sugar Company and its subsidiary, the Kahului Railroad Company. The railroad funded the first 10 years of intensive harbor construction, and was one of the main government contractors thereafter. The company also owned much of the land under Kahului town and kept a firm grip on its development.

BEFORE SUGAR

Written sources leave behind little more than random snapshots of the traditional Hawaiian era and the early years of foreign contact. Kahului—whose name probably means "the winning"[1] (Pukui et al. 1974:67)—is located on the north coast of the Wailuku *ahupua'a* on the Maui isthmus. Its once dry and sandy hinterlands merged toward the northwest with an extraordinarily fertile area traditionally called Na Wai 'Eha or "the four waters," after four streams of windward West Maui: Waikapū, Wailuku, Waiehu, and Waihe'e (Handy and Handy 1972:496).

Na Wai 'Eha was one of Maui's most productive agricultural areas and home to one of its two major population centers. The bay was a rich source of seafood, with a major fishpond—actually two adjacent ponds, named Kanahā and Mau'oni—near its eastern shore. The Kahului shore was once lined with coconut trees (Tomonari-Tuggle and Welch 1995:13).

The area around Kahului Harbor was likely a Hawaiian settlement during prehistoric times, probably a village primarily of fishermen who would have used the shore of the bay to launch their fishing canoes and collect shellfish from the coastal flats. This way of life continued into the early historic

[1] "Winning" here probably carries the sense of "prize" or "spoils," not of the act of victory itself.

period. Based on the account of a native Hawaiian of "considerable age," a writer at the turn of the century described the area (*Paradise of the Pacific*, September 1900, in Silva n.d.:10):

> The shores of Kahului harbor, from Waihee Point to Haiku, were surrounded with the grass huts of the fishermen and of those connected with the innumerable war canoes of the king. Myriads of cocoanut trees lined the beach from Kahakuloa to Wailuku.

Archaeological sites uncovered near Kahului Harbor support this documentation. Cultural deposits (Sites 3119, 3120, 5070) and buried human remains (Sites 3139, 3120, 4211, 5071, 4211) have been found within the beach sand.

Each of the four regions of Na Wai 'Eha had its own special breeze; Wailuku's was named Makani-lawe-malie or "the wind that takes it easy" (Sterling 1998:62). The names of the four streams that define the region are said to have less peaceful meanings, recalling past battles. One of the meanings attributed to Wailuku is "water of destruction," after a legendary battle where men fought with owls (Sterling 1998:63, 74).

Around 1781 chief Kahekili of Maui (who had a residence, Kalanihale, at Wailuku) was attacked by the Big Island chief Kalaniopu'u, whose forces pushed north from Mā'alea Bay on Maui's south shore, but were repulsed at Wailuku.

As tensions rose before the invasion, both chiefs had built *heiau* (temples) to enlist their war gods' support. Kalaniopu'u relied on crack troops called the Alapa and Pi'ipi'i, and Kahekili commanded "chiefs, fighting men, and left-handed warriors whose slingshots missed not a hair of the head or a blade of grass." Kalaniopu'u's men took heavy casualties in two stunning defeats—both likened to schools of mullet being lured or chased into a pond—before he gave up the invasion (Kamakau 1992:85-87).

Nine years later an even more famous attack on Kahekili—led by Kamehameha the Great, who had begun his campaign to consolidate the islands under his own rule—began with a landing at Kahului. Kamehameha's huge fleet of war canoes, some with swivel guns mounted, is said to have filled the bay. A cannon named Lopaka and two trusted foreign advisors, John Young and Isaac Davis, were key to Kamehameha's victory; "[h]ad they fought face-to-face and hand-to-hand, as was the custom," Kamakau asserts (1992:148), "they would have been equally matched." Two days of fierce fighting later, Kamehameha had chased Kahekili's troops up 'Īao Valley to defeat. The valley's red-stained waters became choked with the bodies of fallen warriors; the battle is remembered as Kepaniwai or "the damming of the waters" (Sterling 1998:81, Speakman 1987:53, Clark 1989:7, Bartholomew 1994:5, Kamakau 1992:148-149). "There was great slaughter, but mostly among commoners," Kamakau (1992:148) remarks of the battle. It was a rout for the Maui king, but not a permanent one. Kamehameha would have to fight for Maui again.

Early in the 19th century those wars ended and by mid-century Maui was already home to a handful of foreigners. But a visitor touring the isthmus' north shore on his way to Haleakalā (Gorham 1843:16) could still pick out the site of old battles by the scattered bones and skulls visible on the surface—remnants, he believed, of Kamehameha's campaign.

The lush region was the setting for scenes not only of war but of peace and reconciliation. After Kalaniopu'u's 1781 defeat, there was some bickering among his court about who should be sent to sue for peace. His wife Kalola was a sister of the victorious Kahekili, but she refused to lead the peace party (Kamakau 1992:88), saying,

> It will not do any good for me to go, for we came to deal death. If we had come offering love we should have been received with affection. I can do nothing.

In the end, the elite chief Kiwala'o led the peace mission, his sacred status so high that even the troops of the winning side had to fall to the ground as he passed by. Once they reached Kahekili in Wailuku, the messengers who came with Kiwala'o begged, "grant us our lives." As Kamakau tells it, Kahekili was quick to reconcile, saying

> There is no death to be dealt out here. Let live! Let the battle cease. ... Take the fish of Kanahā and Mau'oni and the vegetable food of Nawaieha...

to the camp of the defeated where his sister waited (Kamakau 1992:88)—giving voice to his generosity in victory as well as to the natural abundance of his home region.

Kahului is also remembered as the site of a peaceful meeting between the 16th century chiefs Keawe-nui-a-'Umi of Hawai'i and Kiha-a-Pi'ilani of Maui (Kamakau 1992:42). In peaceful times, the nearby waters off Wailuku were a favorite surfing spot for the chiefs (Tomonari-Tuggle and Welch 1995:15).[2]

Just east of Kahului Harbor are the remnants of Kanahā fishpond, now a wildlife refuge. The pond may have been built as early as the 1500s with renovations in the 1700s (Tomonari-Tuggle and Welch 1995:15-16). Kanahā was separated from another fishpond, Mau'oni, by a dividing wall. The building of the ponds has been attributed to the early 16th century Maui chief Kiha-a-pi'ilani (Pukui et al. 1974:83, Sterling 1998:88)—the same chief who, with his father, Pi'ilani, is said to have built the Alaloa or long road encircling Maui (Duensing 1998:xiii). But they might also have been built by the 18th century chief Kapi'ioho'okalani (Bartholomew 1994:132, Sterling 1998:87-88).

The latter version[3] relates a stirring adventure that calls up echoes of another island's legendary warriors: King Arthur and his knights. In this case, however, the hero of the quest is a young O'ahu chiefess of high and sacred rank. Her father, Kapi'ioho'okalani, ruled O'ahu and half of Moloka'i and was related to Maui *ali'i* (royalty) as well. He began to build the fishponds but was killed in battle; the Maui king Kamehamehanui continued his work, placing a very strict *kapu* (taboo) on the dividing wall between the two ponds.

Meanwhile, the dead king's daughter, Kahamaluihi, whose home was on O'ahu, traveled to Maui to find her brother, Kanahaokalani. The sacred young chiefess traveled incognito through Maui, and had a number of adventures, including marriage, as she continued to search for her brother. When she arrived near the fishponds her dead father had begun, a crowd had gathered to greet Kamehamehanui, who was approaching in a grand procession. As the king drew near, Kahamaluihi stripped off her *pā'ū* (skirt) and stepped onto the *kapu* center wall between the fishponds. "Around her waist was flying the *pola* [flap] of a white *malo* called the *malo kea*.[4]" The crowd waited in shock to see what punishment the audacious young woman (who had still not revealed her identity) would receive. But the king recognized her and embraced her, saying "I have mourned for you; welcome, cousin," and acknowledged the high rank that

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[2] Tomonari-Tuggle and Welch cite Kamakau and I'i in giving the following names for chiefly surfing spots: Kehu, Ka'akau, Kaleholeho, Kaakau-pohaku, Paukukalo.

[3] For this version of the story, Sterling drew on 1923 interview notes in the Bishop Museum's anthropology collection. The story was given to a researcher by Puea-a-Makakanallii, Mrs. Rosalie Blaisdell, in 1923.

[4] According to Pukui and Elbert's *Hawaiian Dictionary*, the malo kea is "an epithet for a female priest enjoying masculine privileges and exemption from female taboos."

entitled her to tread on the wall where he had placed a *kapu*. Kamehamehanui invited Kahamaluihi to name the fishponds. She named the one closer to the sea Kanahā, in honor of her brother, and the one inland Mau'oni—the alias under which she had traveled in disguise.

A visitor traveling east from Wailuku in 1843 described "a small fresh or brackish water a few rods only from the sea"—possibly the remnants of Kanahā or Mau'oni. He remarked that cattle drank from it and sometimes people used the water too, as "mountain water is some miles off"; at the nearby seashore he saw fishermen at work, fish nets drying, and a few cottages (Gorham 1843:15-16).

Kanahā and Mau'oni provided Hawaiians with mullet during seasons when ocean fishing was *kapu*. The pond was fed by freshwater streams and also had an outlet to the sea; mullet were seen there into the early 1900s. Eventually, dredge materials from Kahului Harbor filled in part of the pond and blocked its outlet to the sea (Bartholomew 1994:132); sadly, by 1907 the "stench from Kanaha pond" was listed as one of the main drawbacks of Kahului's location (*Maui News* December 31, 1947:38).

Before the Europeans came, Na Wai 'Eha contained the "largest continuous region of wet taro cultivation in Hawai'i" and supported the second largest population center on Maui (Bartholomew 1994:127). This concentration of human strength and natural abundance has been suggested as one reason for Maui's success in pre-contact power struggles, greater than might be expected from the island's relative size (Duensing 1998:xiii). But as shipboard diseases swept the islands, "all areas except Lahaina were devastated" (Bartholomew 1994:28). A time-limited search of the archives turned up no details on the fate of the once-thriving Hawaiian community of Na Wai 'Eha.

In 1837 the missionary Richard Armstrong, stationed at Wailuku, described in his journal a tidal wave that wiped out a village of 26 grass houses on the Kahului shore. Strong swimming and quick thinking enabled all but two of the villagers to survive—Armstrong wrote admiringly of the rescue work he witnessed or heard about—but the villagers' homes and belongings were swept inland and smashed into a small lake, possibly Kanahā fishpond.[5]

During the mid-19th century Great Mahele,[6] the *ali'i nui* Victoria Kamāmalu was granted most of the lands around the harbor. In 1876 Kepoikai, the father of Senator A.N. Kepoikai of Wailuku, lived on the beach toward the Wailuku end and owned the fishing right at Kahului (*Maui News* March 3, 1900:2). Numerous smaller grants were parceled out farther inland and westward during the Mahele (Jackson 1881, Unknown 1881), but not within the area under study here.

Hawaiians were among the residents of the impoverished, crowded Chinatown neighborhood that was burned down during Kahului's bubonic plague scare in 1900. Other than that, the original inhabitants of this part of Na Wai 'Eha seem to have left little trace in the written records of the bustling port community that replaced them. It would be tempting to think of that 1837 grass-house village as the precursor to modern Kahului. But only a lengthy and detailed search of archival and Hawaiian-language sources could uncover whether any link between the two exists.

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[5] Armstrong's journal entry for that event was reprinted by the *Maui News* in 1937 for a today-in-history column. Given time constraints it was not possible to find the original document or journal entries for the days and weeks after the event.

[6] This was the legal process, initiated in 1845, that turned Hawai'i's traditional land system into a system of European-style fee-simple ownership.

CAPTAINS OF INDUSTRY

A Chinese man built the first sugar enterprise on Maui, a mill at Wailuku, in 1823; an early rum distillery was put out of business after missionaries complained to Hawai'i's powerful queen and regent, Ka'ahumanu (Best 1978:29). Small sugar plantations sprang up after that in the area around Kahului Bay. But it took foreign access to land ownership after the Great Mahele—and the 1876 reciprocity treaty with the United States (which guaranteed a better American market for Hawai'i sugar)—to turn the crop into a major focus of the Hawaiian economy.

Sugar cane is a thirsty crop, and its growth in the hinterlands of Kahului expanded rapidly after Claus Spreckels and Henry Baldwin acquired land and water rights and built the Hāmākua and Spreckels "ditches" to irrigate the once-arid region. For a century that gloried in industrial progress, these engineering marvels stretching across rugged, gorge-crossed terrain were monumental achievements indeed. As Osorio points out (2002:185), we know too little to say what effect this irrigation system had on the lands where the water originated and the people who lived there.

In 1878, through his friendship with King Kalākaua, Claus Spreckels secured a lease of 40,000 acres of land, among which was a portion of Wailuku *ahupua'a*. In 1882, he acquired fee simple title to all of the *ahupua'a* through Grant 3343 (Kennedy et al. 1992a:12). That same year, Spreckels founded the Hawaiian Commercial and Sugar Company (HC&S), which quickly became the largest and best-equipped sugar plantation in the islands (Kuykendall 1967:60). The Spreckelsville Mill, actually four mills in one complex, was located just to the northeast of the present Kahului Airport, near the intersection of Old Stable Road and Hana Highway.

Maui sugar growers had to move their product to market, often across similarly rugged land. Some tried to ship directly from small docks on their property, but that was a dangerous process and a number of ships were lost. The open roadstead at Lahaina offered little shelter (Bartholomew 1994:79-80). As the need for better port facilities grew, Kahului Bay began its metamorphosis into a deep-draft international harbor. The port, the sugar plantations, and the railroad helped each other grow from modest beginnings into major Maui industries.

Railroads were coming into being across the islands; Hawaiians soon invented a word for the new mode of transportation: *ka'a ahi* or "fire wagon" (Bartholomew 1994:79). Kahului Railroad built its first line from a starting point on the beach at Kahului (Best 1978:14), where the company's headquarters were also located (Clark 1989:7), to Wailuku; its first locomotive was named after Queen Emma. It was built by Thomas Hobron, a former sea captain turned merchant (Clark 1989:7), who already owned both trans-Pacific and inter-island shipping lines (Hungerford 1963:71). Even before the line to Wailuku was finished, a portion of it opened for business on Monday, July 21, 1879, the Hawaiian Gazette reported a week later, carrying 14 tons of freight and 150 passengers a day.

Within a year of its founding the railroad had built an engine house, yards and a station at Kahului; most of the construction was of wood. The terminus continued to grow rapidly (Best 1978:31). After the Kahului-Wailuku track was laid, the narrow-gauge railroad expanded eastward to Ha'iku and beyond, building tall, "spidery" trestles to cross the deep gorges (Hungerford 1963:69) in another marvel of Victorian engineering. Shipping magnate Samuel G. Wilder acquired the railroad in 1884; and in turn sold it in 1899 to a group of businessmen led by Baldwin.

THE TOWN

The beginnings of the city of Kahului are imperfectly known; a key player in the town's early development—the Kahului Railroad Company—lost its early records in the tidal wave of 1946 (Best 1978:29); and the *Maui News* did not begin publication until 1900.

Kahului town got its start in the 1860s as a supplier to neighboring Wailuku; shipping soon became its major focus. By the end of the 19th century it had a warehouse, stores, wheelwright and blacksmith shops, a custom house, a saloon, and Chinese restaurants (Bartholomew 1994:132).

The *Maui News* recalled in a turn-of-the-century retrospective that the very first western-style building was a warehouse built by Thomas Hogan near the beach in 1863; a business known as Kimble's store went up in the same area a decade later; and in 1876, William Goodness built and ran a wheelwright/blacksmith shop "just back of where the Kahului Saloon [which moved to Wailuku after the 1900 bubonic plague] recently stood." That same year, a tidal wave flooded the town and "covered the whole flat back of Kahului." By 1879, there was a small landing for the use of sugar planters (Clark 1989:7) and a new custom house was built in 1882 (*Maui News* March 3, 1900:2). By 1900, Kahului town covered 20 acres of flat and poorly drained land along the shore (*Maui News* March 3, 1900:2).

Several events came together around 1900 to accelerate Kahului's development. Hawai'i became a United States territory in 1898. Baldwin and his associates bought the railroad and began making plans for the port. And the bubonic plague swept through the Hawaiian Islands at the turn of the century, taking 70 lives (Kuykendall and Day 1961:190) including several in Kahului.

The plague struck Honolulu, the hardest-hit Hawaiian city, in December 1899; the first suspicious death in Kahului was that of Ah Tong, a "wash house Chinaman," who died on February 4, 1900. It was several more days before a case developed with clear symptoms of the plague. When it did, Sheriff Baldwin quarantined the city, an order that was soon backed up by the Board of Health, and ordered a detention camp set up at the Kahului racetrack.

By Monday the 12th, the camp was ready. "Over 200 Chinese, [Japanese] and natives were fumigated and dressed in new suits, and at two o'clock the procession quickly moved out to their new quarters," the then-weekly *News* reported on February 17. Their old neighborhood—from the Kahului saloon to the custom house—was immediately dynamited and burned. The breeze was blowing from the sea, which helped keep the blaze contained. Frightened Chinese in neighboring Wailuku asked a missionary to help them store their meager possessions, in case the same thing happened to them (Turner 1920:9)—but Wailuku was spared.

The last plague victim in Kahului appears to have been Miss Julia English, sister of the harbor pilot, who died less than a month after Ah Tong. Authorities seemed confident that she would be the last casualty, although dead rats carrying the plague were still found occasionally.[7]

A proposal to burn down the entire town of Kahului gained serious support—including from the Wailuku-based *Maui News* (March 3 and 10, 1900). In the end, a less drastic measure was chosen.

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[7] Oddly, the quarantine of Kahului doesn't seem to have begun until well into March, the month after the last victim apparently died. The purpose of burning was to exterminate rats, which were known to spread the disease, although the full mechanism of contagion was not yet understood.

Kahului was surrounded by a rat-proof corrugated iron wall;[8] residents moved to temporary housing outside the town limits; and no one was allowed inside the wall except for the rat-catchers. Moving these more well-to-do residents took a little longer: It wasn't until March 24 that the *News* announced, "Kahului is now without a resident." By that date, the last plague-infested rat corpse had also been found. Near the harbor, some industrial buildings were renovated in an attempt to dig out the last of the contamination.

A quick search of the records found conflicting indications of when the Kahului quarantine was completely, officially lifted. Once the worst was over, concern seems to have waned gradually as other events competed for public attention. By early May at the latest, the crisis was clearly over (*Maui News* May 5, 1900).[9]

Camp Wood, where the Chinatowners had been quarantined, was kept open as housing for plantation workers (*Maui News* July 28, 1900:3). Cheerful reports of the former internees' clean little homes and promising new jobs alternated with fund-raising appeals for the destitute; it's not clear how many quarantine survivors fit into which category. A Wailuku missionary recorded that as soon as the quarantine was lifted, hundreds of people "of various nationalities flocked to Wailuku, in need of food, and clothing. A very forlorn lot, having lost their all by the burning of their homes" (Turner 1920:9).

By July 19, 1900 the *News* was cheerfully reporting that "[i]t seems quite like old times at Kahului once more. The rat proof fences have all been taken down ... Business is booming, and there is the making of a live little town, if," the newspaper qualified, "the owner will permit it." Ownership of the land underneath the town and harbor was still highly centralized. As the newspaper had described it near the end of the plague crisis (April 28, 1900):

> At present, Kahului is nothing more than a private store, wharf, and railroad of the Hawaiian Commercial and Sugar Company, who practically own all the town.[10]

The newspaper called on the company to build workshops and stores and then offer them for sale or lease in order to attract a diverse business community. HC&S would soon come forward with its own vision for municipal growth, but Kahului would remain a one-owner town for a long time to come.

The real metamorphosis for the city began seven years later, in 1907, when a cycle of long-term leases came up for renewal. Baldwin and his associates took the opportunity to push for an early version of urban renewal.

On June 8, 1907 the *News* reported, "The Kahului Railroad Company is filling in the low lands in and about Kahului and will in time raise the level of the entire town site." It was hoped this would help

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[8] Inside the fence on the east side of town were a lumber yard, the Hawaiian Commercial and Sugar Company store, various warehouses, and the Kirkland, Church and Filler residences. From there the wall ran parallel to the Wailuku road, to a spot near the detention camp, from where it extended to the beach, leaving a cottage belonging to a Mr. Ball outside the quarantine (*Maui News* March 10, 1900:3). Unfortunately, no map found to date is detailed enough to pinpoint these exact spots. A man by the last name of Ball was manager of the Kahului Saloon, which moved to Wailuku near the end of the plague crisis.

[9] Kahului seems to have learned from its plague experience. In 1911 diphtheria, scarlet fever, and smallpox swept through nearby towns on Maui, but Kahului implemented house-to-house inspections and escaped without a casualty (*Maui News* December 31, 1947). Twenty years later, the Territory passed new plague regulations and inspected all its harbors for compliance; Kahului Harbor got high marks for both work procedures and physical facilities (*Maui News* July 23, 1932).

[10] At that point, Hawaiian Commercial and Sugar Company had only recently passed into the hands of Baldwin and his associates.

with the mosquito problem. The town's other problems included an insufficient water supply and sewage system (*Maui News*, December 31, 1947:38); these had been among the reasons for the frequent calls, during the plague, for burning down the town and relocating it on healthier ground inland.

The company met with its leaseholders on June 13, 1907, asking them to surrender their leases. New lots were being laid out "in the most modern lines" (*Maui News* June 15, 1907:1); when this process was complete, tenants would have to reapply for leases. By October, work was well underway, the *News* reported on the 5th: "Buildings have been removed and Pu'unēnē Avenue now extends to the sea"; the harbor was being dredged and "the beach lots have all been staked out." The lots would be offered in pre-paid, long-term leases; the company still held on to control of the land.

A generation later, a "land expert" touring Maui in 1930 apparently had nothing but praise for the way Kahului town was run—by the Kahului Railroad Company, which still owned almost all the land under the business district. "As soon as leases expire, the owners must replace old structures with new ones in accordance with specifications approved by manager William Walsh of the Kahului Railroad Co.," the *News* explained. The land expert, C.L. Mattfeldt, also gave the company high marks for its emphasis on fire safety, "parks, beauty, civic pride," and sanitation, and noted that leases seemed to be based on the tenant's ability to pay. "The town is under the absolute control of Mr. William Walsh, who instead of being autocratic is the most popular and best liked man in Kahului!" the expert and the newspaper enthused. The railroad company kept a private police force in Kahului, to supplement the public force's efforts to preserve order (*Maui News* May 7 and 10, 1930).

Early in World War II Kahului was shelled, twice, from enemy submarines in the bay. The first attack, at dusk on December 15, 1941, was recorded on Maui in thick black headlines:

SUB SHELLS KAHULUI! *DAMAGE SLIGHT No Injuries*

Two shells fell harmlessly into the harbor. Four rounds hit the Maui Pineapple Company cannery, doing some damage to the roof and smokestack. One fell on the driveway of the Maui Vocational School, another in a waste lumber pile on Pier 1, and one broke a few windows at the Pacific Guano and Fertilizer building. None of the damage was considered major. Some frightened Kahului residents started to flee, but police and Boy Scouts persuaded them to return home (Allen 1950:59, *Honolulu Star Bulletin* December 16, 1941, *Maui News* December 17, 1941).

The second attack on Kahului, on December 31, took place after General Order No. 14 established wartime censorship in Hawai'i and therefore received limited coverage (Maui Historical Society 1992:1). The *News* did, however, mention in its first edition of 1942 that Maui police, navy and marine forces, as well as "HC&S Co. cowboys," were patrolling on horseback to prevent looting. The death toll from the attacks: one unfortunate chicken (Bartholomew 1994:149).

Though Kahului Harbor remained relatively unscathed, men did lose their lives at sea near Maui during the war—including four who died during an attack on the Matson freighter *Lahaina* and 24 when the Army transport *Royal T. Frank* came under fire (Bartholomew 1994:149).

Maui saw extensive construction to accommodate U.S. military needs during World War II—including naval air stations at Kahului and Pu'unēnē and the huge Camp Maui on the slopes of Haleakalā—but apparently very little at the harbor itself. The Army, Navy, and Marines trained "all over the island" (Bartholomew 1994:146); the Marines seem to have found a special place in the hearts of the islanders, who christened them "Maui's own." When the Marines Fourth Division returned to the island

after their victory at Iwo Jima, "the Maui community turned out en masse at Kahului Harbor to welcome their warriors home" (Bartholomew 1994:146-147).

THE HARBOR

A number of ports on Maui developed before Kahului, with a variety of wharves and landings. However, Kahului was the first Maui port with a structure to which ships could directly moor, rather than anchoring offshore and transferring their freight and passengers by lighter (Rush 1957:41).

Early construction on Kahului Bay included a scattering of buildings, early railroad facilities, at least one wharf, an "unfinished jetty" noted in 1881, and a "fishery" (Monsarrat 1879; Jackson 1881; Howell 1896) (Figs. 3. and 4, Photo 1). But as noted earlier, development of the harbor began in earnest under Baldwin's leadership just after the turn of the century. Railroad and port depended on each other to provide service to the merchants of the port town and the plantations around it. As the railroad expanded eastward, the harbor grew to accommodate ever larger and deeper-draft vessels; its most intense period of development would cover the first three decades of the 20th century.

In its original condition, the bay was exposed to the prevailing northeast trade winds and to the occasional severe storm coming directly from the north (Clare and Morrow 1930:73). A high priority at the turn of the century was a breakwater to slow the heavy seas entering the harbor from the northeast. Baldwin's Kahului Railroad Company built the original eastern breakwater on top of the eastern reef, which already gave the bay some natural protection (Williams 1909:130). At first they used huge rocks cleared from the canefields; later, a company quarry supplied the project. The company also dredged the harbor and built a wharf, moorings, and buoys (Hungerford 1963:20, *Maui News* December 12, 1931).

By mid 1900, plans were afoot to rebuild the harbor and downtown areas—enlarging two (apparently already existing) wharves, building new depots and workshops, and erecting a new hotel near the wharf. "There will be a lower and upper balcony extending around three sides of the hotel, and the side next to the sea will extend out into the water, supported on piles," the *Maui News* reported, continuing in a burst of post-plague optimism: "No more shanties are to be built at Kahului, but neat and commodious cottages will be erected as needed."

The hotel was under construction by November, and the "old wharf" was renovated and lengthened (*Maui News* July 28, November 3 and November 10, 1900). Baldwin hired an engineer to survey the harbor in 1901, and asked the pilots and captains that worked for him to record tides, winds and currents to have the information ready when the time for building came (*Maui News* August 23 and December 12, 1931). Work on the breakwater began in 1905 (*Maui News* December 12, 1931). By 1908 the company had built two small wharves (Rush 1957:41, Nakayama 1987:108). Early harbor development apparently did not spoil the beauty of the bay—a 1910 article called it "bathing of the best and a splendid beach" (Clark 1989:7).

By 1910 the harbor (Fig. 5) had reached a number of milestones—an 1,800-foot breakwater protected the harbor from the eastern side, and on it stood a 40-foot-tall lighthouse; the harbor had been dredged, and the new 200-foot pile-and-timber Claudine Wharf could accommodate vessels with up to 25-foot draft.[11]

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[11] Russian workmen contributed greatly to the building of the Claudine Wharf, the *Maui News* reminisced in a 1947 retrospective (December 31:38). The Russians "proved to be good workers but of wandering disposition," the *News* recalled, many leaving for San Francisco and others for the drinking life.

But repeated problems such as storm damage to the breakwater led to increasing conviction that harbor development was a task too big for any one company to handle. The federal government took over responsibility for the harbor itself in 1910; the territorial government later took charge of the wharves; but the Kahului Railroad Company remained in the picture as a major building contractor.

Construction of a western breakwater began in 1917 (see Fig. 5); five years later, work began on a long-awaited new wharf to accommodate larger vessels (Photo 2). Pier 1, as it was called, went up along the eastern breakwater. The 500-foot-long concrete structure was turned over to the Territory of Hawaii in August 1923.

The freight conveyor system it needed in order to be truly effective was not finished until later; but a festive visit by the Matson steam liner *Maui*, carrying an excursion party from the San Francisco Chamber of Commerce in October 1923, celebrated its opening. The vessel docked smoothly in spite of rough weather; passengers had to walk about 1,000 feet to the waiting cars because the roadway approach was still under construction, but nobody seemed to mind. In a major boon for the harbor, the Los Angeles Steamship Company announced in the summer of 1924 that it would make the new pier at Kahului a regular stop for two of its steamers, the *City of Los Angeles* and the *Calawaii*.

The first visit of the *City of Los Angeles* was a public relations disaster for the harbor and its new wharf. Carrying 112 passengers, the liner arrived on July 28 in a stiff wind and had a terrible time maneuvering its way to the dock and mooring securely—in spite of help from two local vessels, the *Leslie Baldwin* and the *Makaiwa*. Eventually, the cruise ship's passengers had to be taken off by small boat and landed, humiliatingly enough, on the old Claudine Wharf. The last passengers got to shore around 5 p.m., which didn't leave much time for sightseeing. It took the *City of Los Angeles* three and a half hours to dock, with all the help the harbor could provide. Leaving the next day, the ship fouled its anchor on old steel cables lying on the harbor floor, fouled its propeller on a buoy, and hit a sandbar on the way out of the harbor. The harbor floor was "disordered," fumed Captain Paulson, who refused to use the dock again.

Two weeks later the somewhat smaller *Calawaii,* arriving in better weather and piloted by Kahului harbormaster E.H. Parker, docked without problems—as a crowd watched in suspense from the shore. Two weeks later, Parker brought the *City of Los Angeles* in without a problem, too, despite a "usually stiff trade wind blowing broadside on" (*Maui News* July 30, August 13, and August 27, 1924).

By the end of 1924, the harbor was becoming congested and the nearly new Pier 1 was already being labeled "inadequate" by the business community (*Maui News* December 20, 1924). Freight was piling up on the wharves, the Claudine Wharf was becoming increasingly unsafe but remained in use, and the planned opening of a new cannery promised to bring even more pressure—and opportunity—to the harbor. The *City of Los Angeles* continued to periodically call off visits to the port due to safety issues; and steamers were lining up at sea waiting for a chance to unload their freight.

The Claudine Wharf was less than 15 years old and the new Pier 1 was scarcely broken in, but already commerce was outstripping the harbor's ability to accommodate it. In 1927, the railroad company's manager, William Walsh, called the Claudine "dangerous to life and property" (*Maui News* March 27, 1927) and complained that Maui was losing business because of the harbor's inadequacies. Two months later, the Claudine was demolished; it had apparently remained in use up to the end, in spite of its hazardous condition.

A new, larger wharf (Pier 2) was already under construction, being built from the sea end in toward shore. It stood in approximately the same place as the Claudine Wharf, but extended farther out to

sea; because its construction began at the seaward end, both old and new structures existed side by side for awhile.

The new wharf's first official customer was the *Mauna Kea* on December 2, 1927; but impatient customers had for some time already been dumping their freight on the unfinished structure and going back across the harbor to complete their paperwork. Two years later, Pier 1—the original deep-draft structure, built along the eastern breakwater—was extended to double its original length. By 1930, although improvements were still incomplete, the congestion had eased. The *News* ran the headline *Pilikia Pau* (the trouble is over) over its report that the harbor, dredged to a minimum depth of 35 feet and a maximum width of 1,455, was now safe for larger vessels; that the two new piers could accommodate two ocean liners, an oil boat, inter-island steamers and lumber carriers; and that a freight conveyor system was planned for the Pier 1 extension, similar to the one that already existed on the first half of the pier.

By August 1931, the *News* was celebrating the successful end of 30 years of harbor development—a well dredged harbor; one pier for large vessels, with the most sophisticated freight handling system in the Islands, a smaller pier for inter-island vessels, and in between "abundant anchorage for sampans and the mosquito fleet" (Fig. 6). On September 16, the paper reported with pride and excitement, the harbor coped smoothly with its busiest day ever, moving five ships in and out right on time with "no interruption, no hurry or flurry," only "ordered activity." By December, the crowning touch: Both east and west breakwaters were repaired, lengthened, complete at last.

During the preceding 30 years, the builders and users of Kahului Harbor had often given voice to restlessness and dissatisfaction, driven by the rapid industrial and commercial growth enveloping Maui and the pressures that growth put on the island's only commercial port. At a Harbor Board meeting in August 1923, the commissioners had no sooner taken official possession of the new Pier 1 than they turned to discussion of new construction projects (such as replacing the Claudine Wharf). Little more than a year after it was built, the Maui Chamber of Commerce was already calling Pier 1 inadequate. A harbor dredging project in 1925 came so soon after the last project that the dredger was still in the bay and didn't have to be called back. (*Maui News* August 31, 1923, December 20, 1924, January 10, 1925, October 4, 1930).

But for a moment in 1931, the federal, territorial and private enterprises, the cruise ship captains and freight handlers, the sugar and pineapple plantation managers, cannery owners, fishermen, lighthouse tenders—and perhaps most of all William Walsh, superintendent of the Kahului Railroad Company, who had been involved with the project from its start—could celebrate a goal achieved and a project completed satisfactorily enough to gladden even the most demanding civic booster.

EPILOGUE

The last major construction milestone at Kahului Harbor was probably the 40,000-ton bulk sugar plant built by the Kahului Railroad Company in 1942—the first of its kind in the islands. Kahului once again outstripped even Honolulu in port technology for a brief while.

By then the nation was at war—a war with a Pacific theater that deeply involved the hearts of Maui's people as they turned thousands of young *malihini* (off-islanders) into "Maui's own," sent them to now-legendary battles, and lined up at Kahului Harbor to welcome the survivors home.

During World War II, the U.S. government annexed land at Kahului for the construction of the 18th Service Battalion camp of the U.S. Marine Corps and Naval Air Station, Kahului. Following the

war, the airport was turned over to civilian authorities, and other facilities were dismantled or abandoned. Historic archaeological sites found near Kahului Harbor reflect these events, and include Kahului Railroad berm (Sites 3112), Kahului Railroad buildings (Site 1607), an historic deposit (Site 3119) and the former 18th service Battalion camp of the U.S. Marine Corps (Site 4232).

Additions continued to be made to the harbor facilities, but no major changes followed the war. The State improved and expanded the Pier 1 wharf in 1955 and the Pier 2 wharf in 1963. The original sheds on these wharves, put up in the 1920s, were demolished, removed, or modified; and new sheds or shed extensions were built in 1955, 1970, and 1973. The most significant change was the construction in 1979 of Pier 3, a new wharf paralleling the shore northeast of Pier 2.

After the war, at about the same time as the more famous Levitts were building their affordable housing units on the East Coast, a model city grew inland from old Kahului under the direction of the respected urban planner Harland Bartholomew. Unlike Levittown, Dream City's homes were designed to take advantage of Pacific tradewinds, and were built to attract plantation workers rather than returning veterans. The aim was "eliminating the traditional landlord tenant relationship of the companies and their employees ... to achieve a more stable and happier plantation company" (*Paradise of the Pacific*, December 1948:116).

The old landscape of plantation camps and small rural stores would fade as Wailuku and Kahului expanded inland and towards each other. As tourism boomed, it would change even more. But in the restless heart of this ever-re-invented community, the pace of change had slowed a bit—change that had brought Kahului Harbor in the space of a generation, in the time span of one man's career, from a nearly pristine bay to a state-of-the-art industrial harbor.

NOTE ON TERMINOLOGY

In the documentation on Kahului Harbor, the names of the main harbor structures changed over time and depending on author, and can be confusing. The Claudine Wharf, completed in 1910, was the first wharf for which there is extensive documentation. It could only accommodate smaller ("inter-island") vessels. The term *Pier 1* almost always refers to the wharf next to the east breakwater, which could accommodate larger ("trans-Pacific") vessels and had the most sophisticated freight handling equipment. It was built in two phases. In original sources, *Pier 2* sometimes refers to the extension (second phase) of Pier 1, sometimes to the new, large-vessel dock that eventually replaced the Claudine Wharf, and more rarely, to the Claudine Wharf itself, while *Pier 3* is sometimes used to refer to the newer, larger structure at the site of the old Claudine Wharf.

For ease of reading, this chapter has used *Pier 1* to refer to the pier along the eastern breakwater and *Pier 2* for the structure that replaced the Claudine Wharf.

The words *wharf* and *pier* are used interchangeably by most writers on Kahului Harbor and this chapter has followed that practice.

III. HISTORIC PROPERTIES IN THE KAHULUI HARBOR AREA

This chapter summarizes the archaeological work and the architectural history research that has been carried out near Kahului Harbor and describes the historic properties that have been identified as a result of this work. The potential for the presence of prehistoric and early historic cultural resources at Kahului Harbor will be assessed within the context of this information.

HISTORICAL/ARCHITECTURAL STUDIES AND SITES

KAHULUI TOWN AND HARBOR

The earliest research at Kahului Harbor was conducted by the state of Hawai'i during the 1974 statewide inventory of historic places. As a result of this survey Kahului Harbor was designated as a historic site, Site 50-50-04-2953 on the State Inventory of Historic Places (SIHP). The harbor also formed part of the area defined as the Kahului Historic District, Site 50-50-04-1607.

Site 2953 consists of the piers, wharves, breakwaters, and associated structures that make up the active harbor facility. As discussed in the preceding chapter, development of Kahului Harbor began in 1863 with the building of a warehouse near the beach, and a small commercial landing was in place by 1879. However, the primary period of construction occurred between 1901 and 1931. The designation of the historical period features of Kahului Harbor as elements comprising a historic property reflect the importance of the harbor's construction and development to Maui's history.

The Kahului Historic District consists of the central, coastal section of the town of Kahului. A nomination form for the State of Hawai'i Register of Historic Places (HRHP) was filled out in 1974 as part of the statewide inventory of historic places that was being conducted at that time. The form lists seven structures as contributing elements to the historic district. Figure 7 shows the location of the buildings that are still standing. Four of these were located on the inland side of Ka'ahumanu Avenue: the First Hawaiian Bank, Kahului School, and the auditorium and grandstand at the fairgrounds. Three buildings that were part of the Kahului Railroad (KRR), which terminated at the harbor, were located on the coastal side of Ka'ahumanu Avenue. These three buildings were used as a roundhouse, an office, and a shop for the railroad. According to the inventory form, the significance of the district derives from the role these structures played in the major period of growth and development of Kahului town, especially after a 1917 fire that destroyed much of the town, leaving few structures standing.

The inventory form does not set out precise boundaries for the Historic District; the sketch map on the form simply shows the location of the contributing structures. The district was not nominated to the National or State Register of Historic Places.

Limited archival and field research have been conducted as part of this assessment to update the information on the inventory form. The old First Hawaiian Bank building, located on the southeast of the Ka'ahumanu and Pu'unēnē Avenue intersection, now belongs to the Bank of Hawaii. The two-story concrete building, with its hip tile roof and copper water catchments (trademarks of its architect C.W. Dickey), has undergone some renovation, but it appears to retain much of its integrity (Photo 3). The

school building, situated between Kane Street and School Avenue on the south side of Ka'ahumanu Avenue, was the location of Kahului School, which, from 1912 through the 1970s, served as the main elementary school for Kahului town. After the school was moved to its present location on Hina Avenue, the building was apparently demolished. Today only temporary structures are present, standing on the inland side of the school parcel. The background research was unable to uncover any evidence of when the building was demolished (or moved) or any further documentation of this historic building prior to its destruction.

The Kahului Railroad Company roundhouse and shop remain standing, adjacent to the harbor, on the west side of Hobron Avenue on land owned by Alexander and Baldwin. This shop is a large, concrete brick building with a pedimental façade. The year of its construction, 1926, is engraved in red numerals on the façade below the front pediment (Photo 4). In the rear the shop connects with the curved roundhouse building (Photo 5). These buildings are still in use and seem to have undergone some interior renovation when they switched from railroad to electrical shop, warehouse, and office functions, but the buildings appear to retain their structural integrity. The Kahului Railroad office building, located on the harbor side of Ka'ahumanu Avenue east of Wharf Street on state of Hawai'i land, is in very good condition and appears to have undergone some recent renovation.

NAVAL AIR STATION, KAHULUI (NASKA)

The coastal area east of Kahului, consisting of sand beaches, sand dunes, marshes, and ponds was developed by the military during World War II as Naval Air Station, Kahului (NASKA); after the war the airport was eventually turned over to the state for use as a civilian airport. Early archaeological studies largely ignored the historic structures at the airport. Welch (1988) noted the presence of extensive remains of military development from World War II, and a preliminary inventory of the World War II features, noting their present condition, was made during a 1994 study of cultural resources for the Kahului Airport Improvements EIS (Tomonari-Tuggle and Welch 1995). Following that study, a more thorough study of the historic buildings was conducted by Mason Architects, including documentation and evaluation of all standing structures (Yoklavich, Tomonari-Tuggle, and Welch 1997). These standing structures include 18 ammunition magazines in the Kanahā Pond area, the Enlisted Men's Beach Pavilion, four small arms magazines, four Quonset huts, and a warehouse. The magazines, pavilion, and the remaining foundation of the Officer's Club were evaluated as potentially eligible for the National Register of Historical Places.

ARCHAEOLOGICAL STUDIES AND SITES

There have been several archaeological studies carried out in the Kahului area; but only one within the harbor itself. Table 1 summarizes the work that has been carried out; Figure 8 locates the various studies. Figure 7 shows the location of archaeological sites that have been identified in the general vicinity of Kahului Harbor. Discussion of the results of previous archaeological studies and the results of these studies is organized by sub-area.

Table 1. Archaeological Studies in the Vicinity of Kahului Harbor.

Report	Location	Level of Survey	Comments
Kikuchi 1973	statewide	fishpond survey; Ph.D. dissertation	described and classified Mau'oni and Kanahā Ponds, Site 50-50-05-1783
Barrera 1976	1,020 acres; Waiale	surface survey of disturbed areas	notes that human remains were previously found in sugar cane fields to south
Connolly 1981	development areas of Kahului Airport	reconnaissance survey; Airport Master Plan EA	Site 1 (50-50-05-1798)—burials in airport area
Keau 1981	Kanahā Park/Wastewater Treatment Plant	overview; pedestrian survey	no surface evidence of sites but major storm had covered surface of the treatment plant
Fredericksen and Fredericksen 1988	232 acres south of airport in sugar cane fields	reconnaissance survey; limited subsurface work	survey limited to roads, ditches, open areas
Fredericksen et al. 1988	34 acres between Kaunoa School and Maui CC	surface survey and backhoe trenching	9 backhoe trenches; no cultural deposits
Welch 1988	Short Term Kahului Airport Development areas	reconnaissance survey; revisit Connolly 1981 sites	probable subsurface deposits in dune extending west of Site 50-50-05-1799; military remains around proposed access road at west end of airport
Kennedy 1990	300 m inland of Kahului Harbor; proposed Maui Community Arts and Cultural Center	backhoe trenching	51 trenches; no cultural remains; absence of cultural remains due to previous leveling of dunes
Donham 1990	4.6 acres; Maui Palms Hotel	surface survey and augering	40 auger cores; cultural deposit interpreted as secondary deposit imported as fill
Goodfellow 1991	warehouse site west of Kanahā Pond	surface survey/ subsurface testing (25 backhoe trenches)	no cultural remains; black beach sand 1 m b.s.
Kennedy et al. 1992b	TMK 3-5-03:01	inventory survey and subsurface testing	
Fredericksen, D. and Fredericksen 1992	Kahului Beach Road and Waiehu Beach Road	Inventory survey	railroad bed (Site 50-50-04-3112), historic refuse and prehistoric deposit (Site 50-50-04-3119), and a prehistoric deposit radiocarbon dated to 1790±70 years BP (Site 50-50-04-3120)
Fredericksen, W. and Fredericksen 1992	Maui Community College	inventory survey	heavily disturbed, no new sites: Kahului Railroad berm and foundations from the 18th Marine Camp

Table 1. Archaeological Studies in the Vicinity of Kahului Harbor (continued).

Report	Location	Level of Survey	Comments
Griffin 1993	Nehe Point, Paukukalo	inadvertent burial	one burial (Site 50-50-04-3139) found beneath a house
Fredericksen et al. 1994	Maui Central Parkway, Wailuku	inventory survey	23 backhoe trenches, no sites found
Dunn and Spear 1995	Waialae Road, Wailuku	archaeological monitoring	three sites: an isolated hearth (Site 50-50-04-4067), a human burial (Site 50-50-04-4005), and pre-contact burials and cultural layer (Site 50-50-04-4068)
Tomonari-Tuggle and Welch 1995	Kahului Airport	limited field survey and cultural resource assessment	five known archaeological sites (2 buried cultural deposits, a burial/reburial area, possible surface habitation area, and a fishpond)
Fredericksen and Fredericksen 1996	Lower Main and Mill Streets, Wailuku	data recovery	Site 50-50-04-4127 found during road improvements; consists of two cultural layers including artifacts associated with fishhook manufacture, lithic tool use, and food preparation; radiocarbon dating indicates late precontact period (AD 1570-1780)
Hammatt and Chiogioji 1996	Waiale Road, Lower Main Street	field inspection	historic bridge and six previously documented sites with human burials
Burgett and Spear 1996	Lower Main Street	inventory survey	Maui Sand Hills (Site 50-50-04-4004), remnant of cultural deposit
Heidel et al. 1997	Maui Central Park, Wailuku	inventory survey	surface survey and 31 backhoe trenches; Kahului Railroad berm (Site 50-50-04-3112), WWII military installation (50-50-04-4232), and an area previously identified as containing scattered human remains (Site 50-50-04-4211)
Wade, Eblé, and Pantaleo 1997	Kahului Harbor Barge Terminal	inventory survey	Surface survey and 11 backhoe trenches; one firepit and two historic artifacts
Fredericksen and Fredericksen 1998	Lower Main and Mill Streets	inventory survey	remnant cultural deposit tentatively associated with previously identified habitation Site 50-50-04-4127 and Site 50-50-04-4414, a precontact cultural deposit with an associated burial
Chaffee et al. 1998	west of Papohaku Park	inventory survey	40 backhoe trenches, no cultural deposits due to prior mechanical disturbance of the soil

Table 1. Archaeological Studies in the Vicinity of Kahului Harbor (continued).

Report	Location	Level of Survey	Comments
Fredericksen and Fredericksen 1999	Lower Main and Mill Streets	Mitigation	habitation area (Site 50-50-04-4127), a habitation area with an in situ burial and disturbed remains from an additional 1 or 2 individuals
Fredericksen 2001	Lower Main and Ho'okahi Streets	monitoring	two sites discovered during traffic signal monitoring: possible precontact habitation area (Site 50-50-04-5070) and a scatter of disturbed human remains contained within fill soil (Site 50-50-04-5071)

KAHULUI HARBOR PROPER

In 1996 Garcia and Associates (GANDA) conducted surface survey and backhoe trenching of 8 acres of the harbor area between Wharf Street and Pu'unēnē Avenue. No surface evidence of archaeological sites was found during the survey. Eleven trenches were excavated in the west half of the property (TMK 8-8-8:6). A probable firepit filled with charcoal was found in Trench 10. Due to apparent ground disturbance, the charcoal sample was not submitted for radiocarbon dating, so the age of the feature is not known. In other trenches two historic period artifacts, a sherd of white porcelain and a piece of bottle glass, were found (Wade, Eblé, and Pantaleo 1997). The finds can be regarded as part of Site 2953 and indicate that there is a potential for the recovery of subsurface cultural materials beneath the harbor fill.

On the seaward side where the piers and wharves are located, the harbor area has been extended out by filling in the bay. Therefore, there is virtually no potential for the presence of intact cultural resources in this part of the harbor. However, the inland portions of the harbor from the wharves to Ka'ahumanu Avenue were built by laying fill on top of the former beach. As shown by the excavations by GANDA, the underlying beach sands retain the potential to contain remains of prehistoric or early historic cultural activity or human burial remains.

THE COASTAL STRIP

Limited archaeological work has been conducted in the coastal strip surrounding Kahului Harbor. Sites that have been uncovered in this area include both traditional Hawaiian and historical archaeological sites. The traditional Hawaiian sites, which were found in sand deposits, include human burials and cultural deposits.

Griffin (1993) recorded a burial (Site 50-50-04-3139) which was uncovered during construction activities near Nehe Point. South of Nehe Point cultural deposits were also found on the west side of Kahului Bay, north of Kahului Harbor (Fredericksen, D., and Fredericksen 1992). Deposits (Site 50-50-04-3119) appearing to date from the late 19th to early 20th century were found overlaying a precontact Hawaiian deposit consisting of marine shell midden, basalt flakes, and abraders. A radiocarbon date of 1790±70 years BP was obtained from charcoal associated with the artifacts. Another cultural deposit (Site 50-50-04-3120) was found ca. 60 ft east of Site 3119. This site contained a variety of artifacts, such as

fishhooks, abraders, basalt flakes, scrapers, and a possible bird bone whistle. In addition, a human phalanx was excavated from what may have been a rodent disturbance, suggesting that burials may be located nearby.

Two more archaeological sites were recorded just northwest of Site 3119 (Frederickson 2001) near the intersection of Lower Main Street and Ho'okai Street. Site 50-50-04-5070, a cultural deposit in dune sand, consists of scattered charcoal flecking and marine shells. It is located on the southern side of Lower Main Street. Site 50-50-04-5071, located on the northern side of the street, consists of human skeletal material. Old breaks in the bone indicate it was previously disturbed.

Three archaeological sites were recorded south of Site 3119 within the 110-acre Maui Central Park (Heidel et al. 1997). Scattered human remains (Site 50-50-04-4211) were found in dune deposits in the central eastern portion of the park near Maui Community Arts and Cultural Center in 1996. The bone appeared to be out of context and was collected by State Historic Preservation Division (SHPD) archaeologist Theresa Donham. Additional testing by Heidel et al. (1997) uncovered no evidence of human remains. Site 50-50-04-3112 consists of remnants of the Kahului Railroad berm (see below). Site 50-50-04-4232 is the former 18th Service Battalion camp of the U.S. Marine Corps, attached to the 4th Marine Division at Camp Maui. Following decommission, a large amount of fill was dumped over the area, possibly obscuring remains of the camp. Only four concrete pads were observed.

Several other studies have failed to reveal any evidence of cultural resources. A surface survey at the Wailuku-Kahului Wastewater Treatment Plant to the east of the harbor failed to uncover any evidence of cultural materials (Keau 1981). A major storm, however, had covered the ground surface with debris, possibly hiding surface archaeological sites. An inventory survey conducted on a 10-acre parcel on the southwest side of the harbor uncovered no evidence of traditional Hawaiian or historic cultural materials (Fredericksen et al. 1994). Modern debris, such as tires, bottles, and concrete, were present on the surface. Twenty-three backhoe test trenches were excavated on the parcel, revealing extensive disturbance. A survey just east of Kahului Harbor and west of Kanahā Pond (Goodfellow 1991), in which 25 backhoe trenches were excavated, also found no evidence of cultural remains.

KAHULUI RAILROAD

Kahului's railroad was developed for the transportation of sugar cane from the fields to Kahului harbor in the late 19th century. The Kahului Railroad (KRR) was founded in 1879 when Thomas Hobron added passenger cars to the rail system. The Kahului Station was located southeast of the harbor at Hobron Point and the line extended along the coast east towards Spreckelsville and west towards Wailuku. A branch also went to Pu'unēnē.

Site 50-50-04-3112 consists of remnants of the Kahului Railroad berm, which extended in a north to south direction, roughly paralleling Kahului Beach Road (Heidel et al. 1997). The berm is roughly 3 m high and 12 m wide. It is lined by ironwood and coconut trees. Historic deposits (Site 50-50-04-3119) have also been found on the west side of Kahului Bay, north of Kahului Harbor (Fredericksen, D., and Fredericksen 1992). The deposits appear to date from the late 19th to early 20th century and were likely related to the railroad. They overlie an earlier, precontact Hawaiian deposit.

KANAHĀ FISHPOND

Kanahā Pond Wildlife Sanctuary is located east of Kahului Harbor. The pond itself, today covering about 37 acres, was a prehistoric Hawaiian fishpond, Site 50-50-05-1783, dating back to at least the middle of the 16th century. Kikuchi (1973) classifies the ponds based on written records and interpretation of aerial photographs. Mau'oni Pond is a Type III pond, a *loko wai*, which is "an inland fresh water fishpond which is usually either a natural lake or swamp, which can contain ditches connected to a river, stream, or the sea, and which can contain sluice gates" (Kikuchi 1973:228). Kanahā Pond is also a *loko wai*, but one "whose shape has been altered by man" (Type IIIa) (Kikuchi 1973:229).

The only documented archaeological survey was a pedestrian survey of the refuge by Connolly (1981). He does not, however, describe his survey method nor any observations of his survey. Survey of the Kanahā Pond Wildlife Sanctuary area was not carried out during the assessment of cultural resources at Kahului Airport (Tomonari-Tuggle and Welch 1995) because it was nesting season and entrance was not permitted. Although the fishpond has been disturbed by modern activity, it remains partially intact. In the absence of any archaeological survey of the area, it remains unknown whether any cultural features associated with Hawaiian use of the pond are still present.

Kanahā Pond has appeared on historical maps from as early as 1881; it should be noted that this map shows a stone wall across the pond, the only historical record of the existence of such a structure (Jackson 1881; see Fig. 3.). Mau'oni Pond is only known from traditions; based on historical maps (especially USGS 1922), however, it is likely that Mau'oni Pond was located in the east half of the Kanahā coastal flat, below the natural, seaward end of Kalialinui Stream. Later historical maps show the changes in the configuration of Kanahā Pond but it was not until World War II that the pond was significantly impacted by the construction of ammunition magazines and access roads for NASKA.

MAUI SAND HILLS

A number of archaeological sites have been found in the coastal dune deposits called Maui Sand Hills. Many of these sites consist of human burials and cultural deposits, often in disturbed contexts. A series of such sites, though frequently disturbed, are located along Lower Main Street extending back from the intersection with Kahului Beach Road toward central Wailuku. These are shown on Figure 8. Remains of the old KRR bed also parallel Lower Main Street.

One of the richest of the archaeological deposits in the Sand Hills is Site 50-50-05-4127, a habitation area with associated human remains found near the intersection of Lower Main Street and Mill Street (Fredericksen and Fredericksen 1999). Artifacts uncovered from this area, such as basalt adzes, *poi* pounders, basalt hammerstones, and shell tools and ornaments, suggest the site was used for permanent habitation.

IV. TRADITIONAL AND CURRENT USES OF THE HARBOR AREA

This chapter describes the cultural impact assessment study conducted in connection with the proposed Kahului Harbor improvements. This study consisted of interviews with persons and groups, including fishermen and Hawaiian *kūpuna*, who use or have used the Kahului Harbor, and those who may be affected by potential developments along the existing harbor. Along with the interviews, site visits were done to assess the proximity of physical features (traditional/historic, recreational, residential, roadways) and user group areas within the project area.

The study was completed to meet Section 106 Consultation requirements of the NHPA and satisfy the Hawai'i State Historic Preservation Division's (SHPD) request for conducting cultural impact assessments. As part of the requirement, attempts were made to contact *kūpuna* (Hawaiian elders) who are knowledgeable about the area. Since the harbor management regularly holds meetings for its tenants and users, many of the informants were participants of these meetings. Interviews were completed between the months of September and October 2002. Organizations using the two canoe *hale* (houses) at Hoaloa Park were visited and consulted with on several occasions.

Due to the relative familiarity of the projects proposed in the 2025 Master Plan to user groups and the generally favorable nature of the plan's overall intent, it is felt that the types of impacts that can be expected (potential or no impacts) identified during this planning level study are adequate for the planning phase.

The primary objective of this cultural impact assessment is to:

1. identify traditional and current cultural uses of the harbor area;
2. identify user groups who would be affected (culturally impacted) by projects proposed in the 2025 Master Plan;
3. conduct interviews with individuals and groups to identify these potential effects; and
4. assess the level of impact(s) from these potential affects on traditional and current cultural practices in the area.

The user groups identified for this cultural impact assessment include tenants of Kahului Harbor who were identified from the tenant-user meeting roster. Non-tenant user groups were identified through site visits to the project area. All user groups were interviewed either in person or by telephone. Interviews and discussions were also held with individuals who expressed general interest in the project area.

Interviewees who previously spoke with this researcher for *An Evaluation of Traditional and Historical Land Uses in the Kahului Airport Area* (Prasad and Tomonari-Tuggle 1999) provided significant information about traditional land uses in the present project area. The informants included *kūpuna* and other individuals of Hawaiian ancestry, and long-term residents who are familiar with the history of Kahului. The following section consists of oral history data gathered during that earlier study, combined with additional information from the present study.

Participants in the current study and the 1999 study are listed in Appendix B.

TRADITIONAL HAWAIIAN USES OF THE KAHULUI HARBOR AREA

The following accounts summarize the types of "traditional uses" recalled or verified by interview participants; the list may not be exhaustive.

FISHING USES OF THE AREA

Fishing appears to have been the primary activity in the Kahului area up until and well after the beginning of the plantation period. Oral interviews indicate that several types of subsistence activities related to fishing took place along the shores of Kahului, in the ponds, and nearby areas. Among these are:

1. fishing in Kanahā pond,
2. shellfish gathering,
3. picking of *limu* (edible water plants),
4. turtle hunting,
5. *hukilau* (traditional net fishing), from Kuau to Lower Pā'ia, and
6. gathering salt from salt pans.

First-hand accounts of fishing activities in the area come from Charles (Charlie) Keau, Aaron Brown, and Rene Sylva.

Charlie Keau: According to Charlie, fishing was the main concern [use] of the area by Hawaiians. Along with Kanahā Pond, the reef area was widely used for gathering shellfish. He does not think that all of Kanahā Pond was used. During certain times of the year, the pond would smell from the *limu*. He remembers that Mau'oni Pond extended all the way to the old Fairgrounds area. Turtle fishing was also known from the Kahului area. Having a nearby stream, people had access to both freshwater and saltwater fish, including *moi* (threadfish) and *'o'opu* (goby). The area was also famous for picking *limu*. (Although not too much traditional fishing takes place nowadays, the shoreline along Kahului remains a popular place for netting and diving.)

Charlie grew up in Paukūkalo, Wailuku (across Kahului Harbor, looking west from Pier 1). Paukūkalo was also good for fishing and picking *limu*. He recalls that the old folks really liked Paukūkalo and that it has changed dramatically since construction of the Community Center. He remembers that old timers used to put their canoes out from "Kalo Grounds," the present location of Maui Beach Hotel. Some of these people also lived underneath the nearby trees.

Charlie recalls Kahului being referred to as "Kahiwa'a," which translates to "the nose of the canoe." According to Edward Baker (in Sterling 1995:93), the name "Kaihuwa'a" was given to the Dream City subdivision in Kahului. Another name used in the area was "Kaimuhee." According to W. Uaua (June 29, 1871, in Sterling 1995:92), Kaimuhee was above the two waters, Kanahā and Mau'oni. Although not familiar with this place name, Charlie says that Kaimuhee can be translated as "underground place for octopus" or "imu for cooking octopus." Since cooking or drying of seafood was generally done

at the shore, it is difficult to determine just where this place would have been located. No one else had heard of the name Kaimuhee.

Aaron Brown: Aaron has been a fisherman for most of his life. He was born in Hilo but raised by his family in Pāʻia. He spent most of his time fishing along the shoreline from Pāʻia to Waiheʻe. Kahului was a very popular fishing grounds, as well as a place for picking *limu*. He recalls Piers 1 and 2 in Kahului as being popular places for fishing, diving, and swimming. The area was very clean before Kahului town was built up. Remnants of both piers, which were directly oceanside of the current Longs Drugs, still remain near the breakwater in Kahului.

Aaron had fished in Kanahā Pond. Along with his brothers and neighbors, he used to catch *ʻoʻopu* and *āholehole* (Hawaiian flagtail) from the pond. Sometimes there was *pāpio* (the young of *ulua* or jackfish) in the pond. They used old pipes to bring up the fish since there wasn't any need for nets. The water in the pond was very clean and the fish were visible. Depending on the season, there could be an abundance of fish in Kanahā. Aaron also recalls picking *limu* along the shoreline, and gathering salt inland of Kanahā Pond. He remembers that the land around the old fairgrounds would fill with water at high tide; he didn't know that this area once formed part of Mauʻoni Pond.

Aaron remembers that his mother participated in the *hukilau* taking place from Pāʻia on down towards Kahului. One of the foremost leaders of the *hukilau* was Makani Hokoana (father of Nancy Hokoana). Aaron spent a great deal of time with the Hokoana family, both fishing as well participating in other traditional Hawaiian activities such as preparing *kalua* pig.

Rene Sylva: Rene has been an avid fishermen in the Kahului- Pāʻia area since the 1930s. Much of what he learned about fishing was taught to him by an older Hawaiian fisherman. Rene is particularly knowledgeable about Hawaiian plants, and knows a great deal about how schools of fish along the shoreline corresponded with the seasonal changes of flowering plants. He was a net fisherman and particularly fond of catching turtle, *enenue* (also called *nenue* – chub or rudderfish), *manini* (surgeonfish), and *akule* (bigeye scad). Rene also remembers that the Kahului area was (and still is) good for catching lobster. He once caught 208 lobsters during the course of a day. Rene also recalls Makani Hokoana as the person who would lead the *hukilau*. Mr. Hokoana was known particularly for his technique of using the *lau*, which consisted of *ti* leaves and a rope.

According to Rene, after the breakwater was built in 1912, the shoreline changed dramatically. It no longer was a long stretch of sandy beach from Pāʻia to Waiheʻe Stream. The military made the shoreline off limits to fishing between 1943 and 1945. During this time, the schools of fish got rather large. In 1944, only Hawaiians, many of whom lived in the fishing villages around Kahului Bay, were allowed to go fishing along Kahului's shoreline.

All forms of fishing (netting, freshwater, reef, and open-water) took place at Kahului during the precontact era and well into the historical period. Kahului is still an important fishing area, although development has changed the face of the shoreline and limited access to many of these resources.

AGRICULTURAL USES OF KAHULUI

During the precontact period, Wailuku *ahupuaʻa* was known as an area for growing taro (Tomonari-Tuggle and Welch 1995). According to Charlie and Aaron, taro was often grown alongside fishponds and in areas with freshwater streams. "Fishing went hand in hand with taro and cultivated plants" (Aaron recalls the taro that his grandmother grew along Baldwin Avenue in Pāʻia). While none of

those interviewed had actually witnessed taro growing in the Kahului area, there is little doubt that taro farming took place alongside the ponds. Changes in the configuration of Kanahā and Mau'oni ponds were significant by the turn of the century.

According to Charlie, it is possible that sweet potato, pumpkin, and Hawaiian sugar cane also were grown in this part of Kahului. Given the type of soil and surrounding activities, it would not have been unusual for Hawaiians to be cultivating these other crops.

GATHERING OF NATIVE PLANTS

As an expert on native Hawaiian plants, Rene is extremely familiar with the plants of Maui, Lāna'i, and Kaho'olawe. Although there appears to be no mention of the gathering of native plants from and around the project area in written accounts, Rene feels that Hawaiians would have gathered plants from the area. Traditional plant species that can still be found in the Kahului area include *'aki'aki* grass and *kauno'a*. He is certain that many other species of traditional plants were found in the area but that some either have become extinct or have been displaced by introduced plants such as *haole koa* and *kiawe* that now surround Kanahā Pond.

HABITATION

Recollections about habitation in the Kahului area date primarily to the historical period. Government records indicate that the *ahupua'a* of Wailuku was claimed as Crown Lands by Kamehameha III, and that there were no commoners' *kuleana* lots in the project area. The small historic settlement in the harbor area grew in conjunction with the development of the railway and commercialization of sugar in the late 1800s. Based on the sequence of recorded events, it does not appear that any Hawaiian families claimed or had permanent habitation/use rights to the land before contact or into the historical period. In contrast, surrounding areas, such as Pā'ia, which had Hawaiian residences before the turn of the century, continue to be home to some of these families; for example, Nancy Hokoana's family has resided on the family lot in lower Pā'ia since before the 1900s. (William Tavares' father purchased the current Tavares family lot from the Hokoana family in 1910.)

While written accounts tell little of Hawaiian settlements in the Kahului area, it is assumed that seasonal camps associated with fishing activities were located along the seashore (e.g., see the "fishing station" on Jackson's 1881 map). Charlie, who spent much of his youth at Raw Fish Camp in Wailuku, knows the area was very popular for fishing activities. The reef, shoreline, and open seas off the Kahului coast would have been ideal fishing grounds for native Hawaiians. Based on the activities that carried over into the historic period, it can be assumed that similar activities took place during earlier times.

According to Charlie, Harbor Road (now Kahului Beach Road) in Wailuku was marked by a row of coconut trees named in memory of the stevedores who worked at the docks. This was also the location of Raw Fish Camp. Only the people of Pā'ia and Kahului know of Raw Fish Camp. It had many homes, and residents included Hawaiians, Japanese, Chinese, Filipinos, and Portuguese, all of whom were employees of Kahului Railroad. The camp was destroyed after Dream City was built in the early 1950s. Russell Okumura is a former resident of Raw Fish Camp. He along with Myoko Onaga and Dorothy Makimoto recalled the days when the houses along the camp were occupied. Dorothy lived just above Raw Fish Camp, in Wailuku, while Myoko lived in the town of Kahului. Photo 6 shows Raw Fish Camp in 1973. According to Fred Woodruff, a volunteer at the Bailey House Museum, the Kahului Railroad

Company built the camp in 1919 to house stevedores and their families, who were primarily of Hawaiian descent (*The Maui News*, July 28, 2002).

Almost everyone interviewed recalled the Hawaiian families who lived along the Kahului waterfront (near the present Maui Islander Hotel). These were people who worked for the railroad. George Ito, who worked on installing the sewer system for Dream City, recalls that these families lived along the waterfront until construction began on the first increment of Dream City. Since the railroad employees were also given the option to buy a house or lot in Dream City, many took the opportunity to relocate. George also remembers a rather large Hawaiian settlement near the site of the present wastewater treatment plant adjacent to Kanahā Pond. He recalls that homes of some of the railroad workers (primarily Hawaiians) were scattered in the area that had large thickets of *kiawe* (around Kanahā Pond).

Hiroshi Arisumi, a resident of Camp 6 at Pu'unēnē, recalls that the towns of Spreckelsville and Kahului had houses all along the beach until the airport was built. He believes that these were homes of the wealthy people. Barbara Woods, who moved to Maui in 1954 after her husband took a job with Hawaii Pineapple Company, confirmed this. A few weeks after their arrival, they moved into the old Cameron house in Spreckelsville; Barbara has remained at this residence since 1955. She recalls there being three houses to the west of her home, all of which belonged to people of status. These homes were referred to as the "Beach Houses." There weren't any Hawaiian families living in this area. She recalls that people were less mobile in those days, relying primarily on the railway to get from one place to another. Her family's focus was in and around Spreckelsville and Pā'ia towns, since these provided most of the necessary social services (e.g., beauty shop, post office, and a theater in nearby Cod Fish Village). Until the building of Dream City, Kahului was not much of a town. This is perhaps best summed up by Charlie Keau, "the old timers from Kahului come from Pu'unēnē…the fishermen and railroad workers are all gone."

OTHER SOCIAL/RECREATIONAL ACTIVITIES

The beach along Kahului, prior to building of the harbor breakwaters, was all sand and could very well have served as an ideal recreational area for swimming, surfing, and sailing canoes (see Photo 1). Many of the written accounts tell of the canoe landings along Kahului (west to Waiehu and east to Kē'au).

Kamakau (1961:83) refers to Ka'akau and Kehu as two beaches in Waiehu where the ruling chiefs played. According to Charlie, Ka'akau or "breakwater" is the surfing beach at Waiehu, and Kehu is a part of Waihe'e. The entire shoreline area from Pā'ia to Waihe'e is referred to as Ka'a. The area in front of Waiehu is also called Ka'a. No one else recalled the beach names by Ka'akau or Kehu in the Kahului area. Charlie also noted that the *ali'i* would have used the beach areas for surfing only seasonally.

The shoreline along Kahului continues to be an area of much recreational activity. Changes such as the harbor breakwaters appear to only have slowed down but not eliminated recreational use of the area.

CURRENT USES OF THE PROJECT AREA

While the primary activities at Kahului Harbor concern commercial uses of the port, the harbor is also used for various cultural activities. Activities such as fishing, surfing and paddling reflect back to a time when this part of Maui served as a primary area for traditional Hawaiian recreational practices.

The following are the primary traditional/recreational user groups identified for Kahului Harbor area.

PADDLING ORGANIZATIONS

The Hawaiian Canoe Club and Na Kai Ewalu are two fairly large organizations that have *hale* (canoe houses) on the harbor grounds. The *hale* are located side by side on the beachfront (off of Hoaloa Beach Park), facing out towards the eastern breakwater and Pier 1. According to Gabby Garcia of Na Kai Ewalu, his club has been paddling from the harbor since at least 1972; Photo 7 shows club members carrying out their canoe to Kahului Beach. Well known paddlers such as David Kaho'ohanohano and Grandpa John Lake are among the individuals who began the club.

The Hawaiian Canoe Club began using the harbor around 1974. It currently trains up to 180 students during its regatta season (June-July). The *hale* also serves as a meeting area for various social and educational groups. According Mary Akiona, the Executive Program Director of the organization, the club leases the building and the land 10 feet outwards, from the county. Alexander and Baldwin (A&B) lease the adjoining lands.

Paddling season for both groups usually extends from March to September/October, with some intermittent practices in between. People of all ages are members; however, because of its protective and relatively calm waters, Kahului Harbor is a favored and regular training ground for *keiki* (child) paddlers. Both clubs use an area that extends ¼ mile from shoreline of the beach, paralleling and passing Pier 2. There are a total of eight paddling lanes. Two are located on the east side of Pier 2 and are used only by adults and only when there are no boats moving through the harbor. Proposed improvements and/or changes in the harbor, specifically those bordering Pier 2, would impact the canoe paddling groups the most since the areas surrounding this pier are regularly used for paddling. Following earlier consultations with canoe club representatives, improvements to Pier 2 have been reduced in size to minimize impacts on the use of the harbor by the paddlers.

FISHERMEN—THROW NET AND POLE (OFF THE HARBOR)

Fishing at Kahului Harbor is still very popular. Depending on the type of fish sought, one of three locations is generally chosen—(1) along Perimeter Road, (2) off Hoaloa Beach, and (3) along the western breakwater/wall area. Along Perimeter Road, fishing is done between the Power Plant and Pier 1, at the far southern edge of the harbor. The large rocks off the breakwater and wall provide a good place from which to do pole fishing. At present, a sign reading "No fishing until further notice" is posted at the entrance to Pier 1. Security measures enforced after September 11, 2001, have temporarily closed the area along Perimeter Road to all fishermen. Also, the current Corps of Engineers project at Pier 1 has temporarily placed some of the fishing spots off limits. (Previously an area inside the harbor along Pier 1, was also open to fishermen; for security and safety reasons, fishing has completely been banned in the area.)

The second fishing area, off of Hoaloa Beach Park, fronts the area used by the canoe clubs. These are primarily pole fishermen. (Throw net fishing is not allowed in the harbor, but according to several fishermen, it is frequently done.) Fishermen off the beach park are looking for "seasonal" catch. One regular, Rudy, says he comes when *halalū* (baby mackerel) and *uouoa* (mullet) are in season; he also collects *manuia* or *ogo* (seaweed) off these shores. Fishing off of the beach park, just east of the canoe *hale*, is a favorite of fishermen; the only times they vacate the area is when paddling takes place. Given

the type of fish (young, small) caught by these fishermen, it is unlikely that the extension of Pier 2C will affect their use of the area.

The third fishing spot is along the western breakwater/wall. This is a more established fishing spot, and includes a fishing shack with table, benches, chairs, and fish cleaning areas nearby. According to Mr. Ishikawa, this is "the place where the old timers stay...to play cards, eat, socialize." The fishing spot is within 50 meters of the small public boat ramp and attracts many fish larger than those in the harbor. According to two fishermen, the area along the western breakwater (inside the harbor) is also good for net fishing. These fishermen would be affected if a new pier is put in place on this western end. However, current harbor improvements do not include construction of such a pier.

FISHERMEN—SMALL BOAT, NON-COMMERCIAL

Small-boat fishermen use the public boat ramp located at the west end of the harbor. The Department of Land and Natural Resources (DLNR) operates this ramp. DLNR also issues licenses/permits for general uses of the harbor area including canoe races. No small boats are known to use the harbor area where commercial activities are focused. During the period of this study, no small boats came to or departed from the small boat ramp. Small boats would also be affected if a new pier were to be placed along the western breakwater/wall area.

SURFERS

Surfers have used the western end of the harbor along the breakwater for many years. It is an ideal surfing location for residents along the northern shores of Maui. The surfers primarily come out when the winter swells rise. They find good waves that can be ridden onto the beach (towards Harbor Lights condominiums), in an area that's well protected from heavy winds and rough seas. No surfers had used the harbor during the period of this study. They would be affected only if the placement of Pier 5 along the western end of the harbor is pursued.

SWIMMERS AND BEACH/PARK USERS

Swimmers and beach/park users are not likely to be affected significantly by any changes that take place within the harbor. Except possibly for limited access (resulting from multiple uses of the same area), these groups use land and sea areas immediately adjacent to the beach, and are unlikely to be affected by the proposed changes.

V. EVALAUTION OF SIGINIFICANCE, ASSESSMENT OF POTENTIAL EFFECTS, AND RECOMMENDATIONS

This chapter assesses the potential impacts of planned harbor improvements on archaeological resources, the Kahului Historic District, traditional native Hawaiian practices in the area, and current uses of the harbor.

The area of potential effect for this project constitutes the four pier areas and the container yard areas directly behind them that will be the sites of the five proposed construction projects. Project areas will be the area into which Pier 1 will be extended, the area in which the Pier 1 comfort station will be built and the sewer line laid, the Pier 3 expansion area, the location of the new Pier 4, and the location of the new passenger terminal.

The modifications could have an indirect impact on remaining areas of the harbor in the vicinity of the improvement areas. Therefore, the entire harbor area will be considered in the assessment of cultural resources and the impacts of the improvement projects on these resources.

ASSESSMENT OF HISTORIC PROPERTIES

EVALUATION OF HISTORIC PROPERTIES IN THE PROJECT AREA

Criteria of Significance

Historic properties are evaluated for significance in terms of their ability to meet the criteria for nomination to the NRHP as set out in federal regulation 36 CFR 800 Part 64 implementing the NHPA and the criteria for the HRHP contained in Chapter 343 Hawaii Revised Statutes, Section 6e, as amended. An impact will be evaluated as significant under National Environmental Policy Act (NEPA) if it involves an adverse effect to a significant historic property; that is, if it alters or modifies those qualities of a property that make it eligible to the NRHP or HRHP or alter the integrity of the historic property.

Historic Properties at Kahului Harbor

Kahului Harbor has been designated a historic site, Site 50-50-04-2953 in the State of Hawai'i Inventory of Historic Places maintained by SHPD. This site consists of those features and structures of the harbor that were constructed during its main period of development between 1901 and 1931. These features are over 50 years old and the harbor retains much of its integrity in setting, materials, and design. This historic site is regarded as potentially eligible to the NRHP and the HRHP on the basis of its importance in the broad patterns of Maui and Hawai'i history and its association with important persons in Maui's history, particularly Henry P. Baldwin. Chapter II of this assessment sets out in detail the historical importance of the harbor in the development of the sugar industry on Maui and the establishment of Kahului as the main commercial center on the island.

The piers and the buildings on them are typical of the facilities found at other neighbor island harbors. They do not possess any characteristics that would make them special, unique, or of high architectural value and thus do not qualify as eligible to the NRHP under Criterion C. Many of the sheds now standing on the piers are less than 50 years old. Of the original buildings constructed in the 1920s, a portion of the Pier 1 shed has been removed, the Pier 2 produce shed was demolished, and the original Pier 2 shed has been modified through the addition of extensions in 1970 and 1973. Thus the significance of the Kahului Harbor site derives from its historical value and not its architectural qualities.

Kahului Harbor also falls within or adjacent to the Historic Kahului District (no formal boundaries have been defined for the district). This district was defined during the 1974 statewide inventory and the district entered as Site 50-50-04-1607 in the SHPD State Inventory of Historic Properties. The register form lists the significance of the district as lying in the areas of architecture and history. Seven structures are specifically listed as contributing elements: the Kahului Railroad roundhouse, shop, and office, the First Hawaiian Bank, Kahului School, and the County Fairgrounds auditorium and grandstand. The three railroad buildings lie adjacent to Kahului Harbor in the area between Ka'ahumanu Avenue and the piers.

Although never formally nominated to the National or State Register, an Hawai'i Register of Historic Places form was filled in, and the SHPD treats the structures contributing to the District as historic properties that are eligible for the National Register. The historic importance of the structures derives from their role in the growth of Kahului town beginning in the late 1880s. Chapter II of this report documents the role of the railroad as well as the harbor in the development of Kahului and the sugar industry on Maui. The buildings are also associated with important figures in Maui's history: T.H. Hobron, Claus Spreckels, and Henry P. Baldwin.

The architectural importance of these buildings is based both on their age and their style. Following a fire in 1917, the town needed to be completely rebuilt. The Kahului School building, built in 1912, though of standard design, was virtually the only building standing in 1974 that dated to before 1917. The auditorium and grandstand of the fairgrounds were constructed in 1919 and form the site of the oldest, continuing fair in the state. The First Hawaiian Bank building is of importance because it was designed by noted architect C.W. Dickey and reflects his trademarks. The railroad buildings display architectural elaborations typical of the 1920s period in which they were built.

Any modification or alteration to these historic structures during harbor improvements would constitute an effect under the stipulations of the NHPA. In accordance with Section 106 of the NHPA, consultation with the State Historic Preservation Officer should take place prior to undertaking actions that would directly or indirectly affect these buildings.

Potential for Subsurface Cultural Deposits

The potential for undiscovered subsurface cultural resources in most of the harbor area is generally quite low. The piers were built on fill from the dredging to deepen the bay and extend out into the bay, so the potential for archaeological deposits beneath these areas is extremely low. The dredged material was also used as fill to cover and level the area stretching back to Ka'ahumanu Avenue and inland of the avenue near Haleakalā Highway. Thus, the upper part of the deposit throughout the harbor area is fill. However, as demonstrated by the previous subsurface testing in the harbor area, in the area between the wharves and Ka'ahumanu Avenue, the fill probably simply covered the existing beach deposits. Since historical and traditional accounts indicate that fishing villages were once located along the shores of the bay and since sand deposits were frequently used for burial by prehistoric Hawaiians,

there is a potential for deeply buried cultural deposits and human burials in these portions of the harbor. Previous subsurface testing during archaeological survey in 1997 in TMK 3-7-8 between Wharf Street and Pu'unēnē Avenue in the Pu'unēnē Yard revealed a single cultural deposit, probably a firepit (Wade et al. 1997). The SHPD in its letter of October 3, 2002 to EKNA specifically notes the potential for such deposits on TMK 3-7-10:2. This was previously an unsurveyed vacant lot, but has been paved over with asphalt, and is now used as a parking area for vehicles being shipped to or from the harbor.

ENVIRONMENTAL CONSEQUENCES: ASSESSMENT OF POTENTIAL IMPACTS

Each of the six proposed projects will directly impact only the piers and the wharves and the container yard areas directly associated with them. These projects, except for the sewer line, will be confined to areas of imported fill that were constructed out beyond the former shoreline of the bay. The only direct impact, then, would be on the pier structures themselves, which form the Kahului Harbor historic site.

The major concern in regard to historic properties from the modification would be a potential adverse effect in regard to the integrity of the setting of these structures and of the KRR buildings that form part of the Kahului District. However, because the structures making up the harbor site derive their historical importance from the part they have played in the development of the harbor, these modifications are simply a continuation of the process that gives the piers and wharves their historic value. Since they have always been integral parts of a changing and actively used harbor facility, this impact is deemed to be minimal and less than significant under the NEPA regulations. Also, as argued above, the harbor piers are regarded as significant cultural resources primarily because of their role in history and not their architectural qualities; therefore, these modifications will not affect the qualities that give the property its value.

Alterations to the harbor could indirectly alter the integrity of setting for the three KRR buildings that form contributing elements of the Kahului Historic District. However, previous alterations around these structures since the time of their construction has already been so great that the effect of the harbor improvement projects will be negligible. Also, since most of the alterations are minor, involving extensions and expansions of current features rather than construction of new facilities, the impact will be unnoticeable. All the proposed new structures will be low in height and similar in form and style to existing structures. From the area of the harbor improvements to the KRR roundhouse, the nearest building in the Historic District, it is a distance of at least 500 feet. Large fuel tanks and the several stories high World War II age sugar plant block any view between the two, eliminating the possibility of further adverse impacts to the visual integrity of the KRR buildings. The KRR buildings are important for their architectural as well as historic value, but any indirect impacts should not affect their architectural integrity and thus would not constitute a significant impact.

While noting that the project falls within the boundaries of a historic site and a historic district, the SHPD in a letter dated October 3, 2002, providing a preliminary review of the project, appears to concur that a finding of no significant impact would be appropriate.

None of the projects as currently planned will affect directly the areas of concern for buried archaeological deposits. Therefore, the project should have no effect on any cultural resources that may be buried at Kahului Harbor.

MITIGATION MEASURES

Mitigation measures for historic properties that may be impacted by this project should consist of efforts in the design of new facilities and during their construction to minimize indirect impacts to the buildings that constitute the Kahului Historic District.

While the potential for finding buried cultural deposits appears quite low, should human remains, prehistoric or historic artifacts, or cultural features (such as trash pits, post holes, or hearths) be encountered in the course of excavations during construction, then the supervisor should halt work in that area and the SHPD Maui office should be notified in accordance with the provisions of Section 6e of Chapter 343 HRS. The Maui archaeologist will then visit the site prior to resumption of construction work in the area of the find, assess the significance of the finds, and decide how to proceed.

The proposed improvements to Pu'unēnē Yard (Project 6) are located in TMK 3-7-08:6, where the archaeologists conducting testing recommended that an archaeological monitor be present during any ground altering activities. In his letter dated October 3, 2002, the SHPO concurred with this recommendation. Therefore an archaeological monitor should be present during all excavation work that might extend below the modern fill level. If any of the other projects should be expanded to the extent that construction work might have an impact on below fill deposits in the properties that form TMK 3-7-08:1, 3, inland portion of 4, and 6 inland of Pier 2 on the west side of Wharf Street, then the SHPD recommends that a qualified archaeological monitor should be present during all ground-altering activities. For any monitoring, a monitoring plan should be prepared prior to the commencement of construction and a monitoring report submitted to the SHPD at the end of monitoring.

At present no ground altering activities are planned for TMK 3-7-10:2, which is located next to Hobron and Ka'ahumanu Avenues and is used as a parking area for incoming and outgoing vehicles. However, if, in the future, any construction is planned for this parcel, then the SHPD recommends that an inventory survey first be conducted of this area to determine if significant historic sites are present. Until a few years ago, this parcel was a vacant lot, but it is now paved with asphalt, precluding any surface survey. Survey would have to consist of subsurface testing to determine if intact cultural deposits are present. An acceptable report would need to be submitted to the SHPD for evaluation of the significance of the cultural resources and the potential adverse effects of the proposed project. Mitigation measures could then be developed in accordance with the findings of the survey. If mitigation of any historic sites were needed, then a mitigation plan would need to be developed in consultation with the SHPD and implemented prior to construction.

CONSULTATIONS WITH SHPD

In reviews of the draft of this report, the State Historic Preservations Officer (SHPO) concurred with the assessment and proposed mitigation measures for the potential archaeological resources, but expressed lingering concern about possible effects of the project on the historic buildings of the area. Following submittal of additional photographs of the project area, a meeting was arranged with the SHPD architect to discuss these concerns. With the use of photographs and an aerial photograph of the harbor, Harbors Division illustrated the presence of existing structures between the proposed construction areas and the structures of the Historic District. Given the distance of 500 feet between the proposed new pier construction and the nearest of these structures, the presence of the other buildings between, and the low height of the planned new buildings, the lack of impact on the visual integrity of the historic buildings was clarified. Harbors Division also emphasized that most of the existing buildings at the harbor itself are less than 50 years old and that all are typical neighbor island harbor sheds, lacking any special or unique

architectural qualities. Following the meeting, in a letter dated March 31, 2004, the SHPD expressed agreement that the harbor improvements will have no effect on any architectural historic properties and that there will be no need to implement measures to mitigate adverse effects.

CULTURAL IMPACT ASSESSMENT

ASSESSMENT OF POTENTIAL IMPACTS

Based on information gathered from interviews with individuals and organizations that use the Kahului Harbor and its surrounding areas, the potential impacts of the proposed project would generally be positive. The analyses are presented in table form, according to each "proposed action" and its potential impacts on each of the five user groups. These improvements/actions are to be undertaken sometime within the span of the 2025 Master Plan.

Tables 2 through 7 present the quantitative results of the data gathered from user groups. Discussion of these results and the potential impact/no impact follows the tables.

Table 2. Pier 1C Extension.

User groups affected	No impact	Possible impacts
Fishermen (small boat)	x	
Fishermen (shoreline/net)		x
Canoe paddlers	x	
Surfers (board and kite)	x	
Swimmers and beach/park users	x	

Table 3. Construction of Comfort Station and Sewer Line at Pier 1.

User groups affected	No impact	Possible impacts
Fishermen (small boat)	x	
Fishermen (shoreline/net)	x	
Canoe paddlers	x	
Surfers (board and kite)	x	
Swimmers and beach/park users	x	

Table 4. Expansion of Pier 3.

User groups affected	No impact	Possible impacts
Fishermen (small boat)	x	
Fishermen (shoreline/net)	x	
Canoe paddlers	x	
Surfers (board and kite)	x	
Swimmers and beach/park users	x	

Table 5. Construction of a New Pier 4 (between Piers 1 and 3).

User groups affected	No impact	Possible impacts
Fishermen (small boat)	x	
Fishermen (shoreline/net)	x	
Canoe paddlers	x	
Surfers (board and kite)	x	
Swimmers and beach/park users	x	

Table 6. Extension of Pier 2C, with Accompanying "Dolphins" (fendering pillars).

User groups affected	No impact	Possible impacts
Fishermen (small boat)	x	
Fishermen (shoreline/net)	x	
Canoe paddlers		x
Surfers (board and kite)	x	
Swimmers and beach/park users	x	

Table 7. Structural Paving, Construction of Access Bridge, and Installation of Utilities at Puunēnē Yard.

User groups affected	No impact	Possible impacts
Fishermen (small boat)	x	
Fishermen (shoreline/net)	x	
Canoe paddlers	x	
Surfers (board and kite)	x	
Swimmers and beach/park users	x	

No Cultural Impacts (Positive)

The improvement project proposed for Pier 3 is seen to have no cultural impacts.

The improvement project proposed for Pier 4 is seen to have no cultural impacts.

The comfort station and sewer line improvement project proposed for Pier 1 is seen to have no cultural impacts.

Potential Indirect Cultural Impacts (Short-Term)

The improvement project proposed for extending Pier 1 will have no long-term impacts. Short-term impacts may occur to line/net fisherman using the shoreline area to the right of Pier 1, along Perimeter Road. The effect would primarily be restricted access during the construction phases, and is not evaluated as a significant impact.

Improvement projects proposed for and around Pier 2C will have potential short-term impacts on restricting/limiting paddling lanes. Once construction has been completed, canoes and small boats should have access through the fendering pillars. This temporary impact is not considered significant by any of the user groups. The project is slated for 5+ years from the current date.

Potential "Direct" Cultural Impacts (Long-Term)

The placement of Pier 2C will likely close two or three of the existing eight canoe paddling lanes that run parallel to the beach. Scheduling/coordinating changes will need to be made by the canoe clubs to accommodate the reduced number of lanes. In general, most members of the canoe clubs using the lanes do not seem to feel that the loss of canoe lanes through the addition of Pier 2C would significantly impact their activities. Any negative impacts from the loss of lanes would be offset to some extent by the beneficial effect of added protection that the pier would provide for inexperienced paddlers who are learning canoe skills. (According to S. Cunningham, this project entails no dredging so there should be little change/effects to the existing surf pattern.)

COMMENTS/SUGGESTIONS OFFERED BY USER GROUPS

The opinions expressed by the various user groups in the Kahului Harbor area generally support the proposed improvement projects. There is also appreciation for current management efforts and style of discussing matters at the tenant-user group meetings. Overall, there is a good relationship between the commercial uses of the harbor and the public (cultural/social) uses such as canoe paddling, fishing, and surfing. One example is the regular communication to user groups by the harbormaster's office on daily boat movements. This is sent via fax to each group.

By far, the activity most likely to be affected by any changes within the harbor area proper, is canoe paddling. Canoe paddlers share the protected bay closest to the area of greatest commercial activity. The fishermen are off to either side of the harbor, or go out in small boats from the public boat ramp on the western end. Surfers and other recreational users of the harbor are primarily active along the western shores, away from the commercial center. Many of these groups are seasonal users of the harbor.

The primary area of concern is the construction of Pier 2C. Although not slated for another 5+ years, development and design plans for construction of Pier 2C should obtain input from the canoe groups to be affected. The construction of Pier 5, a project that would have significant cultural impacts, has been deemed unsuitable at this time for various reasons. If it goes forward, a more project-specific assessment would need to be done.

Specific comments offered by harbor users include the following:

1. Allow the placement of a "main line" for canoe paddlers from Pu'unēnē Avenue out towards and beyond the newly constructed Pier 2C.

2. The addition of Pier 2C looks good, although it may require the paddling regattas to be moved to Saturdays and Sundays (to accommodate the ships), and the reduction of their existing eight lanes to five or six lanes.

3. Open Pier 2C to fishermen. (For security reasons, they can no longer fish off the walls of the existing Pier 2, nor can they any longer use the inner area along Pier 1.) This would allow use of one inner harbor area to fishermen.

4. Construction of Pier 2C will destroy our existing race course. We now have eight clubs and eight lanes; it will reduce it down to five lanes.

5. Plans to expand the harbor should look at other possible sites. However, such alternatives have already previously been assessed by Harbors Division, such as:

   - toward Kanahā Pond (southward of the existing harbor area);
   - Mā'alaea;
   - Olowalu Bay (but need to consider the area's value as a traditional shark breeding habitat);
   - Pā'ia/Spreckelsville;
   - Kīhei (site of historic boat ramp);
   - Waiehu area.

6. Bigger ships such as luxury liners should be ported in another area; they are eyesores.

7. The harbor is much cleaner now that Maui Pine and Land is no longer dumping in the water.

8. We (Maui) have only one harbor, while all other islands have at least two. We need a second commercial harbor.

9. Since tourists generally go to Lahaina, let the ships bringing them dock on the other side.

10. Dredging for the placement of Pier 5 will increase/produce higher surf. It will change the surf conditions within the entire harbor area.

EVALUATION OF FINDINGS WITH RESPECT TO SPECIFIC STATE CRITERIA

PASH and Traditional/Cultural Concerns in the Project Area

Public Access Hawaii Shoreline (PASH), the State of Hawai'i Supreme Court decisions that define the rights of native Hawaiians as *ahupua'a* tenants to exercise traditional and customary practices, is not a consideration for Kahului Harbor and the current project area. The application of PASH rights encompasses issues that relate to the broader concept of *ahupua'a*, which includes the shoreline. Although PASH generally applies to access to shoreline areas for traditional and customary practices by native Hawaiians, this is not a concern at Kahului Harbor for two reasons. First, Hawaiian groups (canoe paddlers, surfers, fishermen) have access to the harbor, and most importantly, will not be denied access as a result of future developments. In the near future, an altar for the god Kanaloa will be completed on the shoreline, between the two canoe *hale* (Gabby Gouveia of Na Kai Ewalu, pers. comm.). The rock representing Kanaloa was brought from Kahakaloa, and is already in place in front of the *hale*. Second, PASH has not been a concern for the harbor area since other traditional uses have either been long abandoned or have been discontinued for a significant period of time.

Application of the Environmental Council Guidelines for Cultural Impact Assessments

Efforts were taken to meet the Environmental Council's guidelines for conducting cultural impact assessments. An evaluation of the council's six-point protocol is offered below.

1. Efforts were made to contact individuals and organizations that have expertise concerning the types of cultural resources, practices, and beliefs found within the vicinity of Kahului Harbor.
2. Efforts were made to locate individuals and organizations that would be directly affected by changes to the proposed project area.
3. Formal and informal interviews, past and present, were done with individuals who have historical knowledge about the area.
4. Documentary research, particularly on the location of traditional and cultural uses of the area, was completed.

5. Cultural resources in the project area were examined in the archaeological portion of this project, and are not seen as a major component of the current cultural impact study's purpose.

6. The assessment above is considered appropriate in meeting the goals of the current study, taking into consideration that the projects (improvements) are slated for an approximate 25-year period and will occur in an area that is already designated and used as the primary commercial harbor on Maui.

Meeting the Goals of the Hawaii State Plan for Socio-Cultural Advancement

The proposed project aims to meet the goals of the Hawaii State Plan, Chapter 226 - Socio-Cultural Advancement in HRS Section 225-20-21; 23-27, of the Hawaii Revised Statues. The Hawaii State Plan was prepared as a guide for future development of the State of Hawai'i "in the areas of population growth, economic benefits, enhancement and preservation of the physical environment, facility systems maintenance and development, and socio-cultural advancement (2025 Master Plan 2000:X-1)." At present, Kahului Harbor has two canoe clubs that are actively providing social and cultural education to their young students. These are the kind of activities that could be enhanced and benefit from being incorporated into the state plan's future development goals.

RECOMMENDED MITIGATION MEASURES FOR CULTURAL PRACTICES

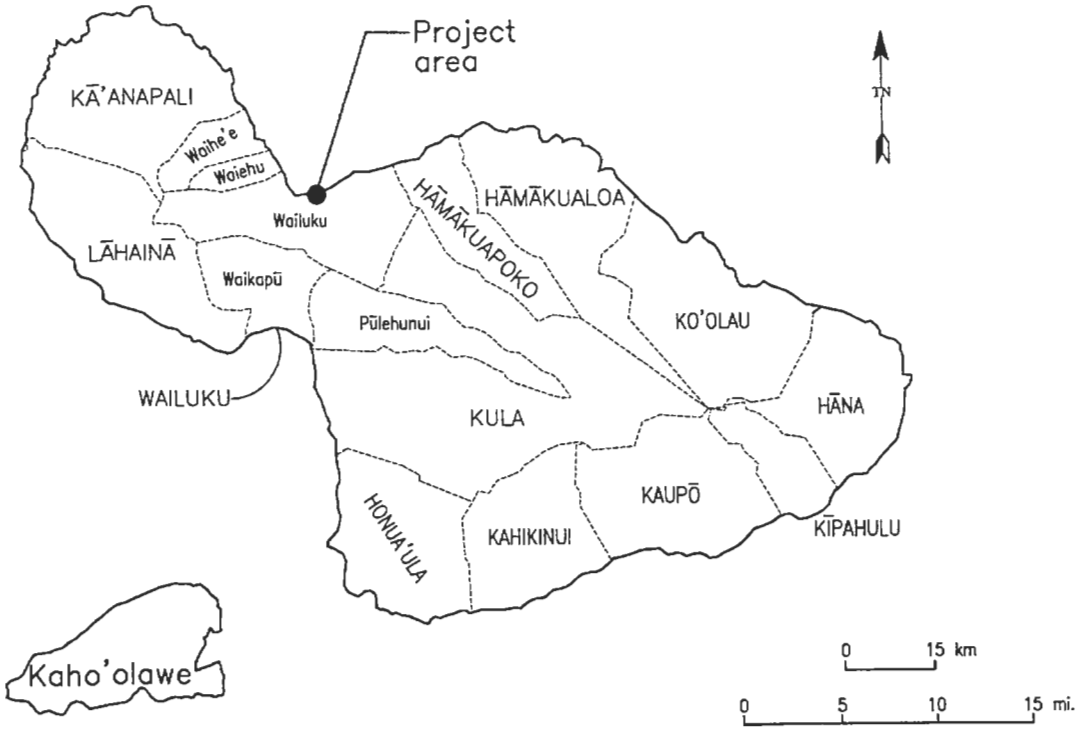
Since the cultural impact assessment portion of this report was prepared for a planning level document, there is allowance for any potential negative impacts to be mitigated before actions are taken. There also is an opportunity to properly plan for adverse impacts that may be unavoidable. Based on the information gathered, the following recommendations are made.

1. Address cultural/social impacts as part of an environmental assessment prior to initiating new actions not covered by this assessment. This would include the additional projects proposed in the 2025 Master Plan but not covered in this study that might have potential cultural impacts on user groups.

2. Continue tenant-user meetings and exchange of information regarding the activities in the harbor. These meetings have been highly informative and allow the user groups to be part of the decision-making process. When an improvement project is about ready to begin, notify the user groups at these community meetings prior to initiating the project.

3. Consider creating a pictorial or written display of the rich history of Kahului Harbor. This could provide significant information on the traditional Hawaiian and plantation-era history of the harbor, and display the harbor's current multiple uses including the various commercial needs it fulfills. User groups can be recruited to help create this presentation (both the Hawaiian Canoe Club and Na Kai Ewalu are currently active in offering traditional Hawaiian cultural programs).

FIGURES



ISLAND OF MAUI

Figure 1. Location of Kahului Harbor.

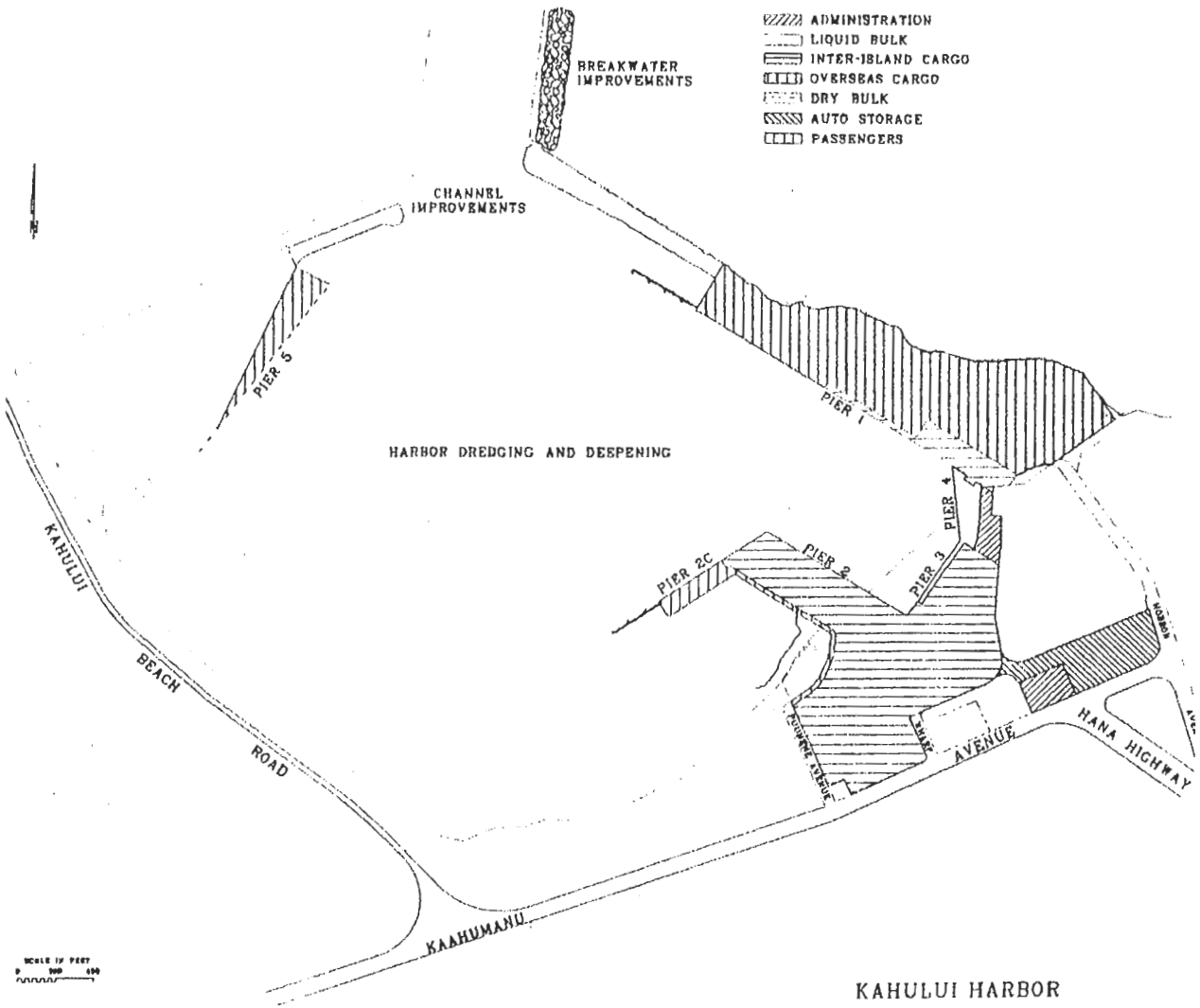


Figure 2. Map of Kahului Harbor showing proposed harbor improvement projects.

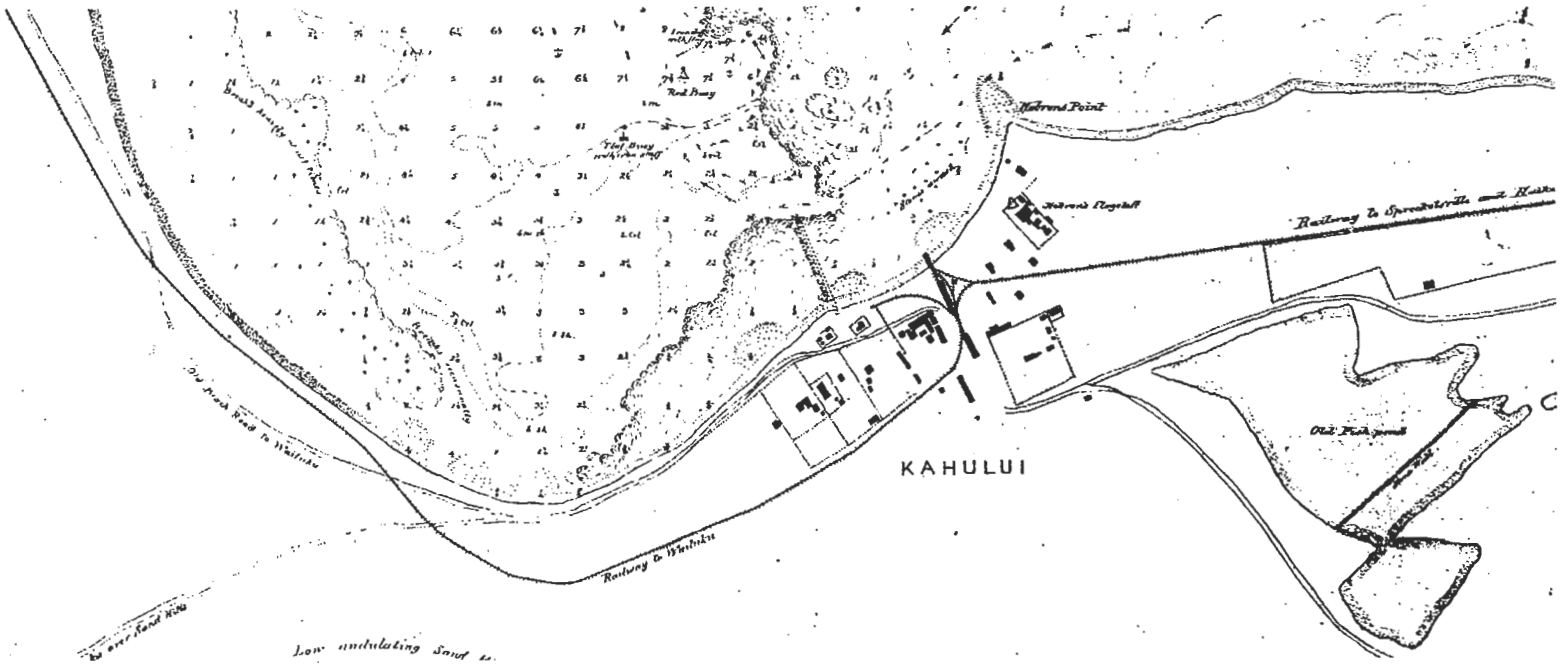


Figure 3. This 1881 Hawaiian Government Survey map by George Jackson shows the beginnings of Kahului town and harbor, the rail lines to Wailuku and Ha'ikū, and the fishponds Kanahā and Mau'oni.

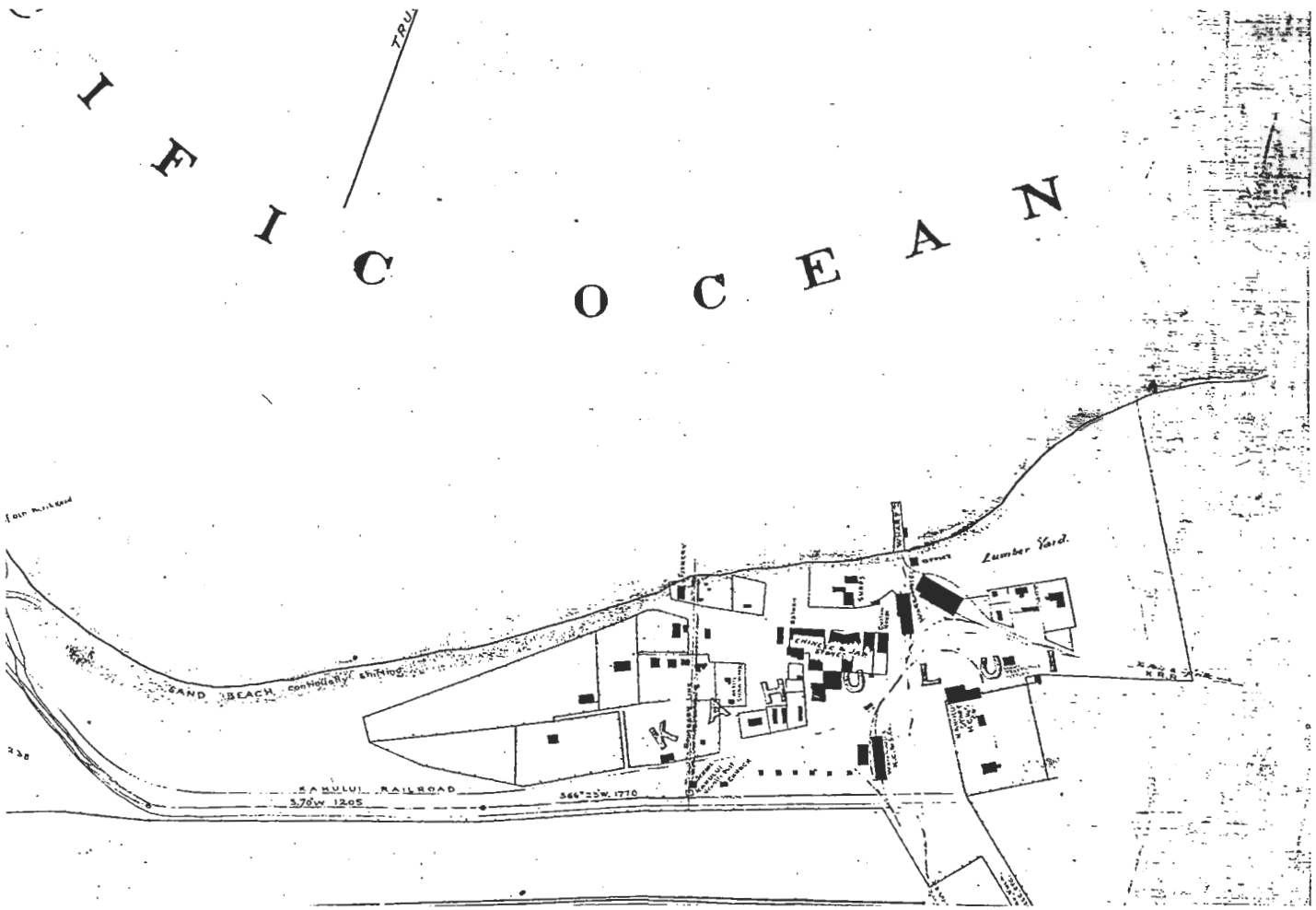


Figure 4. This map by Hugh Howell (1896) shows the town and harbor in somewhat more detail 15 years after Jackson's map.

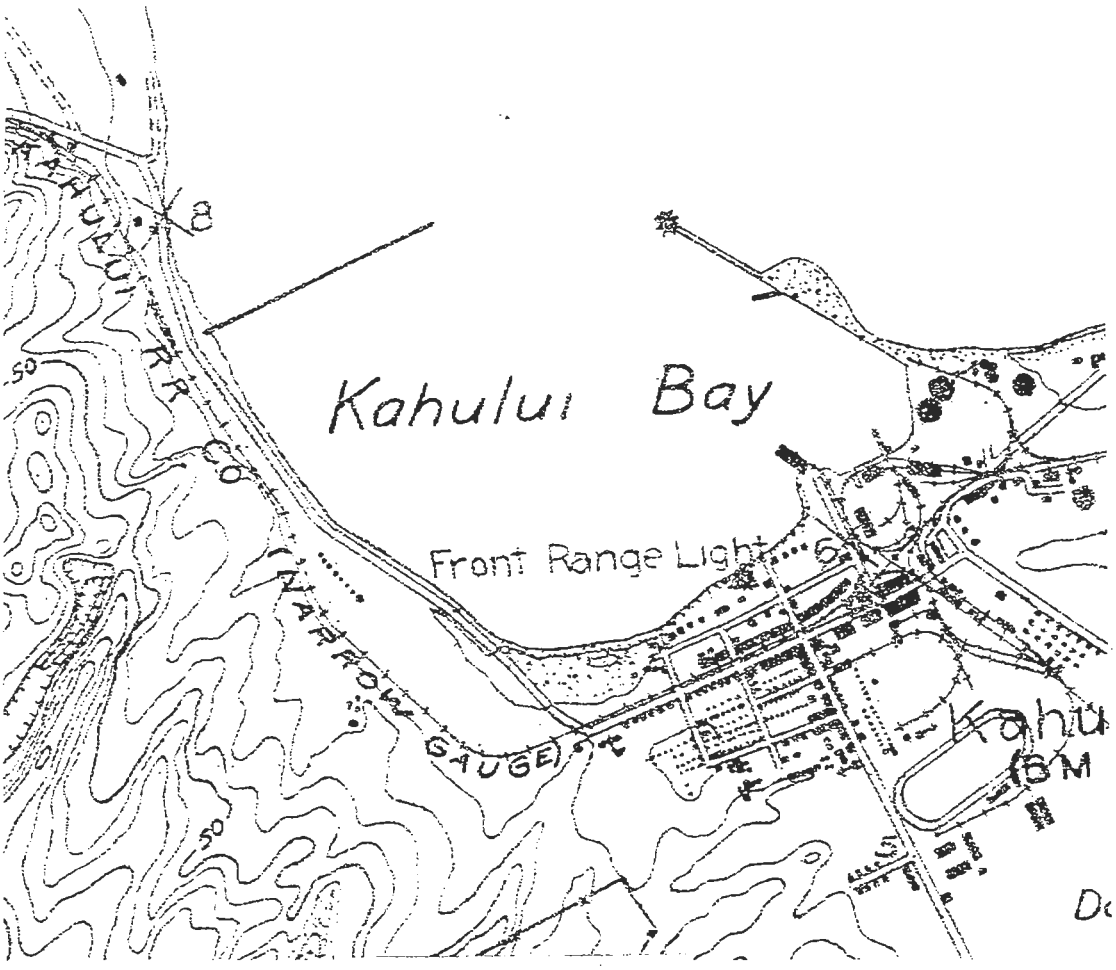


Figure 5. Kahului Harbor's eastern breakwater was completed in 1910; work on the western breakwater began in 1917. This 1922 USGS map shows both breakwaters.

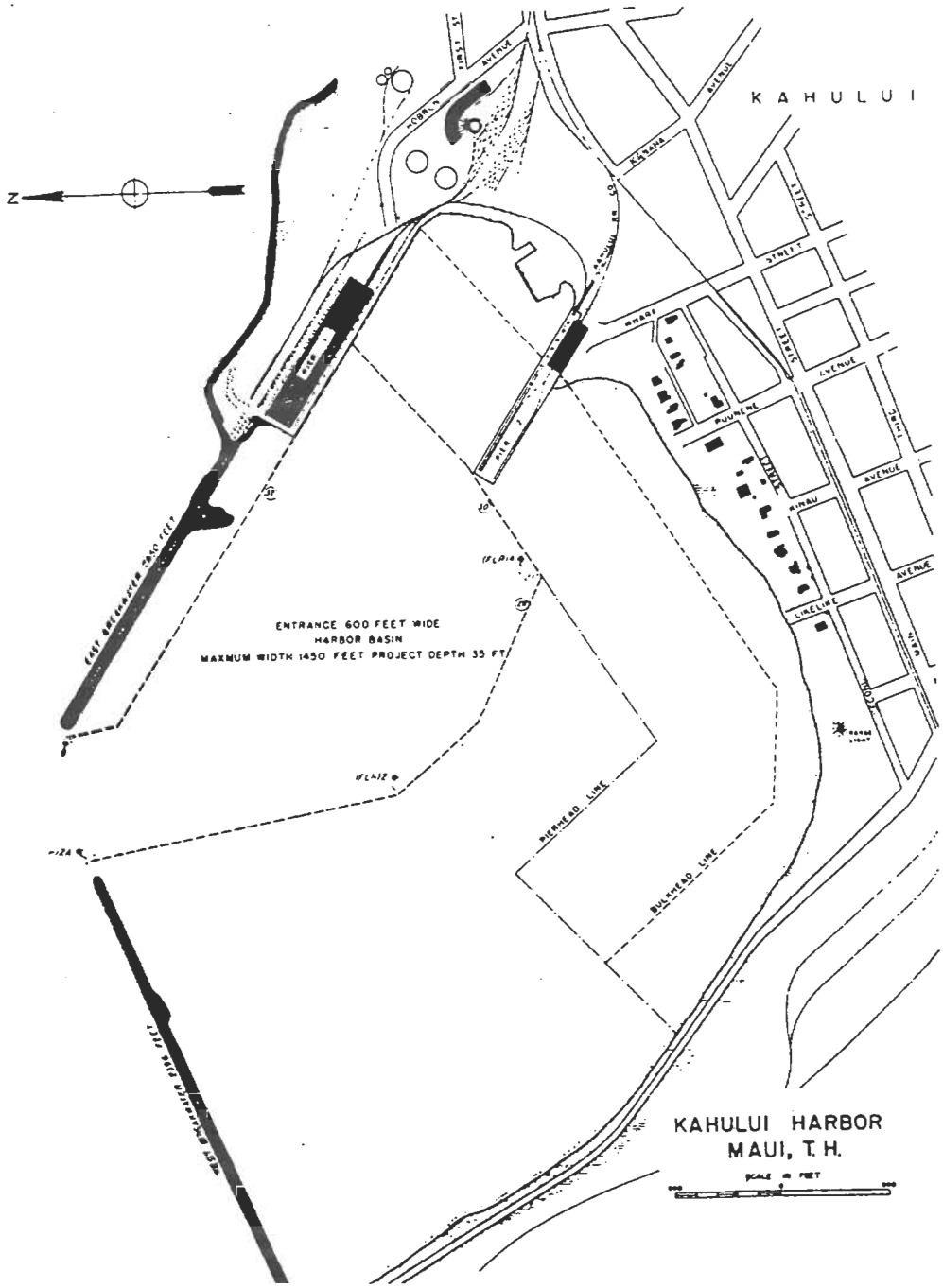


Figure 6. By 1950, the transformation of Kahului Harbor was nearly complete, as seen in this map from Stroup's *The Ports of Hawai'i* (1950:73).

Kahului Harbor - Archaeological Sites

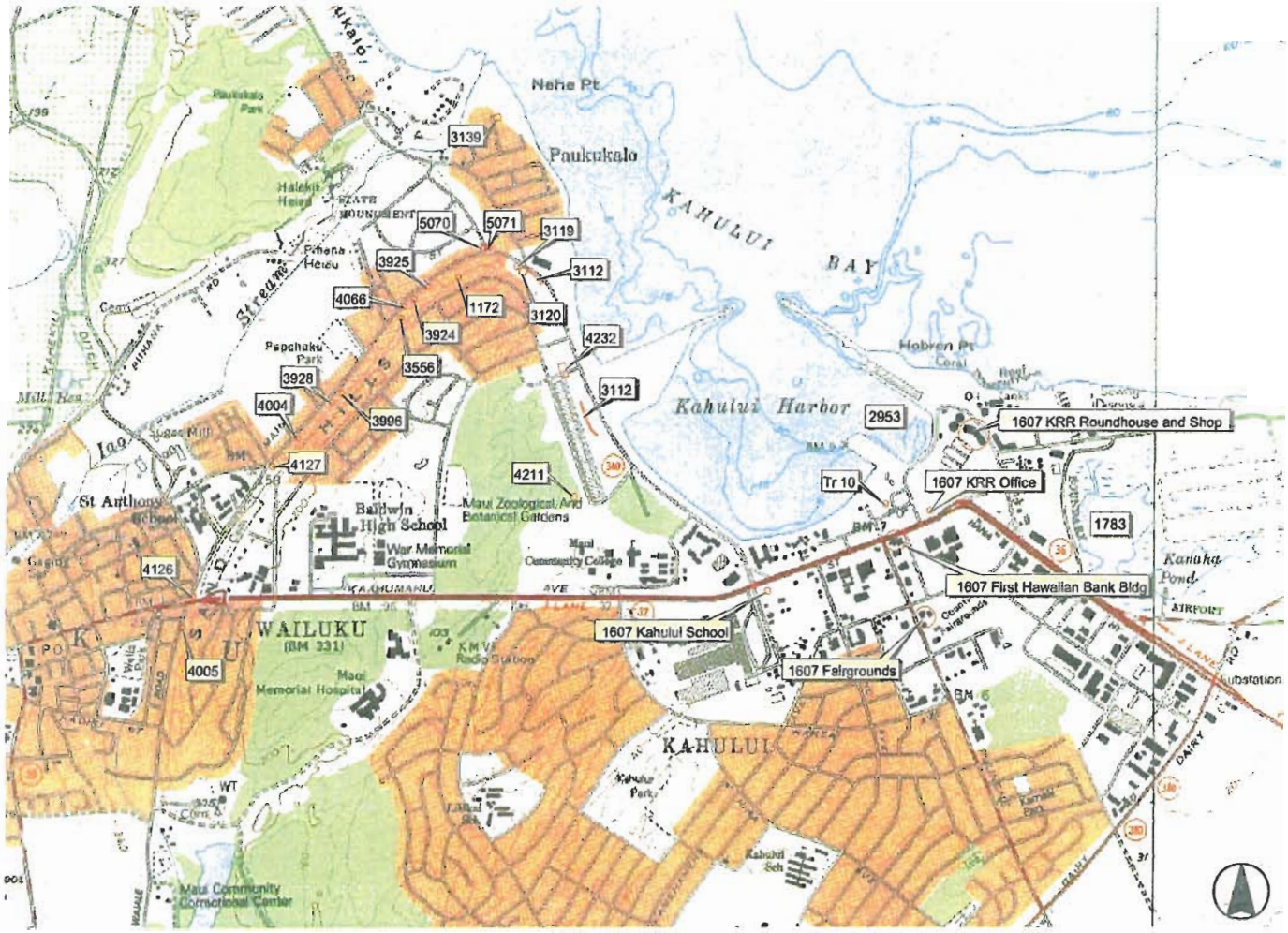


Figure 7. Location of historic properties in the Kahului Harbor area.

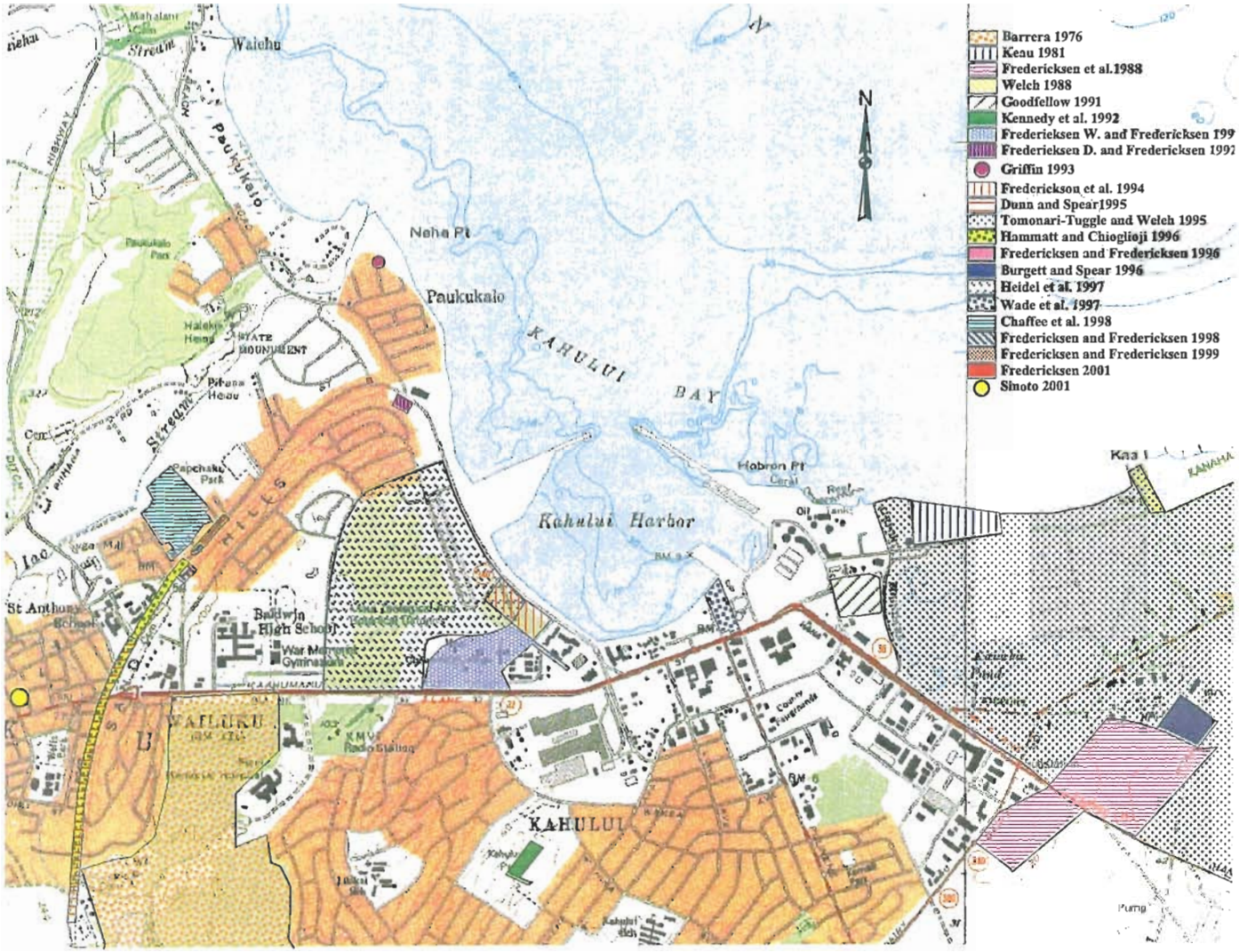


Figure 8. Areas of previous archaeological studies (Source: SHPD GIS).

PHOTOGRAPHS

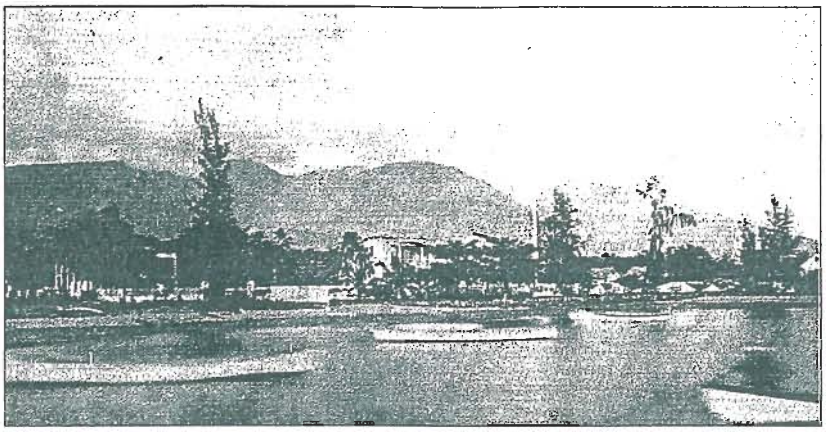


Photo 1. Kahului Waterfront, 1870 to 1880s (Source: Bartholomew 1994).

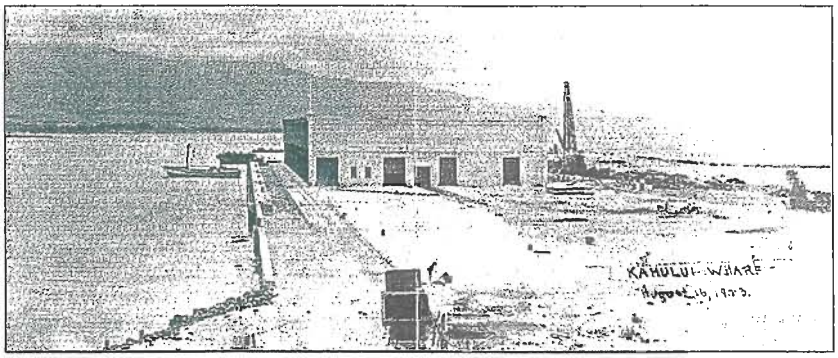


Photo 2. Construction of Pier One at Maui Wharf, 1923 (Source: Bartholomew 1994).

Photo 3. Site 1607 Bank of Hawaii (former First Hawaiian Bank) building.

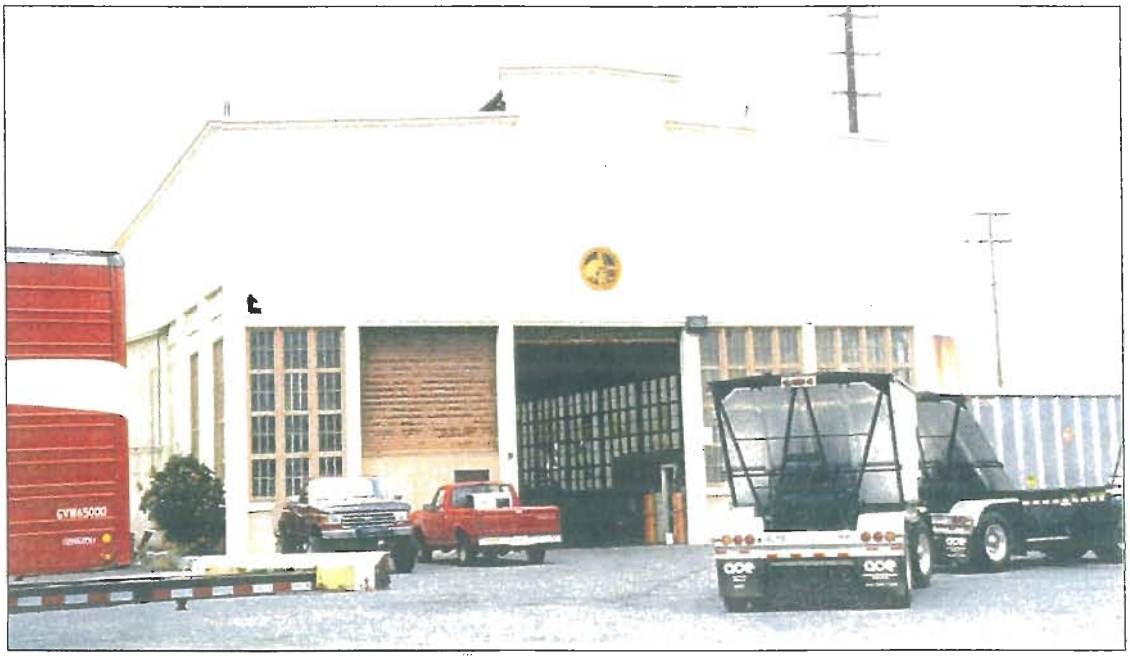


Photo 4. Site 1607 former Kahului Railroad shop building.

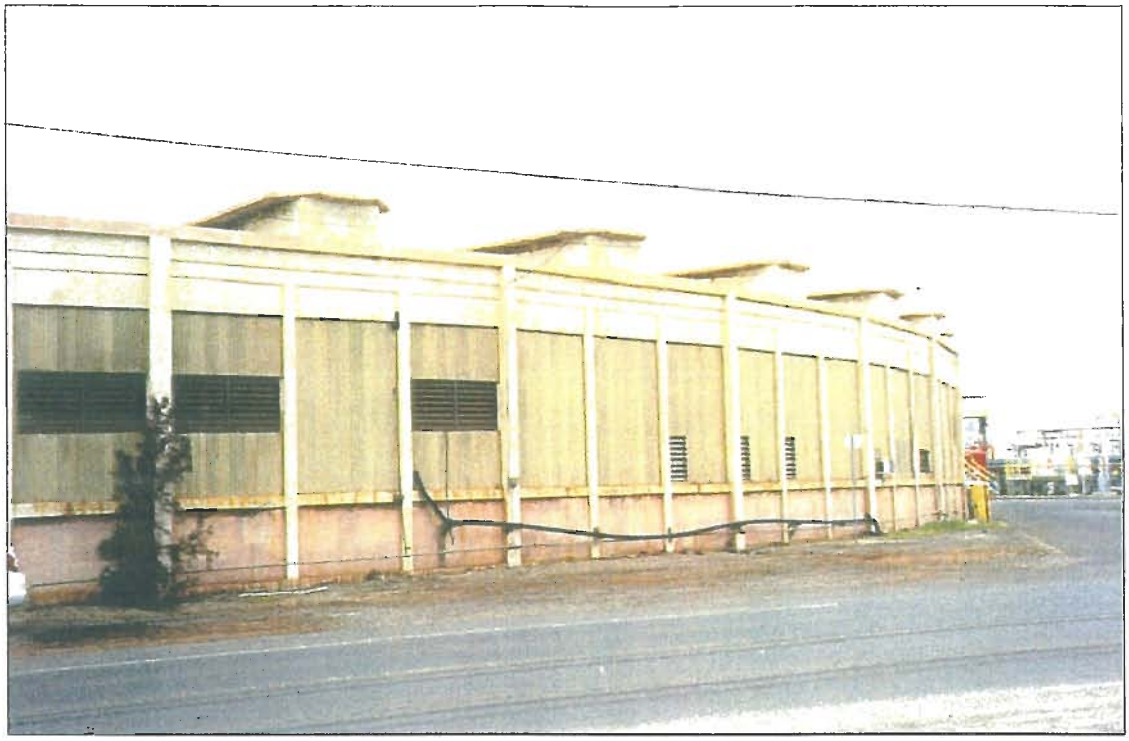


Photo 5. Site 1607 former Kahului Railroad roundhouse.

Photo 6. Raw Fish Camp (Photo courtesy of Maui Historical Society, Bailey House Museum).

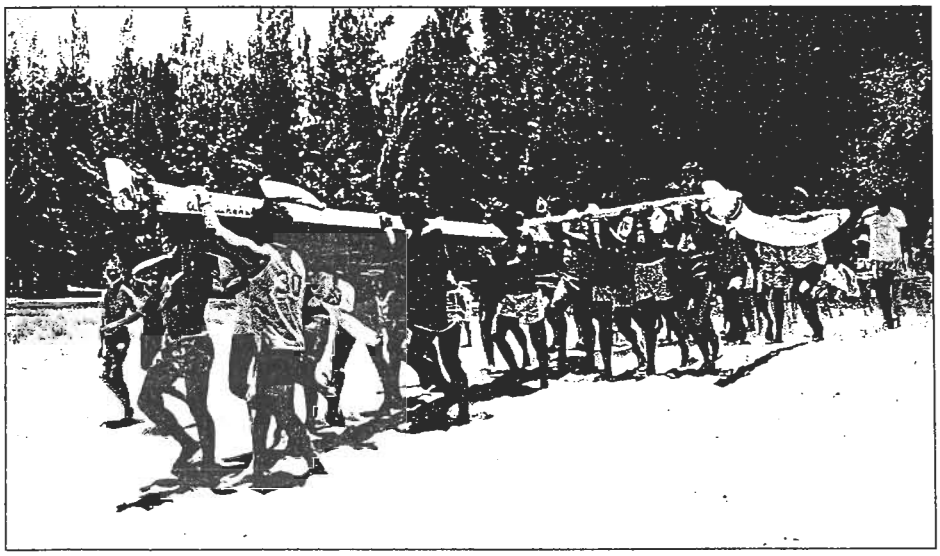


Photo 7. Canoe being carried to the beach at Kahului, 1970s (Source: Bartholomew 1994).

APPENDIX A.

KAHULUI HARBOR TIMELINE

"There were so many harbors to be dug, three decades ago."
— *Maui News* August 23, 1931

"Contrary to general belief, the Kahului breakwater project is not entirely finished." — *Maui News* October 30, 1931

Year	Event
1857	*The Friend* publishes an article on ports of the Sandwich Islands; Kahului is not mentioned.
1863	A warehouse, the first European-style structure, is built near the beach.
1873	Kimble's Store is built near the beach.
1876	A wheelwright/blacksmith shop is built near the old site of the Kahului saloon.
1876	A tidal wave floods Kahului.
1879	A small landing is built for sugar growers.
1879-1881	Captain Thomas Hobron and his associates build the first line of Kahului Railroad; the Kahului Railroad Company is incorporated two years later.
1884	Samuel G. Wilder acquires Kahului Railroad.
1899	Hawaiian Commercial and Sugar Company buys the railroad.
1900 – November	A new hotel is under construction at the harbor; the "old wharf" has gotten new piles and been extended 40 feet and is in the process of getting new flooring.
1901	H.P. Baldwin hires an engineer to survey the harbor.
1903 – April	During a mass meeting on April 24 at the Wailuku Court House, the crowd expresses strong support for a public wharf at Kahului and chooses representatives to lobby for it.
1904	A new roundhouse is built.
1905	Kahului Railroad Company makes many improvements during the year, including new buildings, additions to old buildings, and improved shipping facilities.
1905	Work starts on the harbor's east breakwater.
1907	Breakwater construction and harbor dredging are underway.
1908	By this year the Kahului Railroad Company has built two small wharves. Vessels do not pull up to the wharves but sent freight and passengers in on lighters.

Year	Event
1901	Kahului has a customs officer, a government pilot, and a Public Health and Marine Hospital Service quarantine officer.
1909	Kahului is still completely dependent on lighters to transfer goods and people; there is no wharf suitable for steamers or sailing vessels to pull up to directly.
1909 – October, November	Representatives of Kahului Railroad Company meet with the governor to discuss plans for the waterfront. Negotiations focus on the smaller of two planned wharves (which will become known as the Claudine Wharf). Discussion of a bigger wharf are expected to take place later, after the harbor has been dredged. The government reserves the option to take over the wharf at a future date. Within a few weeks the company receives a license to build an inter-island wharf.
1910	By 1910, Kahului Railroad Company has built an 1,800-foot breakwater on the eastern side of the harbor, dredged the harbor basin, and built a 200-foot wharf that can accommodate 25-foot-draft vessels.
1910	The federal government takes over responsibility for the harbor; Kahului Railroad Company cedes all rights to the existing breakwater and agrees to make no financial claim on the government for harbor improvements already made.
1910 – July	A 40-foot lighthouse is established on the breakwater.
1910	The "Claudine Wharf," as the inter-island wharf is known, is completed.
1911	Work on the breakwater continues, now under the control of the U.S. Engineers.
1913 – March, July	A project to add 75 feet to the breakwater is going forward on a rush basis, conducted by Kahului Railroad Company under contract to the War Department. The line for the new (west) breakwater has been surveyed and charted but Congress has not approved that project yet. The (east) breakwater extension is finished July 3.
1916 – August	President Wilson signs a Rivers and Harbors appropriations bill that includes funding for the west breakwater.
1917 – July	Work starts on the west breakwater. Kahului Railroad Company is the contractor.
1918	More harbor dredging begins.
1922	Hawaiian Dredging Company is awarded the contract for the "inshore end" of Pier 1—consisting of "a concrete apron 500 feet long and a concrete shed 132' x 375', with steel trusses, wooden purlins and sheathing, tar and gravel roof." Work begins in May.
1923 – June	Claudine Wharf is closed for repairs; goods and passengers are again moved by lighters.
1923 – August	Pier 1 is completed and turned over to the Territory of Hawaii on August 29—but it is not completely open for business yet; the conveyors and other equipment are not installed. With 500 feet of berthing space, the new wharf is suitable for large steamers that the Claudine Wharf can't accommodate.
1923 – September	The new wharf is used for the first time on Sunday, September 23, by the lighthouse tender *Kukui*. (The facilities for moving freight are still not installed.) A few naval vessels use the wharf the following month.
1923 – October	The Matson steam liner *Maui* berths at the new wharf, carrying aboard it an "excursion party" from the San Francisco Chamber of Commerce. Freight moving equipment has not yet been installed and the roadway to the wharf is not yet complete.
1923	An office building is built, fronting Main Street in a grove of coconut palms, and an 11-stall roundhouse is built soon after.

Year	Event
1923-26	More workshops are built at the railway terminus in Kahului.
1924 – May	Construction of the freight conveyor system (which required a separate bond issue to finance it) is finally underway. The approach road is completed on May 3 and taken over by the Territory two weeks later.
1924 – July	Los Angeles Steamship Company announces that its two steamers, the *City of Los Angeles* and the *Calawaii*, will make regular visits to Kahului beginning the end of the month. The first visit (July 28) is a public relations disaster, as the *City of Los Angeles* has serious problems both docking and leaving the harbor. The first freight shipment goes out from the new wharf (probably on the *City of Los Angeles*, despite its earlier docking problems).
1924 – August to November	The Los Angeles Steamship Company announces it will not use the new wharf (instead, it will moor offshore and transfer passengers and freight by lighter). However, in mid-month the company's second steamer—the *Calawaii*, which is somewhat smaller and arrives in better weather—ties up at the wharf without a problem. Later, the *City of Los Angeles* also docks successfully several times, but in mid-November abandons the Kahului stopover for the winter because it considers it unsafe during the stronger winds.
1924 – November	The Territory of Hawaii buys the Claudine Wharf for $25,000. The west breakwater loses 15 feet in a storm; so far it has lost 125 feet in "surface washout."
1924 – December	The Kahului wharves are congested, freight is piling up, and at least one ship has had to wait for its turn to unload. The Maui Chamber of Commerce labels the new wharf (which can only accommodate one large vessel at a time) "inadequate," and calls for it to be lengthened.
1925 – February	Claudine Wharf's piles give way; it's believed that ocean currents, possibly affected by recent harbor dredging, might have swept away sand supporting the piles.
1925 – October	California Packing Company plans to build a cannery at Kahului; the increased business is seen as one more reason to move forward with harbor improvements.
1925 – November	Kahului Railroad Company alerts the harbor board that water is eroding the road to Claudine Wharf, in front of the ticket office.
1926 – May	The Los Angeles Chamber of Commerce announces it will skip its planned June visit onboard the *City of Los Angeles* because of safety issues.
1926 – June	Steamers are again lining up waiting a turn to unload at the wharf.
1926 – October	Harbor dredging, preliminary to construction of a new wharf (in about the same place as the Claudine Wharf but longer) is underway. The Claudine was declared unsafe "some time ago" but shippers are still using it. A part of it has already collapsed; this was expected, though, and the railroad tracks had already been moved in anticipation. Driving routes in the vicinity are already changing, and congestion and delays are expected.
1926 – October	Around the harbor, Kahului Railroad Company is replacing its old wooden buildings, one by one, with "fine concrete structures of imposing dimensions."
1927 – March	Pier #1 is overcrowded. Kahului Railroad Company's manager, William Walsh, calls the older Claudine Wharf "dangerous to life and property" and says Maui is missing out on shipping because of the condition of the harbor.
1927 – May	Demolition of the Claudine Wharf begins May 3.
1927	The *Maui News* carries several articles in the second half of the year on port congestion and inconvenience during construction.

Year	Event
1927 – December	There remain loose ends to tie up, but Wharf #2 (the replacement for the Claudine Wharf) is now open for business.
1928 – March	The breakwaters are damaged in a storm; debris clutters harbor floor; shipping access is expected to be very limited until the seas calm down.
1929—May	Construction is complete on the extension ("second unit") of Pier 1.
1929 – November	A bad storm damages the east breakwater.
1930	The extension to the Pier 1 shed is nearly complete and already in use.
1930 – October	"Pilikia Pau"—the *Maui News* summarizes harbor improvements: • The harbor is dredged to a minimum depth of 35 feet and a maximum width of 1,455 feet and is "now safe for large vessels." • Pier 1 can accommodate two liners and an oil boat; Pier 2 can accommodate inter-island steamers and lumber carriers. • Work on the breakwater continues.
1930 – December	The east breakwater is now complete and a lighthouse has been re-established on it—the Kahului East Breakwater Light, "a pyramidal skeleton tower the top 41 feet above water from which there flashes the light, visible ten miles away." Work on the west breakwater continues.
1931 – August	Matson Navigation Company includes Kahului on its San Francisco/ Honolulu/Hilo route.
1931 – August	This is the condition of the harbor: • It is dredged to 35 feet, with a 600-foot channel that is 40 feet deep or more. • Pier 1 (adjoining the east breakwater) has four rail tracks and a more modern conveyer system than Honolulu. It has a storage capacity of 70,000 tons of sugar, 375 cases of pineapple, and additional freight, and a "full complement of molasses and oil pipelines." It is quickly paying for itself in storage and shipping fees. • Pier 2, at the site of the old Claudine Wharf, handles inter-island passengers and freight. • Between the two piers is "abundant anchorage for sampans and the mosquito fleet."
1931 – October	The west breakwater is finished.
1931 – December	The *Maui News* celebrates the end of a harbor improvement process that began in 1901.
1942	Kahului Railroad Company builds the first bulk sugar plant in the Islands, with a 40,000-ton capacity, at Kahului Harbor.

Sources: Bartholomew, Best, Clare and Morrow Clark, Hungerford, Kuykendall 1982, *Maui News*, Nakayama, "Ports of the Sandwich Islands," Rush, Stroup, United States Board of Engineers for Rivers and Harbors, Williams.

Note: This timeline is based on a quick search of the records, is necessarily incomplete, and contains references to places and events that may not be given full context here or in the main text.

APPENDIX B.

INDIVIDUALS AND GROUPS CONTACTED AND INTERVIEWED FOR THE CULTURAL IMPACT ASSESSMENT

CONTACTED FOR THIS STUDY

Scott Cunningham, Harbormaster
Mary Akiona, Executive Director, Hawaiian Canoe Club
Sharon Balidoy, Laeula O Kai Canoe Club
Gabby Gouveia, Na Kai Ewalu Canoe Club
Uncle Boogie, Head Coach Na Kai Ewalu, 38-year employee for Young Brothers
Iokepa Naeole, Past President of the Hawaiian Canoe Club
Ethel Ujie, former frequent visitor of Raw Fish Camp
Russel Okumura, former resident of Raw Fish Camp
Maui Historical Society
Mr. Ishikawa, long-term shoreline fisherman at Kahului
Rudy, long-term fisherman at Kahului
Dorothy Makimoto
Myoko Onaga
Fishermen (seven) at the "fish shack"
Paddlers (various with both clubs)

No surfers were located or observed in the project area during the study period.

CONTACTED FOR EARLIER STUDY

The following individuals provided oral histories for *An Evaluation of Traditional and Historical Land Uses in the Kahului Airport Area* (Prasad and Tomonari-Tuggle 1999).

Kūpuna Charles (Charlie) Keau
Kūpuna Aaron Brown
Kūpuna Nancy Hokoana
Kūpuna Rene Sylva
Hiroshi Arisumi
Richard Cameron
George Ito
Glen Misubayashi
Sam Ohigashi
Jon Sakamoto
Maizie Sanford
William Tavares
Barbara Woods
Joe McCabe

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APPENDIX C

WATER QUALITY, MARINE BIOLOGICAL AND NATURAL RESOURCES IMPACTS ASSESSMENT; KAHULUI HARBOR CURRENT DROGUE MEASUREMENTS AND CTD PROFILES; MACROALGAL STUDY

Kahului Commercial Harbor 2025 Master Plan Environmental Assessment

Water Quality, Marine Biological and Natural Resources Impacts Assessment

Prepared for:

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Introduction

Kahului Harbor is located on the south side of Kahului Bay on the north coast of the island of Maui (Figure 1). Waihee Reef extends 0.7-mile northwest of the breakwaters, and Spartan Reef extends 1.2 miles east of the breakwaters.

The commercial deep-water port of Kahului is on the southeast side of Kahului Harbor. The harbor is protected by two rubble mound breakwaters which extend outward from the east and west shores and enclose an area of about 200 acres. The entrance to the harbor is in deep water from the north through a 600-foot-wide opening between the outer ends of the breakwaters. The channel then turns sharply southeast to the Kahului Piers. The channel and basin are maintained at or near a 35-foot depth. The west part of the inner harbor is shallow. The southeastern shoreline consists of fine-grained sand beaches. The southwest shoreline is gravelly. The prevailing winds are the northeast trades, and harbor currents are weak.

Kahului has regular interisland barge service and is a port of call for transpacific vessels. Large vessels may anchor outside the breakwaters. Small craft have plenty of anchorage room in the unimproved areas behind the breakwaters. Vessels approaching the harbor entrance need to avoid the reefs. Product loading at Kahului Harbor occurs at Pier 3 located on the eastern side of the harbor within the commercial basin.

The State of Hawaii, Department of Transportation, Harbors Division (DOT-HAR) is proceeding with implementation of improvements at Kahului Harbor as outlined in the Kahului Commercial Harbor 2025 Master Plan, September 2000. An Environmental Assessment is being prepared under HRS 343 and possibly NEPA to assess the potential for significant impacts by the proposed harbor improvements. The proposed construction, particularly dredging and in-water construction, may have direct or indirect impacts on marine biological communities or natural resources.

In support of the EA, studies were conducted to address the potential for impacts to water quality, marine biological communities and natural marine resources in and adjacent Kahului Harbor as a result of the proposed improvements.

Water Quality Conditions

Methods

Water quality conditions within Kahului Harbor are influenced by a range of factors, including tidal exchange with nearshore waters outside the harbor, the pattern of flow and circulation within the harbor, surface discharge from surrounding lands during heavy rainfall events, and continuous discharge of nutrient-laden groundwater. The largest and longest term influences are expected to be related to season. In order to characterize in more detail the current water quality conditions in the harbor, water quality surveys were conducted on October 16, 2002, under light winds and scattered rain squalls, and on April 15, 2003, under strong trade winds.

Water quality parameters measured during the impact study include those listed in the State of Hawaii water quality criteria for marine waters. Additional parameters provide information on groundwater sources and potential public health problems, and have been measured in previous assessment and monitoring surveys. The instrumentation and methods used for each analysis are presented in Table 1.

On October 16, 2002, water samples were collected at eight shoreline stations (S1 – S8), one station located along the east arm of the harbor (E1), six stations within the harbor entrance channel and turning basin (H1 – H6), four stations in nearshore coastal waters immediately outside the harbor (NS 1 – NS4) and one station in the small stream which empties into the harbor along its western side (Stream). All station locations are shown in Figure 2. Samples could not be collected at a shallow nearshore station (NS5) and at stations along the western arm of the harbor (W1 – W2) because of high surf.

On April 15, 2003, water samples were collected at seven shoreline stations (S1 – S7), one station located along the east arm of the harbor (E1), three stations along the western arm of the harbor (W1 – W3), nine stations within the harbor entrance channel and turning basin (H1 – H9), and three stations in nearshore coastal waters immediately outside the harbor (NS2 – NS4). All station locations are shown in Figure 2. Samples could not be collected at a shallow nearshore stations (NS1, NS5) because of high surf.

For the shoreline stations on both surveys, a single sample was collected from just below the surface in water less than 0.5 m deep. For all other stations on October 16, three samples were collected: one just below the surface, one at mid-depth, and one 0.5 m above the bottom. On April 15, samples were collected just below the surface and 0.5 m above the bottom.

At each station on October 16, measurements of temperature and dissolved oxygen were made *in situ* with a portable temperature/DO sensor. For both surveys, water samples were collected with a Niskin bottle which was triggered to collect a sample at a specific depth. Upon retrieval, water samples were placed in 1 liter polyethylene bottles and held on ice for shipment to the analytical lab. On October 16, pH and turbidity were determined within 2 hours after collection. Upon receipt at the lab, subsamples of each sample were filtered for determination of total suspended solids and chlorophyll. The filtrate was analyzed for total dissolved nitrogen and phosphate, nitrate, nitrite, ammonium, reactive phosphate and silicate. Unfiltered subsamples were analyzed for salinity.

Table 1. Water quality parameters examined during the study, and analytical method.

Water Quality Parameter	Collection and Analysis Method
Dissolved Oxygen	Portable dissolved oxygen meter
Temperature	Portable dissolved oxygen meter
Salinity	Laboratory salinometer
pH	Portable pH meter
Water Samples:	5-liter Niskin bottles
Nutrients	Technicon AutoAnalyzer II;
Total nitrogen	D'Elia et al., 1977
NH_4	Solorzano, 1969
NO_3/NO_2	Technicon Inc., 1977
Total Phosphorus	Grasshoff et al., 1983
Orthophosphate	Murphy and Riley, 1962
Silicate	Strickland and Parsons, 1972
Chlorophyll	Filtration, acetone extraction, Turner Designs fluorometer; Strickland and Parsons, 1972
Turbidity	Turner Designs nephalometer; Standard Methods, 1992
Total Suspended Solids	Filtration, Cahn electrobalance Standard Methods, 1992

Results

Results of water quality analyses on samples collected at Kahului Harbor on October 16, 2002 are presented in Table 2. Samples were collected between 9:00 am and 12:20 pm, on a rising tide. Dissolved oxygen and temperature data were not collected at depths greater than 5 m, the length of the probe cable. The shallow bottom at station NS4 limited sampling depths to 2 m. Due to high surf breaking over the reef, samples were not collected at station NS5. Shallow bottom depths at stations H4 and H5 limited maximum sample depths to 8 and 5 m, respectively. An additional sample ("Stream") was collected in the small stream located at the eastern end of the harbor beach, approximately 50 m inland from the shoreline (Figure 2).

Water temperature was generally uniform between nearshore stations, and between surface and 5 m depths at nearshore stations. Within the harbor, surface waters tended to be 0.3 - 0.7 deg C cooler than 5 m depths, reflecting surface cooling associated with passing rain showers and light trade winds. Shoreline water temperatures were generally 0.3 - 0.5 deg C warmer than surface harbor waters, probably reflecting solar warming, as shoreline samples were collected in early afternoon.

Dissolved oxygen concentrations were generally typical of nearshore marine waters, ranging from 6.0 to 4.8 mg/l, values that are greater than 90% saturation at their respective temperatures and salinities. pH levels varied little and were typical of nearshore marine conditions.

Salinity levels were lower than typical for Hawaiian waters, ranging from 29.66 at the shoreline station S2 to 34.35 in nearshore samples outside the harbor. Depressed salinity levels reflected the recent input of freshwater by rain and runoff.

Turbidity levels were highly variable between nearshore stations, increasing from west to east, and reflecting visually-observed decreases in water clarity due to high surf and resuspended sediments on the western stations and both resuspended sediments and stream-borne sediments discharged during earlier heavy rains to the east. Nearshore turbidity levels ranged from 1.6 to 10.4 NTU. Turbidity levels within the harbor were not different from those in nearshore waters outside the harbor, and ranged from 1.9 to 9.4, with a very high value from a near-bottom sample (37.6 at E1). Turbidity levels at shoreline stations within the harbor (S2 - S7) reflected variable shoreline wave action and build-up of detached macroalgal material. Shoreline station S8 was taken to the east of the sewage treatment plant, in an area of high turbidity (234 NTU) consisting of red soil particles discharged from adjacent streams during recent heavy rainfall. Overall, Turbidity levels were highly significantly related to Total Suspended Solids (Turb = -147 + 4.95 * TSS; $r^2 = 0.81$, $p < 0.01$), and showed the same patterns of distribution and concentrations.

Levels of dissolved nutrients reflected the strong influence of groundwater influx to the harbor. Plots of silicate vs. salinity, nitrate + nitrite vs. silicate and phosphate vs. silicate are presented in Figure 3a – c, respectively. Increasing levels of silicate with decreasing salinity reflect the dilution of low silicate nearshore coastal seawater with high silicate groundwater. The majority of the data fall along a single line; however a group of five samples with a lower silicate-salinity line comprise samples collected at S1 and NS 2 – 3, stations outside and to the north of the harbor. These data suggest a groundwater source with a somewhat decreased silicate load.

The nitrate + nitrite vs. silicate (Figure 3b) and phosphate vs. silicate (Figure 3c) plots show the strong relation between silicate and other dissolved nutrients, suggesting a common upland source. Only samples from shoreline station S2 and S3, located along the western shoreline of the harbor, showed a different nitrogen : silicate and phosphorus : silicate ratio, suggesting a local source of additional nutrients.

Chlorophyll levels were generally low and showed no systematic relationship to salinity (Figure 3d). Elevated chlorophyll levels were observed at shoreline stations (S2 – S4) along the western coastline of the harbor.

A second water quality survey was conducted in Kahului Harbor on April 15, 2003, during a period of strong trade winds. Results of this second survey are presented in Table 3. Samples were collected between 9:00 am and 12:20 pm, on a rising tide. Dissolved oxygen and temperature data were not collected during this survey, as the prior survey showed little horizontal or vertical variation in these parameters. The shallow bottom at station NS4 limited sampling to the surface sample only. Due to high surf breaking over the reef, samples were not collected at stations NS1 and NS5.

Water quality conditions at the nearshore stations outside the harbor were typically open coastal in nature, with higher salinity levels (34.14 – 34.89 ppt) than observed during the previous

survey under light Kona conditions. Levels of dissolved nutrients were consequently low, and typical of open coastal waters with little groundwater influence.

Waters within the harbor were highly stratified, despite the strong wind conditions. Salinity at stations along the western portion of the harbor (H3, H5, H6, H7, H8 and H9) showed salinity levels of 35 ppt in near-bottom samples, and salinity levels of 29.77 – 33.82 ppt in surface samples. Reflecting the strong groundwater input, dissolved nutrient levels were also elevated in surface samples, with NO2+NO3 levels ranging from 10.2 – 30.6 uM, and NH4 levels ranging from 0.58 – 2.44 uM.

Samples collected along the shoreline again showed strong influence of groundwater, with salinity of samples collected within the western part of the harbor (S2 – S6) ranging from 27.2 – 32.59 ppt. Lowest salinities were observed at stations S3 and S4, located in the southwest corner of the harbor. Salinity at station S1, a shoreline station on the northern face of the western breakwater, outside the harbor, was similar to open coastal waters (34.39 ppt), as was salinity at S7, near the base of Pier 1 (34.67 ppt).

Levels of dissolved nutrients again reflected the strong influence of groundwater influx to the harbor. Plots of silicate vs. salinity, nitrate + nitrite vs. silicate and phosphate vs. silicate are presented for the April 15 survey data in Figure 4a – c, respectively. Increasing levels of silicate with decreasing salinity reflect the dilution of low silicate nearshore coastal seawater with high silicate groundwater. The majority of the data fall along a single line, suggesting a single groundwater source.

The nitrate + nitrite vs. silicate (Figure 4b) and phosphate vs. silicate (Figure 4c) plots show the strong relation between silicate and other dissolved nutrients, suggesting a common terrestrial source. Samples from shoreline stations S2 and S3, located along the western shoreline of the harbor, showed different nitrogen:silicate and phosphorus:silicate ratios, suggesting a local source of additional nutrients, or localized nutrient uptake.

Chlorophyll levels were generally low and showed no systematic relationship to salinity (Figure 3d).

Marine Biological Conditions

Nearby marine benthic and fish communities may be impacted by the transport and deposition of sediment suspended during construction and harbor dredging, or by changes in water quality. To assess the magnitude of these potential impacts, the nearshore biological communities have been characterized through compilation of historical data from the Kahului Harbor and immediate vicinity. The Maui Coastal Resource Inventory (AECOS, 1981) was the primary source of the following descriptive marine biological characterization.

Kahului Bay and Kahului Harbor

The general bathymetry of Kahului Bay, Kahului Harbor and adjacent coastal waters is shown in Figure 5. Kahului Bay is a broad embayment between the slopes of two volcanoes: Haleakala

and West Maui. A sand channel entering Kahului Bay is believed to be a relic feature representing the ancient drainage course of Waikapu Stream.

Kahului Harbor, a fan-shaped basin at the head of Kahului Bay, is bounded on the east and northwest by long boulder and dolose breakwaters. The sand shoreline at the head of Kahului Harbor between Pier 2 and the shore along Kahului Beach Road is known as Kahului Beach. The beach is composed of brown, detrital sand and is broken by several boulder jetties built to retard erosion. Much of the southwest shoreline between the extreme south corner of the harbor and the coral fill area is a beach of gravel to boulder size rubble.

Much of the southern and southwestern perimeter of the harbor is fringed by a shallow reef shelf extending a few hundred feet offshore. Beyond the reef edge, the harbor bottom is a terrace of silty-sand and limestone rubble dipping gradually seaward to depths of over 50 feet (15 m). Off the sand beach west of Pier 2 is a sand bottom extending to a depth of 10 feet (3 m). Here, consolidated rock pocketed by sand is encountered. The seaward edge of this formation drops to the dredged basin forming the eastern portions of the harbor.

Sand bottom occurs at depths greater than 30 feet (9 m) outside the mouth of Kahului Harbor. The west breakwater overlies an irregular reef whose margin is about 15 feet (5 m) deep. Here, the limestone platform drops a short distance to a sand bottom continuing offshore from a depth of about 20 feet.

The crab, *Macrophthalmus telescopicus*, is the most conspicuous inhabitant of the silty-sand bottom nearshore between Piers 1 and 2 in the eastern harbor. Less common are solitary tunicates and a few small solitary heads of the coral, *Montipora* sp., in poor condition. *Mugil cephalus, Selar crumenophthalmus, Decapterus macarellus, Acanthurus triostegus, Etrumeus micropus, Kuhlia sandvicensis, Caranx ignobilis*, and *Chanos chanos* are reportedly common within the harbor.

East of Kahului Harbor

A shallow reef extends west from Pa'ia toward Kahului Harbor. The reef margin lies generally one-quarter mile offshore. A narrow band of sand borders the beach off much of the shore, but most of the reef platform is consolidated reef rock. The reef slopes to a depth of about 15 feet (5 m) over 1,000 feet (300 m) offshore from Ka'a. The limestone platform displays complex relief in the form of numerous arches, overhangs, and projections above the bottom. Surge channels and sand pockets occur over the surface of reef rock. Coral cover is sparse over the reef flat, but approaches 60% along the reef edge over 1,000 feet off Ka'a. *Porites lobata* is most abundant, although nearly equaled in abundance by *Montipora flabellata*. Algae are sparse, covering less than 5% of the bottom. *Laurencia* sp. is the most common species. The soft coral, *Palythoa tuberculosa*, is conspicuous. *Scarus* sp., *Acanthurus leucopareius*, *A. triostegus*, *Kyphosus* sp., and juvenile carangids dominate the fish assemblage.

Off the MECO plant the reef has a smooth surface 5 to 10 feet deep extending offshore a distance of about half a mile (800 m), beyond which the bottom drops abruptly. The reef surface is irregular off Hobron Point where depths of 30 to 35 feet (9 to 11 m) are reached within 1,000

feet from shore. The reef face is a steep drop-off to a deep sand bottom off of the east breakwater of Kahului Harbor. Hard corals are scarce and scattered along this high energy shallow reef. The red alga, *Acanthophora spicifera*, is the most common fleshy alga on the reef. Encrusting coralline algae are also abundant. The green algae, *Enteromorpha* and *Cladophoropsis*, increase in abundance near the thermal discharge of the MECO power station. Polychaetes, alpheid shrimp, xanthid crabs, and brittlestars are abundant in substratum samples taken from the reef fronting the power generating station.

Northwest of Kahului Harbor

The shoreline extending north from the west breakwater to Nehe Point is a continuous, narrow beach of rubble and boulders. A reef extends along the coast northwest of Kahului Harbor. The outer part of the limestone shelf off Paukukalo Beach is irregular with high vertical relief. Projections of reef rock rise above sand pockets from a depth of 15 feet (3 m). Small overhangs of reef rock occur along the sides of sand-bottom surge channels. Coral cover reaches 35% on the deeper slopes of the irregular reef flanking the west breakwater. *Montipora patula* is dominant. Algae are generally sparse, but total cover approaches 15% in places. *Halymenia formosa* and *Amansia glomerata* are most common. *Thalassoma duperreyi, Stegastes fasciolatus, Bodianus bilunulatus,* and *Plectroglyphidodon imparipennis* dominate the fish assemblage. Green sea turtles, *Chelonia mydas,* may be seen outside the western breakwater. The mussel, *Brachidontes crebristriatus*, is abundant in shallow waters off the east breakwater.

A submerged fringing reef fronts the coast between Kahului and Waihee Point. Southeast of Waiehu Point, the reef narrows to about 500 feet, half the width of the Waihe'e reef section. Volcanic rubble covers the back reef at the base of the beach. Just offshore the consolidated reef platform is covered by limestone rubble, interspersed with sand pockets. In some areas, reef rock rises above the rubble and provides vertical relief. The reef platform slopes gradually to a depth of about 6 feet (2 m) some 500 feet from shore. Near the reef edge, limestone rubble diminishes and sand deposits are predominant. Beyond the reef margin is a steep-sloping reef front. A sand channel (Kawili Channel) crosses the reef and approaches shore near the mouth of Waiehu Stream. Coral cover approaches 40% on the outer part of the reef bordering Paukukalo Beach. *Montipora patula* is most common. The sea urchin, *Echinothrix* sp., is abundant. Fleshy algae cover up to 10% of the bottom, with *Martensia* sp. predominating. *Rhinecanthus rectangulus, Chaetodon fremblii, Thalassoma purpureum, Acanthurus dussumieri,* and *A. triostegus* are the most conspicuous fishes.

The outer part of the reef off Ka'ehu Beach is a consolidated limestone shelf furrowed by numerous surge channels and sand pockets. Vertical relief is high. Limestone ridges project some 12 feet (4 m) above sand pockets at -20 feet (-6 m). Coral cover averages 20% on the outer part of the reef fronting Ka'ehu Beach. *Montipora patula* is most abundant. The soft coral, *Palythoa tuberculosa*, is common. Algal cover approaches 10%. *Martensia* sp. is most abundant. Few fishes are present: *Acanthurus triostegus* and *Thalassoma ballieui* are most conspicuous.

Off Waiehu Beach Park, the reef platform is interrupted by numerous surge channels, but vertical relief is less than in areas to the southeast. Sparse coral growth and few fishes characterize the

reef platform fronting Waiehu Beach Park. However, this area is rich in algae, which covers about 75% of the bottom near shore, thinning out to 30% cover with increasing depth. *Ulva fasciata* and *U. reticulata* are the most abundant of at least 16 species (and one angiosperm), including several edible varieties. Only a few species of fishes are recorded in shallow waters between shore and the reef edge. Corals are abundant on the outer reef where at least 12 species are represented. *Porites lobata* dominates the cover, which totals 80%. The solitary coral, *Fungia scutaria*, is common, as well as *Montipora patula*. *Acanthurus dussumieri* is the most abundant fish.

Impact Analysis

The potential for significant impacts to regional water quality and adjacent marine communities due to the proposed Kahului Harbor improvements is small. Water quality conditions within the harbor and in adjacent open coastal waters are influenced primarily by the input of nutrient-rich groundwater and the resuspension of sediment by wave action. Groundwater input occurs all along the coastline, but appears to be higher than usual in the southwest corner of the harbor. Lowered salinity values and high levels of dissolved nutrients in this area demonstrate the localized source. Water quality conditions within the harbor and nearby coastal waters reflect the simple physical mixing of the high nutrient groundwater with low nutrient coastal water. None of the proposed harbor improvements will alter the quality of groundwater entering coastal waters, or change the location of groundwater discharge.

Physical oceanographic studies (EKNA, 2003) examined current patterns and water exchange rates in Kahului Harbor under several wind and tide conditions. Current studies using surface and subsurface drogues showed a generally closed circulation within the harbor, with little exchange with waters outside the harbor over a tidal cycle. Under strong trade wind conditions, surface flow was across the harbor to the west and over the shallow reef along the western side of the harbor. These circulation patterns tend to minimize the impact of sediment generated by construction activities on communities outside the harbor.

While some sediment and turbidity may be generated by the proposed construction activities, its impact on water quality and marine communities will be small. Levels of suspended particulates in the waters of the harbor and adjacent coastal waters are primarily the result of resuspension of bottom sediment by strong winds and/or wave action. The harbor basin is characterized by a bottom comprised of sand and mud. Under strong trade winds, vertical mixing may bring fine sediment suspended near the bottom up into surface waters. Ship traffic, especially large ships with drafts approaching the harbor bottom depth, can resuspend large amounts of sediment as they maneuver within the harbor. Typical surf outside the harbor also keeps fine sediment particles suspended in a layer 1 – 2 m in thickness above the bottom (pers. obs.). Within this system of naturally-occurring high turbidity and suspended solids loads, the addition of small, localized sediment sources will have little incremental impact.

The location and distribution of general bottom types within and in the vicinity of the mouth of Kahului Harbor can be seen in aerial photographs of the area taken May 24, 2000 (Plate 1). The edges of bottom features have been enhanced for clarity in the color plate. The extensive sandy-mud bottom of the harbor extends for a long distance to the north outside the harbor mouth.

Bottom depths range from approximately 30 feet at the harbor mouth to 60 feet at a distance of 1 km from the harbor mouth. Fringing reefs for several km on either side of the harbor (Figure 5) comprise scoured reef platforms with sparse coral and fish communities.

The area outside the harbor mouth potentially impacted by sediment from the harbor is small. Sea Engineering, Inc. (SEI, 2000) conducted a modeling study of sediment transport associated with the proposed dredging of additional berthing space in Kalaeloa Barbers Point Harbor, Oahu. Kalaeloa Barbers Point Harbor is similar to Kahului Harbor in having a harbor basin connected to coastal waters by a narrow entrance channel. The SEI study concluded that turbidity levels would rarely exceed ambient levels by 1 NTU at distances of 1 km from the harbor entrance. Since no dredging is proposed for the Kahului Harbor improvement project, these modeling results for Kalaeloa Barbers Point Harbor represent a worst-case scenario for Kahului Harbor. Construction-related turbidity is likely to remain within the harbor, or to be discharged through the harbor mouth into coastal waters where mixing and transport would rapidly disperse any turbidity plume, probably within less than 1 km from the harbor mouth.

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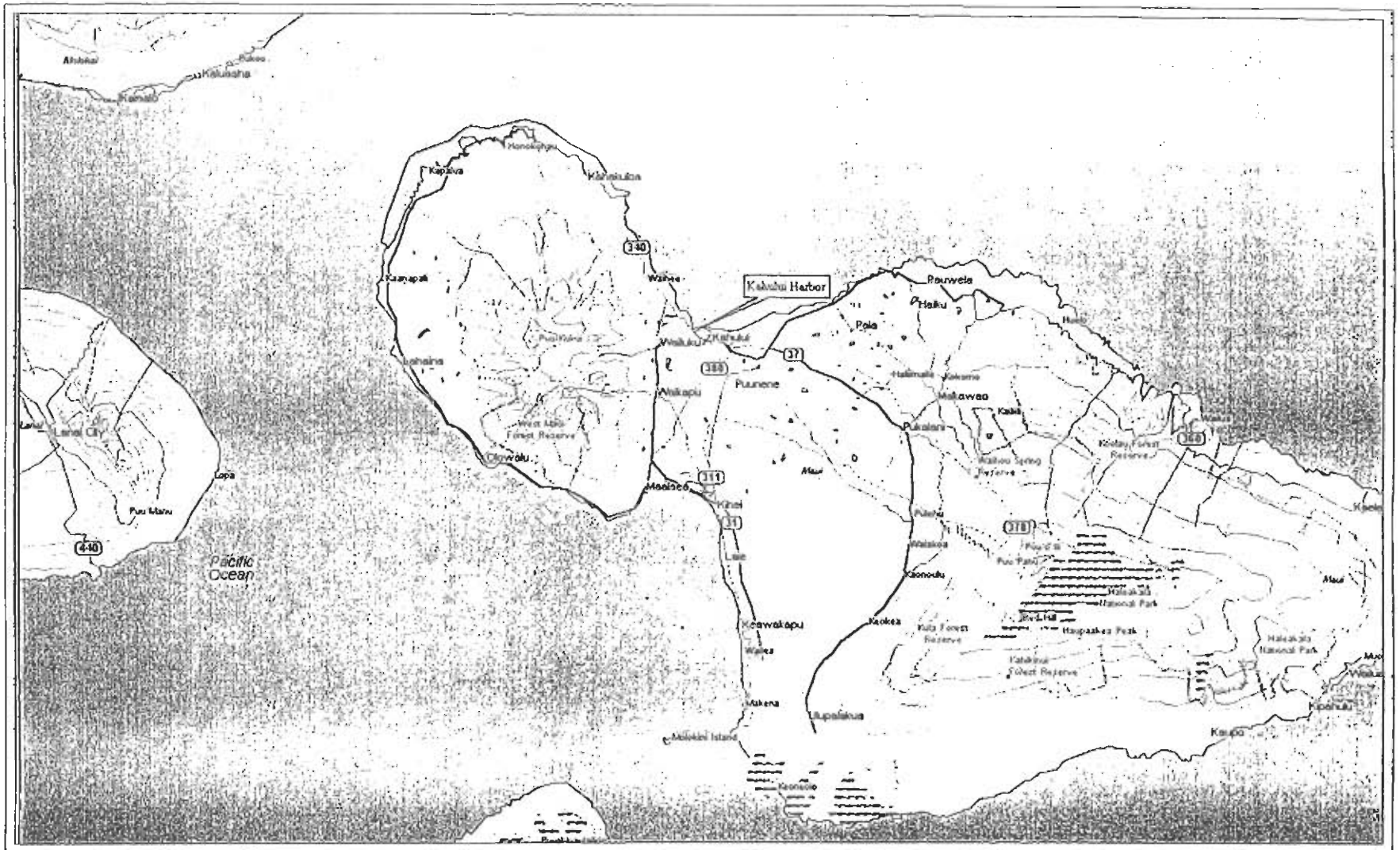
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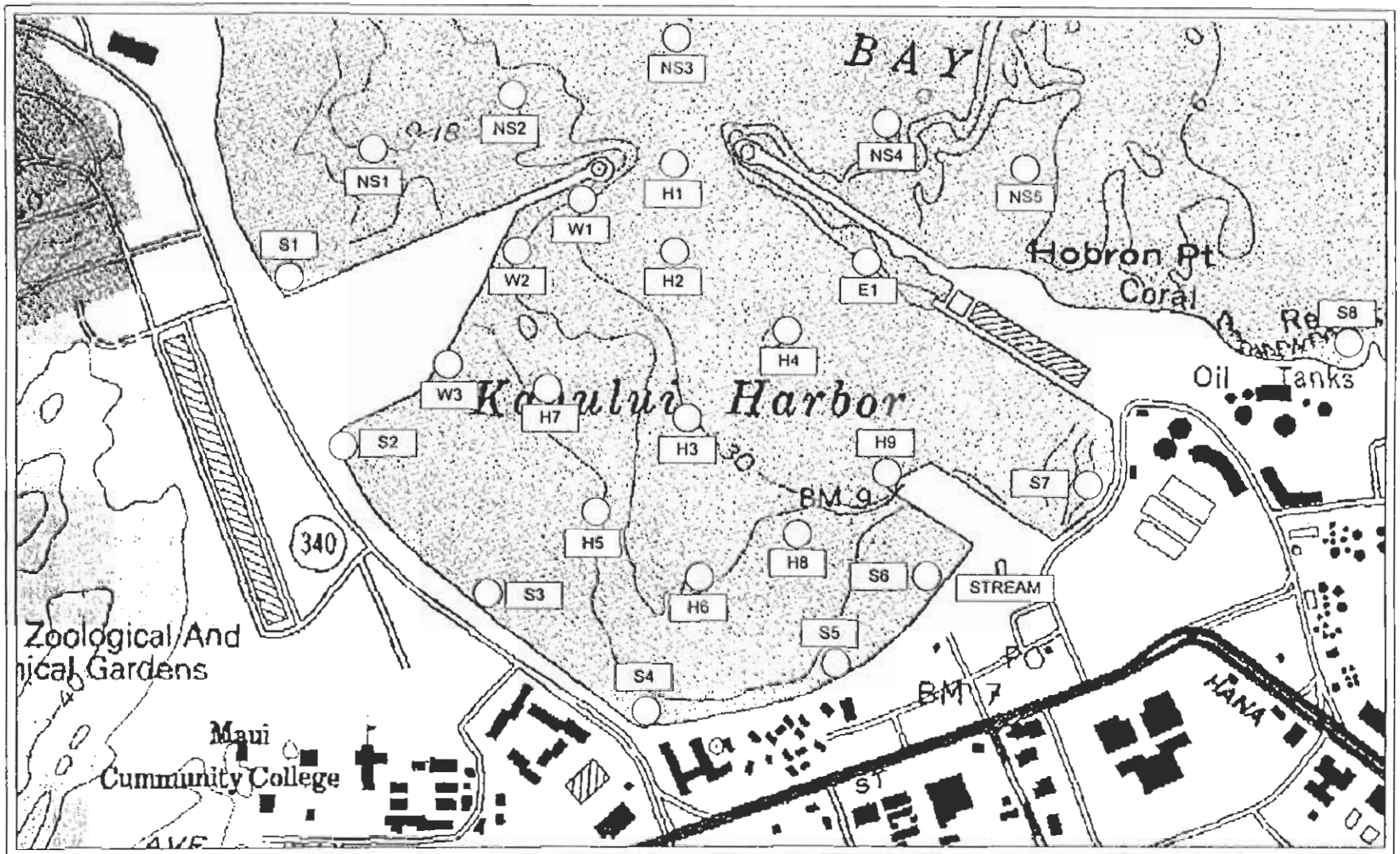


The Oceanic Institute Makapuu Point Waimanalo, Hawaii 96795	Kahului Commercial Harbor 2025 Master Plan Environmental Assessment Location of Water Quality Survey Stations ○	Figure 2

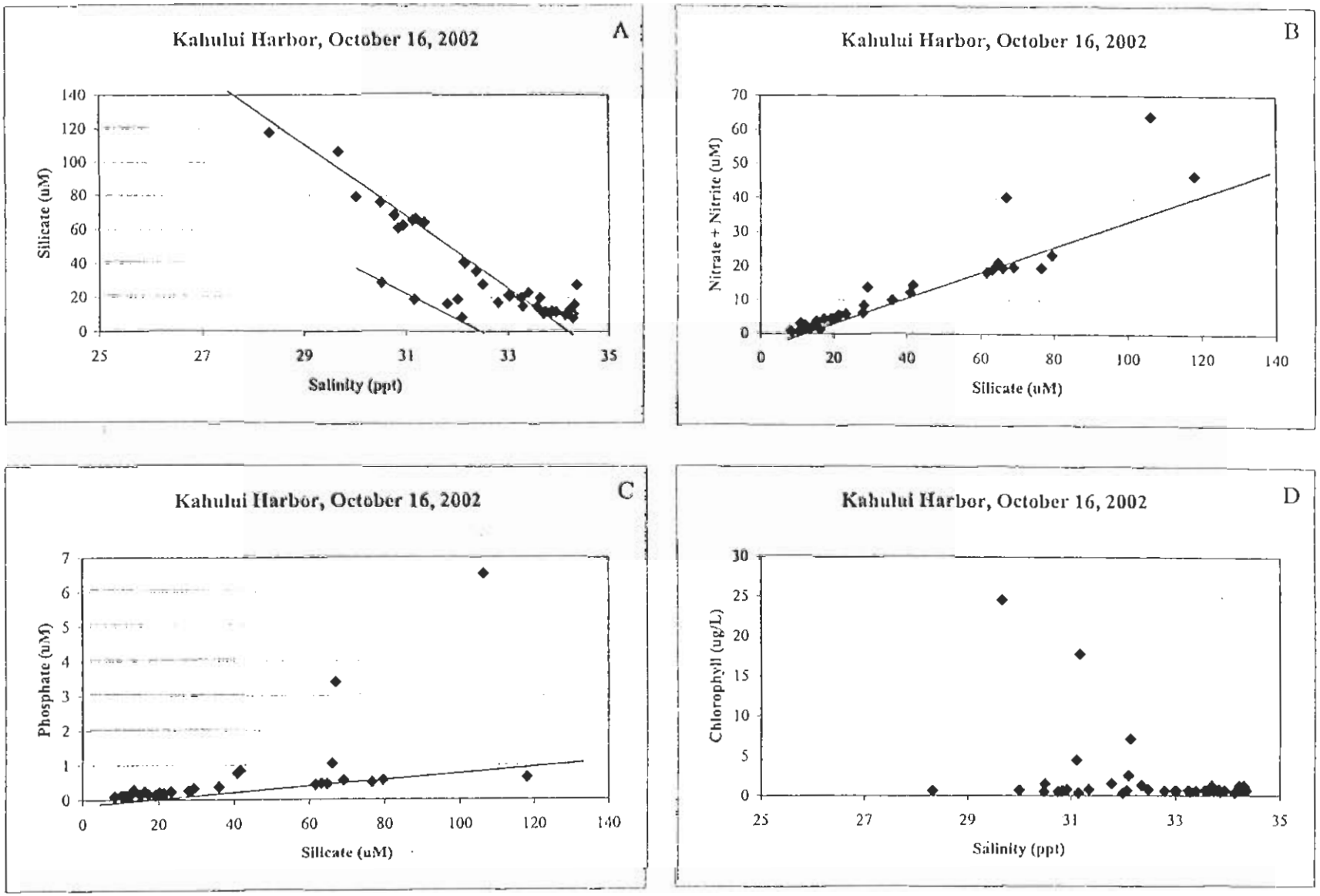


Figure 3. Plots of water quality data for survey conducted at Kahului Harbor, Hawaii, on October 16, 2002.

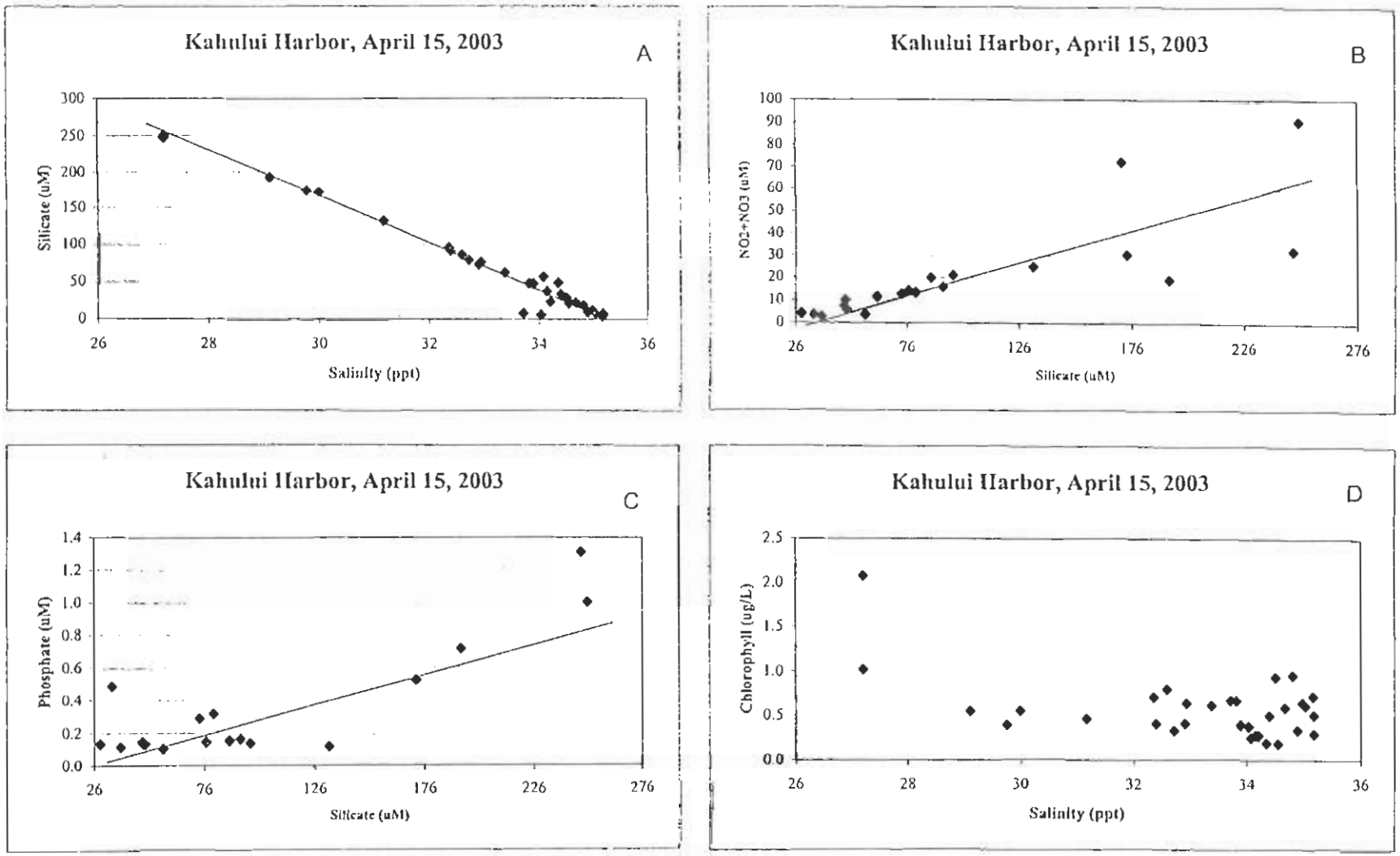
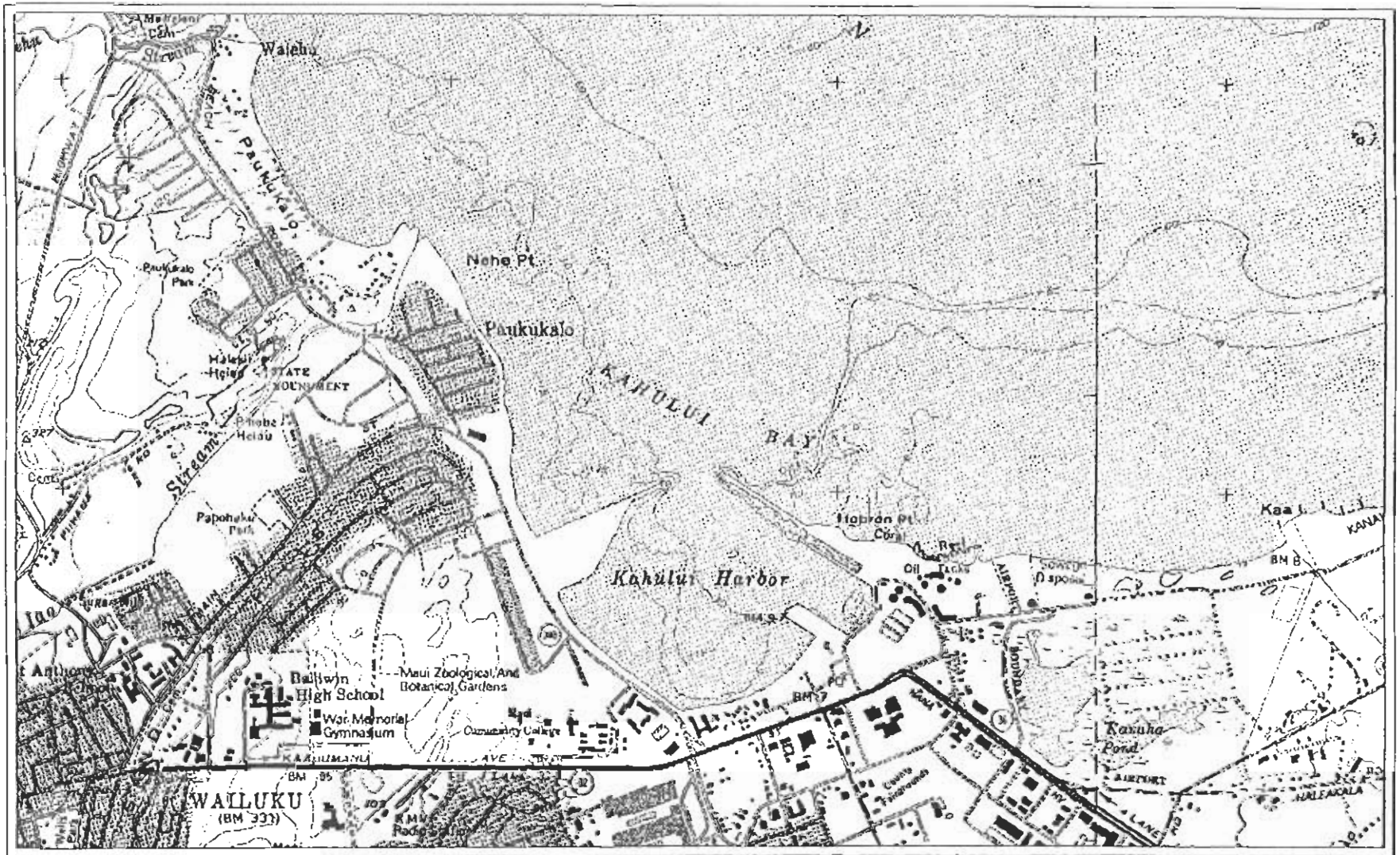


Figure 4. Plots of water quality data for survey conducted at Kahului Harbor, Hawaii on April 15, 2003.

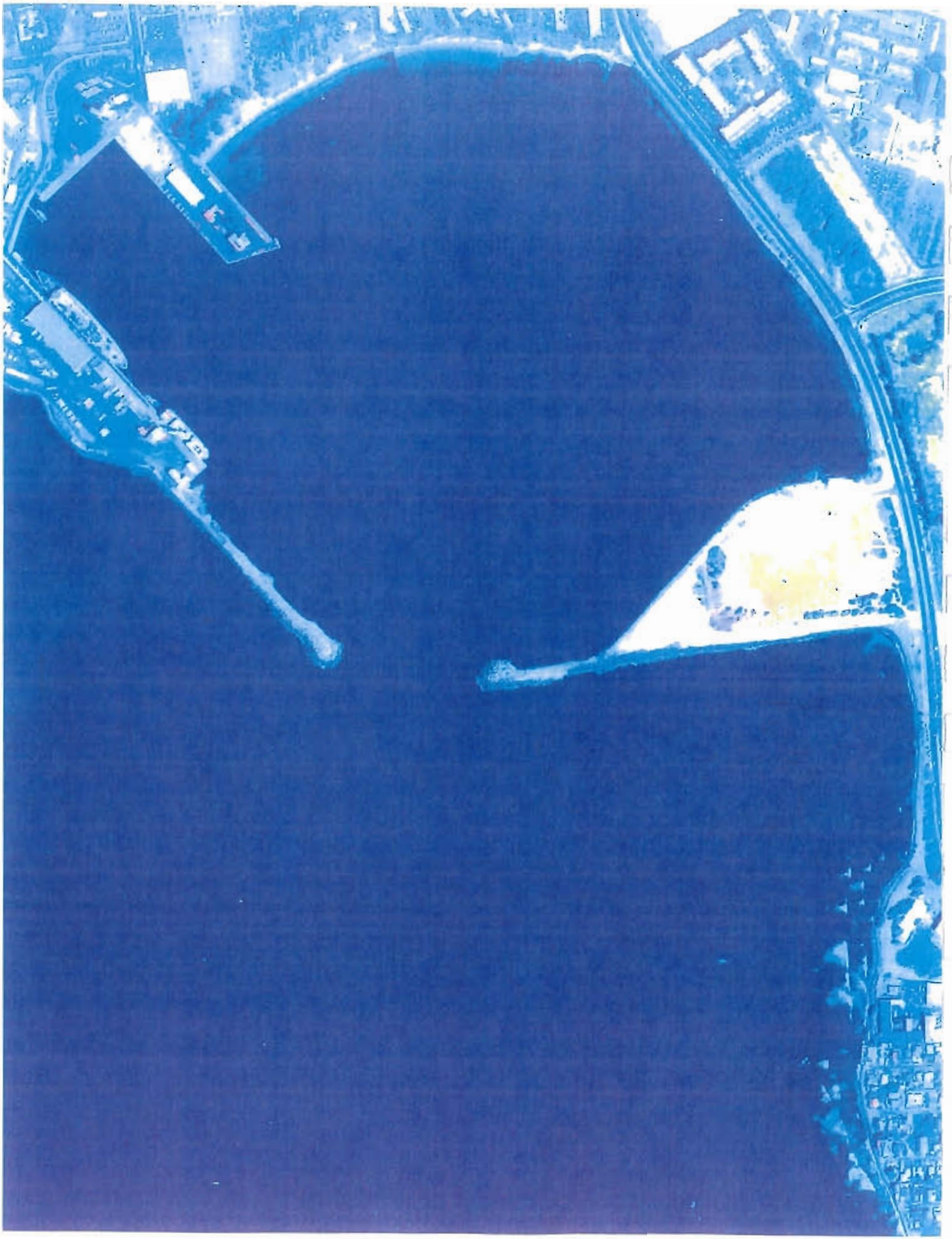


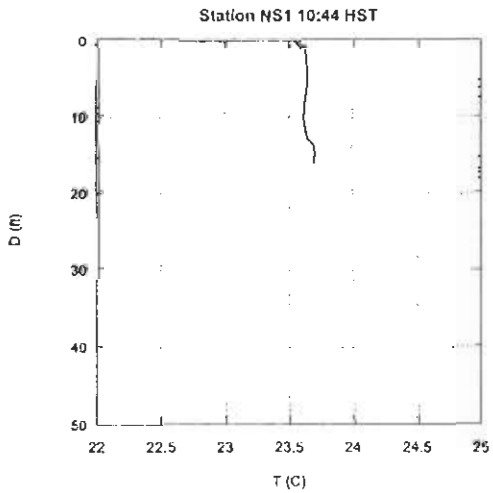
The Oceanic Institute
Makapuu Point
Waimanalo, Hawaii 96795

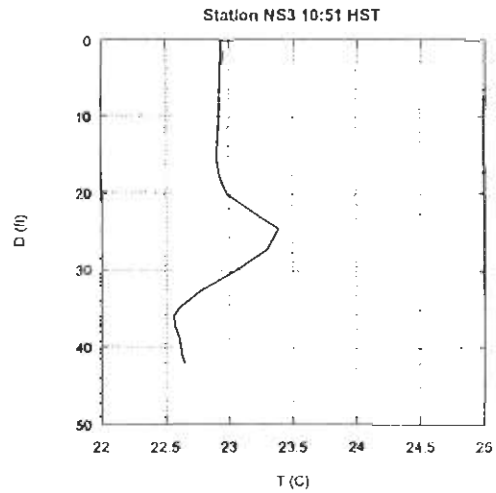
Kahului Commercial Harbor 2025 Master Plan Environmental Assessmernt

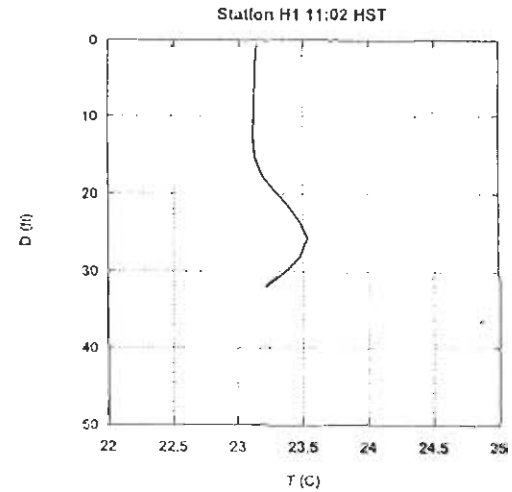
Kahului Harbor Offshore Bathymetry

Figure 5

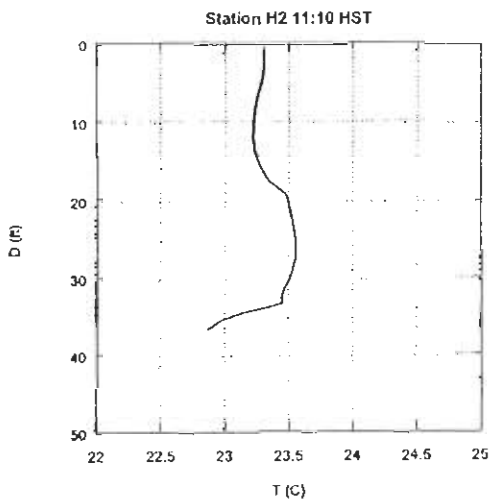


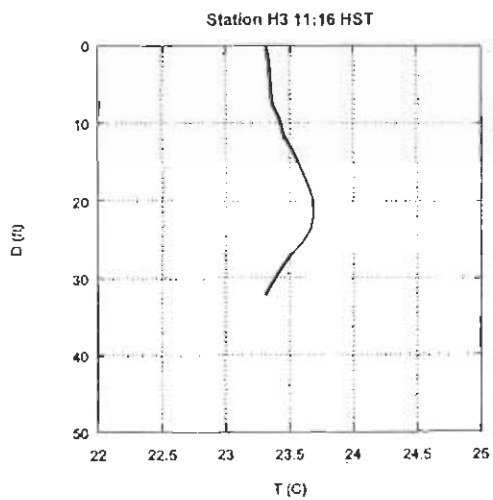


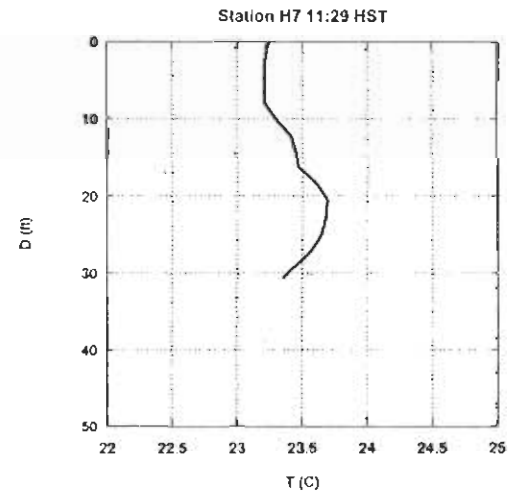


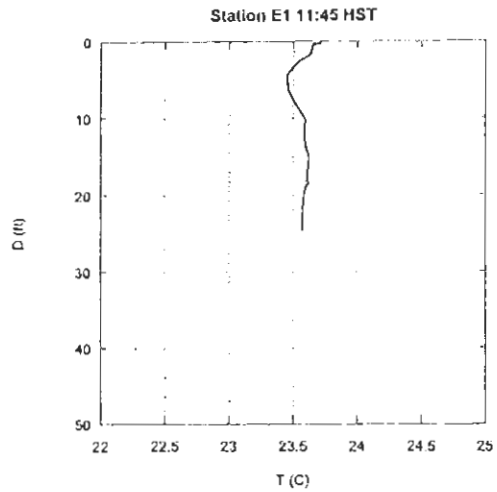


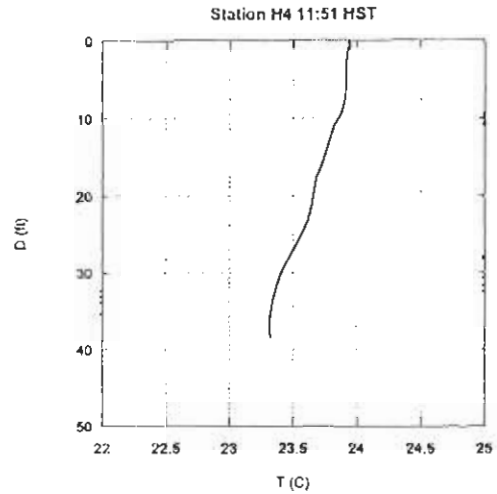
KAHULUI HARBOR TEMPERATURE PROFILES
APRIL 15 2003

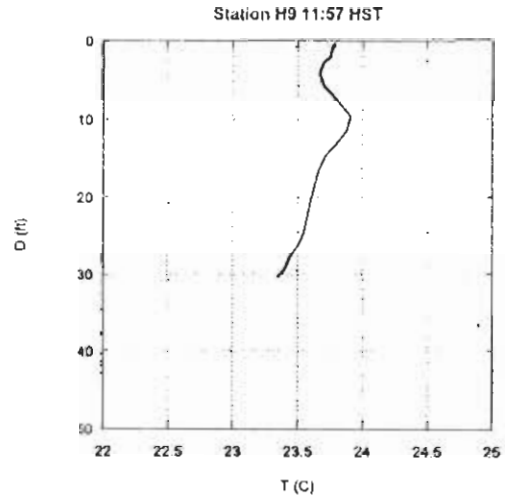












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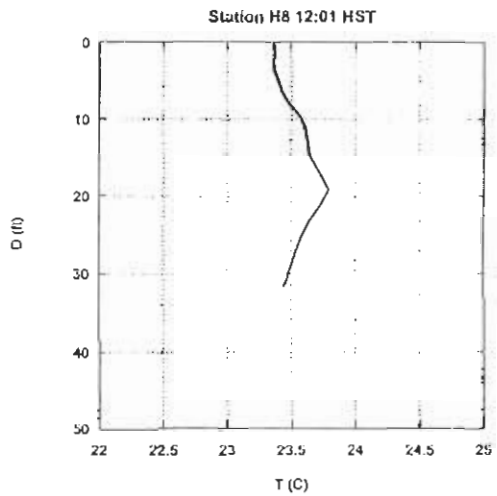

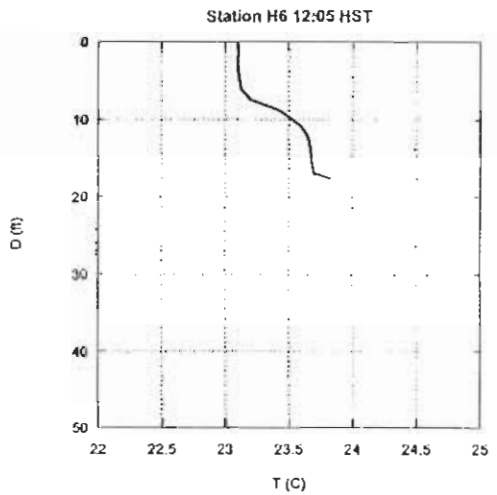

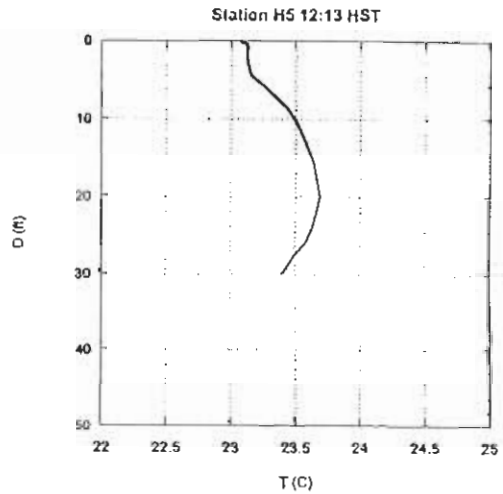

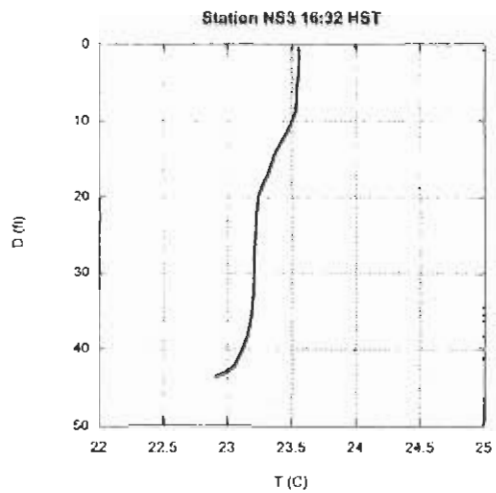

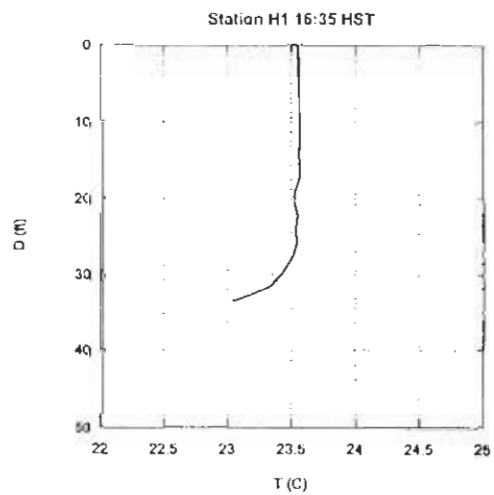

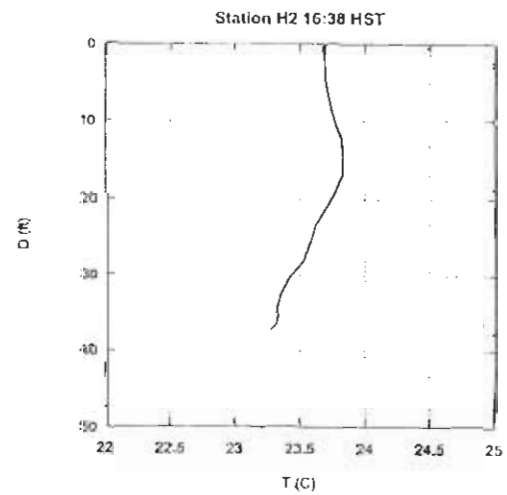

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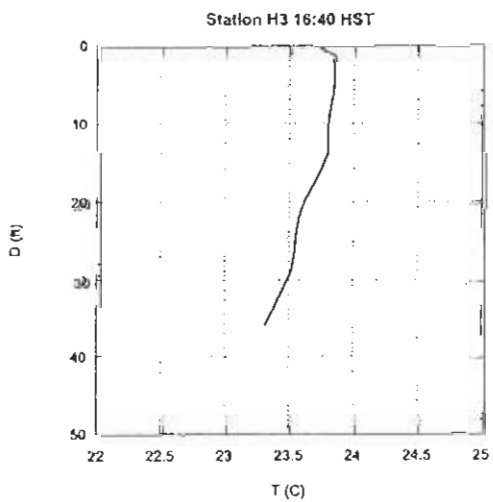
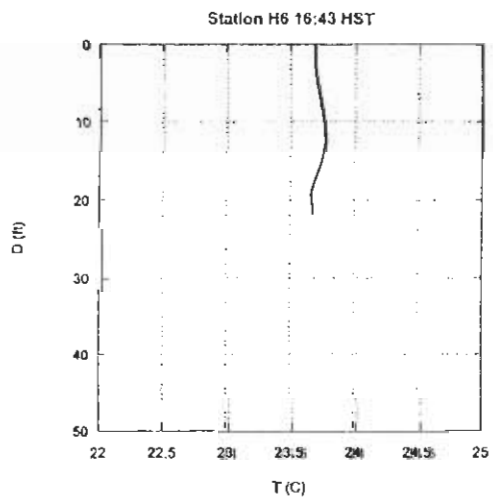
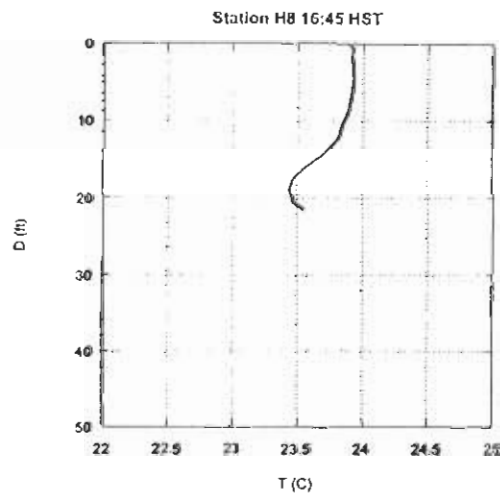
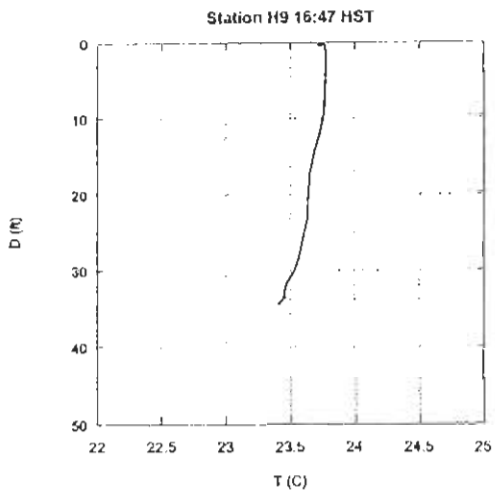
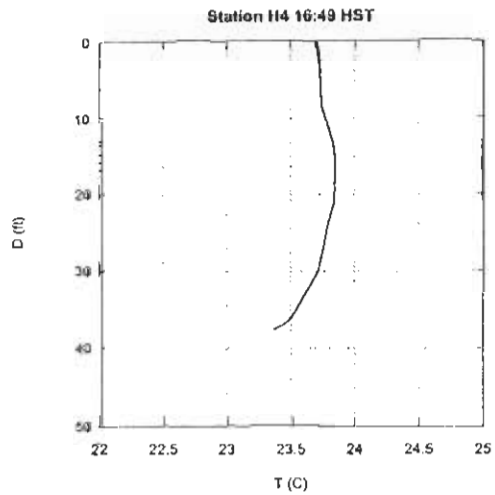
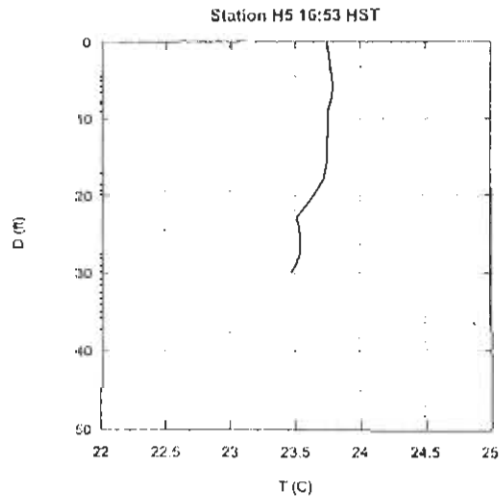




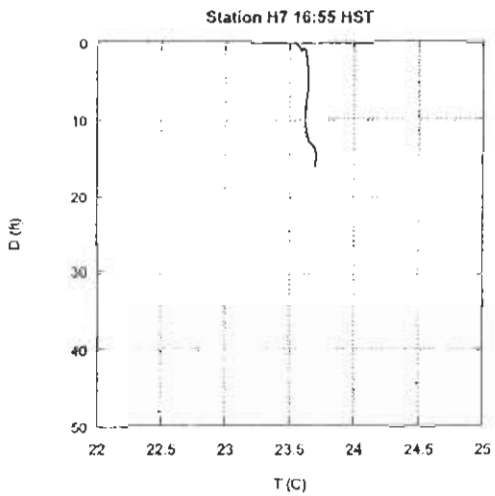


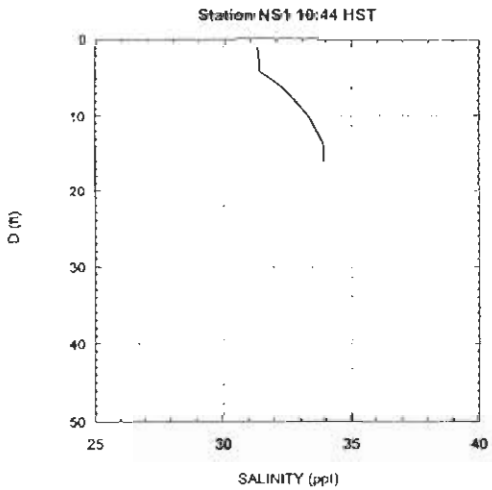


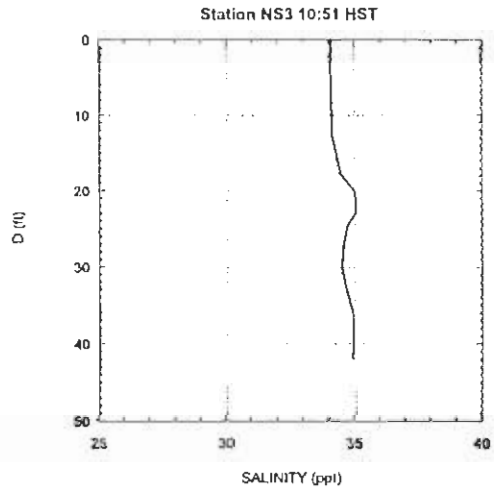


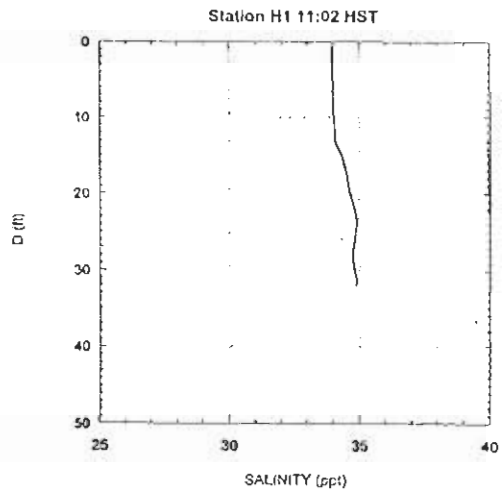


KAHULUI HARBOR TEMPERATURE PROFILES
APRIL 15 2003

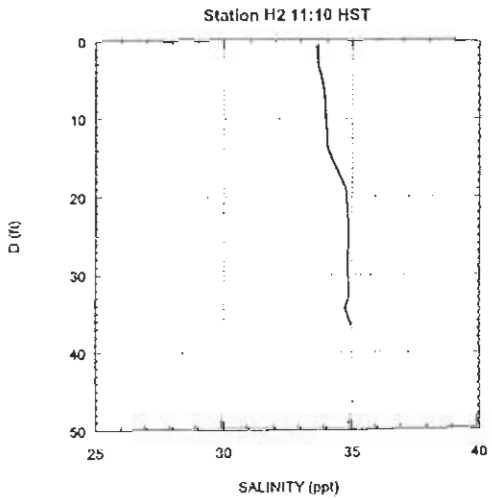


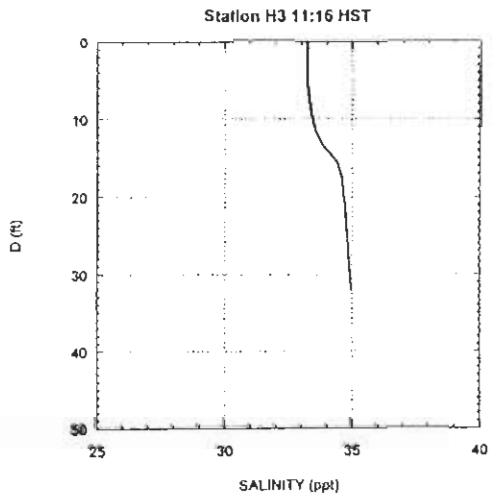


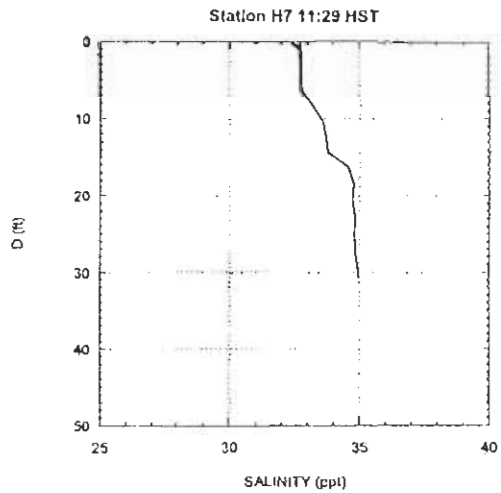


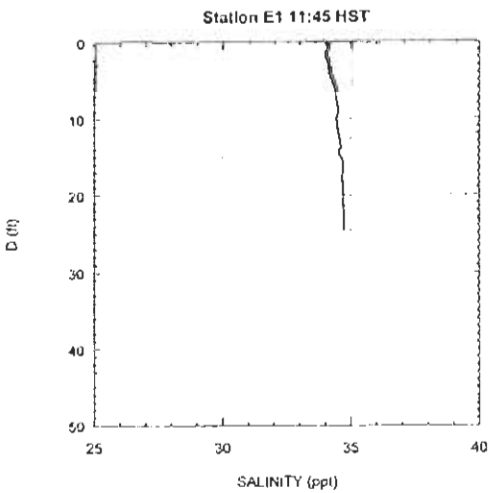


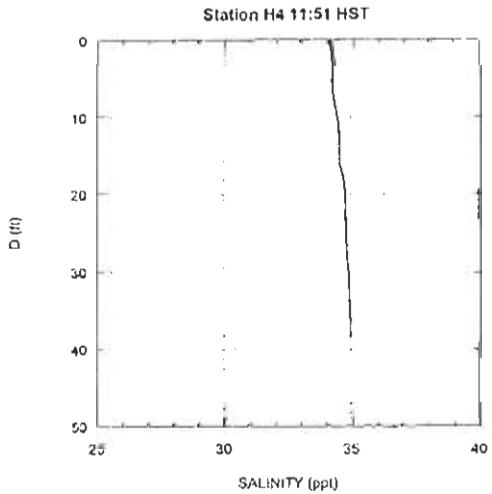
KAHULUI HARBOR SALINITY PROFILES
APRIL 15 2003

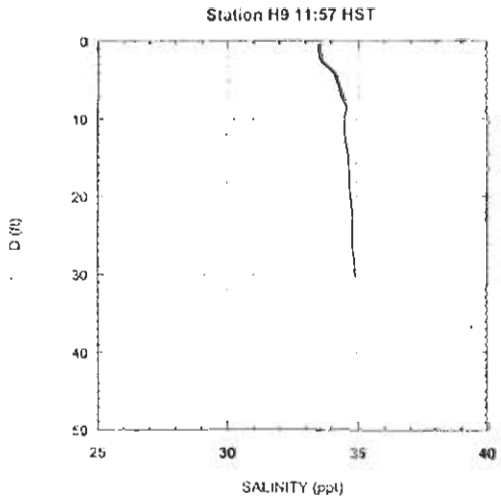




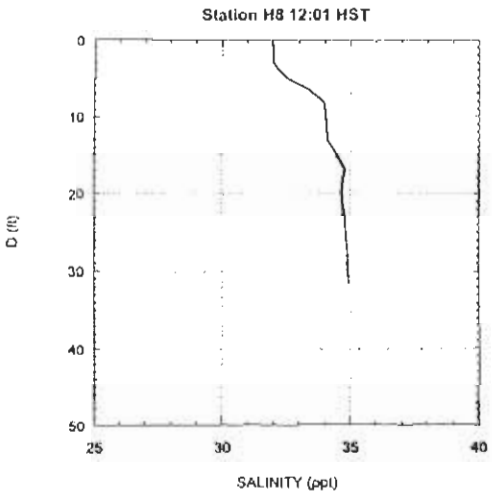


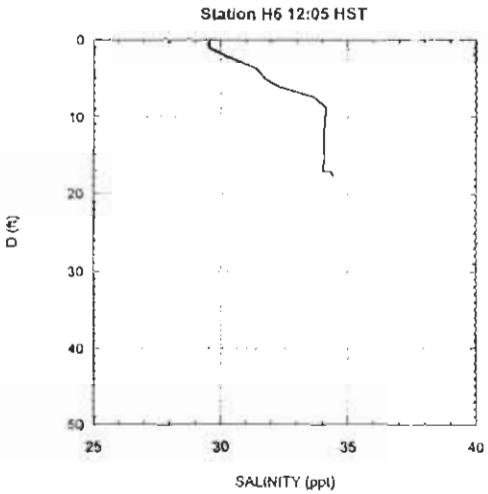


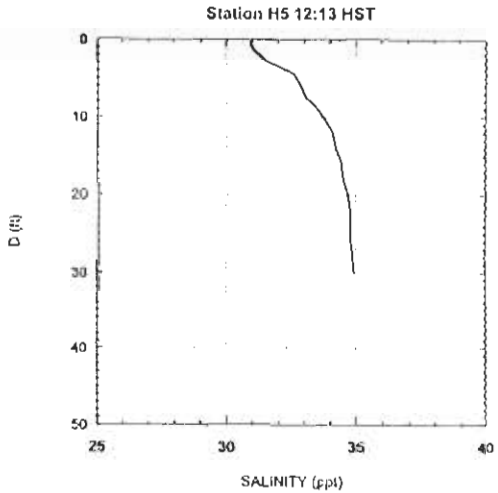


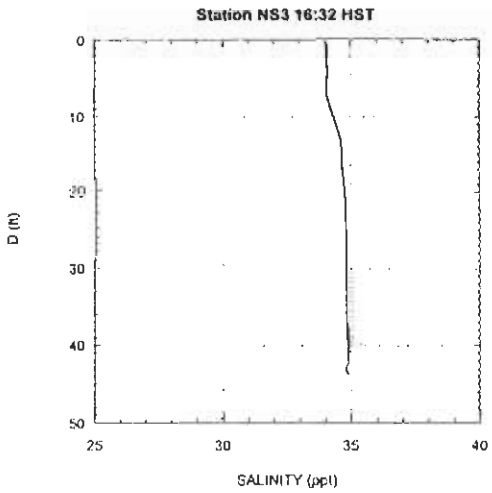


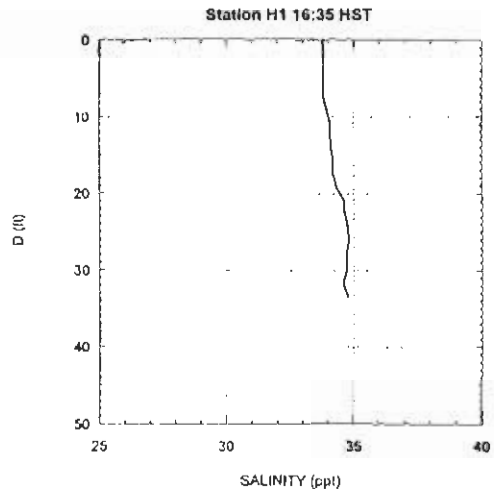
KAHULUI HARBOR SALINITY PROFILES
APRIL 15 2003

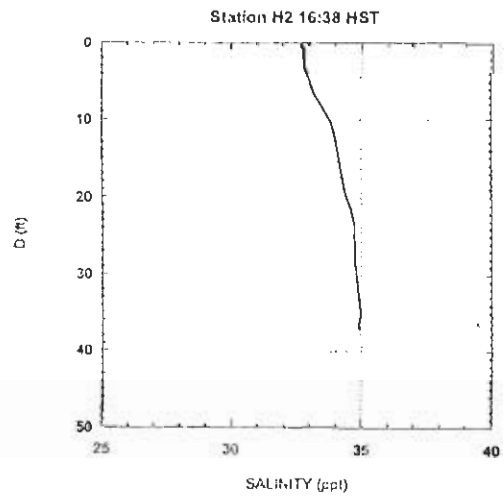




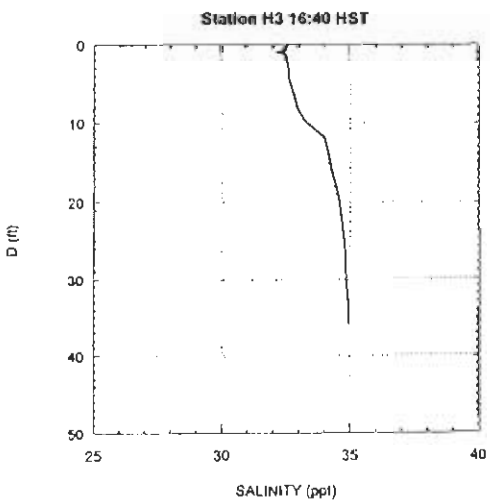


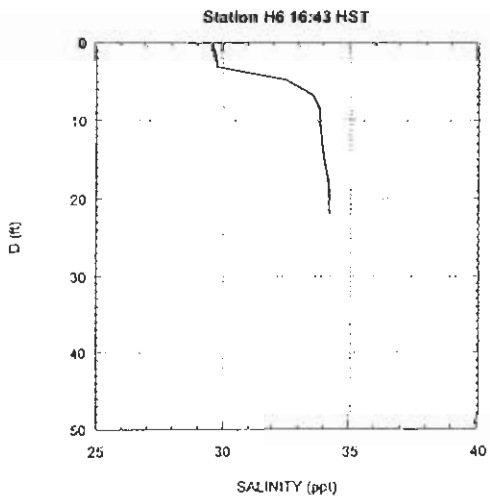


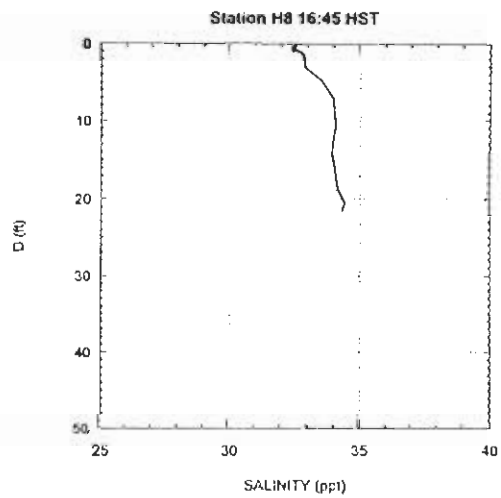


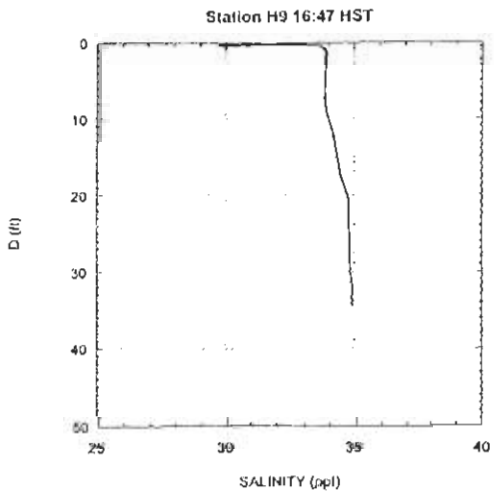


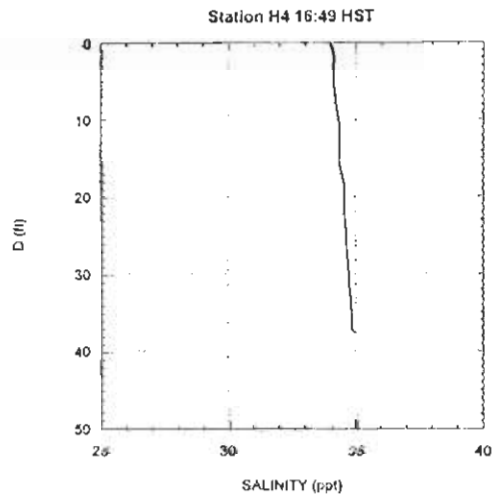
KAHULUI HARBOR SALINITY PROFILES
APRIL 15 2003

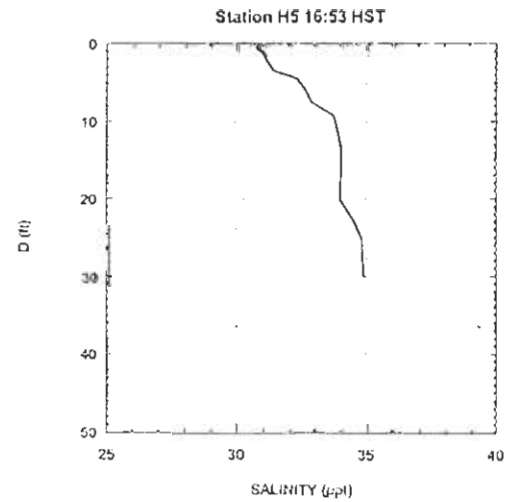




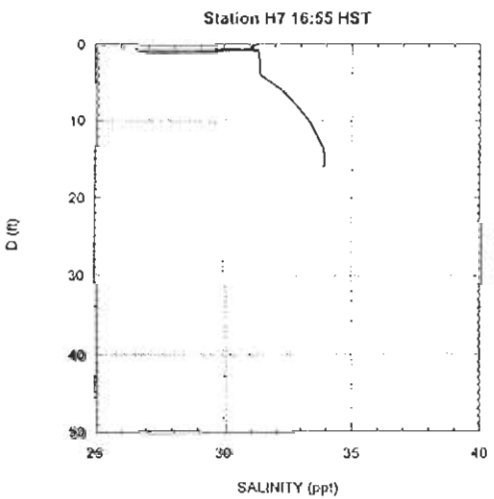


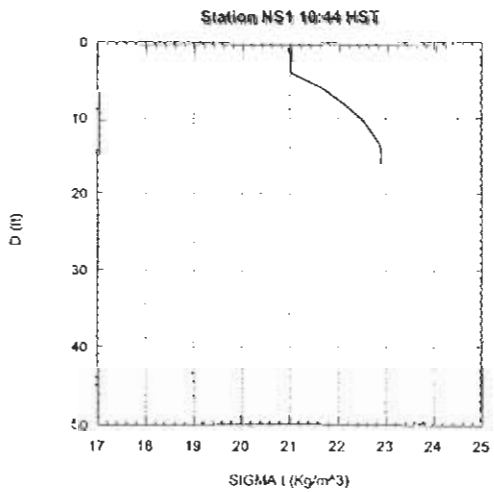


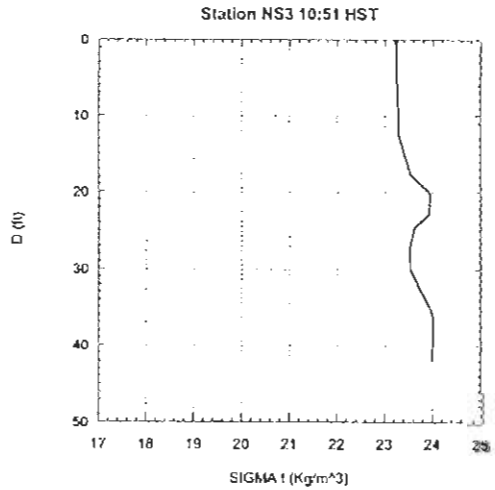


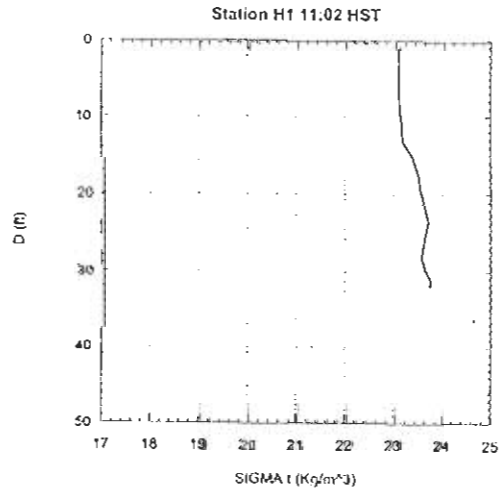


KAHULUI HARBOR SALINITY PROFILES
APRIL 15 2003









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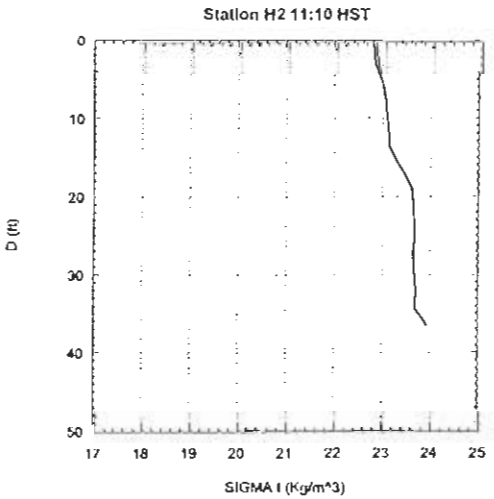

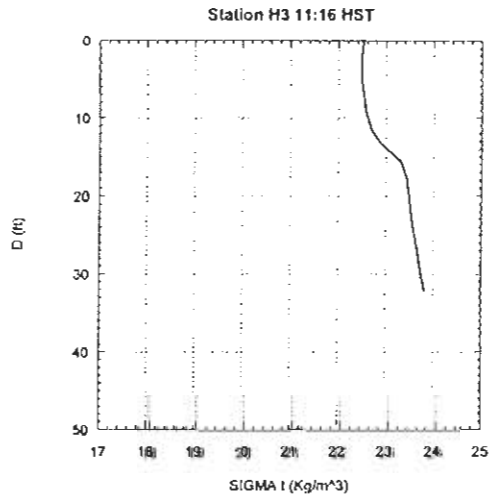

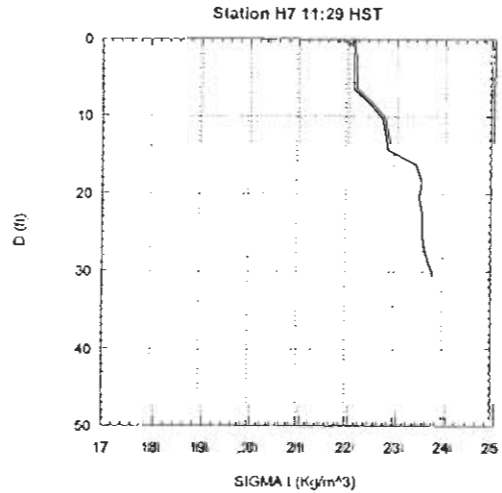

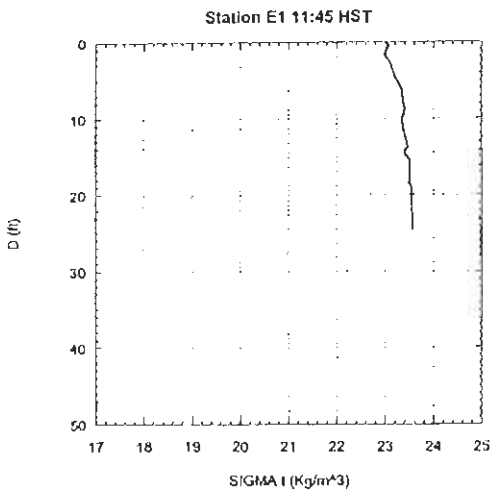

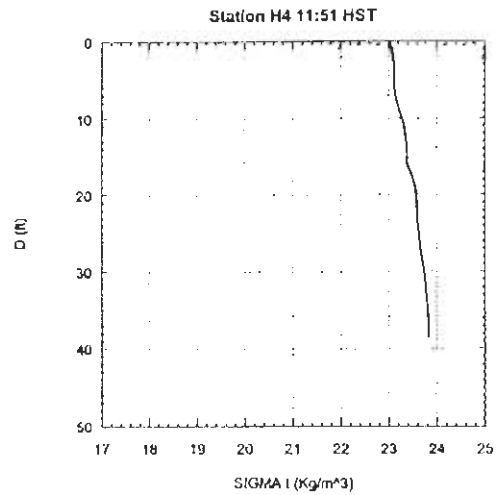

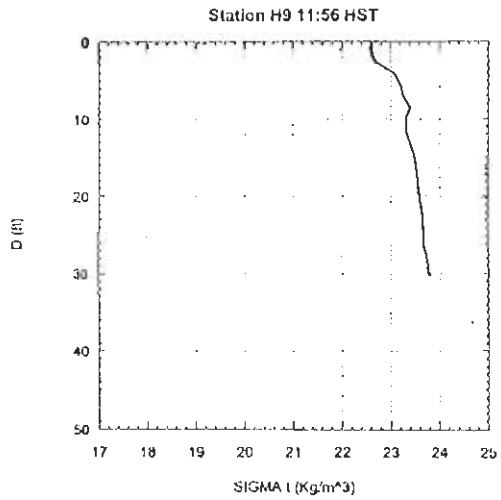

KAHULUI HARBOR SIGMA T PROFILES
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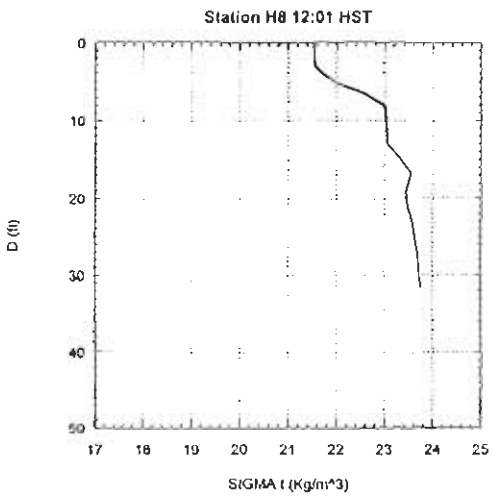

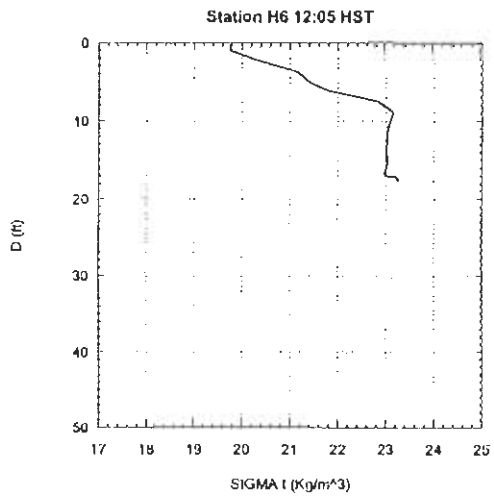

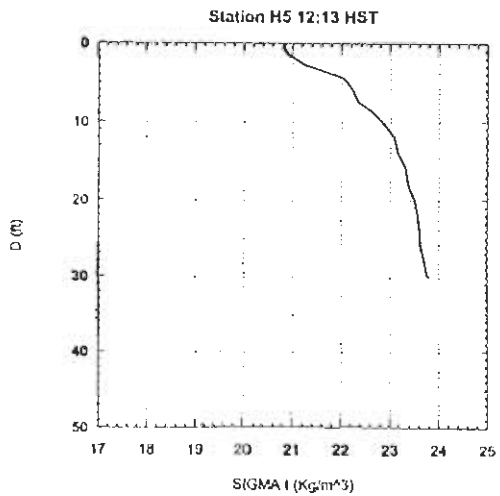

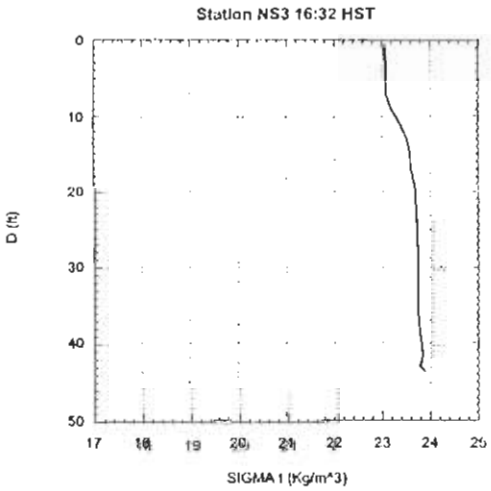

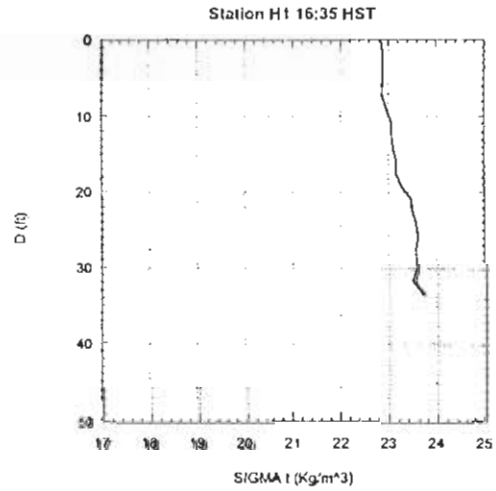

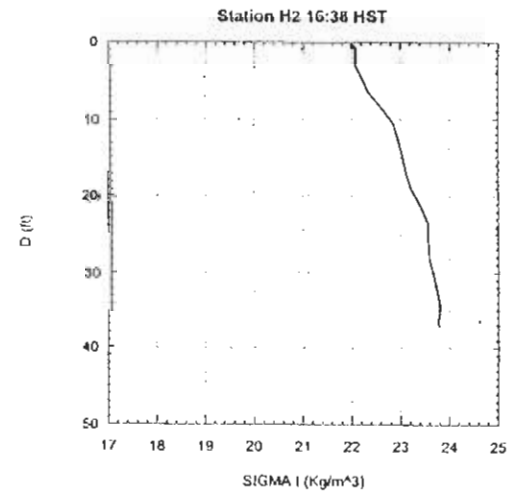

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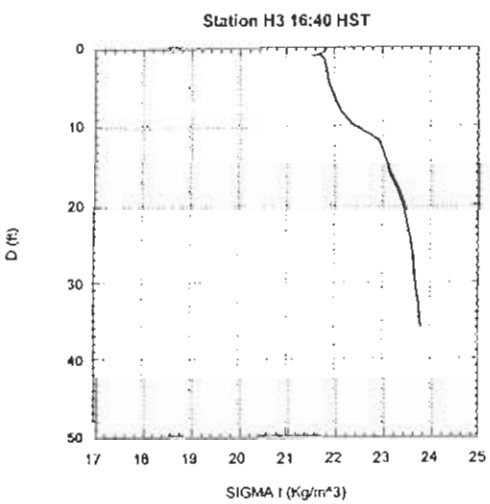
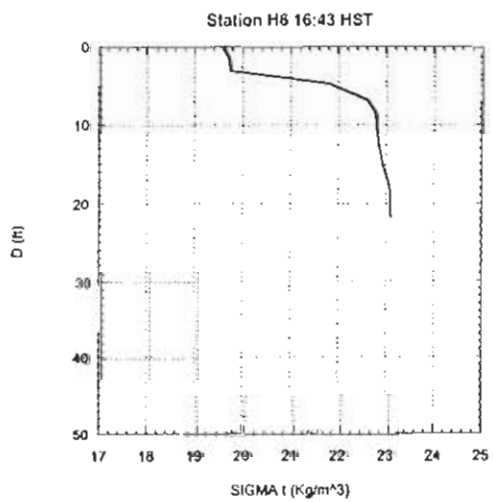
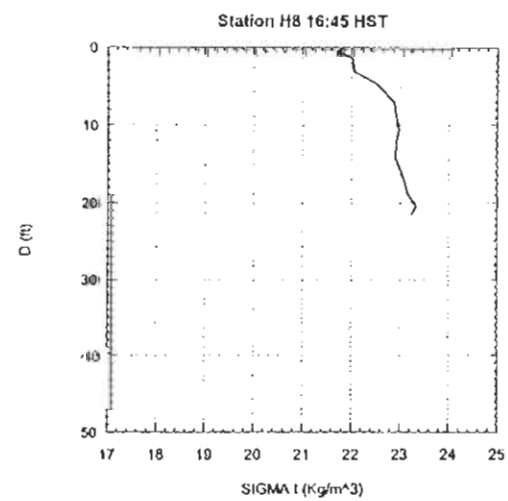
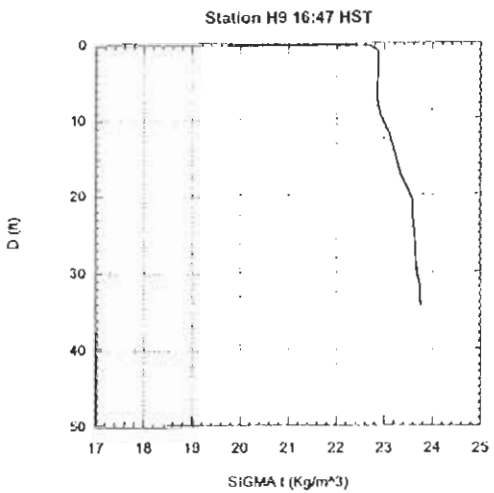
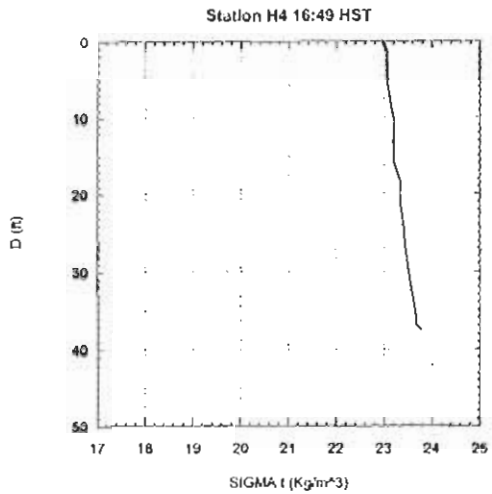
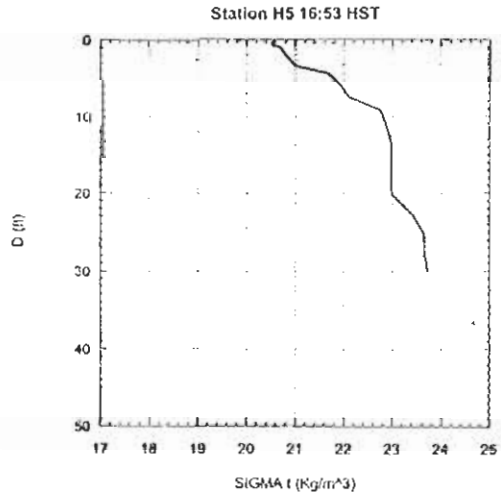




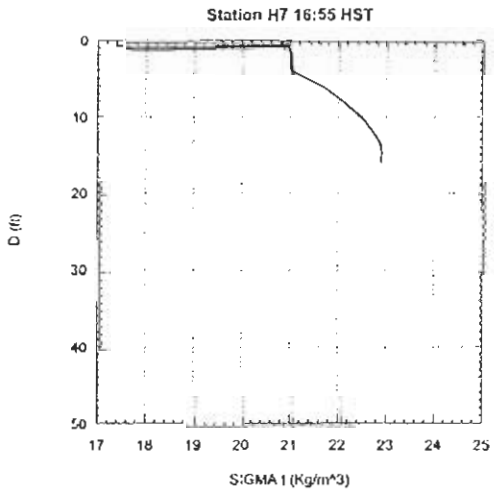


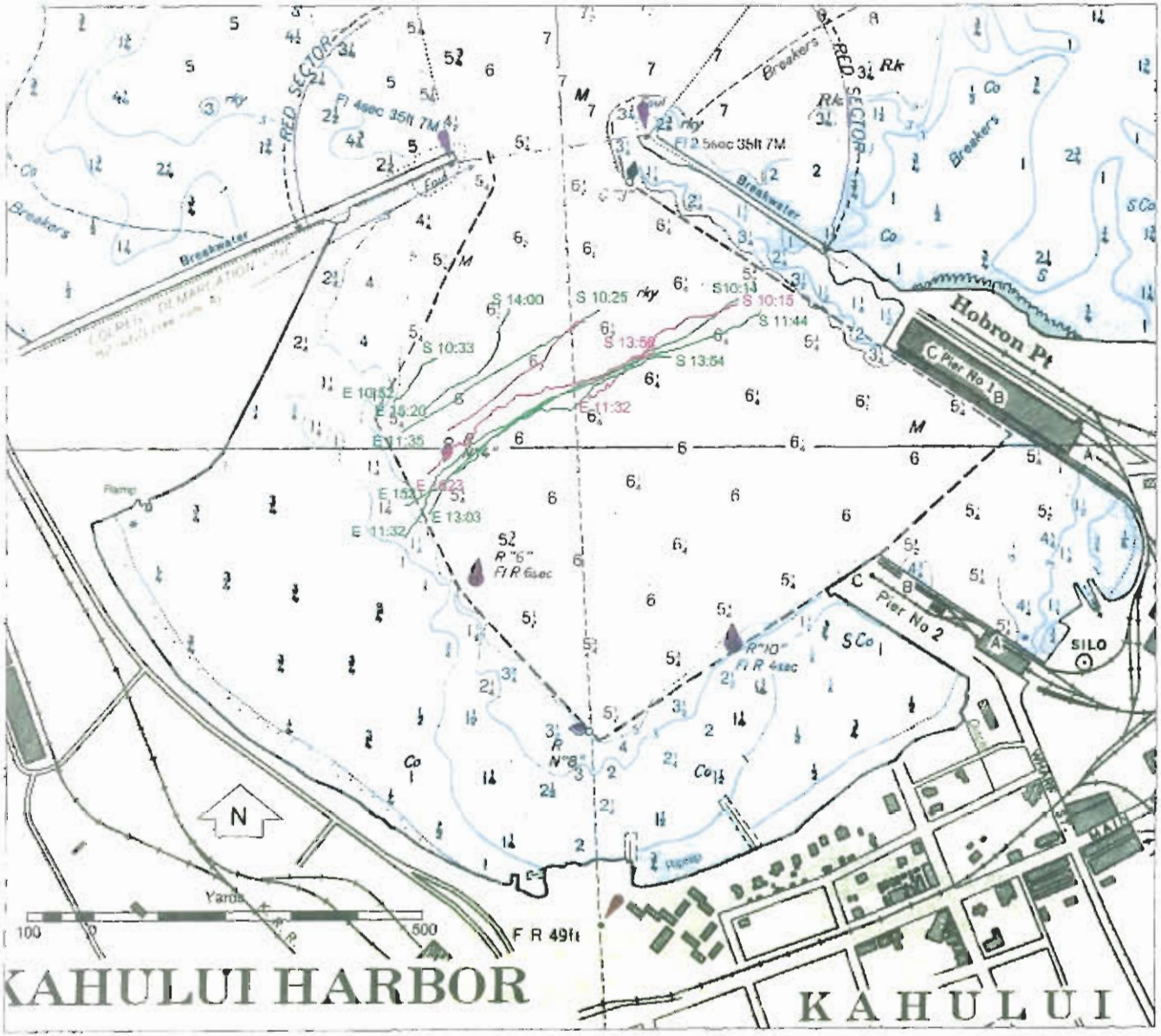


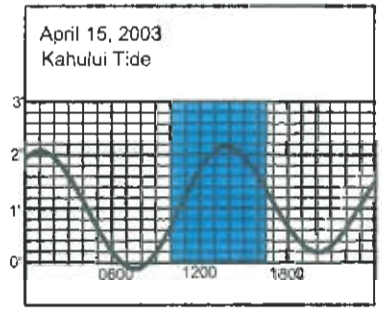




KAHULUI HARBOR SIGMA T PROFILES
APRIL 15 2003







April 15, 2003

TIME (HST)	Wind Spd (knots)	Wind Dir (deg T)	Weather
10:14	20	50	Ptly Cldy
11:35	19	50	Sunny
12:36	21	50	Sunny
13.40	22	50	Ptly Cldy
14:41	23	50	Sunny

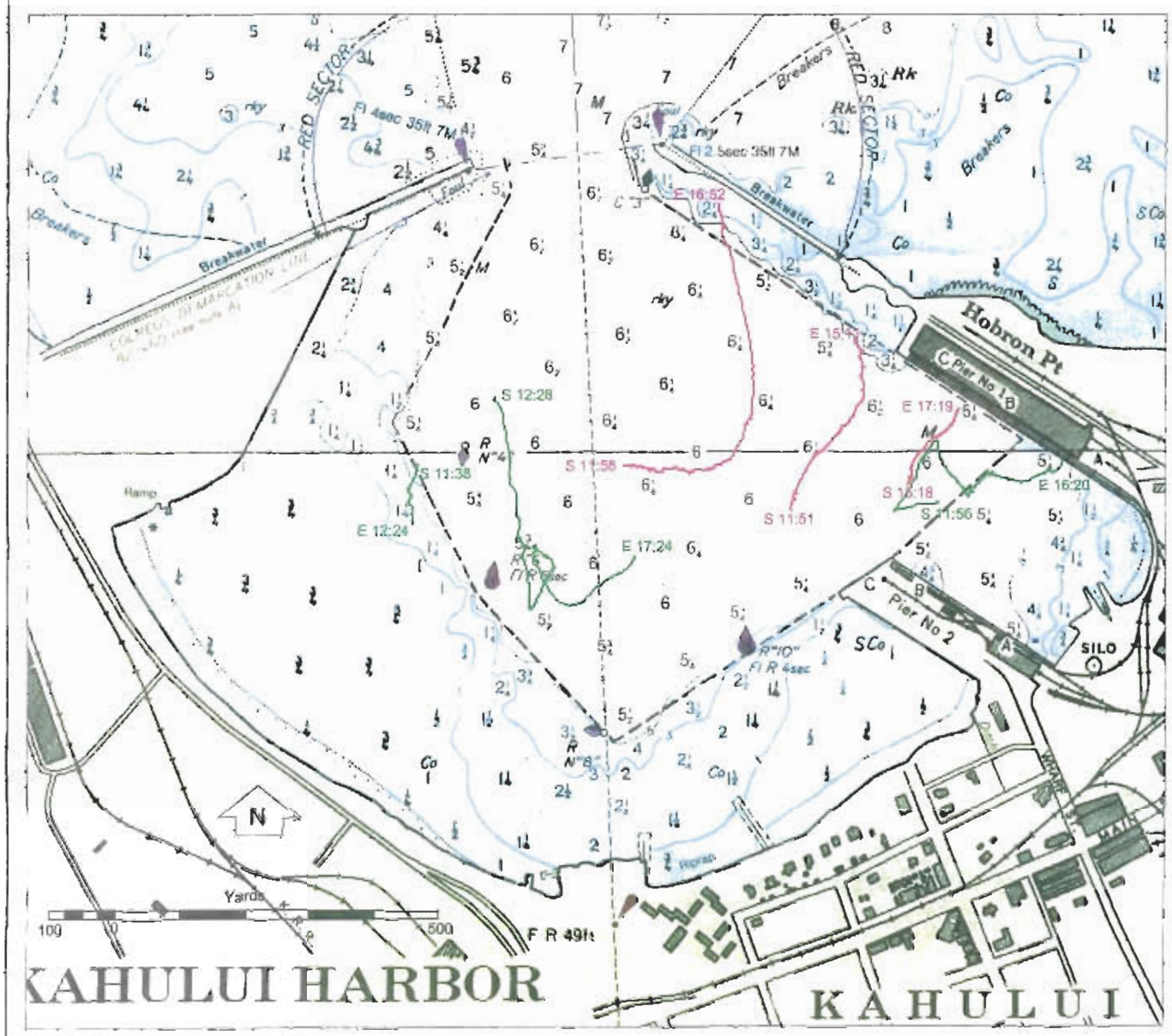
LEGEND

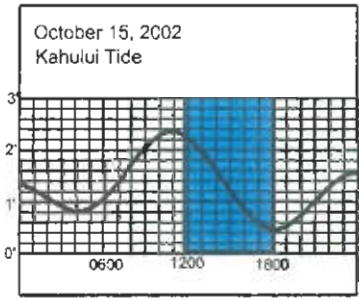
Start Time	Depth	End Time
S 10:00	25 feet	E 12:00
S 10:00	5 feet	E 12:00

Kahului Commercial Harbor
2025 Master Plan EA

Edward K. Noda and Associates, Inc.

Drogue Survey Results
15 April 2003





October 15, 2002

TIME (HST)	Wind Spd (knots)	Wind Dir (deg T)	Weather
13:13	3	0	Sunny
1349	5	20	Ptly Cloudy
1430	0	0	Cloudy
1439	10	180	Cloudy
1455	5	180	Ptly Sunny
1700	5	180	Ptly Sunny

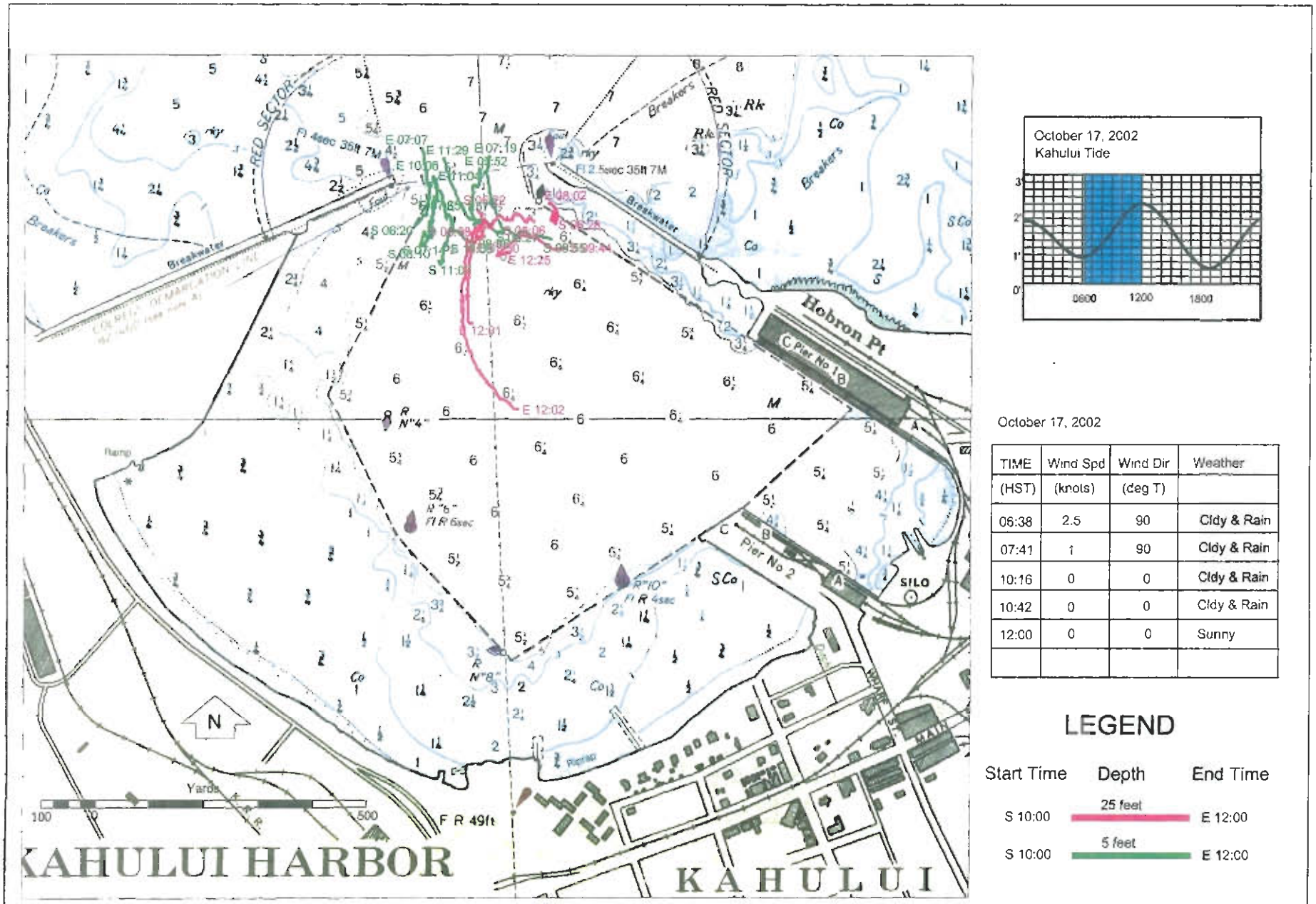
LEGEND

Start Time	Depth	End Time
S 10:00	25 feet	E 12:00
S 10:00	5 feet	E 12:00

Kahului Commercial Harbor
2025 Master Plan EA

Edward K. Nodo and Associates, Inc.

Drogue Survey Results
15 October 2002 Ebb Tide



October 17, 2002

TIME (HST)	Wind Spd (knots)	Wind Dir (deg T)	Weather
06:38	2.5	90	Cldy & Rain
07:41	1	90	Cldy & Rain
10:16	0	0	Cldy & Rain
10:42	0	0	Cldy & Rain
12:00	0	0	Sunny

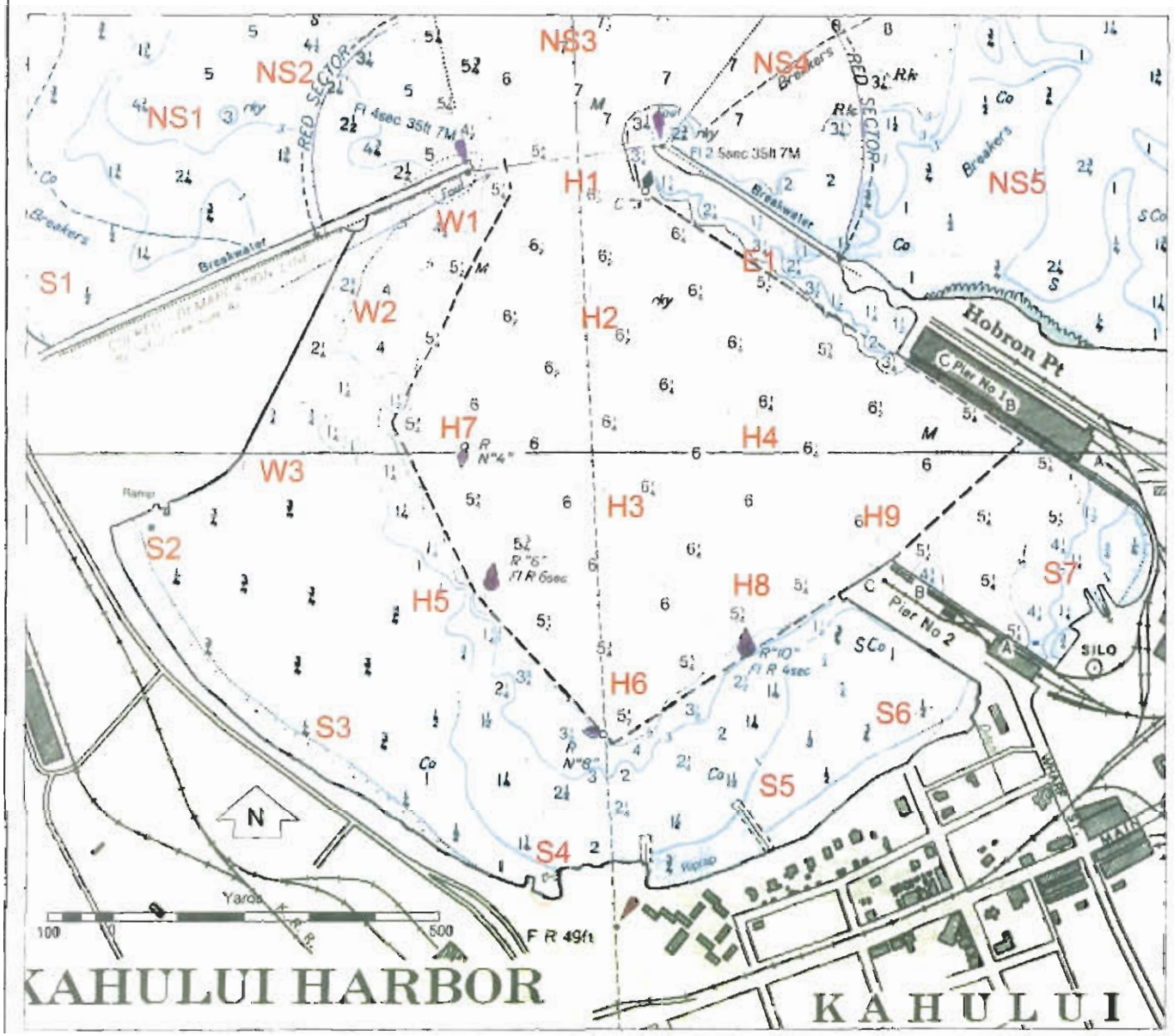
LEGEND

Start Time	Depth	End Time
S 10:00	25 feet	E 12:00
S 10:00	5 feet	E 12:00

Kahului Commercial Harbor
2025 Master Plan EA

Edward K. Noda and Associates, Inc.

Drogue Survey Results
17 October 2002 Flood Tide



LEGEND

Start Time	Depth	End Time
S 10:00	25 feet	E 12:00
S 10:00	5 feet	E 12:00

Kahului Commercial Harbor
2025 Master Plan EA

Edward K. Noda and Associates, Inc.

Water Quality Station Locations

Kahului Commercial Harbor

Macroalgal Study Final Report

Prepared for:

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Introduction

Kahului Harbor is located on the south side of Kahului Bay on the north coast of the island of Maui (Figure 1). Kahului Harbor, a fan-shaped basin at the head of Kahului Bay, is bounded on the east and northwest by long boulder and dolose breakwaters. Waihee Reef extends 0.7-mile northwest of the breakwaters, and Spartan Reef extends 1.2 miles east of the breakwaters.

The southwestern shoreline of the harbor is often covered with windrows of macroalgae of several species, occasionally to depths of several feet. As this macroalgal material decays, adjacent residents are subjected to unpleasant smells for periods of weeks at a time. Cleanup of this material is done by hand or using small tractors, at considerable expense to the state.

The State of Hawaii, Department of Transportation, Harbors Division (DOT-HAR) is proceeding with implementation of improvements at Kahului Harbor as outlined in the Kahului Commercial Harbor 2025 Master Plan, September 2000. A study of the macroalgae in the harbor was undertaken to examine the distribution and abundance of macroalgae in the harbor, utilize contemporaneous current and water quality data to determine the factors supporting the macroalgal production, and suggest potential methods to mitigate the macroalgal buildup along the shoreline.

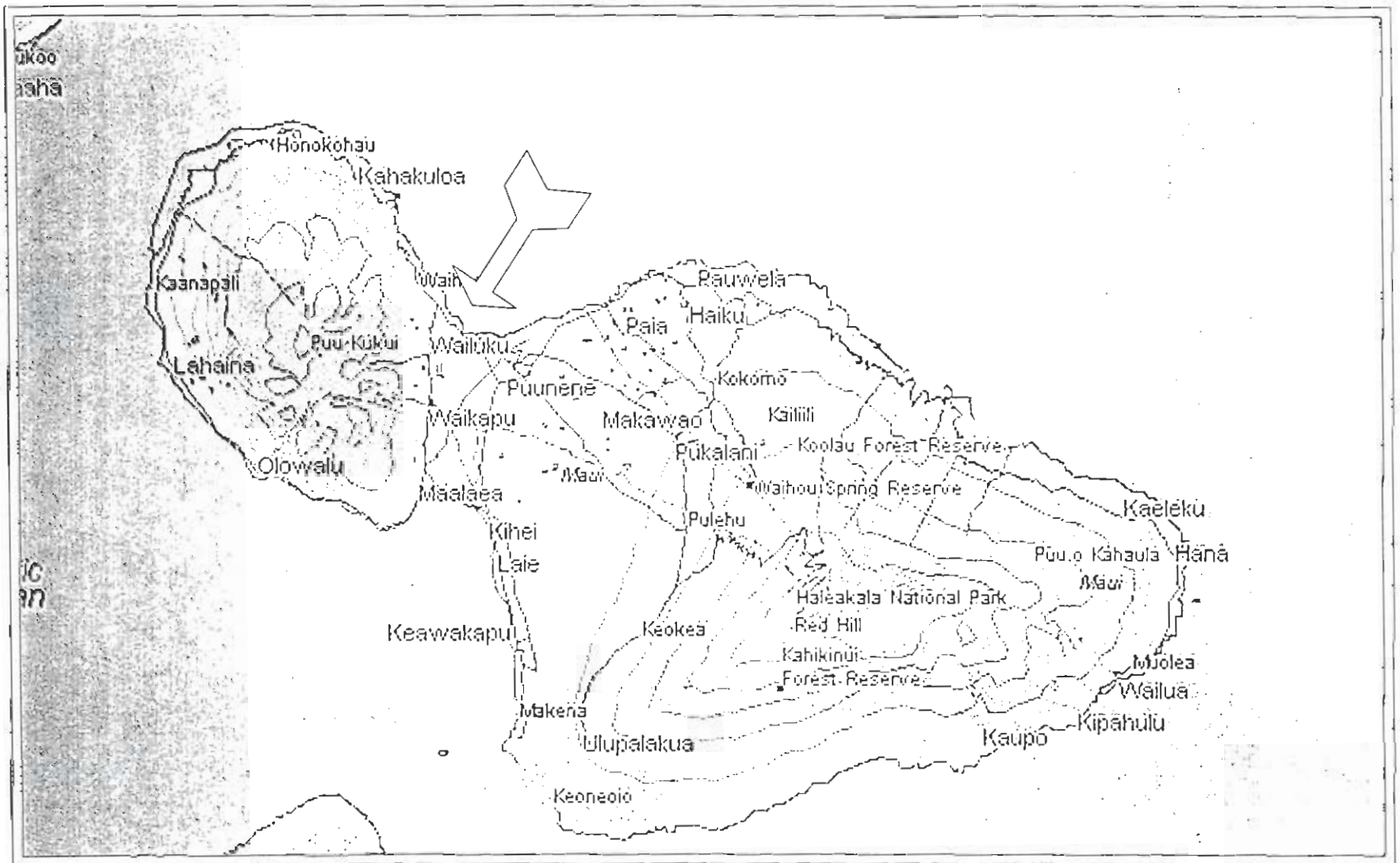
Physical Features of Kahului Harbor

The commercial deep-water port of Kahului is on the southeast side of Kahului Harbor. The harbor is protected by two rubble mound breakwaters which extend outward from the east and west shores and enclose an area of just over 200 acres. The entrance to the harbor is in deep water from the north through a 600-foot-wide opening between the outer ends of the breakwaters. The channel then turns sharply southeast to the Kahului Piers. The channel and basin are maintained at or near a 35-foot depth.

The sand shoreline at the head of Kahului Harbor between Pier 2 and the shore along Kahului Beach Road is known as Kahului Beach. The beach is composed of brown, detrital sand and is broken by several boulder jetties built to retard erosion. Much of the southwest shoreline between the extreme south corner of the harbor and the coral fill area is a beach of gravel to boulder size rubble. It is in this area that the periodic build-up of macroalgae occurs.

Much of the southern and southwestern perimeter of the harbor is fringed by a shallow reef shelf extending a few hundred feet offshore (Figure 2). The small southern reef comprises an area of approximately 9 acres, while the larger southwestern reef covers approximately 40 acres. Beyond the reef edge, the harbor bottom is a terrace of silty-sand and limestone rubble dipping gradually seaward to depths of over 50 feet (15 m). Off the sand beach west of Pier 2 is a sand bottom extending to a depth of 10 feet (3 m). Here, consolidated rock pocketed by sand is encountered. The seaward edge of this formation drops to the dredged basin forming the eastern portions of the harbor.

The prevailing winds are the northeast trades. During weak to moderate tradewinds, currents within the harbor basin form a circular pattern, with some exchange with coastal waters outside



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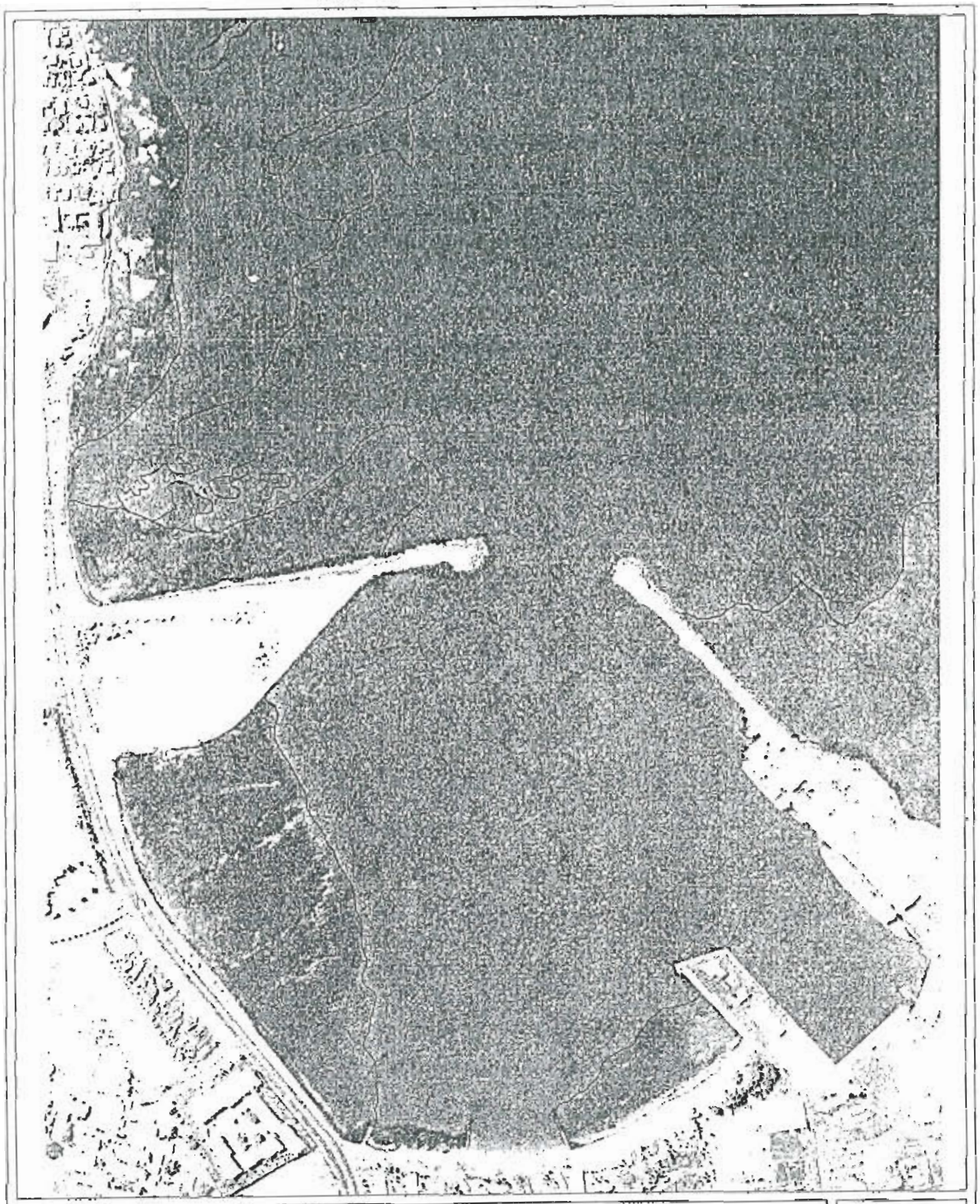
KAHULUI HARBOR MACROALGAL STUDY

LOCATION OF KAHULUI HARBOR, MAUI

Figure 1



The Oceanic Institute Makapuu Point Waimanalo, Hawaii 96795	KAHULUI HARBOR MACROALGAL STUDY LOCATIONS OF SHALLOW REEFS WITHIN KAHULUI HARBOR	Figure 2

the harbor due to tidal currents, but little flow over the shallow reef areas. During strong tradewinds, currents within the basin are generally similar, with increased wind-driven flow over the southwestern reef (EKNA 2003).

Macroalgal survey

Methods

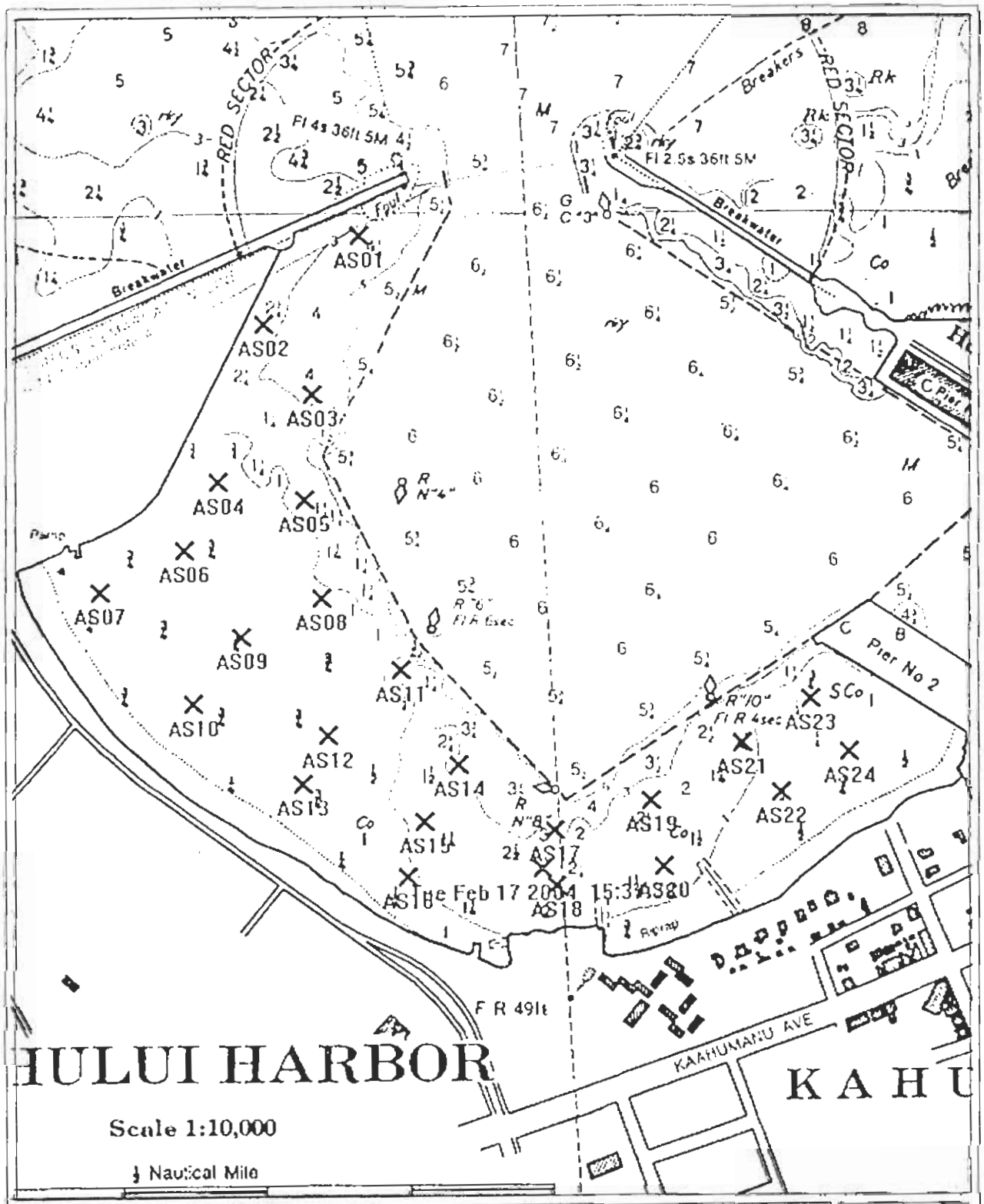
Quantitative surveys of the distribution and abundance of attached macroalgae were conducted within the harbor on February 23, 2003. A photoquadrat survey of the bottom over the south and southwest reef flats was conducted to quantify macroalgal distribution and abundance. A 0.6 x 1.0 m frame fitted with an underwater camera and wide-angle lens was used to take a photograph of the bottom at 24 stations (Figure 3) within the shallow, non-dredged portions of the harbor. The relative abundance and species composition of macroalgae were also determined from samples of bottom flora collected by snorkeling. Samples of attached macroalgae were collected at stations in the shallow reef flat to the west of the turning basin. Sediment was characterized as mud, mud/sand, sand, sand/rubble, or rubble. Macroalgae were identified to genus and species, if possible.

Results

Results of the quantitative photoquadrat survey are presented in Table 1. At six stations (AS01 and AS02, along the inner face of the west breakwater; and at AS17, 18, 19, and 20, a shallow channel extending from the southern part of the dredged turning basin to the shoreline, and separating the south and southwest reefs) sand comprised 100% of the bottom, and no attached macroalgae were seen. Sand comprised a significant portion of the bottom at AS03 and AS11 as well. Sand was seen only in small scattered patches at other sites. Diver observations at stations within the dredged portion of the harbor found only sand/mud bottom, with no attached macroalgal growth.

Eroded beach rock formed the bottom at the remaining stations. At stations along the southwestern portion of the reef (AS04 – AS16), the bottom was a mix of bare rock or rock covered with attached macroalgae. A close-cropped algal turf covered approximately 11% of the bottom within the photoquadrats, with maximum coverage of 73% at station AS05, the northern outer edge of the reef flat, and an area of generally higher surf and wave action. *Acanthophora specifera*, *Ulva fasciata* and *Hypnea musciformis* were the dominant macroalgae seen in the photoquadrats. *Acanthophora specifera* was found in greatest abundance at stations AS12 – AS14, a swath of bottom extending from the shoreline to the edge of the dredged harbor basin near the middle of the southwest reef. *Ulva fasciata* was found in highest abundance at stations AS10 and AS13, near the shoreline in the central part of the southwest reef. *Hypnea musciformis* was found in scattered patches throughout the southwest reef.

Overall, macroalgal cover was greatest at station near the shoreline (average 57%), lowest along the middle of the reef (38%) and high again at stations along the outer reef edge (49%). High cover (58 – 61%) of a mixed macroalgal community, which could not be identified because of poor visibility, was found at the eastern-most stations (AS23 and AS24) of the southern reef.



The Oceanic Institute Makapuu Point Waimanalo, Hawaii 96795	KAHALUI HARBOR MACROALGAL STUDY LOCATIONS OF MACROALGAL PHOTOQUADRAT SURVEY STATIONS	Figure 3

Table 1. Distribution and percent cover of bottom substrate and attached communities on the shallow reef flat in the western portion of Kahului Harbor, as determined from photoquadrat analysis of photos taken on February 24, 2003. Station locations shown in Figure 3.

	algal turf	*Acanthophora specifera*	*Ulva fasciata*	*Hypnea musciformis*	*Coelothrix irregularis*	unidentified macroalgae	zooanthids	hard coral	sand	rock / rubble	TOTAL MACROALGAL COVERAGE
AS01									100.0%		
AS02									100.0%		
AS03	10.5%	3.0%							29.0%	57.5%	13.5%
AS04	45.0%						55.0%				45.0%
AS05	73.0%						18.0%	6.5%	2.5%		73.0%
AS06	38.5%						54.5%	6.5%	0.5%		38.5%
AS07		7.5%	1.5%	23.0%						68.0%	32.0%
AS08			6.0%	15.5%						78.5%	21.5%
AS09	5.0%							3.5%		91.5%	5.0%
AS10	30.0%		24.0%	16.0%					20.0%	10.0%	70.0%
AS11	2.0%			39.0%						59.0%	41.0%
AS12	8.5%	28.0%	10.5%		1.0%				3.5%	48.5%	48.0%
AS13	15.0%	30.5%	20.5%						1.0%	33.0%	66.0%
AS14	19.5%	65.0%	6.5%						2.0%	7.0%	91.0%
AS15			1.0%	20.0%	37.0%	2.0%				40.0%	60.0%
AS16			2.0%	45.0%						53.0%	47.0%
AS17									100.0%		
AS18									100.0%		
AS19									100.0%		
AS20									100.0%		
AS21		13.5%								86.5%	13.5%
AS22					60.0%	3.0%				37.0%	63.0%
AS23						58.0%				42.0%	58.0%
AS24						61.0%				39.0%	61.0%
TOTAL	10.3%	6.1%	3.0%	6.6%	4.1%	5.2%	5.3%	0.7%	27.4%	31.3%	47.1%

Frequent patches of zoanthids, primarily *Palythoa tuberculosa*, were found at stations AS04, AS05 and AS06. These three stations border the narrow channel from the deeper harbor basin to the boat launch ramp, and are the site of frequent breaking waves and high wave energy.

Water Quality Surveys

Methods

In order to characterize in more detail the current water quality conditions in the harbor, water quality surveys were conducted on October 16, 2002, under light winds and scattered rain squalls, and on April 15, 2003, under strong trade winds.

Water quality parameters measured during the impact study include those listed in the State of Hawaii water quality criteria for marine waters. Additional parameters provide information on groundwater sources, and have been measured in previous assessment and monitoring surveys. The instrumentation and methods used for each analysis are presented in Table 2.

On October 16, 2002, water samples were collected at eight shoreline stations (S1 – S8), one station located along the east arm of the harbor (E1), six stations within the harbor entrance channel and turning basin (H1 – H6), four stations in nearshore coastal waters immediately outside the harbor (NS 1 – NS4) and one station in the small stream which empties into the harbor along its western side (Stream). All station locations are shown in Figure 4. Samples could not be collected at a shallow nearshore station (NS5) and at stations along the western arm of the harbor (W1 – W2) because of high surf.

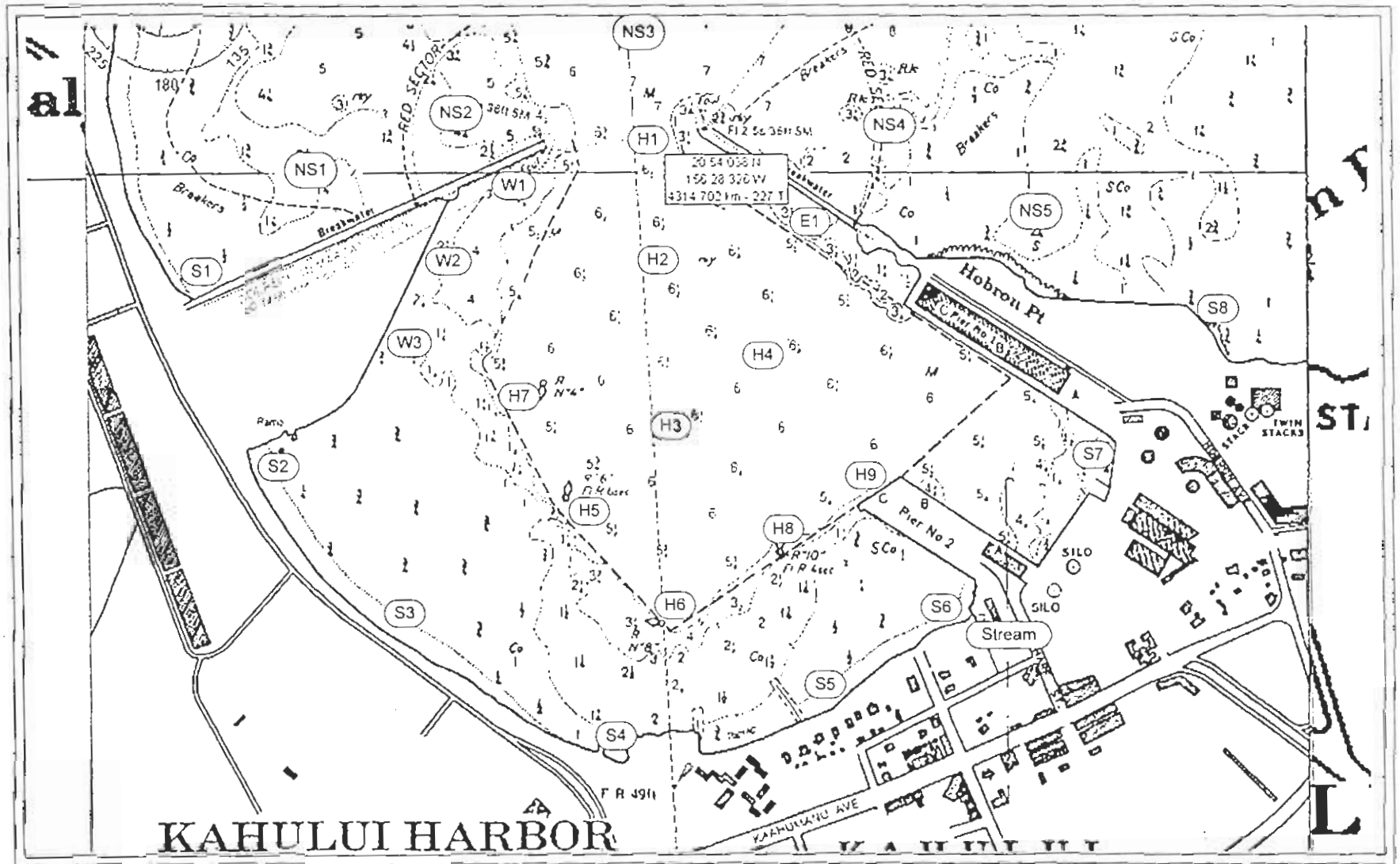
On April 15, 2003, water samples were collected at seven shoreline stations (S1 – S7), one station located along the east arm of the harbor (E1), three stations along the western arm of the harbor (W1 – W3), nine stations within the harbor entrance channel and turning basin (H1 – H9), and three stations in nearshore coastal waters immediately outside the harbor (NS2 – NS4). All station locations are shown in Figure 4. Samples could not be collected at a shallow nearshore stations (NS1, NS5) because of high surf.

For the shoreline stations on both surveys, a single sample was collected from just below the surface in water less than 0.5 m deep. For all other stations on October 16, three samples were collected: one just below the surface, one at mid-depth, and one 0.5 m above the bottom. On April 15, samples were collected just below the surface and 0.5 m above the bottom.

At each station on October 16, measurements of temperature and dissolved oxygen were made *in situ* with a portable temperature/DO sensor. For both surveys, water samples were collected with a Niskin bottle which was triggered to collect a sample at a specific depth. Upon retrieval, water samples were placed in 1 liter polyethylene bottles and held on ice for shipment to the analytical lab. On October 16, pH and turbidity were determined within 2 hours after collection. Upon receipt at the lab, subsamples of each sample were filtered for determination of total suspended solids and chlorophyll (Table 2). The filtrate was analyzed for total dissolved nitrogen (TDN) and phosphate (TDP), nitrate + nitrite- nitrogen (NO3-N), ammonia-nitrogen (NH4-N), reactive

Table 2. Water quality parameters examined during the study and analytical methods used.

WATER QUALITY PARAMETER	COLLECTION AND ANALYSIS METHOD
Temperature	YSI portable dissolved oxygen/temperature meter
Dissolved Oxygen	YSI portable dissolved oxygen/temperature meter
pH	Portable pH meter
Turbidity	Hach portable nephalometer; Standard Methods, 1986
Salinity	Laboratory salinometer
Water Samples:	5-liter Niskin bottles
Nutrients	Technicon AutoAnalyzer II;
Total nitrogen	D'Elia et al., 1977
NH_4	Solorzano, 1969
NO_3/NO_2	Technicon Inc., 1977
Total Phosphorus	Grasshoff et al., 1983
Orthophosphate	Murphy and Riley, 1962
Silicate	Strickland and Parsons, 1972
Chlorophyll	Filtration, acetone extraction, Turner Designs fluorometer; Strickland and Parsons, 1972
Total Suspended Solids	Filtration, electrobalance, Standard Methods, APHA 1992



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LOCATION OF WATER QUALITY SURVEY STATIONS (S1)

Figure 4

phosphate (PO4-P) and silicate. Unfiltered subsamples were analyzed for salinity (Table 2). Total organic nitrogen (TON) and total organic phosphorus (TOP) were determined by calculation: TON = TDN – NO3 – NH4; TOP = TDP – PO4.

Results

Results of water quality analyses on samples collected at Kahului Harbor on October 16, 2002 are presented in Table 3. Samples were collected between 9:00 am and 12:20 pm, on a rising tide. Dissolved oxygen and temperature data were not collected at depths greater than 5 m, the length of the probe cable. The shallow bottom at station NS4 limited sampling depths to 2 m. Due to high surf breaking over the reef, samples were not collected at station NS5. Shallow bottom depths at stations H4 and H5 limited maximum sample depths to 8 and 5 m, respectively. An additional sample ("Stream") was collected in the small stream located at the eastern end of the harbor beach, approximately 50 m inland from the shoreline.

Water temperature was generally uniform between nearshore stations, and between surface and 5 m depths at nearshore stations. Within the harbor, surface waters tended to be 0.3 - 0.7 deg C cooler than 5 m depths, reflecting surface cooling associated with passing rain showers and light trade winds. Shoreline water temperatures were generally 0.3 - 0.5 deg C warmer than surface harbor waters, probably reflecting solar warming, as shoreline samples were collected in early afternoon.

Dissolved oxygen concentrations were generally typical of nearshore marine waters, ranging from 6.0 to 4.8 mg/l, values that are greater than 90% saturation at their respective temperatures and salinities. pH levels varied little and were typical of nearshore marine conditions.

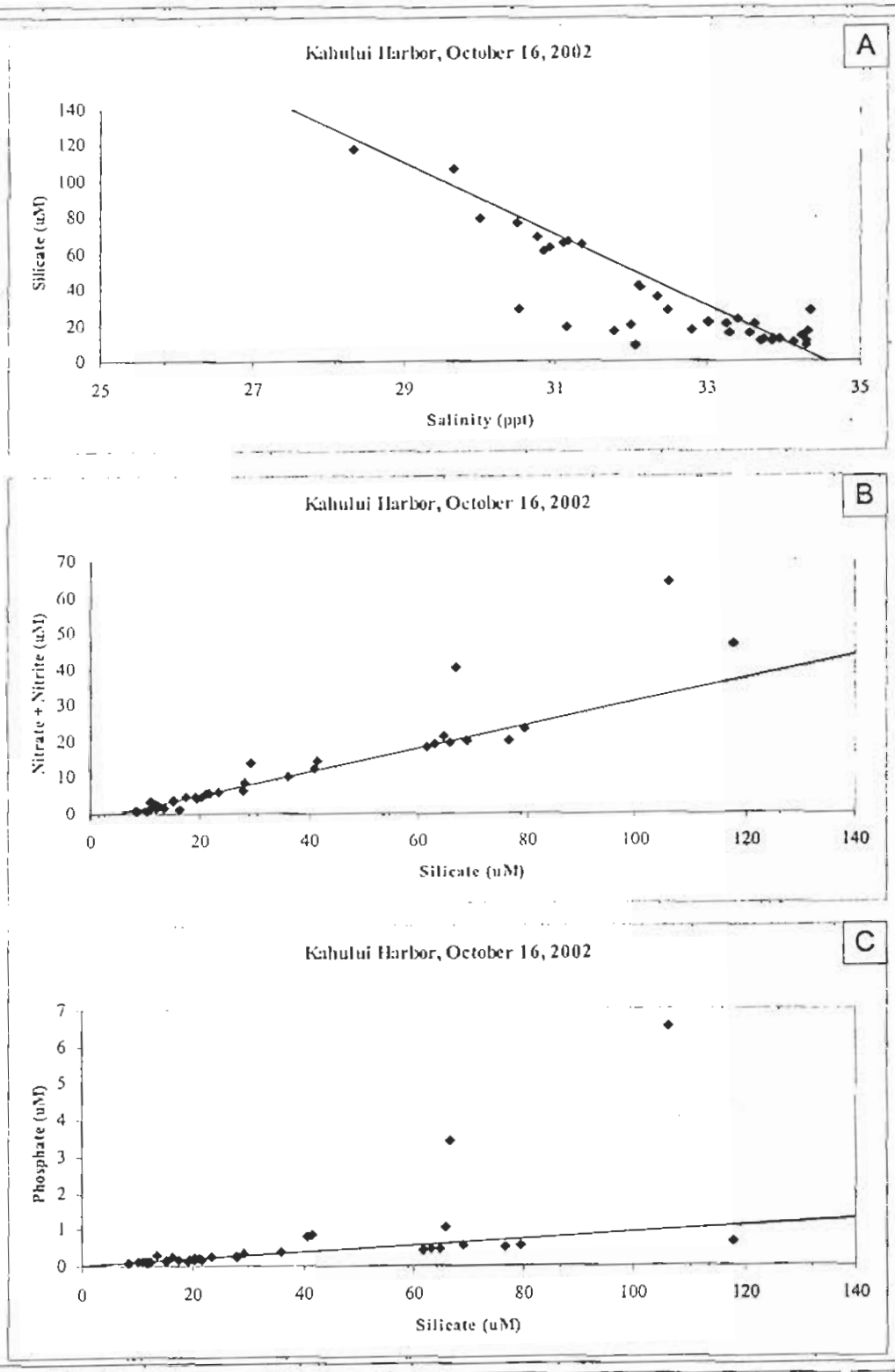
Salinity levels were lower than typical for Hawaiian waters, ranging from 29.66 at the shoreline station S2 to 34.35 in nearshore samples outside the harbor. Depressed salinity levels reflected the recent input of freshwater by rain and runoff.

Turbidity levels were highly variable between nearshore stations, increasing from west to east, and reflecting visually-observed decreases in water clarity due to high surf and resuspended sediments on the western stations and both resuspended sediments and stream-borne sediments discharged during earlier heavy rains to the east. Nearshore turbidity levels ranged from 1.6 to 10.4 NTU. Turbidity levels within the harbor were not different from those in nearshore waters outside the harbor, and ranged from 1.9 to 9.4, with a very high value from a near-bottom sample (37.6 at E1). Turbidity levels at shoreline stations within the harbor (S2 - S7) reflected variable shoreline wave action and build-up of detached macroalgal material. Shoreline station S8 was taken to the east of the sewage treatment plant, in an area of high turbidity (234 NTU) consisting of red soil particles discharged from adjacent streams during recent heavy rainfall. Overall, Turbidity levels were highly significantly related to Total Suspended Solids (Turb = -147 + 4.95 * TSS; $r^2 = 0.81$, $p < 0.01$), and showed the same patterns of distribution and concentrations.

Levels of dissolved nutrients reflected the strong influence of groundwater influx to the harbor. Plots of silicate vs. salinity, nitrate + nitrite vs. silicate and phosphate vs. silicate are presented in Figure 5a – c, respectively. Increasing levels of silicate with decreasing salinity reflect the

Table 3. Results of water quality survey in Kahului Harbor conducted October 16, 2002. Station locations as shown in Figure 4. "n/s" means no sample collected.

Station	Depth (m)	D.O. (mg/l)	Temp (deg C)	Sal (ppt)	pH (units)	Turb (NTU)	TSS (mg/l)	Chl a (ug/l)	TAN µM	NO3-N µM	PO4-P µM	Silicate µM
NS1	0	6.0	26.3	31.99	8.4	2.2	30.51	0.35	1.77	4.39	0.16	19.29
NS1	4	5.6	26.4	32.79	8.5	4.1	29.83	0.59	1.73	4.54	0.16	17.30
NS1	7	n/s	n/s	33.84	8.7	4.8	30.65	0.75	1.40	2.74	0.12	11.37
NS2	0	5.7	26.3	31.14	8.5	1.6	30.83	0.38	1.64	4.58	0.12	19.16
NS2	5	5.5	26.6	33.28	8.5	3.0	30.96	0.51	1.64	3.87	0.15	15.18
NS2	10	n/s	n/s	34.28	8.6	3.9	31.23	0.62	0.96	0.91	0.09	8.28
NS3	0	5.4	26.4	32.07	8.4	3.3	31.85	0.68	1.53	0.67	0.10	8.46
NS3	7	5.7	26.5	33.73	8.4	4.0	31.52	0.59	1.30	2.73	0.12	12.06
NS3	15	n/s	n/s	34.35	8.4	7.0	30.43	0.66	2.01	6.38	0.27	27.90
NS4	0	5.8	26.6	33.70	8.5	8.3	31.97	0.96	0.82	3.24	0.11	10.81
NS4	2	5.8	26.6	33.69	8.5	10.4	31.33	1.24	0.96	3.30	0.11	10.95
NS5	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
H1	0	5.3	26.2	30.83	8.6	4.0	30.63	0.61	3.74	18.35	0.43	61.64
H1	5	5.5	26.5	33.56	8.7	4.0	31.17	0.68	1.32	3.20	0.15	15.06
H1	10	n/s	n/s	34.31	8.7	9.4	31.10	1.21	3.94	1.43	0.24	16.20
H2	0	4.6	26.1	30.00	8.7	3.1	30.71	0.73	5.41	23.52	0.57	79.50
H2	5	5.5	26.6	33.02	8.8	2.9	30.59	0.61	2.10	5.49	0.19	21.11
H2	10	n/s	n/s	34.13	8.8	3.1	30.46	0.40	1.79	0.91	0.13	10.13
H3	0	4.4	26.2	30.48	8.7	3.6	30.88	0.53	4.20	19.75	0.51	76.56
H3	5	5.5	26.6	32.99	8.8	1.9	30.45	0.61	1.76	5.47	0.18	21.48
H3	10	n/s	n/s	33.94	8.8	2.2	29.96	0.66	1.73	1.57	0.10	11.89
H4	0	4.8	26.3	31.34	8.6	3.6	30.90	0.80	5.11	21.21	0.46	64.71
H4	4	5.2	26.5	32.48	8.7	3.7	30.59	0.78	1.98	8.44	0.24	28.17
H4	8	n/s	n/s	33.86	8.7	2.9	30.16	0.52	1.42	1.95	0.12	12.36
H5	0	5.0	25.9	28.32	8.0	5.3	30.62	0.64	9.78	46.86	0.65	117.95
H5	5	5.3	26.6	33.62	8.3	2.7	30.97	0.66	2.13	4.76	0.21	20.17
H5	10	n/s	n/s	34.29	8.4	3.6	30.72	0.73	1.87	1.21	0.12	10.82
H6	0	4.8	26.5	30.75	8.5	5.4	30.90	0.53	6.03	19.91	0.56	69.00
H6	5	5.5	26.5	33.24	8.6	3.6	30.85	0.64	1.48	4.59	0.17	20.08
E1	0	4.7	26.2	30.92	8.4	4.1	32.90	0.79	5.80	19.12	0.47	63.17
E1	4	4.7	26.6	33.39	8.7	5.5	31.06	0.59	1.84	5.98	0.24	23.23
E1	9	n/s	n/s	34.22	8.8	37.6	34.04	1.28	2.09	1.52	0.29	13.38
W1	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
W2	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
S1	0	6.0	26.7	30.50	8.6	27.0	34.14	1.49	1.95	13.90	0.33	29.20
S2	0	5.9	26.4	29.66	8.3	84.6	51.46	24.59	30.90	63.97	6.55	106.34
S3	0	5.6	26.4	31.17	8.5	84.5	43.01	17.87	8.46	40.50	3.40	66.88
S4	0	5.9	26.8	32.13	8.5	32.5	35.13	7.16	4.87	12.32	0.78	40.80
S5	0	5.6	26.4	32.10	8.5	13.2	33.38	2.54	3.65	14.58	0.85	41.56
S6	0	5.3	26.6	31.11	8.4	47.5	38.31	4.55	6.35	19.70	1.06	65.98
S7	0	4.5	26.5	32.35	8.4	9.5	32.50	1.32	3.19	10.16	0.37	35.93
S8	0	5.3	26.4	31.78	8.4	234.0	43.57	1.59	2.61	10.69	0.22	16.52
Stream	0	3.2	26.6	2.00	8.4	72.1	35.72	1.71	7.37	21.51	2.16	129.77



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KAHULUI HARBOR MACROALGAL STUDY

RELATIONSHIPS BETWEEN SELECTED WATER QUALITY PARAMETERS

Figure 5

dilution of low silicate nearshore coastal seawater with high silicate groundwater. The majority of the data fall along a single line; however a group of five samples with a lower silicate-salinity line comprise samples collected at S1 and NS 2 – 3, stations outside and to the north of the harbor. These data suggest a groundwater source with a somewhat decreased silicate load.

The nitrate + nitrite vs. silicate (Figure 5b) and phosphate vs. silicate (Figure 5c) plots show the strong relation between silicate and other dissolved nutrients, suggesting a common upland source. Only samples from shoreline station S2 and S3, located along the western shoreline of the harbor, showed different nitrogen : silicate and phosphorus : silicate ratios, suggesting a local source of additional nutrients.

Chlorophyll levels were generally low and showed no systematic relationship to salinity. Elevated chlorophyll levels were observed at shoreline stations (S2 – S4) along the western coastline of the harbor, and may represent small particulates derived from macroalgae washed onto the shore.

A second water quality survey was conducted in Kahului Harbor on April 15, 2003, during a period of strong trade winds. Results of this second survey are presented in Table 4. Samples were collected between 9:00 am and 12:20 pm, on a rising tide. Dissolved oxygen and temperature data were not collected during this survey, as the prior survey showed little horizontal or vertical variation in these parameters. The shallow bottom at station NS4 limited sampling to the surface sample only. Due to high surf breaking over the reef, samples were not collected at stations NS1 and NS5.

Water quality conditions at the nearshore stations outside the harbor were typically open coastal in nature, with higher salinity levels (34.14 – 34.89 ppt) than observed during the previous survey under light Kona conditions. Levels of dissolved nutrients were consequently low, and typical of open coastal waters with little groundwater influence.

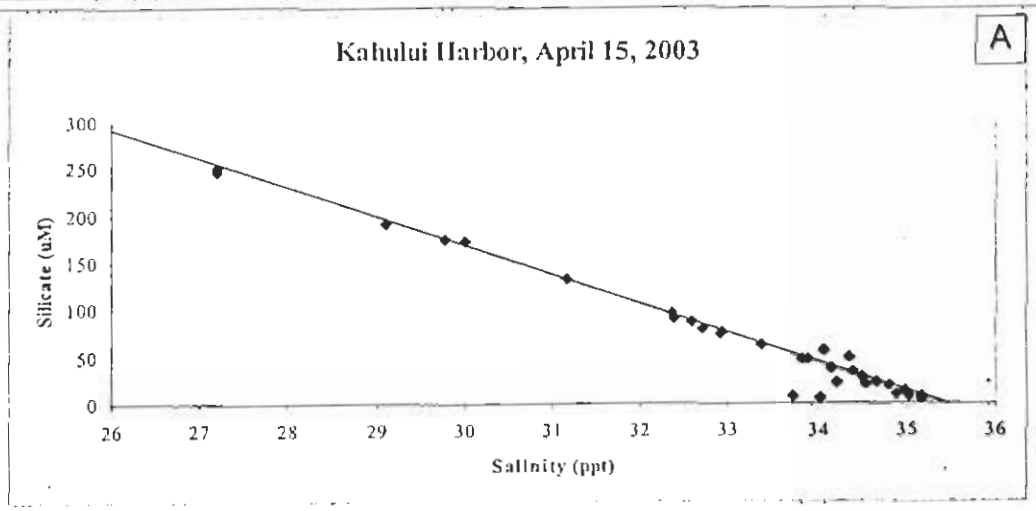
Waters within the harbor were highly stratified, despite the strong wind conditions. Salinity at stations along the western portion of the harbor (H3, H5, H6, H7, H8 and H9) showed salinity levels of 35 ppt in near-bottom samples, and salinity levels of 29.77 – 33.82 ppt in surface samples. Reflecting the strong groundwater input, dissolved nutrient levels were also elevated in surface samples, with NO2+NO3 levels ranging from 10.2 – 30.6 uM, and NH4 levels ranging from 0.58 – 2.44 uM.

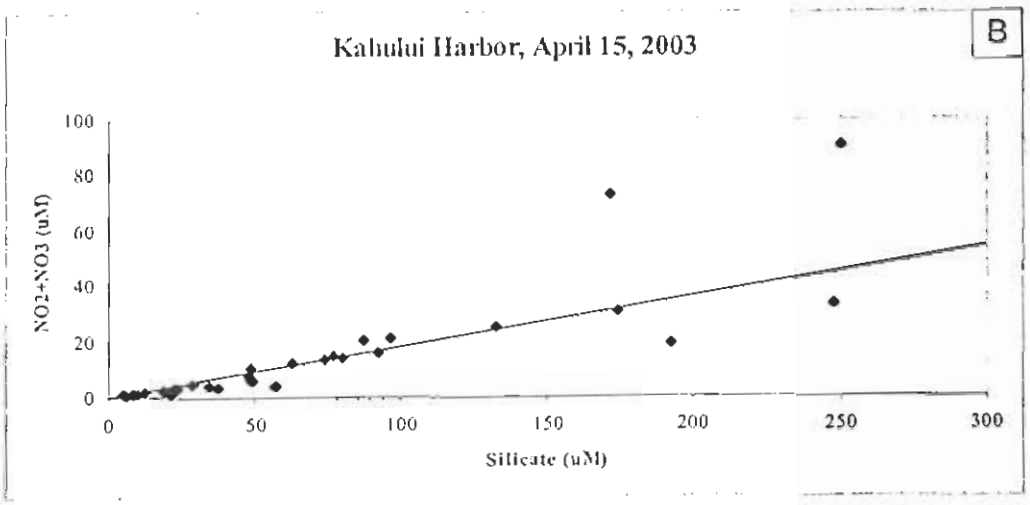
Samples collected along the shoreline again showed strong influence of groundwater, with salinity of samples collected within the western part of the harbor (S2 – S6) ranging from 27.2 – 32.59 ppt. Lowest salinities were observed at stations S3 and S4, located in the southwest corner of the harbor. Salinity at station S1, a shoreline station on the northern face of the western breakwater, outside the harbor, was similar to open coastal waters (34.39 ppt), as was salinity at S7, near the base of Pier 1 (34.67 ppt).

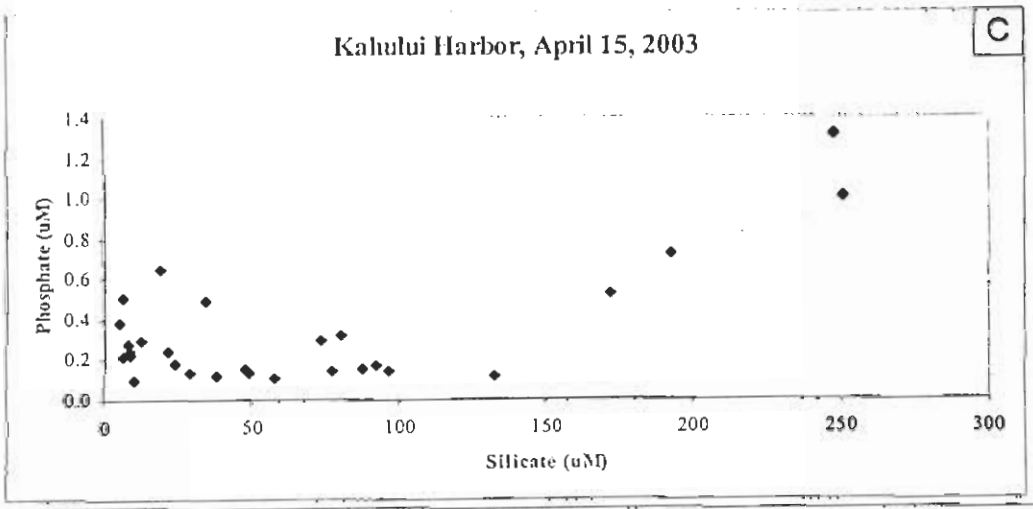
Levels of dissolved nutrients again reflected the strong influence of groundwater influx to the harbor. Plots of silicate vs. salinity, nitrate + nitrite vs. silicate and phosphate vs. silicate are presented for the April 15 survey data in Figure 6a – c, respectively. Increasing levels of silicate

Table 4. Results of water quality survey in Kahului Harbor conducted April 15, 2003. Station locations as shown in Figure 4. "n/s" means no sample collected.

Station	Depth (m)	Salinity ppt	Ammonia µM	NO3 -N µM	PO4-P µM	Silicate µM	Chl ug/L
NS2	0						
NS2	10	34.20	0.69	3.01	0.18	23.71	0.28
NS3	0	34.14	0.92	2.90	0.18	37.67	0.28
NS3	10	34.89	0.64	1.45	0.12	9.55	0.34
NS4	0	34.54	0.64	1.52	0.10	21.21	0.20
H1	0	34.07	1.21	3.77	0.24	57.12	0.26
H1	10	34.03	0.66	0.82	0.11	6.39	0.38
H2	0	33.89	1.04	7.66	0.21	47.69	0.40
H2	10	35.03	1.15	1.24	0.15	8.38	0.62
H3	0	33.38	0.71	11.78	0.24	62.47	0.62
H3	10						
H4	0	34.50	0.58	4.20	0.10	28.57	0.94
H4	8	35.18	1.01	0.90	0.14	6.02	0.30
H5	0	31.16	2.15	25.14	0.51	132.40	0.47
H5	10	34.81	0.76	2.80	0.12	18.75	0.97
H6	0	29.77	2.44	30.62	0.65	173.99	0.39
H6	10						
H7	0	32.93	0.87	14.60	0.25	76.53	0.64
H7	10	35.16	1.05	1.11	0.15	4.62	0.72
H8	0	32.36	1.61	21.24	0.38	96.59	0.71
H8	10	33.71	1.71	1.09	0.14	8.24	0.67
H9	0	33.82	0.94	10.20	0.22	48.20	0.67
H9	8	35.17	0.83	1.10	0.14	7.95	0.51
E1	0	34.34	0.80	5.80	0.28	48.94	0.21
E1	8	34.98	0.73	1.60	0.13	12.42	0.65
W1	0	32.90	0.94	13.06	0.30	73.45	0.41
W2	0	32.72	0.96	13.70	0.29	79.79	0.34
W3	0	32.39	0.92	16.14	0.31	92.08	0.41
S1	0	34.39	0.65	3.79	0.16	34.08	0.50
S2	0	29.11	1.00	19.27	0.49	192.63	0.54
S3	0	27.20	0.99	32.85	0.72	247.70	2.08
S4	0	27.21	11.06	90.51	1.31	250.58	1.02
S5	0	30.00	5.04	72.47	1.00	172.03	0.55
S6	0	32.59	1.97	20.27	0.52	87.04	0.80
S7	0	34.67	1.22	3.49	0.15	22.97	0.59







The Oceanic Institute
Makapuu Point
Waimanalo, Hawaii 96795

KAHULUI HARBOR MACROALGAL STUDY

RELATIONSHIPS BETWEEN SELECTED WATER QUALITY PARAMETERS

Figure 6

with decreasing salinity reflect the dilution of low silicate nearshore coastal seawater with high silicate groundwater. The majority of the data fall along a single line, suggesting a single groundwater source.

The nitrate + nitrite vs. silicate (Figure 6b) and phosphate vs. silicate (Figure 6c) plots show the strong relation between silicate and other dissolved nutrients, suggesting a common terrestrial source. Samples from shoreline stations S2 and S3, located along the western shoreline of the harbor, showed different nitrogen:silicate and phosphorus:silicate ratios, suggesting a local source of additional nutrients, or localized nutrient uptake.

Chlorophyll levels were generally low and showed no systematic relationship to salinity.

Discussion

The quantitative surveys of macroalgal distribution and abundance showed the shallow southwestern reef to be the primary source of macroalgal material which collects on the beach along the southwestern portion of Kahului Harbor. Overall, macroalgal coverage on hard bottom areas averaged 47%, ranging from 5% to over 90% coverage. No macroalgal growth appears to occur within the dredged harbor basin, a result of the deep and turbid water which limits light at the bottom, and the generally sand/mud bottom which affords no solid substrate for macroalgal attachment. No macroalgal growth was observed in the sand area separating the southern and southwestern reefs.

The high macroalgal coverage on the shallow reef areas of Kahului Harbor are likely the result of a combination of factors:
predominantly hard bottom with few scattered sand patches;
long days of clear skies and bright sunshine;
continuous input of high levels of dissolved nutrients;
slow water exchange or restricted water circulation; and
generally low wave energy across the reef.

No single factor can be identified as being the primary factor supporting macroalgal growth; rather, the high macroalgal coverage is the result of all these factors acting in concert.

The table below presents the primary factors affecting macroalgal growth and distribution in Kahului Harbor. For each factor, one or several conditions which contribute to macroalgal growth are listed. For each condition, potential actions, if any, which could be taken to mitigate the growth of macroalgae are presented.

FACTOR	CONDITION	MITIGATION/MODIFICATION
Substrate	Generally hard substrate with scattered rubble	None
Light	High, due to: low cloud cover shallow water depth	 None Dredge to deeper depth
Nutrients Concentrations Distribution - horizontal Distribution - vertical	High, due to: Groundwater input Slow circulation over reef Low dilution rates	 None Increase circulation over reef Increase water depth
Macroalgae	Rapid growth Macroalgal build-up	Introduce herbivores *In situ* harvesting
Wave energy Circulation	Periodic high wave energy breaks off macroalgal fronds Fronds collect along shoreline	Wave barrier along outer reef edge Modified circulation, algal collection/removal structure

Substrate

Macroalgae require hard substrate upon which to attach and grow. This hard substrate may be exposed basalt or limestone, large basalt boulders, concrete piers and pilings, or loose coral and basalt rubble. The southwestern reef within Kahului Harbor is primarily a shallow reef bench consisting of exposed limestone with patches of small to medium coral rubble and basalt rocks. Macroalgae were seen growing on all hard surfaces which were generally stable, i.e., all but small rocks which would move with light wave action. No macroalgal growth was seen on sandy patches or sand channels in shallow water, or on the sandy/muddy bottom of the harbor basin. There does not appear to be any reasonable mitigative action that could be undertaken to change the character of the hard bottom shallow reef. Overlaying the bottom with loose rubble and/or sand would likely be a temporary solution, with most of the material being moved onshore or offshore to the deeper basin under high wave and wind conditions.

Light and Nutrients

Macroalgae grow rapidly under conditions which provide high light levels and continuous supplies of nutrients. The shallow reef environment provides an abundance of light with little loss due to attenuation by suspended particulate material.

Dissolved nutrients within Kahului Harbor are derived primarily from terrestrial sources, both natural and anthropogenic, and enter the harbor as a continuous discharge of nutrient-laden groundwater. The concentrations of nitrate and phosphate, the primary nutrients supporting macroalgal growth, are highest along the shoreline and strongly correlated with concentrations of dissolved silicate, an indicator of groundwater. Groundwater appeared to discharge along the south and southwestern harbor shorelines, rather than at well-defined points. The concentrations and horizontal distributions of dissolved nutrients are influenced by tidal exchange with nearshore waters outside the harbor, the pattern of flow and circulation within the harbor, and periodic surface discharge from surrounding lands during heavy rainfall events.

There is little that can be done to decrease or mitigate the input of dissolved nutrients. The dissolved nutrients entering the harbor appear to be primarily derived from natural processes upslope of Kahului. There is no evidence that local injection wells, for example, contribute to the groundwater nutrient load. Most injection wells in the area are dry wells designed to dispose of storm water runoff. As such, the well injectate is typically low in nutrients and sporadic in contribution. Injection wells for the Kahului wastewater treatment plant are located to the east of the harbor, close to the shoreline, and too far removed to have an impact on harbor waters.

Some dissolved nutrients may be derived from urban landscaping upslope of the harbor. However, this contribution appears to be small. Levels on nitrate+nitrite-N in groundwater, estimated from salinity and nitrate+nitrite-N in shoreline samples, is similar to that seen in areas down slope of relatively undeveloped lands. Estimates of groundwater nitrate+nitrite-N entering the harbor are 4 – 5 times lower than for groundwater at Pa'ia, down slope of intensive agriculture (OI Consultants, Inc. 1993)

Circulation

The constant input of nutrients with groundwater which enters the harbor along the shoreline provides essential nutrients for macroalgal growth, and these nutrients are not rapidly diluted by mixing with large volumes of nutrient-poor coastal oceanic waters, as they are along the adjacent unprotected coastlines. Circulation over the shallow reef platform appears to be slow, even under brisk trade winds. The slow circulation results in a long contact time for macroalgae to take up dissolved nutrients, thus increasing potential production. Drogue studies conducted during this project showed little exchange between the dredged portion of the harbor and the shallow reef. Circulation within the dredged harbor basin was generally driven by tides, with limited water exchange between the basin and nearshore coastal waters.

Circulation and mixing within harbors or other semi-enclosed bodies is typically much lower than over shallow coastal reefs. Engineering studies might suggest modifications to the harbor design that could increase exchange with coastal waters, mixing between harbor waters and groundwater, and circulation patterns within the harbor. However, the costs of such harbor modifications would have to be weighed against conflicts with current and future harbor development, existing and future shoreline uses, and the current cost of macroalgal clean-up and disposal.

Water Depth

Currently the shallow depths over the reef platform serve to maximize macroalgal production by providing hard substrate at depths that are well lit and supplied with nutrients.

Increasing the depth of the reef by dredging might provide a means to reduce, if not eliminate the excessive macroalgal growth. Increasing the bottom depth from the existing conditions, where the bottom slopes from the shoreline to 6 – 8 feet at the reef edge, to a uniform depth of 12 – 15 feet, for example, would result in a thicker water layer which would reduce light reaching the bottom, and a deeper water column into which groundwater nutrients would mix and dilute. It is also likely that the slightly less dense groundwater would remain at the surface rather than being mixed to the bottom, thus reducing the nutrients provided to the macroalgae. As an additional factor, a deeper dredged bottom consisting of small rubble and sand would provide less substrate for macroalgal attachment. Finally, a deeper reef would be less affected by wave action, and macroalgae growing on the bottom would be less likely to be broken off and washed onto the shore under heavy surf.

The dredging of a large portion of the reef platform could be done as a project to increase commercial and/or recreational uses of the harbor. Currently, the shallow reef area is used for only a few recreational activities, including canoe paddling and surfing along the western breakwater. Under strong trade winds or heavy surf, waves form at the reef edge and break across the width of the reef flat to the shoreline. A rubble breakwater along the reef edge might be constructed to minimize wave action within the newly- deepened area.

Summary

No single factor can be identified as being the primary factor supporting macroalgal growth in Kahului Harbor; rather, the high macroalgal coverage is the result of a multitude of factors acting in concert. As such, a single, simple mitigative solution to the Kahului Harbor macroalgal problem may not exist. The results of the water quality and macroalgal surveys suggest there are no nutrient sources that could be reduced or eliminated, and major modifications to the existing harbor design are not likely to be cost effective compared to continued clean-up and disposal. Designs for future harbor development, however, should incorporate elements that can increase bottom depth or decrease the area of the shallow reef, increase exchange with waters outside the harbor and increase mixing and circulation within the harbor.

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APPENDIX D

PRE-CONSULTATION CORRESPONDENCE AND COMMENTS

HAR-EP
9821.06

April 27, 2006

Mr. and Mrs. Roger Strong
101 Kaahumanu Avenue, No. C-K
Kahului, Hawaii 96732

Letter also sent to:
See attached list.

Dear Mr. and Mrs. Strong:

Subject: Draft Environmental Assessment for State Land Acquisition of Alexander & Baldwin Property in Kahului, Maui – Pre-Consultation

The State of Hawaii Department of Transportation Harbors Division intends to purchase two parcels of land from Alexander & Baldwin (A&B) Properties, Inc. Request your agency/organization's comments and concerns in regard to any potential environmental impacts of this action. We further request that these comments/concerns be submitted by May 12, 2006.

The following are descriptions of the parcels being considered for purchase.

Tax Map Key: Division II, Zone 3, Section 7, Plat 10, Parcel 036.

Owner of Record: A&B Properties, Inc.
Real Property Tax Assessments: $2,009,300 – land; $379,0000 – building.
Size and Shape: Approximately 2.16 acres or 94,002 square feet, generally rectangular in shape.
Topography and Soil Condition: Generally level with street grade. Presumed to have Stable soil conditions.
Access: Directly from Kaahumanu Avenue as well as Wharf Street.
Flood Status: Zone V23 (coastal high hazard area), Zone A-4 (areas of 100-year flood With base flood elevations and flood hazard factors determined), Zone C (areas of Minimal flooding).
Utilities: All public utilities are available along Kaahumanu Avenue.
State Land Use Classification: Urban District.
Zoning: M-2 Heavy Industrial District.
Wailuku-Kahului Community Plan: Light Industrial
Improvements: Three detached single-story retail-office structures that were originally

constructed circa 1923 as a railroad building. The buildings are of concrete block construction of a concrete slab foundation with approximately 6,935 square feet of leasable areas. The units range in size from 168 to 2,567 square feet. The buildings are separated by a landscaped courtyard and connected by concrete walkways. Parking is situated on the north, west and east sides of the buildings. The improvements were observed to be of sound construction quality and in average condition due to renovations and regular maintenance through the years. Most of the interior improvements were made by tenants and were observed to be of average construction quality and condition.

Summary of Tenant Leases:

Joel & Heidi Stuart – Retail. 1,042 square feet. Lease period: 12/01/04-1/31/07 with two-year option.
Lightning Bolt Maui, Inc. 1,919 square feet. Lease period: 5/01/04-4/30/07.
Scott & Amber Emerzian – Retail. 854 square feet. Lease period: 11/01/04-10/31/07.
Fabric Mart – Retail. 5,011 square feet. Lease period: 5/01/02-4/30/05 with two-year lease option.
Island Beauty Supply, LLC – Retail/Office. Lease period: 5/15/00-5/14/07.
Gary Guenther – Office. 1,608 square feet. Month-to-month licensing agreement.
LF & Sons Landscape Maintenance – Storage. 228 square feet. Month-to-month licensing agreement.
Joel & Heidi Stuart – Storage. 202 square feet. Month-to-month licensing agreement.
Lightning Bolt Maui, Inc. – Storage. 179 square feet. Month-to-month licensing agreement.
Charles Buckingham – Storage. 136 square feet. Month-to-month licensing agreement.
Global Travel Center – Pad. 5,000 square feet. Lease period: 7/01/05-2/28/07.

Tax Map Key: Division II, Zone 3, Section 7, Plat 10, Parcel 001.

Owner of Record: A&B Properties, Inc.
Real Property Tax Assessments: $1,612,700 – land; $548,600 – building.
Size and Shape: Approximately 1.8 acres or 78,364 square feet, generally rectangular in shape.
Topography and Soil Condition:. Generally level with street grade. Presumed to have stable soil conditions.
Access: Directly from Kaahumanu Avenue as well as from Wharf Street.
Flood Status: Zone V23 (coastal high hazard area), Zone A-4 (areas of 100-year flood with base flood elevations and flood hazard factors determined), Zone C (areas of minimal flooding).
Utilities: All public utilities are available along Kaahumanu Avenue.

America FREESTYLE CRUISING

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06.0939

May 4, 2006

'06 MAY -9 AM 9:22

Mr. Barry Fukunaga
Deputy Director – Harbors
Hawaii State Department of Transportation
79 South Nimitz Highway
Honolulu, Hawaii 96813-4898

Dear Mr. Fukunaga:

I am responding to your letter of April 27, 2006 requesting our comments on the state's plan to purchase two parcels of property from Alexander & Baldwin Properties, Inc. in the Kahului Harbor area. While we do not have any comments on the acquisition of the property and understand that use of the property will be determined by the master plan for the harbor, we are concerned about possible adverse impacts on traffic if cargo operations are relocated to these parcels. We would like to be kept apprised and be given the opportunity to provide comment as the plan is developed.

Thank you for the opportunity to provide these comments. Should you have any questions, please call me at 527-3852.

Sincerely,

Dale Hahn

Dale Hahn
Director of Government Affairs

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813 Tel. 808.527.3800 Fax. 808.527.3801 www.ncl.com

Young Brothers, Limited.
"Lifeline of the Hawaiian Islands"
Hawaiian Tug & Barge
"Ready to Serve"

May 10, 2006

Mr. Barry Fukunaga
Deputy Director
Department of Transportation, Harbors Division
Hale Awa Ku Moku Building, Room 305
79 South Nimitz Highway
Honolulu, HI 96813-4898

Re: Draft Environmental Assessment for State Land Acquisition of Alexander and Baldwin Property in Kahului, Maui - Pre-Consultation

Dear Mr. Fukunaga:

Thank you for your letter of April 27, 2006 to Young Brothers, Limited regarding the agency action above-described and for giving us the opportunity to submit comments and/or concerns.

We strongly support the agency action above-described and appreciate the detail stated in the April 27, 2006 Letter. We offer the following comments as part our desire to support an efficient and timely environmental review process and look forward to working with you and your office on this project and commenting on future environmental review, planning and other documents.

1. **Scope/Phasing**. We understand that your agency is undertaking this pre-consultation in the context of Section 11-200-9(A) of the Hawaii Administrative Rules (HAR) (relating to "Assessment of Agency Actions and Applicant Actions"), which provides:

> A. For agency actions, except those actions exempt from the preparation of an environmental assessment pursuant to section 343-5, HRS, or section 11-200-8, the proposing agency shall:
>
> 1. Seek, at the earliest practicable time, the advice and input of the county agency responsible for implementing the county's general plan for each county in which the proposed action is to occur, and consult with other agencies having jurisdiction or expertise as well as those citizen groups and individuals which the proposing agency reasonably believes to be affected;

An agency action is essentially "any program or project to be initiated by an agency or applicant." HAR §11-200-2.

With respect to a multi-phased project, HAR §11-200-7 (Multiple or Phased Applicant or Agency Actions) provides:

P.O. Box 3288, Honolulu, HI 96801, Phone (808) 543-9311
Website: www.htbyb.com

> A group of actions proposed by an agency or an applicant shall be treated as a single action when:
>
> A. The component actions are phases or increments of a larger total undertaking;
> B. An individual project is a necessary precedent for a larger project;
> C. An individual project represents a commitment to a larger project; or
> D. The actions in question are essentially identical and a single statement will adequately address the impacts of each individual action and those of the group of actions as a whole.

In the present matter, your agency's action is described as follows: "The State of Hawaii intends to purchase two parcels of land from Alexander and Baldwin (A&B) Properties, Inc." While we understand that this is an accurate statement, we also understand that the use of the subject property will be changed and that a future phase of the agency action may include improvements and/or alterations to the property and its structures. We suggest that the subsequent Environmental Assessment make clear that (a) this acquisition is in furtherance of the State of Hawaii intent to expand inter-island barge terminal facilities at Kahului Harbor to accommodate the increasing volume of inter-island cargo handled at this harbor and the operation of modern cargo handling equipment and (b) the agency action includes (1) purchasing two parcels of land from Alexander and Baldwin (A&B) Properties, Inc. (as described in the April 27, 2006 Letter) as well as (2) possibly improving the currently paved surface on the parcels for purposes of supporting cargo loads and cargo equipment, (3) possibly improving the currently existing structures for the primary purposes of supporting the administration of inter-island cargo transportation and related harbor uses and possibly demolishing currently existing structures (other than those structures or portions of structures that are listed in the National Register of Historic Places or the Hawaii Register of Historic Places and (4) changing the primary use of the acquired parcels from primarily retail and non-harbor related office use to primarily harbor-related uses.

2. Description of Parcels to be acquired.

a. Tax Map Key: Division II, Zone 3, Section 7, Plat 10, Parcel 036. With respect to this parcel, commonly known as the "Old Kahului Railway Building" property, the April 27, 2006 Letter describes the existing improvements as follows:

> Improvements – Three detached single-story retail-office structures that were originally constructed circa 1923 as a railroad building.

We believe that this description is inaccurate in that the original 1923 railroad building consisted only of the single story building fronting Kaahumanu Street; the other two buildings, connected by concrete walkways to the 1923 railroad building, were constructed much later and do not have any particular historical significance. We suggest that you refer to these two other structures as the "railroad building annexes."

The original construction of the 1923 railroad building is reflected in the following County of Maui real property tax record (found at http://www.mauipropertytax.com/)

370100360000

KAAHUMANU AVE **A AND B PROPERTIES INC**

Commercial 1 of 2

TMK	370100360000
Property Class	
Card	1
Building Number	0001
Improvement Name	
Identical Units	1
Units	
Structure Type	COMMER LOW RISE C3
Year Built	1923
Effective Year	
Gross Building Value	
Gross Building Description	

Data Last Modified : 5/1/2006

While we have not undertaken a thorough review of the construction/development history of this parcel or the railroad building annexes, the subsequent construction of the annexes was apparently undertaken in 1955 as reflected in the following County of Maui real property tax record for the same parcel of property (found at http://www.mauipropertytax.com/):

370100360000

KAAHUMANU AVE **A AND B PROPERTIES INC**

Commercial 2 of 2

TMK	370100360000
Property Class	
Card	2
Building Number	0002
Improvement Name	
Identical Units	2
Units	
Structure Type	COMMER MASONRY C3
Year Built	1955
Effective Year	
Gross Building Value	
Gross Building Description	

Data Last Modified : 5/1/2006

Lastly, the April 27, 2006 letter lists certain tenants for the Old Kahului Railroad Building. We think this listing is mistaken and that the listing of tenants for the Old Kahului Railroad Building should be switched with the listing of tenants for the Old Kahului Store. (The Old Kahului Store is discussed below).[1]

b. Tax Map Key: Division II, Zone 3, Section 7, Plat 10, Parcel 001. Although we have not undertaken a thorough review of the construction/development history of this parcel or the relevant structure(s), we note that, with respect to this parcel, commonly known as the "Old Kahului Store" property, the April 27, 2006 Letter states that this structure was "originally constructed circa 1904." We understand that County of Maui real property tax records reflect a 1904 construction date for the original part of the building, but note that A & B records reflect that this construction date for the Old Kahului Store is 1916. *See* *http://www.alexanderbaldwin.com/irprop/spreadsheets/hiport123104.xls.* *http://www.alexanderbaldwin.com/irprop/spreadsheets/hiport123104.pdf.* In addition, we note that County of Maui real property tax records reflect that a portion of this structure was constructed in 1979 (found at http://www.mauipropertytax.com/):

---

[1] We also note that the April 27, 2006 Letter may not reference the most recent real property tax assessments. The letter recites "Real Property Tax Assessments: $2,009,300 – land; $379,000 – building." By "Real Property Tax Assessments" we understand the April 27, 2006 Letter to mean "assessed value" for real property tax purposes. The land value and building value listed in the April 27, 2006 Letter do not appear to reflect recent County of Maui tax records (found at http://www.mauipropertytax.com/):

370100360000

KAAHUMANU AVE **A AND B PROPERTIES INC**

Assessed Values	1 of 1
Property Class	INDUSTRIAL
Land Value	$1,927,600
Land Exemption	$0
Net Taxable Land Value	$1,927,600
Building Value	$393,100
Building Exemption	$0
Net Taxable Building Value	$393,100
Total Taxable Value	$2,320,700
Homeowner Class	

Data Last Modified : 5/1/2006

370100010000

55 KAAHUMANU AVE **A AND B PROPERTIES INC**

Commercial	2 of 2
TMK	370100010000
Property Class	
Card	2
Building Number	0002
Improvement Name	GLOBAL TRAVEL
Identical Units	1
Units	
Structure Type	COMMER FRAME C1
Year Built	1979
Effective Year	1984
Gross Building Value	
Gross Building Description	

Data Last Modified : 5/1/2006

Lastly, as noted above, the April 27, 2006 letter lists certain tenants for the Old Kahului Store. We think this listing is mistaken and that the listing of tenants for the Old Kahului Railroad Building should be switched with the listing of tenants for the Old Kahului Store. In addition, we believe that the tenant listed as "Four Stage Mortgage Corp." should be listed as "Four Star Mortgage Corporation".[2]

---

[2] The April 27, 2006 Letter lists: "Real Property Tax Assessments: $1,672,700 – land; 548,60000 – building." We note that the land value and building value listed in the EA do not appear to reflect recent County of Maui real property tax records (found at http://www.mauipropertytax.com/):

370100010000

55 KAAHUMANU AVE A AND B PROPERTIES INC

Assessed Values	1 of 1
Property Class	INDUSTRIAL
Land Value	$1,727,900
Land Exemption	$0
Net Taxable Land Value	$1,727,900
Building Value	$575,600
Building Exemption	$0
Net Taxable Building Value	$575,600
Total Taxable Value	$2,303,500
Homeowner Class	

Data Last Modified : 5/1/2006

* * * * *

We ask that you, in future communications regarding this environmental review process, include the undersigned as an addressee.

Thank you for this opportunity to comment. Please contact us should you have any questions.

Very truly yours,

Roy Catalani
Vice President
Strategic Planning and Governmental Affairs

APPENDIX E

DRAFT ENVIRONMENTAL ASSESSMENT COMMENTS AND RESPONSES

07.0065

DIR 1281

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION
2006 JUL 25 A 8:45

July 17, 2006

Mr. Rodney K. Haraga, Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813

Dear Mr. Haraga:

Subject: Draft EA for the Kahului Harbor Land Acquisition, Maui

Thank you for the opportunity to review the subject document. We have the following comment.

1. Will DOT conduct its own appraisal before purchasing the land from A&B?

2. Did the surface transportation impact analysis include roadway circulation and traffic generation resulting from the proposed Superferry project?

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Genevieve Salmonson

Genevieve Salmonson
Director

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
79 SOUTH NIMITZ HIGHWAY
HONOLULU, HAWAII 96813-4898

IN REPLY REFER TO:

HAR-EP
2125.07

July 28, 2007

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Draft Environmental Assessment (EA) and Anticipated Finding of No Significant Impact (FONSI), Acquisition of Land and Improvements For the Expansion of Kahului Commercial Harbor

Thank you for your correspondence of July 17, 2006 with your questions on the subject draft EA.

1. "Will DOT conduct its own appraisal before purchasing the land from A&B?"

The State Department of Transportation (DOT) Harbors Division has contracted an appraiser to conduct the evaluation for an objective determination of the value of the two Alexander & Baldwin Properties, Inc. (A&B) parcels. This appraisal will provide a basis for the Harbors Division's negotiations with A&B on the purchase price of the properties.

2. "Did the surface transportation impact analysis include roadway circulation and traffic generation resulting from the proposed Superferry project?"

The Draft EA's Surface Transportation System analysis did not include the Hawaii Superferry's roadway circulation and potential traffic impacts. The Draft EA addresses the impacts of the purchase of the two A&B parcels. The recommendations for the most advantageous maritime use of the two parcels as well as a permanent berth and operating area for the Superferry will be determined by the *Kahului Commercial Harbor 2030 Master Plan*, which is slated to begin within the next seven weeks. The completed 2030 master plan's recommended projects will then be analyzed in accordance with the tenets of Hawaii Revised Statutes Chapter 343.

Please call Mr. Glenn Soma of our Harbors Division Engineering Planning Section at 587-2503, if there are any further questions.

Very truly yours,

BARRY FUKUNAGA
Deputy Director - Harbors

Young Brothers, Limited.
"Lifeline of the Hawaiian Islands"
Hawaiian Tug & Barge
"Ready to Serve"

July 21, 2006

Department of Transportation, Harbors Division
Hale Awa Ku Moku Building, Room 305
79 South Nimitz Highway
Honolulu, HI 96813-4898

Attention: Mr. Glenn Soma

Re: DRAFT ENVIRONMENTAL ASSESSMENT
RELATING TO ACQUISITION OF LAND AND IMPROVEMENTS FOR THE EXPANSION OF KAHULUI COMMERCIAL HARBOR
District of Wailuku, County of Maui
Tax Map Key: 3-7-10: 001 and 3-7-10: 036

Dear Mr. Soma:

As published in the July 23, 2006 edition of the Environmental Notice, the State Department of Transportation has published a "draft environmental assessment (DEA) notice pending 30-day public comment" relating to the acquisition of land and improvements for the expansion of Kahului Commercial Harbor.

We strongly support the agency action relating to the acquisition of the property and offer the following comments as part our desire to support an efficient and timely environmental review process.

The DEA, in Section 3.1, describes the acquisition of the "***A&B lands***" as follows:

> The Harbors Division proposes to use State funds to acquire privately owned A&B lands and the improvements thereon. The properties consist of two adjoining parcels, located adjacent to and south of Kahului Commercial Harbor between Hobron Avenue and Wharf Street, and identified as TMK: Division II, Zone 3, Section 7, Plat 10, Parcel 001 and Division II, Zone 3, Section 7, Plat 10, Parcel 036. The total land area of both parcels is approximately 4.96 acres.

Section 3.3 of the DEA recognizes that this acquisition is necessary not only to address forecasted martime demands but also to address "***existing***" maritime demands:

> The proposed land acquisition will offer additional terminal space for more efficient, economical and safer maritime operations. The additional acreage provided by the proposed land acquisition will assist the Harbors Division in addressing existing and forecast maritime demands.

However, in various sections of the document, the DEA states (a) that the DEA addresses only the intended purchase by Department of Transportation, Harbors Division ("***DOT/Harbors***") of the two

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Website: www.htbyb.com

A&B parcels, (b) no demolition or construction activities are being proposed for any structures within these parcels at this time and (c) the two parcels will not be developed for maritime use until DOT/Harbors completes the acquisition, completes the Kahului Commercial Harbor 2030 Master Plan with the two parcels included in the recommendations, and completes the HRS Chapter 343 environmental analysis for the 2030 master plan. *See, e.g.*, DEA at 4.5.2, 4.9.2. 4.13.2, 4.14.2, 4.15.2, 5.0.

While we support the concept of development in accordance with a master plan, we request that the DOT/Harbors consider that (a) it is critical that DOT/Harbors take action to immediately relieve the "***existing***" need for additional terminal space and (b) this action may be in the form of an interim measure, prior to the completion of a master plan and redevelopment of the two parcels for maritime use, to make available additional space to Young Brothers and enable Young Brothers to continue to meet the presently existing daily cargo demands of the residents and businesses of the Island of Maui.

To be more specific, prior to any demolition or substantial construction activities, and as an interim measure prior the completion of the master plan and redevelopment of the two parcels for maritime use, we recommend that DOT/Harbors expand the mauka fence line of the existing Young Brothers' Kahului harbor operations across the State-owned Ala Luina Street and into that portion of the A&B lands that are currently at (and near) grade and that are not needed to meet the parking requirements (as determined by the Maui County Code) of the tenants within the A&B lands as of the end of the first quarter of 2007. That is to say, we recommend that Young Brothers' existing operations, as an interim measure, be expanded to incorporate the above-described portion of the A&B lands (as well as a portion of Ala Luina Street) in order for Young Brothers to meet the present demand for its current services.

We note that our recommendation is consistent with the 2006 State Legislature's request in Senate Concurrent Resolution 33 ("***SCR 33***"). SCR 33 quotes the Hawaii Harbor Users Group report, entitled *Harbor Facility Development To Serve The State of Hawaii* (December 2005), for the propositions that "the harbor capacity situation on Maui is considered the most critical of all the neighbor islands" and that "the combination of rising cargo volumes and increased passenger activity brings Maui closer and closer to the point at which service breakdowns and delivery disruptions can be expected." SCR 33 requests that the DOT/Harbors give priority to four measures identified as critical, including "acquir[ing] and incorporate[ing] into an expanded inter-island cargo terminal the four acres of land currently owned by A&B Properties, Inc."

Thank you for this opportunity to comment. We ask that you, in future communications regarding any environmental review involving harbor property, include the undersigned as an addressee.

Please contact us should you have any questions.

Very truly yours,

Roy Catalani
Vice President
Strategic Planning and Governmental Affairs

Cc: Mr. Barry Fukunaga (DOT/Harbors)
Mr. Marshall Ando (DOT/Harbors)

HAR-EP
2123.06

July 28, 2006

Mr. Roy Catalani
Vice President, Strategic Planning and
Government Affairs
Young Brothers, Limited
P. O. Box 3288
Honolulu, Hawaii 96801

Dear Mr. Catalani:

Subject: Draft Environmental Assessment (EA) and Anticipated Finding of No Significant Impact (FONSI), Acquisition of Land and Improvements for the Expansion of Kahului Commercial Harbor

Thank you for your July 21, 2006 correspondence with your comments on the subject draft EA and anticipated FONSI.

The Final EA and FONSI will be modified accordingly. Full redevelopment of the Alexander & Baldwin Properties, Inc. (A&B) properties will be scheduled once the Harbors Division completes the acquisition of the two A&B parcels, the *Kahului Commercial Harbor 2030 Master Plan*, and the Hawaii Revised Statutes Chapter 343 environmental analysis of the master plan. Minor projects, such as those contained in the *Comprehensive Exemption List for the State of Hawaii Department of Transportation*, Amended, November 15, 2000, may be implemented in the interim for the inter-island cargo carrier's continuation of its full range of cargo services, including the less-than-container load (LCL) cargo operations.

Please call Mr. Glenn Soma of our Harbors Division Engineering Planning Section at 587-2503 if there are any questions.

Very truly yours,

BARRY FUKUNAGA
Deputy Director – Harbors

bc: HAR-M, HAR-EE

GTS:lm

JOHN BLUMER-BUELL
S.R. 111, HANA, MAUI, HAWAII 96713
PHONE and FAX 808-248-8972
EMAIL blubu@aloha.net

06 JUL 24 AM 10:50
HARBORS DIVISION
07.0056

July 21, 2006

State of Hawaii
Department of Transportation, Harbors Division
79 South Nimitz Hwy Honolulu, Hawaii 96813
Attention: Mr. Glen Soma

Subject: Public Comments Regarding Acquisition of Land & Improvements for the Expansion of Kahului Commercial Harbor (HS 343 DEA). TMK (2)3-7-10:001 & 3-7-10:036

Aloha,

I request the following questions and comments be addressed as part of this process.

1) Are the Old Kahului Store and Railroad Building included in this acquisition?

If the answer is yes, please answer the following questions and comments.

1A) What is the proposed use of the buildings?

1B) Is the plan to demolish the buildings as part of the redevelopment process?

1C) Is there a plan to preserve the buildings?

1D) Please discuss the history and significance of the buildings.

1E) Please discuss the age and history of the trees in close proximity to the buildings.

1F) Please discuss other historical features of the property.

2) Please discuss the entire plan and impacts of the redevelopment and the Kahului Commercial Harbor 2030 Master Plan.

3) Please discuss the entire economic plan and impacts for the redevelopment, including, but not limited to, Young Brothers and the less than container load issues.

4) Please discuss the entire scope and impacts of the superferry operation in relation to the proposed acquisition. I suggest a full Environmental Impact Statement for this part of the redevelopment.

Sincerely yours,

John Blumer-Buell

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GOVERNOR

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DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
79 SOUTH NIMITZ HIGHWAY
HONOLULU, HAWAII 96813-4898

IN REPLY REFER TO:

HAR-EP
2122.07

July 27, 2006

Mr. John Blumer-Buell
S. R. 111
Hana, Hawaii 96713

Dear Mr. Blumer-Buell:

Subject: Draft Environmental Assessment (EA) and Anticipated Finding of No Significant Impact (FONSI), Acquisition of Land and Improvements for the Expansion of Kahului Commercial Harbor

We provide the following information in response to the questions contained in your recent submittal on the Draft Environmental Assessment prepared for the State Department of Transportation Harbors Division (Harbors Division) intention to acquire the land that immediately adjoins the Kahului Harbor, Kahului, Maui.

1. "Are the Old Kahului Store and Railroad Building included in this acquisition?"

Yes, the Old Kahului Store and Railroad Building are included in this acquisition.

1A. "What is the proposed use of the buildings?"

The Harbors Division will initially retain use of both buildings in their present use as commercial retain and office spaces. The future disposition of the buildings will be considered under the *Kahului Commercial Harbor 2030 Master Plan* project that is scheduled to take place in the fall of 2006. The master planning effort will invite participation by representatives from the County of Maui, State and Federal government services, the maritime industry, associated businesses and associations, community organizations and concerned individuals. The goal of the planning effort will be the development of long-range recommendations of the 2030 Master Plan, including the future use of the property sought for acquisition.

1B. "Is the plan to demolish the buildings as part of the redevelopment process:"

The *Kahului Commercial Harbor 2030 Master Plan* will assist in determining whether the buildings can be used and incorporated in a manner that will serve the needs of Kahului Harbor activities.

1C. "Is there a plan to preserve the buildings?"

The 2030 master plan's task force will discuss and develop the recommendations for the maritime industry's future use of the buildings. Any historical significance of the buildings must be determined in accordance with the State Historic Preservation Division's guidelines.

1D. "Please discuss the history and significance of the buildings."

John C. Wright surveyed the buildings in 1974 and listed the buildings in the Hawaii Register of Historic Places. The buildings were de-listed in 1980 because of a technicality. The Kahului Railroad Office Building (1923) is one of three structures that constitute the only extant remnants of the Kahului Railroad Company's infrastructure at Kahului Commercial Harbor. The other buildings, the Locomotive Shops and Roundhouse (1929), are not on either of the two properties.

Railroad resources (especially locomotive shops and roundhouses) are extremely rare. Together with the Kahului Railroad Office Building, these buildings constitute the last intact remnant railroad complex in Hawaii. They are all eligible for listing in both the Hawaii Register and the National Register of Historic Places. The Old Kahului Store has been altered and is not eligible for listing in the National Register of Historic Places.

1E. "Please discuss the age and history of the trees in close proximity to the buildings."

The age and history of the trees on the two parcels are not known at this time. The historical significance and value of these trees will be researched during the Hawaii Revised Statutes (HRS) Chapter 343 environmental analysis of the *Kahului Commercial Harbor 2030 Master Plan.*

1F. "Please discuss other historical features of the property."

A request has been submitted to the State Historic Preservation Division for their assistance determination of any/all historic features of the two parcels during the pre-assessment consultation phase of the *Draft Environmental Assessment and Anticipated Finding of No Significant Impact, Acquisition of Land and Improvements for the Expansion of Kahului Commercial Harbor.* While we have yet to receive a response, we will continue to investigate the historical features of the property during the environmental analysis of the 2030 Master Plan. Consultation will include both the State Historic Preservation Division as well as the Maui County Cultural Resources Commission for their determinations of historical significance.

2. "Please discuss the entire plan and impacts of the redevelopment and the Kahului Commercial Harbor 2030 Master Plan."

The *Kahului Commercial Harbor 2030 Master Plan* is scheduled to begin within the next seven weeks. The 2030 Master Plan's Task Force will invite a wide range of representatives from government service, the maritime industry, private enterprise, recreational, cultural and community organizations. Invitations will be extended to the Mayor of Maui, the Maui Mayor's environmental advisor, the Maui County Transportation Department, the Maui County Planning Department, the Maui County Public Works Department, the Maui County Council, the Governor's Office, Maui State legislators, Maui's congressional representatives, the State Department of Transportation Airports, Highways and Harbors Divisions and Statewide Transportation Planning Office, the State Department of Land and Natural Resources, the State Department of Agriculture, the State Department of Health, the State Department of Business, Economic Development & Tourism, the Public Utilities Commission, the United States Army Corps of Engineers, the United States Environmental Protection Agency, the United States Customs and Border Protection, Na Kai Ewalu, Maui Canoe Club, Maui Tomorrow, the Sierra Club, the Kahului Harbor Coalition, the Maui Mall Association, the Maui Chamber of Commerce, the Maui Visitors Bureau, the Friends of Haleakala National Park, Alexander & Baldwin, Hawaiian Commercial & Sugar Company, Matson, Horizon Lines, Young Brothers, Sause Brothers, Hawaii Pilots Association, Hawaiian Tug & Barge Company, Maui Petroleum, Chevron, Aloha Petroleum, Tesoro, Norwegian Cruise Lines, the Hawaii SuperFerry, Kahului Trucking and Storage, Maui Electric Company, Hawaiian Cement, Grace Pacific Corporation, Hawaii Farm Bureau Federation, etc.

The process will be initiated with a public scoping meeting to acquaint and familiarize participants with a general background on the issues pertinent to Kahului Commercial Harbor's long-range requirements and the process that will be observed for formulation of the plan. Areas for consideration should include the maritime industry's operational requirements, anticipated growth and development for Maui County, environmental concerns, recreational and cultural concerns, transportation demands, traffic congestion, and the County's overall economic outlook.

Following the scoping meeting, the 2030 Master Plan Task Force will convene in plenary session(s). Participants will be asked to engage in discussion of issues that they feel affect the harbor and brainstorm ideas to address the commercial harbor's long-term needs. The group will be asked to reduce their ideas into the preferred scenario and provide a number of viable alternatives. To accomplish this task, the task force must consider the feasibility of the alternatives, identify potential obstacles to the options and prioritize the alternatives.

The task force's recommendations will be presented to the Governor for approval. The approved 2030 Master Plan will serve as the long-range development guide for the Kahului Commercial Harbor. The recommendations will address the future requirements of the overseas cargo, inter-island cargo, liquid bulk cargo, dry bulk cargo, neobulk cargo, and the handling of passenger operations.

The 2030 Master Plan's recommendations will be subsequently reviewed through the Hawaii Revised Statutes (HRS) Chapter 343 environmental analysis. Any potential impacts to air quality, water quality, endangered species, recreational activities, cultural practices, historic properties and structures, view-planes, social considerations, power supply, public services (fire, police, emergency medical, health, schools, parks, wastewater, solid waste, flood plains, etc.) will be identified, analyzed and the proper mitigation measures defined.

3. Please discuss the entire economic plan and impacts for the redevelopment, including, but not limited to, Young Brothers and the less than container load issues."

   The planning effort should include consideration on the requirements of all aspects of operation by the inter-island barge service operator. Expansion opportunities will need to consider options for such growth, the impact and effect on current or adjoining tenants, and the state of the operator to continue engaging in less than full container load service based on both requirements to conduct such activity at Kahului and at other ports in the State. In order to accommodate the LCL service, sufficient space must also be available in Honolulu and other ports as the service is dependent on the availability of space throughout the State. Once the Chapter 343 environmental analysis is completed, cost estimates for the individual development projects will be developed and the projects will be prioritized and included in the Harbors Division's budget. As funds become available, the high priority projects will be scheduled for design and construction. In the interim, minor projects such as those contained in the *Comprehensive Exemption List for the State Department of Transportation*, Amended, November 15, 2000, may be implemented to provide Young Brothers with the requisite space for continuance of its less-than-container load cargo operations.

4. "Please discuss the entire scope and impacts of the superferry operation in relation to the proposed acquisition. I suggest a full Environmental Impact Statement for this part of the redevelopment."

   The acquisition of the properties are not related to the superferry operation, however to the extent that expansion of the harbor benefits all users, the addition of the 4.0-acre parcel will provide additional area to augment existing harbor uses and provide opportunity through the master planning process, consideration on future uses or applications.

Improvements, changes or uses identified in the 2030 Master Plan will be subject to Chapter 343 environmental analysis that is likely to be addressed through an Environmental Impact Statement

We hope we have answered your questions satisfactorily. Please call Mr. Glenn Soma, in Honolulu at (808) 587-2503 if there are any further questions.

Very truly yours,

BARRY FUKUNAGA
Deputy Director – Harbors