EISPN Comment Letters
and
Responses

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

APR - 2 1999

In reply refer to: KBF

Mr. Glen Soma
State of Hawaii
Department of Transportation
Harbors Division
79 South Nimitz Highway
Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation Notice (EISPN) for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase, Oahu Island, Hawaii

Dear Mr. Soma:

The U.S. Fish and Wildlife Service (Service) has reviewed the above referenced notice. The EISPN was prepared by Wil Chee-Planning, Inc., for the project sponsor, the State of Hawaii, Department of Transportation, Harbors Division (DOT-HD). The proposed project involves the enhancement of commercial port facilities at Honolulu Harbor and Keehi Lagoon. Proposed projects at Honolulu Harbor involve the construction of a cruise passenger terminal at Pier 2, finger piers at Piers 12 - 16, and an excursion vessel terminal at Piers 24 - 29. Lay berth facilities are proposed for Keehi Lagoon. The proposed berthing facilities would accomodate vessels on a year-round basis, including the Petroleum Oil and Lubricating (POL) emergency response vessels. Construction-related activities (*e.g.* piling installation) will occur in the marine environment for each of the proposed projects. The Service offers the following comments for your consideration.

The Service recommends that the Draft Environmental Impact Statement (DEIS) discuss the ecological impacts of the proposed Honolulu Harbor and Keehi Lagoon modifications for each of the alternatives under consideration. Particular attention should be given to addressing potential impacts to endangered and threatened species, coral-reef ecosystems, wetlands, migratory birds, and rare native species.

**Environmental Impact Statement Preparation Notice (EISPN)
for the Oahu Commercial Harbors 2020 Master Plan
Oahu, Hawaii**

On March 24, 1999, the Service met with representatives of the DOT-HD and their consultant, AECOS, to discuss potential project-related impacts associated with the proposed berthing facilities at Keehi Lagoon. The Service explained that the mudflats at Keehi Lagoon, which are exposed during low-tide conditions, provide loafing and foraging habitat for migratory shorebirds such as the wandering tattler or 'Ulili (*Heteroscelus incanus*), sanderling or Hunakai (*Calidris alba*), and the ruddy turnstone or 'Akekeke (*Arenaria interpres*). Additionally, the mudflats provide a staging area where each shorebird species congregates with their own kind prior to flying off as a flock during migrations to northern breeding sites. In order to secure habitat protection for the above species, we recommend that the project design avoid the mudflats of Keehi Lagoon during the construction and long-term operation of the berthing facilities.

Another concern is the suspension of fine sediments from activities associated with piling installation. Suspended sediments can abrade and smother coral and algae in the nearshore environment. The Service recommends that Best Management Practices be incorporated into the project to minimize the project-related degradation of water quality and impacts to fish and wildlife resources and habitats, including coral-reef ecosystems. These measures should be fully described in the DEIS.

Finally, the Service is concerned that the introduction of marine alien species, by increased vessel traffic at Keehi Lagoon and Honolulu Harbor, may impact nearshore marine ecosystems by displacing Hawaiian marine species. Introduced species represent a major threat to the perpetuation of native marine plants and animals. The DEIS should include a detailed discussion of how the control of marine alien species introductions will be accomplished within the anticipated increase in vessel traffic within the lagoon and harbor. The Service also recommends that the Hawaii Division of Aquatic Resources (DAR) be contacted regarding the prevention of marine alien species introductions to the State of Hawaii.

The Service appreciates the opportunity to comment on the EISPN. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Kevin Foster (808/541-3441).

Sincerely,

Barbara A. Maxfield, acting
for Robert P. Smith
Pacific Islands Manager

cc: R.Stook, Wil Chee
NMFS-PAO, Honolulu

April 21, 1999

Robert P. Smith, Pacific Islands Manager
U.S. Fish and Wildlife Service - Pacific Islands Ecoregion
300 Ala Moana Blvd. Room 3-122
Box 50088
Honolulu, Hawaii 96850

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Smith:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the United States Fish and Wildlife Service letter to the HDOT-HAR dated April 2, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your first comment recommends that the DEIS discuss the ecological impacts of the proposed projects on endangered and threatened species, coral-reef ecosystems, wetlands, migratory birds and rare native species. The DEIS will fully explore potential ecological impacts of the proposed projects on the natural environment in the area. Additionally, biological and water quality studies are being prepared in conjunction with the DEIS to comprehensively address this issue.

Your second comment explained the importance of the Keehi Lagoon tidal mudflats to several species of migratory shorebirds. Further, it recommended that the project design avoid these mudflats during construction and long-term operation of the berthing facilities. The current conceptual plans for the proposed layberths at Keehi Lagoon have their location outside of any tidal mudflat areas. The forthcoming DEIS will discuss all potential project-related impacts associated with the proposed berthing facilities and will indicate that impacts to these mudflats must be given careful consideration during project design and construction phases.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

Your final two comments expressed your concerns regarding the suspension of sediments associated with piling activities and the introduction of marine alien species due to increased vessel traffic. The DEIS will incorporate Best Management Practices and mitigative measures to address the minimization of potential project degradation of water quality and marine ecosystems. Coordination with the Hawaii Division of Aquatic Resources has been initiated to address the prevention of marine alien species introduction into the State of Hawaii.

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

March 15, 1999

Civil Works Branch

Mr. Richard Stook
Environmental Planner
Wil Chee Planning, Incorporated
1400 Rycroft Street, Suite 928
Honolulu, Hawaii 96814

Dear Mr. Stook:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISPN) for the Oahu Commercial Harbors 2020 Master Plan. The following comments are provided in accordance with U.S Army Corps of Engineers, Honolulu District authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit will be required for the project. For further information, please contact Mr. William Lennan of our Regulatory Section staff at 438-9258 (extension 13) and refer to file number 990000220.

b. The flood hazard information provided on page 31 of the EISPN is correct.

Sincerely,

Paul Mizue, P.E.
Chief, Civil Works Branch

April 20, 1999

Paul Mizue, P.E., Chief, Civil Works Branch
U.S. Army Engineer District,
Honolulu Building 230
Fort Shafter, Hawaii 96858-5440

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Mizue:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the U.S. Army Corps of Engineers (USACE) letter to the HDOT-HAR dated March 15, 1999. . The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your first comment indicated that Department of the Army Permits would be required for the proposed project. This is correct. The proposed project will require a USACE permit under Section 10, Rivers and Harbors Act, and may require a Section 404 permit if filling activities are required. All necessary USACE permits will be obtained prior to any construction activities.

Your second comment confirms that the flood hazard information on page 31 of the EISPN is correct. Thank you for confirming the accuracy of this information.

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR

David W. Blane
DIRECTOR, OFFICE OF PLANNING

OFFICE OF PLANNING
235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-8047

April 23, 1999

Mr. Richard Stook
Environmental Planner
Wil Chee - Planning, Inc.
HMSA Center
1400 Rycroft Street, Suite 928
Honolulu, Hawaii 96814

Dear Mr. Stook:

Subject: Environmental Impact Statement Preparation Notice for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

We have reviewed the proposal to construct a cruise passenger terminal at Pier 2, finger piers at Piers 12-16, excursion vessel terminal at Piers 24-29, and lay berth facilities in Keehi Lagoon. We have the following comments related to the Special Management Area (SMA) and general energy concerns.

Please note that the site of the proposed cruise passenger terminal at Pier 2 is within a designated community development district. As such, SMA permits for development and shoreline setback variances for structures are administered directly by us pursuant to Section 206E-8.5, Hawaii Revised Statutes (HRS). These corrections should be made to pages 46 and 49 of your report.

We understand that this and subsequent phases of the project (along Piers 2-29 and along Lagoon Drive in Keehi Lagoon) which implement the Harbors 2020 Master Plan will not impact petroleum storage facilities. We also acknowledge and support the planned improvements of fuel lines for vessel bunkering and the additional berthing facility with associated support buildings for petroleum, oil and lubricants, emergency spill and cleanup response vessels.

The environmental impact statement should address the requirements in State laws for evaluating energy impacts. For example, the requirements of Chapter 33, HRS (State Environmental Policy) and Chapter 226 (Hawaii State Planning Act) should be addressed. In particular, Section 226-18(c)(4) establishes as a State objective the promotion of cost-effective energy conservation through the adoption of energy-efficient practices and technologies.

In addition, the project's relationship with the State Energy Functional Plan should be discussed in the environmental impact statement. The discussion should clarify how energy-efficient practices and technologies would be employed. The Hawaiian Electric Company, Inc., should be consulted for information on rebates and incentives that are available for energy conservation measures under its New Construction Demand-side Management Program. In addition, there are also the requirements of the Honolulu Energy Code.

Since the master plan also calls for the construction of passenger terminals, we suggest that the project reflect a "Hawaiian sense of place." This can be accomplished by an innovative architectural design incorporating natural ventilation. We are enclosing a copy of Hawaiian Design-Strategies for Energy Efficient Architecture which presents design strategies to achieve energy efficiency.

Prior to demolition, a recycling plan for harbor structures should be considered so that the benefits of reuse and recycle can be realized. There may also be recycling opportunities during and after construction.

Provisions for recycling such as collection systems and space fort recycling bins should be considered and addressed in the environmental impact statement.

If there are any questions, please contact Christina Meller at 587-2845 regarding the SMA and John Tantlinger at 587-3805 about the energy comments.

Sincerely,

David W. Blane
Director
Office of Planning

Enclosure

May 5, 1999

David W. Blane, Director
Office of Planning
P.O. Box 2359
Honolulu, Hawaii 96804

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Blane:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Office of Planning letter dated April 23, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued sometime this summer.

Your first comment pointed out that the proposed development at Pier 2 will be subject to SMA permits and shoreline setback variances. We understand that these permits would not be administered through the City and County of Honolulu. Instead, they would be administered directly through your office as the site is located within the Kakaako Community Development District. These corrections will be incorporated into the DEIS. Thank you for clarifying this issue.

Your second comment expressed concern over the energy impacts of the proposed projects. The DEIS will evaluate and discuss the relationship of the proposed projects to relevant energy-related laws and policies. The laws and policies mentioned in your letter (incl. Chapters 33 and 226 HRS, State Energy Functional Plan, Honolulu energy Code, and HECO's New Construction Demand-side Management Program) will be included in this discussion.

Your third comment suggested that the proposed passenger terminal buildings reflect a "Hawaiian sense of place". We would like to point out that at the present time the proposed projects are in their conceptual stages. Detailed architectural design of the proposed structures will be determined during the design phase of the project.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants

HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

During the design phase full consideration will be given to both energy efficiency and the conformance of building design with a "Hawaiian sense of place". We very much appreciate your forwarding a copy of Hawaiian Design-Strategies for Energy Efficient Architecture for our use as a reference.

Your final comment suggested that the DEIS consider the benefits of recycling demolished building materials. HDOT-HAR recognizes the importance of waste recycling efforts and fully supports the minimization of demolition-derived wastes through such efforts. The DEIS shall examine and discuss potential recycling opportunities for waste materials associated with the demolition of harbor structures.

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

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

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

APR -5 1999

Ref: PS:EH

Mr. Richard Stook
Environmental Planner
Wil Chee-Planning Inc.
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814

Dear Mr. Stook:

Subject: Environmental Impact Statement Preparation Notice for the Oahu Commercial Harbors 2020 Master Plan-Immediate Phase

We have reviewed the subject document and offer the following comment for your consideration.

Engineering Branch:

Please coordinate water requirements for proposed Immediate Phase (IP) projects with the Land Division, Engineering Branch.

We are currently working on the Water Master Plan for State Projects, Oahu (WMPSPO) and the State Water Projects Plan (SWPP), and need to include the IP projects requiring water in both the WMPSPO and SWPP.

Thank you for the opportunity to comment on this project.

Very truly yours,

Dean Uchida,
Administrator

c.c. Engineering Branch

April 20, 1999

Dean Uchida, Administrator
State Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawaii 96809

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Uchida:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Land and Natural Resources letter to the HDOT-HAR dated April 5, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your only comment requested that water requirements for the proposed Immediate Phase projects be coordinated with your agency's Land Division – Engineering Branch. You also informed us that your agency is currently working on the Water Master Plan for State Projects (WMPSPO) and the State Water Projects Plan (SWPP) which would need to include the IP projects water requirements.

The proposed IP projects are presently in their conceptual stages. Projected water requirements will be developed during the design phase of the project. At that time, the water requirements for the proposed projects will be coordinated with the Land Division, Engineering Branch for your inclusion in the WMSPO and SWPP.

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

TIMOTHY E. JOHNS, CHAIRPERSON
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LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

March 29, 1999

Richard Stook, Planner
Wil Chee Planning Inc.
1400 Rycroft Street, Suite 928
Honolulu, Hawaii 96814

LOG NO: 23142
DOC NO: 9903EJ12

Dear Mr. Stook:

SUBJECT: Chapter 6E-8 Historic Preservation Review - EISPN For the Oahu Commercial Harbors 2020 Master Plan Immediate Phase - Environmental Impact Statement
Honolulu, Kona, O'ahu
TMK: various

Thank you for the opportunity to comment on the EISPN for the proposed improvements to Honolulu Harbor as part of the Oahu Commercial Harbors 2020 Master Plan, Immediate Phase. Four projects are being fully examined in the upcoming EIS, while other components of the Master Plan are exempt from the EIS review or have already undergone separate environmental reviews. The four projects included in the Immediate Phase and under current review are:

1. Construction of a cruise passenger terminal at Pier 2
2. Construction of finger piers at Piers 12 - 16
3. Construction of an excursion vessel terminal at Piers 24 - 29
4. Construction of lay berth facilities in Keehi Lagoon, along Lagoon Drive.

We previously commented to Wil Chee Planning, during the pre-EISPN phase (Log. 22157, September 1, 1999), that no known archaeological sites are located within the four project areas. We also stated that we believed that the four projects would have "no effect" on archaeological sites because these areas have been in-filled to enlarge the shoreline during the original development of Honolulu harbor.

We also requested that the EIS identify if there are any structures over 50 years old within the proposed plans, and evaluate if they meet the criteria to be eligible for listing on the National Register of Historic Places. If eligible structures are present, the EIS must identify what "effect," if any, the project may have on these structures.

The EISPN, in Section, 3.8 states that several historic buildings (over 50 years old) exist within the proposed project area, and that it is not anticipated that any of the structures would be eligible for listing on the National Register of Historic Places. It appears that this evaluation has not yet been conducted. We request this evaluation be coordinated with the State Historic Preservation Division for review and acceptance.

If you have any questions regarding archaeological determinations please call Elaine Jourdane at 692-8027, or for any questions regarding the pier structures call Carol Ogata at 692-8032.

Aloha,

Don Hibbard, Administrator
State Historic Preservation Division

EJ:jk

c: Dean Uchida, Administrator, DLNR/Land Division

April 21, 1999

Don Hibbard, Administrator
State Historic Preservation Office
Department of Land and Natural Resources
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Hibbard:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the State Historic Preservation Division letter to the HDOT-HAR dated March 29, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your comments were regarding the existence of historic structures within the project area. You expressed concern over the possible presence of structures which may be eligible for listing on the National Register of Historic Places and that the DEIS identify what "effect" if any, the project may have on these structures. Finally, you requested that evaluation of these structures be coordinated with your office for review and acceptance.

As indicated in the EISPN there are several structures within the project area which are over 50 years old. Effects of the proposed projects on these structures will be fully discussed in the DEIS. Additionally, an archaeological report is being prepared in conjunction with the DEIS. This report will evaluate all structures within the project area for historic significance. Upon its completion, a copy of the archaeological report will be forwarded to your office for evaluation, review, and concurrence.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

March 10, 1999

Mr. Richard Stook
Environmental Planner
Will Chee – Planning, Inc.
1400 Rycroft Street, Suite # 928
Honolulu, Hawai'i 96814

EIS#217

Re: Environmental Impact Statement Preparation Notice for the Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.

Dear Mr. Stook:

Thank you for the opportunity to review the preparation notice for the Oahu Commercial Harbors 2020 Master Plan – Immediate Phase (EISPN). As described in the notice, the State Department of Transportation, Harbors Division (DOT-HAR) anticipates the construction of three improvements to Honolulu Harbor and one improvement project at Ke'ehi Lagoon. These include:

1. Construction of a cruise passenger terminal at Pier 2
2. Construction of finger piers at Piers 1-16
3. Construction of an excursion vessel terminal at Piers 24-29
4. Construction of lay berth facilities in Ke'ehi Lagoon.

In a letter dated August 20, 1999 to DOT-HAR, the Office of Hawaiian Affairs (OHA) offered various areas of concern for the anticipated EIS. Many of the issues listed in that letter have been included in the preparation notice. However, we remain concerned that gathering rights, such as konohiki fishing, are not included in the EISPN. It can be safely assumed that Native Hawaiian gathering and fishing occurred along the Honolulu waterfront. In order to address these gathering rights, we strongly suggest that you prepare a cultural impact statement and included it in the EIS.

We further suggest that the Hawaiian cultural expert(s) chosen to work on the statement be person(s) recognized within the Hawaiian community for his/her cultural expertise. We caution that the concerns of the community will not be addressed if the cultural impact statement contains information and analysis provided solely by a person whose knowledge of Hawaiian

culture is limited to a study of archaeology or anthropology. If we can be of any assistance with this study, please contact us.

In addition, we would like the EIS to include the cumulative effects of the four above-detailed projects, the "exempt" projects described in the EISPN and the harbor projects for which separate environmental documents have been completed.

Again, thank you for the opportunity to review the EISPN. If we can be of any other help, please contact EIS Planner, Lynn Lee at 594-1936.

Sincerely,

Colin Kippen
Deputy Administrator

C. Sebastian Aloot
Land and Natural Resources Division Officer

cc: Board of Trustees

April 20, 1999

C. Sebastian Aloot
Land and Natural Resources Division Officer
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Aloot:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Office of Hawaiian Affairs letter to the HDOT-HAR dated March 10, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your first comment expressed concerns over Native Hawaiian Gathering Rights and suggested the preparation of a separate cultural impact statement to be included in the DEIS. Although a separate cultural impact statement is not being prepared there are several other technical studies being conducted in conjunction with the EIS.

Among these technical studies will be an archaeological report which will address the presence of historic, archaeological, and cultural sites within the project area. In addition to the archaeological report, the forthcoming DEIS will assess potential cultural impacts of the proposed project on the Native Hawaiian people.

Your second comment requested that the cumulative effects of all the immediate phase projects be included in the DEIS. The DEIS will fully explore both potential adverse and beneficial impacts (incl. direct, indirect, and cumulative impacts) of the proposed immediate phase projects.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

State of Hawaii
Department of Transportation
MEMORANDUM

STP 99-028
STP 8.9069

TO: HAR-EP DATE: APRIL 30, 1999

FROM: STP (Julia M. Tsumoto) Dean S. Nakagawa

SUBJECT: EISPN FOR THE OAHU COMMERCIAL HARBORS 2020 MASTER PLAN - IMMEDIATE PHASE

Thank you for the additional time to review the subject EISPN.

We note that the Immediate Phase (IP) demolition and construction activities for the general cargo yard at Piers 19-20 are exempt from the EIS review process. Are we correct to assume that this includes the interim improvements for the ferry and passenger ship terminals? In light of the federal funding for the interim ferry improvements at Pier 19 and the current efforts related to ferry operations, should there be some mention of the anticipated ferry operations and/or improvements?

Also, it may be advantageous to revisit your 2020 master plan and selectively edit portions of your plan to generally describe your plans in regard to ferry operations.

Thank you for the opportunity to comment on the EISPN. Please call Dean Nakagawa at 587-1345 should you have any questions on our comments.

DN:km

c: STP(DN)

May 10, 1999

Julia Tsumoto, State Transportation Planner
State Department of Transportation
Statewide Planning Office
600 Kapiolani Blvd., Room 306
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Ms. Tsumoto:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the State Transportation Planning Office memo to the HDOT-HAR dated April 30, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued this summer.

You are correct in your assumption that the interim improvements for the ferry and passenger ship terminals at Piers 19-20 are exempt from the environmental review process. The State Office of Environmental Quality Control has confrimed with HDOT-HAR that the subject project qualifies as being exempt in accordance with the Chapter 343 Hawaii revised Statutes. The ferry terminal will be further discussed in the upcoming DEIS.

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE · PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-5088
Fax 808-942-1351

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

March 31, 1999

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Attention: Harbors Division

Dear Mr. Hayashida:

Subject: Your Transmittal of the Environmental Impact Statement Preparation Notice for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISPN) for the Oahu Commercial Harbors 2020 Master Plan.

We have the following comments on the EISPN:

1. There are existing water services to the following harbor locations:

   a. Cruise Passenger Terminal at Pier 2:

Prem ID #	Meter Size
1132715	6-inch compound meter
1132716	6-inch compound meter
1132717	Two 8-inch detector check meters
1132718	Two 8-inch detector check meters

   b. Finger Piers at Piers 12 through 16:

Prem ID #	Meter Size
1132707	3-inch compound meter
1132708	2-inch meter
1132709	3-inch compound meter
1132711	Ordered off
1132712	1½-inch meter

   c. Excursion Vessel Terminal at Piers 24 through 29:

Prem ID #	Meter Size
1115981	3/4-inch meter
1115982	3/4-inch meter
1115977	4-inch compound meter

   d. Lay Berths along Lagoon Drive at Keehi Lagoon:

Prem ID #	Meter Size
1091359	8-inch turbine meter

   Prem ID #1132711 was ordered off on November 6, 1998.

2. The existing water system is presently adequate to accommodate the proposed harbor improvements.

3. The commercial harbors 2020 master plan should indicate the project's projected potable water demand to ensure sufficient source capacity is planned. The applicant will be required to obtain a water allocation from the Department of Land and Natural Resources.

4. The availability of water will be confirmed when the building permit application is submitted for our review and approval. When water is made available, the applicant will be required to pay our Water System Facilities Charges for transmission and daily storage.

5. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

6. If a three-inch or larger meter is required, the construction drawings showing the installation of the meter should be submitted for our review and approval.

7. Board of Water Supply approved Reduced Pressure Principle Backflow Prevention Assemblies will be required to be installed after all domestic water meters serving the proposed harbor improvements.

Pure Water . . . our greatest need - use it wisely

8. We reserve further comment until we review the Draft Environmental Impact Statements.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Richard Stook, Wil Chee Planning, Inc.

April 20, 1999

Clifford Jamile, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Jamile:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Board of Water Supply (BWS) letter to the HDOT-HAR dated March 31, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your first two comments identified the existing water services to the proposed project area and indicated that the existing water system is adequate to accommodate the proposed harbor improvements. Thank you for providing us with this information.

The remainder of your comments requested that potable water demands and water availability be confirmed and approved by appropriate agencies. The proposed projects are presently in their conceptual stages. Projected water demand will be determined during the design and construction phases of the project.

During these project phases HDOT-HAR will obtain all necessary permits and approvals which may be required. Required permits and approvals may include but not be limited to water allocation from the Department of Land and Natural Resources, submittal of building permits and construction drawings for BWS approval, payment of Water System Facilities Charges, compliance with on-site fire protection requirements, and installation of BWS approved backflow prevention assemblies at appropriate water meters.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

DEPARTMENT OF PLANNING AND PERMITTING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
Phone: (808) 523-4414 • Fax: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

March 25, 1999

1999/CLOG-1372(ASK)

Mr. Glenn Soma
Harbors Division
Department of Transportation
State of Hawaii
79 South Nimitz Highway
Honolulu, Hawaii 96813

Dear Mr. Soma:

Environmental Impact Statement Preparation Notice (EISPN)
Oahu Commercial Harbors 2020 Master Plan

We have reviewed the above-referenced document and offer the following comments:

The City Administration supports efforts to allow our county to achieve its full potential. We recognize that modern and adequate port facilities are essential to advancing toward this goal. It is the City's vision to free up the Nimitz waterfront for economic redevelopment, and to make Honolulu a true waterfront city. To accomplish this, the Mayor has proposed re-routing traffic off Nimitz Highway onto a new Sand Island Parkway and a tunnel under Honolulu Harbor.

The draft EIS should indicate how the Oahu Commercial Harbors 2020 Master Plan Immediate Phase is consistent with this vision.

Development Plans

Proposed facilities are within either the Ewa or Primary Urban Center (PUC) Development Plan Area. The City is currently revising its Development Plans (DPs). This is not reflected in the description of the DPs on page 48 of the EISPN. These revisions provide substantial changes from the format of previous DPs. The City has already officially adopted the revised DPs for Ewa (enclosed), and a revised plan for the PUC is under preparation and should be available for public review soon.

The draft Environmental Impact Statement (EIS) should examine how the Oahu Commercial Harbors 2020 Master Plan Immediate Phase will be supportive of the DPs for Ewa and the

PUC, and if mitigation measures need to be undertaken because the Master Plan conflicts with the DPs.

It is likely that the proposed developments at Barbers Point Harbor are consistent with the Ewa DP's vision, policies and guidelines, but specific discussions should be provided in the draft EIS to confirm this. The EISPN did not provide sufficient details to make such an assessment.

We expect that the City will soon adopt proposed revisions to the PUC DP. The draft EIS should look at the degree to which the Master Plan pertaining to the Honolulu Harbor area is compatible with both the policies in the existing DP and the visions and policies being considered for the revised DP for the area. We have enclosed a copy of the Policy Evaluation Report for your reference.

Zoning

The EISPN does not correctly identify the zoning districts of the project area. We recommend that the draft EIS contain zoning maps showing the project locations.

The draft EIS should indicate if any work is proposed within the shoreline area as defined in Section 205-A-41 HRS.

Should you have any questions regarding the above, please contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,

JAN NAOE SULLIVAN
Director of Planning and Permitting

JNS:am
Encls.

cc: Mr. Richard Stook, Wil Chee - Planning, Inc.

posse doc no. 3232
A:2020.ask

April 21, 1999

Jan Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Sullivan:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Planning and Permitting letter to the HDOT-HAR dated March 25, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your first set of comments concerned the compatibility of the proposed projects with the Development Plans for both the Primary Urban Center (PUC) and the Ewa areas. Additionally, you pointed out that the City is currently in the process of revising these development plans.

The forthcoming DEIS will contain a section evaluating the relationship of the proposed projects to existing policies and plans, including the revised Ewa and PUC Development Plans. This section will examine the degree to which the proposed Master Plan Immediate Phase projects are compatible with the existing and revised City and County Development Plans.

Your final two comments concerned zoning issues. Thank you for pointing out that the zoning designations in the EISPN were incorrect. These designations have been corrected. Additionally, the DEIS will include zoning maps showing the project locations and indicate if any work is proposed within the shoreline area as defined in Section 205-A-41 HRS.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR
DEPUTY DIRECTOR

TPD2/99-00977R
TPD3/99-01610R

May 19, 1999

Mr. Glenn Soma
Harbors Division
Department of Transportation
79 S. Nimitz Highway
Honolulu, Hawaii 96813

Dear Mr. Soma:

Subject: Oahu Commercial Harbors 2020 Master Plan
Immediate Phase

In response to the February 23, 1999 letter from Wil Chee - Planning, Inc., the environmental impact statement (EIS) preparation notice for the subject project was reviewed. The following comments are the result of this review:

1. This department is presently preparing a draft EIS for the Primary Corridor Transportation Project. This project proposes transportation improvements in the primary transportation corridor of Oahu to implement the Islandwide Mobility Concept Plan. One of the improvements being proposed is a Sand Island Bypass Road which includes a tunnel from Sand Island with a portal in the vicinity of the proposed cruise passenger terminal at Pier 2. Another proposed improvement would transform a portion of Nimitz Highway into a parkway. While coordination of this project with your department has already been initiated, it is essential that it be continued. We look forward to working together on both projects.

2. The proposed project should provide adequate off-street parking and loading areas, thereby minimizing the project's impacts on the surrounding roadway network.

3. The EIS should discuss how the development will address compliance issues related to the Americans with Disabilities Act of 1990 (ADA). As a public facility and a facility with public accommodations, the proposed harbor facilities must comply with Titles II and III of the ADA.

4. Section 4.3.2 on Page 48 of the EIS Preparation Notice discusses the Development Plans (DPs) for the City and County of Honolulu. These DPs have been updated or are in the process of being updated. The City's Department of Planning and Permitting should be contacted to obtain current information regarding these DPs.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Wil Chee - Planning, Inc.

May 26, 1999

Cheryl Soon, Director
Department of Transportation Services
711 Kapiolani Blvd., Suite 1200
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Ms. Soon:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Transportation Services letter dated May 19, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued sometime this summer.

Your first comment informed us of your preparation of the Primary Corridor Transportation Project (PCTP) EIS. We acknowledge the preparation of the PCTP EIS by your office, and HDOT-HAR is in agreement that interagency coordination should continue during the planning stages of both the PCTP and the Oahu Commercial Harbors 2020 Master Plan.

Your second comment expressed concern over adequate parking facilities. A traffic impact analysis report is being prepared for the EIS and will address traffic related impacts including off-street parking and loading areas.

Your third comment suggested that the proposed buildings should be in compliance with the Americans with Disabilities Act of 1990 (ADA). We would like to point out that at the present time the proposed projects are in their conceptual stages. Detailed architectural design of the proposed structures will be determined during the design phase of the project. During that stage all applicable requirements of the ADA shall be fully addressed and complied with.

Lastly, the Department of Planning and permitting has been contacted, and any updates to the City and Counties Development Plans will be discussed in the DEIS.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 323
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-[illegible]351

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6663 • FAX: (808) 527-6675

JEREMY HARRIS
Mayor

KENNETH E. SPRAGUE, P.E., Ph.D.
Director

CHERYL K. OKUMA-SEPE, ESQ.
Deputy Director

ENV 99-34

MAR 0 9 1999

Mr. Tom Fujikawa, Chief
Harbors Division
Department of Transportation
State of Hawaii
9 South Nimitz Highway
Honolulu, Hawaii 96813

Attention: Mr. Glenn Soma

Dear Mr. Fujikawa:

Subject: Environmental Impact Statement Preparation Notice
Oahu Commerical Harbors 2020 Master Plan Improvements
TMK: Various

We have reviewed the subject document and have no comments to offer at this time.

Should you have any questions, please contact Alex Ho, Environmental Engineer at 523-4150.

Sincerely,

CHERYL K. OKUMA-SEPE
KENNETH E. SPRAGUE
Director

cc: Wil Chee - Planning, Inc. (Richard Stook)

April 20, 1999

Dr. Kenneth E. Sprague, Director
Department of Environmental Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Sprague:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Environmental Services letter to the HDOT-HAR dated March 9, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

We acknowledge that you have reviewed the EISPN and have no comments to offer at this time.

We appreciate your agency's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

February 23, 1999

Dr. Jonathan Shimada, Director
Department of Facility Maintenance
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Subject: Environmental Impact Statement Preparation Notice for the Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.

Dear Mr. Shimada:

Enclosed, please find a copy of the above-referenced EISPN for your review. The EISPN addresses proposed improvements by the Hawaii State Department of Transportation – Harbors Division (HDOT-HAR) to facilities at Honolulu Harbor and Keehi Lagoon as part of their Oahu Commercial Harbors 2020 Master Plan.

We would appreciate any comments and/or questions you may have with regard to the proposed actions. Please submit your comments to HDOT-HAR with a copy to our office.

Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

February 26, 1999
We do not have any comments. If you have any questions, please call Laverne Higa at 527-6246. No further submission to our office is required.

Ross S. Sasamura
Acting Director and Chief Engineer
Department of Facility Maintenance

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

April 20, 1999

Ross S. Sasamura
Acting Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Sasamura:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Facility Maintenance letter to the HDOT-HAR dated February 26, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

We acknowledge that you have no comments to offer at this time and that no further submission to your office is required.

Once again, we appreciate your agency's response to the EISPN. Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

NATIVE HAWAIIAN LEGAL CORPORATION
1164 BISHOP STREET • SUITE 1205 • HONOLULU, HAWAII 96813 • TELEPHONE (808) 521-2302 • FAX (808) 537-4268

SEND COPIES TO APPROPRIATE PARTIES

February 25, 1999

'99 FEB 26 P1:51

Governor, State of Hawaii
c/o Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Department of Transportation, Harbors Division
79 South Nimitz Highway
Honolulu, Hawaii 96813

(ATTN: Glenn Soma)

Wil Chee Planning, Inc.
1400 Rycroft Street, Suite 928
Honolulu, Hawaii 96814

(ATTN: Richard Stook)

Re: Environmental Impact Statement Preparation Notice for Oahu Commercial Harbors 2020 Master Plan

Gentlemen:

I am writing on behalf of Anna Marie Kahunahana-Castro-Howell and Letty T.K. Omura in response to the notice of the EIS Preparation Notice for the Oahu Commercial Harbors 2020 Master Plan published in the Feb. 23, 1999, issue of The Environmental Notice.

To the extent the proposed EIS will address matters relating to the Barbers Point Deep Draft Harbor, my clients request that that document fully address the concerns identified in my January 6, 1999, and January 7, 1999, letters (including attachments thereto) sent in response to the EISPN for DOT's proposed Barbers Point Harbor Modifications, copies of which are attached hereto. In particular, I believe the new proposed EIS should fully address issues relating to historic preservation (including but not limited to the reinitiation of consultation under § 106 of the National Historic Preservation Act) and the protection of animal and plant species listed under the federal and Hawaii Endangered Species Acts.

I also request that a copy of the draft EIS be sent to this office for review when that document is made available for public review and comment.

Niolo. upright straight stately tall and straight as a tree without branches sharply peaked as mountains Fig. righteous correct

Thank you for this opportunity to comment on this EISPN.

Very truly yours,

Carl C. Christensen
Staff Attorney

Encls.

cc: Clients

April 21, 1999

Carl C. Christensen, Staff Attorney
Native Hawaiian Legal Corporation
1164 Bishop Street
Suite 1205
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Christensen:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Native Hawaiian Legal Corporation letter to the HDOT-HAR dated February 25, 1999. The Draft Environmental Impact Statement (DEIS) is expected to be issued in June.

Your comment requested that the DEIS address matters relating to the Barbers Point Deep Draft Harbor. Specifically, that the DEIS address the concerns identified in your January 6, 1999 and January 7, 1999 letters sent in response to the EISPN for DOT's proposed Barbers Point Harbor Modifications. Your concerns included potential impacts on and/or from disposal of dredged materials, construction methods (blasting), noise, ciguatera, groundwater, water quality, marine life, threatened and endangered species, and archaeological and historical resources (incl. reinitiation of consultation under section 106 of the National Historic Preservation Act).

As indicated in the Oahu Commercial Harbors 2020 Master Plan – Immediate Phase EISPN the Barbers Point Deep Draft Harbor modification projects will be incorporated into the forthcoming DEIS by reference. The Draft Supplemental Environmental Impact Statement (DSEIS) for the Barbers Point Harbor Modifications is currently in the process of being prepared by Parsons Brinkerhoff Quade and Douglas, Inc. (PBQD).

WIL CHEE · PLANNING, INC.
Land Use Planners and Environmental Consultants

HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

Clyde Shimizu of PBQD recently informed me that they are presently awaiting the completion of three additional technical studies (Feasibility Study, Waterways Experimental Study, and Alternative Disposal Study) being prepared for their forthcoming DSEIS. These studies will provide additional information upon which to base determinations regarding potential impacts associated with the proposed Barbers Point Harbor modifications. We will be coordinating our efforts with those of PBQD in order to adequately address the concerns identified in your January 6, 1999 and January 7, 1999 letters.

We appreciate your organization's interest in the environmental review process and response to the EISPN. Your agency will receive a copy of the DEIS when it becomes available.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

March 9, 1999

SEND COPIES TO
APPROPRIATE PARTIES

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

'99 MAR 23 P2:48

Dear Sirs:

Subject: Berthing Facilities Along Keehi Lagoon Drive

I recently read where the Transportation department is seeking public comments for the harbor plan. More specifically, the intent of using Keehi Lagoon shore side for lay berthing facilities for boats, barges and impounded vessels. I have serious concerns in this regard.

Keehi Lagoon is home to some 800 vessels which includes the Keehi Small Boat Harbor (a state facility), Keehi Marine Center, with a dry dock repair facility, and La Mariana Sailing Club (both private marinas), the Marine Education Training Center, launch ramp facilities, and the canoe facility. It is also home to approximately 200 people, possibly more, who live on their boats.

Keehi Lagoon is also a major recreational area encompassing 4 commercial jet ski operations, a seaplane operation, and a dive operation. It also lies in the airport traffic area of the Honolulu International Airport.

Throughout the years, various barges, work boats and pure junk had been left in the harbor. Some of the submerged barges and junk had been on the bottom for more than 15 years. This had always been an eyesore for everyone especially the tourists as they got their first look at Hawaii from the airplane windows as they landed.

Keehi Lagoon was among five shores cited as being of most concern in a study by the National Oceanic and Atmospheric Administration. The study monitored 14 elements and compounds. The trace elements under study were arsenic, cadmium, copper, mercury, nickel, lead, selenium and zinc, all of which can be harmful to humans and sea life in high concentrations. The organic compounds under study were DDT, chlordane, dieldrin (all pesticides), butyltin (a paint additive), PCB (an electrical industry chemical) and PAH (a widespread byproduct of industrial and oil pollution). In high concentrations, many of these compounds can cause cancer and genetic mutations or can interfere with reproduction.

It was a democratic state government process that created the law and rules governing the clean-up operations at Keehi Lagoon. These rules were initiated by the state legislature, went through public hearings, were discussed at numerous harbor advisory committee and other public informational meetings, and came down to the Boating Division for implementation. As a result, a slow and methodical process was implemented and put into operation.

Vast amounts of time and energies have been exhausted in the process, which has taken years to accomplish. In addition to the more than 600 derelict vessels/contrivances that were disposed of, the North Lagoon had abandoned ships, abandoned 110' barges, sunken 110' barges, a multitude of machine parts, barrels, cable and trash parts, that lined the harbor's floor. The U. S. Navy became involved and has been for the last three years.

In this major undertaking, tremendous amounts of research had to be undertaken. Dealing with the removal of asbestos insulation on a 96' vessel prior to relocation and disposal. The search and recovery of submerged, hazardous materials effort was joined by the Division of Boating and Recreation state employees, the Federal Bureau of Investigation, the U. S. Coast Guard, the Department of Health, and the Environmental Protection Agency. Ongoing investigations revealed cans of sulfuric and phosphoric acid (acids are considered hazardous waste under the federal Resource Conservation and Recovery Act (RCRA) which regulates hazardous waste. The Office of Hazard Evaluation and Emergency Response determined that an imminent and substantial hazard to human health and the environment existed.

Hazardous substances observed were Xylene, Dolphinite bedding compound (containing pentachlorophenol, large quantities of epoxy paints (two part), resin, lubricating oil, and cleaning compounds containing Glycol ethers and solvents. There was also waste insecticide and unknown debris, automotive artillery grease, aircraft oil lubricant, a scooter, and a sedan to name a few.

Each step taken created another caveat. Procedures for applications, instructions, preparation forms had to be established, requirements and documentation for ocean disposal had to be researched and established. Numerous meetings with the Environmental Protection Agency, the land division, and the U. S. Coast Guard. Once the path was established on how to proceed, then procedures were set in motion to follow the detailed requirements prior to obtaining the authorization for permits and/or disposals.

The reporting burden included time for reviewing the instructions, gathering data, completing and reviewing the various questionnaires required.

An article that appeared in the Star Bulletin editorial in 1994 stated that the clean-up of Keehi lagoon was one of the top achievements of the Waihee Administration. This same clean-up at Keehi Lagoon brought over $600,000 in Federal EPA super fund monies to address the environmental issues, Hawaii's largest single super funded clean-up project. It also more than doubled the responsibilities of the state employees working at Keehi at the time.

With the efforts of the U. S. Navy, the north lagoon was cleared of undesirable sights and hazards that have plagued Keehi Lagoon for years. In this past year alone, they accomplished the loading and testing of numerous pieces of salvage and diving equipment, developed a salvage plan to conduct topside and underwater cutting in conjunction with heavy lifting equipment to salvage the scrap metal, salvaged various miscellaneous pieces of scrapmetal weight up to ten tons, salvaged two scrap barges weighing in excess of three hundred tons.

I am not against change and believe additional marinas and additional commercial activities can work alongside the recreational aspects of the lagoon. I understand the refurbishment of Kewalo Basin and the construction of the new Fishing Village, but we cannot use Keehi Lagoon as a dumping ground for the state as it was used by entrepreneurs that had gone bust. Millions of dollars, countless man-hours have been invested in our lagoon. We must not sacrifice our environment or values at any cost. We must not allow Keehi Lagoon to be used as a means to move a long existing problem from one location to another. We must do what is right.

Now, as you sail around Keehi Lagoon, you will see it as a far better, safer, cleaner and more attractive recreational facility. Just last evening a boater reported a young sea turtle within 10' of a vessel (this was unheard of), we have manta rays that come to visit, various types of fish are now congregating around the piers; even some coral is beginning to return. We also have the sailboat races on Wednesday evenings. Given the proper resources and a watchful eye, we will be able to maintain the lagoon in a fashion the state intended it to be.

Sincerely,

Eric P. Schladerundt
Slip 334, Keehi SBH.

SEND COPIES TO
APPROPRIATE PARTIES

March 12, 1999

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

'99 MAR 22 A

Dear Sirs:

As members of the Keehi Boat Club located in Keehi Lagoon, we are concerned with the intention of using Keehi Lagoon shore side for lay berthing and dead storage of impounded, derelict, and abandoned vessels.

Throughout the years, numerous boats, barges, junk, and hazardous materials had been left to rot, pollute, and destroy our harbor. When the state was charged with the task of cleaning up the lagoon, we as members of the club attended many harbor advisory committee and public information meetings. We became a part of the slow and methodical cleanup process.

Numerous articles appeared in the 'Star Bulletin' and the Honolulu Advertiser' concerning the cleanup operations in Keehi. We read about our state employees and their time and energies spent in this endeavor; we read about the hazardous wastes that were dumped and the investigations involved; and we read about the U.S. Navy's major contributions. Now, we are able to see it as a far better, safer, cleaner and more attractive recreational facility.

We believe in the best interests of the community, but we must not allow economic growth to destroy our environment. There is never an easy solution; but there is a right one. We are asking that you do the right thing - don't use our lagoon for the wrong reasons. Don't bring impounded, derelict, and abandoned vessels to Keehi Lagoon.

Respectfully,

Signature

J. W Bullock
Print Name

Address

Honolulu
City, state and zip code
Hon 96822

There were a total of 19 copies of the March 9, 1999 form letter received by DOT – Harbors Division. The names of three of the signatories were illegible. The names of the remaining 16 Keehi Boat Club Members who submitted signed copies of this form letter are listed below:

Eric P. Schadler
J.R. Poole
Dave Salle
Charles Mench
Curtis W. Collins
James P. Leville
Russell S. Chimaka
Martin Lemke
James H. Moody
Harry & Mary Abbott
Dori Conroy
Robert Young
Nancy E. Murphy
Robert Bear
Margret & Kenneth Rachar
Mineo Inuzuka

There were a total of 24 copies of the March 12, 1999 form letter received by DOT – Harbors Division. The name of one signatory was illegible. The names of the remaining 23 Keehi Boat Club Members who submitted signed copies of this form letter are listed below:

William Fujikawa
Stanley Kon
E. Choy
Beverlee Baldwin
S. Dalde
Lionel A. Muller
Ben Maher
Marie Muller
Janet Kushima
Carmen Sylvester
Karen Monday
Darrell Oka
Susan Crenshaw
Nancy Iwamoto
J. W. Bullock
Arlene L. Cabrinha
Del Sylvester
Bryan Ikehara
William Souza
Phyllis F. Souza
Kay K. Kon
Winona Shito
Steve Iwamoto

The concerns expressed in both of the preceding form letters are addressed in the following response letter addressed to Mr. Jack Bullock, President - Keehi Boat Club.

April 29, 1999

Jack Bullock, President
Keehi Boat Club
4 Sand Island Access Road
Honolulu, Hawaii 96819

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Environmental Impact Statement (EISPN)

Dear Mr. Bullock:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Keehi Boat Club comment letters which were forwarded to HDOT-HAR by the Office of Environmental Quality Control on March 29, 1999. A total of forty-three Ke'ehi Boat Club members submitted comments expressing concerns about the proposed lay berthing facilities along Lagoon Drive.

The forty-three individual comment letters submitted by the Ke'ehi Boat Club members were submitted as two form letters. The two letters expressed similar concerns, and this letter is written in response to those concerns.

The form letters expressed concerns over past and potential future dumping practices of i) abandoned vessels and ii) miscellaneous garbage and hazardous materials into Ke'ehi Lagoon. DOT-HAR understands these concerns and is aware of the past practices of illegal dumping which continued for many years and required extensive clean up efforts to restore the lagoon to its present condition.

Specific concerns expressed in the comment letters were:

- The use of Ke'ehi Lagoon shore side for lay berthing and dead storage of impounded, derelict, and abandoned vessels.

- Illegal dumping of hazardous materials and garbage into Ke'ehi Lagoon

WIL CHEE · PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

- The use of Ke'ehi Lagoon as a dumping ground for the State of Hawaii

- The preservation of Ke'ehi Lagoon as a safe, clean, and attractive recreational facility.

The proposed layberths will be used primarily for the temporary docking of fully operational fishing vessels which are not in use. To a lesser degree, the layberths will also be utilized for the storage of impounded vessels.

It is a common misperception that an "impounded" vessel is synonymous with an "abandoned" vessel. This is not the case. Vessels which are impounded are held until such time it is determined that the vessel's owner(s) is unable to meet due restitution. Only after it has been determined that the owner(s) is unable to meet due restitution would the vessel be considered abandoned.

DOT-HAR is required to follow a specific set of procedures when disposing of abandoned vessels. Abandoned vessels must be thoroughly cleaned, prepared, weighted, and sunken in offshore areas where they would subsequently function as artificial reefs. The vessels are usually placed in sandy offshore areas where there is no existing natural reef.

Disposal of abandoned vessels is a carefully monitored process requiring close coordination with both federal and state agencies. Coordination with the United States Coast Guard and the State Department of Health is required during the cleaning, preparation, weighting, and certification of the vessel(s). Coordination with the State Department of Land and Natural Resources is required in determining a suitable offshore location for the vessel(s). This mechanism of inter-agency coordination and approvals ensures the timely removal and environmentally sound disposal of abandoned vessels.

DOT-HAR shares your concerns regarding potential illegal dumping of garbage and hazardous materials into Ke'ehi Lagoon. Therefore, DOT-HAR believes in taking a proactive approach in the prevention of illegal dumping practices.

The Harbor Patrol is an enforcement branch of DOT-HAR which patrols the waters of Honolulu Harbor and Ke'ehi Lagoon. Harbor Patrol officers are highly mobile utilizing both wheeled vehicles and motorized boats. This mobility allows officers to effectively cover large areas of Honolulu Harbor and Ke'ehi Lagoon and serve as a deterrent to illegal dumping practices. Additionally, the close proximity of the proposed layberths to the DOT-Airport Division fire station (located directly to the south-west of the site), and DOT-Airport's patrol units would further deter illegal dumping practices within Ke'ehi Lagoon.

Parties engaging in illegal dumping activities would also be subject to legal action. Various laws at the county (Revised Ordinances Sect. 29-4.1 – 29-4.9), state (HRS Sect. 128D1-6 – 128D1-11), and federal (42 U.S.C. Sect. 9601-9675) levels address the issue of illegal dumping of both garbage (litter) and hazardous wastes. These laws are designed to provide an enforcement authority, defining responsible parties, holding parties "liable" for their actions, and subjecting them to applicable civil and criminal penalties.

DOT-HAR would like to reiterate that they do not conduct or condone illegal dumping activities of any sort in Hawaii's coastal waters. Your club members and the surrounding community can be assured that Ke'ehi Lagoon will not become a "dumping ground" for garbage and hazardous materials. DOT-HAR prohibits, and actively prevents the illegal dumping of wastes within waters under their jurisdiction.

In closing, we emphasize that DOT-HAR fully recognizes and intends to preserve the unique resources which Ke'ehi Lagoon provides the citizens of Hawaii. To this end, harbor development projects such as the proposed layberths are meant to improve the recreational, educational, commercial, and industrial infrastructure of the state while also preserving the quality of the environment.

We appreciate all of the Ke'ehi Boat Club members who responded to the EISPN and expressed an interest in Hawaii's coastal environment, and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR
KEEHI BOAT CLUB MEMBERS:

Eric P. Schadler	J.R. Poole	Dave Salle
Charles Mench	Curtis W. Collins	James P. Leville
Russell S. Chimaka	Martin Lemke	James H. Moody
Harry & Mary Abbott	Dori Conroy	Robert Young
Nancy E. Murphy	Robert Bear	Margret & Kenneth Rachar
Mineo Inuzuka	William Fujikawa	Stanley Kon
E. Choy	Beverlee Baldwin	S. Dalde
Lionel A. Muller	Ben Maher	Marie Muller
Janet Kushima	Carmen Sylvester	Karen Monday
Darrell Oka	Susan Crenshaw	Nancy Iwamoto
J. W. Bullock	Arlene L. Cabrinha	Del Sylvester
Bryan Ikehara	William Souza	Phyllis F. Souza
Kay K. Kon	Winona Shito	Steve Iwamoto

DEIS Comment Letters
and
Responses

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

SEP 3 1999

In reply refer to: KBF

Richard Stook
Wil Chee - Planning, Inc.
HMSA Center
1400 Rycroft Street
Suite, # 928
Honolulu, Hawaii 96814

Re: Draft Environmental Impact Statement for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

Dear: Mr. Stook,

The U.S. Fish and Wildlife Service (Service) has reviewed the above referenced Drafi Environmental Impact Statement (DEIS). The proposed action is sponsored by the Hawaii Department of Transportation, Harbors Division (HDOT-HAR). The HDOT-HAR has developed the Oahu Commercial Harbors 2020 Master Plan (2020 Plan) to address needs at Honolulu Harbor, Kewalo Basin, Keehi Lagoon and Barbers Point Harbor. The 2020 Plan includes several proposed projects, of which some are exempt from the EIS review process and some have already had separate environmental documents prepared for them. The Service offers the following comments for your consideration.

The DEIS examines four major projects at Honolulu Harbor and Keehi Lagoon. The proposed projects include the construction of a cruise passenger terminal at Pier 2, finger piers at Piers 12 - 16, and an excursion vessel terminal at Piers 24 - 29 in Honolulu Harbor; and lay berth facilities in Keehi Lagoon. The proposed action involves the expansion of existing piers and construction of new piers; demolition of existing structures and construction of new terminal buildings, with lighting, sewers, drainage, and other features; and construction of lay berths to accommodate fishing vessels, barges, and other craft and fuel facilities to support emergency response vessels.

GENERAL COMMENTS

In general, the Service believes that the DEIS adequately describes the proposed action and the primary fish and wildlife resources located at the proposed project site. The Service believes that among the alternatives considered in the DEIS, the preferred alternative is the action least likely to impact fish and wildlife resources. Potential impacts to fish and wildlife resources have been adequately addressed in the DEIS, and the mitigation that is proposed is adequate to minimize anticipated unavoidable impacts to fish and wildlife resources.

SPECIFIC COMMENTS

Page 43; Section 3.5.1 Keehi Lagoon

In paragraph four, the DEIS mentions that the following shorebirds use the mudflats at Keehi Lagoon: wandering tattler or ulili (*Heteroscelus incanus*), sanderling or hunakai (*Calidris alba*), and ruddy turnstone or akekeke (*Arenaria interpres*). Since these species are considered to be Federal trust resources, protected by the Federal government under international agreements (Migratory Bird Conventions) that underlie the Migratory Bird Treaty Act, we recommend that the following sentence be included in this paragraph of the DEIS: "Migratory shorebirds such as the wandering tattler or ulili (*Heteroscelus incanus*), the sanderling or hunakai (*Calidris alba*), the ruddy turnstone or akekeke (*Arenaria interpres*), and the Pacific golden-plover or Kolea (*Pluvialis fulva*) are known to occur at the mudflats at Keehi Lagoon, and these species are afforded protection under the Migratory Bird Treaty Act (16 USCS §703)."

Page 45; Section 3.6.1 Existing Conditions

In paragraph three, the DEIS states that only seven coral species were recorded at this site (*Porties compressa, P. lobata, Montipora patula, M. verucosa*) but..." The Service recommends that all seven species be identified in this section of the DEIS.

Page 94; Section 5.1.6 Endangered Species Act and Marine Mammal Protection Act

In paragraph one, the DEIS reads " The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over endangered and threatened terrestrial flora and terrestrial fauna, and birds." We recommend that this sentence read: " The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over certain federally listed endangered and threatened species that occur in terrestrial and aquatic environments."

SUMMARY

The Service believes that among the alternatives currently under consideration, the preferred alternative identified in the DEIS is the action least likely to impact fish and wildlife resources. We also believe that the mitigation proposed in the DEIS is adequate to minimize unavoidable impacts to fish and wildlife resources anticipated to result from implementation of the proposed project.

The Service appreciates the opportunity to comment on the DEIS, and we look forward to receiving a copy of the Final EIS when it is available. If you have any questions concerning our comments, please contact Fish and Wildlife Biologist Kevin Foster by telephone at (808/541-3441) or by facsimile transmission at (808/541-3470).

Sincerely,

Barbara A. Maxfield, Acting

for Robert P. Smith
Pacific Islands Manager

cc: NMFS-PAO, Honolulu
EPA-Region IX, Honolulu
DLNR, Hawaii
DAR, Hawaii
CZMP, Hawaii
CWB, Hawaii

WIL CHEE - PLANNING, INC

September 14, 1999

Robert P. Smith, Pacific Islands Manager
U.S. Fish and Wildlife Service - Pacific Islands Ecoregion
300 Ala Moana Blvd. Room 3-122
Box 50088
Honolulu, Hawaii 96850

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Mr. Smith:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the United States Fish and Wildlife Service letter to the HDOT-HAR dated September 3, 1999.

We acknowledge your general comment that the preferred alternative is the action least likely to impact fish and wildlife resources...and the mitigation that is proposed is adequate to minimize anticipated unavoidable impacts to fish and wildlife resources.

For ease of reference, we have responded to your specific comments in the order they appear in your letter.

Page 43; Section 3.5.1 Keehi Lagoon

As per your recommendation this section has been modified to incorporate the following sentence: "The ulili (*Heteroscelus incanus*), sanderling or hunakai (*Calidris alba*), the ruddy turnstone or akekeke (*Arenaria interpres*), and the Pacific golden-plover or Kolea (Pluvialis fulva) are all migratory bird species afforded protection under the Migratory Bird Treaty Act (16 USCS section 703)."

Page 45; Section 3.6.1 Existing Conditions

As per your recommendation this section has been modified to identify each of the seven coral species recorded at the Pier 12 site. The seven species are: *Porites compressa, Porites lobata, Montipora patula, Montipora verucosa, Pocillopora damicornis, Carijoa riisei, and Zoanthus pacificus.*

Page 94; Section 5.1.6 Endangered Species Act and Marine Mammal Protection Act

As per your recommendation this section has been modified. The sentence "The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over endangered and threatened

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terrestrial flora and terrestrial fauna, and birds" has been rewritten to read as follows: "The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over certain federally listed endangered and threatened species that occur in terrestrial and marine environments".

We trust that our responses adequately address your comments. We thank you for your comment letter, interest in the project, and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to
File:

August 24, 1999

95-113D/epo

(41)

Mr. Glenn Soma
Harbors Division
Department of Transportation
State of Hawaii
79 South Nimitz Highway
Honolulu, Hawaii 96813-4898

Dear Mr. Soma:

Subject: Draft Environmental Impact Statement (DEIS)
Oahu Commercial Harbors 2020 Master Plan -
Immediate Phase (Phase I)

Thank you for allowing us to review and comment on the subject document. We do not have any comments to offer at this time, as our previous questions have been adequately addressed.

Sincerely,

GARY GILL
Deputy Director for
Environmental Health

c: Wil Chee - Planning, Inc.

WIL CHEE · PLANNING, INC.

September 14, 1999

Mr. Gary Gill, Deputy Director for Environmental Health
Hawaii State Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Mr. Gill:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Health letter to the HDOT-HAR dated August 24, 1999.

We acknowledge your comment that your office does not have any comments to offer as your previous questions have been adequately addressed.

We thank you for your letter, interest in the project, and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

Land Use Planners and Environmental Consultants
HMSA Center • 1400 Rycroft Street • Suite 1928 • Honolulu, Hawaii 96814 • Phone 808-955-6088 • Fax 808-942-1851 • E-Mail wcp@aloha.net

R/S 00.0146

BENJAMIN J. CAYETANO
GOVERNOR

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

LETTER NO. (P) 1548.

JUL 30 1999

TO: Mr. Thomas Fujikawa, Administrator
Harbors Division
Department of Transportation

SUBJECT: Oahu Commercial Harbors 2020 Master Plan
Draft Environmental Impact Statement

Thank you for the opportunity to review the subject document. The proposed project will have no impact on our facilities. Therefore, we have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

GORDON MATSUOKA
Public Works Administrator

RY:jk
c: Wil Chee - Planning, Inc.

August 3, 1999

Gordon Matsuoka, Public Works Administrator
State Department of Accounting and General Services
1151 Punchbowl Street, Suite #426
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Draft Environmental Impact Statement (DEIS) Comment Letter

Dear Mr. Matsuoka:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Accounting and General Services comment letter dated July 30, 1999.

We acknowledge that the proposed project will have no impact on your facilities and you have no comments to offer at this time.

Once again, we appreciate your agency's response to the DEIS. Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-5088
Fax 808-942-1851

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
BENJAMIN J. CAYETANO GOVERNOR
SELJE HAT DIRECTOR
BRADLEY J. MOSSMAN DEPUTY DIRECTOR
ENERGY, RESOURCES, AND TECHNOLOGY DIVISION
235 South Beretania St., 5th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804
Tel.: (808) 587-380
Fax: (808) 586-253

August 23, 1999

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To Richard Stook	From Gail
Co. Wil. Chee Plng.	Co. DBEDT/ERTD
Dept.	Phone # 587-3502
Fax # 942-1851	Fax # -3820

Mr. Thomas Fujikawa
Administrator
Harbors Division
Department of Transportation
79 N. Nimitz Highway
Honolulu, HI 96817

Subject: Draft Environmental Impact Statement (DEIS) for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

Dear Mr. Fujikawa:

We have reviewed the DEIS for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase and appreciate the incorporation of considerations for energy efficient practices and technologies and construction and demolition recycling. We would recommend the following comments addressed to: (1) State energy conservation goals, and (2) recycling and recycled-content products for your consideration:

(1) Energy conservation goals. In addition to the incorporation of energy efficient design, practices, and technologies, we would like to reiterate that in the design phase, the passenger terminal project should reflect a "Hawaiian sense of place" which can be accomplished through innovative master planning, architectural design and natural ventilation.

(2) Recycling and recycled-content products. Consider designating Harbors property and infrastructure development for industries such as reuse, recycling, and remanufacturing that depend heavily on interisland, interstate, and international shipping.

We would also like to reiterate, the following measures that would divert significant amounts of material from the landfill, conserve resources, and contribute to the recycling, remanufacturing, and reuse industries in Hawaii:

- Prior to demolition, evaluate deconstruction opportunities:
  - Develop job-site recycling plan for the deconstruction of existing Harbors structures; and
  - Reuse and recycle as much deconstruction and demolition waste as possible.

- During construction and operations, consider inclusion of recycling and recycled-content products:
  - Develop job-site recycling plan for the construction of the Harbor projects, and reuse and recycle as much construction waste as possible;
  - Incorporate provisions for recycling into the built projects such as collection systems and space for recycling bins;
  - Specify and use products with recycled-content such as: steel, concrete aggregate fill, asphalt paving, drywall, carpet and glass tile; and
  - Specify and use locally produced recycled-content products such as recycled plastic lumber and recreational and parking products.

If you have any questions, please contact Carilyn Shon at 587-3810.

Very truly yours,

Maurice H. Kaya
Energy, Resources, and Technology
Program Administrator

c: Richard Stook
Wil Chee - Planning, Inc.

WIL CHEE - PLANNING, INC.

September 3, 1999

Mr. Maurice Kaya, Administrator
Energy Resources and Technology Division
Department of Business Economic Development and Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Mr. Kaya:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the DBEDT – Energy, Resources, and Technology Division's letter to the HDOT-HAR dated August 23, 1999.

We acknowledge your appreciation of the DEIS' incorporation of considerations for energy efficient practices and construction and demolition recycling. HDOT-HAR views energy conservation and waste minimization as an integral part of sustainable development of its properties.

In response to your first comment relating to energy conservation we have added the consideration of a "Hawaiian sense of place" into section 3.11.3. We agree that a "Hawaiian sense of place" is an important design aspect and it has also been addressed in section 4.2.3.

Your second comment suggests the consideration of designating Harbors property and infrastructure development for reuse, recycling, and remanufacturing industries. Section 3.12.3 has been revised to incorporate your suggestion.

Your final comment reiterates specific measures that would "divert significant amounts of material from the landfill, conserve resources, and contribute to the recycling, remanufacturing, and reuse industries in Hawaii".

Section 3.12.3 addresses the development of a construction and demolition recycling plan and diversion of wastes from landfills. Pre-demolition deconstruction opportunities and the use of specific recycled and recycled-content products would be determined during the development of an on-site construction and demolition recycling plan.

Land Use Planners and Environmental Consultants
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We trust that our responses adequately address your comments. We thank you for your interest in the project and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

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

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

August 30, 1999

LD-NAV
Ref.: DEIS2020.RCM

PSF/99-250

Mr. Richard Stook, Planner
Wil Chee - Planning, Inc
Land Use Planners and
Environmental Consultants
HMSA Center
1400 Rycroft Street Suite 928
Honolulu, Hawaii 96814

Dear Mr. Stook:

Subject: Review Draft Environmental Impact (DEIS) Statement for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

Thank you for the opportunity to review the Oahu Commercial Harbors 2020 Master Plan.

Attached herewith are copies of our Division of Aquatic Resources and Land Division Engineering Branch comments on the subject matter.

The Department of Land and Natural Resources has no other comments to offer on the subject matter at this time.

Should you have any questions, please contact Nicholas Vaccaro of our Land Division's Support Services Branch at 587-0438

Very truly yours,

DEAN Y. UCHIDA
Administrator

c: Oahu District Land Office

Department of Land and Natural Resources
DIVISION OF AQUATIC RESOURCES

August 11, 1999

TO: Dean Uchida, Administrator
Division of Land Management

FROM: William Devick, Administrator
Division of Aquatic Resources

SUBJECT: Request for Comments on DEIS for the Oahu Commercial Harbors 2020 Master Plan Immediate Phase, File No. 99-250

In September of 1998, DAR received a request for comments on the initial scoping for the Pre-assessment Consultation for the Environmental Impact Statement Preparation Notice (EISPN). At that time, the project was still in its initial stages and we advised the consulting firm, Wil Chee Planning, Inc. of the specific concerns and issues DAR normally has with projects like the one that was being proposed.

After almost a year, the DEIS is currently being circulated for review and comments. Our concerns and comments are offered below.

Description:

DOT-HAR developed the Oahu Commercial Harbors 2020 Master Plan (2020 Plan), to function as a conceptual master plan that characterizes Honolulu, Kewalo Basin and Barbers Point Harbors as dependent harbors. The 2020 Plan functions as a long-range guide for the development and enhancement of these three commercial ports. To implement the 2020 Plan DOT-HAR must accomplish a series of improvements at Honolulu Harbor. The improvements need to be inititiated by 2003 and have been designated as Immediate Phase (IP) projects in the DEIS.

Four major IP projects are proposed. These are construction of: 1) a cruise passenger terminal at Pier 2, 2) finger piers at Piers 12-16, 3) an excursion vessel terminal at Piers 24-29, and 4) lay berth facilities at Keehi Lagoon (along Lagoon Drive). The DEIS examines each of the projects for its potential direct, indirect and cumulative impacts upon the environment.

There are also four IP projects that are exempt from the EIS review process. These projects are the 1) renovation and reconstruction of harbor facilitites at Piers 5-7, 2) demolition and construction activities for the general cargo yard and construction of a ferry terminal at Piers 19-20, 3) extension of exisitng fuel lines at Piers 28-29 for bunkering purposes, and 4) demolition and construction activities for the neo bulk cargo yard at Piers 31-34.

Finally, there are four IP projects that have been incorporated into the DEIS by reference. These four projects are the : 1) Domestic Commercial Fishing Village At Piers 36-38, 2) Inter-Island Cargo Yard Improvements at Piers 9-40, 3) Barbers Point Deep Draft Harbor Expansion Improvements, and 4) Barbers Point Harbor Perimeter Lighting project.

Biological surveys of the marine environment in the proposed project areas were conducted in September, 1998 by S.L. Coles and R.E. De Felice of the Bishop Museum's Department of Natural Sciences. These surveys were incorporated in the *Aquatic Habitat and Water Quality Impact Assessment Report* prepared by AECOS, Inc. in conjunction with this DEIS.

The DEIS reports that the marine biological community of Honolulu Harbor is much more diverse than Keehi Lagoon. Surveys were conducted in the waters of Honolulu Harbor at Pier 12, Pier 15, and Pier 16.

No in-water surveys were conducted at Piers 24-29 for two major reasons: 1) their interior location and 2) the proposed improvements would not involve work in the water. The consultant states that the marine biota in this area is similar to that of Pier 15, which is reported to be basically fouling biota on vertical piles and a few fish species.

It is the opinion of the consultant that there will be some project-related impacts, but that they are not likely to result in any significant long-term effects on the marine environment. Instead, project related impacts on the resident marine biota are likely to be short-term disturbances such as an increase in turbidity and sedimentation rates which result from construction activities.

Additionally, if sediments are resuspended in the water column by construction activities, these sediments will fall into the fine to medium sands category. The sands settle out rapidly and would have minimal effect on the marine organisms growing on the vertical surfaces of the pier pilings near Pier 2, which is near the channel opening. Water circulation is good in this location and should help dissipate any turbidity resulting from construction activities.

Pile driving activites will occur during certain phases of the proposed project and are another concern. Installation of piles are proposed for the lay berth and finger piers. The area most likely to show an impact from the pile driving activities is the coral community and asssociated organisms in the vicinity of Pier 12. The consultant states that the corals in this area appear to have adapted to relatively high levels of turbidity and sedimentation and that they have withstood previous construction activities and other stresses occurring in this area over the past decade. The consultant notes that the sessile marine biota in the vicinity of Piers 12-16 are already limited and are composed primarily of organisms adapted to a sedimentary or turbid environment. The report states that any benthic organisms that are disturbed or displaced will likely be replaced by rapid resettlement on new surfaces provided as a result of the construction. Fish communities that may be disrupted or temporarily driven out can return when conditions are more favorable.

Comments:

The consultant states that no SIGNIFICANT impacts to the marine biota are anticipated as a result of the proposed project. Any impacts resulting from construction activities are expected to be minor ones, which the consultant feels can be mitigated by employing various measures to reduce suspended silt and sediments.

DAR is encouraged that the consultant acknowledged the issues and concerns presented during the pre-assessment consultation process and attempts to address them in the DEIS. The biological surveys conducted for this DEIS were timely (conducted in September, 1998) and comprehensive (provided an inventory of the marine biota present at each site). Additionally, information describing construction activites proposed for each site was provided, along with favorable conditions present at the site which would facilitate in mitigating any impacts.

The DEIS states that the proposed harbor improvements will require NPDES permit approvals from DOH. The NPDES permit application will require development of a Best Management Practices Plan (BMPP). This plan will be developed prior to construction activities, will identify the most effective erosion, sedimentation, and turbidity control measures to reduce the amount of soil and sediment accumulation in the coastal waters as a result of proposed construction activites. Unknown factors such as pile driver size and type, construction equipment to be used, construction site staging areas, etc., are necessary for determining the most effective BMPP for mitigating construction related impacts on coastal waters. Mitigation measures may include, but are not limited to, the on-site utilization of the following BMP technologies: 1) silt curtains, 2) drainage swales, 3) storm drain inlet protection, 4) sediment traps, and 5) soil stabilization. The specific BMP's for the proposed actions will be determined during the design and construction phases and incorporated into the BMPP.

Finally, DAR requests the opportunity to review and comment on the BMPP for the above proposed project when it has been completed.

ENGINEERING BRANCH

COMMENTS

We confirm that the proposed project sites, except for the Keehi Lagoon site, according to FEMA Community Panel Number 150001 0115 C are located in Zone X. This is an area determined to be outside 500-year flood plain. The Keehi Lagoon site is located in Zone D. This is an area in which flood hazards are undetermined.

The EIS should include water demands for the proposed project. Also, please clarify if water will be provided by an existing BWS meter.

For your information, if there is as an increase in water demands (gpd) for the project site, then a water allocation from the Engineering Branch (EB) is required to obtain a building permit and/or water meter. Please provide the water demands (gpd) and water demand calculations to EB, Land Division. The water demands will be included in Water Master plan for Oahu being prepared by Fukunaga and Associates for the Department of Land and Natural Resources.

Also, please provide us a copy of the final EIS for our files.

WIL CHEE - PLANNING, INC.

September 20, 1999

Dean Y. Uchida, Administrator
State Department of Land and Natural Resources – Land Division
P.O. Box 621
Honolulu, Hawaii 96809

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Mr. Uchida:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Land and Natural Resources (DLNR) letter to the HDOT-HAR dated August 30, 1999. Your letter contained specific comments from DLNR's Division of Aquatic Resources Division (DAR) and Land Division Engineering Branch (LDEB).

We acknowledge and appreciate DAR's general comment expressing approval of the DEIS sections pertaining to biological resources and coastal and ground waters. As per DAR's request, they will be forwarded a copy of the Best Management Practices Plan for review and comment when it becomes available.

We acknowledge LDEB's confirmation that the entire project site, with the exception of Keehi Lagoon, is designated as being outside the 500-year flood plain. The project site located at Keehi Lagoon is designated as being in an undetermined flood hazard area.

Sections 3.11.1 and 3.11.2 address existing utilities (including water meters) which could service the project areas. Additionally, the sections indicate that at the present time precise water demand figures are not yet available. However, the BWS has indicated that the existing water supply system is currently adequate to accommodate the proposed Honolulu Harbor and Keehi Lagoon improvement projects. After water demands have been established during the design phase, DOT-HAR will be required to obtain a water allocation from the State Department of Land and Natural Resources. The availability of water will be confirmed when the building permit application is submitted to the BWS for review and approval.

We acknowledge your comment that if there is an increase in water demands for the project site, a water allocation from LDEB will be required to obtain a building permit and/or water meter. When available, water demand calculations will be provided to LDEB for inclusion in the Water Master Plan for Oahu being prepared by DLNR.

Land Use Planners and Environmental Consultants
HMSA Center • 1400 Rycroft Street • Suite 1 928 • Honolulu, Hawaii 96814 • Phone 808-955-6088 • Fax 808-942-1851 • E-Mail wcp@aloha.net

We trust that our responses adequately address your comments. As requested, a copy of the Final EIS will be forwarded to LDEB when it becomes available.

We thank you for your comment letter, interest in the project, and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

August 9, 1999

Mr. Richard Stook, Environmental Planner
Wil Chee – Planning, Inc.
1400 Rycroft Street, Suite 928
Honolulu, Hawai'i 06814

EIS #217

Re: Draft Environmental Impact Statement for the O'ahu Commercial Harbors Master Plan – Immediate Phase.

Dear Mr. Stook:

Thank you for the opportunity to review the draft Environmental Impact Statement (DEIS) for the O'ahu Commercial Harbors Master Plan – Immediate Phase. The State Department of Transportation, Harbors Division (DOT-HAR) anticipates the construction of a cruise passenger terminal at Pier 2, finger piers at Piers 1-16, and excursion vessel terminals at Piers 24-29. Improvements planned for Ke'ehi Lagoon include the construction of lay berth facilities. The Office of Hawaiian Affairs has the following comments.

Generally, the DEIS is well done. However, there are two areas of concern. The first is contained in Section 3.8.3. That section discusses mitigation measures for alien species that might be introduced to Honolulu Harbor from ballast tank discharge and hull growths. Our concern is that these mitigation measures rely on voluntary compliance. There appears to be no mandatory or explicit measures that would accomplish the mitigation goals. Thus the affects of ballast tank discharge and hull growth contamination remain unmitigated.

The second concern is that the cumulative effects of the 2020 Master Plan have not been included in the DEIS although the effects of the Immediate Phase appears to include the effects from projects which are exempt from the environmental process. The final EIS should include some discussion of the likely effects of the 2020 Master Plan.

If you have any questions, please call Lynn Lee, Policy Analyst, at 594-1936.

Sincerely,

Colin Kippen
Deputy Administrator

C. Sebastian Aloot
Director, Hawaiian Rights Division

cc: Board of Trustees

WIL CHEE · PLANNING, INC

September 3, 1999

C. Sebastian Aloot
Land and Natural Resources Division Officer
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Mr. Aloot:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Office of Hawaiian Affairs letter to the HDOT-HAR dated August 9, 1999.

Your first comment expressed concern over the introduction of alien species into Honolulu Harbor from ballast tank discharge. You are correct in your assessment that at the present time "there are no mandatory or explicit measures" governing ballast tank discharge.

Section 3.8.3 of the DEIS, acknowledges that at the present time, there are no enforceable laws which regulate ballast water discharge. However, concerted efforts are currently being undertaken by both international organizations and individual governments to establish regulatory mechanisms to monitor ballast water discharge. The main purpose of these efforts is to establish universal mandatory regulations that are enforceable in both international and national waters.

Additionally, the U.S. Coast Guard recently developed a "Ballast Water Program" (July 14, 1999) which outlines mandatory reporting requirements designed to work in conjunction with the existing IMO Voluntary Guidelines. The mandatory guidelines outlined in the Ballast Water Program require vessels entering U.S. Ports to record and report detailed ballast water-related information to the U.S. Coast Guard. The development of these mandatory U.S. Coast Guard regulations is an example of the progress being made as a result of on-going domestic and international efforts to establish mandatory guidelines designed to prevent and control the spread of aquatic nuisance species via ballast water discharge.

Your second concern addresses the "likely effects" of the overall Oahu Commercial Harbors 2020 Master Plan. The 2020 Master Plan is a long-range document which

proposes conceptual improvements to Oahu Commercial Harbors over a 20 year period. Due to the long-range nature of the 2020 Master Plan, proposed harbor improvements are being addressed in phases. This EIS addresses only the immediate phase projects (proposed improvements through the year 2003). During the implementation of subsequent phase projects (years 2004 – 2020) potential project-related impacts will be thoroughly addressed in separate environmental impact studies.

We trust that our responses adequately address your comments. We thank you for your interest in the project and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

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

July 22, 1999

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Attention: Harbors Division

Dear Mr. Hayashida:

Subject: Your Transmittal of the Draft Environmental Impact Statement for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (EIS) for the Oahu Commercial Harbors 2020 Master Plan.

Our comments of March 31, 1999 on the EIS Preparation Notice are still applicable and included in Appendix A of the Draft EIS.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Richard Stook, Wil Chee Planning, Inc.

August 3, 1999

Clifford Jamile, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Draft Environmental Impact Statement (DEIS) Comment Letter

Dear Mr. Jamile:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Board of Water Supply (BWS) comment letter dated July 22, 1999.

We acknowledge that your comments of March 31, 1999 on the EIS Preparation Notice are still applicable to the DEIS. We have reiterated our responses to your EIS Preparation Notice comments below.

Your first two comments identified the existing water services to the proposed project area and indicated that the existing water system is adequate to accommodate the proposed harbor improvements. Thank you for providing us with this information.

The remainder of your comments requested that potable water demands and water availability be confirmed and approved by appropriate agencies. The proposed projects are presently in their conceptual stages. Projected water demand will be determined during the design and construction phases of the project.

During these project phases HDOT-HAR will obtain all necessary permits and approvals which may be required. Required permits and approvals may include but not be limited to water allocation from the Department of Land and Natural Resources, submittal of building permits and construction drawings for BWS approval, payment of Water System Facilities Charges, compliance with on-site fire protection requirements, and installation of BWS approved backflow prevention assemblies at appropriate water meters.

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants

HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

We appreciate your agency's interest in the environmental review process and response to the DEIS. Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6663 • FAX: (808) 527-6675

JEREMY HARRIS
Mayor

KENNETH E. SPRAGUE, P.E., Ph.D.
Director

BARRY FUKUNAGA
Deputy Director

JUL 28 1999

ENV 99-83

Mr. Richard Stook
Environmental Planner
Wil Chee - Planning, Inc.
HMSA Center
1400 Rycroft Street
Suite #928
Honolulu, HI 96814

Dear Mr. Stook:

Subject: Draft Environmental Impact Statement (DEIS)
Oahu Commercial Harbors 2020 Master Plan
TMK: Various

We have reviewed the subject DEIS and have the following comment:

Please coordinate construction schedule with our Division of Environmental Quality to avoid schedule conflict since we frequently conduct nearshore and shoreline water quality monitoring activities in Honolulu Harbor and Keehi Lagoon areas.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Sincerely,

KENNETH E. SPRAGUE
Director

August 3, 1999

Dr. Kenneth E. Sprague, Director
Department of Environmental Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Draft Environmental Impact Statement (DEIS) Comment Letter

Dear Dr. Sprague:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Environmental Services comment letter dated July 28, 1999.

We acknowledge that your agency conducts regularly scheduled water quality monitoring activities in the Honolulu Harbor and Keehi Lagoon areas. In order to avoid possible scheduling conflicts during construction activities, construction schedules for the proposed harbor improvements will be coordinated with your Division of Environmental Quality.

We appreciate your agency's interest in the environmental review process and response to the DEIS. Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants

HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1351

July 6, 1999

From:

Dr. Jonathan Shimada, Director
Department of Facility Maintenance
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.

Dear Mr. Shimada:

Enclosed, please find a copy of the above-referenced draft EIS for your review. The draft EIS addresses proposed improvements by the Hawaii State Department of Transportation – Harbors Division (HDOT-HAR) to facilities at Honolulu Harbor and Keehi Lagoon as part of their Oahu Commercial Harbors 2020 Master Plan.

We would appreciate any comments you may have regarding the proposed actions. Please submit your comments to HDOT-HAR with a copy to our office by August 23, 1999.

To:

Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

July 9, 1999
We do not have any comments. If you have any questions, please call Laverne Higa at 527-6246.

Ross S. Sasamura
Director and Chief Engineer
Department of Facility Maintenance

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

August 3, 1999

Ross S. Sasamura
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Draft Environmental Impact Statement (DEIS) Comment Letter

Dear Mr. Sasamura:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Facility Maintenance comment letter dated July 9, 1999.

We acknowledge that you have no comments to offer at this time and that no further submission to your office is required.

Once again, we appreciate your agency's response to the DEIS. Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH H. MAGALDI, JR.
DEPUTY DIRECTOR

August 26, 1999

TPD99-00510

Mr. Thomas Fujikawa, Administrator
Harbors Division
Department of Transportation
State of Hawaii
79 South Nimitz Highway
Honolulu, Hawaii 96813

Dear Mr. Fujikawa:

Subject: Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

In response to the July 6, 1999 letter from Wil Chee - Planning, Inc., the draft environmental impact statement (EIS) for the subject project was reviewed. The draft EIS should include a discussion regarding the adequacy of the off-street loading and parking facilities for each of the proposed immediate phase improvements.

Previously, in response to the EIS preparation notice, this department commented that adequate off-street parking and loading areas should be provided for the project. The EIS traffic impact analysis report includes a brief discussion on the transportation and parking facilities that would be appropriate to serve the Pier 2 cruise passenger terminal. However, this discussion should also be included in the EIS to justify the proposed off-street loading and parking facilities. Similar analyses should be added for the other harbor improvements that are being examined in the EIS.

Should you have any questions regarding this matter, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

CHERYL D. SOON
Director

cc: Office of Environmental Quality Control
Wil Chee - Planning, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
79 SO. NIMITZ HWY. • HONOLULU, HAWAII 96813-4898

IN REPLY REFER TO:
HAR-EP
6980.00

September 9, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Oahu Commercial Harbors 2020 Master Plan Environmental Impact Statement

Thank you for your correspondence of August 26, 1999, requesting that adequate off-street parking and loading areas be provided for our projects.

We will consult the potential tenants and users of our projects for their off-street parking and loading area requirements during the development planning stage of our projects. We understand the limitations of on-street parking in the areas surrounding Honolulu Harbor and will make every attempt to accommodate the requisite space within our properties.

Please call Mr. Glenn Soma, at 587-2503, if there are any questions.

Very truly yours,

Thomas T. Fujikawa
Harbors Administrator

c: Richard Stook, Wil Chee - Planning, Inc. ✓

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C CHEE
DEPUTY DIRECTOR

August 24, 1999

1999/CLOG-4443(ASK)
'99 EA Comments Various Zones

Mr. Glen Soma
Harbors Division
Department of Transportation
State of Hawaii
79 South Nimitz Highway
Honolulu, Hawaii 96813

Dear Mr. Soma:

Draft Environmental Impact Statement (DEIS) For
Oahu Commercial Harbors 2020 Master Plan, Immediate Phase

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

Zoning

- The Draft EIS does not correctly identify the zoning districts of the project area.
- Page 5, County Zoning, should read I-2 Intensive Industrial District, I-3 Waterfront Industrial District, and IMX-1 Industrial-Commercial Mixed Use District. Section 5.3.3, County Land Use Ordinances and Zoning, should also be amended to note these zoning districts.
- Tax Map Key parcel 2-1-1: 42 is zoned P-1 Restricted Preservation District, as are all parcels located in the State Conservation District.
- Some parcels are in the Kakaako Community Development District, and are therefore not subject to county zoning and have no county zoning designation(s).
- The map shown in Figure 2-3 does not show the specific zoning district as designated by the Land Use Ordinance. We recommend that the final EIS contain zoning maps showing the project location.

General Plan

- The proposed projects for Honolulu Harbor and the Barbers Point Deep Draft Harbor support the General Plan objectives and policies relating to the "full development of the primary urban center; and the continued development of Barbers Point as a major industrial center".

Development Plan

- The proposed project supports the City's objectives and policies for the current Primary Urban Center and Ewa Development Plan (DP). Additionally, the proposed cruise ship and excursion vessel terminals support one of the City's long-range vision elements - "The City on the Water" intended to draw people to the waterfront. The final EIS should discuss how these two projects can be coordinated with the City's efforts to create an intermodal transportation system including public transit, walking and bicycling to link such activities on the waterfront to activity nodes mauka of Nimitz Highway.
- Sec. 2.6.1, Cruise Passenger Terminal at Pier 2: The proposed two-story height and mauka-makai orientation of the long-axis of the planned terminal complex building is consistent with the City's vision for the redevelopment of the Honolulu Waterfront, as is the proposed system of internal roadways (Reference, Primary Urban Center Development Plan Public Review Draft, July 1999).
- Sec. 2.6.3, Excursion Vessel Terminal: The proposed single-story height and planned landscaping and "maritime theme garden" are also consistent with the City's vision for the redevelopment of the Honolulu Waterfront (Reference, Primary Urban Center Development Plan Public Review Draft, July 1999).
- Sec. 4.2.3, Aesthetic and Recreational Considerations, Proposed Mitigation Measures: We generally support the proposed mitigation measure to require that new structures connote a "Hawaiian sense of place."
- Section 5.3.2, Development Plan for the City and County of Honolulu: The second paragraph refers to an "Oahu DP." There is no "Oahu DP"; rather, the project site is affected by the Ewa DP (Barbers Point Deep Draft Harbor) and Primary Urban Center (PUC) DP (Honolulu Harbor). Further, the Ewa DP has been revised and no longer contains common and special provisions. The existing PUC DP does; however, it is currently being revised, and the revised PUC DP also will not consist of common and special provisions. Rather, the format of the revised DPs is to contain policies, principals and guidelines expressing the "vision" for the area which is to be implemented through other development and investment decisions.
- Regarding the third paragraph of Section 5.3.2, we would normally refer to a proposal as being "consistent" with the relevant DP rather than being "in conformance with" these plans.

- Barbers Point Deep Draft Harbor is actually designated as Industrial on the Ewa DP as a "commercial harbor."

Wastewater Infrastructure

- The sewer improvements for the two passenger vessel terminal building with a design vessel capacity of two thousand passengers at pier 2 should be made in conjunction with the Kakaako Community Development District Makai Area Sewerage Master Plan.

- At Piers 24 through 29, a commercial excursion vessel passenger terminal will be constructed to accommodate excursion and tour operations.

- The municipal sewer system is not available for the layberths and Petroleum Oil and Lubricating emergency response vessel facility along Lagoon Drive at Keehi Lagoon.

- Improvements to increase facilities at finger piers 12 through 16 will not be allowed at this time because the municipal sewer system is inadequate to accommodate additional flows. A project to relieve the existing sewer lines, the Nimitz Highway Reconstructed Sewer (Auahi Street to Hotel Street), is tentatively scheduled for completion in September 2000. Improvements will be considered after this sewer project is completed.

- These statements shall not be construed as confirmation of sewage capacity reservation. Sewer capacity reservation is contingent on submittal and approval of a Sewer Connection Application form.

Should you have any questions regarding the above, please contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,

JAN NAOE SULLIVAN
Director of Planning and Permitting

JNS:am

cc: Hawaii Community Development Authority
√Richard Stook, Wil Chee - Planning, Inc.

posse doc no. 6709

WIL CHEE · PLANNING, INC.

September 19, 1999

Jan Naoe Sullivan, Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street
Honolulu, Hawaii 96813

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Ms. Sullivan:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for the Department of Planning and Permitting letter to the HDOT-HAR dated August 24, 1999.

For ease of reference, we have responded to your specific comments in the order they appear in your letter.

Zoning

- Thank you for clarifying the county zoning designations within the project area. The DEIS identified the zoning as: Industrial District, Waterfront Industrial District, and Mixed Use Zone - Industrial District. The zoning designations in sections 1.0 and 5.3.3 (pages 5 and 104 respectively) will be changed to read "I-2 Intensive Industrial District, I-3 Waterfront Industrial District, and IMX Industrial-Commercial Mixed Use District".

- You are correct in identifying Tax Map Key parcel 2-1-1:42 as being zoned P-1 Restricted Preservation District. The correct zoning designation of the subject parcel was an oversight during the DEIS preparation. The FEIS will correctly identify the subject parcel as being P-1 Restricted Preservation District.

- You are correct in stating that some parcels (within the project area) are in the Kakaako Community Development District (KCDD) and are not subject to county zoning designations. Section 5.2.6 of the DEIS indicates that the "proposed Pier 2 Cruise Terminal is situated within the KCDD...administered at the State level and is not subject to City and County rules and regulations".

Land Use Planners and Environmental Consultants
HMSA Center · 1400 Rycroft Street · Suite # 928 · Honolulu, Hawaii 96814 · Phone 808-955-6088 · Fax 808-942-1851 · E-Mail wcp@aloha.net

- The map shown in Figure 2-3 in the DEIS was based upon information contained on the City and County of Honolulu Digital Map Data CD-ROM. The map will be revised to reflect the zoning districts shown in the City and County of Honolulu, Department of Planning and Permitting Zoning Map No. 5 (Kalihi – Nuuanu).

General Plan

- We acknowledge and concur with your comment that, "The proposed projects for Honolulu Harbor and Barbers Point Deep Draft Harbor support the General Plan objectives and policies relating to the full development of the primary urban center; and the continued development of Barbers Point as a major industrial center".

Development Plan

- We acknowledge and concur with your comment that, "the proposed project supports the City's objectives and policies for the current Primary Urban Center and Ewa Development Plan", and that the "proposed cruise ship and excursion vessel terminals support one of the City's long-range vision elements – "The City on the Water" intended to draw people to the waterfront". Additionally, section 5.3.2 of the FEIS will be modified to reiterate the fact that proposed cruise ship and excursion vessel terminals are compatible with the City's development plans.

- Section 2.6.1, Cruise Passenger Terminal at Pier 2 - As per your suggestion, this section of the FEIS will be modified to incorporate the following text: "The proposed two-story height and mauka-makai orientation of the long-axis of the planned terminal complex building is consistent with the City's vision for the redevelopment of the Honolulu Waterfront, as is the proposed system of internal roadways".

- Section 2.6.3, Excursion Vessel Terminal - As per your suggestion, this section of the FEIS will be modified to incorporate the following text: "The proposed single-story height and planned landscaping and "maritime theme garden" are consistent with the City's vision for the redevelopment of the Honolulu Waterfront."

- Section 4.2.3, Aesthetic and Recreational Considerations, Proposed Mitigation Measures - We acknowledge your comment in support of the proposed mitigation measure which addresses the consideration of a "Hawaiian sense of place" during the design stages of the proposed projects.

- Section 5.3.2, Development Plan (DP) for the City and County of Honolulu – We thank you for pointing out that there is no "Oahu DP". The second paragraph of this section should have read "the Oahu DP's consist of" rather than "the Oahu DP consists of". This correction shall be made and incorporated into the FEIS. The remainder of the section correctly addresses the DP's as separate plans. Additionally, the section further discusses the recent revisions to both the Primary Urban Center and Ewa Development Plans including their revised format containing general policies, planning principles, and guidelines.

- Section 5.3.2 (third paragraph) – Per your suggestion, the descriptive term "in conformance with" shall be changed to "consistent with".

Wastewater Infrastructure

- Section 3.11.2 of the FEIS will indicate that the proposed sewer improvements at Pier 2 should be made in conjunction with the Kakaako Community Development District Area Sewerage Master Plan.

- Your comment that the a municipal sewer system is not available for the layberths and POL facility along Lagoon Drive is correct. The existing and proposed wastewater improvements necessary for this project area have been addressed in sections 3.11.2 and 3.11.2 of the DEIS.

- Section 3.11.2 of the DEIS states that the proposed operations at Piers 12-16 will be "small, non-service oriented operations". Proposed sewer improvements for the proposed project will be minor. However, the FEIS will indicate that any proposed sewer improvements will be contingent upon the upcoming Nimitz Highway Reconstructed Sewer Project (Auahi Street to Hotel Street), tentatively scheduled for completion in September 2000.

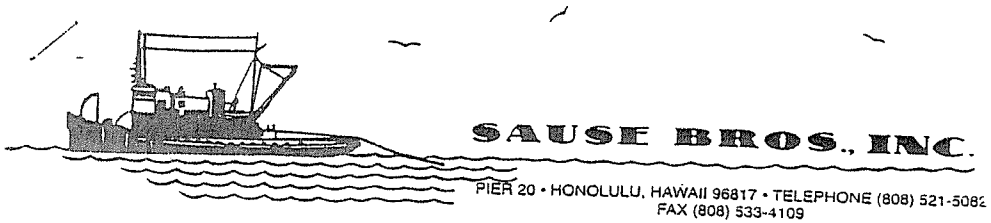
- We acknowledge that statements in your comment letter shall not be construed as "confirmation of sewage capacity reservations". Final sewer capacity reservations will be contingent upon the submittal and approval of a Sewer Connection Application from.

We trust that our responses adequately address your comments. We thank you for your comment letter, interest in the project, and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR



SAUSE BROS., INC.
PIER 20 • HONOLULU, HAWAII 96817 • TELEPHONE (808) 521-5082
FAX (808) 533-4109

July 19, 1999

Mr. Glenn Soma
STATE OF HAWAII
Harbors Division
79 S. Nimitz Highway
Honolulu, HI 96813

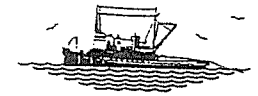
Subject: Oahu Commercial Harbors 2020 Master Plan
Draft Environmental Impact Statement

Dear Mr. Soma:

The Excursion Vessel Terminal's proposed location at Pier 24-29, Honolulu Harbor, is positioned between the industrial operations of Hawaiian Tug & Barge, Hawaiian Flour Mills and the Chevron Shipping Company. The land is contaminated by petroleum products with occasional vapor releases, seepages and explosions. We believe the visual impacts of the surrounding industrial operations and the potential for hazardous materials exposures restrict the viability of this site to industrial operations and therefore offer to relocate our neobulk cargo operations from Piers 2, 19 and 20 to areas within Piers 24-29.

The Excursion Vessel Terminal would be best located at Piers 19-20, where the ferry terminal and the alternate cruise passenger terminal are being planned. This area of the harbor faces the eye-pleasing designs of the downtown waterfront architecture and Aloha Tower Marketplace and is buffered from Nimitz Highway's traffic by the fishing boats berthed at Piers 16-18.

With Sause Bros.' relocation to areas within Piers 24-29, the excursion ferry and cruise passenger operations could have exclusive rights to Piers 19-20, eliminating the safety hazards of mixed cargo and passenger activities. Commercial maritime passenger



SAUSE BROS., INC.

operations would then be concentrated in the eastern portion of Honolulu Harbor (Piers 2 through 20). Maritime industrial operations would occupy Fort Armstrong and the western portions of Honolulu Harbor.

Thank you for your consideration.

Very truly yours,

SAUSE BROS., INC.

Douglas Won
Vice President

Cc: Wil Chee Planning, Inc.
HMSA Center
1400 Rycroft Street, Suite 928
Honolulu, HI 96814

August 3, 1999

Douglas Won, Vice President
Sause Bros., Inc.
Pier 20
Honolulu, Hawaii 96817

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Draft Environmental Impact Statement (DEIS) Comment Letter

Dear Mr. Won:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for your comment letter dated July 19, 1999.

Your comment letter suggested that the location of the proposed Excursion Vessel Terminal be relocated from Piers 24-29 to Piers 19-20. We acknowledge your suggestion and admit it has merit. The Final EIS will include the option of switching the Excursion Vessel Terminal at Piers 24-29 with the General Cargo Yard at Piers 19-20.

The cumulative environmental impacts will not be affected by the switch of the operations as they are in the same general area. Traffic, air, marine biology, noise, archaeological, etc. impacts will not increase with the change.

We appreciate your company's interest in the environmental review process and response to the DEIS. Thank you for your time and cooperation.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

WIL CHEE - PLANNING, INC.
Land Use Planners and Environmental Consultants
HMSA Center
1400 Rycroft Street
Suite # 928
Honolulu, Hawaii 96814
Phone 808-955-6088
Fax 808-942-1851

August 20, 1999

Attention: Glenn Soma
Dept. of Transportation, Harbors Division
79 South Nimitz Highway
Honolulu, HI 96813

Dear Sir:

Subject: Berthing Facilities Along Keehi Lagoon Drive

After reading an Environmental Notice in February concerning the lay berthing facilities along Lagoon Drive for foreign and domestic fishing boats, barges and impounded vessels, I felt compelled to respond. On March 11, 1999, I submitted my concerns in writing. Several people from the Keehi boating community also responded in writing.

On July 23, 1999, I read another Environment Notice concerning Oahu Commercial Harbors 2020 Master Plan involving the construction of lay berth facilities in Keehi Lagoon to accommodate foreign and domestic commercial fishing vessels, barges, and other vessels, and the construction of a berthing facility for Honolulu Harbor's two emergency spill-response vessels.

Once again, due to my concern of using Keehi Lagoon shore side for lay berthing and dead storage of impounded, derelict, and abandoned vessels, I wish to share my concerns with you.

First, I am an employee of the State of Hawaii; however, the contents and philosophy of this letter is that of an environmentalist and boater. I care deeply about what happens to our state and am passionately involved in the boating community. We are the state's guardian and it is our duty to cherish, nurture, and protect her.

Keehi Lagoon is home to some 800 vessels which includes the Keehi Small Boat Harbor (a state facility), Keehi Marine Center, with a dry dock repair facility, and La Mariana Sailing Club (both private marinas), the Marine Education Training Center, launch ramp facilities, and the canoe facility. It is also home to approximately 200 people, possibly more, who live on their boats.

Keehi Lagoon is also a major recreational area encompassing 4 commercial jet ski operations, a seaplane operation, and a dive operation. It also lies in the airport traffic area of the Honolulu International Airport.

Throughout the years, various barges, work boats and pure junk had been left in the harbor. Some of the submerged barges and junk had been on the bottom for more than 15 years. This had always been an eyesore for everyone especially the tourists as they got their first look at Hawaii from the airplane windows as they landed.

Keehi Lagoon was among five shores cited as being of most concern in a study by the National Oceanic and Atmospheric Administration. The study monitored 14 elements and compounds. The trace elements under study were arsenic, cadmium, copper, mercury, nickel, lead, selenium and zinc, all of which can be harmful to humans and sea life in high concentrations. The organic compounds under study were DDT, chlordane, dieldrin (all pesticides), butyltin (a paint additive), PCB (an electrical industry chemical) and PAH (a widespread byproduct of industrial and oil pollution). In high concentrations, many of these compounds can cause cancer and genetic mutations or can interfere with reproduction.

It was a democratic state government process that created the law and rules governing the clean-up operations at Keehi Lagoon. These rules were initiated by the state legislature, went through public hearings, were discussed at numerous harbor advisory committee and other public informational meetings, and came down to the Boating Division for implementation. As a result, a slow and methodical process was implemented and put into operation.

Vast amounts of time and energies have been exhausted in the process, which has taken years to accomplish. In addition to the more than 600 derelict vessels/contrivances that were disposed of, the North Lagoon had abandoned ships, abandoned 110' barges, sunken 110' barges, a multitude of machine parts, barrels, cable and trash parts, that lined the harbor's floor. The U. S. Navy became involved and has been for the last three years.

In this major undertaking, tremendous amounts of research had to be undertaken. Dealing with the removal of asbestos insulation on a 96' vessel prior to relocation and disposal. The search and recovery of submerged, hazardous materials effort was joined by the Division of Boating and Recreation state employees, the Federal Bureau of Investigation, the U. S. Coast Guard, the Department of Health, and the Environmental Protection Agency. Ongoing investigations revealed cans of sulfuric and phosphoric acid (acids are considered hazardous waste under The Federal Resource Conservation and Recovery Act (RCRA) which regulates hazardous waste. The Office of Hazard Evaluation and Emergency Response determined that an imminent and substantial hazard to human health and the environment existed.

Hazardous substances observed were Xylene, Dolphinite bedding compound (containing pentachlorophenol, large quantities of epoxy paints (two part), resin, lubricating oil, and cleaning compounds containing Glycol ethers and solvents. There was also waste insecticide and unknown debris, automotive artillery grease, aircraft oil lubricant, a scooter, and a sedan to name a few.

Each step taken created another caveat. Procedures for applications, instructions, preparation forms had to be established, requirements and documentation for ocean disposal had to be researched and established. Numerous meetings with the Environmental Protection Agency, the land division, and the U. S. Coast Guard. Once the path was established on how to proceed, then procedures were set in motion to follow the detailed requirements prior to obtaining the authorization for permits and/or disposals. The reporting burden included time for reviewing the instructions, gathering data, completing and reviewing the various questionnaires required.

An article that appeared in the Star Bulletin editorial in 1994 stated that the clean-up of Keehi lagoon was one of the top achievements of the Waihee Administration. This same clean-up at Keehi Lagoon brought over $600,000 in Federal EPA super fund monies to address the environmental issues, Hawaii's largest single super funded clean-up project. It also more than doubled the responsibilities of the state employees working at Keehi at the time.

With the efforts of the U. S. Navy, the north lagoon was cleared of undesirable sights and hazards that have plagued Keehi Lagoon for years. In this past year alone, they accomplished the loading and testing of numerous pieces of salvage and diving equipment, developed a salvage plan to conduct topside and underwater cutting in conjunction with heavy lifting equipment to salvage the scrap metal, salvaged various miscellaneous pieces of scrapmetal weight up to ten tons, salvaged two scrap barges weighing in excess of three hundred tons.

We are not against change and believe additional marinas and additional commercial activities can work alongside the recreational aspects of the lagoon. We understand the refurbishment of Kewalo Basin and the construction of the new Fishing Village, but we cannot use Keehi Lagoon as a dumping ground for the state as it was used by entrepreneurs that had gone bust. Millions of dollars, countless man-hours have been invested in our lagoon. We must not sacrifice our environment or values at any cost. We must not allow Keehi Lagoon to be used as a means to move a long existing problem from one location to another. We must do what is right.

Now, as you sail around Keehi Lagoon, you will see it as a far better, safer, cleaner and more attractive recreational facility. We have boaters reporting young sea turtles in the lagoon (this was unheard of), we have manta rays that come to visit, various types of fish are now congregating around the piers; even some coral is beginning to return. We also have the sailboat races on Wednesday evenings. Given the proper resources and a watchful eye, we will be able to maintain the lagoon in a fashion the state as well as mother nature intended it to be.

Respectfully submitted,

Nancy E. Murphy

Nancy E. Murphy
5122 Likini Street, #716
Honolulu, HI 96818

cc: Governor, State of Hawaii
Office of Environmental Quality Control
Wil Chee Planning, Inc.

WIL CHEE · PLANNING, INC.

September 3, 1999

Nancy E. Murphy
5122 Likini Street, #716
Honolulu, Hawaii 96818

Subject: Oahu Commercial Harbors 2020 Master Plan – Immediate Phase.
Response to the Draft Environmental Impact Statement (DEIS)

Dear Ms. Murphy:

On behalf of the Hawaii Department of Transportation – Harbors Division (HDOT-HAR), we thank you for your comment letter to the HDOT-HAR dated August 20, 1999. Your comments primarily expressed concern about the proposed lay berthing facilities along Lagoon Drive.

Your letter expressed concern over past and potential future dumping practices of i) abandoned vessels and ii) miscellaneous garbage and hazardous materials into Ke'ehi Lagoon. DOT-HAR understands these concerns and is aware of the past practices of illegal dumping which continued for many years and required extensive clean up efforts to restore the lagoon to its present condition.

Specific concerns expressed in your comment letter were:

- The use of Ke'ehi Lagoon shore side for lay berthing and dead storage of impounded, derelict, and abandoned vessels.
- Illegal dumping of hazardous materials and garbage into Ke'ehi Lagoon
- The use of Ke'ehi Lagoon as a dumping ground for the State of Hawaii
- The preservation of Ke'ehi Lagoon as a safe, clean, and attractive recreational facility.

The proposed layberths will be used primarily for the temporary docking of fully operational fishing vessels which are not in use. To a lesser degree, the layberths will also be utilized for the storage of impounded vessels. A detailed description of the proposed improvements in along Lagoon Drive have been presented in section 2.6.4 of the DEIS.

Land Use Planners and Environmental Consultants
HMSA Center · 1400 Rycroft Street · Suite # 328 · Honolulu, Hawaii 96814 · Phone 808-955-5038 · Fax 808-942-1351 · E-Mail wcp@aloha.net

It is a common misperception that an "impounded" vessel is synonymous with an "abandoned" vessel. This is not the case. Vessels which are impounded are held until such time it is determined that the vessel's owner(s) is unable to meet due restitution. Only after it has been determined that the owner(s) is unable to meet due restitution would the vessel be considered abandoned.

DOT-HAR is required to follow a specific set of procedures when disposing of abandoned vessels. Abandoned vessels must be thoroughly cleaned, prepared, weighted, and sunken in offshore areas where they would subsequently function as artificial reefs. The vessels are usually placed in sandy offshore areas where there is no existing natural reef.

Disposal of abandoned vessels is a carefully monitored process requiring close coordination with both federal and state agencies. Coordination with the United States Coast Guard and the State Department of Health is required during the cleaning, preparation, weighting, and certification of the vessel(s). Coordination with the State Department of Land and Natural Resources is required in determining a suitable offshore location for the vessel(s). This mechanism of inter-agency coordination and approvals ensures the timely removal and environmentally sound disposal of abandoned vessels.

DOT-HAR shares your concerns regarding potential illegal dumping of garbage and hazardous materials into Ke'ehi Lagoon. Therefore, DOT-HAR believes in taking a proactive approach in the prevention of illegal dumping practices.

The Harbor Patrol is an enforcement branch of DOT-HAR which patrols the waters of Honolulu Harbor and Ke'ehi Lagoon. Harbor Patrol officers are highly mobile utilizing both wheeled vehicles and motorized boats. This mobility allows officers to effectively cover large areas of Honolulu Harbor and Ke'ehi Lagoon and serve as a deterrent to illegal dumping practices. Additionally, the close proximity of the proposed layberths to the DOT-Airport Division fire station (located directly to the south-west of the site), and DOT-Airport's patrol units would further deter illegal dumping practices within Ke'ehi Lagoon.

Parties engaging in illegal dumping activities would also be subject to legal action. Various laws at the county (Revised Ordinances Sect. 29-4.1 – 29-4.9), state (HRS Sect. 128D1-6 – 128D1-11), and federal (42 U.S.C. Sect. 9601-9675) levels address the issue of illegal dumping of both garbage (litter) and hazardous wastes. These laws are

designed to provide an enforcement authority, defining responsible parties, holding parties "liable" for their actions, and subjecting them to applicable civil and criminal penalties.

DOT-HAR would like to reiterate that they do not conduct or condone illegal dumping activities of any sort in Hawaii's coastal waters. Your club members and the surrounding community can be assured that Ke'ehi Lagoon will not become a "dumping ground" for garbage and hazardous materials. DOT-HAR prohibits, and actively prevents the illegal dumping of wastes within waters under their jurisdiction.

In closing, we emphasize that DOT-HAR fully recognizes and intends to preserve the unique resources which Ke'ehi Lagoon provides the citizens of Hawaii. To this end, harbor development projects such as the proposed layberths are meant to improve the recreational, educational, commercial, and industrial infrastructure of the state while also preserving the quality of the environment.

Thank you very much for your comments on the DEIS, your interest in Hawaii's coastal environment, and the environmental review process.

Sincerely,

Richard Stook
Environmental Planner

cc. Glenn Soma, HDOT-HAR

ACOUSTIC STUDY FOR THE OAHU COMMERCIAL HARBORS 2020 MASTER PLAN, IMMEDIATE PHASE

HONOLULU, HAWAII

Prepared for:

WILL CHEE – PLANNING, INC.

Prepared by:

Y. EBISU & ASSOCIATES
1126 12th Avenue, Room 305
Honolulu, Hawaii 96816

MAY 1999

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CHAPTER I. SUMMARY

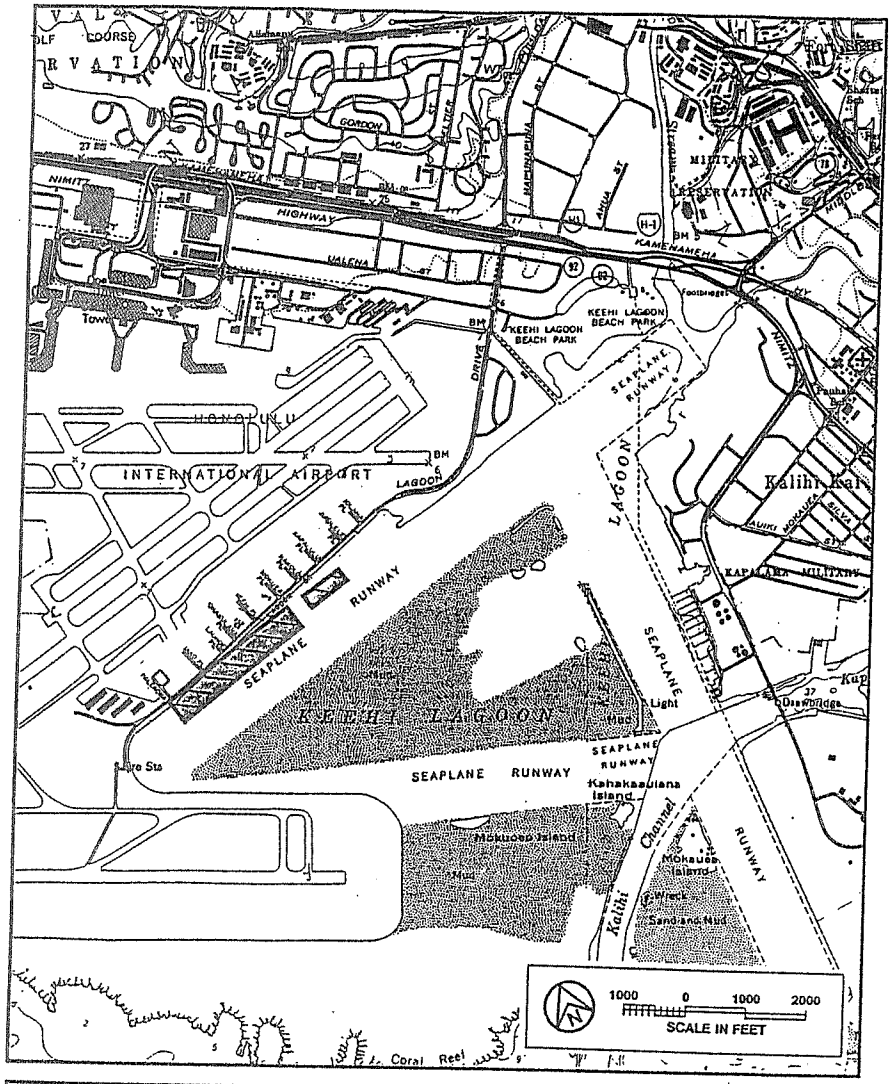
This noise study describes the potential noise impacts associated with implementation of the Oahu Commercial Harbors 2020 Master Plan, Immediate Phase. The specific projects included in this study were:

- The Construction of Lay-Berths Along Lagoon Drive in Keehi Lagoon for Commercial Fishing and Oil Response Vessels;
- Reconstruction and Expansion of Piers 12 to 16 To Accommodate More Domestic Fishing Vessels;
- Construction of An Excursion Vessel Passenger Terminal at Piers 24 to 29; and
- Construction of a Two-Ship, Cruise Vessel Terminal at Pier 2.

Figures 1 through 5 depict the locations of these four projects. The existing and future traffic noise levels in the vicinity of two of the four proposed harbor projects were evaluated for their potential noise impacts. The increases in traffic noise levels attributable to the project are predicted to be less than 1.0 DNL along Nimitz Highway and Ala Moana Boulevard. Although future traffic noise levels along these high volume roadways are predicted to remain above the FHA/HUD standard of 65 DNL along the lots fronting these roadways, the proposed harbor projects should not contribute significantly (0.5 DNL or less) to future traffic noise levels along the high volume roadways.

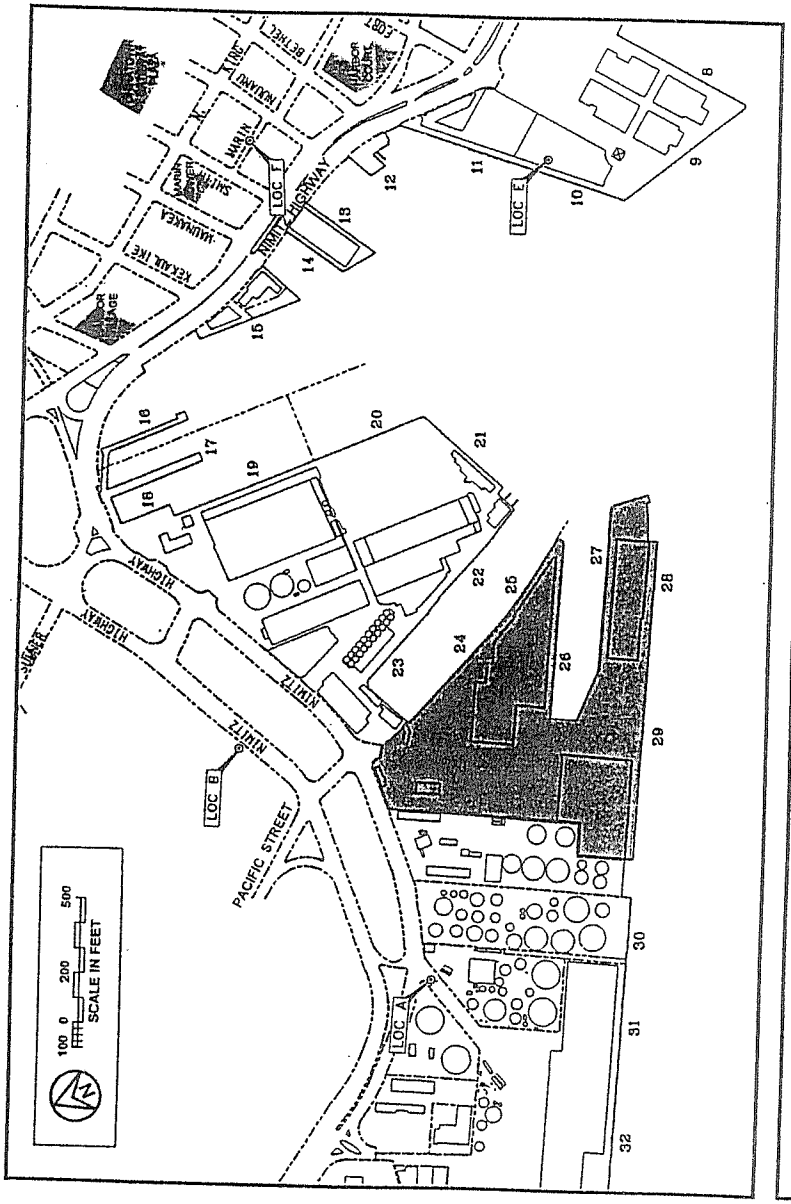
Although projected noise level increases of 2.6 to 4.8 DNL are predicted along the low volume roadways makai of Nimitz Highway and Ala Moana Boulevard (Channel, Ilalo, South, and Pacific Streets) at the project sites, the future traffic noise levels associated with these roadways are expected to remain relatively low and less than 60 DNL at 100 feet distance from their centerlines. Because no significant traffic noise impacts are expected from the two harbor projects examined, traffic noise mitigation measures should not be required.

Other noise sources emanating from the site, such as from fixed mechanical equipment, heavy truck and buses, mobile harbor equipment and vessels, and ship whistles and horns, have the potential for being audible at adjoining properties or at nearby residential condominiums. Noise mitigation measures designed to limit the noise levels from these sources to the State DOH limits (where applicable) are recommended for minimizing risks of adverse noise impacts from these sources. The available buffer distances between the harbor noise sources and existing residential condominiums are relatively large, such that risks of adverse noise impacts from these sources are considered to be low.



PROJECT LOCATION MAP – NEW LAY–BERTHS AT KEEHI LAGOON ALONG LAGOON DRIVE

FIGURE 1



PROJECT LOCATION MAP – NEW EXCURSION VESSEL PASSENGER TERMINALS AT PIERS 24 TO 29

FIGURE 2

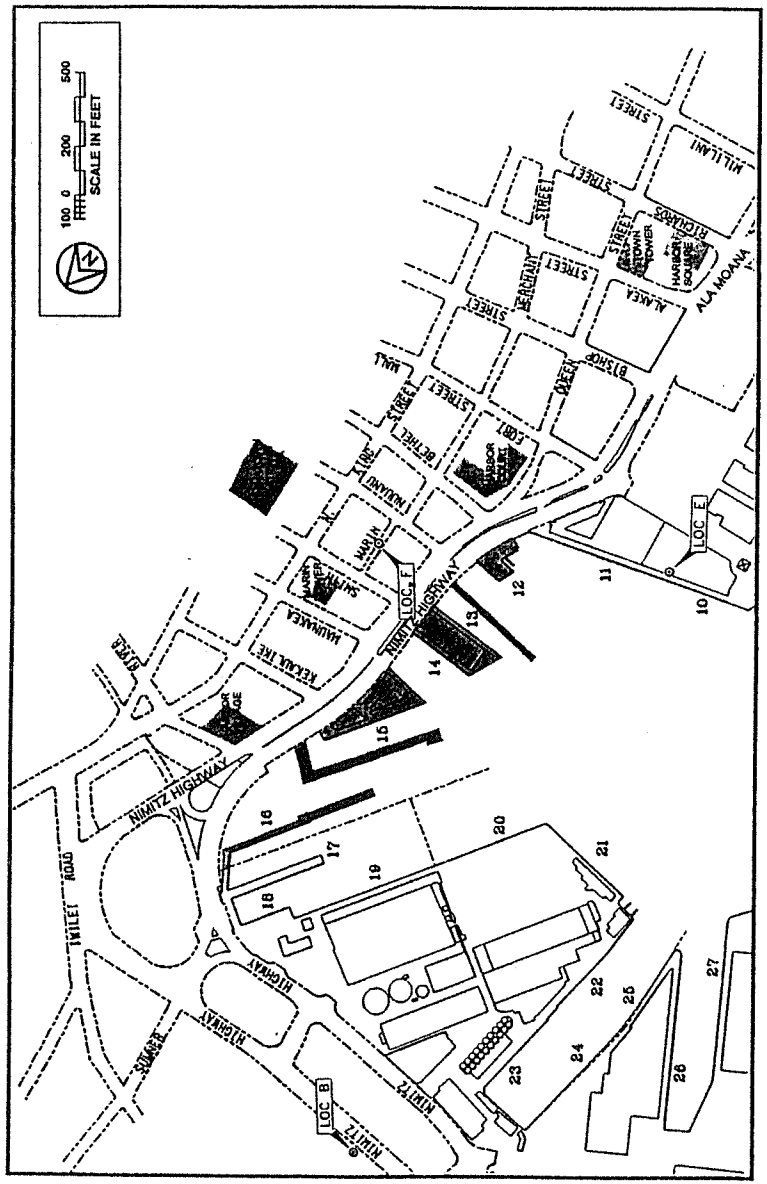


FIGURE 3

PROJECT LOCATION MAP – RECONSTRUCTION AND EXPANSION OF PIERS 12 TO 16

Unavoidable, but temporary, noise impacts may occur during the construction period. Because noise from construction activities are predicted to be audible at adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to minimize noise and vibration during the site and foundation work at the harbor project sites are recommended. Mitigation measures to reduce construction noise to inaudible levels may not be practical in all cases. Compliance with State Department of Health (DOH) noise regulations and applicable construction curfew periods are recommended to minimize construction noise impacts.

CHAPTER II. PURPOSE

The overall objective of this study was to describe the potential noise impacts associated with implementation of the Oahu Commercial Harbors 2020 Master Plan. Immediate Phase, and to provide noise mitigation measures as required. The specific projects included in this study were:

- The Construction of Lay-Berths Along Lagoon Drive in Keehi Lagoon for Commercial Fishing and Oil Response Vessels;
- Reconstruction and Expansion of Piers 12 to 16 To Accommodate Domestic Fishing Vessels;
- Construction of An Excursion Vessel Passenger Terminal at Piers 24 to 29; and
- Construction of a Two-Ship, Cruise Vessel Terminal at Pier 2.

The additional objectives of this study were to describe the existing and future noise environment in the vicinity of the proposed Oahu harbor projects. Traffic noise level increases and impacts associated with the Cruise Vessel Terminal (Pier 2) and Excursion Vessel Passenger Terminal (Piers 24 to 29) projects were to be determined within the project site as well as along the public roadways expected to service the project traffic. A specific objective was to determine future traffic noise level increases associated with both project and non-project traffic, and the potential noise impacts associated with these increases. Recommendations for minimizing these noise impacts were also to be provided as required.

Assessments of future noise impacts from the proposed harbor activities and from temporary construction activities at the project sites were also included in the noise study objectives. It was assumed that the facility would be acoustically designed to comply with local noise regulations, and that automobiles, buses, and trucks traveling to and from the harbor project sites would also comply with local vehicular noise limits. Compliance with local noise regulations should minimize risks of adverse noise impacts from mechanical and vehicular noise sources. Therefore, evaluations of special noise mitigation measures associated with potential vehicular and mechanical equipment noise emissions from the project site were not included in this study.

Noise impacts during construction of the planned improvements, which could involve pile driving operations, were also to be evaluated. In addition, potential traffic noise level increases and impacts associated with project traffic along the roadways servicing the four harbor projects were assessed. Assessments of possible future impacts from harbor vessel and equipment noise sources were also included as noise study objectives. Recommendations for minimizing identified noise impacts were also to be provided as required.

CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (DNL or Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. By definition, the minimum averaging period for the DNL descriptor is 24 hours. Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the DNL descriptor. A more complete list of noise descriptors is provided in Appendix B to this report.

Table 1, derived from Reference 1, presents current federal noise standards and acceptability criteria for residential land uses, which are present within the general environs of the Oahu harbor areas and which may be affected by noise from harbor related activities. Land use compatibility guidelines for various levels of environmental noise as measured by the DNL descriptor system are shown in Figure 6. In general, the recommended noise levels for residences are lower than those for commercial and industrial uses. In the Oahu harbor areas where the four project sites are located, existing DNL levels generally range from 60 to 70 DNL, and are influenced by surf noise, motor vehicle traffic, aircraft, and harbor vessels and equipment. These estimates of existing background ambient noise levels were based on noise measurements obtained at Piers 2, 11, 12, and 25 during the month of December 1998.

For the purposes of determining noise acceptability for funding assistance from federal agencies [Federal Housing Administration/Housing and Urban Development (FHA/HUD) and the Veterans' Administration (VA)], an exterior noise level of 65 DNL or lower is considered acceptable. This standard is applied nationally (Reference 2), including Hawaii. Because of the predominant use of naturally ventilated dwellings on Oahu, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 DNL does not eliminate all risks of noise impacts. Because of these factors, and as recommended in Reference 3, a lower level of 55 DNL is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 DNL, government agencies such as FHA/HUD and VA have selected 65 DNL as a more appropriate regulatory standard.

For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 DNL are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 DNL. The Oahu harbor project areas include proposed land uses and activities which fall within the commercial and industrial categories. These proposed land uses and activities are not considered to be noise sensitive, and risks of adverse noise impacts within the harbor areas are considered to be small.

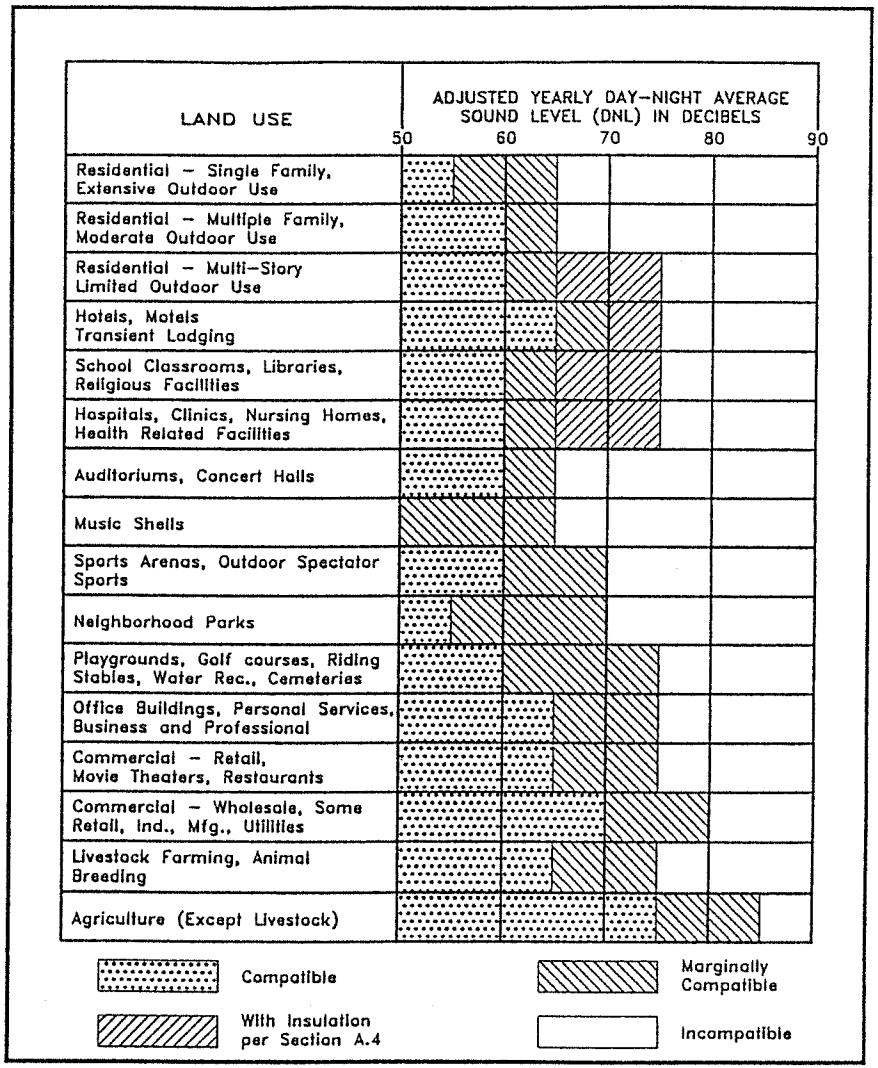
TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION (RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY–NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL (1) STANDARD
Minimal Exposure	Not Exceeding 55 Ldn	Not Exceeding 55 Leq	Unconditionally Acceptable
Moderate Exposure	Above 55 Ldn But Not Above 65 Ldn	Above 55 Leq But Not Above 65 Leq	Acceptable(2)
Significant Exposure	Above 65 Ldn But Not Above 75 Ldn	Above 65 Leq But Not Above 75 Leq	Normally Unacceptable
Severe Exposure	Above 75 Ldn	Above 75 Leq	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 Leq.



LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY–NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED.
(Source: American National Standards Institute S12.9–1998/Part 5)

FIGURE 5

In Hawaii, the State Department of Health (DOH) regulates noise from motor vehicles (see Reference 4), from stationary mechanical equipment (see Reference 5), and from construction activities (see Reference 5). The noise from ships and small water craft are not regulated by the DOH. State DOH noise regulations concerning stationary mechanical equipment are expressed in maximum allowable property line noise limits rather than DNL (see Reference 5). For agricultural or industrial lands, the allowable limits are 70 dBA for daytime and nighttime periods along the property boundaries. The daytime period is defined to be from 7:00 am to 10:00 pm, and the nighttime period is considered to be the remaining hours by the DOH rules. For properties zoned for apartment, hotel, or business uses, the applicable DOH property line noise limits are 60 and 50 dBA during the daytime and nighttime periods, respectively. For single family residences, public and open spaces, and preservation zoned lands, the daytime and nighttime DOH limits are 55 and 45 dBA, respectively. Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for residential, commercial, and agricultural/industrial lands equate to approximately 55, 60, and 76 DNL, respectively. In general, the lower noise limits would only apply to harbor lands which abut lands zoned for activities other than industrial or agricultural uses.

It should be noted that the noise compatibility guidelines and relationships to the DNL noise descriptor may not be applicable to impulsive noise sources. The use of penalty factors (such as adding 10 dB to measured sound levels or the use of C-Weighting filters) have been proposed. However, the relationships between levels of impulsive noise sources and land use compatibility have not been as firmly established as have the relationships for non-impulsive sources. The State DOH limits for impulsive sounds which exceed 120 impulses in any 20 minute period are 10 dB above the limits for non-impulsive sounds. If impulsive sounds do not exceed 120 impulses in any 20 minute time period, there are no regulatory limits on their sound levels under the State DOH regulations.

CHAPTER IV. GENERAL STUDY METHODOLOGY

Existing traffic noise levels were measured at three locations in the project environs to provide a basis for developing the project's traffic noise contributions along the public roadways which will service the proposed harbor projects at Pier 2 and Piers 24 to 29: Ala Moana Boulevard, Nimitz Highway, Pacific Street, Channel Street, and South Street. The locations of the measurement sites (Sites "A" thru "C") are shown in Figures 2 through 5. Noise measurements were performed during the month of December 1998, and were performed prior to and during the PM peak traffic hour.

The noise measurement results, and their comparisons with computer model predictions of existing traffic noise levels are summarized in Table 2. The results of the noise measurements were also compared with calculations of existing traffic noise levels to validate the computer model used. Traffic noise calculations for the existing conditions as well as noise predictions for the year 2003 following completion of the proposed development were performed using the Federal Highway Administration (FHWA) Noise Prediction Model (Reference 6). Traffic data entered into the noise prediction model were: hourly traffic volumes, average vehicle speeds, and estimates of traffic mix. The traffic assignments for the project (Reference 7) and Hawaii State Department of Transportation (HDOT) traffic counts on Ala Moana Boulevard and Nimitz Highway (References 8 and 9) were the primary sources of data inputs to the model. For existing and future traffic without the project, it was assumed that the PM peak hour Leq(h) [Equivalent Sound Level] was 0.5 to 1.5 dB less than the 24-hour DNL. This assumption was based on computations of the hourly Leq and 24-hour DNL of traffic noise along Nimitz Highway and Ala Moana Boulevard (see Figures 7 through 9). Traffic noise levels for existing and future conditions in the project environs were developed for the worst case conditions of a high-rise receptor without the benefit of shielding effects. The projected increases in traffic noise levels attributable to project-related traffic were calculated, and noise impact risks evaluated. The relative contributions of non-project and project-related traffic to the total noise levels were also calculated, and an evaluation of possible traffic noise impacts was made.

The possibility of adverse noise impacts from planned harbor activities were also evaluated. Measured sound levels of harbor equipment, ship music and public address announcements, ship horns, and ship machinery were obtained at Sites "D" through "F" where shown in Figures 2 through 5. Predicted sound levels from these on-site activities at the nearest noise sensitive receptor locations were compared with the noise limits of the State Department of Health (DOH) noise regulation (Reference 5). Additionally, noise levels from on-site construction activities were also estimated to assess the risks of adverse noise impacts at the neighboring noise sensitive properties due to short-term construction activities.

TABLE 2

TRAFFIC NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	--Hourly Traffic Volume-- AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
A. 65 FT from the center-line of Nimitz Hwy. (12/9/98)	1457 TO 1555	45	2,263	85	44	71.8	71.9
B. 56 FT from the center-line of Nimitz Hwy. (12/9/98)	1600 TO 1655	43	2,828	56	14	68.9	68.9
C. 111 FT from the center-line of Ala Moana Blvd. (12/10/98)	1435 TO 1600	37	4,878	124	124	67.0	66.9
C. 111 FT from the center-line of Ala Moana Blvd. (12/10/98)	1600 TO 1651	37	5,555	94	50	65.5	65.9

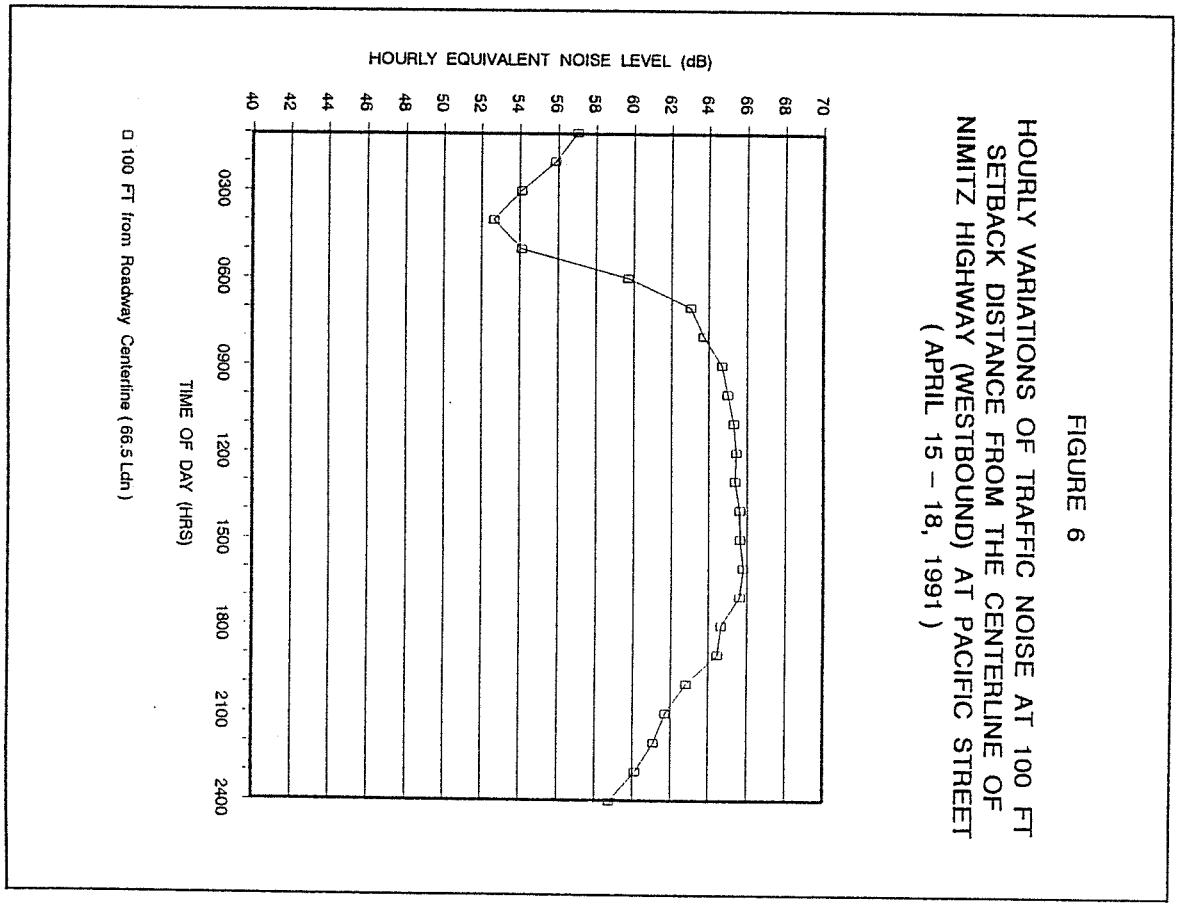


FIGURE 6

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF NIMITZ HIGHWAY (WESTBOUND) AT PACIFIC STREET (APRIL 15 – 18, 1991)

FIGURE 7

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF NIMITZ HIGHWAY (EASTBOUND) AT PACIFIC STREET (APRIL 15 – 18, 1991)

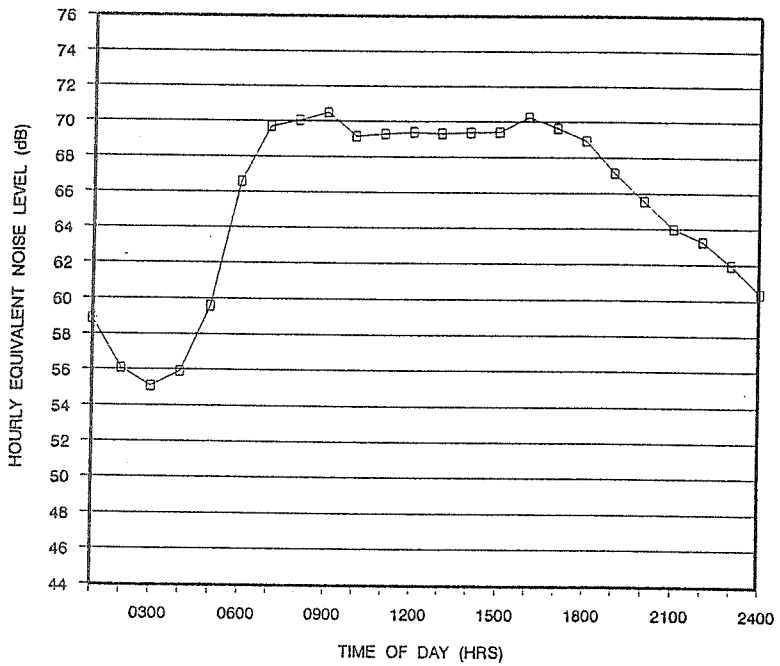
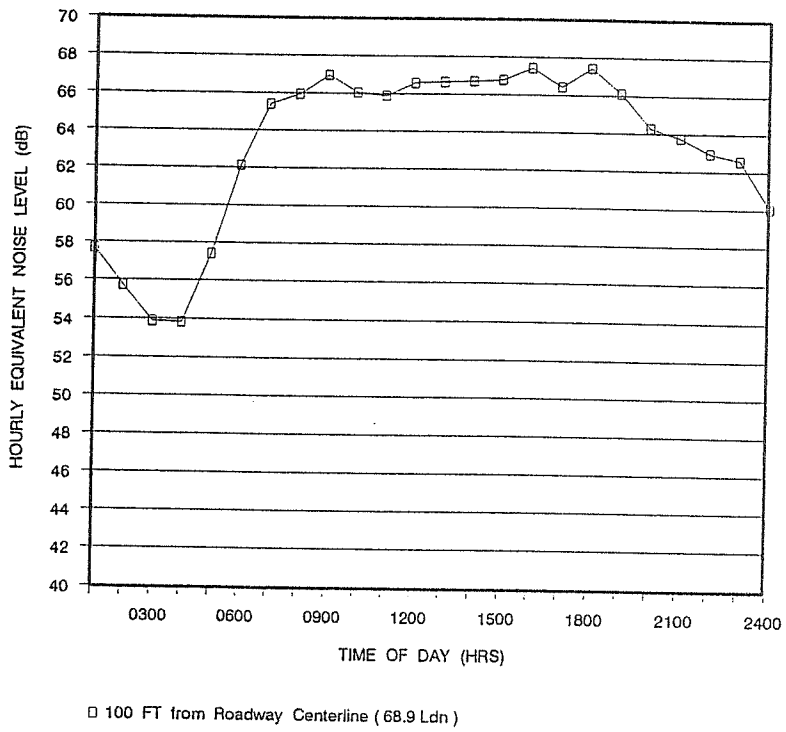


FIGURE 8

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF ALA MOANA BOULEVARD WEST OF SOUTH STREET (MAY 17 – 18, 1995)



CHAPTER V. EXISTING NOISE ENVIRONMENT

The existing traffic noise levels in the project environs are in the "Significant Exposure, Normally Unacceptable" category for noise sensitive activities at the lots which front Nimitz Highway and Ala Moana Boulevard. For commercial and industrial uses, existing traffic noise levels along these roadways are in the "Compatible" and "Marginally Compatible" categories. Traffic noise levels along the Right-of-Way of a roadway generally represent the worst case (or highest) levels due to the proximity of the Right-of-Way to the noise sources.

Calculations of existing traffic noise levels during the PM peak traffic hour at 100 feet from the centerlines of the various roadways are presented in Table 3. The hourly Leq (or Equivalent Sound Level) contribution from each street section in the project environs was calculated for comparison with forecast traffic noise levels with and without the project. In Table 3, existing peak hour traffic volumes (in VPH, or vehicles per hour) during 1998 are compared with forecast conditions with the project in CY 2003. The existing and forecast mixes and hourly noise contributions from the automobile (AUTO), medium truck (MT) and heavy vehicle (HT) traffic components are shown in the tables. The existing setback distances from the roadways' centerlines to their associated 65, 70, and 75 DNL contours were also calculated as shown in Table 4. The contour line setback distances do not take into account noise shielding effects or the additive contributions of traffic noise from intersecting street sections. However, as indicated previously, the setback distances to the 65 DNL (of FHA/HUD noise standard) contour lines are very large for the high volume streets in the project environs.

Existing background ambient noise levels at noise sensitive receptor locations closest to the harbor projects are controlled by traffic noise. Average traffic noise levels in the project environs typically remain steady during the daylight hours from 7:00 AM and through the evening hours until 6:00 PM. After 6:00 PM, average traffic noise levels decline to their lowest levels at 4:00 AM the next morning. The residual (or minimum) background noise level during the daytime hours is approximately 55 to 60 dB, and declines to a value between 45 and 50 dB during the quietest hour near 4:00 AM. This pattern of relatively high traffic noise levels during the daytime followed by a declining period to 4:00 AM is characteristic of Honolulu, and is depicted in Figures 7 through 9.

TABLE 3

COMPARISONS OF EXISTING (CY 1998) AND FUTURE (CY 2003)
TRAFFIC NOISE LEVELS ALONG ROADWAYS IN PROJECT AREA
(PM PEAK HOUR AND 100 FT FROM ROADWAY CENTERLINE)

LOCATION	SPEED (MPH)	VPH	**** HOURLY LEQ IN dB **** AUTO	MT	HT	ALL VEH
EXISTING (CY 1998) PM PEAK HR. TRAFFIC:						
Ala Moana Blvd. West of Punchbowl	37	5,699	61.2	55.9	58.4	66.7
Ala Moana Blvd. East of Punchbowl	37	5,400	61.0	55.6	58.2	66.5
Ala Moana Blvd. West of South	37	5,395	61.0	55.6	58.2	66.4
Ala Moana Blvd. East of South	37	4,989	60.6	55.3	57.9	66.1
Punchbowl Street	35	831	56.7	50.1	51.2	58.4
Channel Street	15	131	34.5	31.9	41.1	42.4
South Street (Mauka of Ala Moana)	35	691	55.9	49.3	50.4	57.6
South Street (Makai of Ala Moana)	35	115	47.9	43.8	49.6	52.5
Nimitz Highway (North) At Pacific	43	2,898	63.5	57.9	59.9	66.9
Nimitz Highway (South) At Pacific	45	2,715	66.0	60.3	62.1	69.2
Pacific Street (Mauka)	30	392	50.8	45.9	49.3	53.9
Pacific Street (Middle)	30	428	51.1	47.2	53.6	56.2
Pacific Street (Makai)	15	132	34.6	31.9	41.1	42.4
FUTURE (WITH PROJECT, CY 2003) PM PEAK HR. TRAFFIC:						
Ala Moana Blvd. West of Punchbowl	37	7,134	62.2	56.8	59.4	67.7
Ala Moana Blvd. East of Punchbowl	37	6,114	61.5	56.2	58.7	67.0
Ala Moana Blvd. West of South	37	6,112	61.5	56.2	58.7	67.0
Ala Moana Blvd. East of South	37	5,670	61.2	55.8	58.4	66.7
Punchbowl Street	35	881	56.9	50.4	51.4	58.7
Ilalo Street	25	839	51.0	47.4	54.6	56.7
South Street (Mauka of Ala Moana)	35	766	56.3	49.8	50.8	58.1
South Street (Makai of Ala Moana)	35	216	50.7	46.5	52.3	55.2
Nimitz Highway (North) At Pacific	43	3,508	64.3	58.7	60.7	67.7
Nimitz Highway (South) At Pacific	45	3,153	65.6	59.9	61.7	68.9
Pacific Street (Mauka)	30	361	50.5	45.5	48.9	53.5
Pacific Street (Middle)	30	475	51.6	47.7	54.1	56.6
Pacific Street (Makai)	15	219	36.8	34.1	43.3	44.6

Notes:

The following assumed traffic mix of autos, medium trucks, and heavy vehicles were used:

1. For Nimitz Hwy. and Ala Moana Blvd.: 97.0% autos, 2.0% medium trucks, and 1.0% heavy
2. For Channel St., Ilalo St., South St. (Makai), Pacific St. (Middle & Makai): 95.0% autos, 2.5% medium trucks, and 2.5% heavy trucks and buses.
3. For All Other Roadways: 98.0% autos, 1.5% medium trucks, and 0.5% heavy trucks and buses.

TABLE 4

EXISTING AND CY 2003 DISTANCES TO 65, 70, AND 75 DNL CONTOURS

STREET SECTION	65 DNL SETBACK (FT)		70 DNL SETBACK (FT)		75 DNL SETBACK (FT)	
	EXISTING	CY 2003	EXISTING	CY 2003	EXISTING	CY 2003
Ala Moana Blvd. West of Punchbowl	202	250	69	83	35	38
Ala Moana Blvd. East of Punchbowl	192	218	66	73	34	35
Ala Moana Blvd. West of South	192	218	66	73	34	35
Ala Moana Blvd. East of South	177	203	62	68	33	35
Punchbowl Street	31	33	<20	<20	<10	<10
Channel / Ilalo Streets	<20	21	<20	<20	<10	<10
South Street (Mauka of Ala Moana)	26	29	<20	<20	<10	<10
South Street (Makai of Ala Moana)	<20	<20	<20	<20	<10	<10
Nimitz Highway (North) At Pacific	206	258	78	84	39	31
Nimitz Highway (South) At Pacific	345	338	121	110	52	39
Pacific Street (Mauka)	<20	<20	<20	<20	<20	<20
Pacific Street (Middle)	<20	<20	<20	<20	<20	<20
Pacific Street (Makai)	<20	<20	<20	<20	<10	<10

Notes:

(1) All setback distances are from the roadways' centerlines.
(2) See TABLE 3 for traffic volume, speed, and mix assumptions.
(3) Setback distances are for unobstructed line-of-sight conditions.
(4) Hard ground conditions assumed along all roadways.
(5) Along Nimitz Highway and Pacific Street, DNL = PM Peak Hour Leq + 1.0.
(6) Along Ala Moana Blvd., Punchbowl, South, Channel, and Ilalo Streets, DNL = PM Peak Hour Leq + 1.5.

CHAPTER VI. DESCRIPTION OF FUTURE TRAFFIC NOISE LEVELS

The future traffic noise levels in the immediate vicinity of the Piers 24 to 29 Project and the Pier 2 Project during CY 2003 were evaluated for the No Build and Build Alternatives. The same methodology that was used to calculate the Base Year noise levels was also used to calculate the year 2003 noise levels. Under both the No Build and Build Alternatives, average vehicle speeds and traffic mix were assumed to be identical to the Base Year values.

Table 3 presents the CY 2003 traffic volumes, speeds, mixes, and noise levels for the Build Alternative during the PM peak hour along the roadways which are expected to service to two harbor projects. The traffic volumes for Scheme 2 of the Pier 2 Project was included in Table 3, so as to include the larger noise level increases along Channel Street and South Street makai of Ala Moana Boulevard. The increases in setback distances to the 65, 70 and 75 DNL contours from CY 1998 to CY 2003 are shown in Table 4. Traffic noise levels in the immediate vicinity of the project are predicted to increase by less than 1.0 dB on the high volume roadways (Nimitz Highway and Ala Moana Boulevard) between CY 1998 and CY 2003 as a result of project and non-project traffic volume increases. Table 5 presents the predicted increases in future traffic noise levels associated with project and non-project traffic. The predicted increases in traffic noise levels along Ala Moana Boulevard or Nimitz Highway are considered to be very small and not significant. This is due to the very high ratios of non-project to project traffic volumes along these two roadways. Predicted increases in traffic noise levels along Channel Street and South Street makai of Ala Moana Boulevard and along Pacific Street makai of Nimitz Highway are relatively large (2.6 to 4.8 dB), but that is attributable to the very low Base Year traffic noise levels along these low volume roadways. Future traffic noise levels along the low volume roadways makai of Nimitz Highway and Ala Moana Boulevard are predicted to remain at less than 60 DNL at 100 feet setback distance.

Risks of adverse traffic noise impacts attributable to the two harbor projects along Ala Moana Boulevard and Nimitz Highway are considered to be very low. The future increases in traffic noise levels will be very small and difficult to measure. For this reason, traffic noise mitigation measures should not be required for these two harbor projects.

TABLE 5

CALCULATIONS OF PROJECT AND NON–PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 2003)

STREET SECTION	NOISE LEVEL INCREASE (DNL) DUE TO: NON–PROJECT TRAFFIC	PROJECT TRAFFIC
Ala Moana Blvd. West of Punchbowl	0.6	0.3
Ala Moana Blvd. East of Punchbowl	0.5	0.5
Ala Moana Blvd. West of South	0.5	0.4
Ala Moana Blvd. East of South	0.5	0.3
Punchbowl Street	0.3	0.0
Channel / Ilalo Streets	0.1	4.8
South Street (Mauka of Ala Moana)	0.5	0.1
South Street (Makai of Ala Moana)	2.9	3.4
Nimitz Highway (North) At Pacific	0.5	0.3
Nimitz Highway (South) At Pacific	0.3	0.4
Pacific Street (Mauka)	0.2	0.1
Pacific Street (Middle)	0.2	1.0
Pacific Street (Makai)	0.2	2.6

CHAPTER VII. OTHER NON-TRAFFIC NOISE CONSIDERATIONS

Construction Noise. Audible construction noise will be unavoidable during the construction of the planned harbor improvement projects. Typical levels of noise during the noisier phases of construction activity (excluding pile driving activity) are shown in Figures 10 and 11. The impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in Figure 11, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure.

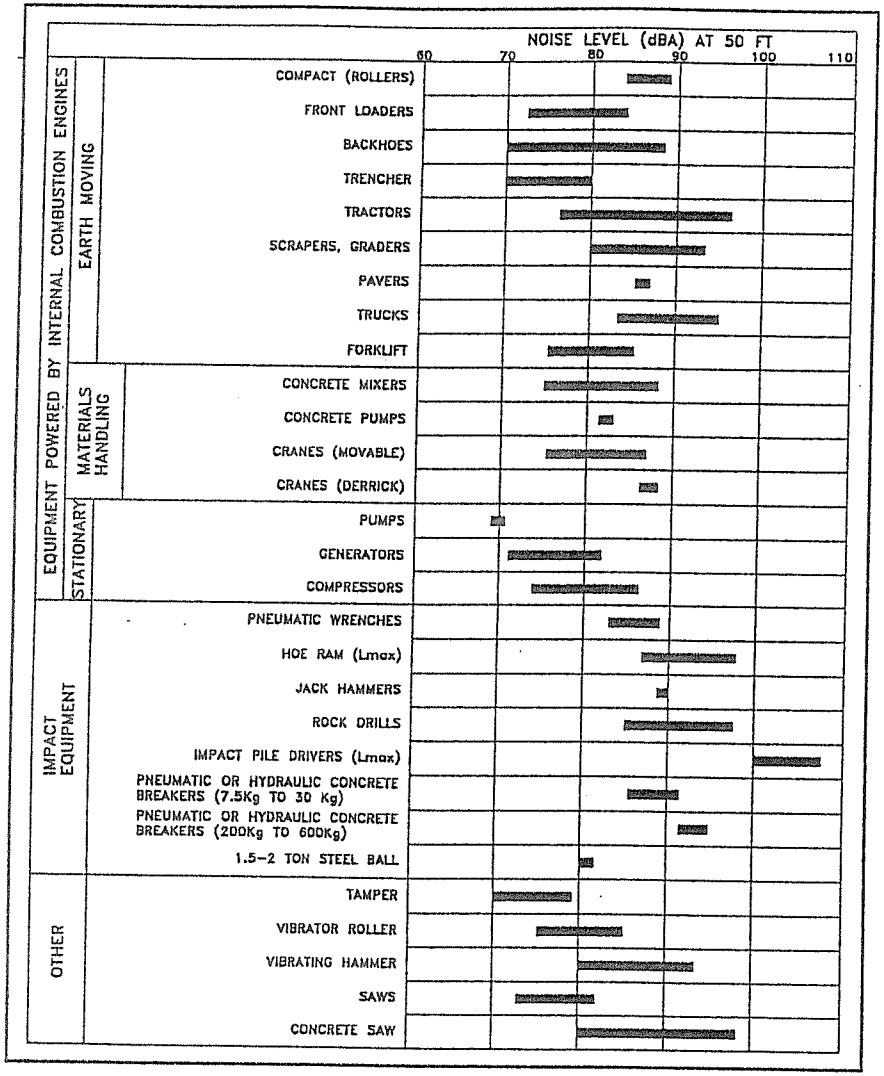
Noise impacts are not anticipated during construction of the Lagoon Drive Lay Berths or the Excursion Vessel Passenger Terminal at Piers 24 to 29 since these two projects are relatively far (in excess of 2,000 feet) from the nearest noise sensitive receptors. The noise sensitive properties which are predicted to experience the highest noise levels during construction of the proposed harbor projects are the residential condominiums across Nimitz Highway from Piers 12 to 16. At these condo-minimum units (Harbor Village, Marin Tower and Harbor Court), construction noise levels are predicted to range from 75 dB during close-in construction of the harbor improvements, to less than 60 dB during distant construction activities. During impact pile driving operations at the Piers 12 to 16 project sites, maximum noise levels of 90 dB at 250 FT distance, decreasing to 80 dB at 1,000 FT distance can be expected without mitigation measures. Indoors, typical levels of pile driving noise within naturally ventilated and air conditioned structures are approximately 10 and 22 dB less, respectively, than the outdoor levels listed above.

During construction of the Cruise Vessel Terminal at Pier 2, noise sensitive receptors at the Waterfront Towers Condominium may experience some increase in noise due to construction. Pile driving operations are not expected to occur during construction of the Pier 2 improvements. The construction activities will typically be at least 1,000 feet from the condominiums, and construction noise levels should be barely audible or inaudible.

Mitigation of construction noise to inaudible levels may not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 FT distance), and due to the exterior nature of the work (pile driving, earth moving, trenching, concrete pouring, hammering, etc.). However, the following noise mitigation measures should be implemented if determined to be feasible:

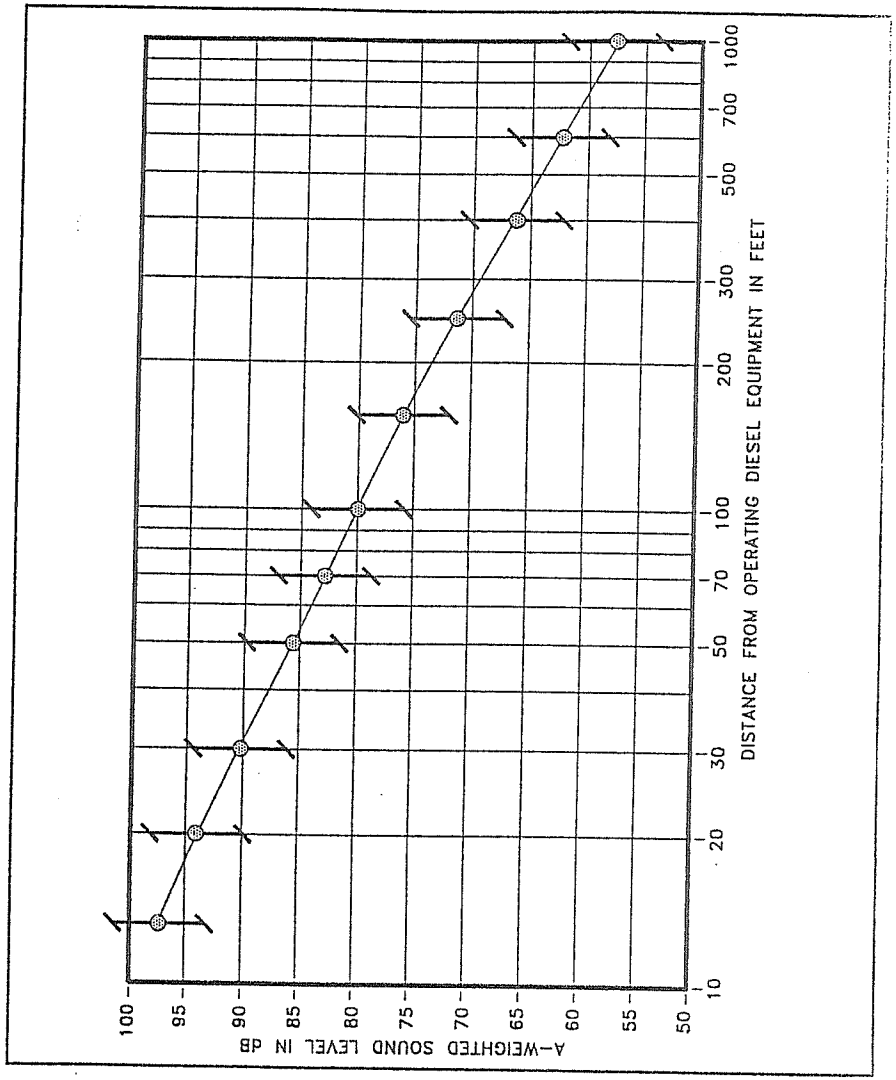
- The use of properly muffled construction equipment should be required on the job site. Heavy equipment and portable diesel engines and generators should be located at least 400 to 500 FT from residences, if possible.

- Reduction of pile driving noise may be possible, if soil conditions allow, through the use of vibratory pile driving equipment rather than impact pile drivers.



RANGES OF CONSTRUCTION EQUIPMENT NOISE LEVELS

FIGURE 9



ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE 10

- Pre-drilling may reduce the number of blows required to drive a pile to refusal, but is not expected to significantly reduce pile driving noise levels, particularly at refusal. The use of bored-and cast-in-situ piles can reduce the high level impact noise associated with driven piles by 25 to 30 dB. However, the implementation of these mitigation measures may not be feasible for the specific conditions of the harbor project.

- The incorporation of State Department of Health construction noise limits and curfew times during the construction phases of this project is another noise mitigation measure which is normally used. Table 6 depicts the allowed hours of construction under the DOH permit procedures.

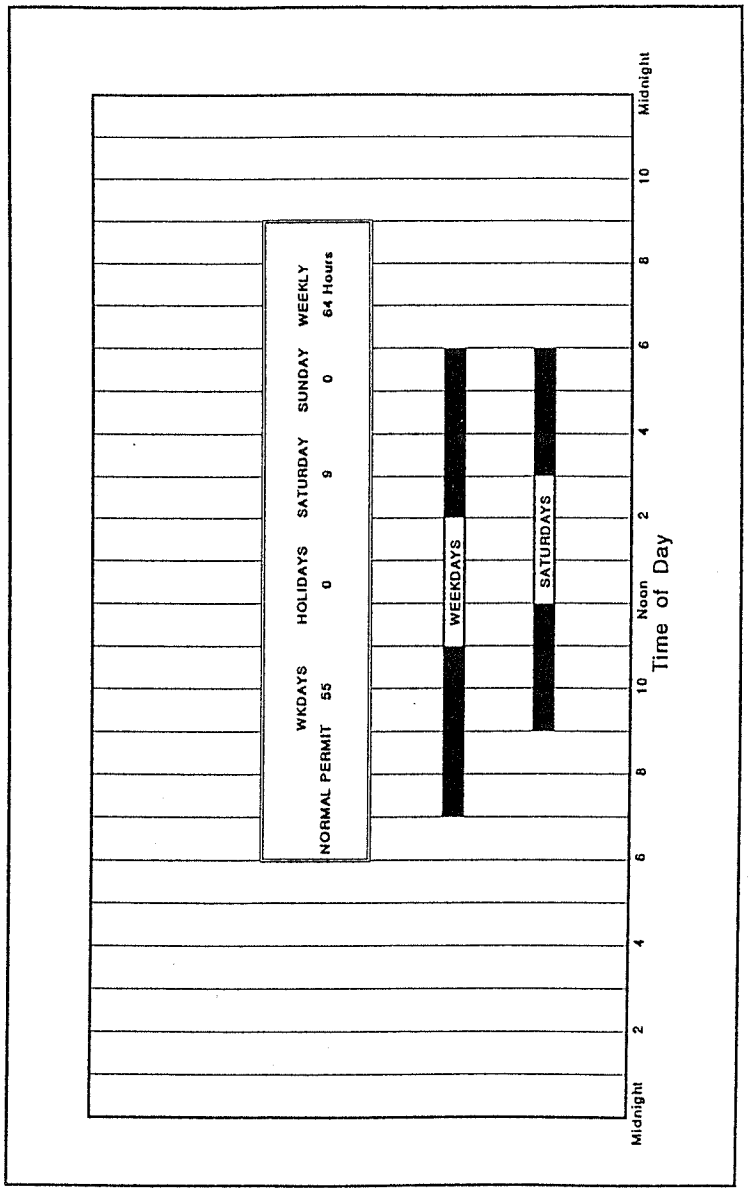
On-Site Vehicles and Fixed Mechanical Equipment. Harbor vehicles, such as heavy trucks, forklifts, sweepers, and the ships which utilize the harbors are potential sources of noise from the various harbor projects. Heavy trucks and buses which transport materials and personnel to and from the harbor projects must comply with the existing State DOH vehicular noise limits (Reference 4). The noise levels of forklifts, sweepers, and ships are not regulated. New mechanical equipment such as emergency electrical generators, air conditioning cooling towers, air conditioning compressors, exhaust fans, and other ventilating fans are the primary fixed on-site noise sources expected to be located at the harbor project sites. Noise from these fixed mechanical equipment are regulated by the State DOH property line noise limits (Reference 5). Noise from vehicles or fixed mechanical equipment will be difficult to hear at the closest noise sensitive receptors if the noise radiated beyond the harbor property boundaries are at or below the residual background ambient noise levels of approximately 50 to 55 dB, which are controlled by roadway traffic along Nimitz Highway and Ala Moana Boulevard.

Typical noise levels of mobile harbor equipment are between 65 to 85 dB at 100 feet distance. However, the loudest noise source associated with harbor activities are the boat whistles and horns. Whistles and horns of the excursion vessels operating out of Kewalo Basin and Pier 5 were measured at approximately 90 dB at 250 feet distance. The horns of the large cruise ships were measured at Location F at 85 dB at 1,000 feet distance. The horns are intermittent, and are typically sounded prior to sailing or during safety drills. Because of their low frequency characteristics, the horns of the large ships do not interfere with speech communication, but may startle nearby residents.

The location of excursion vessels at Piers 24 to 29 should not cause excessive noise from boat whistles or horns due to the relatively large distances (2,000 feet) to the nearest residential condominiums. Predicted noise levels should be less than 75 dB, which are similar to levels associated with street traffic noise. The relocation of the large cruise ships from Pier 11 to Pier 2 should significantly reduce noise levels at the Harbor Court Condominiums. Condominium units at Waterpark Towers and within Kakaako may experience more frequent ship horn signals. Larger buffer distances to

TABLE 6

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE



residential condominiums of approximately 1,500 feet are available from Pier 2, which should minimize potential noise impacts from the ship horn signals. It should also be noted that use of Pier 2 by large ships is not a new use, but a continuing use. Special noise mitigation measures should not be required for the Piers 24 to 29 or Pier 2 harbor projects, primarily due to their relatively large buffer distances from their nearest noise sensitive neighbors. Adherence to existing State DOH vehicular and property line noise limits, as well as existing construction noise permit and curfew periods should be adequate to minimize potential noise impacts from these harbor projects.

Vibration from Pile Driving. Pile driving will probably be necessary to implant sheet and concrete piles at the harbor project sites. Induced ground vibrations from these pile driving operations have the potential to cause architectural and structural damage to structures.

Ground vibrations generated during pile driving operations are generally described in terms of peak particle (or ground) velocity in units of inches/second. The human being is very sensitive to ground vibrations, which are perceptible at relatively low particle velocities of 0.01 to 0.04 inches/second. Damage to structures, however, occur at even higher levels of vibration as indicated in Table 7. The most commonly used damage criteria for structures is the 2.0 inches/second limit derived from work by the U.S. Bureau of Mines. A more conservative limit of 0.2 inches/ second is also used, and is suggested for planning purposes on this project because of the repetitive nature of pile driving operations which can increase risks of damage due to fatiguing, and particularly if structures are adjacent to pile driving activities.

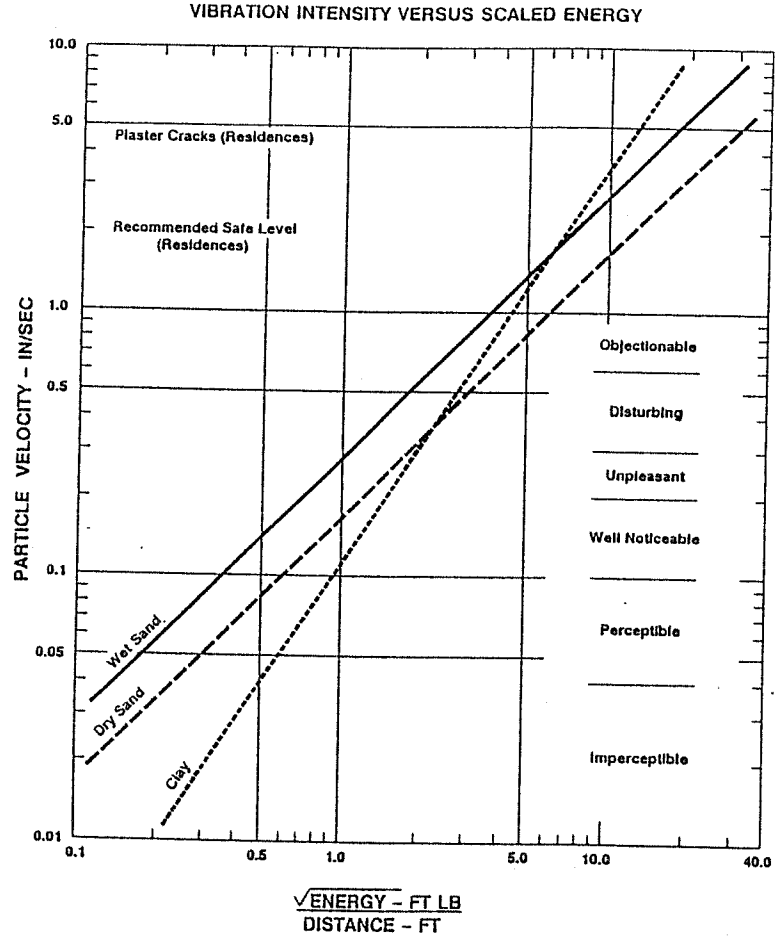
Based on measured vibration levels during pile driving operations under various soil conditions and at various distances, estimates of ground vibration levels vs. distance from the pile driver have been made for various soil conditions and for various energy ratings of the pile drivers. Figure 12, which was extracted from Reference 10, may be used to predict vibration levels for the soil conditions indicated. When coral layers must be penetrated, vibration levels can be expected to be higher than those shown in Figure 12, particularly if the adjacent structures are supported by the common coral layer. From Figure 12, and for wet sand soil conditions, the 0.2 inches/second vibration damage criteria will be exceeded at a scaled energy distance factor of approximately 0.7. The scaled energy distance factor is equal to the square root of the energy (in foot-pounds) per blow of the hammer divided by the distance (in feet) between the pile tip and the monitoring location. For a 30,000 foot-pound pile driver, a scaled energy distance of 0.7 equates to a separation distance of 247 feet. Under clay soil conditions, and using the prediction procedures contained in Figure 12, a shorter separation distance of 115 feet is required to not exceed the 0.2 inches/second criteria when using a 30,000 foot-pound pile driver. It should be noted that 0.2 inches/second vibration levels were measured from a 22,400 foot-pound pile driver at even shorter separation distances of approximately 30 feet in sandy, layered

TABLE 7

SUMMARY OF BUILDING DAMAGE CRITERIA

PEAK GROUND VELOCITY (mm/sec)	PEAK GROUND VELOCITY (in/sec)	COMMENT
193.04	7.6	Major damage to buildings (mean of data).
137.72	5.4	Minor damage to buildings (mean of data).
101.16	4.0	'Engineer structures' safe from damage.
50.8	2.0	Safe from damage limit (probability of damage <5%).
		No structural damage.
33.02	1.3	Threshold of risk of 'architectural' damage for houses.
25.4	1.0	No data showing damage to structures for vibration <1 in./sec.
15.24	0.6	No risk of 'architectural' damage to normal buildings.
10.16	0.4	Threshold of damage in older homes.
5.08	0.2	Statistically significant percentage of structures may experience minor damage (including earthquake, nuclear event, and blast data for old and new structures).
		No 'architectural' damage.
3.81	0.5 to 0.15	Upper limits for ruins and ancient monuments.
1.0	0.04	Vertical vibration clearly perceptible to humans.
0.32	0.01	Vertical vibration just perceptible to humans.

Source: 'State-of-the-Art Review: Prediction and Control of Groundborne Noise and Vibration from Rail Transit Trains'; U.S. Department of Transportation; December 1983.



MINIMUM VIBRATION INTENSITIES EXPECTED FROM PILE DRIVING

FIGURE 11

soil (Reference 11). The measurement data reported in Reference 11 are significantly lower than the vibration levels predicted by the methodology of Reference 10.

As indicated above, predictions of peak ground vibration levels vs. scaled energy distance factor from the driven pile are not precise, with initial uncertainty factor for a given location in the order of 10:1. For this reason, it is standard practice to employ seismograph monitoring of ground vibrations during pile driving operations with a 3-axis geophone or accelerometer. If pile drivers of approximately 30,000 foot-pounds or larger ratings are anticipated to be used on the job site, and the initial vibration predictions indicate that there is some risk of exceeding the 0.2 inches/second vibration damage criteria at nearby structures, then monitoring during pile driving operations is warranted. Monitoring alone, however, may not be a practical mitigation measure unless there are alternative pile driving methods or foundation plans which can be employed if the damage criteria is exceeded. For these reasons, the following preventative measures are recommended for implementation during the planning and design phases of the harbor projects:

- In addition to the normal planning and design concerns regarding potential damage due to settling and heaving during construction, consideration should also be given to risks of damage due to vibration from pile driving. A damage criteria of 0.2 inches/second should be initially used in conjunction with the vibration prediction method of Reference 10 to identify the potential damage risk distances to the driven piles.

- If predicted vibration levels from pile driving exceed 0.2 inches/second at nearby buildings, and predicted levels cannot be reduced by sizing of the pile driver or through the use of alternate types of piles (bored or non-displacement types), test piles should be driven and its vibrations monitored and recorded. The monitoring of the test piles should be designed to measure the expected peak, 3-axis vibration levels at the historic buildings. The results of the monitoring, in addition to the specific types of adjacent structures, should be used to define the empirical distance from the driven pile to the damage risk location, and to reevaluate the risks of structural damage to the adjacent structures during actual construction.

- If predicted vibration levels from pile driving exceed 2.0 inches/second at the adjacent buildings, the use of alternate types of piles should be considered for implementation during the design phase.

APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, 1979.

(3) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety;" Environmental Protection Agency (EPA 550/9-74-004); March 1974.

(4) "Title 11, Administrative Rules, Chapter 42, Vehicular Noise Control for Oahu;" Hawaii State Department of Health; October 24, 1981.

(5) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.

(6) "FHWA Highway Traffic Noise Model User's Guide;" FHWA-PD-96-009, Federal Highway Administration; Washington, D.C.; January 1998.

(7) Draft "Traffic Impact Analysis Report - Honolulu 10/28/98 Harbor 2020 Master Plan;" Phillip Rowell and Associates; August 1998.

(8) 24-Hour Traffic Counts, Station 327, Nimitz Highway at Pacific Street; April 15-18, 1991; Hawaii State Department of Transportation.

(9) 24-Hour Traffic Counts, Station 513, Ala Moana Boulevard at South Street; May 17-18, 1995; Hawaii State Department of Transportation.

(10) Wiss, John F., Janney, Elstner and Assoc.; "Damage of Pile Driving Vibration;" Highway Research Record, Number 155.

(11) Gutowski, T.G., Wittig, L.E., and Dym, C.L.; "Some Aspects of the Ground Vibration Problem;" Noise Control Engineering; May-June 1978.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., decl).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

	TERM	SYMBOL
1.	A-Weighted Sound Level	L_A
2.	A-Weighted Sound Power Level	L_{WA}
3.	Maximum A-Weighted Sound Level	L_{max}
4.	Peak A-Weighted Sound Level	L_{Apk}
5.	Level Exceeded x% of the Time	L_x
6.	Equivalent Sound Level	L_{eq}
7.	Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8.	Day Sound Level	L_d
9.	Night Sound Level	L_n
10.	Day-Night Sound Level	L_{dn}
11.	Yearly Day-Night Sound Level	$L_{dn(Y)}$
12.	Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78,

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

	TERM	A-WEIGHTING	ALTERNATIVE(1) A-WEIGHTING	OTHER(2) WEIGHTING	UNWEIGHTED
1.	Sound (Pressure)(3) Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2.	Sound Power Level	L_{WA}		L_{WB}	L_W
3.	Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4.	Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5.	Level Exceeded x% of the Time	L_x	L_{Ax}	L_{Bx}	L_{px}
6.	Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7.	Equivalent Sound Level (4) Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8.	Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9.	Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10.	Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11.	Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12.	Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13.	Energy Average Value Over (Non-Time Domain) Set of Observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14.	Level Exceeded x% of the Total Set of (Non-Time Domain) Observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15.	Average L_x Value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

AIR QUALITY IMPACT REPORT (AQIR)

Oahu Commercial Harbors 2020 Master Plan EIS
Immediate Phase Projects

23 March 1999

PREPARED FOR:

Wil Chee - Planning, Inc.

PREPARED BY:

J. W. MORROW
Environmental Management Consultant
1481 South King Street, Suite 548
Honolulu, Hawaii 96814

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1. INTRODUCTION

The Harbors Division of the State Department of Transportation is proposing a number of improvement projects in the Honolulu Harbor area (Figure 1) as part of its 2020 Master Plan[1]. Specifically, the following proposed actions have triggered a requirement for environmental impact analysis and review:

- construction of a cruise ship passenger terminal at Pier 2
- construction of finger piers at Piers 12 - 16
- construction of an excursion vessel terminal at Piers 24 - 29
- construction of lay berth facilities in Keehi Lagoon along Lagoon Drive

The purpose of this report is to assess the short and long-term impacts of the proposed actions on local air quality. The actions when taken together can be considered an "indirect source" of air pollution as defined in the federal Clean Air Act[2] since their primary association with air quality is an inherent attraction for mobile sources, i.e., motor vehicles. Much of the focus of this analysis, therefore, is on the project's ability to generate traffic and the resultant impact on air quality. Air quality impact was evaluated for existing (1999) and future (2003) conditions with and without the proposed development.

During construction of the various buildings and facilities air pollutant emissions will also be generated onsite and offsite due to vehicular movement, site preparation, concrete and asphalt batching, and general dust-generating construction activities. These impacts have also been addressed.

2. AIR QUALITY STANDARDS

A summary of State of Hawaii and national ambient air quality standards is presented in Table 1.[3,4] Note that Hawaii's standards are not divided into primary and secondary standards as are the federal standards.

Primary standards are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, man-made materials, animals, wildlife, visibility, climate, and economic values [5].

Some of Hawaii's standards (CO, NO_2, and O_3) are clearly more stringent than their federal counterparts but, like their federal counterparts, may be exceeded once per year. It should also be noted that in November 1993, the Governor signed amendments to Chapter 59, Ambient Air Quality Standards [4], adopting the federal standard for particulate matter equal to or less than 10 microns in diameter (PM_{10}). Since measurement data in Hawaii indicate that PM_{10} comprises about 50% of total

FIGURE 1

PROJECT LOCATION

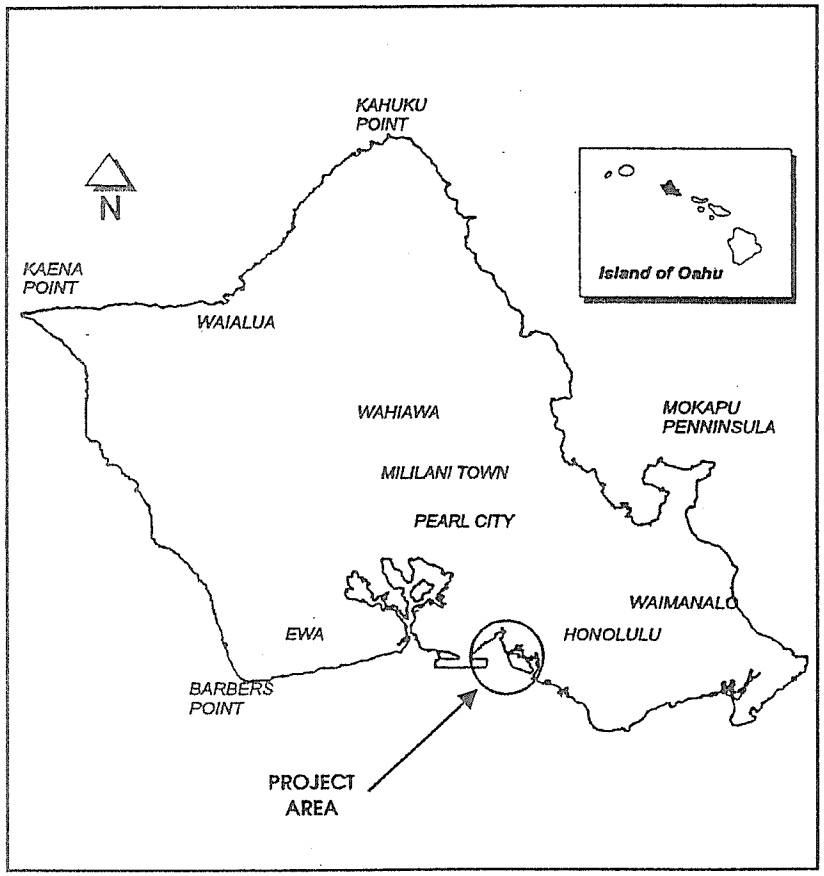


TABLE 1

SUMMARY OF STATE OF HAWAII AND FEDERAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	SAMPLING PERIOD	NAAQS PRIMARY	NAAQS SECONDARY	STATE STANDARDS
PM_{10}	Annual	50	50	50
	24-hr	150	150	150
SO_2	Annual	80	—	80
	24-hr	365	—	365
	3-hr	—	1,300	1,300
NO_2	Annual	100	—	70
CO	8-hr	10	—	5
	1-hr	40	—	10
O_3	1-hr	235	—	100
H_2S	1-hr	—	—	35
Pb	Calendar Quarter	1.5	—	1.5

KEY: PM_{10} - particulate matter < 10 microns
SO_2 - sulfur dioxide
NO_2 - nitrogen dioxide
CO - carbon monoxide
O_3 - ozone
H_2S - hydrogen sulfide
Pb - lead

All concentrations in micrograms per cubic meter ($\mu g/m^3$) except CO in milligrams per cubic meter (mg/m^3).

particulate matter (TSP), the adoption of that federal standard with a numerical value equal to the original state TSP standard of 150 mg/m^3 represented a substantial relaxation of the standard (approximately doubling it). In the case of the automotive pollutants [carbon monoxide (CO), nitrogen dioxide (NO_2), and ozone (O_3)], there are only primary standards.

Until 1983, there was also a hydrocarbons standard which was based on the precursor role hydrocarbons play in the formation of photochemical oxidants rather than any unique toxicological effect they had at ambient levels. The hydrocarbons standard was formally eliminated in January 1983 [6].

The U.S. Environmental Protection Agency (EPA) is mandated by Congress to periodically review and re-evaluate the federal standards in light of new research findings[2]. The latest review resulted in an EPA proposal to tighten the ozone standard from 235 to 160 micrograms/cubic meter (ug/m^3) and also implement $PM_{2.5}$ standards for particulate matter [7]. The carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) standards have been reviewed in the past, but no new standards have been proposed.

Finally, the State of Hawaii also has fugitive dust regulations for particulate matter (PM) emanating from construction activities [8]. There simply can be no visible emissions from fugitive dust sources.

3. EXISTING AIR QUALITY

3.1 General. The state Department of Health (DOH) maintains a limited network of air monitoring stations around the state to gather data on the following regulated pollutants:

- particulate matter ≤ 10 microns (PM_{10})
- total suspended particulate matter (TSP)
- sulfur dioxide (SO_2)
- nitrogen dioxide (NO_2)
- carbon monoxide (CO)
- ozone (O_3)
- lead (Pb)

In the case of PM_{10} , measurements are made on a 24-hour basis to correspond with the averaging period specified in state and federal standards. Samples are collected once every six days in accordance with U.S. Environmental Protection Agency (EPA) guidelines. Carbon monoxide, sulfur dioxide, and ozone, however, are measured on a continuous basis due to their short-term (1- and 3-, and 8-hour) standards. Nitrogen dioxide is measured with continuous instruments and averaged over a full year to correspond to its annual standards. Lead concentrations are determined from particulate matter (TSP) samples.

3.2 Department of Health Monitoring. The DOH monitoring stations nearest to the project area are located at the DOH building on the corner of Punchbowl and Beretania Streets and on Sand Island . A summary of the most recent published air quality data from those stations is presented in Table 2.

TABLE 2

AIR QUALITY DATA
DEPARTMENT OF HEALTH MONITORING SITES
1996

Pollutant		Concentration (µg/m^3)
Particulate matter ≤ 10 microns (PM_{10})	24-hr (max)	28
	Annual	14
Sulfur dioxide (SO_2)	3-hr (max)	73
	24-hr (max)	18
	Annual	3
Carbon monoxide (CO)	1-hr (max)	4.6
	8-hr (max)	2.1
	Annual	0.9
Ozone (O_3)	1-hr (max)	92
	Annual	27
Lead (Pb)	Quarterly (max)	0.0
	Annual	0.0

Notes: 1. CO, TSP, SO_2, and Pb are from the DOH building.
2. O_3 data are from the Sand Island site.
3. CO concentrations in milligrams per cubic meter (mg/m^3)

3.3 Onsite Carbon Monoxide Sampling. In conjunction with this project, air sampling was conducted in December 1998 in the vicinity of key intersections serving the project area. A continuous carbon monoxide (CO) instrument was set up and operated during the a.m. and p.m. peak traffic hours. An anemometer and vane were also installed to record onsite surface winds during the air sampling. A simultaneous manual count of traffic was performed. The variability of each of the parameters measured during the peak hours is clearly seen in Figures 2 - 7.

Weather conditions during the morning peak hour at South Street on 11 December 1998 were characterized by partly cloudy skies and light northeasterly trade winds averaging 2.6 mph. Total traffic along Ala Moana Boulevard fronting the project site was about 93% of the a.m. peak hour volume reported for that street segment in the traffic consultant's report on existing conditions [9]. CO concentrations measured were low, averaging only 2.1 mg/m^3 due in part to the distance of the sampling site from the street (about 30 meters).

On the afternoon of 10 December 1998 at South Street, the northeasterly winds were of slightly greater velocity than they had been in the morning, averaging 4.3 mph. Skies were again partly cloudy. The CO level was lower than the a.m., averaging 1.9 mg/m^3, due primarily to the doubled wind speed since traffic volume was about 15% greater.

At Channel Street on 9 December 1998, the morning weather conditions consisted of light (1.1 mph) northerly winds, overcast skies, and occasional light showers. CO levels were also low averaging 1.6 mg/m^3, due primarily to the northerly winds which did carry vehicle emissions directly toward the sampling site. During the afternoon peak hour at this site on 8 December 1998, winds were light (1.9 mph) and variable between southeasterly and southwesterly resulting again in a low CO level of 1.6 mg/m^3.

During the morning peak hour at Pacific Street on 8 December 1998, weather conditions were mostly cloudy with northeasterly trade winds averaging 2.2 mph. The sampling site was approximately 10 meters from the eastbound lanes of Nimitz Highway, and CO concentrations averaged 3.7 mg/m^3. Afternoon conditions at this site on 7 December 1998 were also overcast but the winds were mostly northerly at 2.6 mph and the traffic volume was about 31% less than in the morning resulting in an average CO level of 1.3 mg/m^3.

4. CLIMATE AND METEOROLOGY

4.1 Temperature and Rainfall. Temperatures in the project area are expected to be similar to those found elsewhere in Hawaii. The nearest long-term weather station operated by the National Weather Service is located at the Honolulu International Airport. In an annual summary for that station, the National Climatic Center has summarized Honolulu's temperature regime as follows:

> *Hawaii's equable temperatures are associated with the small seasonal variation in the amount of energy received from the sun and the tempering effect of the surrounding ocean. The range of temperatures averages only 7 degrees between the warmest months*

FIGURE 2

A.M. PEAK HOUR CONDITIONS
ALA MOANA BOULEVARD AT SOUTH STREET
11 DECEMBER 1998

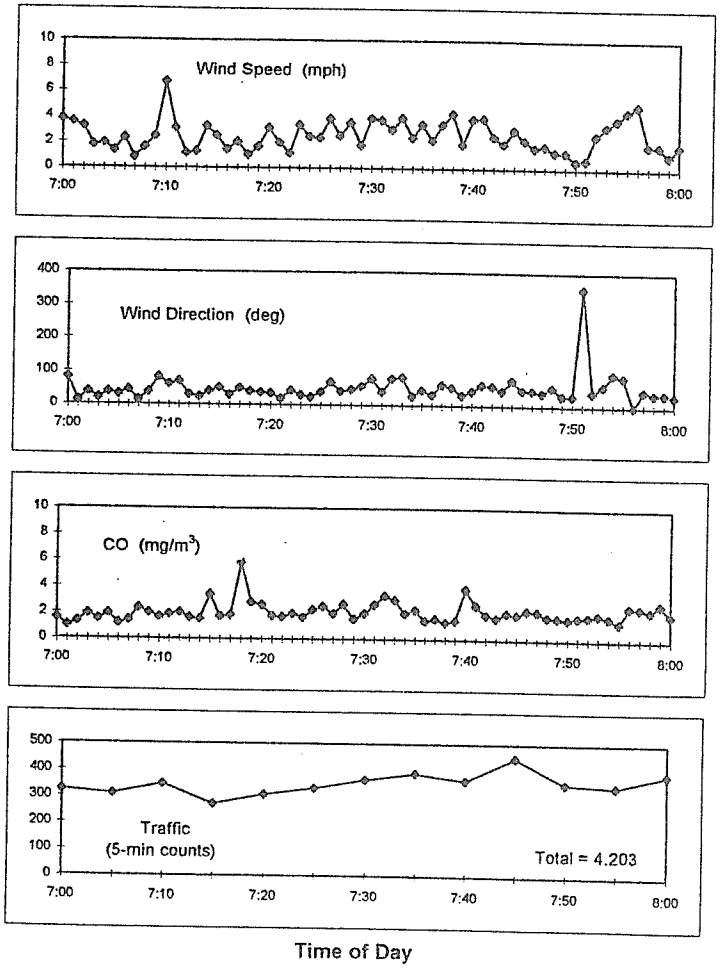


FIGURE 3

P.M. PEAK HOUR CONDITIONS
ALA MOANA BOULEVARD AT SOUTH STREET
10 DECEMBER 1998

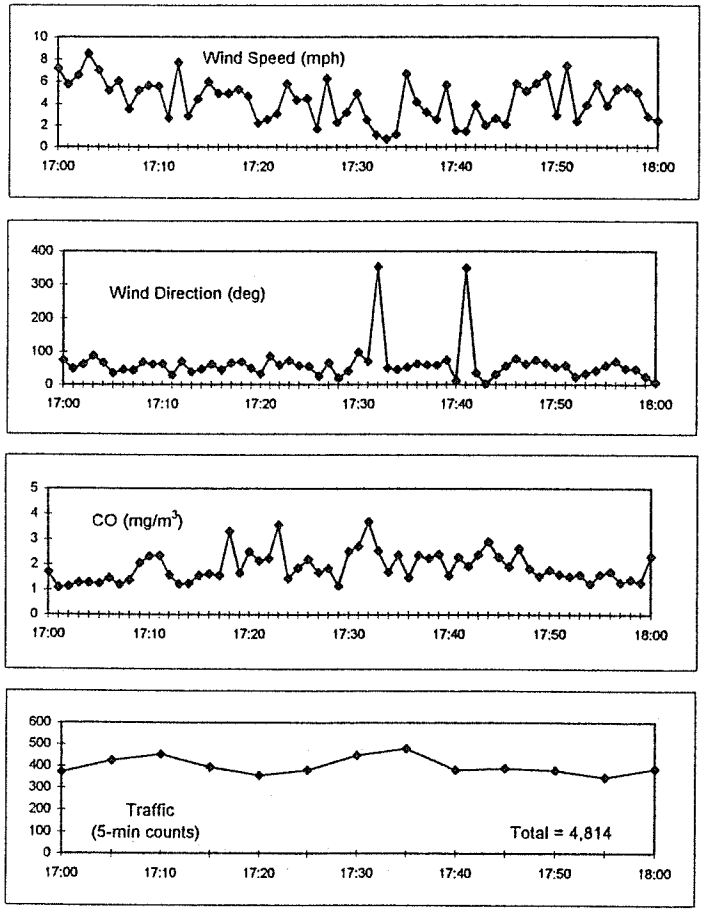


FIGURE 4

A.M. PEAK HOUR CONDITIONS
ALA MOANA BOULEVARD AT CHANNEL STREET
9 DECEMBER 1998

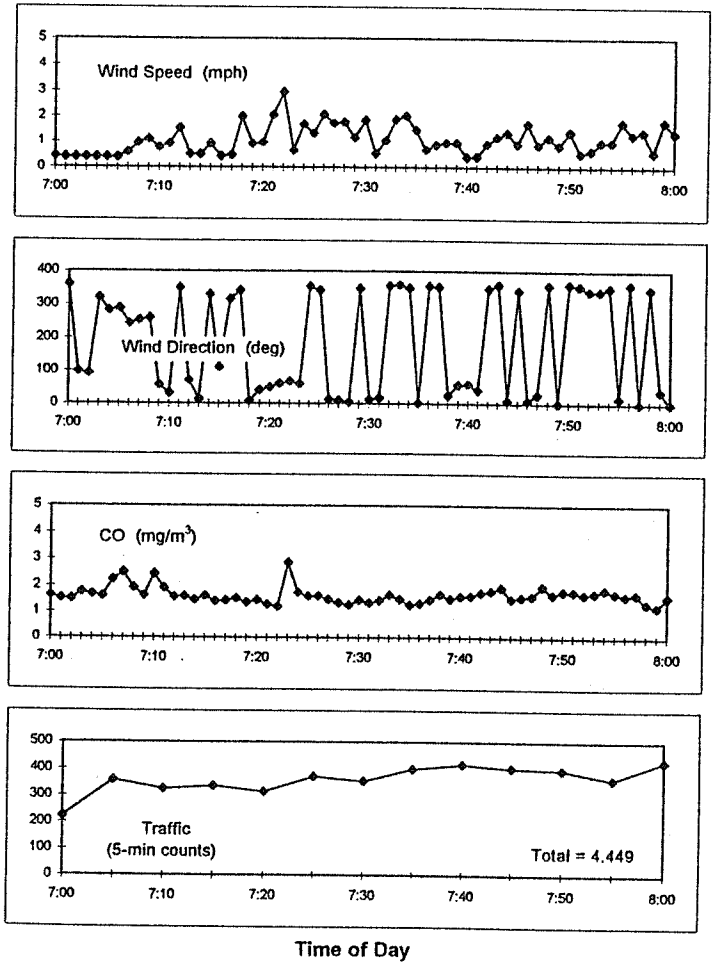


FIGURE 5

P.M. PEAK HOUR CONDITIONS
ALA MOANA BOULEVARD AT CHANNEL STREET
8 DECEMBER 1998

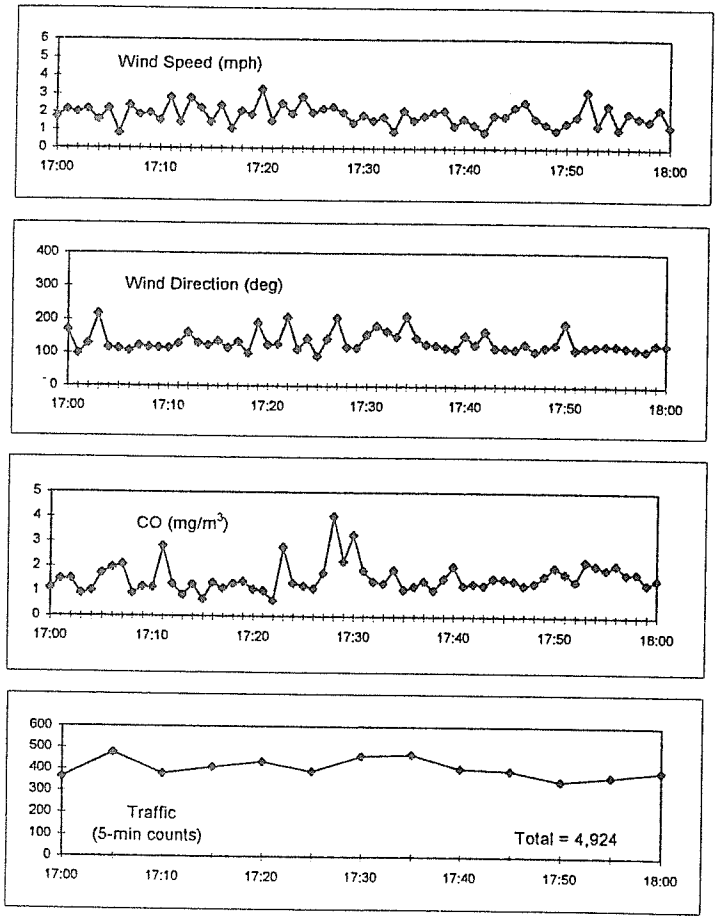


FIGURE 6

A.M. PEAK HOUR CONDITIONS
NIMITZ HIGHWAY AT PACIFIC STREET
8 DECEMBER 1998

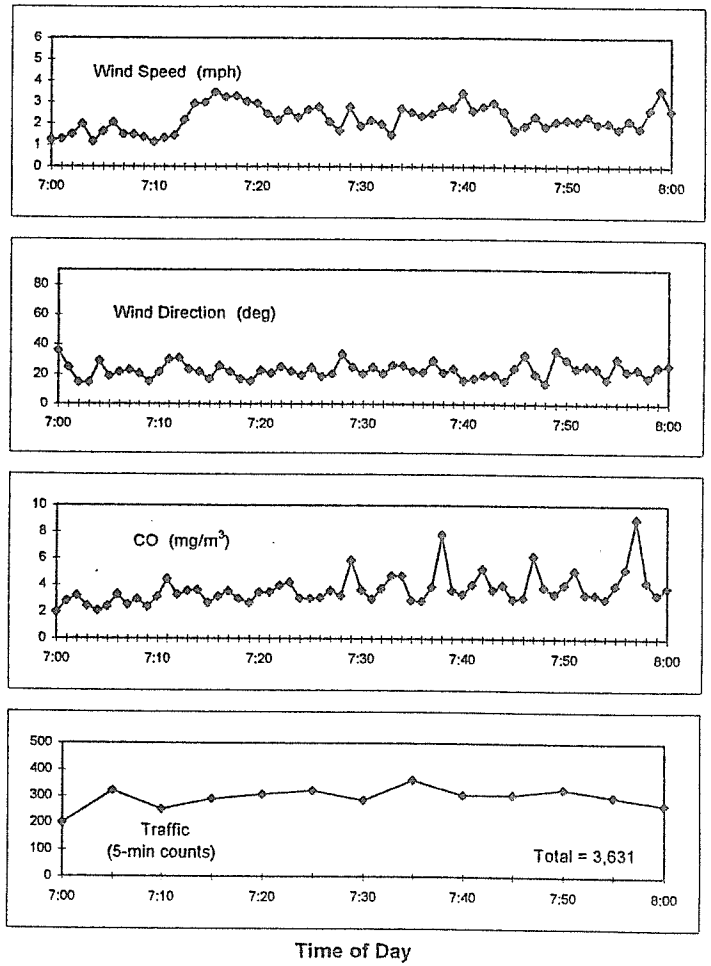
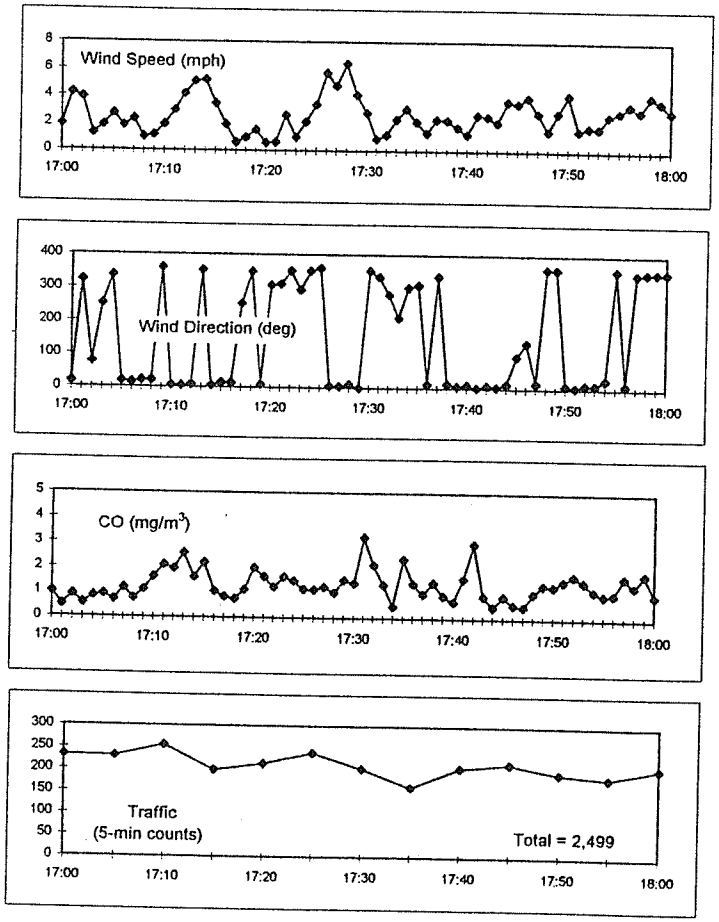


FIGURE 7

P.M. PEAK HOUR CONDITIONS
NIMITZ HIGHWAY AT PACIFIC STREET
7 DECEMBER 1998



(August and September) and the coolest months (January and February) and about 12 degrees between day and night. Daily maximums run from the high 70's in winter to the mid-80's in summer, and daily minimums from the mid-60's to the low 70's. However, the Honolulu Airport area has recorded as high as 93 degrees and as low as 53 [10].

Historical data from the National Weather Service at Honolulu International Airport indicate that annual rainfall on the leeward side of Oahu averages 22.0 inches [11]. In accordance with Thornwaite's scheme for climatic classification, the area would therefore be considered semi-arid with a precipitation - evaporation (P/E) Index of 28.9 [12].

4.2 Surface Winds. Meteorological data records were reviewed from the Honolulu International Airport and Hickam Air Force Base. The annual prevalence of northeast trade winds is clearly shown in Table 3. A closer examination of the data, however, indicates that low velocities (less than 10 mph) occur frequently and that the "normal" northeasterly trade winds tend to break down in the Fall giving way to more light, variable wind conditions through the Winter and on into early Spring. It is during these times that Honolulu generally experiences elevated pollutant levels. This seasonal difference in wind conditions can be easily contrasted by comparing August and January wind roses (Figures 8 and 9). Of particular interest from an air pollution standpoint were the stability wind roses prepared for Hickam Air Force Base [13]. These data indicated that stable conditions, i.e., Pasquill-Gifford stability categories E and F [14], occur about 28% of the time on an annual basis and 36% of the time during the peak winter month (January). It is under such conditions that the greatest potential for air pollutant buildup from groundlevel sources, e.g., motor vehicles, exists.

5. SHORT-TERM IMPACTS

5.1 Onsite Impacts. The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing streets as well as on the project site itself. Since many segments of Ala Moana Boulevard are currently operating at a level of service (LOS) "D" during peak traffic hours [9], additional construction vehicle traffic during those hours would aggravate that situation and lengthen delays.

Site preparation will create particulate emissions as will construction of the building itself. Construction vehicles movement onsite will also generate particulate emissions. EPA studies on fugitive dust emissions from construction sites indicate that about 1.2 tons/acre per month of activity may be expected under conditions of medium activity, moderate soil silt content (30%), and a precipitation/ evaporation (P/E) index of 50 [12, 15]. Applied to the project with the largest acreage, i.e., the Excursion Vessel Terminal (15.4 acres), that rate would equate to 18.5 tons per month of construction activity, 0.92 tons per day based on a 5-day work-week, and 15 pounds per hour per acre based on an 8-hour work-day

The semi-arid local climate (P/E Index = 28.9) suggests a greater potential for fugitive dust emissions than estimated using EPA's P/E Index of 50. With the following "worst case" adjustment for climate, the revised emission rate becomes:

$$50/26.9 \times 18.5 = 32.0 \text{ T/mo or } 25.9 \text{ lb/hr per acre}$$

TABLE 3

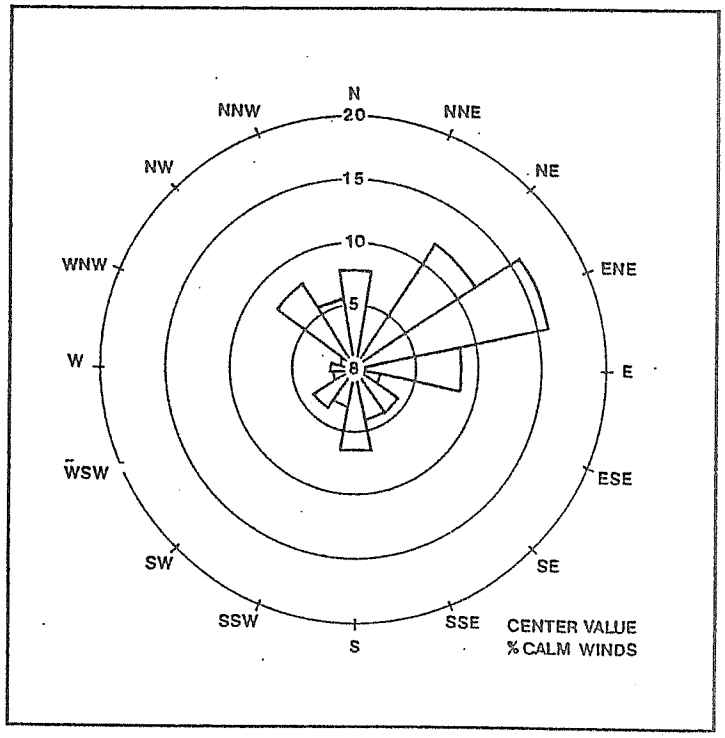
ANNUAL JOINT FREQUENCY DISTRIBUTION
OF WIND SPEED AND DIRECTION
HONOLULU INTERNATIONAL AIRPORT

	Wind Speed (m/sec)						
Dir (deg)	< 3.1	< 4.5	< 5.8	< 7.2	< 8.5	>/= 8.5	All
10	0.0065	0.0038	0.0023	0.0016	0.0009	0.0001	0.0151
20	0.0082	0.0041	0.0025	0.0023	0.0011	0.0001	0.0183
30	0.0100	0.0061	0.0051	0.0038	0.0028	0.0007	0.0286
40	0.0188	0.0157	0.0258	0.0222	0.0174	0.0040	**0.1039**
50	0.0268	0.0290	0.0449	0.0385	0.0307	0.0054	**0.1752**
60	0.0344	0.0289	0.0436	0.0273	0.0238	0.0041	**0.1621**
70	0.0250	0.0181	0.0197	0.0122	0.0096	0.0009	**0.0855**
80	0.0113	0.0081	0.0065	0.0039	0.0009	0.0003	0.0310
90	0.0073	0.0049	0.0040	0.0009	0.0008	0.0000	0.0179
100	0.0031	0.0016	0.0014	0.0006	0.0002	0.0000	0.0068
110	0.0027	0.0019	0.0010	0.0007	0.0005	0.0001	0.0069
120	0.0027	0.0013	0.0019	0.0009	0.0003	0.0003	0.0075
130	0.0022	0.0032	0.0018	0.0015	0.0007	0.0002	0.0096
140	0.0034	0.0033	0.0039	0.0018	0.0011	0.0006	0.0141
150	0.0022	0.0030	0.0019	0.0003	0.0002	0.0005	0.0081
160	0.0024	0.0033	0.0023	0.0010	0.0005	0.0000	0.0094
170	0.0031	0.0046	0.0023	0.0007	0.0003	0.0000	0.0109
180	0.0055	0.0042	0.0018	0.0008	0.0005	0.0000	0.0128
190	0.0065	0.0038	0.0013	0.0002	0.0000	0.0000	0.0117
200	0.0057	0.0032	0.0011	0.0001	0.0000	0.0000	0.0101
210	0.0076	0.0038	0.0016	0.0001	0.0000	0.0000	0.0131
220	0.0083	0.0077	0.0016	0.0001	0.0001	0.0000	0.0179
230	0.0076	0.0049	0.0014	0.0001	0.0001	0.0000	0.0141
240	0.0042	0.0016	0.0013	0.0000	0.0000	0.0000	0.0071
250	0.0040	0.0010	0.0003	0.0000	0.0000	0.0000	0.0054
260	0.0064	0.0023	0.0005	0.0000	0.0000	0.0000	0.0091
270	0.0065	0.0010	0.0005	0.0002	0.0000	0.0000	0.0082
280	0.0099	0.0005	0.0002	0.0000	0.0000	0.0000	0.0106
290	0.0123	0.0003	0.0002	0.0001	0.0000	0.0000	0.0130
300	0.0167	0.0018	0.0011	0.0000	0.0000	0.0000	0.0197
310	0.0235	0.0022	0.0015	0.0001	0.0000	0.0000	0.0272
320	0.0200	0.0022	0.0013	0.0006	0.0001	0.0000	0.0241
330	0.0121	0.0023	0.0011	0.0005	0.0000	0.0000	0.0159
340	0.0094	0.0010	0.0003	0.0001	0.0000	0.0000	0.0109
350	0.0082	0.0025	0.0016	0.0002	0.0000	0.0000	0.0125
360	0.0093	0.0027	0.0022	0.0006	0.0005	0.0001	0.0154
All	0.3537	0.1898	0.1917	0.1240	0.0932	0.0174	0.9698
						Calms:	0.0302

SOURCE: National Weather Service, 1992

FIGURE 8

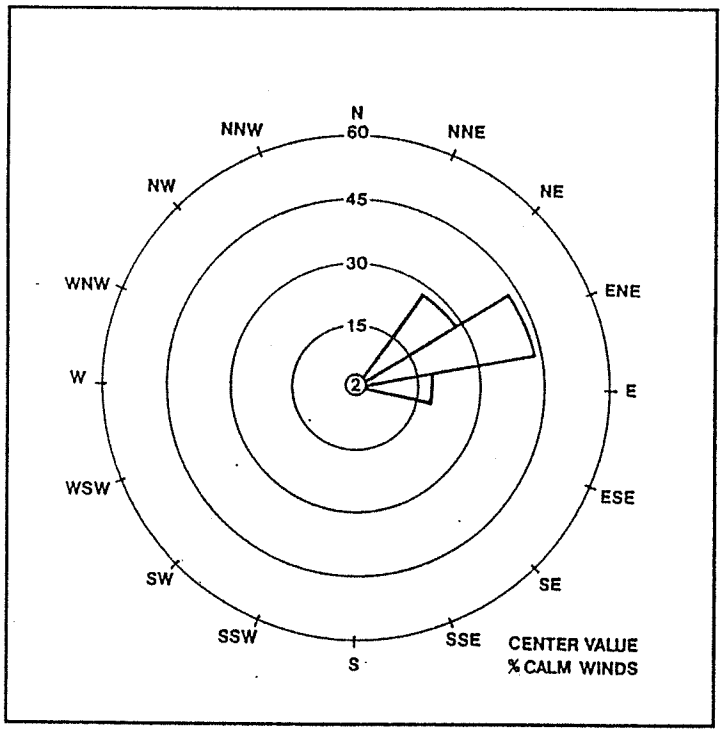
JANUARY WIND ROSE
HONOLULU INTERNATIONAL AIRPORT



SOURCE: National Weather Service
Historical Records, 1940-57

FIGURE 9

AUGUST WIND ROSE
HONOLULU INTERNATIONAL AIRPORT



SOURCE: National Weather Service
Historical Records, 1940-57

Using this adjusted emission rate, the EPA guideline dispersion model, ISC3 [16, 17], and one year of Honolulu meteorological data preprocessed for modeling use [18], an analysis was conducted to estimate particulate matter (PM_{10}) impacts in the area surrounding the construction site. Eight-hour concentrations were computed, mathematically combined with the maximum 24-hour concentration reported at the DOH monitoring station (Table 2), and then compared with the State and Federal 24-hour standards (Table 1). The result indicated a *worst-case* concentration of 43 $\mu g/m^3$, a level well below the 150 $\mu g/m^3$ standard.

5.2 Offsite Impacts. In addition to the onsite impacts attributable to construction activity, there will also be offsite impacts due to the operation of concrete and asphalt batching plants needed for construction. Such plants routinely emit particulate matter and other gaseous pollutants. It is too early, however, to identify the specific facilities that will be providing these materials and thus the discussion of air quality impacts is necessarily generic. The batch plants which will be producing the concrete for foundations, curbing, etc. and the asphalt for roadways must be permitted by the Department of Health Clean Air Branch pursuant to state regulations [8]. In order to obtain these permits they must demonstrate their ability to continuously comply with both emission [8] and ambient air quality [4] standards. Under the recently promulgated federal Title V operating permit requirements[19], now incorporated in Hawaii's rules [8], air pollution sources must regularly attest to their compliance with all applicable requirements.

6. MOBILE SOURCE IMPACTS

6.1 Mobile Source Activity. The traffic impact analysis [9] prepared for the proposed project served as the primary basis for this mobile source impact analysis. Existing peak-hour traffic volumes and projections for 2003 for the principal intersections serving the project area were provided in that report. This analysis focused on those same Ala Moana Boulevard/Nimitz Highway intersections, i.e., South Street, Channel Street, Punchbowl Street and Pacific Street. The traffic study along with State DOT Highways Division 24-hour traffic counts permitted development of 24-hour traffic scenarios for each intersection. Existing conditions at the intersections are depicted in Figures 10 - 13.

6.2 Emission Factors. Automotive emission factors for carbon monoxide (CO) were generated for calendar years 1999 and 2003 using the Mobile Source Emissions Model (MOBILE-5B) [20]. To localize the emission factors as much as possible, the March 1992 age distribution for registered vehicles in the City & County of Honolulu [21] was used in lieu of national statistics. That same age distribution was the basis for the distribution of vehicle miles traveled as well.

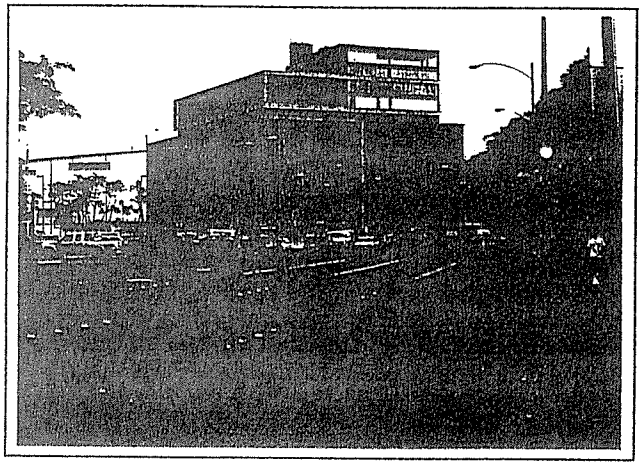
6.3 Modeling Methodology. Due to the present state-of-the-art in air quality modeling, analyses such as this generally focus on estimating concentrations of non-reactive pollutants. For projects involving mobile sources as the principal source, carbon monoxide is normally selected for modeling because it has a relatively long half-life in the atmosphere (ca. 1 month)[22], and it comprises the largest fraction of automotive emissions.

A version of the EPA guideline model CAL3QHC [16, 23, 24] designed for refined analysis was employed to estimate near-intersection carbon monoxide concentrations. One year of preprocessed [18] Honolulu

FIGURE 10

EXISTING SITE CONDITIONS
ALA MOANA BOULEVARD AT SOUTH STREET

South Street
(facing southwest)

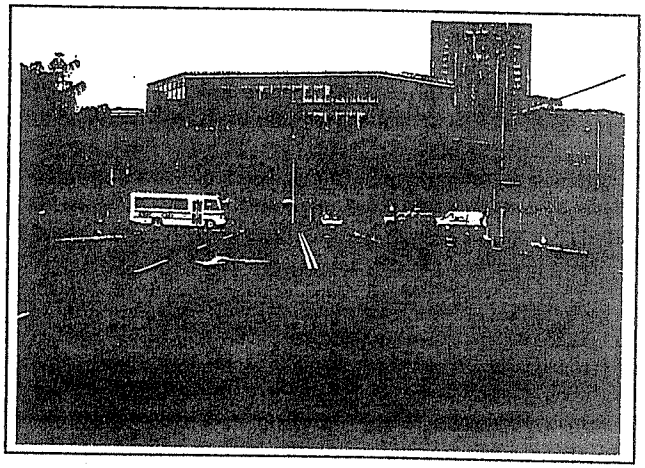


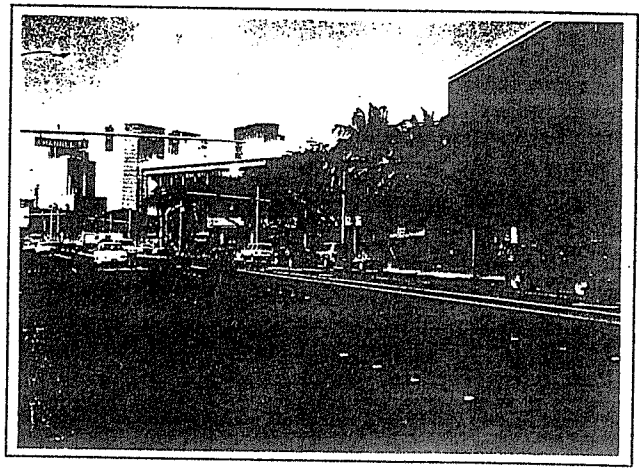
Ala Moana Boulevard
(facing south)

FIGURE 11

EXISTING SITE CONDITIONS
ALA MOANA BOULEVARD AT CHANNEL STREET

Channel Street
(facing east)



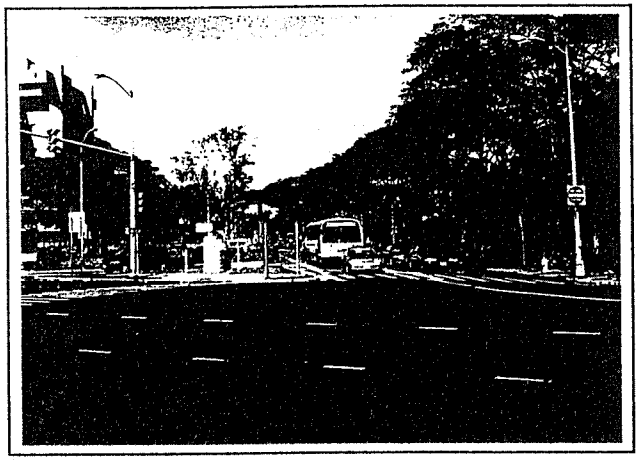


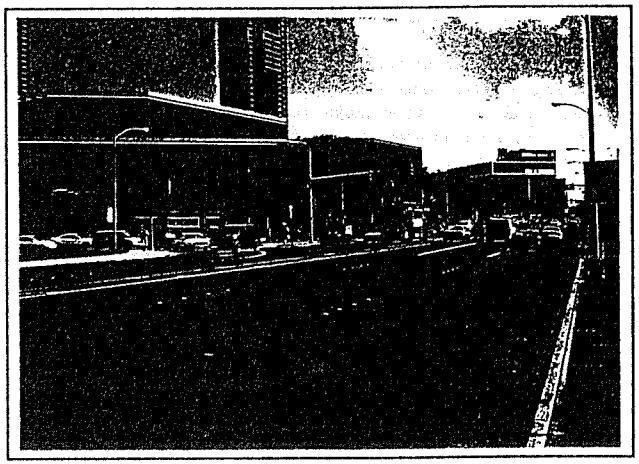
Ala Moana Boulevard
(facing north)

FIGURE 12

EXISTING SITE CONDITIONS
ALA MOANA BOULEVARD AT PUNCHBOWL STREET

South Street
entering Ala Moana Blvd
(facing northeast)



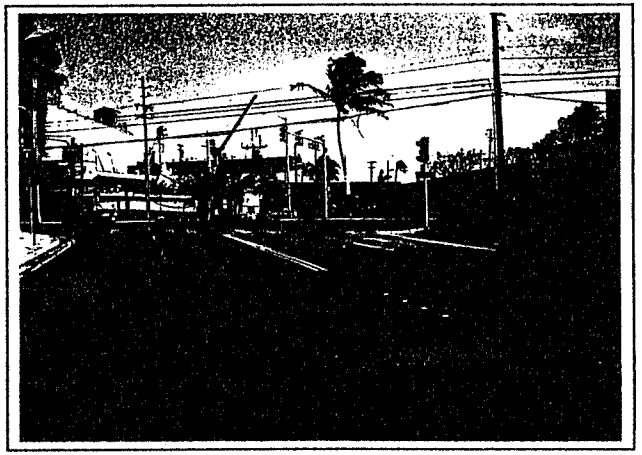


Ala Moana Boulevard
(facing south)

FIGURE 13

EXISTING SITE CONDITIONS
NIMITZ HIGHWAY AT PACIFIC STREET

Pacific Street
(facing south)



Nimitz Highway
(west-bound lanes
facing east)

meteorological data was used as model input. An array of 20 to 40 receptor sites at 10 meters from the road edge were entered in the model. Because the area is urban, a background CO concentration of 1.0 milligrams per cubic meter (mg/m^3) was assumed. This refined model, referred to as CALQHC3R, is capable of computing maximum 1-hour and 8-hour concentrations at each receptor location based on the full year of hourly meteorological and traffic data input.

6.4 Results: 1-Hour Concentrations. The results of this modeling are presented in Figures 14 - 17. Each figure depicts the locations of the receptor sites around the respective intersections. Maximum estimated concentrations in milligrams per cubic meter (mg/m^3) for each of the evaluated scenarios are also presented along with the particular receptor location at which they were predicted.

The results suggest that, under all conditions of meteorology and traffic throughout the year, both the federal and state 1-hour CO standards would be met at most receptor locations in close proximity (10 meters) to the intersection. Only during the a.m. peak hour at a few receptors in the southeast corner of the Punchbowl intersection did there appear to be a possible exceedance of the State 1-hour standard. There were 2 - 4 exceedances per year at these receptors. Beyond 10 meters the standards appear to be met at all locations. It should also be noted that the predicted exceedances appear to be already occurring under existing conditions and the number of exceedances does not change in the future even with the proposed project. The differences in maximum 1-hour CO concentrations under the "existing", "without project" and "with project" scenarios were so small as to be insignificant.

6.5 Results: 8-Hour Concentrations. The 8-hour results, also presented in Figures 14 - 17, are similar to the 1-hour findings. The federal standard is met at all locations, but there appears to be a possibility of exceedance of the state standard in the same southeast corner of the Punchbowl intersection cited above. Beyond 10 meters there appears to be little chance of exceeding even the stringent state standard.

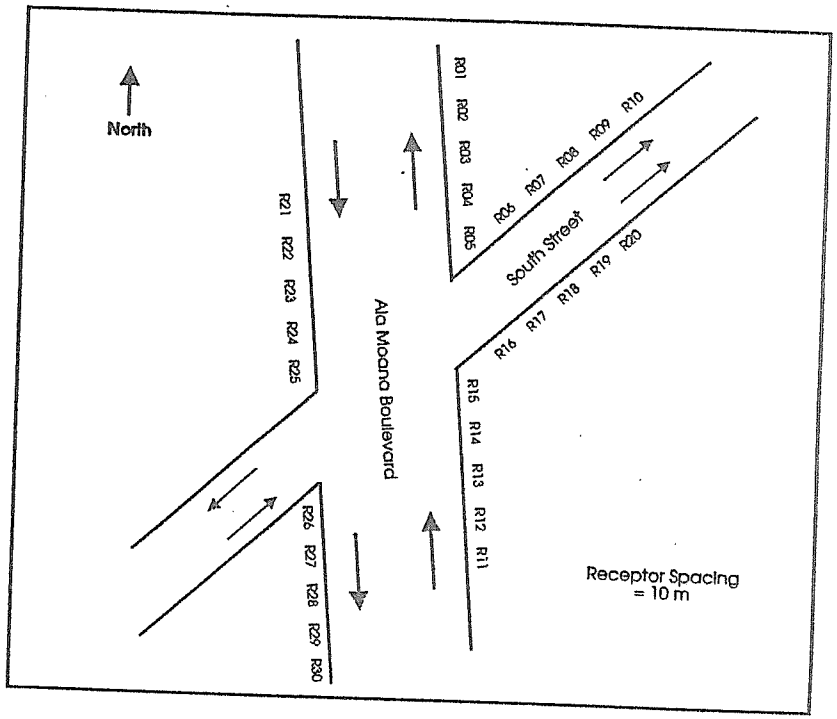
6.6 Parking Facility. The two parking lots (400 stalls total) associated with the proposed Cruise Ship Passenger Terminal are not expected to contribute significantly to overall air quality in the area due to the relatively small number and intermittent arrivals and departures of cruise ships throughout the year in contrast to a normal municipal parking facility which is likely to be actively used on a daily basis. Also, as noted in the traffic report[9], peak traffic activity associated with ship arrivals/departures does not normally coincide with peak traffic hours on the adjoining street network, thereby limiting its impact on air quality since such impact is largely a function of traffic congestion.

7. DISCUSSION, CONCLUSIONS AND MITIGATION

7.1 Short-Term Impacts. Since, as noted above, the project area is considered semi-arid by Thornwaite's classification system, there is an increased potential for fugitive dust. It will be very important to employ adequate dust control measures during the construction period. Dust control could be accomplished through frequent watering of unpaved roadways and areas of exposed soil. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50% [15]. The soonest possible landscaping of completed areas will also help.

FIGURE 14

ESTIMATES OF MAXIMUM 1- AND 8-HOUR CARBON MONOXIDE CONCENTRATIONS
Ala Moana Boulevard at South Street
Peak Traffic Hours
1999 - 2003

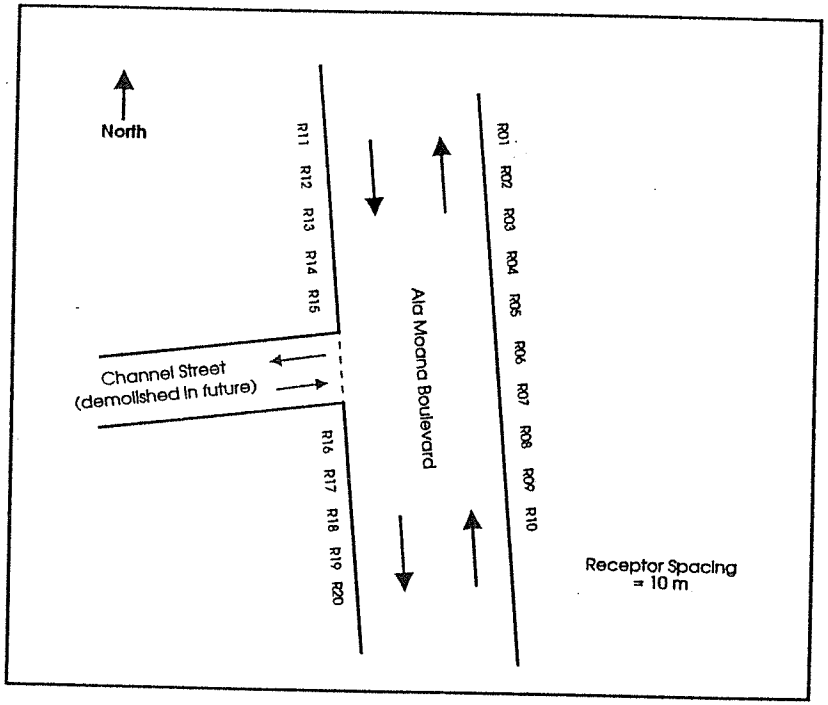


HIGHEST OF SECOND HIGHEST CONCENTRATIONS
(mg/m^3)

Period	1999	2003 w/o project	2003 w/project	Receptors
A.M.	5.7	5.7	5.7	R16
P.M.	5.3	5.2	5.3	R05
8-Hr	3.3	3.4	3.5	R05

FIGURE 15

ESTIMATES OF MAXIMUM 1- AND 8-HOUR
CARBON MONOXIDE CONCENTRATIONS
Ala Moana Boulevard at Channel Street
Peak Traffic Hours
1999 - 2003

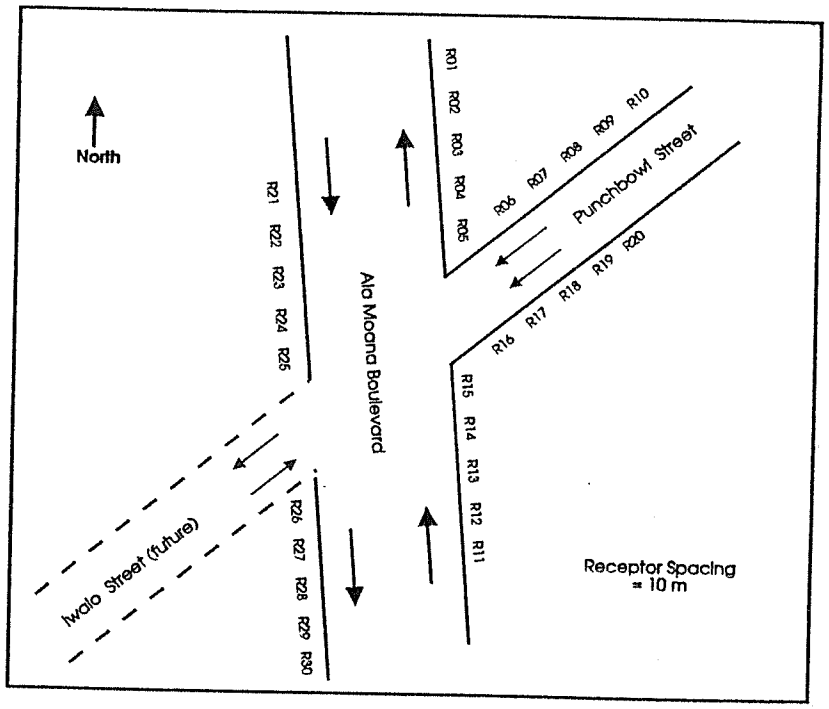


HIGHEST OF SECOND HIGHEST CONCENTRATIONS
(mg/m^3)

Period	1999	2003 w/o project	2003 w/project	Receptors
A.M.	7.4	8.3	4.4	R16,R10
P.M.	4.7	4.1	4.1	R15,R5,R16
8-Hr	3.4	3.6	2.6	R16,R8

FIGURE 16

ESTIMATES OF MAXIMUM 1- AND 8-HOUR
CARBON MONOXIDE CONCENTRATIONS
Ala Moana Boulevard at Punchbowl Street
Peak Traffic Hours
1999 - 2003

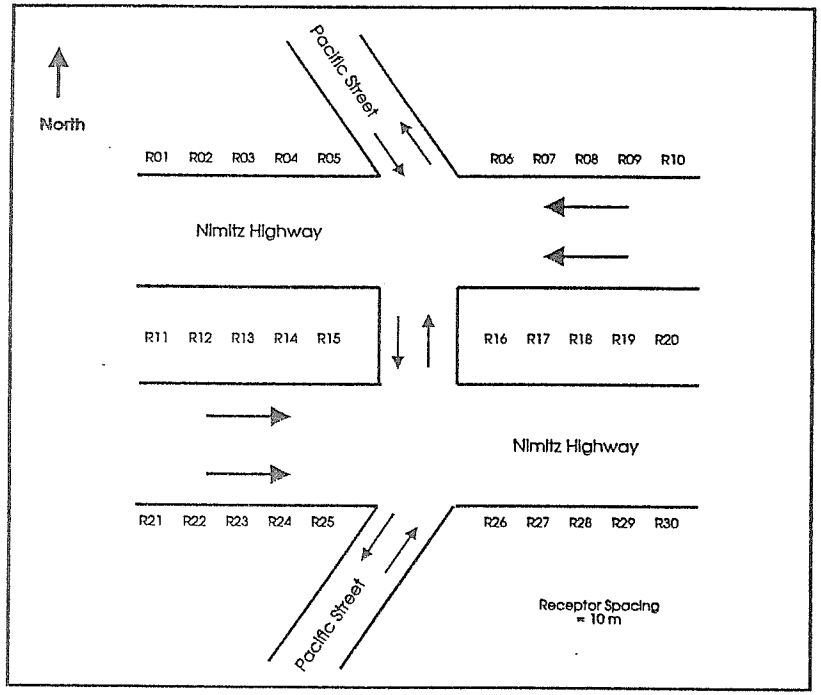


HIGHEST OF SECOND HIGHEST CONCENTRATIONS
(mg/m^3)

Period	1999	2003 w/o project	2003 w/project	Receptors
A.M.	10.4	10.1	10.4	R16,R15
P.M.	8.9	8.8	8.9	R5,R10
8-Hr	5.3	5.3	5.7	R05

FIGURE 17

ESTIMATES OF MAXIMUM 1- AND 8-HOUR
CARBON MONOXIDE CONCENTRATIONS
Nimitz Highway at Pacific Street
Peak Traffic Hours
1999 - 2003



HIGHEST OF SECOND HIGHEST CONCENTRATIONS
(mg/m^3)

Period	1999	2003 w/o project	2003 w/project	Receptors
A.M.	4.8	5.1	5.3	R16
P.M.	4.3	4.5	4.7	R15,R14
8-Hr	2.6	2.8	3.0	R06,R07

If construction vehicle activity is limited to off-peak hours, then its effects of lowering average speeds, reducing level of services (LOS), and increasing vehicle emissions can be greatly diminished.

7.2 Mobile Source Impacts. As noted in Section 6, both federal and state carbon monoxide standards are generally met during the a.m. and p.m. peak traffic hours which represent the *worst case* hours of the day. Only during the a.m. peak hour within 10 meters of the street at a few locations in the southeast corner of the Punchbowl intersection were exceedances predicted. The two to three predicted exceedances per year at any one of these receptor locations, if actually occurring, would amount to 0.023 - 0.034% of the hours in a year. At all locations beyond 10 meters from the Punchbowl intersection and at all receptors at the other intersections the standards are predicted to be met during the 8,760 hours of the year.

7.3 Conclusions. The following conclusions may be drawn from the foregoing analysis:

- While there will be short-term construction-related impacts on air quality, they can be adequately mitigated to prevent violations of standards or air pollution control rules.
- The project's impact on air quality in the vicinity of major intersections serving the project area will be minimal and will not threaten or contribute to violations of national ambient air quality standards (NAAQS).
- The project will contribute minimally to the overall growth in traffic which is already causing carbon monoxide (CO) levels to approach and possibly exceed the state's 1-hour CO standard in close proximity to the Punchbowl Street - Ala Moana Boulevard intersection during two or three hours per year.
- The state's 8-hour CO standard may also be exceeded on those same two or three days when the 1-hour standard is exceeded, but the proposed project will not aggravate those exceedances.

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Aquatic Habitat and Water Quality Impact Assessment for the Oahu Commercial Harbors 2020 Master Plan EIS

Prepared for:

Wil Chee - Planning, Inc.
1400 Rycroft Street, Suite 928
Honolulu, Hawaii 96814

Prepared by:

Eric B. Guinther
and
S. Allen Cattell

AECOS, Inc.
970 North Kalaheo Avenue
Suite C311
Kailua, Hawaii 96734
Phone: (808) 254-5884
Fax: (808) 254-3029

May 18, 1999

A review of existing aquatic habitat and water quality, and impacts assessment for the Oahu Commercial Harbors 2020 Master Plan EIS[1]

May 18, 1999 | *FINAL REPORT* | *AECOS* No. 904

S. Allen Cattell & Eric B. Guinther
AECOS, Inc. 970 N. Kalaheo Ave., Suite C311
Kailua, Hawai'i 96734
Phone: (808) 254-5884 Fax: (808) 254-3029 Email: aecos@aecos.com

Introduction

This report provides a description of extant aquatic (marine and brackish water) habitat and water quality in Honolulu Harbor and adjacent Ke`ehi Lagoon for the *Oahu Commercial Harbors 2020 Master Plan, Immediate Phase EIS.* The report provides a review of past biological and water quality surveys conducted in the project areas. This technical support document is one of several prepared for the EIS.

Honolulu Harbor originally was developed over a century ago along a channel through the reef created by Nu`uanu Stream. Dredging over the years gradually increased the size and depth of the harbor basin and entrance channel (Honolulu or Fort Armstrong Channel). Dredged fill was used to create fast land, particularly on the seaward reef at Sand Island (formerly Anuenue Island). The Kapalama Basin, also once a natural break in the reef, was eventually joined to the Honolulu Basin by dredging a channel between them. The expansion of fill areas across the inner reef flats to the south and west resulted in a harbor with generally poor circulation and attendant water quality problems (Cox and Gordon, 1970). In 1960, the western entrance channel (Kalihi Channel) was opened to Kapalama Basin, substantially improving circulation within the latter basin and Honolulu Harbor as a whole. Circulation appears to have benefited still further with changes to the bathymetry made in Ke`ehi Lagoon by the Reef Runway Project (Noda, 1979; *AECOS*, 1991).

[1] Report prepared for Wil Chee — Planning, Inc. for the "Environmental Impact Statement for the Oahu Commercial Harbors 2020 Master Plan, Immediate Phase, Oahu Island, Hawaii" This report will become part of the public record.

Honolulu Harbor is the primary commercial harbor for ship traffic in and out of Hawai`i. Sand Island borders it to the south and extensive commercial and industrial areas occur on all sides. Honolulu Harbor is classified as a Class A embayment by the State of Hawaii, Department of Health (HAR, §11-54; DOH, 1992).

Ke`ehi Lagoon was once a large, shallow reef flat west of Honolulu Harbor that was part of the fringing reef all along the south coast of O`ahu. The Kalihi Channel was a natural, narrow break in the reef margin that provided an outlet for brackish water from Kalihi and Moanalua Streams. Lands surrounding Ke`ehi Lagoon are part of the Honolulu coastal plain (Stearns, 1966) and are primarily composed of marine sediments. The shoreline of Ke`ehi Lagoon itself has undergone extensive and repeated modifications so that none of the original natural shoreline now exists. Prior to the 1940s the lagoon could be characterized as generally not navigable tidal flats surrounded by ancient fishponds built by the native population. Because the shallow fringing reef to seaward created calm conditions closer to shore, three large seaplane runways were dredged out of the shallow, back reef area. These have been enlarged on occasion, and the spoil used for nearby land fill and shoreline modification. The channels remain the most conspicuous physical modifications to the lagoon, and their influence on water circulation patterns and flushing, and consequently on water quality, is substantial . The central portion of the lagoon, inside the triangular area created by the seaplane runways, includes some shallow tidal flat, although most of this area has been used as a borrow (source of fill material). Most of the remaining reef flat is found seaward of the seaplane channels.

Opening of a western entrance channel into Honolulu Harbor required dredging a channel through the reef across the mouth of Ke`ehi Lagoon. Later, construction of the Reef Runway resulted in significant alterations to the seaward boundary of Ke`ehi Lagoon. Ahua Point essentially no longer exists. A large portion of the fringing reef adjacent to the point was covered, borrow areas established, and a circulation channel dredged past the eastern end of the new runway and through the reef. Circulation in Ke`ehi Lagoon was greatly improved with the construction of the Reef Runway (Noda, 1979). At about the same time, sewage discharge from the nearshore waters of Sand Island was diverted offshore greatly enhancing the water quality conditions in Honolulu Harbor, Kapalama Basin and Ke`ehi Lagoon.

Ke`ehi Lagoon is a major marine thoroughfare for both commercial and recreational boat traffic, and is home for many live-aboard boats. The lagoon is heavily used for fishing, crabbing and recreational water sports. Ke`ehi Lagoon is bordered by major industrial areas and marina facilities, as well as by the Honolulu International Airport, which lies along the northern and western side of the lagoon. Ke`ehi Lagoon is classified as a Class A embayment (HAR §11-54; DOH 1992).

The Watersheds

Honolulu Harbor receives stream flow from Nu`uanu Stream which is joined by Pauoa and Waiolani Streams before flowing into the main harbor basin between Piers 15 and 16. The Nu`uanu watershed encompasses about 6,557 acres (10.24 mi²) and is divided nearly equally into conservation and urban land uses (GDSI, 1994) (Table 1).

Table 1. Watershed characteristics for major streams draining into the Ke`ehi - Kapalama - Honolulu Harbor complex (after GDSI, 1994).

	Stream				
	Nu`uanu	Kapalama	Kalihi	Moanalua	Ke`ehi
drainage area (acres)	6,557	2140	3,976	6,778	1,578
drainage area (sq. mi.)	10.24	3.34	6.20	10.59	2.46
% agricultural	0	0	0	0	0
% conservation	51	15	61	65	19
% urban	49	85	39	35	81
% rural	0	0	0	0	0

The Kapalama watershed, which is drained by Kapalama Stream, is about a third of the size of the Honolulu Harbor watershed. Conservation lands comprise about 320 acres and the remainder is given to urban land use (about 1820 acres).

Conservation lands make up about 45 percent of the combined Kapalama Basin - Honolulu Harbor watersheds. Housing and public facilities account for about 40 percent of the coverage and industrial/commercial property located in and around the harbor areas make up somewhat less than 10 percent of the watershed. (Freeman, 1993; Stevenson et al., 1995).

Ke`ehi Lagoon receives drainage from three watersheds: Kalihi, Moanalua and Ke`ehi. The Kalihi watershed comprises about 3,679 acres and includes Kalihi Stream which flows into the head-end of Ke`ehi Lagoon. The Moanalua watershed is approximately 6,778 acres in size and includes three streams; Manaiki and Kahauiki Streams which flow into Moanalua Stream which empties into the northernmost section of Ke`ehi Lagoon near Kalihi Stream. All three streams in the Moanalua watershed are intermittent. The combined Kalihi/Moanalua watershed area is comprised principally of conservation lands (50 percent), residential and public facilities (30 percent) and commercial/industrial property (20 percent). The Ke`ehi watershed is about 1,578 acres in area and includes no streams. There is, however, a major drainage canal discharging into the northwest section of Ke`ehi Lagoon.

This watershed includes the airport industrial/commercial area (about 81 percent) and 19 percent conservation land.

Flushing and Circulation

Water flow in Honolulu Harbor is governed principally by tidal exchange, although very few actual measurements have been made in the harbor. The Water Quality Program for Oahu study (Dillingham Environmental Co., 1971) established a station in Kapalama Channel between the Kapalama and Honolulu Basins which showed tidal reversal in the current, moderate velocities (maximum of 0.3 kts), and net transport toward Ke`ehi Lagoon. Circulation in the main basin was studied by Nishioka (1971) who found that on a flooding tide water entered the basin from the Kapalama Channel and from deeper layers through the Honolulu Channel. There is significant surface flow in the direction of the wind vector. Thus, during typical trade wind conditions, surface waters would tend to move out of the harbor during both flooding and ebbing tides. On an ebbing tide both surface and deeper layers moved seaward through Honolulu Channel.

The present situation is complicated by the fact that the western channel (Kalihi Channel) connects with Ke`ehi Lagoon. Since construction of the Reef Runway to the west, the flushing volume of the lagoon exceeds (by a factor of 3.5 to 5.5) the volume attributable to simple tidal exchange. Honolulu Harbor participates in this enhanced flushing (Noda, 1979). Thus, during typical Trade Wind conditions subsurface water flows into Honolulu Harbor through both ship channels on a flooding tide and flows out through these channels on an ebbing tide (Bathen, 1978). However, during periods of light and variable winds (e.g., kona conditions), the relationship between the tide and flow direction are reversed for Kalihi Channel in the area of the bascule bridge. In other words, net flow is out of the harbor to the west during the flooding tide and into the Kapalama Basin on an ebbing tide (Noda, 1979). Maximum velocity measured by Noda near the bascule bridge was 0.9 ft/sec (0.5 kts.).

In Ke`ehi Lagoon, during typical trade wind conditions and a flooding tide, the net flows are into the lagoon through Kalihi Channel and out through Honolulu Harbor (Table 2). Other inputs include those through Circulation Channel "B" near the end of the Reef Runway and the waterski channel west of Sand Island. A Trade Wind ebbing tide reverses many, but not all, of the above. The dominant net transport is through the ewa seaplane runway and out of the lagoon through Circulation Channel "B". Water flows into Ke`ehi Lagoon from Kapalama Basin and out through Kalihi Channel. Some input still occurs through the waterski channel. Surface flow (to a depth of up to 3 meters) is in the direction of the wind vector with speeds up to 0.45

ft/sec (0.25 kts) (Noda, 1978). Thus, during Trade Wind conditions, surface flow will be out of the lagoon into Mamala Bay on both rising and ebbing tides.

Table 2. Water volume flow into or out of Ke`ehi Lagoon (10^7 ft^3) during trade wind conditions (after Noda, 1979)

Location	Flood Tide			Ebb Tide			Complete Tidal Cycle			
	into	out	net	into	out	net	into	out	net	
Kalihi Channel	9.64	0	in 9.64	0	3.38	out 3.38	9.64	3.38	in	6.26
Circulation Channel "B"	4.76	0.61	in 4.15	0	9.98	out 9.98	4.76	10.59	out	5.83
Kapalama Basin	0	10.81	out 10.81	7.09	2.67	in 4.42	7.09	13.48	out	6.39
Ski Channel	5.27	0	in 5.27	2.61	1.26	in 1.35	7.88	1.26	In	6.62
TOTAL	19.67	11.42	in 8.25	9.7	17.29	out 7.59	29.37	28.71	In	0.66

During calm, or light to variable wind conditions, a large flow enters Ke`ehi Lagoon from Kapalama Basin and a large flow exits Circulation Channel "B" (Table 3). Water flows out Kalihi Channel and in through the waterski channel. An ebbing tide during kona conditions produces a large flow into Kapalama Basin. Water moves in through the Kalihi and waterski channels and out through Channel "B".

Table 3. Water volume flow into or out of Ke`ehi Lagoon (10^7 ft^3) during light and variable wind conditions.

Location	Flood Tide			Ebb Tide			Complete Tidal Cycle			
	into	out	net	into	out	net	into	out	net	
Kalihi Channel	2.13	3.62	out 1.49	9.63	0	in 9.63	11.76	3.62	in	8.14
Circulation Channel "B"	0	12.06	out 12.06	0	4.67	out 4.67	0	16.73	out	16.73
Kapalama Basin	17.14	0	in 17.14	0	22.61	out 22.61	17.14	22.61	out	5.47
Ski Channel	5.95	0	in 5.95	9.8	0	In 9.80	15.75	0	in	15.75
TOTAL	25.22	15.68	in 9.54	19.43	27.28	out 7.85	44.65	42.96	In	1.69

Based on estimates by Stevenson et al (1995) and Noda (1978), the volumes of Honolulu Harbor and Kapalama Basin (assuming an average depth of 35 ft.) are calculated to be on the order of 6.4×10^8 ft^3 and 3.2×10^8 ft^3 respectively. The volume of Ke`ehi Lagoon is estimated by to be roughly $5.8 \times 10^8$ ft$^3$. During Trades and light to variable wind conditions, average tidal flushing volumes in Ke`ehi Lagoon were determined by Noda (1978) to be about 2.9×10^8 ft^3 and $4.3\ 10^8$ ft^3 respectively. This means that the turnover rate in Ke`ehi lagoon is about one day (2

tidal cycles) during Trade Wind conditions and less than one day during light to variable wind conditions. Based upon tidal flows between Ke`ehi Lagoon and Kapalama Basin (Table 2 and 3), we can estimate that the volume of Kapalama Basin is replaced in less than 1.5 days (about 2.3 tidal cycles) during Trade Wind conditions and in less than one day (about 1.4 tidal cycles) during light to variable wind conditions. Because of a lack of flow data for Honolulu Channel, it is not possible to make a realistic estimate of volume turnover for Honolulu Harbor. However, considering the strong tidal flows into Kapalama Basin on the western end, it seems likely that turnover will, at most, be a matter of a few days. Buske and McCain (1972) estimated flushing time of Honolulu Harbor at 6 hours from thermal studies for the Honolulu Generating Station.

The Basins

Honolulu Harbor receives inflow from Nu`uanu Stream and its tributaries which enters the Harbor between Piers 15 and 16. Baseline flow from Nu`uanu Stream is about 2.3 mgd (3.6 cfs) based upon analysis of stream flow data (USGS, 1999). The average storm event flow is on the order of 49.9 mgd. Flood flow can be substantial during periods of high rainfall over Honolulu and the watershed behind Honolulu - peak discharge in 1981, for example, was 252 mgd at the 650 ft. elevation USGS stream gage. At such times a brackish surface plume forms in the harbor that is driven seaward through the ship channels during typical trade wind conditions. Nu`uanu Stream is a significant source of sediment and nutrient inputs to Honolulu Harbor.

Kapalama Stream flows into Kapalama Basin near Pier 38. Baseline flow is estimated at about 1.1 mgd (1.7 cfs) with an average storm event flow of about 16.6 mgd. This stream is also a primary source of sediment and nutrient inputs into Kapalama Basin.

Historically, water quality in Honolulu Harbor and Kapalama Basin has generally been regarded as poor (c.f. Cox & Gordon, 1971). This is not surprising considering the potential sources of pollution. The two watersheds which drain into these basins through Nu`uanu Stream and Kapalama Canal encompass major developed areas of the city of Honolulu. Honolulu Harbor is the principal commercial port for the Hawaiian Islands, and aside from the comings and goings of large ships, the waterfront surrounding these basins, Kapalama Canal, and the lower reaches of Nu`uanu Stream all receive discharges and runoff from major industrial and urban areas of the city. Honolulu Harbor waters near Pier 7 are also used for cooling purposes at the Hawaiian Electric Company Honolulu Generating Station. Prior to construction of the deep sewage outfall off Sand Island, sewage contamination of nearshore waters undoubtedly influenced the waters of both Honolulu Harbor and

Kapalama Basin under certain oceanographic conditions (Laevastu, Avery, and Cox, 1964). Most of the point discharges historically entering Honolulu Harbor have now been diverted to the new Sand Island Treatment Plant (DOH, 1982).

A water quality sampling station in the Harbor at the mouth of Nu`uanu Stream showed that water temperature, nutrient concentrations and pH met State Water Quality standards for Class B waters in 1970-71. However, dissolved oxygen, salinity, secchi depth, and total coliform levels did not (DPW, 1971). A study by Ultramar (1968) noted low levels of dissolved oxygen in violation of water quality standards at this location, although fecal coliform, pH, and total phosphorus were all within the limits set by the standards at the time. Enhanced flushing of Ke`ehi Lagoon and Kapalama Basin after completion of the Reef Runway project, along with diversion of the Sand Island sewage effluent into deep water offshore, have all likely had a positive impact on water quality in the project areas. As a general indication of water quality, *AECOS* (1979) compared mean extinction coefficients (a measure of water column clarity) from before construction of the Reef Runway (data from Oceanic Institute, 1970 reported in R. M. Towill, 1976) of 0.72/m with a mean post-construction value of 0.39/m. The difference indicated a considerable improvement in mean water column clarity in Kapalama Basin after construction of the Reef Runway.

The State of Hawaii, Department of Health samples Honolulu Harbor waters on an irregular basis, except microbiological testing which is done monthly near the bascule bridge in Kapalama Channel. Total and fecal coliform levels (DOH, 1978, 1981) measured here and elsewhere off Sand Island showed a dramatic decrease in 1977 apparently reflecting diversion of the Honolulu Sewage Treatment Plant effluent to the deeper offshore waters.

Cooling water for the Honolulu Generating Station is taken from the Honolulu Basin north of Pier 7 and discharged into the Harbor south of Pier 7. The thermal effluent normally moves toward the southwest across the main basin and surface water temperature elevation is reduced below 0.8 C° within 460 meters of the discharge (Buske and McCain, 1972). Harbor waters are sometimes oily on the surface, and substantial contamination by non-volatile hydrocarbons was noted in sediment samples collected in November 1982 (*AECOS*, 1982a), particularly those from the stations around piers 12A and 12B.

Ke`ehi Lagoon receives inputs from Moanalua and Kalihi Stream systems. Moanalua Steam and its tributaries (Manaiki and Kahauiki Streams) are interrupted[2] streams with significant flow only during freshet events. The average storm related inpul

[2] Interrupted streams are perennial streams in which flow is continuous only in specific segments, usually at higher elevations where rainfall is more reliable.

from Moanalua Stream is estimated at around 69 mgd. Kalihi Stream, on the other hand, is a perennial stream with a continuous baseline input to Ke`ehi Lagoon of about 2.1 mgd (3.2 cfs) and an average storm runoff volume of about 31.4 mgd.

Prior to the dredging of the seaplane lanes during the 1940s, the lagoon was essentially a broad, shallow reef flat. Water quality on the reef flat was probably very good prior to western-style development on the watershed and gradual obliteration of the ancient fishponds along the shore. Nutrients and fine sediments washed in from the watershed would have been largely captured by coastal wetlands or (during freshet flows) directed out to sea through channels in the reef opposite stream mouths. Studies in the late 1960s (Ultramar, 1968) and early 1970s (Cox & Gordon, 1970; Dillingham, 1971) identified water quality problems in Ke`ehi Lagoon that were possibly related to effluent from the Sand Island Sewage Treatment Plant and to terrestrial runoff. By that time, all coastal wetlands and fishponds had been obliterated. Dredged channels encouraged accumulation of fine organic-rich sediments in the lagoon.

Diversion of the Sand Island Sewage Treatment Plant effluents from the nearshore waters off Sand Island to the present deep ocean site (240 feet deep) nearly two miles offshore in November of 1976 has resulted in improved water quality conditions in the Honolulu-Kapalama-Ke`ehi basin complex. Similarly, the completion of the Reef Runway project in 1976 significantly improved circulation in Ke`ehi Lagoon and in the western end of Kapalama Basin. This resulted in a noted improvement in water quality (*AECOS*, 1979).

Present Water Quality Conditions

Water quality conditions in the study area have changed over the years (as noted above) as the result of various alterations to the physical environment. These changes have generally resulted in a steady decline in water quality for the marine environment, somewhat reversed by improving circulation in the basins and by moving sewage discharges to deeper, offshore waters more recently. Water quality data since these most recent changes are scarce for the study area, as few major environmental changes have taken place here since the construction of the Reef Runway and diversion of the Sand Island sewage effluent in the mid 1970s. We consider that "present" water quality includes any representative data available since 1976.

The marine waters of the Honolulu-Kapalama-Ke`ehi complex serve as the receiving waters for runoff, drainage, and seepage from some 21,000 acres of watershed (GDSI, 1994), much of which is in residential and commercial/industrial land use. The natural function of these drainage basins is to serve a settling and initial mixing

basin for land-derived materials. As such, these embayments would not be expected to demonstrate pristine water quality conditions which characterize embayments such as Hanauma Bay that are little influenced by terrestrial inputs and have unrestricted circulation with open coastal waters.

Water quality in these basins are constantly in a state of flux, being influenced by numerous factors which include: storm runoff, wind conditions, tidal state, and even the movements of large ships which can cause resuspension of sediments into the water column as they pass by. A major storm event will cause a temporary decrease in both salinity and temperature near stream mouths and the formation of plumes (often visible because of high turbidity/TSS levels) that spread out over much of the surface area of a basin. Strong winds can resuspend sediments and nutrients into the water column, while tidal flushing is greatly enhanced during light or variable wind conditions (Noda, 1978). Changes in water quality due to these perturbations may be substantial and reflect the dynamic nature of water quality in these basins. The intent of the results presented below, and generalizations derived therefrom, is to provide as accurate a representation of the average water quality conditions in these basins as possible based on the limited data available for this task.

Honolulu Harbor, Kapalama Basin and Ke`ehi Lagoon are all designated in HAR §11-54-06 (DOH, 1992) as Class A embayments. These water quality standards are summarized in Table 4.

The State standards for embayments are divided into "wet" and "dry" categories depending upon the influx of freshwater (see footnotes Table 4). Based upon estimated stream flows and basin volumes, we can compute the average number of days per year that each basin will qualify as a wet or dry embayment (Table 5). The percent of time that Honolulu Harbor and Kapalama Basin fit the "wet" embayment category is very low (5 percent or less). Even Ke`ehi Lagoon only qualifies as a "wet" embayment about 13 percent of the time. Therefore, in the discussion that follows, we will use the "dry" embayment State criteria as the standard for comparison with existing data.

Table 4. State of Hawaii water quality criteria for embayments (HAR §11-54-06)(DOH, 1992).

Parameter	Geometric Mean value not to exceed this value	Value not to be exceeded more than 10% of the time	Value not to be exceeded more than 2% of the time
Total Nitrogen	200.0	350.0	500.0
(µg N/l)	*150.0*	*250.0*	*350.0*
Ammonia	6.0	13.0	20.0

(µg N/l)	*3.5*	*8.5*	*15.0*
Nitrate + Nitrite	8.0	20.0	35.0
(µg N/l)	*5.0*	*14.0*	*25.0*
Total Phosphorus	25.0	50.0	75.0
(µg P/l)	*20.0*	*40.0*	*60.0*
Chlorophyll α	1.50	4.50	8.50
(µg/l)	*0.50*	*1.50*	*3.00*
Turbidity	1.5	3.0	5.0
(ntu)	*0.4*	*1.0*	*1.5*

Two values: upper, "wet" criteria apply when the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day; lower, "dry" criteria apply when the average fresh water inflow from the land is less than one percent of the embayment volume per day.

Other "standards":

- pH units shall not deviate more than 0.5 units from a value of 8.1, except at coastal locations where and when freshwater from stream, stormdrain or groundwater discharge may depress the pH to a minimum level of 7.0.
- Dissolved oxygen shall not decrease below 75% saturation.
- Temperature shall not vary more than 1 C° from ambient conditions.
- Salinity shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

A synopsis of water quality data is presented in Table 6. It has been compiled from various studies (*AECOS*, 1979, 1982a, 1982b, 1991, 1995; OI Consultants, 1986; Oceanit Labs, 1992) in the study area plus several DOH monitoring stations (STORET, 1993). (See Appendix __ for data details). Data from a station located in the open coastal waters of Mamala Bay off the Reef Runway (*AECOS*, 1979) is included in this table for comparative purposes.

Table 5. Estimates of "wet" and "dry" conditions in the Honolulu-Kapalama-Ke`ehi basin complex.

	Ke'ehi Lagoon	Kapalama Basin	Honolulu Harbor
1% basin volume (million gallons)	32.2	23.9	47.9
"wet embayment"			
rain days > 1% volume	47	11	17
% of time	13	3	5
"dry embayment"			
rain days < 1% volume	318	354	348
% of time	87	97	95

Table 6. A summary of water quality data (1977 - present) for the Honolulu Harbor - Ke`ehi Lagoon complex.

Location		Salinity (‰)	Temp (°C)	DO (% sat)	Turbidity (ntu)	NO_3+NO_2 (µg/l)	NH_3 (µg/l)	TN (µg/l)	TP (µg/l)	Chl. a (µg/l)
Ke`ehi Lagoon	mean	33.7	25.4	95	2.7	1.8	3.7	167	22	0.32
	stdev	3.2	1.6	10	1.2 - 5.8	0.5 - 5.7	1.4 - 9.7	102 - 272	11 - 47	0.13 - 0.77
	n	*282*	*213*	*209*	*284*	*42*	*42*	*180*	*180*	*41*
Kapalama Basin	mean	34.6	25.7	95	1.9	2.2	5.1	137	31	0.26
	stdev	0.6	1.5	9	1.2- 2.9	1.0 - 4.8	2.5 - 10.3	97 - 193	16 - 59	0.08 - 0.84
	n	*38*	*37*	*36*	*19*	*19*	*17*	*19*	*19*	*19*
Honolulu Harbor	mean	34.9	25.9	85	0.7	4.3	6.8	124	20	0.36
	stdev	0.3	0.8	21	0.3 – 1.5	2.0 - 9.0	3.2 - 14	101 - 153	13 - 32	0.14 - 0.92
	n	*17*	*13*	*17*	*24*	*21*	*10*	*21*	*21*	*21*
Mamala Bay	mean	34.8	26.1	98	0.3	3.6	3.1	101	32	0.05
	stdev	0.2	0.9	3	0.1 - 0.6	1.3 - 9.7	1.6 - 6.2	81 - 128	20 - 50	0.02 - 0.11
	n	*13*	*13*	*12*	*13*	*13*	*13*	*13*	*13*	*13*

Grayed areas indicate that mean (or geometric mean) values of State water quality criteria were exceeded.

In general, freshwater inputs appear to exert more influence on salinity in Ke`ehi Lagoon than in the other two basins. This makes sense as Ke`ehi Lagoon (which is about one-half the combined volume of Kapalama Basin + Honolulu Harbor) receives about 110 mgd in runoff during an average storm event, while the Kapalama Basin - Honolulu Harbor area receives only about 66 mgd during a similar event.

The cooler average temperatures in Ke`ehi Lagoon are somewhat unexpected and may result from higher levels of fresh water input into this basin; fresh water inputs typically being several degrees cooler than ambient coastal waters in this area. Another possibility is the influx of deeper, cooler water through Kalihi Channel. The differential could also simply represent a bias in the data used. A seasonal cycle in temperature occurs in these waters and these data are presented without regard to time of year sampled.

Dissolved oxygen (DO) saturation levels are notably lower in Honolulu Harbor in comparison with surrounding marine waters, but are still well within the State water quality criterion (Table 4). Increased residence time in the Harbor, coupled with limited fetch in this area, which would restrict turbulence and mixing, may contribute to the lower DO saturation levels. That DO saturation levels in Kapalama Basin are not similarly depressed may, in part, be explained by significant inputs from Ke`ehi Lagoon during flooding tides. Also, the only water quality data available for Kapalama Basin was from a station located near the bascule bridge which is significantly influenced by Ke`ehi Lagoon.

Turbidity levels form a gradient of decreasing concentration from Ke`ehi Lagoon to Honolulu Harbor. This may well be related to higher runoff levels into Ke`ehi Lagoon coupled with the relatively shallow nature of much of Ke`ehi Lagoon which allows for resuspension of shallow sediments during typical trade wind conditions.

The distribution of nitrogen products in the various basins presents an interesting situation. Total nitrogen (TN) decreases from Ke`ehi Lagoon towards Honolulu Harbor and probably results from the greater input of fresh water into Ke`ehi Lagoon. The inorganic forms (nitrate + nitrite and ammonia) both show a reverse trend; i.e., decreasing in concentration from Honolulu Harbor. Note also that ammonia levels are consistently higher than nitrate + nitrite levels in all the basins, but are lower in the open coastal waters of Mamala Bay. Since ammonia is rapidly oxidized to nitrate + nitrite in the presence of oxygen, it seems likely that reactive organic nitrogen in all three basins is actively being broken down into inorganic compounds; first into ammonia and then into nitrate + nitrite. The amounts of ammonia and nitrate + nitrite that accumulate in a basin may be roughly proportional to the basin turnover rates; i.e., higher concentrations in Honolulu Harbor and lower levels in Ke`ehi Lagoon.

The distribution of total phosphorus (TP) and chlorophyll α in the Ke`ehi Lagoon / Honolulu Harbor complex display no distinct trends at this macro-scale level. Phosphorus patterns in aquatic environments are often a puzzle as this chemical tends to sorb onto particulate matter, such as TSS and especially colloidal matter (turbidity), and may then settle into the bottom. This often results in patchy and peculiar distributions in the water column. Note, for example, that the mean TP level at the Mamala Bay station is higher than that in any of the three basins. The concentration of chlorophyll α, on the other hand, is notably higher in the basins than in the coastal waters as would be expected since the turnover rate of plant nutrients and shallow nature of these basins provides a more optimal environment for phytoplankton growth.

In comparison with the State water quality standards, Ke`ehi Lagoon exceeded the most criteria -- those for turbidity, ammonia, TN and TP; and Honolulu Harbor the

least --those for turbidity and ammonia (Table 5). Interestingly, the coastal water station in Mamala Bay also did not meet certain State criteria (turbidity, nitrate + nitrite, ammonia and TP). Because this complex of basins serves as a settling area for terrestrial runoff, it is unlikely that any management practice, short of the diversion of runoff, will help these waters meet the State's criteria for turbidity and certain nutrients. At the same time, it is encouraging to note that both DO saturation levels and chlorophyll α concentrations are, in fact, well within the State's criteria. These two parameters represent the culmination of a number of factors influencing water quality and, therefore, are more appropriate indicators of the health of a specific aquatic environment than either nutrients or turbidity.

Water quality data are available for several different sectors of Ke`ehi Lagoon (Table 7). The north Ke`ehi Lagoon sector is located at the mouths of Moanalua and Kalihi Streams. It is a shallow, restricted area due to sediment deposits from stream inputs and demonstrates the poorest water quality conditions in the Lagoon. The southwestern Ke`ehi Lagoon station is located at the southwest corner in the old seaplane channel behind the east end of the Reef Runway. The stations making up eastern Ke`ehi Lagoon were mostly situated in the area where the seaplane channels, Kapalama Channel, and Kalihi Ship Channel all come together, although one station (DOH Station #165) was located midway down the seaplane channel (also known as the "waterski channel") off Sand Island. Circulation Channel "B" is located at the end of the Reef Runway and is a major passageway connecting inner Ke`ehi Lagoon with Mamala Bay. The Mamala Bay station located midway along the Reef Runway is included here for comparative purposes.

Noda (1978) has demonstrated that there is significant surface flow in Ke`ehi Lagoon in the direction of the prevailing winds at speeds up to 14 cm sec^{-1} and up to a depth of about 3 meters. Thus, surface waters in the northern section of the Lagoon, during typical trade wind conditions, are pushed along the seaplane channel parallel to the airport and towards the station in the southwest sector of Ke`ehi Lagoon. Even at an average speed of 6 cm sec^{-1}, these waters could travel over 5 kilometers (3 miles) in a single day. This movement of the surface waters is very important to the water quality of the Lagoon; especially during significant storm events as fresh water runoff into the Lagoon fans out as a thin plume on top of the more dense marine waters. This lens of relatively fresh (but water quality poor) water would then be pushed towards Mamala Bay during trade wind conditions and at fairly rapid rate. Certainly, there is mixing of these surface waters with depth during this process and much of the suspended particulate load will settle out in the Lagoon. Nevertheless, because of the high tidal flushing rates in Ke`ehi Lagoon (see Flushing above), the entire volume of the Lagoon is potentially exchanged with Mamala Bay (and Kapalama Basin) water each day.

Table 7. Water quality conditions in Ke`ehi Lagoon.

Location		Salinity (‰)	Temp (°C)	DO (% sat)	Turbidity (ntu)	NO_3+NO_2 (µg/l)	NH_3 (µg/l)	TN (µg/l)	TP (µg/l)	Chl. a (µg/l)
North Ke`ehi Lagoon	mean	32.6	26.1	91	4.8	2.6	5.6	190	30	0.53
	stdev	4.7	1.5	12	2.5 - 9.6	0.7 - 9.1	2.7 - 11	117 - 332	16 - 54	0.20 - 1.36
	count	94	49	48	96	13	13	96	96	13
Southwest Ke`ehi Lagoon	mean	34.7	26.3	97	2.1	1.3	3.3	126	38	0.27
	stdev	0.3	1.1	4	1.7 - 2.6	0.5 - 3.5	1.5 - 7.5	104 - 153	24 - 60	0.13 - 0.56
	count	13	13	12	13	13	13	13	13	13
East Ke`ehi Lagoon	mean	34.1	24.9	95	2.0			146	11	
	stdev	2.0	1.5	10	1.0 - 3.8			96 - 223	7 - 17	
	count	161	137	137	160			56	56	
Circulation Channel "B"	mean	34.8	26.3	99	1.9	2.2	3.3	114	35	0.20
	stdev	0.4	1.1	5	1.4 - 2.5	1.0 - 4.9	1.5 - 7.3	99 - 131	16 - 64	0.09 - 0.44
	count	13	13	12	13	13	13	13	13	13
Mamala Bay		34.8	26.1	98	0.3	3.6	3.1	101	32	0.05
		0.2	0.9	3	0.1 - 0.6	1.3 - 9.7	1.6 - 6.2	81 - 128	20 - 50	0.02 - 0.11
		13	13	12	13	13	13	13	13	13

Grayed areas indicate that mean (or geometric mean) values of State water quality criteria were exceeded.

A general improvement in water quality can be seen moving from the northern part of Ke`ehi Lagoon to either the west or east parts of the basin (Table 7). Since the eastern section of the Lagoon exchanges considerable volumes of water with Kapalama Basin (Table 2 and 3), the changes in water quality there are less noteworthy than those in the western section where exchange with Mamala Bay is facilitated by Circulation Channel "B". Yet, with the exception of turbidity and chlorophyll α, there is a striking similarity between water quality at the Mamala Bay station and in all sections of Ke`ehi Lagoon, except the northernmost sector. It is concluded that water quality conditions in most of the Lagoon are good and this is principally due to the efficient flushing characteristics of this basin (Noda, 1978).

Water quality measurements in Kapalama Basin have mostly been made at a station located near the bascule bridge. To our knowledge only 2 individual samples have been taken in Kapalama Basin proper and in the connection between this basin and Honolulu Harbor during the past twenty years. Water quality data in Honolulu Harbor has been mostly restricted to the pier areas on the mauka side of the Harbor with a few samples having been collected in pier areas on the Sand Island side of the Harbor. Fortunately, a few samples have also been taken in the Honolulu Channel area. These data are presented in Table 8 together with the Mamala Bay station data.

Table 8. Water quality characteristics of Kapalama Basin and Honolulu Harbor.

Location		Salinity (‰)	Temp (°C)	DO (% sat)	Turbidity (ntu)	NO_3+NO_2 (µg/l)	NH_3 (µg/l)	TN (µg/l)	TP (µg/l)	Chl. a (µg/l)
Kapalama Basin	mean	34.6	25.7	95	1.9	2.2	5.1	137	30	0.26
	stdev	0.61	1.5	9	1.2 - 2.9	1.0 - 4.8	2.5 - 10	97 - 193	16 - 59	0.08 - 0.84
	count	38	37	36	19	19	17	19	19	19
Honolulu Harbor	mean	35.0	25.7	77	0.9	4.8	6.8	131	23	0.40
	stdev	0.4	0.3	20	0.5 - 1.7	2.1 - 11	3.2 - 14	107 - 161	15 - 36	0.1 - 1.15
	count	12	6	12	19	16	10	16	16	16
Honolulu Channel	mean	34.8	25.4	91	0.3	3.0		102	13	0.24
	stdev	0.1	0.2	20	0.2 – 0.6	2.3 – 4.0		100 – 103	12 - 14	0.18- 0.23
	count	5	5	5	5	5		5	5	5
Mamala Bay	mean	34.8	26.1	98	0.3	3.6	3.1	101	32	0.05
	stdev	0.2	0.9	3	0.1 - 0.6	1.3 - 9.7	1.6 - 6.2	81 - 128	20 - 50	0.02 - 0.11
	count	13	13	12	13	13	13	13	13	13

Grayed areas indicate that mean (or geometric mean) values of State water quality criteria were exceeded.

Circulation in the Kapalama-Honolulu Harbor complex is probably somewhat less complex compared with that in Ke`ehi Lagoon as there are only two points of egress; one from Kapalama Channel into Ke`ehi Lagoon and the other through Honolulu Channel into Mamala Bay. It can be assumed that surface flow will be driven by prevailing wind conditions in a manner similar to Ke`ehi Lagoon (see above). Deeper waters enter through both Kapalama Channel and Honolulu Channel on flooding tides and reverse on ebbing tides during trade wind conditions (Bathen, 1978; Noda, 1978). During light wind, or kona conditions, this pattern is reversed (Table 2 and 3) in Kapalama Channel with water flowing into Ke`ehi Lagoon during the flood tide and into Kapalama Basin during the ebbing tide (Noda, 1978). It is presumed that tidal flows through Honolulu Channel during kona conditions do not reverse, but continue to flow into the Harbor on the flood tide and out during the ebbing tide. However, these flows may be noticeably stronger than during typical trade wind conditions.

It can be assumed that the poorest water quality occurs in the vicinity of the mouth of Kapalama Stream in Kapalama Basin and at the mouth of Nu`uanu Stream in Honolulu Harbor and this is substantiated from older studies in the area (Dillingham, 1971). Water quality then likely improves as it moves towards one of the two exits from these basins. Mean turbidity levels are highest in Kapalama Basin and are likely influenced by tidal exchange with Ke`ehi Lagoon (see Table 7 above).

Turbidity levels are lower in Honolulu Harbor and decrease progressively through Honolulu Channel and into Mamala Bay. The somewhat lower mean salinity level in Kapalama Basin may also be influenced by tidal exchange with Ke`ehi Lagoon. DO saturation levels in Honolulu Harbor are notably lower than the surrounding areas (but still in compliance with State criteria). This fact, coupled with higher inorganic nitrogen levels, increased chlorophyll α levels, and slightly enhanced salinity levels may well be indicative of a longer residence time (i.e., lower turnover time) for waters in Honolulu Harbor. A longer residence time would allow for greater evaporation in the basin (i.e., higher salinity), more time for the breakdown of organic nitrogen to inorganic compounds and growth of phytoplankton (i.e., increase in chlorophyll α concentrations). A longer residence time would also allow time for the settling out of more particulate matter, resulting in lower turbidity levels.

Biological Habitats

No marine areas of comparable size in Hawai`i have seen greater alteration of the natural environment than the fringing reef flat along Oahu's south coast from Ahua Point to Fort Armstrong — the area now comprising Honolulu Harbor, Sand Island. Ke`ehi Lagoon, and the Honolulu International Airport. Within this area, most of the original shallow reef platform has been either dredged or filled. The shoreline has been extended seaward and mostly replaced with bulkhead, pier, or revetment structures. Mauka of the reef, extensive fishponds and wetlands have disappeared under landfill. This part of O`ahu serves as the center of sea and air transport in and out of the Hawaiian Islands, and the lowlands and created fast land along the coast are developed in light industrial, commercial, and industrial storage facilities.

Existing marine biological communities in Honolulu Harbor and Ke`ehi Lagoon, surveyed for this document, are described in an attached report by S. L. Coles and R. E. DeFelice, entitled *Biological Surveys in Honolulu Harbor relating to the Oahu Commercial Harbors 2020 Master Plan EIS.* Conclusions from their report are expanded upon here.

It is unlikely that the proposed modifications in Honolulu Harbor and Ke`ehi Lagoon would have any significant, long-lasting impact on the resident marine biota. Construction activities at Pier 2 would require no dredging and should cause little or no disturbance of sediments. Any sediments that might be resuspended into the water column by construction activity would be fine to medium sands which settle out rapidly with minimal affect on the marine organisms which are growing primarily on the vertical surfaces of pier pilings. Since this site is relatively close to the channel opening, circulation can be assumed to be good and any construction related turbidity would rapidly dissipate.

Construction of new finger piers in the vicinity of Piers 12-16 will not entail dredging. Some suspension of silt, sedimentation, and elevated turbidity during construction activities could occur. However, the sessile marine biota in the area are already limited in both abundance and diversity, and are composed primarily of organisms adapted to or favored by a sedimentary and turbid environment. Any benthic organisms disturbed or displaced at Piers 12-16 are likely to be replaced by rapid resettlement following construction, and the total community will be increased by settlements on any new surfaces provided by the construction. Disturbed fishes may leave the area temporarily and return when conditions are more favorable.

The area most likely to show an impact from these activities is the coral community and associated organisms that are in the vicinity of Pier 12. However, these corals appear to be adapted to relatively high levels of turbidity and sedimentation, and have withstood previous construction activities and other stresses that have occurred in this area of the harbor, maintaining a high level of coral coverage by a variety of species. No change was discernable from the descriptions of this coral community by *AECOS* (1982) and Oceanit (1990), in spite of the considerable development that has gone on in this section of the harbor in the last decade, including construction of Piers 16 and 17 (R. M. Towill Corp. 1982).

Improvements described for Piers 24-29 are not expected to require any work specifically in the water. Rather, all work will proceed on the existing docks above the water line. The biota in this area is generally similar to that described for Pier 15, consisting of fouling biota on vertical piles and generally sparse community of associated fishes. Stations this far into the harbor show the lesser diversity of organisms compared with piling-associated biota closer to the harbor entrance.

Construction of lay berths along Lagoon Drive at the shore of Ke`ehi Lagoon will require mostly shoreline construction to improve access to piers and driving of piles to support those piers. No dredging is required for this project. However, again it would be unlikely that any reasonable activity will cause a substantial impact on the marine communities in this area. This area had the fewest taxa found of any of the sites, and the organisms that were found were primarily intertidal mollusks, a barnacle and sponges which can withstand high levels of sedimentation. Moreover, water movement and turbidity in the area are generally high because of wind driven turbulence. Therefore any construction related re-suspended sediments and turbidity are likely to be rapidly dissipated, and resident organisms that may be impacted by these activities are adapted to withstand sedimentation-related stress.

Within the harbor, there would appear to be no rare, threatened, or endangered species as listed by USFWS (1996). Further, habitats present are not those which would be important to any listed species. The same may be said for the Ke`ehi Lagoon lay berth site. However, several species of water birds are known from the

reef flat remnant in Ke`ehi Lagoon south (across the channel) from the lay berth location (see below).

Avifauna

Tidal flats and scattered shoreline areas around Ke`ehi Lagoon are used by a variety of shorebirds, including wading Hawaiian stilt (*Himantopus mexicanus knudseni*), a species listed as endangered by the Federal government (USFWS, 1996). One report (OI Consultants, 1989) describes Ke`ehi Lagoon as one of the most-studied marine habitats for migrant birds in the Hawaiian Islands. The results of several studies (Berger & Walker, 1976; Walker , 1978; Berger, 1987, 1988) have demonstrated a significant decline in the numbers of wintering migrant shorebirds and Hawaiian stilt after completion of the HIA Reef Runway. Walker (1978) attributed the decline in numbers to the increase in air traffic and flight paths directed over important sand and mud flats used for feeding by these birds.

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ATTACHMENT

Biological Surveys in Honolulu Harbor

Relating to the Oahu Commercial Harbors 2020 Master Plan

Immediate Phase EIS

S. L. Coles

R. E. DeFelice

Department of Natural Sciences
Bishop Museum
1525 Bernice Street
Honolulu, HI 96817

Submitted to:

AECOS Inc.
970 N. Kalaheo Ave., C311
Kailua, HI 96734

December 20, 1998
(Revised May 10, 1999)

Summary

Biological surveys were conducted in the vicinity of Honolulu Harbor's Piers 2, 12, 15 and 16 and along the shoreline near Lagoon Drive at Keehi Lagoon, and results were compared with previous surveys in these areas. Total taxa of algae, invertebrates and fishes observed at each site ranged from 27 to 47, comparable to previous surveys in the harbor. In Honolulu Harbor fishes were more diverse at Pier 2 while invertebrates were more diverse at Pier 15. Lower numbers of taxa of both fishes and invertebrates were found at Pier 16 and along Lagoon Drive. The composition of the Pier 2 biota suggested a strong influence of oceanic water from the harbor entrance, while the Pier 15 and 16 communities showed the effects of Nuuanu Stream outflow. The Pier 12 benthic community was dominated by reef corals as previously reported, surprising for an area located so far into the harbor. Both the Pier 16 and Keehi Lagoon sites appeared to be stressed by high sedimentation and turbidity, and their benthic communities were composed of species adapted to these conditions.

It is unlikely that the proposed modification of the harbor will impart a substantial negative impact to the biotic communities resident in the vicinities of the construction activities. If dredging is conducted, it will be confined to the Pier 15-16 and Lagoon Drive areas where the biota are already presently exposed to at least periodic increases in sedimentation and turbidity. Based on the similarity of present conditions to those of earlier studies, no long lasting negative impacts have resulted from similar previous construction activities in Honolulu Harbor.

Introduction

Honolulu Harbor is the principal port serving the Hawaiian Islands and has been so since the early 19th century. The port has grown substantially from its beginnings as a sheltered anchorage in the natural embayment formed by the outflow of Nuuanu Stream through the nearshore coral reef. Landmarks along the way of the development of Honolulu Harbor have been the deepening and widening of the main channel in 1892 (Anon. 1892), dredging of the Kapalama Channel to connect with the Kapalama Basin in 1917, further widening of channels and basins in 1935 and 1946 (Rush 1957), and the opening of the Kalihi channel in 1962 to give two entrances to the harbor (Wilson Okamoto & Assoc. 1968). Construction and modification of piers and jetties in the Harbor have been part of this development process since 1825, when a ship's hull was sunk to form a pier at the foot of Nuuanu Avenue, at the site of the present Pier 12 (Rush 1957).

As part of the continued development of the harbor, the Harbors Division, Hawaii State Department of Transportation, is considering modification or construction of piers in Honolulu Harbor and Keehi Lagoon. Three sites may involve work that could impact the marine environment and resident marine communities. These sites are the Pier 2 Cruise Passenger terminal along the main entrance channel, Piers 12 to 17 at the mouth of Nuuanu Stream, and lay berths to be constructed along Lagoon Drive on the northwestern side of Keehi Lagoon. The condition of the marine communities present in these areas was evaluated in the present study to

provide information about the potential impact of piling construction that may occur as a part of harbor development.

Site Descriptions

The characteristics of the areas sampled (Figures 1 and 2) are as follows:

Pier 2. This site is located at Diamond Head Terminal, along the east side of the main channel to Honolulu Harbor, about 1000 m from the channel entrance. In the early days of Honolulu Harbor, sailing ships were pulled into the harbor against the prevailing winds by ox teams walking along the reef that existed in this area before the channel was widened (Stewart 1936). Pier 2 was the site of the first drydock and marine railway constructed in Honolulu Harbor and the Hawaiian Islands, completed in 1883 (Anon. 1883, 1906). Construction of a pier at this site was completed in 1922 and the pier was used for unloading lumber, coal and freight (Board of Engineers 1936). Improvements were made in 1947, which included construction of a new terminal that was later combined with adjoining property to make up the present Diamond Head Terminal, first used in 1954 (Stroup 1959).

Pier 2 presently consists of a large cement docking area that is supported on cement posts about two feet square in cross section. The pier extends out about 10 m from the shoreline and bottom depth ranges from about 1.5 m next to the shore to 10 m at the pier's edge. The bottom is coarse to fine white sand mixed with coral rubble, and water clarity is relatively high, reflecting the closeness of this site to the mouth of the entrance channel and the influence of oceanic water.

Pier 12. This is the site of the first pier that was made in Honolulu Harbor in 1825 by sinking a ship's hull at the foot of Nuuanu Avenue and building a dock around the hull (Rush 1957). This pier is shown in an 1847 map (Metcalf 1847) as part of the government wharf that existed west of the Honolulu Fort. The fort was torn down in 1857 and its materials were used in filling the nearshore reef and subtidal area which make up the present Aloha Tower area, formerly known as the Esplanade (Anon. 1936; Judd 1975). Pier 12 was built in 1907 (Wilson, Okamoto & Assoc. 1968) and is no longer present, but a small area suitable for docking small boats exists at the former site. The perimeter of this dock is made up of cut coral blocks, stated in Oceanit (1990) to be taken from the Honolulu Fort, but this is unverified. The blocks extend down to about 6 m depth in a mixed silt-rubble bottom which has abundant trash such as wire, old appliances and fishing lines. Despite generally poor water clarity in this area, live reef corals are common to abundant on the coral blocks on both sides of the pier, right up to and including pilings supporting Nimitz Highway.

Pier 15. A rudimentary pier at this site was replaced in 1883 by a more permanent structure, (Anon. 1950) which was used through the early decades of this century for loading interisland freight and passengers. Much of Pier 15 was eliminated when Nimitz

Highway was constructed in 1952 (Rush, 1957). The present pier is made of wood which sits on cement posts of about 0.75 m in diameter in depths from 8 m at the piers edge to 1.5 m at the shore side of the pier, about 10 m from its edge. The bottom is fine sand and silt with abundant benthic holes that may indicate the presence of alpheid shrimps (*Alpheus mackayi*) or other benthic burrowers. Water clarity is low and decreases going toward Nimitz Highway and the mouth of Nuuanu Stream, which discharges into the harbor about 100 m from the Ewa end of this pier.

Pier 16. This pier was reconstructed in about 1984 on the site of a pier that had been demolished in the 1950s. Piers 16 and 17 are the most recently constructed in Honolulu Harbor and were built to provide increased berthing space for Oahu's commercial fishing fleet. Pier 16 extends into the harbor from the Iwilei curve along Nimitz Highway and lies about 100 m directly downstream of the discharge of Nuuanu Stream. It is supported on 0. 5 m diameter cylindrical posts rising out of 4.2 m water depth. The bottom is soft, muddy silt littered with old tires and other trash. Water at the site is quite turbid because of runoff from Nuuanu Stream, and sedimentation is apparently high, as indicated by shoaling of the area from a dredged depth of 5.5 m when the pier was constructed (R. M. Towill 1982).

Lagoon Drive. The Keehi Lagoon seaplane runways were dredged in 1941-44 to a depth of 3.3 m from mud flats and fossil reef offshore of the John Rodgers (Honolulu) airport (Harvey et al. 1971). Unfortunately, limited circulation of water through the runways resulted in stagnation and poor water quality that was somewhat relieved by circulation channels that were dredged as part of the construction of the Honolulu Airport Reef Runway in the early 1970s (Environmental Consultants 1979). The area sampled along Lagoon Drive is on the site of a former mooring basin for seaplanes that was dredged as part of the original Seaplane Runway "A", but had become partially filled in by sediment deposits and mangrove growth by the time of reef runway construction. At that time the entire mooring basin was filled to align with the remainder of the shore and the shoreline was lined with boulders to limit erosion.

The sampling site is at about the middle of the northwest side of the former Seaplane Runway "A" channel. The boulders aligning the channel extend from above the high water mark to about 0.5 m depth and sit on a gently sloping hard substratum littered with oyster shells, which slopes gradually down to a flat bottom at 2-3 m that is covered with fine silt. The area is over three km downwind of the Kalihi-Moanalua Stream mouth and is subject to substantial wind driven waves during trade wind conditions that produce considerable water turbulence and turbidity from wave stirred sediments.

Methods

The benthos and fish faunas at Piers 2, 12 and 15 were surveyed on 18 September 1998; Pier 16 and the Lagoon Drive-Keehi Lagoon site on 22 September, 1998. Using Scuba, two investigators experienced in identifying Honolulu Harbor organisms dived for approximately 45 minutes at each site and noted the fishes and benthic invertebrates that were present. Organisms identified on site were noted on underwater paper and samples were scraped from pier surfaces, preserved in 70% alchohol and returned to the laboratory for identification. Photographs were taken of representative organisms using a Nikonos camera with a 28 mm lens and closup attachment with framer. Surveys along the dock covered approximately 100 m along the dock to the rear of the dock and all depths down to the base of the dock pilings.

Results

The taxa of macroalgae, macroinvertebrates and fishes noted at each site are listed in Table 1, and the total numbers of each taxonomic group found in this and previous studies for these sites are shown in Table 2. General descriptions of the biotic communities at each site are as follows.

Pier 2. Benthic algae and invertebrates, mostly sponges and corals, sparsely populated the pier pilings at this site. Ten species of sponges were found, which included two undescribed new species of *Dysidea*, one undescribed new species of *Toxiclona* and one new genus of the family Chalinidae. Five coral species occurred along with two other cnidarians, the introduced hydroid *Halocordyle disticha* (Goldfuss, 1820) (Plate 2) and the introduced octocoral *Carijoa riisei* (Duchassaing & Michelotti 1860) (Plate 1). All of the sponges and corals were small, seldom more than a few cm in their largest dimension. The other dominant organism on the pier pilings was the red algae *Mesophyllum* cf. *mesomorphum* (Foslie) Adey, which was common in shallow areas near the edge of the pier where light was sufficient.

The upper intertidal zone was dominated by abundant *Chthamalus proteus* Dando & Southward, 1980, a barnacle that has recently been introduced to Hawaii (Southward et al. 1998), and by small oysters (*Ostrea* sp.). Three molluscs occurred only at this station. the black and blue nudibranch *Tamja morosa*, the pearl oyster *Pinctada margaritifera* (Linneaus 1758) and the thorny oyster *Spondylus ?tenebrosus* Reeve, 1856. The mucus-feeding worm *Chaetopterus* sp. was also seen only at this station.

A total of 31 taxa of invertebrates and two species of algae were recorded at Pier 2. Twelve fish species were noted under and around the pier and five species were unique to this site, including *Parapeneus multifasciatus* Quoy & Gaimard, 1824, *Chaetodon miliaris* Quoy & Gaimard, 1824, *Forciper flavissimus* Jordan & McGregor, 1898, *Thalosomma duperrey* (Quoy & Gaimard, 1824) and *Canthigaster jactator* (Jenkins, 1901).

The only previous study of marine organisms in this vicinity was closer to the channel entrance at Pier 1 (AECOS 1988, Table 2) and recorded 29 taxa of fishes but only 8 invertebrates and one macroalgae. These differences from present results can be partly explained by the fact that no sponges were identified in the earlier study, and that Pier 1 is closer to the channel entrance where more reef fishes were likely to be present. Both studies showed a pronounced presence of reef corals, again probably due, in part, to the proximity of both piers to channel entrance and oceanic conditions.

Pier 12. Despite its location well within Honolulu Harbor only 500 m of the mouth of Nuuanu Stream, this location supports a high coverage of reef corals that has been previously noted (AECOS 1982, Oceanit 1990). Six hard and one soft coral species were found (Table 1) and coverage was high, especially by *Porites compressa* Dana, 1846 (Plate 4), *Porites lobata* Dana, 1846, *Montipora patula* Verrill, 1864 *and Montipora verrucosa* (Lamarck, 1816) (Plate 3) which encrust the walls of the dock and other hard surfaces down to 5 m depth. Total coverage ranges up to 50% of available surfaces. Other cnidarian species were found at this site: the hard coral *Pocillopora damicornis* Linnaeus, 1758, the octocoral *Carijoa riisei*, the hydroids *Halocordyle disticha* and *Thyroscyphus fruticosus* (Esper, 1793) and the zoanthid *Zoanthus pacificus* Walsh and Bowers, 1971.

Because of the dominance of available space by corals at this site other taxa were less abundant but still present. Eight sponge species were found, including *Dictyodendrilla* sp., which was recorded only at this site. The large fan worm *Sabellastarte sanctijosephi* Gravier, 1906 (Plate 3) was prominent, along with the ectoprocts *Amathia distans* Busk, 1866, *Schizoporella errata* (Waters, 1878) (Plate 6) and *Diaperoecia* sp. Plates 2 and 5). Two echinoderms, *Actinopyga mauritiana* Selenka, 1867 and *Tripneustes gratilla* (Linnaeus, 1758), commonly occurring on coral reefs, were found only at this station. A total of one alga species, 29 invertebrate and nine fish species were recorded at the site. The fishes included two species of chaetodontids (*Chaetodon unimaculatus* Bloch, 1788, and *C. trifasciatus* Mungo Park, 1797), common on coral reefs, were found only at this site.

These results are very similar to those found by AECOS (1982) in a survey of the dock areas from Pier 12 to Pier 15, where two macroalgae, 28 invertebrates and 13 fishes were recorded. However these previous results included microinvertebrates sorted from sediment samples, with one taxa each of nematodes, oligochaetes and pycnogonids, five taxa of polychaetes and two crustaceans. The other principal difference between findings of the two studies was that no sponges were identified on the 1982 study.

Pier 15 The community at this site was the most diverse of any on the study, with a total of 47 taxa found, composed of 4 macroalgae, 35 invertebrates and eight fishes. Sponges had the greatest representation at this site with 14 taxa found, including two genrera (*Leucetta* sp. and *Callyspongia* sp.) and one species (*Aplysilla sulfurea* Schulze, 1878)

found only here. No corals occurred and the only cnidarians were the hydroids *Halocordyle disticha* and *Thyroscyphus fruticosus* and the octocoral *Carijoa riisei*. The serpulid worm *Salmacina dysteri* Huxley, 1855 was found only at this site, along with the fanworm *Sabellastarte sanctijosephi*. The barnacle *Chthamalus proteus* was abundant in the intertidal, and the banded shrimp *Stenopus hispidus* Rathbun, 1906 was found here as well as at Pier 12. More molluscs were found here than at any other site, including *Littoraria scabra* (Linnaeus, 1758), *Hipponix* sp., *Dendostrea sandvichensis* Sowerby, 1871, *Ostrea* sp. and *Isognomon californicum* (Conrad, 1837), which is abundant on at the mouth of Nuuanu Stream, suggesting an influence of fresh water discharge at the Pier 15 site. Other invertebrate taxa common at this site were ectoprocts (*Amathia distans, Bugula dentata* and *Diaperoecia* sp.) and ascidians (*Phallusia nigra* Savigny, 1816 and *Botryllus* sp.). The four species of algae included the introduced *Acanthophora spicifera* (Vahl) Boergesen found only at this site and *Ulva* sp., indicative of fresh water influence. It was also noted that invertebrate coverage on the pier's pilings became more sparse going toward the Nuuanu Sream mouth, suggesting the limitation of stream outflow on the marine community. Eight fish taxa were noted at the site, including three species (*Sphyeana barrucuda* [Walbaum, 1792], *Neoniphon sammara* [Forsskal, 1775] and *Apogon kallopterus* Bleeker, 1856) that were noted only at this site.

Pier 16. This site is about 100 m from the mouth of Nuuanu Stream and had the fewest taxa of invertebrates and fish of any site surveyed. Surfaces at the site showed pronounced effects of sedimentation, with silt adhering even to horizontal surfaces of pier pilings. Although three taxa of macroalgae were recorded, including the brackish-water tolerant *Ulva* sp., only 21 invertebrate and three fish taxa were found. The dominant groups were sponges with eight taxa and ectoprocts with four taxa, all of which are considered tolerant of relatively high levels of sedimentation and turbidity. The two taxa of ascidians (*Phallusia nigra* and *Botryllus* sp.) were also more abundant here than at any other site, suggesting selection for filter feeding, sedimentation tolerant organisms. The three fish species found included the boxfish *Ostacion meleagris* (Jenkins, 1901), the puffer *Arothron hispidus* (Linnaeus, 1758) and a school of about 20 *Papio* (*Caranx melampygus* [Cuvier, 1833]).

Viewing the Honolulu Harbor sites overall, one macroalga (*Mesophyllum mesomorphum*) and eight invertebrate taxa (sponges *Mycale cecilia* [de Laubenfels, 1936] and *Hyatella intestinalis* [Lamarck, 1816]; hydroid *Halocrdyle disticha*; barnacle *Chthamalus proteus*; ectoprocts *Amathia distans and Diaperoecia* sp.; ascidians *Phallusia nigra* and *Bottryllus* spp.) occurred at every site. All of these except the alga and the ectoproct *Diaperoecia* sp. are known or suspected nonindigenous species introduced from areas outside of Hawaii (Carlton and Eldredge, in prep) and are also commonly found in Pearl Harbor (Coles et al 1997, ms submitted).

Lagoon Drive. The substantially different environmental conditions that prevail at this site compared to the Honolulu Harbor sites are reflected by the resident marine community.

Only 21 macoinvertebrates and six fishes were noted. Many of the invertebrates inhabit the intertidal, such as the gastropods *Littoraria scabra* (Linnaeus, 1758), *Nodolittorina picta* (Philippi, 1846) and *Nerita picea* (Recluz, 1841) and the introduced barnacle *Chthamalus proteus*, which virtually covered rocks in the high intertidal zone. Most of the remaining invertebrates were sponges, which, with eleven taxa, had the second highest number of any site surveyed, and sponges were the only invertebrate commonly found in the subtidal. Three taxa, *Dysidea* sp. 1, *Suberites zeteki* (de Laubenfels, 1936. And *Tedania* sp. occurred only at this site. The only coral found *was Leptastrea purpurea* Dana, 1846, and the fan worm *Sabellastarte sanctijosephi* was also present. Six species of fish were observed among the rocks along the shoreline, including the stripey *Microcanthus strigatus* Cuvier & Valenciennes, 1831 and the surgeonfish *Acanthurs nigrorus* Valenciennes, 1835, which were not observed at any other site.

Anticipated Impact of Proposed Project

It is unlikely that the proposed modifications in Honolulu Harbor and Keehi Lagoon would have a significant long lasting impact on the resident marine biota. Construction activities at Pier 2 would require no dredging and should cause little or no disturbance of sediments. Any sediments that might be suspended into the water column by construction activity would be fine to medium sands which would rapidly settle out with minimal affect on the marine organisms which are growing primarily on the vertical surfaces of pier pilings. Since this site is relatively close to the channel opening, circulation can be assumed to be good and any construction related turbidity would rapidly dissipate.

Construction of new finger piers in the vicinity of Piers 12-16 will not entail dredging. Some suspension of silt, sedimentation, and elevated turbidity during construction activities could occur. However, the sessile marine biota in the area are already limited in both abundance and diversity, and are composed primarily of organisms adapted to or favored by a sedimentary and turbid environment. Any benthic organisms disturbed or displaced at Piers 12-16 are likely to be replaced by rapid resettlement following construction activities, and the total community will be increased by settlements on any new surfaces provided by the construction. Disturbed fishes may leave the area temporarily and return when conditions are more favorable.

The area most likely to show an impact from these activities is the coral community and associated organisms that are in the vicinity of Pier 12. However, these corals appear to be adapted to relatively high levels of turbidity and sedimentation, and have withstood previous construction activities and other stresses that have occurred in this area of the harbor, maintaining a high level of coral coverage by a variety of species. No change was discernable from the descriptions of this coral community by AECOS (1982) and Oceanit (1990), in spite of the considerable development that has gone on in this section of the harbor in the last decade, including construction of Piers 16 and 17 (R. M. Towill Corp. 1982).

Construction of lay berths along Lagoon Drive in Keehi Lagoon will require mostly shoreline construction to improve access to piers and driving piles to support those piers. No dredging is required for this project. However, again it would be unlikely that any reasonable activity will cause a substantial impact on the marine communities in this area. This area had the fewest taxa found of any of the sites, and the organisms that were found were primarily intertidal molluscs, a barnacle and sponges which can withstand high levels of sedimentation. Moreover, water movement and turbidity in the area are generally high because of wind driven turbulence. Therefore any construction related re-suspended sediments and turbidity are likely to be rapidly dissipated, and resident organisms that may be impacted by these activities are adapted to withstand sedimentation-related stress.

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Table 1. Marine organisms observed on Honolulu Harbor and Keehi Lagoon Surveys

Phylum/Class/ Order	Family	Genus	Species	Author/Date	Pier 2	Pier 12	Pier 15	Pier 16	Lagoon Drive
Chlorophyta	Ulvaceae	*Ulva*	*fasciata*	Forsskal			1	1	
Phaeophyta	Ectocarpaceae	*Lobophora*	*variegata*	(Lamouroux) Womersly	1		1	1	
Rhodophyta	Corallinaceae	*Mesophyllum*	*?mesomorphum*	(Foslie) Adey	1	1	1	1	
	Rhodomelaceae	*Acanthophora*	*spicifera*	(Vahl) Boergesen			1		
		Total Macroalgae	3		2	1	4	3	0
Porifera	Leucettidae	*Leucetta*	sp.				1		
	Callyspongiidae	*Callyspongia*	sp.				1		
	Chalinidae	*Chalinidae*	*n.g., n. sp.*					1	1
		Gelliodes	*fibrosa*	(Wilson, 1925)			1	1	1
		Sigmadocia	*caerulea*	Hechtel, 1965				1	1
		Toxiclona	n. sp.						1
	Darwinellidae	*Aplysilla*	*sulfurea*	Schulze, 1878			1		
	Desmacellidae	*Biemna*	*fistulosa*	Topsent, 1897	1	1	1	1	1
	Dictyodendrillidae	*Dictyodendrilla*	sp.			1			
	Dysideidae	*Dysidea*	n. sp. 1		1		1		
		Dysidea	n. sp. 2						1
		Dysidea	*arenaria*	Bergquist, 1965	1		1		
		Dysidea	*avara*	(Schmidt, 1862)	1		1		
	Microcionidae	*Clathria*	sp.		1				
	Mycalidae	*Mycale*	*cecilia*	(de Laubenfels, 1936)	1	1	1	1	
		Mycale	*armata*	Thiele, 1903		1	1	1	1
		Naofolitispa	*ungiculata*	(Dendy, 1921)	1	1			1
		Zygomycale	*parishii*	(Bowerbank, 1875)			1	1	
		Iotrochota	*protea*	(de Laubenfels, 1950)	1	1	1		1
	Raspailiidae	*Echinodictyum*	*asperum*	Ridley and Dendy, 1886	1	1	1		
	Spongiidae	*Hyatella*	*intestinalis*	(Lamarck, 1814)	1	1	1	1	
	Suberitidae	*Suberites*	*zeteki*	(de Laubenfels, 1936)					1
	Tedaniidae	*Tedania*	sp.						1
		Total Porifera	23		10	6	14	8	11
Hydrozoa	Pennariidae	*Halocordyle*	*disticha*	(Goldfuss, 1820)	1	1	1	1	
Hydrozoa	Sertilaridae	*Thyroscyphus*	*fruticosus*	(Esper, 1793		1	1		
Anthozoa	Telestidae	*Carijoa*	*riisei*	(Duchassaing & Michelotti 1860)	1	1	1	1	
Anthozoa	Zoanthidae	*Zoanthus*	*pacificus*	Walsh & Bowers, 1971		1			
	Pocilloporidae	*Pocillopora*	*damicornis*	Linnaeus, 1758		1			
	Acroporidae	*Montipora*	*patula*	Verrill, 1864	1	1			
			verrucosa	(Lamarck, 1816)		1			
	Poritidae	*Porites*	*compressa*	Dana, 1846		1			
		Porites	*lobata*	Dana, 1846	1	1			
	Faviidae	*Cyphastrea*	*ocellina*	Dana, 1846	1				
	Agariciidae	*Pavona*	*varians*	Verrill, 1864	1				
	Faviidae	*Leptastrea*	*purpurea*	Dana, 1846	1	1			1
		Total Cnidaria	12		7	10	5	2	1
Polychaeta	Chaetopteridae	*Chaetopterus*	sp.		1				
	Sabellidae	*Sabellastarte*	*sanctijosephi*	Gravier, 1906		1	1	1	1
	Serpulidae	*Salmacinia*	*dysteri*	Huxley, 1855	1		1		
		Total Polychaetes	3		2	1	2	1	1
Crustacea	Cirripedia	*Balanus*	sp.						1
		Chthamalus	*proteus*	Dando & Southward, 1980	1	1	1	1	1
	Stenopididae	*Stenopus*	*hispidus*	Rathbun, 1906		1	1		
		Total Crustacea	3		1	2	2	1	2
Gastropoda	Neritidae	*Nerita*	*picea*	(Recluz, 1841)					1
	Littorinidae	*Littoraria*	*scabra*	(Linnaeus, 1758))			1		1
		Nodolittorina	*picta*	(Philippi, 1846)					1
	Hipponicidae	*Hipponix*	sp.				1		
	Siphonariidae	*Siphonaria*	*normalis*	Gould, 1846			1		
Nudibranchia	Polyceridae	*Tambja*	*morosa*		1		1		
Bivalvia	Pteriidae	*Pinctada*	*margaritifera*	(Linnaeus, 1758)	1				

Table 1 (cont.)

Phylum/Class/ Order	Family	Genus	Species	Author/Date	Pier 2	Pier 12	Pier 15	Pier 16	Lagoon Drive
Bivalvia	Spondylidae	*Spondylus*	*tenebrosus?*	Reeve, 1856	1				
	Chamidae	*Chama*	pacifica	Broderip, 1835				1	
	Isognomonidae	*Isognomon*	*californicum*	(Conrad, 1837)			1		1
	Ostreidae	*Dendostrea*	*sandvichensis*	Sowerby, 1871			1	1	
		Ostrea	sp.		1	1	1	1	1
		Total Mollusca	13		14	10	7	3	5
Ectoprocta	Gymnolaemata	*Amathia*	*distans*	Busk, 1886	1	1	1	1	
		Bugula	*dentata*	(Lamouroux, 1816)	1		1	1	
		Schizoporella	*errata*	(Waters, 1878)	1	1		1	1
	Stenolaemata	*Diaperoecia*	sp.		1	1	1	1	
		Total Ectoprocta	4		4	3	3	4	1
Echinoidea	Diadematidae	*Diadema*	*paucispinum*	Agassiz, 1863	1		1		
Echinoidea	Toxoneustidae	*Tripneustes*	*gratilla*	(Linnaeus, 1758)		1			
Holothuroidea	Holothuridae	*Actinopyga*	*mauritiana*	Selenka, 1867		1			
		Total Echinoderms	3		1	2	1	0	0
Urochordata	(Ascidacea)	*Phallusia*	*nigra*	Savigny, 1816	1	1	1	1	1
		Botryllus	*spp.*		1	1	1	1	1
		Total Ascidians	2		2	2	2	2	2
Osteichthyes	Sphyraenidae	*Sphyaena*	*barracuda*	(Walbaum, 1792)			1		
	Holocentridae	*Myripristis*	*sp.*			1	1		
		Neoniphon	*sammara*	(Forsskal, 1775)			1		
	Aulostomidae	*Aulostomus*	*chinensis*	(Linnaeus, 1766)	1				
	Kuhliidae	*Kuhlia*	*sandvicensis*	(Steindachner, 1876)		1			
	Apogonidae	*Apogon*	*kallopterus*	Bleeker, 1856			1		
	Carangidae	*Caranx*	*melampygus*	(Cuvier, 1833)				1	
	Mullidae	*Parupeneus*	*multifasciatus*	Quoy & Gaimard, 1824	1				
	Scorpididae	*Microcanthus*	*strigatus*	Cuvier & Valenciennes, 1831					1
	Chaetodontidae	*Chaetodon*	*miliaris*	Quoy & Gaimard, 1824	1				
		Chaetodon	*unimaculatus*	Bloch, 1788		1			
		Chaetodon	*trifasciatus*	Mungo Park, 1797		1			
		Chaetodon	*lunula*	(Lacepede, 1802)		1	1		1
		Chaetodon	*auriga*	Forsskal, 1775					1
		Forcipiger	*flavissimus*	Jordan & McGregor, 1898	1				
	Pomacentridae	*Abudefduf*	*abdominalis.*	(Quoy & Gaimard, 1824)	1		1		
		Dascyllus	*albisella*	Gill, 1862	1	1	1		
	Labridae	*Thalassoma*	*duperrey*	(Quoy & Gaimard, 1824)	1				
	Acanthuridae	*Acanthurus*	*xanthopterus*	Valenciennes, 1835	1	1	1		1
		Acanthurus	*triostegus*	(Linnaeus, 1758)					1
		Acanthurus	*nigrorus*	Valenciennes, 1835					1
		Zebrasoma	*flavescens*	(Bennett, 1828)	1	1			
	Zanclidae	*Zanclus*	*cornutus*	(Linnaeus, 1758)	1	1	1		
	Ostraciontidae	*Ostracion*	*meleagris*	(Jenkins, 1901)	1			1	
	Tetraodontidae	*Arothron*	*hispidus*	(Linnaeus, 1758)				1	
		Canthigaster	*jactator*	(Jenkins, 1901)	1				
		Total Fishes	26		12	9	8	3	6
		Total Taxa	61		45	39	47	27	27

Table 2. Summary of taxonomic groups found at study sites by present (1998) and previous studies (AECOS 1982, 1988). (s) designates taxa identified from sediment samples (AECOS 1982).

Taxa	Location: Pier 1 (1988)	Pier 2 (1998)	Piers 13-15 (1988)	Pier 12 (1998)	Pier 15 (1998)	Pier 16 (1998)	Lagoon Drive (1998)
Macroalgae	1	2	2	1	4	3	0
Sponges	0	10	0	8	14	8	11
Cnidaria	6	7	9	10	3	2	1
Nematoda	0	0	1(s)	0	0	0	0
Oligochaeata	0	0	1(s)	0	0	0	0
Polychaeta	0	2	6(5s)	2	2	1	1
Pycnogonida	0	0	1(s)	0	0	0	0
Crustacea	0	1	4(2s)	2	2	1	0
Molluscs	1	4	4	1	7	3	5
Ectoprocts	1	4	0	3	3	4	1
Echinoderms	1	1	0	2	0	0	0
Ascidians	0	2	0	2	2	2	2
Total Invertebrates	9	31	28	29	35	21	21
Fishes	29	12	13	9	8	3	6
Total Taxa	39	45	43	39	47	27	27

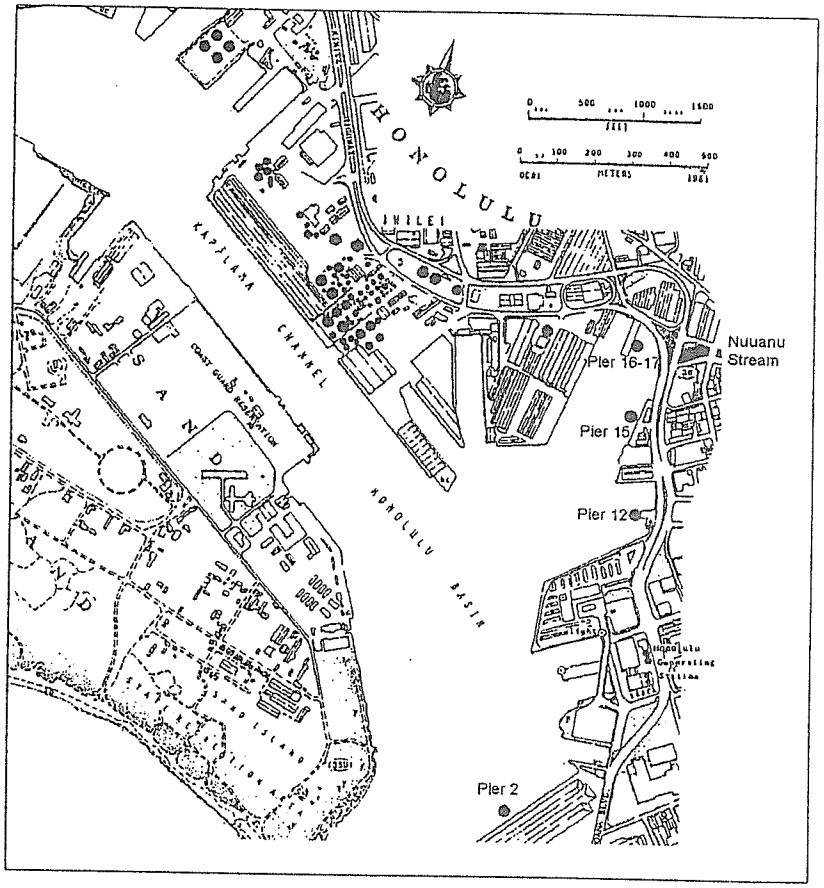

Figure 1. Honolulu Harbor sampling locations

Figure 2. Keehi Lagoon sampling location

Color Plates 1 through 6

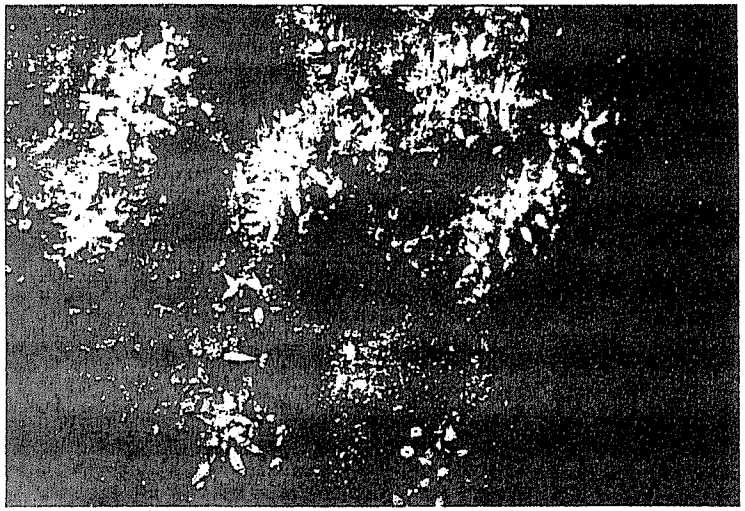

Plate 1. Introduced octocoral, *Carijoa riisei* at Pier 2.

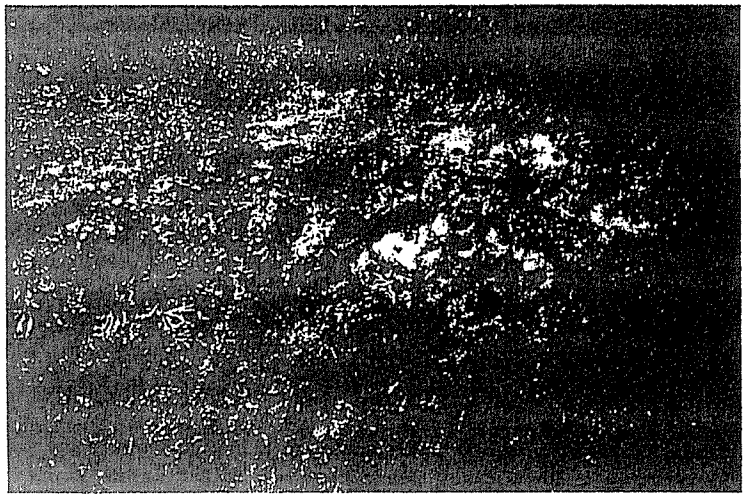

Plate 2. Pier 2 dock piling with red sponge *Mycale* sp., hydrozoan *Halocordyle disticha* (black branches with white polyps), and brown arborescent bryozoan *Diaperoracia* sp.

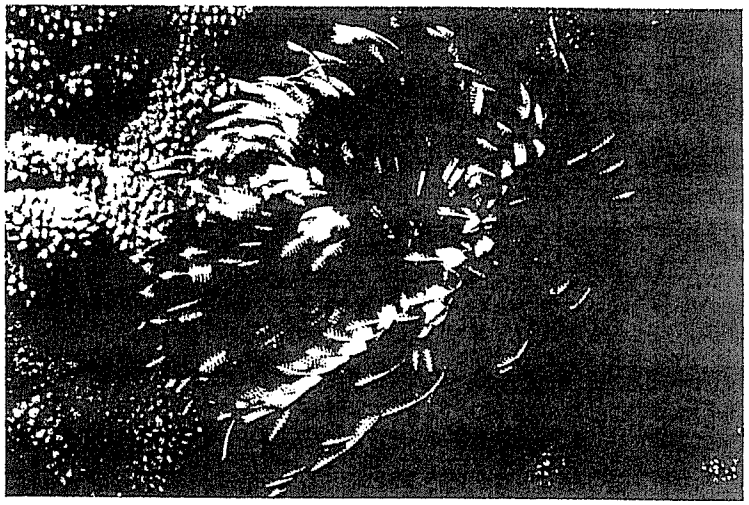

Plate 3. Fanworm *Sabellastarte sanctijosephi* growing from hard coral *Montipora verrucosa* at Pier 12.

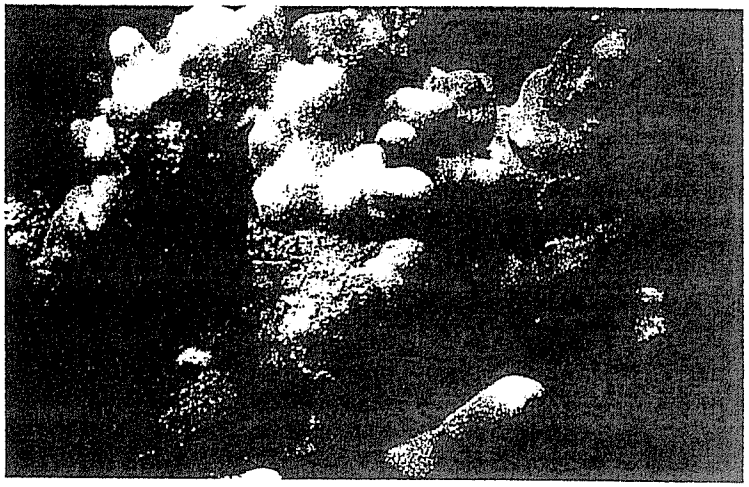

Plate 4. Hard coral *Porites compressa* at Pier 12.

Plate 5. Red sponge *Mycale cecilia*, arborescent brown bryozoan *Diaperoracia* sp, and tunicate *Phallusia nigra* at Pier 16.

Plate 6. Grey soft bryozoan *Amathia distans* growing on branch end of bryozoan *Schizoporella errata* at Pier 16.