LINDA LINGLE
GOVERNOR
STATE OF HAWAII

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CHAIRMAN
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EXECUTIVE ASSISTANT

STATE OF HAWAII

DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879

HONOLULU, HAWAII 96805

April 27, 2005

RECEIVED
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OFC. OF ENVIRONMENTAL QUALITY CONTROL

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR DHHL EAST KAPOLEI DEVELOPMENT PARCEL B, TMK 9-1-016: 108 (portion), EWA, OAHU, HAWAII

The State of Hawaii Department of Hawaiian Home Lands has reviewed the comments received during the 30-day public comment period which began on February 8, 2005. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the May 8, 2005 OEQC Environmental Notice.

We have enclosed the following items:

1. Four copies of the Final EA, and
2. Completed publication form (also to be emailed).

If you have any questions regarding the project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

2005-05-08 FONSI
EAST KAPOLEI DEVELOPMENT PARCEL B

MAY 8 2005
FILE COPY

DHHL East Kapolei Development
Parcel B

Final Environmental Assessment

RECEIVED
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DEPT. OF ENVIRONMENTAL
QUALITY CONTROL

Prepared by:

PBR HAWAII

April 2005

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1.0 INTRODUCTION

1.1 PROJECT SUMMARY

The following summary describes the project location, existing entitlements, and proposed actions:

Project Name:	Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B
Location:	Kapolei, O'ahu, Hawai'i (Figure 1)
Landowner:	State of Hawai'i
Applicant:	*Department of Hawaiian Home Lands*
Tax Map Key:	(1) 9-1-016: 108 (portion) (Figure 2)
Land Area:	92.1 acres
Existing Use:	Mostly vacant agricultural land (Figure 3)
Proposed Use:	Single-family residential with commercial and park (Figure 4)
State Land Use District:	Urban District (Figure 5)
City and County of Honolulu Zoning:	AG-1 Restricted Agriculture (Figure 7)
Ewa Development Plan Land Use Map:	High Density Residential and Transit Node (Figure 8)
Action Requested:	Use of State lands and funds for the development of a single-family residential area with commercial and park use
Accepting Authority:	Department of Hawaiian Home Lands, State of Hawai'i
Determination:	Finding of No Significant Impact (FONSI)
Agencies Consulted:	Various City/State agencies, Neighborhood Boards, Legislators, and area landowners

1.2 PROPOSING AGENCY

In accordance with Section 343-5(b), *Hawaii Revised Statutes* (HRS), whenever an agency proposes the use of state lands, that agency shall prepare an environmental assessment for such action at the earliest practicable time to determine whether an environmental impact statement shall be required.

To identify the appropriate uses for the study area, the Department of Hawaiian Home Lands (DHHL) (the State's lead agency for the project), has contracted with PBR Hawaii to prepare an environmental assessment in compliance with Chapter 343, *Hawaii Revised Statutes* (HRS). The DHHL is the proposing agency for this project. The mailing address and primary contact person for the DHHL is listed below:

Mr. Larry Sumida
State of Hawai'i
Department of Hawaiian Home Lands
Land Development Division
P.O. Box 1879
Honolulu, Hawaii 96805

1.3 OWNERSHIP AND MAJOR APPROVALS REQUIRED

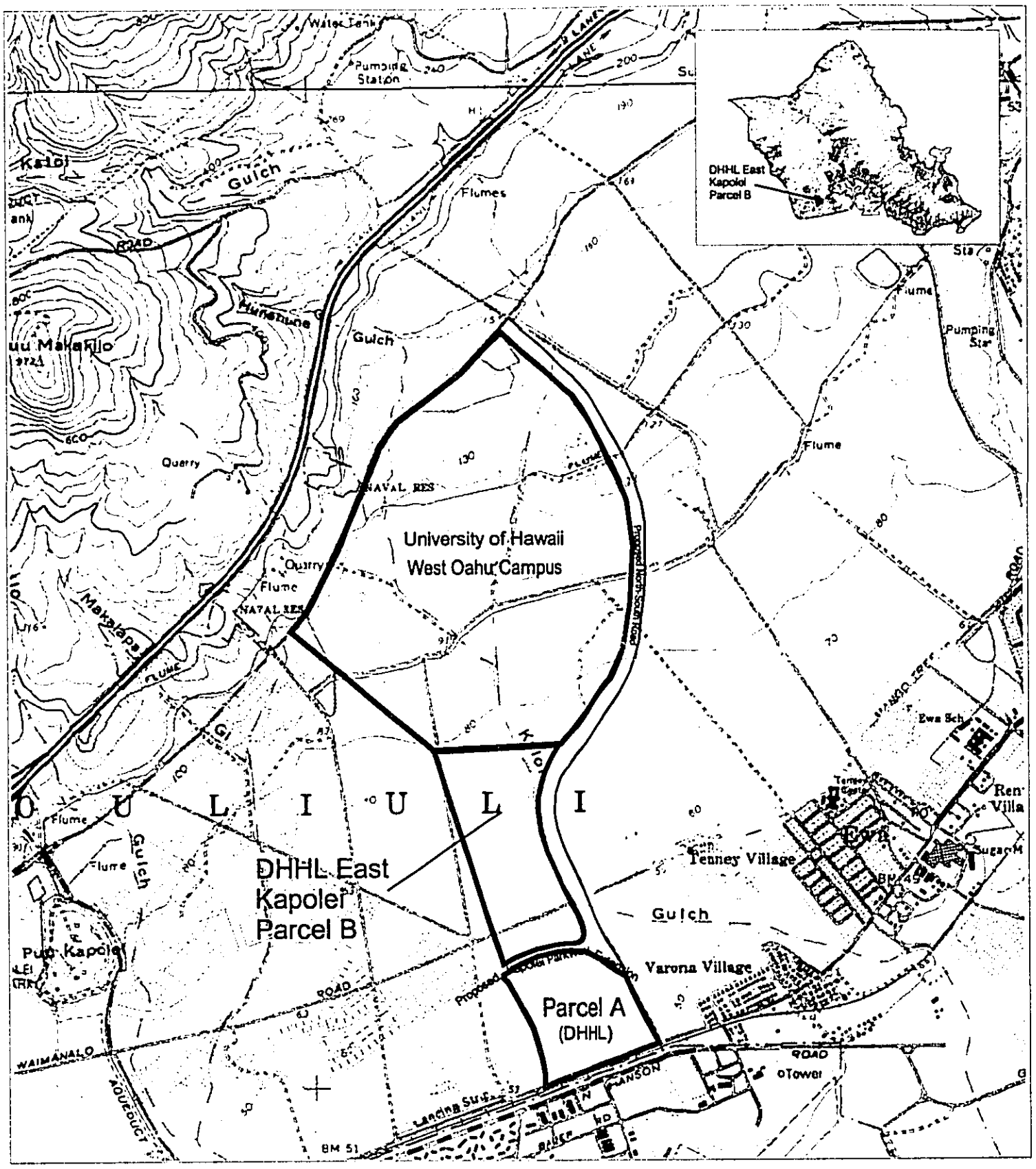
The DHHL is the potential landowner of the subject property and the agency preparing this environmental assessment. The DHHL is also acting as applicant for the applicable entitlements. Primary approval from the State will be acceptance of the environmental disclosure documents in accordance with Chapter 343, *Hawaii Revised Statutes* (HRS).

1.4 DESCRIPTION OF THE PROPERTY

The subject property is located in 'Ewa, adjacent to and west of the proposed North-South Road. The property includes 92.1 acres of mostly vacant agricultural land that was previously leased for many years by Oahu Sugar Company, Limited (OSCo) to cultivate sugarcane. Located on the 'Ewa Plain, the property is generally flat to slightly sloping with an average slope of 1.5 percent. The entire property is within the State Land Use Commission Urban District (Figure 5) and was included in the *East Kapolei Master Plan Final Environmental Impact Statement* for the 1,300-acre area formerly proposed for mostly residential development by the State of Hawai'i, Housing and Community Development Corporation of Hawaii (HCDCH).

1.5 SURROUNDING LAND USES

The subject property is bounded to the north by the proposed University of Hawai'i – West O'ahu (UHWO) Campus, to the west by the existing Kapolei Golf Course, to the east by the proposed North-South Road alignment, and to the south and southeast by the proposed Kapolei



Legend

DHHL East Kapolei Parcel B

Source: USGS Topographic Map

Figure 1
Location Map
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH

LINEAL SCALE (FEET)
1,000 0 2,000

ISLAND OF OAHU

PBR HAWAII

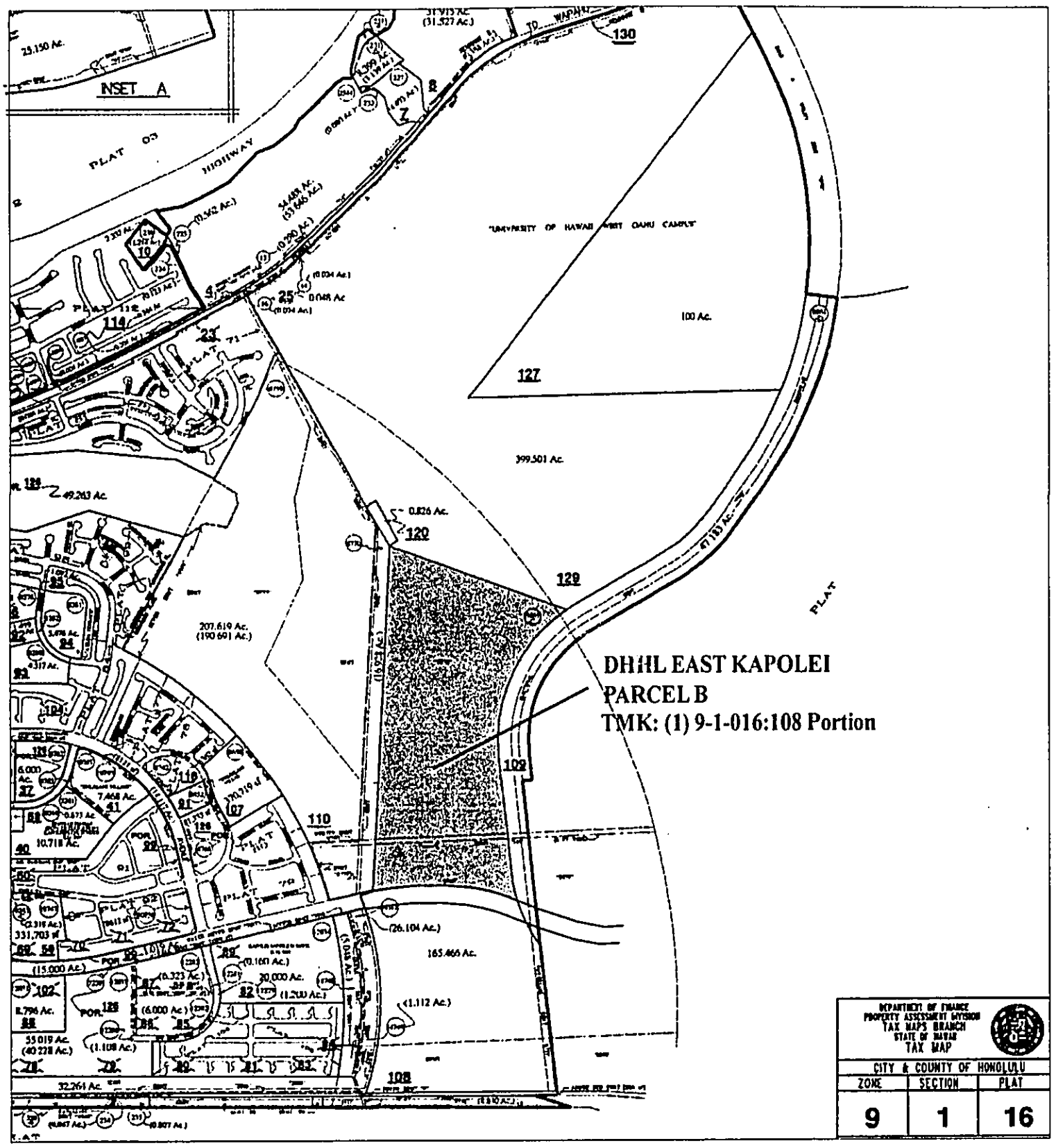


Figure 2
Tax Map Key
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH
LINEAL SCALE (FEET)
750 0 1,500
ISLAND OF OAHU

Source: State of Hawaii Department of Finance Property Assessment Division

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Figure 3
Aerial Photograph
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

PBR
HAWAII

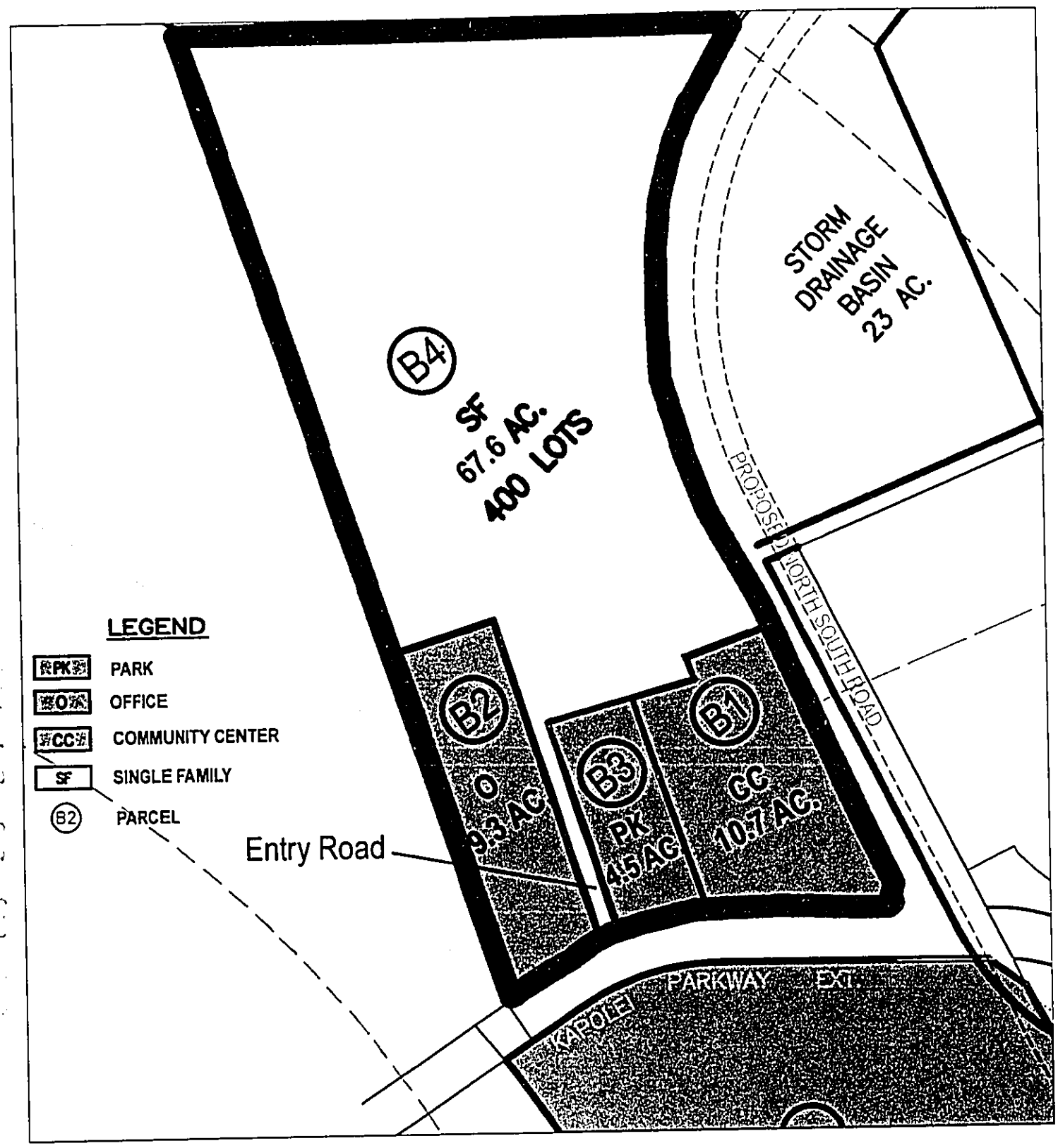

Figure 4
Conceptual Plan (Subject to Change)
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH
LINEAL SCALE (FEET)
250 0 500
ISLAND OF OAHU
PBR HAWAII

Legend

- DHHL East Kapolei Parcel B
- Agricultural District
- Urban District

Source: State Land Use Commission

Figure 5
State Land Use District Boundary Map
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH

LINEAL SCALE (FEET)
1,000 0 2,000

ISLAND OF OAHU

PBR HAWAII

Parkway and the former Naval Air Station Barbers Point (now referred to as Kalaeloa) beyond (Figure 1).

1.6 BACKGROUND

The subject property consists of approximately 92.1 acres of land previously used for sugarcane production in the district of 'Ewa and the ahupua'a of Honouliuli, on O'ahu (Figure 3).

The Kapolei area, as shown in the Kapolei Area Long Range Master Plan (Figure 6) prepared by the Estate of James Campbell, is located on the 'Ewa Plain approximately 30 minutes from downtown Honolulu. The 'Ewa Plain encompasses approximately 32,000 acres, or about 8 percent of the island of O'ahu. The City of Kapolei and surrounding developments have been master-planned to provide for commercial, industrial, resort, recreational, and residential uses. The proposed DHHL East Kapolei Parcel B site is designated for residential, low density apartment, and commercial/office land uses.

The DHHL East Kapolei Development Parcel B involves the construction of 67.6 acres for single-family residential, 9.3 acres for office, 10.7 acres for community center, and 4.5 acres for park use. The residences of the project will be located adjacent to or nearby the proposed University of Hawai'i – West O'ahu (UHWO) Campus, a proposed 8-acre park site, a proposed elementary school site, the proposed North-South Road, 'Ewa Villages Golf Course, Kapolei Parkway, Kapolei Middle School, and the Kapolei Golf Course. Off-site requirements for the proposed project include construction of Kapolei Parkway Extension from the lower channel bridge to the North-South Road intersection, a potable water reservoir located at the 215-foot-elevation and a water transmission main (a 215-foot-elevation non-potable water reservoir and distribution mains along North-South Road are proposed to be constructed by the Board of Water Supply), and a wastewater transmission main from Parcel B to the Kapolei Interceptor Sewer.

The potential impacts of the DHHL Parcel B development were discussed in the HCDCH *East Kapolei Master Plan Final Environmental Impact Statement*, which was accepted in 1998. To implement the development of the East Kapolei Master Plan and to realize the potential revenues from the future sale of 1,300 acres of State land in East Kapolei, the State designated HCDCH as the lead agency to prepare the master plan and process the applicable land use entitlement applications. Subsequently, the portions of the 1,300 acres of State land in East Kapolei that were not set aside for UHWO were transferred to the State Department of Land and Natural Resources (DLNR). In turn, DLNR will transfer major portions of its land to DHHL to support its programs for native Hawaiians[1]. The proposed East Kapolei Parcel B project is the first project from DHHL's East Kapolei landholdings.

[1] In this report, a lower case "n" is used in the phrase "native Hawaiian" when referring to Hawaiian Homes Commission Act beneficiaries, who by definition must have 50 percent Hawaiian ancestry in order to qualify. The upper case "N" is used when more generally describing persons with any percentage of Hawaiian ancestry, as for federal programs regarding health and education.

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Source: The Estate of James Campbell

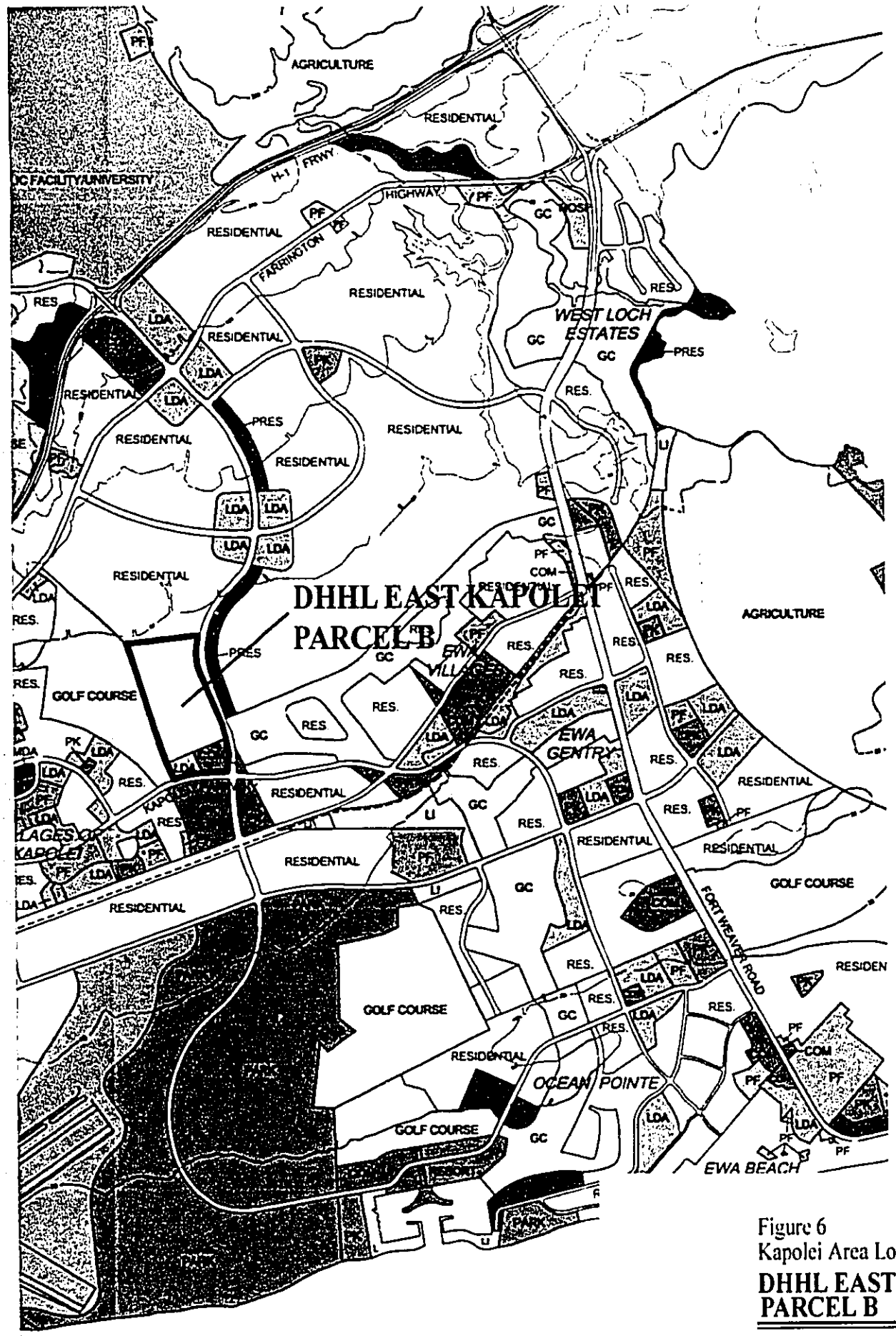

Figure 6
Kapolei Area Long Range Master Plan

DHHL EAST KAPOLEI DEVELOPMENT PARCEL B

ISLAND OF OAHU

NOT TO SCALE

PBR HAWAII

2.0 DESCRIPTION OF THE PROJECT

2.1 PROJECT GOALS AND OBJECTIVES

The project objective established by the DHHL is to provide a livable community for native Hawaiians, which would include single-family residences, commercial uses, and a park.

2.2 NEED FOR THE PROJECT

According to the *DHHL Applicant Survey 2003*, there has been a 57 percent increase in applicants for homesteads since 1995. Based on indicated preferences and focus groups, most applicants are looking to the DHHL to provide them with housing solutions. Of the three types of land awards (pastoral, agricultural, and residential), newer applicants have mostly applied for residential only or agricultural and residential land. Residential only applications have increased by 98 percent since 1995, and the number of residential applications (7,400) is highest on O'ahu. Qualified applicants indicated their preferred housing type, which varied by island. On O'ahu, 37 percent preferred turnkey homes.

According to the 2000 Census, 64 percent of Hawaiians or Part Hawaiians live on O'ahu. The DHHL Parcel B development in East Kapolei will help to meet the growing demand for residential land by providing much needed single-family residential units for native Hawaiians. The project will also help to ease the statewide shortage of housing, as residences will become available to the general population once DHHL beneficiaries move to their homestead lots.

2.3 KEY ELEMENTS OF THE CONCEPTUAL PLAN

The DHHL East Kapolei Development Parcel B is proposed to be located on a 92.1-acre parcel of land within the 1,300-acre HCDCH East Kapolei Master Plan. It will include single-family residential lots and commercial and park uses (Figure 4). In support of the development, infrastructure facilities to be expanded or improved include access and circulation roadways, drainage systems, water and wastewater collection lines, and electrical/communication systems. All infrastructure improvements will be designed and sized to accommodate the residential development in accordance with applicable standards of the City and County of Honolulu (City), the Board of Water Supply, the State of Hawai'i (State), and public utility companies.

2.3.1 Site Development

The final layout and configuration of the proposed development will be refined through the planning, engineering, and design process to ensure that long-range use of the property will be consistent with surrounding land uses. Where appropriate, guidelines for sustainable building design and landscaping with native plants will be considered. Major land use elements of the conceptual plan (Figure 4) are described below.

Single-Family Residential
Of the approximately 92.1 acres of land in Parcel B, 67.6 acres will be allocated to single-family residential use and provide 400 lots.

Office
Within Parcel B, the DHHL is interested in developing 9.3 acres of land for its Kapolei Office Facility. The building would be approximately 40,000 square feet for up to 150 employees. The office would be located proximate to proposed major transportation nodes and would allow DHHL beneficiaries easier access to the department's services and offices.

Park
Parcel B will include 4.5 acres of park use.

Community Center
A 10.7-acre community center is proposed within Parcel B. The center would be developed and operated by the Salvation Army. Financing for the center would be provided by a gift from the late Joan Kroc. The community center could include facilities such as a swimming pool, performing arts center, child care center, gymnasium, craft room, chapel and worship center, education center, game and recreation areas, commercial kitchen and dining areas, family service offices, and other adaptable multi-use spaces. The facilities would be available to homestead families as well as the general public. The proposal to locate the Kroc community center at Parcel B is one of 20 to 25 to be considered by the Salvation Army western territory headquarters. While the DHHL believes there is a good chance that the center will be developed in East Kapolei, a decision is not expected until mid-2006. If Parcel B is not selected as a site for a Kroc community center, then DHHL will develop the 10.7-acre site for single-family residential use.

The State Department of Business, Economic Development and Tourism (DBEDT) Office of Planning (OP) stated that the proposed uses are consistent with the uses designated in the HCDCH *East Kapolei Master Plan Final Environmental Impact Statement* (Appendix A-1). The OP further stated that it supports the proposed uses, provided that it complies with applicable State and City regulations and meets infrastructure and public service needs.

Final determination of land use allocations, building densities, the development timetable, and projected improvement costs will be identified during the entitlement review process. During the pre-consultation period for this EA, the State Land Use Commission (LUC) cited LUC Docket No. A99-728/Housing and Community Development Corporation of Hawaii, which established conditions under which the East Kapolei Master Plan area was urbanized (Appendix A-2). In accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County. However, the DHHL fully intends to develop its lands to meet the spirit and intent of the land use conditions by providing affordable housing in a clean and safe environment with the improvements, including water, sewer, and drainage, being built to City and State standards.

The LUC also noted that the HCDCH East Kapolei Master Plan originally planned the project area for 70.2 acres of single-family residential, 10.5 acres of multi-family residential, 8 acres of commercial, and 5.5 acres of park use. The proposed DHHL Parcel B project includes 67.6 acres of single-family residential, 9.3 acres of office, 10.7 acres of community center, 4.5 acres of

park, and no multi-family residential use. Since Parcel B would be lower in density, roads and water and sewer facilities within the region would be less impacted compared to a higher-density development.

2.4 INFRASTRUCTURE IMPROVEMENTS

Construction of the proposed DHHL Parcel B will begin with development of the infrastructure after the applicable grading permits are issued. The project roadways and utilities will be provided by DHHL.

On-site Improvements
Presently, there are no significant infrastructure facilities located on the property. Kapolei Parkway is the closest major transportation access, and plans are presently being prepared for the completion of Kapolei Parkway, the future construction of North-South Road, and the improvement of Farrington Highway (between Kapolei Golf Course and Fort Weaver Road). New on-site infrastructure will be required, including facilities for water transmission and distribution, wastewater collection, traffic circulation, drainage, and electrical and communication systems.

Off-site Improvements
Extensive off-site infrastructure improvements are designed to accommodate 'Ewa and Kapolei as O'ahu's second city. These improvements include transportation systems, water and wastewater facilities, and electrical/communication systems. Planned infrastructure improvements for the project include:

- Kapolei Parkway Extension from the lower channel bridge to the North-South Road intersection;
- A 215-foot-elevation potable water reservoir and water transmission main (a 215-foot-elevation non-potable water reservoir and distribution mains along North-South Road are proposed to be constructed by the Board of Water Supply);
- Drainlines and structures;
- A wastewater transmission main from Parcel B to the Kapolei Interceptor Sewer; and
- Sandwich Isles Communications, Inc. (SIC) fiber optic network along Kapolei Parkway and North-South Road (SIC will also be installing its fiber optic network along Farrington Highway).

All improvements will be designed in accordance with the applicable standards of the City, State, Board of Water Supply, and public utilities companies.

2.4.1 Water Supply and Distribution

Presently, there is no potable water system servicing the subject property. Maximum daily potable water demand generated by the project is estimated at 0.42 million gallons per day (mgd), for an ultimate residential population of 1,768 and park and commercial areas.

The City and County of Honolulu Board of Water Supply (BWS) rules and regulations require the use of non-potable water for the irrigation of large landscaped areas, if a suitable supply is

available. As such, non-potable water will be used to supplement the potable water system in meeting the total water demand for the Parcel B development. This non-potable system will utilize brackish water and/or reclaimed water (from the Honouliuli Wastewater Reclamation Facility) for irrigation purposes primarily within road right-of-ways and landscaped open space, including the park. The potable and non-potable water systems will comply with all applicable State Department of Health (DOH) regulations.

When the DHHL Parcel B is fully developed, the total storage requirement is calculated at 0.4 mgd. A new 4.0-million gallon (mg) reservoir for the 215-foot-elevation system will be developed to serve Parcel B, as well as Parcels A, C, and portions of Parcel D of the East Kapolei Development. This will surpass the storage requirement for the proposed Parcel B project. The 215-foot-elevation system will be connected to the 36-inch water main along Farrington Highway.

New transmission and distribution lines include 30-inch, 24-inch, and 20-inch lines along North-South Road and East-West Road, and a 16-inch line along Farrington Highway. A 12-inch distribution line will also be located within Kapolei Parkway. The *East Kapolei Development Master Plan Water System Study* will be submitted to the BWS for its approval. This master plan includes the proposed development layout, along with the proposed water system facilities and necessary hydraulic calculations for the entire East Kapolei Development. It also addresses source requirements and transmission and storage facilities to service the entire development of East Kapolei.

2.4.2 Wastewater Collection and Transmission

The DHHL Parcel B is located within the City's Honouliuli Wastewater Treatment Plant (WWTP) service area. The WWTP is located adjacent to Kalaeloa (formerly known as Naval Air Station Barbers Point). The only major trunk sewer line near the subject property is the 30-inch Makakilo Interceptor, which runs from Makakilo, along Fort Barrette Road and Renton Road (parallel to the OR&L Railroad right-of-way) to the Honouliuli WWTP. This sewer line will be supplemented by the proposed Kapolei Interceptor New Sewer. Off-site improvements for this project include a wastewater transmission main from Parcel B to the Kapolei Interceptor Sewer. These improvements will be designed in accordance with the applicable standards of the City, BWS, State, and public utility companies.

Average design flow generated by the Parcel B development is projected at 0.315 million gallons per day (mgd).

2.4.3 Drainage Facilities

Impermeable surfaces established by on-site roadways, parking areas, and buildings within the subject property will increase the amount of storm runoff generated. These increases in surface runoff could cause downstream flooding if on-site drainage improvements are not made or if downstream drainage facilities cannot accommodate the additional flows. The existing Kalo'i Gulch drainage system is inadequate and significant drainage impacts will occur if appropriate mitigation measures are not implemented.

Current plans for drainage improvements for the proposed Parcel B development are consistent with the HCDCH *East Kapolei Master Plan FEIS*. Upon approval by the U.S. Army Corps of Engineers, drainage from Kalo'i Gulch above Farrington Highway will be realigned to the North-South Road utility corridor. The proposed realignment of Kalo'i Gulch will reduce the existing flood potential within Parcel B. A drainage report for this project will be provided upon completion of construction plans. The drainage report will be consistent with the drainage plans.

2.4.4 Transportation Improvements

To implement the project, the DHHL is required by the City to build the entire section of Kapolei Parkway Extension from the lower channel bridge to the North-South Road intersection. At this level of planning, the jurisdictional responsibility for internal roadways has not been determined. However, it is foreseen that roadways within Parcel B will be controlled by the DHHL. The North-South Road and Interchange would be State facilities and the Kapolei Parkway would remain under the jurisdiction of the City and County of Honolulu. These major external roadways will be designated and built in accordance with applicable State and City design standards.

2.5 PHASING AND TIMING OF ACTION

Phase I of the project includes planning procedures for the East Kapolei Development Parcel B and will run through mid-March 2005. Phase II includes engineering services for off-site improvements. Construction is scheduled to begin at the end of May 2006 and continue through January 2007.

2.6 ORDER OF MAGNITUDE COSTS

The budget for on-site improvements is approximately $26 million and the budget for off-site improvements is approximately $12 million.

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3.0 RELATIONSHIP TO PLANS AND POLICIES

3.1 CHAPTER 343, HAWAII REVISED STATUTES

This Environmental Assessment is prepared pursuant to Chapter 343, *Hawaii Revised Statutes* (HRS).

Various agencies and individuals were consulted in preparation of this EA. Pre-consultation comments and applicable responses have been reproduced in Appendix A-2. The DEA was published in the Office of Environmental Quality Control (OEQC) *The Environmental Notice* on February 8, 2005, commencing a 30-day public review period that ended on March 9, 2005. Comments on the DEA and applicable responses have been reproduced in Appendix A-1. A complete list of agencies and individuals consulted is provided in Chapter 9.0 of this FEA.

3.2 STATE OF HAWAI'I – HAWAII STATE PLAN

The *Hawaii State Plan* (Chapter 226, HRS) serves as a guide for the future long-range development of the State; identifies goals, objectives, policies, and priorities for the State; provides a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; improves coordination of Federal, State, and County plans, policies, programs, projects, and regulatory activities; and establishes a system for plan formulation and program coordination to integrate all major State and County activities. Sections of the *Hawaii State Plan* applicable to the DHHL East Kapolei Parcel B project are discussed in the following pages.

Section 226-4 State goals: *In order to guarantee, for present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:*

(1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations.

(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well- being of the people.

(3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.

Discussion: The DHHL East Kapolei Parcel B project will help present and future generations of native Hawaiians reach their desired level of self-reliance by providing home ownership opportunities. The project will also benefit the State by easing the shortage of housing, as beneficiaries vacate residences and move onto homestead lots. The economy will also be supported through this project, which will provide numerous construction-related employment opportunities, as well as long-term jobs related to the commercial/office area within Parcel B. In addition, this project will promote the physical and social well-being of individuals and families in Hawai'i by including recreational opportunities.

Section 226-5 Objective and policies for population:

(a) It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

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

(1) Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.

(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.

Discussion: The DHHL Parcel B project is consistent with State and City policies to direct new development to the 'Ewa region. Socio-economic opportunities for Hawai'i's people will be offered through the project, which will provide new housing with a park (or other recreational opportunities) and commercial area/office facility proximate to schools and other employment centers.

Section 226-6 Objective and policies for the economy – in general:

(a) Planning for the State's economy in general shall be directed toward achievement of the following objectives:

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

Discussion: Parcel B will be proximate to several employment centers within the Second City and as such, residents will have nearby opportunities for increased income and job choice and improved living standards. Additionally, a 9.3-acre office area within Parcel B may include a 40,000-square foot building, which could provide employment for up to 150 employees.

Section 226-9 Objective and policies for the economy – federal expenditures:

(a) Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaii's economy.

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

(3) Promote the development of federally supported activities in Hawaii that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaii's environment.

Discussion: The DHHL East Kapolei Parcel B project will receive federal funding from the U.S. Department of Housing and Urban Development (HUD), and this EA has been prepared to address potential impacts to the physical, social, and economic environment.

Section 226-10 Objective and policies for the economy – potential growth activities:

(a) Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawaii's economic base.

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

(10) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaii's social, economic, physical, and environmental objectives.

Discussion: This project will receive federal and State funding to provide native Hawaiians with enhanced socio-economic opportunities through home ownership, in a livable community with nearby employment centers.

Section 226-11 Objectives and policies for the physical environment – land-based, shoreline, and marine resources:

(a) Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives.
(2) Effective protection of Hawaii's unique and fragile environmental resources.
(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.
(8) Pursue compatible relationships among activities, facilities, and natural resources.
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.

Discussion: This EA identifies the physical, archaeological, and cultural attributes of the Parcel B site. Several surveys of the site were conducted, and features such as slope, soil, streams and drainage, archaeological sites (none of which were found on the site), and flora and fauna were identified; however, most natural features have been modified by previous agricultural activities. Clusters of the endangered plant species *Abutilon menziesii*, or ko'oloa'ula, were found on Parcel B and would need to be removed from the site. However, a Habitat Conservation Plan has been developed and approved, and with successful implementation of the plan, ko'oloa'ula will significantly improve and increase in number over existing conditions.

Other potential impacts resulting from the project have been identified throughout this EA, which also reports on proposed mitigation measures. Proposed infrastructure improvements will better control runoff and erosion, and the residential community (with commercial and park uses) will use less water, pesticides, and fertilizers than previous agricultural activities on the site. New recreational opportunities (in addition to economic opportunities offered by the project) will be created within Parcel B, which proposes a 4.5-acre park and a 10.7-acre community recreation center. Since Parcel B is located over 9,000 feet from the shoreline, it is not expected to impact coastal or marine resources.

Section 226-12 Objective and policies for the physical environment – scenic, natural beauty, and historic resources:

(a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.

(b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:

(1) Promote the preservation and restoration of significant natural and historic resources.

(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

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

(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Discussion: As discussed above, a Habitat Conservation Plan has been developed for the preservation of the endangered plant species, ko'oloa'ula. No archaeological or culturally-significant sites have been identified on Parcel B; however, should any sites be uncovered during construction, work will cease and the State Historic Preservation Division will be notified in accordance with State requirements.

Since the project area is relatively flat, there are no shoreline views provided from the site. The DHHL East Kapolei Parcel B project will improve the aesthetic quality of the site by changing its appearance from a vacant scrub land to a residential community with commercial and park areas. These proposed land uses are consistent with the *Ewa Development Plan* adopted by the City, which directs new development to this region, and the previously proposed HCDCH East Kapolei Master Plan.

Section 226-13 Objectives and policies for the physical environment – land, air, and water quality:

(a) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:

(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.

(b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:

(2) Promote the proper management of Hawaii's land and water resources.

(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.

(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.

(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.

(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.

(7) Encourage urban developments in close proximity to existing services and facilities.

Discussion: The DHHL East Kapolei Parcel B project will maintain the quality of Hawai'i's land, air, and water. To mitigate short-term air quality impacts during construction, all activities will comply with State Air Pollution Control regulations and the provisions of *Hawaii Administrative Rules*, §11-60.1-33 on Fugitive Dust, a dust control plan will be developed, and a best management practices will be implemented to control erosion. Over the long term, air

quality impacts could result from vehicular exhaust and indirect emissions from increased electrical power demand; however, increasingly stringent automobile emission standards, advanced technology, provisions for bicycling in the region, and enhanced public transportation from the City will mitigate these impacts.

Proposed infrastructure improvements will mitigate the potential flood hazard through a system of retention/detention facilities. All improvements will comply with City drainage regulations and ensure that current off-site runoff quantities are maintained. Potential damage from hurricanes, earthquakes, and volcanic eruptions is no more likely to affect Parcel B than other locations in the 'Ewa region. All structures will be constructed in compliance with the Uniform Building Code and other City requirements to minimize potential damage from natural disasters.

Since Parcel B is located inland, coastal and marine resources are not expected to be impacted by the project.

Current State and City policies direct new development to the 'Ewa region. Parcel B is bounded by the proposed North-South Road and Kapolei Parkway Extension, which will provide transit corridors, and proximate to existing public facilities and services within the Second City.

Section 226-15 Objectives and policies for facility systems – solid and liquid wastes:

(a) Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards achievement of the following objectives:

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

Discussion: Solid waste generated by the DHHL East Kapolei Parcel B project will be transferred to the City's H-POWER (Honolulu Program of Waste Energy Recovery) plant. The Honouliuli Wastewater Treatment Plant is expected to be able to accommodate projected flows from the project, and wastewater transmission lines and pump stations will be expanded and constructed. Wastewater will be collected, treated, and reused/disposed of in accordance with applicable DOH and City regulations.

Section 226-16 Objective and policies for facility systems – water:

(a) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.

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

(1) Coordinate development of land use activities with existing and potential water supply.

Discussion: Potable water will be provided by the Board of Water Supply (BWS) distribution system. Parcel B will be served by the Kapolei 215-foot-elevation water system, and improvements will be designed in accordance with the applicable standards of the City, BWS, State, and public utility companies. All applicable governmental regulations will be observed to ensure the public's safety and health.

Section 226-17 Objectives and policies for facility systems – transportation:

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

(6) Encourage transportation systems that serve to accommodate present and future development needs of communities.
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation.
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.

Section 226-18 Objectives and policies for facility systems – energy:

(c) To further achieve the energy objectives, it shall be the policy of this State to:
(7) Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure.

Discussion: With future transit nodes located nearby, including one at the southeast corner of Parcel B, residents of the proposed development and other nearby subdivisions will be encouraged to use public transportation systems to commute to/from schools and places of employment. The project will encourage energy efficiency through alternate transportation modes (i.e., walking or bicycling), as Parcel B is located near employment and education centers (including Kapolei Middle School, Kapolei High School, the proposed University of Hawai'i – West O'ahu Campus, and a proposed elementary school on the proposed UH West O'ahu site) and includes office, park, and community center uses. The use of water-efficient landscaping and provisions for insulation and natural ventilation of proposed structures will further promote energy efficiency.

Section 226-19 Objectives and policies for socio-cultural advancement – housing:

(a) Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:
(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.
(2) The orderly development of residential areas sensitive to community needs and other land uses.
(b) To achieve the housing objectives, it shall be the policy of this State to:
(1) Effectively accommodate the housing needs of Hawaii's people.
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.
(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.

Discussion: The DHHL East Kapolei Parcel B development will provide native Hawaiians with home ownership opportunities in a location near various public facilities and services. As beneficiaries move into Parcel B, home ownership and rental opportunities will become available to the general public, helping to ease the statewide shortage of housing. This project proposes the development of single-family residences, as well as office, park, and recreational center

facilities, on vacant, developable urban land where State and City policies have directed new development. Parcel B will be designed to reflect the character of existing surrounding neighborhoods, and office, park, and recreational facilities within the site will foster a sense of community and cohesiveness.

Section 226-52 Statewide planning system.

(a) The statewide planning system shall consist of the following policies, plans, and programs:
(2) The priority guidelines established in this chapter shall provide guidelines for decision-making by the State and the counties for the immediate future and set priorities for the allocation of resources. The formulation and amendment of state functional plans shall be in conformance with the priority guidelines.
(b) The statewide planning system shall also consist of several implementation mechanisms, including:
(2) The state budgetary, land use, and other decisionmaking processes. The state budgetary, land use, and other decisionmaking processes shall consist of:
(D) Land use decisionmaking processes of state agencies. Land use decisions made by state agencies shall be in conformance with the overall theme, goals, objectives, and policies, and shall utilize as guidelines the priority guidelines contained within this chapter, and the state functional plans adopted pursuant to this chapter. The rules adopted by appropriate state agencies to govern land use decisionmaking shall be in conformance with the overall theme, goals, objectives, and policies contained within this chapter.

Discussion: The DHHL East Kapolei Parcel B project complies with the guidelines established by the *Hawaii State Plan* and *State Functional Plans* regarding the statewide planning system and the land use decision-making process.

Section 226-103 Economic priority guidelines.

(f) Priority guidelines for energy use and development:
(1) Encourage the development, demonstration, and commercialization of renewable energy resources.
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.

Discussion: Solar water heating and other energy-efficient devices are likely to be incorporated into the various structures on the property. Parcel B is conveniently located near educational facilities, employment centers, and public transit corridors, thus encouraging walking, bicycling, and other alternate forms of transportation and increasing energy efficiency.

Section 226-104 Population growth and land resources priority guidelines.

(b) Priority guidelines for regional growth distribution and land resource utilization:
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.
(6) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.
(10) Identify critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and

recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.

(12) Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.

Discussion: State and City policies direct new development to the 'Ewa region. As this area develops, additional public facilities will be provided near the DHHL East Kapolei Parcel B. The Parcel B site is not a critical environment, although it contains clusters of the endangered plant species ko'oloa'ula, for which a Habitat Conservation Plan has been developed and approved. The project is not expected to negatively impact the shoreline, conservation lands, or other limited resources and will provide single-family residences to eligible native Hawaiian homestead beneficiaries, helping to accommodate the projected population growth and address the demand for new housing.

No significant potable groundwater resources or recharge areas are associated with the site, and best management practices will be employed during construction to mitigate potential erosion, which has the potential for impacting air and water quality. Mitigation measures for other potential impacts resulting from this project have been identified in this EA. Should any historic and cultural sites be encountered during the construction period, they will be treated in accordance with accepted standards and regulations of the State DLNR Historic Preservation Division (SHPD).

Section 226-106 Affordable housing.

(b) Priority guidelines for the provision of affordable housing:

(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.

(4) Create incentives for development which would increase home ownership and rental opportunities for Hawaii's low- and moderate-income households, gap-group households, and residents with special needs.

(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.

Discussion: The DHHL East Kapolei Parcel B development will use public land and will provide home ownership opportunities for eligible native Hawaiians. As DHHL beneficiaries move to Parcel B, their residences will become available to the general public, thus helping to ease the statewide shortage of housing.

In addition to providing housing, Parcel B would include office, park, and community center facilities to provide employment and recreational opportunities for the community.

3.3 STATE OF HAWAI'I – STATE FUNCTIONAL PLANS

The *Hawaii State Plan* is primarily guided by the *State Functional Plans* (Chapter 226, HRS) and implemented by the State Department of Budget and Finance and the LUC. *State Functional*

Plans, prepared by various State agencies with citizen input, provide specific recommendations for action. The areas addressed by the plans are: agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism, and transportation. The following describes how the DHHL East Kapolei Parcel B project complies with applicable *State Functional Plans*.

Housing Functional Plan

The *Housing Functional Plan* focuses on governmental incentives to develop and deliver a wide range of affordable and market-priced dwelling units. The DHHL East Kapolei Parcel B project supports the *Housing Functional Plan* policies as herein described.

Objective A: *Homeownership for at least sixty percent, or roughly 248,500 households by the year 2000.*

Strategy: *Expand the supply of affordably priced residential units through joint public/private sector efforts. Mobilize resources to better assist families seeking home ownership opportunities. Alternate or Innovative approaches to developing housing should also be pursued.*

Policy A(1): *Direct Federal, State and county resources and efforts toward the development of affordable for-sale housing units.*

Policy A(2): *Encourage increased private sector participation in the development of affordable for-sale housing units.*

Policy A(3): *Ensure that (1) housing projects and (2) projects which impact housing provide a fair share/adequate amount of affordable home ownership opportunities.*

Policy A(4): *Assist first time home buyers in purchasing a home.*

Policy A(5): *Use alternative approaches in providing affordable housing for sale.*

Discussion: The DHHL East Kapolei Parcel B project proposes the development of single-family residences with office, park, and recreational facility uses. The project will direct Federal and State resources and efforts to the development of for-sale housing units and assist first-time home buyers in purchasing homes. Housing opportunities afforded by this project will stimulate and promote increased housing choices for Hawai'i's citizens, directly to eligible native Hawaiians and indirectly to the general population as residences become available when DHHL beneficiaries move out of their current residences and onto homestead lots. The project will add to the housing inventory, thus helping to stabilize the price, overall quality, location, style, and size of housing in Hawai'i.

Objective E: *Homeownership for at least sixty percent, or roughly 248,500 households by the year 2000.*

Strategy: *Acquire public and, where applicable, privately-owned lands for future residential development.*

Policy E(1): *Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, employment and other concerns of existing communities and surrounding areas.*

Policy E(3): *Where feasible, acquire privately owned lands that are suitable for housing development.*

Discussion: The DHHL East Kapolei Parcel B site is owned by the State and is fallow. Based on its physical site conditions; accessibility to existing and proposed schools, public facilities and services, and employment centers; and proximity to other residential communities, Parcel B is an ideal location for a new mixed-use development, enabling residents to live, work, attend school, and play within the area. The proposed project, which includes office, park, and recreational facility uses, is consistent with the *Housing Functional Plan* and other State and City policies directing new development to the 'Ewa region.

Agriculture Functional Plan

The objectives, policies, and implementation actions in the *Agriculture Functional Plan* address the broad issues of agricultural research, marketing, development, regulations, and protection; however, they do not directly apply to the proposed Parcel B project. Parcel B is currently within the Urban State land use district and zoned Ag-1 Restricted Agriculture by the City. However, Hawaiian home lands needed for the purposes of the Hawaiian Homes Commission Act are not subject to County zoning requirements, and the property is currently vacant. In addition, sufficient replacement lands exist on O'ahu to accommodate the continued production of diversified agricultural crops to meet market demand.

Employment Functional Plan

The policies and recommended actions in the *Employment Functional Plan* center around the development and improvement of career/job training programs, the expansion of the labor pool, and the improvement of quality of life for workers. The proposed DHHL East Kapolei Parcel B project will generate direct, indirect, and induced construction-related jobs, both within the property and on an island-wide and statewide basis. Construction industries, as well as industries supporting construction, will benefit from the employment and economic opportunities provided by the project. Various nearby businesses in the City of Kapolei would achieve significant economic gains, as construction workers and residents of the proposed development are expected to patronize them. Within Parcel B, 9.3 acres are proposed for office use. A proposed 40,000-square foot office building could accommodate up to 150 employees.

Energy Functional Plan

The *Energy Functional Plan* outlines policies to promote energy efficiency, displace fossil fuel consumption, support public education and legislation on energy, and better develop and manage energy. The DHHL East Kapolei Parcel B project will promote the efficient use of energy by encouraging walking, bicycling, and the use of public and alternate forms of transportation. With future transit nodes located nearby, including one at the southeast corner of Parcel B, residents of the proposed development and other nearby subdivisions will be encouraged to use public transportation systems to commute to/from schools and workplaces. Parcel B is also

located near employment and education centers (including Kapolei Middle School, Kapolei High School, the proposed University of Hawai'i – West O'ahu Campus, and a proposed elementary school on the proposed UH West O'ahu site). The office, park, and recreational uses within Parcel B will encourage walking and bicycling, further promoting Kapolei as the Secondary Urban Center on O'ahu and reducing the need to commute to Downtown Honolulu.

Solar water heating and other energy-efficient devices are likely to be incorporated into the various structures on the property. The use of water-efficient landscaping and provisions for insulation and natural ventilation of proposed structures will also promote energy efficiency, and the State's Model Energy Code will be considered during the detailed design phases of project development.

Historic Preservation Functional Plan

According to the *Historic Preservation Functional Plan*, the preservation of historic properties involves three major areas of activity: the identification, protection, and management and treatment of historic properties. The policies in the *Historic Preservation Functional Plan* are aimed primarily toward government action to provide mechanisms for improving the State's inventory, preservation systems, public access, and public awareness programs on archaeological matters.

During the pre-consultation process for this EA, the SHPD confirmed that this project has already gone through the historic preservation review process (Appendix A-2). The SHPD believes that no historic properties will be affected by the project, and as such, no mitigation measures are proposed. However, should any archaeological sites be uncovered during construction, the SHPD will be notified in accordance with State regulations.

Recreation Functional Plan

The *Recreation Functional Plan* addresses government action toward the acquisition of recreation areas and accesses, the establishment and development of areas and facilities, and the management and usage of recreation resources. New recreational opportunities will be created within Parcel B, which proposes a 4.5-acre park and a 10.7-acre community recreation center.

Tourism Functional Plan

Objective II.A: Development and maintenance of well-designed visitor facilities and related developments which are sensitive to the environment, sensitive to neighboring communities and activities, and adequately serviced by infrastructure and support services.

Discussion: Although no visitor facilities are proposed on Parcel B, Ko Olina Resort is planned for significant resort development, and new housing units, as well as public services and facilities, will be needed to support the resort's workforce living in the resort vicinity.

Transportation Functional Plan

Objective I.A: Expansion of the transportation system.

Policy I.A.1: *Increase transportation capacity and modernize transportation infrastructure in accordance with existing master plans and laws requiring accessibility for people with disabilities.*

Policy I.A.2: *Improve regional mobility in areas of the State experiencing rapid urban growth and road congestion.*

Objective I.B: *Reduction of travel demand through zoning and decentralization initiatives.*

Policy I.B.1: *Close the gap between where people live and work through decentralization, mixed zoning, and related initiatives.*

Discussion: The DHHL will comply with "Impact Fees for Traffic and Roadway Improvements in Ewa," Chapter 33A, ROH.

With future transit nodes located nearby, including one at the southeast corner of Parcel B, residents of the proposed development and other nearby subdivisions will be encouraged to use public transportation systems to commute to/from schools and workplaces. The project will also encourage alternate transportation modes (i.e., walking or bicycling), as Parcel B is located near employment and education centers (including Kapolei Middle School, Kapolei High School, the proposed University of Hawai'i – West O'ahu Campus, and a proposed elementary school on the proposed UH West O'ahu site) and includes office, park, community recreational center uses.

All standards relating to accessibility of transportation facilities for people with disabilities will be implemented in accordance with Federal Americans with Disabilities Act requirements.

The proposed project closes the gap between where people live and work (and play) by offering a mixed-use development that includes office use.

3.4 STATE OF HAWAI'I – COASTAL ZONE MANAGEMENT PROGRAM

The objectives of the Coastal Zone Management (CZM) Program, (Section 205A-2, HRS), are to provide the public with recreational opportunities, protect historic and prehistoric resources, protect scenic and open space resources, protect coastal ecosystems, provide facilities for economic development, reduce hazards, and manage development. Program objectives applicable to the DHHL East Kapolei Development Parcel B project are discussed below.

Recreational Resources

Objective: *Provide coastal recreational opportunities accessible to the public.*

Policies:

(B) *Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*

(i) *Protecting coastal resources uniquely suited for recreation activities that cannot be provided in other areas.*

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.
(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing.
(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

Discussion: The DHHL East Kapolei Development Parcel B is well inland from the coastline (over 9,000 feet) and will not impact access to coastal recreational opportunities.

Historic Resources

Objective: *Protect, preserve, and where desirable, restore those natural and man made historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.*

Policies:
(A) Identify and analyze significant archaeological resources;
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Discussion: During the pre-consultation process, the SHPD confirmed that this project has already gone through the historic preservation review process (Appendix A-2). The SHPD believes that no historic properties will be affected by the project, and as such, no mitigation measures are proposed. In addition, the cultural impact assessment stated that sugar production would have destroyed any historic properties related to Hawaiian culture, and there should be minimal direct impact upon native Hawaiian cultural practices and beliefs.

Scenic and Open Space Resources

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

Policies:
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.
(C) Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources.
(D) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: Parcel B is located outside of the Special Management Area and away from the shoreline. Since the area is relatively flat and over 9,000 feet from the shoreline, no shoreline views are offered from Parcel B. The visual appearance of the property will change from vacant scrub land to a landscaped residential community with office, park, and recreational center facilities.

Coastal Ecosystems

Objective: *Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*

Policies:

(B) Improve the technical basis for natural resource management.

(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance.

(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs.

(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: Although the DHHL East Kapolei Parcel B is located away from the shoreline, its development will incorporate measures to mitigate any water quality impacts from surface runoff in accordance with applicable State DOH and City drainage regulations. Since the project area receives relatively little rainfall, drainage improvements will be designed to control the quantity and quality of surface water on-site. In addition, best management practices will be used during construction to control erosion. The DHHL, the University of Hawai'i, and the SDOT are seeking to realign Kalo'i Gulch to the drainage easement within the North-South Road roadway alignment. This can be considered an unresolved issue as of this writing.

Economic Uses

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

Policies:

(A) Ensure that coastal dependent development such as harbors and ports, and coasted related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area.

(B) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside presently designated areas when:

(ii) Adverse environmental effects are minimized.

Discussion: Parcel B is not a coastal dependent development and is located well inland. As such, existing coastal areas are not likely to be affected by the project.

Coastal Hazards

Objective: *Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.*

Policies:

(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards.

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program.
(D) Prevent coastal flooding from inland projects.

Discussion: The DHHL East Kapolei Parcel B is not anticipated to be affected by tsunami, as it is located away from the shoreline and out of the tsunami evacuation zone. The majority of the project site (mauka) is designated Zone D, which are areas of undetermined but possible flood hazards. Realignment of Kalo'i Gulch to North-South Road would significantly alter the flood hazard designations in the area. The remainder of the site is designated Zone X, which are areas determined to be outside of the 500-year floodplain. Although hurricanes and earthquakes cannot be prevented, potential damage would be minimized with compliance to the Uniform Building Code and other City requirements. Impervious surfaces created by the DHHL Parcel B development (i.e. roads, sidewalks, roofs, and buildings) could increase the potential for flooding; however, proposed drainage improvements including on-site retention/detention basins will maintain existing off-site runoff quantities. Development of Parcel B will also comply with the Federal Flood Insurance Program requirements, and any possible impact on near-shore ecosystems from surface runoff would be mitigated by the implementation of best management practices during construction. The U.S. Army Corps of Engineers will be contacted to determine whether a federal license or permit is required, and a National Pollutant Discharge Elimination System (NPDES) permit will be obtained prior to construction to address non-point source discharges.

Managing Development

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

Policies:
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and
(C) Communicate the potential short- and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Public Participation

Objective: *Stimulate public awareness, education, and participation in coastal management.*

Policies:
(A) Promote public involvement in coastal zone management processes.
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion: This EA reports on the potential short- and long-term impacts of the proposed Parcel B project. Prior to and throughout the development of this EA, various public and private agencies and individuals were consulted (see consultation list in Sections 9.1 and 9.2). Requests for pre-consultation comments on the DHHL East Kapolei Parcel B project were distributed in August 2004, and this project was presented to the 'Ewa Neighborhood Board on January 13, 2004. The DEA was distributed to various agencies and individuals in February 2005. The

public comment period for the DEA was from February 8, 2005 to March 9, 2005. Comment letters on the DEA and response letters have been reproduced in Appendix A-1. Pre-consultation comment letters and response letters have been reproduced in Appendix A-2.

Beach Protection

Objective: *Protect beaches for public use and recreation.*

Policies:

(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion.

(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion: The DHHL East Kapolei Parcel B development will be located inland and will not interfere with natural shoreline processes.

Marine Resources

Objective: *Promote the protection, use, and development of marine and coastal resources to assure their sustainability.*

Policies:

(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.

(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency.

Discussion: As a development located away from the shoreline, Parcel B is not expected to have an impact on marine and coastal resources.

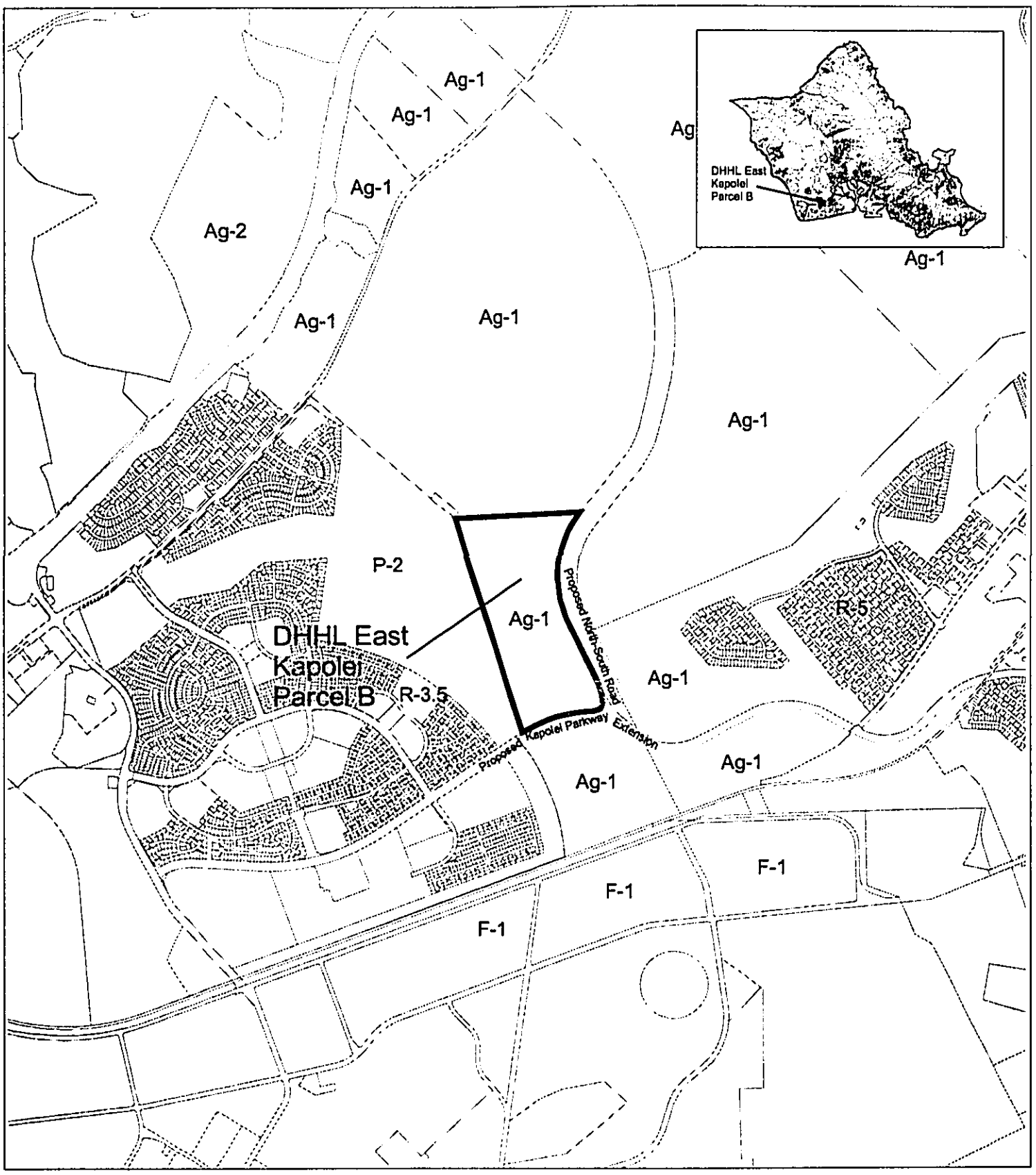
3.5 STATE OF HAWAI'I – STATE LAND USE LAW

In its pre-consultation comments (Appendix A-2), the State LUC confirmed that the project site is designated within the boundary of the Urban District. As suggested by the LUC, Figure 5 shows the project site in relation to this and other State land use districts.

3.6 CITY AND COUNTY OF HONOLULU – LAND USE ORDINANCE

3.6.1 Zoning

The study area is presently zoned Ag-1 Restricted Agriculture by the City Land Use Ordinance (LUO) (Figure 7). However, it should be noted that Hawaiian home lands needed for the purposes of the Hawaiian Homes Commission Act are not subject to County zoning requirements.



Legend (Zoning Districts)

Ag-1 Restricted Agricultural
Ag-2 General Agricultural
P-2 General Preservation
R-3.5 Residential
R-5 Residential
F-1 Military and Federal

Source: City and County of Honolulu Department of Planning and Permitting

Figure 7
Zoning Map
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH
LINEAL SCALE (FEET)
1,000 0 2,000
ISLAND OF OAHU
PBR HAWAII

3.6.2 Ewa Development Plan Land Use Map

The subject area on the *Ewa Development Plan* Urban Land Use Map is designated for High Density Residential and Transit Node (High Density Residential and Commercial) uses (Figure 8). The planning and development process within the *Ewa Development Plan* area has been and continues to be a joint effort of the community, the State, the City, area developers, and The Estate of James Campbell.

3.7 REQUIRED PERMITS AND APPROVALS

The following is an approximate list of major approvals and permits required for the implementation of the proposed DHHL Parcel B development. From the earliest stages of the planning process, the DHHL has worked with all affected agencies to obtain their comments and necessary approval of plans and specifications.

Permit or Approval	Approving Authority	Status
Environmental Assessment (EA)	Chapter 343, HRS, Governor	Underway
Department of Army Permit	U.S. Army Corps of Engineers	
Building/Grading Permits	City Department of Planning and Permitting	
National Pollutant Discharge Elimination System (NPDES)	State Department of Health	

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Building/Grading Permits	City Department of Planning and Permitting	
National Pollutant Discharge Elimination System (NPDES)	State Department of Health	

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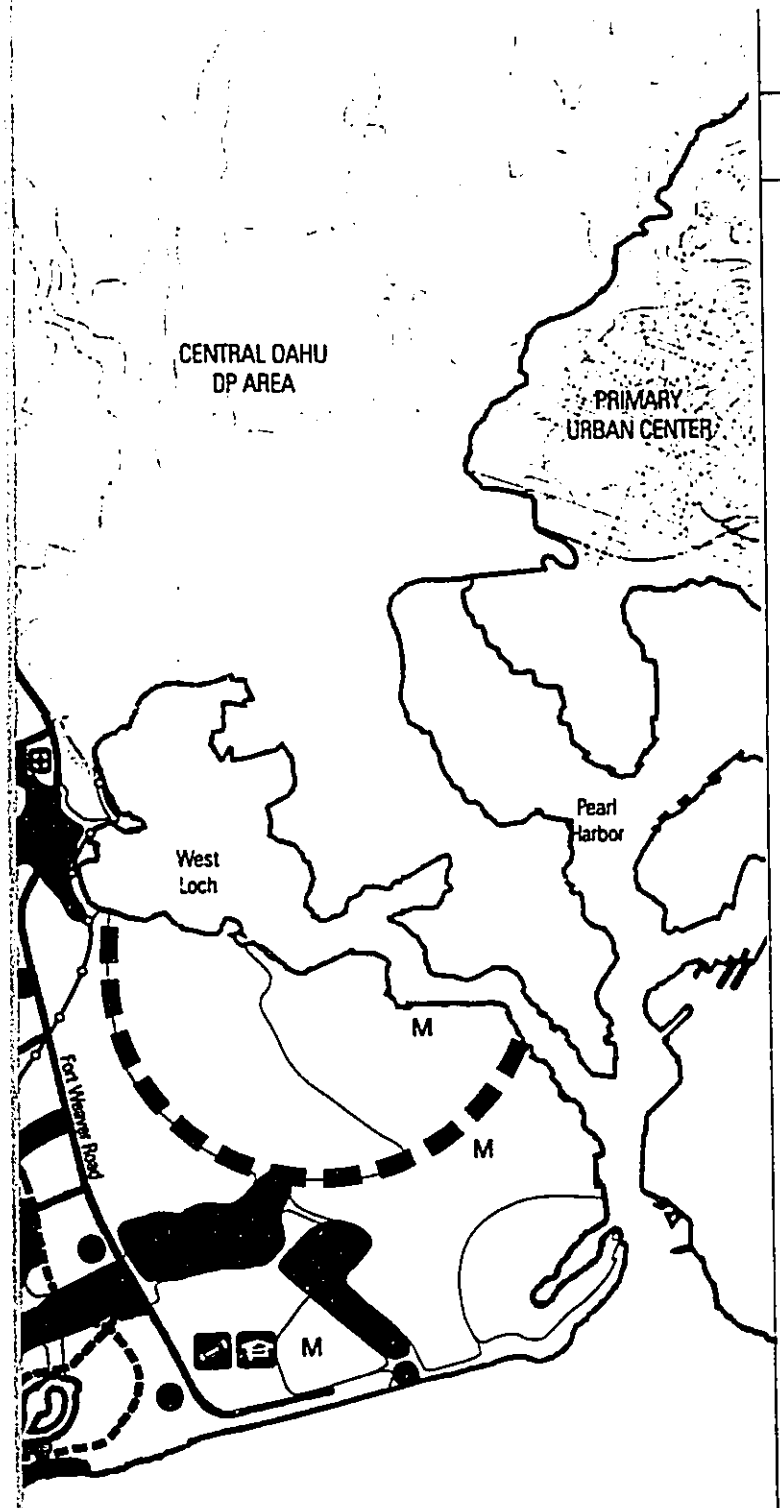
Source: City & County of Honolulu Department of Planning and Permitting



EWA DEVELOPMENT PLAN

Urban Land Use Map

- Low and Medium Density Residential
- High Density Residential
- Community Commercial Center
- City of Kapolei (High Density Residential and Commercial)
- Resort/Recreation Area
- Industrial
- Military
- Public Institution
- Agricultural and Preservation
- Parks and Golf Courses
- Transit Node (High Density Residential and Commercial)
- Urban Growth Boundary

EXISTING	FUTURE	
		Civic Center
		Electric Power Plant
		Wastewater T.P.
		Intermediate School
		High School
		U.H. West Oahu
		Hospital
		Small Boat Marina
		Commercial Harbor
		Airfield
		Highways, Arterial & Major Streets
		Historic Railway

Figure 8

'EWA DEVELOPMENT PLAN

DHHL EAST KAPOLEI DEVELOPMENT PARCEL B

ISLAND OF OAHU

NOT TO SCALE

PBR HAWAII

4.0 ASSESSMENT OF THE EXISTING NATURAL ENVIRONMENT, POTENTAL IMPACTS, AND MITIGATION MEASURES

From a local and regional perspective, the subject property reflects a logical extension of existing and planned urban development on the 'Ewa Plain. The 'Ewa Plain has been determined by both the State and City as O'ahu's "Second City."

The following describes the existing natural environment associated with the property and potential impacts that may result from development of the DHHL Parcel B. Mitigation measures to address potential impacts are also described as applicable.

4.1 CLIMATE

Based on more than 50 years of data collected at the 'Ewa Plantation, average annual daily minimum and maximum temperatures in the project area are 65 and 84 degrees Fahrenheit, respectively. Extreme minimum and maximum temperatures were 47□and 93 degrees Fahrenheit.

The most representative long-term wind data available for the subject property was collected at the former Naval Air Station Barbers Point (now referred to as "Kalaeloa"), located southwest of the proposed project site. Wind frequency data for Kalaeloa show that the annual prevailing wind direction for this area is east northeast, about 40 percent of the time, at approximately 10 knots (12 miles per hour). Winds from the south are infrequent, occurring only a few days during the year and mostly in the winter, in association with Kona storms. The 'Ewa Plain experiences light rainfall with a mean annual rainfall of about 20 inches per year, most of which occurs between the months of November and April.

Potential Impacts and Mitigation Measures

With project build-out, there may be some localized temperature increases resulting from paved surfaces and roofs. However, extensive landscaping of the property will include shade trees and require irrigation, which will help mitigate localized temperature increases from roadways, walkways, and buildings.

4.2 TOPOGRAPHY AND GEOLOGY

The island of O'ahu is of volcanic origin and is characterized by underlying basaltic flows. The 'Ewa Plain is an emerged coral reef formed during the Pleistocene Period when the ocean level was at a higher elevation. For the most part, the 'Ewa Plain is flat with a few isolated bluffs eroded by Honouliuli Stream. The underlying material has been modified over the millennia and is hard but extremely permeable. This hard, permeable caprock made of sedimentary deposits forms a wedge, which hinders the seaward movement of fresh groundwater from the inland basaltic aquifer. At higher elevations the ground surface is made of alluvium and sedimentary

deposits washed down slope over the millennia.

The proposed DHHL Parcel B development is located in the mid-to-lower portion of the Kalo'i Stream watershed, on the southern slopes of the Wai'anae Mountain Range. The uppermost portion of the watershed is over 2,200 feet above sea level. The elevation at the lower boundary of the property is about 56 feet mean sea level (msl) and about 80 feet msl at the upper boundary. The property is relatively flat with an average slope of 1.5 percent. Much of the property had been historically utilized for sugarcane cultivation and extensively modified with cane haul roadways, a furrow irrigation system, and other appurtenant agricultural structures.

Potential Impacts and Mitigation Measures

With the proposed DHHL Parcel B development, the property will eventually be modified with new roadways, single-family residential homes, multi-residential units, a commercial area, a park, landscaping, and improvements to the existing drainage system. However, the construction of drainage improvements and landscaping will mitigate potential short-term impacts such as soil erosion. The property presently consists of fallow agricultural land, and reduced erosion and better control and management of surface runoff during intense storms will likely result with landscaping of the proposed project.

All grading operations will comply with dust and erosion control requirements of the City and County of Honolulu Grading Ordinance. In addition, all construction activities will comply with the provisions of Chapter 11-60.1, *Hawaii Administrative Rules*, Section 11-60.1-33 on Fugitive Dust. A grading permit will be required to modify the topography and a National Pollutant Discharge Elimination System (NPDES) permit will be required prior to construction to address non-point source discharges. The DOH Clean Water Branch (CWB) confirmed this during the pre-consultation period for this EA (Appendix A-2). As required by the CWB, a Notice of Intent (NOI) will be submitted at least 30 days before commencement of the activities covered by the NPDES general permit (i.e. clearing, grading, excavation, or any discharges).

4.3 DRAINAGE

A large portion of the proposed project site lies in the Kalo'i Gulch floodplain. Existing drainage conditions are poor due to the flat topography of the land and inadequate drainage swales, which were primarily used to drain the surrounding sugarcane fields. Runoff from two primary drainage basins, Kalo'i Gulch and Hunehune Gulch, flows through the area. The Kalo'i Gulch "stream" crosses the H-1 Freeway and Farrington Highway, each at one location. In the upper level of the watershed, Hunehune Gulch, a tributary to Kalo'i Gulch, crosses the H-1 Freeway at six locations. These gulches then combine and cross Farrington Highway at two locations. After crossing Farrington Highway, the Hunehune Gulch "stream" combines with the Kalo'i Gulch "stream", which (during storms) flows south through the 'Ewa Villages Golf Course and then the Coral Creek Golf Course.

West Loch Tributary Basin is adjacent to and east of the Kalo'i Gulch drainage basin. The Makakilo Gulch drainage basin is adjacent to and west of the Kalo'i Gulch drainage basin. Kapolei Gulch drainage basin is further west of Kalo'i Gulch. The proposed DHHL Parcel B site lies at the eastern boundary of the Kalo'i Gulch drainage basin, and a very small portion of

the site lies within the West Loch Tributary Basin.

The Federal Emergency Management Agency classifies flood hazard zones as part of the Flood Insurance Program for the City and County of Honolulu. Portions of the site are designated Zones D (areas in which flood hazards are undetermined) and X (areas determined to be outside the 500-year floodplain) (Figure 9). This was confirmed by the DLNR Engineering Division (Appendix A-1).

Potential Impacts and Mitigation Measures

An individual drainage master plan will be prepared for the DHHL Parcel B during the design of the development to control flooding and provide adequate storm water disposal for on-site and off-site generated runoff. On a regional scale, the ultimate drainage plan is not expected to differ significantly from that prepared for the HCDCH East Kapolei Master Plan.

The proposed North-South Road would run along the eastern boundary of Parcel B. This roadway is planned to be incorporated into the regional drainage plan for the area. Regional facilities are proposed to address off-site runoff and mitigate flooding from Kalo'i Gulch by draining into a 23-acre storm drainage basin along North-South Road immediately mauka of the Ewa Villages Golf Course. Backbone facilities are proposed to address the on-site generated runoff and feed into the regional facilities. Areas above Farrington Highway and west of the proposed North-South Road are planned to feed the regional drainage system. The DHHL, the University of Hawai'i, and the SDOT are planning to realign Kalo'i Gulch to the drainage easement within the North-South Road roadway alignment.

Existing drainage conditions are poor due to the flat topography of the land and inadequate drainage swales used to drain surrounding sugarcane fields. However, with the proposed realignment of Kalo'i Gulch, the existing potential for flood would be reduced. In the long term, detention basins along a realigned Kalo'i Channel (following the proposed North-South Road alignment) are planned to attenuate the peak flow due to the Parcel B development and any future projects west of the proposed North-South Road and above Farrington Highway.

During the pre-consultation process for this EA (Appendix A-2), the State DOH Clean Water Branch stated that the Army Corps of Engineers should be contacted to identify whether a Federal license or permit (including a Department of Army permit) is required. The DEA was submitted to the Army Corps of Engineers for its review, comment, and decision in February 2005. While no response was received from the Army Corps of Engineers on the DHHL East Kapolei Development Parcel B project, the Corps provided the following comments on the UHWO Environmental Impact Statement Preparation Notice in March 2005:

> *...coordination has already been initiated with our office in regard to the Corps' jurisdictional authority over the Kaloi Gulch and the Hunehune Gulch, both of which traverse the subject properties. Site inspections were conducted by my staff on December 21, 2004, and January 11 and February 4, 2005. The field investigations revealed that both features, within and throughout the bounds of the subject properties, have well-defined channels with a cobbled bottom and a distinctive lack of vegetation within the invert. Based on the site inspections, and a review of reference materials found in our offices, the Kaloi Gulch and Hunehune Gulch are defined as waters of the U.S. pursuant to Part 328 of the CWA.*
>
> *Section 404 of the Clean Water Act requires that a DA permit be obtained prior to the placement*

or discharge of dredged and/or fill material into waters of the U.S. Based on our review of the information provided, we have determined that the aforementioned project would involve work in and/or placement of the dredged and/or fill material into waters of the U.S. under our regulatory jurisdiction. Therefore, a DA permit would be required prior to any construction occurring within the gulches.

4.4 SOILS

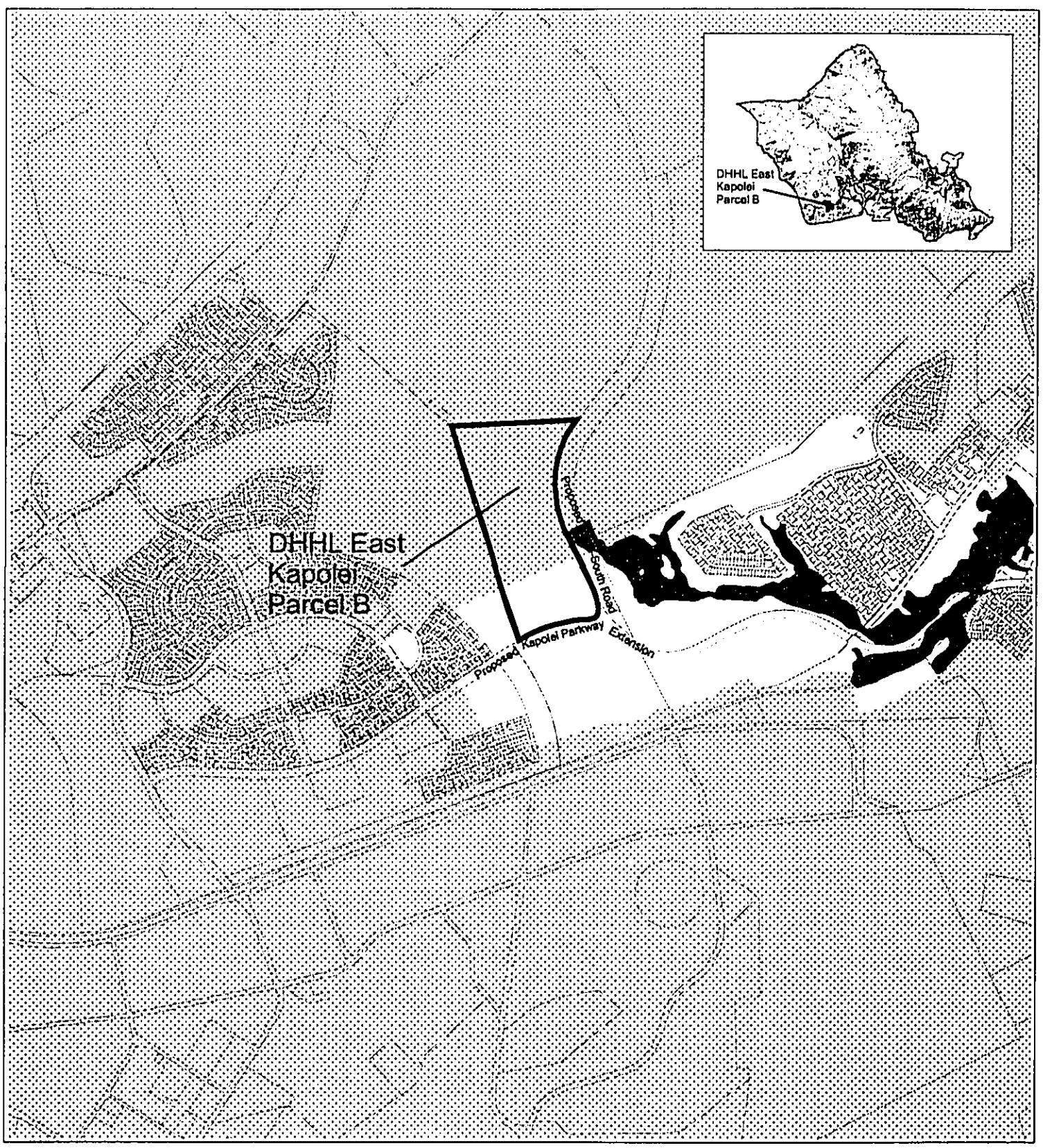
Soil Suitability Studies. Three soil suitability studies have been prepared to describe the physical attributes of land and the relative productivity of different land types for agricultural production in Hawai'i. These studies include the Land Study Bureau Detailed Land Classification, the U.S. Department of Agriculture Soil Conservation Service Soil Survey, and the Agricultural Lands of Importance to the State of Hawaii (ALISH).

Land Study Bureau Detailed Land Classification. The Detailed Land Classification (1965 through 1972) series was produced for each island by the Land Study Bureau (LSB) of the University of Hawai'i. The intent of these reports was to develop a land inventory and productivity evaluation based on statewide standards of crop yields and levels of management. The LSB land classification is a synthesis of the information found in the 1955 *Soil Survey for the Territory of Hawaii* as well as several other sources of data on geology, topography, climate, water resources, and crops. The LSB classification system groups land into homogeneous units called Land Types, describes their condition and environment, delineates the areas on aerial photo base maps, rates the lands on their overall quality (productivity) in relation to other land, and appraises their performance under selected alternative agricultural crops. A five-class productivity rating is applied using the letters A, B, C, D and E, with A representing the class of highest productivity and E the lowest.

The majority of the soils on the property are rated B, good (Figure 10). The soils along the western portion of the property are not rated by the LSB.

Soil Conservation Service Soil Survey. The proposed project site contains one general soil type, Honouliuli Clay, 0 to 2 percent slopes (HxA), as classified by the Soil Conservation Service, now called the Natural Resource Conservation Service (NRCS) (Figure 11). This type consists of clay soils with moderately low permeability and high shrink-swell potential. The erosion hazard is no more than slight for the Honouliuli Clay (HxA) soils. The Honouliuli series consists of well-drained soils on coastal plains. These materials developed in alluvium derived from basic igneous material. They are nearly level and gently sloping, and permeability is moderately slow. The Honouliuli Clay, 0 to 2 percent slopes (HxA) soils have a capability classification of I, if irrigated and IIe, if irrigated. Class I soils have few limitations that restrict their use and Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Agricultural Lands of Importance to the State of Hawaii. The Agricultural Lands of Importance to the State of Hawaii (ALISH) (1977) system identifies and maps three broad classes of agricultural land. These classes are based, in part, on the criteria established by the Soil Conservation Service. Prime Agricultural Land is defined as "land best suited for the production of food, feed, forage, and fiber crops." This class of land has the soil quality,



Legend

- DHHL East Kapolei Parcel B
- ZONE A:
  Special Flood Hazard Areas Inundated by 100-Year Flood
  No Base Flood Elevations Determined
- ZONE D:
  Area of Undetermined But Possible Flood Hazards
- ZONE X:
  Areas Determined To Be Outside 500-Year Floodplain

Source: Federal Emergency Management Agency

Figure 9
Flood Insurance Rate Map
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH

LINEAL SCALE (FEET)
1,000 0 2,000

ISLAND OF OAHU

PBR HAWAII

Legend

- DHHL East Kapolei Parcel B
- A: Excellent — Prime Agricultural Soils
- B: Good — Prime Agricultural Soils
- C: Fair — Marginal Agricultural Soils
- D: Poor — Marginal Agricultural Soils
- E: Very Poor — Marginal Agricultural Soils

Source: Land Study Bureau

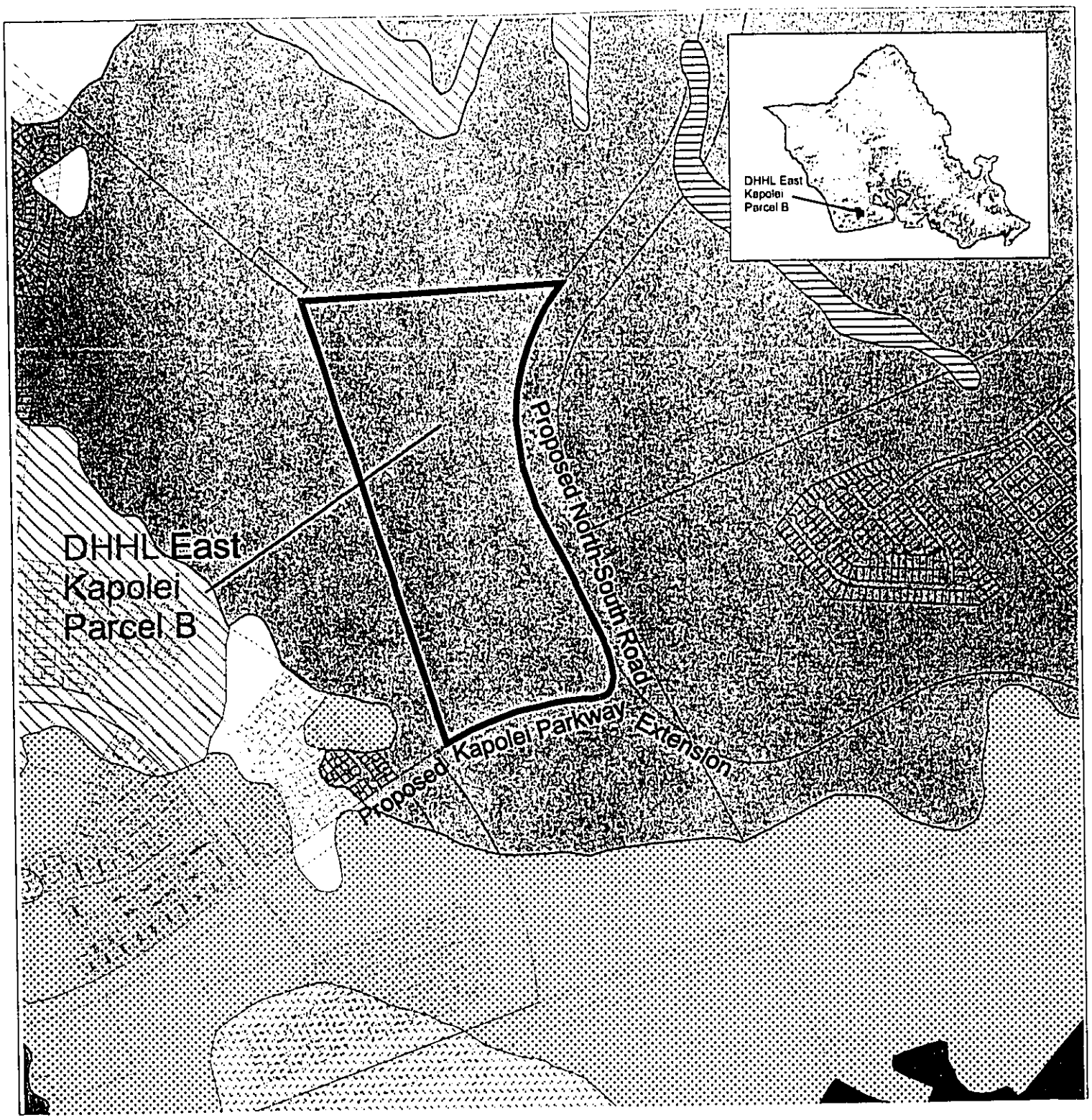
Figure 10
Detailed Land Classification
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH

LINEAL SCALE (FEET)
1,000 0 2,000

ISLAND OF OAHU

PBR HAWAII



Legend

- DHHL East Kapolei Parcel B
- Fill Land, Mixed
- Honouliuli Clay, 0-2% Slopes
- Mamala Stony Silty Clay Loam, 0-12% Slopes
- Coral Outcrop
- Honouliuli Clay, 2-6% Slopes
- Waialua Silty Clay, 0-3% Slopes

Source: U.S.Department of Agriculture Soil Conservation Service

Figure 11
Soil Conservation Service Survey
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH
LINEAL SCALE (FEET)
500 0 1,000
ISLAND OF OAHU
PBR HAWAII

growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed (including water management) according to modern farming methods. Prime Agricultural Land produces the highest yields with the lowest inputs of energy or money, and with the least damage to the environment. The two other classes are Unique Agricultural Land and Other Important Agricultural Land, which are successively less productive soils.

All of the lands on the proposed project site are designated as Prime Agricultural Land by the ALISH system (Figure 12).

Potential Impacts and Mitigation Measures

With the DHHL Parcel B development, the soils on the property will be permanently lost to soil-based agriculture. There is potential for soil loss through the generation of dust and water-borne soil erosion as areas are graded during the construction phases (although the erosion hazard of the soils is rated "no more than slight"). However, since much of the property presently consists of exposed soil and scrub vegetation, overall soil loss will likely be reduced significantly after project development. Landscaping, groundcover, and drainage improvements will further mitigate soil loss during construction and after project build-out. All grading operations will be conducted in compliance with dust and erosion control requirements of the City Grading Ordinance and applicable provisions of Chapter 11-60.1, HAR, Section 11-60.1-33 regarding Fugitive Dust. A watering program will be implemented during construction to minimize soil loss through fugitive dust emission. Other erosion control measures include cleaning job-site construction equipment and establishing of groundcover as quickly as possible after grading. Permanent landscaping will also help to retain soil throughout the project area and significantly reduce erosion compared to the previous agricultural practices. In addition to landscaping and watering programs, other mitigation measures generally associated with best management practices include:

- Early construction of drainage control features;
- Construction of temporary sediment basins to trap silt;
- Use of temporary berms and cut-off ditches where needed; and
- Use of temporary silt fences or straw bale barriers to trap silt.

To further mitigate potential soil impacts, a National Pollutant Discharge Elimination System (NPDES) permit will be required prior to construction to address non-point source discharges. Prior to the issuance of a grading permit by the City Department of Planning and Permitting (DPP), an erosion control plan and best management practices required for the NPDES permit will be submitted.

Geotechnical Considerations. Based on previous study of the project area, no significant geological and/or geotechnical constraints are anticipated to be present. The primary geotechnical considerations for development of the proposed Parcel B site are site drainage, abandoned agricultural infrastructure, expansive soil conditions, and possible backfilled, undocumented ditches or reservoirs associated with past use of the land. A soils report will determine if the upper soils of the property need to be removed and replaced as compacted fill during the mass grading of the project site. Finally, due to the relatively dry climatic conditions of the 'Ewa Plain, it is important that proper site drainage improvements and landscaping, along

with a permanent non-potable irrigation system, be implemented to assist in controlling the expansive soil conditions and reducing the potential for airborne soil erosion.

4.5 AGRICULTURAL IMPACT

The entire 92.1-acre DHHL Parcel B site was cultivated in sugarcane. Currently, the site is fallow.

Potential Impacts and Mitigation Measures

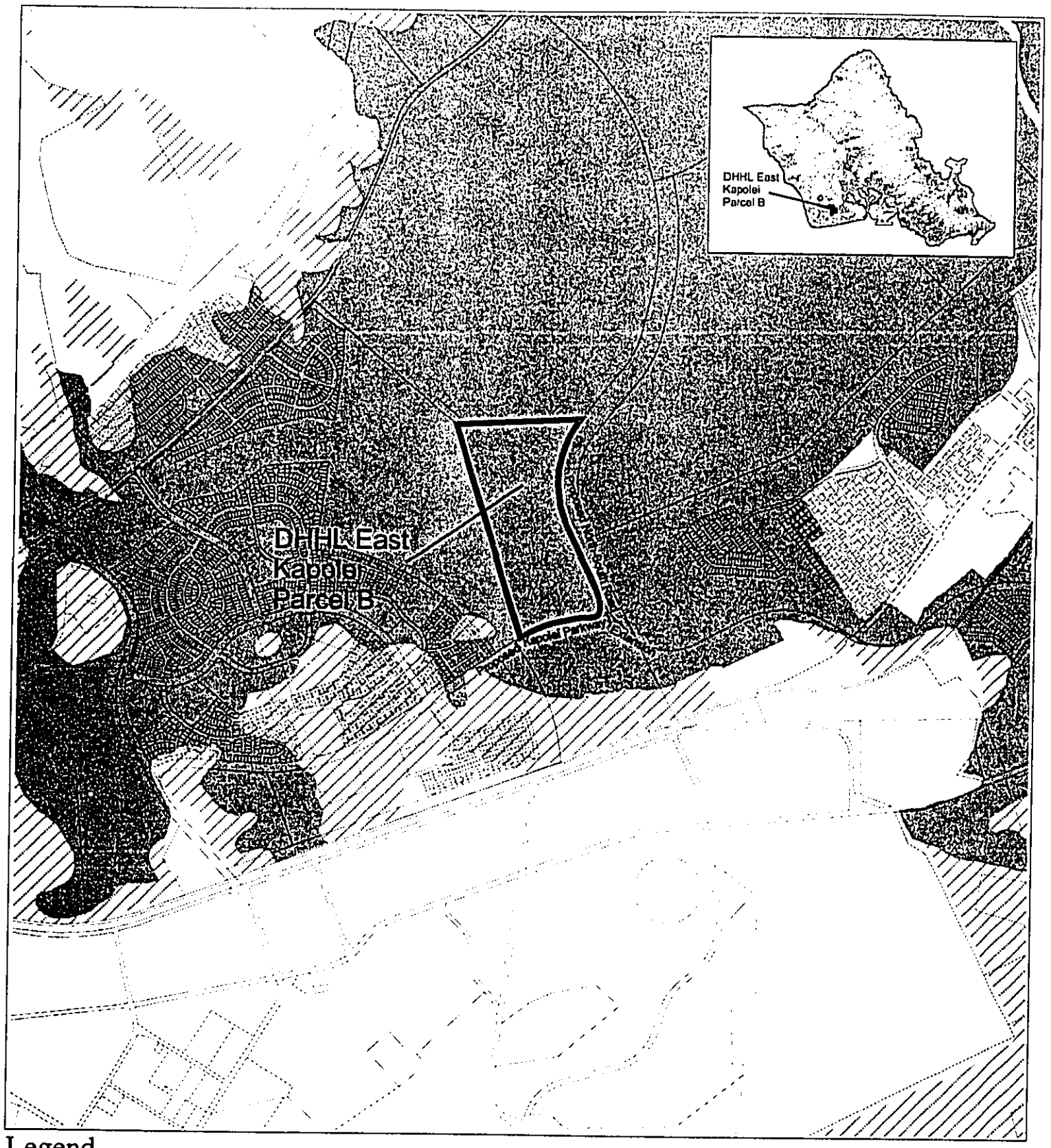
The project site is not currently used for agricultural activities; therefore, no agricultural lands will be withdrawn from agricultural production. This will result in no loss in revenues, jobs, or payroll, and additional agricultural land is available on O'ahu. The limiting factor to the growth of diversified agriculture is not the land supply, but rather the size of the market for those crops than can be grown profitably in Hawai'i. Based on the ample supply of land suitable for diversified agriculture on O'ahu and the relative lack of market demand (compared to the supply available), no mitigation measures are proposed for the loss of agricultural land and production associated with the proposed site.

4.6 GROUNDWATER RESOURCES/HYDROLOGY

The 'Ewa region of O'ahu overlies the Southern O'ahu Basal Aquifer (SOBA), a designated Sole Source Aquifer. The gently sloping topography of the 'Ewa Plain is comprised of terrestrial alluvium, which is made up of clay and mud eroded from volcanic rock and inter-layered with coral limestone deposited when the area was covered by the ocean. This geologic feature is commonly referred to as caprock. The depth of the groundwater is estimated to be approximately 60 feet below ground surface. This caprock aquifer is brackish and non-potable, with a chloride content level between 1,000 and 5,000mg/L. The potential for surface contamination of water under the caprock is low due to artesian conditions and the relative impermeability of the caprock. Infiltration of surface water mauka of the caprock could contaminate the potable groundwater resource since the caprock is not present in this area to function as a barrier. Hydrological modeling predicts that the salinity of the caprock aquifer will increase as freshwater recharge declines with the reduction in sugarcane irrigation (Mink and Yuen, 1993).

The State DOH has established the Underground Injection Control (UIC) line at North Hanson Road, which is south of the proposed project site. The primary purpose of the UIC line is to protect potential sources of drinking water by prohibiting wastewater injection wells or cesspools mauka of the line.

The use of non-potable irrigation water on the 'Ewa Plain is encouraged to facilitate the recharge of caprock water and reduce the demand for potable water from the Board of Water Supply system. If treated wastewater effluent is used for non-potable irrigation water in the immediate area of the 'Ewa caprock aquifer, the DOH will grant Water Use Permits from this aquifer only if no alternative source is available, and only until treated effluent is available to the property.



Legend

- DHHL East Kapolei Parcel B
- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Agricultural Land

Source: State of Hawaii Department of Agriculture

Figure 12
Agricultural Lands of Importance to the State of Hawaii
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH

LINEAL SCALE (FEET)
1,000 0 2,000

ISLAND OF OAHU

PBR HAWAII

Once the effluent is available, the DOH has indicated that reasonable time to connect to the effluent water system will be provided and the Water Use Permit should be withdrawn.

To further protect the groundwater resource, in March 1993, the DLNR Commission on Water Resource Management (CWRM) officially adopted the 'Ewa caprock aquifer as a separate aquifer within the existing Pearl Harbor Ground Water Control Area. Since this designation, the CWRM has awarded one-year interim permits for new users of the aquifer. However, with the shutdown of the Oahu Sugar Company, Limited (OSCo) irrigation practices in 1994, a re-evaluation of the 'Ewa caprock aquifer sustainable yield was initiated. The Pu'uloa Caprock Users Group (PCUG), which included the HCDCH and the City Department of Wastewater Management, responded with a preliminary plan to establish sustainable yields of the 'Ewa caprock aquifer. According to the *Reevaluation of the Ground-Water Resources and Sustainable Yield of the Ewa Caprock Aquifer*, prepared for the CWRM in September 1996, the chloride level of water pumped by each well is the best available indicator of source sustainability, and the optimal amount of pumpage to achieve an acceptable water quality for irrigation is assumed to be less than 1,000 mg/l chloride.

Potential Impacts and Mitigation Measures

All storm water entering the proposed project site must ultimately flow through the property and evaporate, discharge into the ocean, or infiltrate into the ground. Consequently, all development downstream of the property must also accommodate the existing Kalo'i Gulch drainage. To mitigate the impact of flooding from Kalo'i Gulch and to facilitate groundwater recharge, a drainage control system is planned within the 300-foot-wide utility, drainage, and access corridor within the proposed North-South Road right-of-way. This corridor will provide a realigned and channelized Kalo'i Gulch with appropriate detention basins. Future development of the former HCDCH East Kapolei Master Plan area will include mitigation measures, such as detention/retention basins (with a major retention basin of 23 acres being located along North-South Road, immediately mauka of the Ewa Villages Golf Course), to maintain off-site storm runoff at existing levels and to promote the recharge of groundwater.

Irrigation for landscaping within the property will utilize brackish water from the 'Ewa caprock aquifer, in accordance with sustainable capacity regulations adopted by the CWRM, and/or treated effluent from the City's Honouliuli Wastewater Reclamation Facility.

Although the proposed DHHL Parcel B development is mauka of the UIC line, no injection wells or cesspools are proposed. Any runoff or wastewater disposal required for the project will be managed in full compliance with the UIC and other applicable regulations.

4.7 NATURAL HAZARDS

Natural hazards are events such as tsunami, earthquakes, floods, hurricanes, soil slippage, and volcanic hazards. The DHHL East Kapolei Development Parcel B may be subject to hurricanes and minor earthquakes in the future; however, the site is not unique to these potential hazards. Earthquakes in the Hawaiian Islands are associated with volcanic eruption or tectonic movement. Volcanic hazards in the area are considered minimal as the volcanoes on O'ahu are extinct.

Since 1982, Hawai'i has been affected twice by devastating hurricanes, 'Iwa in 1982 and 'Iniki in 1992. While it is difficult to predict these natural occurrences, it is reasonable to assume that events could be likely. The project area is no more or less vulnerable than the rest of the island to the destructive winds and torrential rains associated with hurricanes and cyclones.

Flood hazards are primarily identified by the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA) (Figure 9). The majority of the project site (mauka side) is designated by the FIRM as Zone D, which includes areas of undetermined but possible flood hazards. The remainder of the project site is in Zone X, which are areas determined to be outside of the 500-year floodplain. At the property boundary by the proposed North-South Road and to the east are areas designated by the FIRM as Zone A, which are special flood hazard areas inundated by the 100-year flood (no base flood elevations determined).

Potential Impacts and Mitigation Measures

The project site is not anticipated to be affected by tsunami, as it is located over 9,000 feet from the shoreline and outside of the tsunami evacuation zone. Although hurricanes and earthquakes cannot be prevented, their impacts will be mitigated as the project will comply with the Uniform Building Code adopted by the City. All structures will be constructed to lessen damage from earthquakes and tropical hurricanes in accordance with City requirements. Impervious surfaces created by the DHHL Parcel B development (i.e. roads, sidewalks, roofs, and buildings) could increase the potential for flooding. However, proposed drainage improvements including on-site retention/detention basins will maintain existing off-site runoff quantities.

4.8 FLORA

The proposed DHHL Parcel B site was surveyed in September 1996 as part of the *East Kapolei Master Plan Biological Survey* prepared by Kenneth M. Nagata for the *HCDCH East Kapolei Master Plan FEIS*. This survey was conducted on 1,300 acres of land to determine whether endangered flora species were present. According to this biological survey, the vegetation of the region was described by Ripperton and Hosaka (1942) as lowland shrub with a coastal fringe of kiawe trees. Recent surveys conducted on certain portions of the 1,300-acre site and adjacent lands recognized sugarcane fields, ruderal fields, and fallow fields. These communities were characterized by actively cultivated sugarcane fields, abandoned cane fields, common "weedy" introduced plants, and lowland wayside species.

According to the 1996 biological survey, the vegetation of the 1,300 acres of land surveyed (which includes the proposed project site) is entirely secondary and determined by the history of cultivation (or disturbance) on each individual parcel of land. Eight plant communities were recognized, each community existing as a continuum with one blending into another. The survey stated that species composition and vegetation cover will differ somewhat during the rainy season. Within the eight plant communities identified, 99 different plant species were recorded with two indigenous ('ilima and pā'ūohi'iaka), two probably indigenous ('uhaloa and hoary abutilon) and one endemic (ko'oloa'ula, or *Abutilon menziesii*). Except for ko'oloa'ula, all of the native species on the site are common lowland species in Hawai'i.

Abutilon menziesii, or Ko'oloa'ula. *Abutilon menziesii*, or ko'oloa'ula, was formally listed under the provisions of the Endangered Species Act as an endangered species in 1986. It was once endemic to Lāna'i, Maui, O'ahu, and Hawai'i, where it may now be extinct. According to botanical/environmental consultants Char & Associates, the largest population of approximately 600 plants currently exists on Lāna'i. Prior to its listing as an endangered species, ko'oloa'ula was sold by several nurseries as "red 'ilima" due to its attractiveness and ease of cultivation. It is not known how many plants remain as urban landscape elements resulting from prior nursery sales.

In 1997, the Hawai'i State Legislature enacted and passed House Bill 1292 to provide private landowners with incentives to promote the conservation and recovery of threatened and endangered species and their habitats. House Bill 1292 was signed into law by the Governor and now augments Chapter 195D, *Hawaii Revised Statutes.* The Act provides for the preparation and implementation of Habitat Conservation Plans and Safe Harbor Agreements under the federal Endangered Species Act and the State of Hawai'i endangered species law, and for the State law to complement the Federal law. In addition, the Act provides new incentives for private landowners to recover and protect threatened and endangered species on their lands, while providing a dynamic and flexible framework to allow creative solutions, increase public appreciation and understanding of endangered species issues, and encourage partnerships to help Hawai'i recover its unique natural heritage. This legislation makes Hawai'i law generally consistent with the Federal Endangered Species Act.

In accordance with both State and Federal regulations, the *Habitat Conservation Plan for Abutilon menziesii at Kapolei* (HCP) was prepared in consultation with the DLNR (Appendix B). The goal of the HCP is to initiate and sustain a program that would result in an overall net gain in the number of *Abutilon menziesii* on O'ahu. Three objectives have been identified: 1) describe the existing conditions of the Kapolei population; 2) describe the potential impacts of the Kapolei projects on *Abutilon menziesii*; and 3) describe the strategies and actions to mitigate the impacts. According to the HCP, two clusters (Cluster A, comprised of 10 individuals and Cluster B, comprised of 14 individuals) exist on the proposed DHHL East Kapolei Development Parcel B site (Figure 13).

Potential Impacts and Mitigation Measures

The proposed DHHL Parcel B project site was previously utilized for agricultural cultivation, which significantly disrupted the original vegetation characteristic of the property. Construction activities for the proposed development would remove the existing population of ko'oloa'ula. The development sequence of the project will affect Cluster B initially, followed by Cluster A. However, the HCP was prepared to protect the ko'oloa'ula and ensure its proliferation. The major strategy designed by the HCP to mitigate impacts and to benefit the species is the creation of three protected off-site wild populations on O'ahu from the single degraded Kapolei population. The new off-site populations will protect existing individuals as well as the genetic diversity of the existing population. The HCP also proposes long-term management of the populations to occur concurrently with project development. The long-term impact of the project on the ko'oloa'ula population in Kapolei would be beneficial, as successful implementation of the HCP would significantly increase the numbers of new plants on O'ahu and improve the quality of the existing population, compared to the existing *in situ* disturbed cane field conditions

at the Kapolei property.

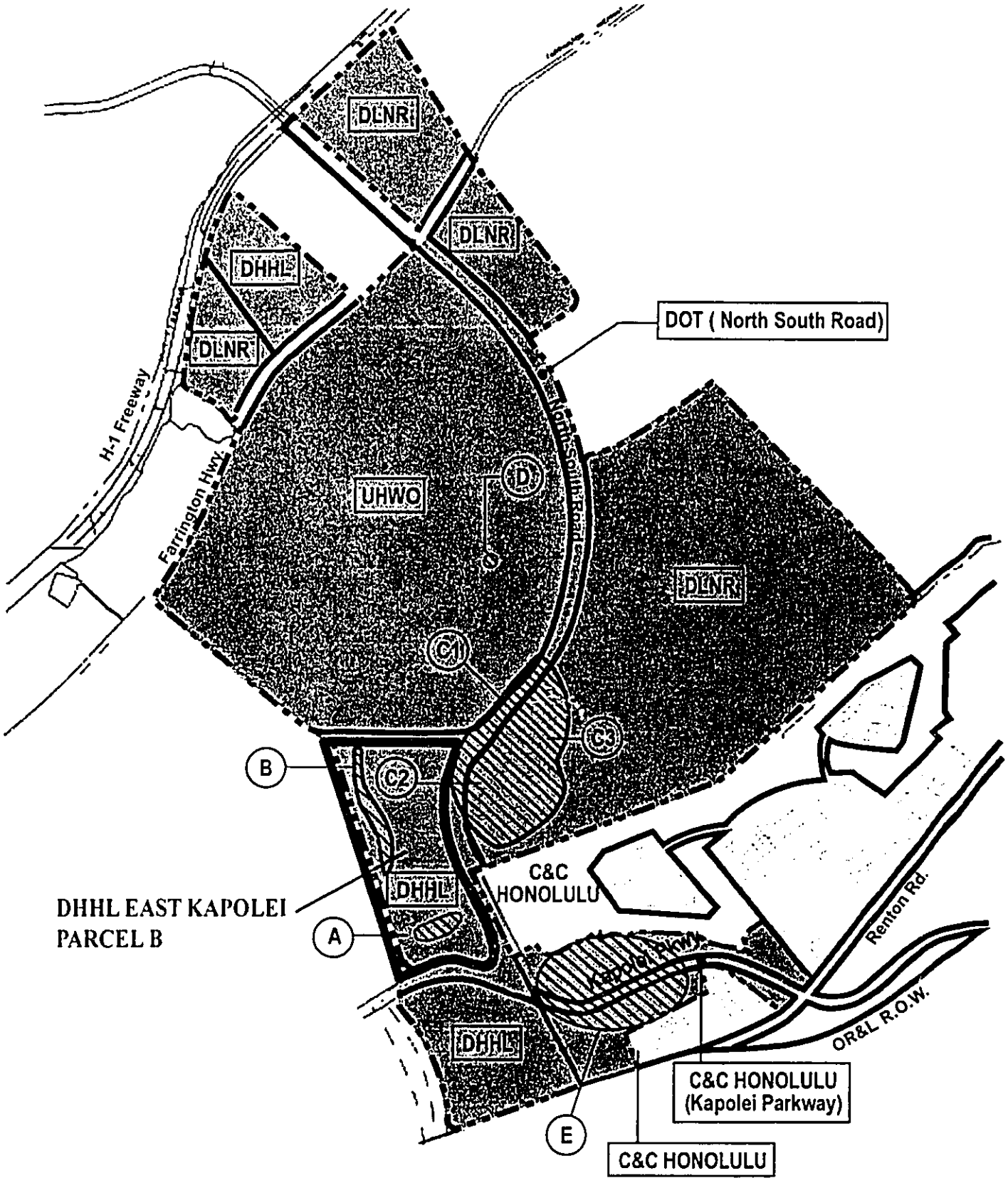
In its pre-consultation comment letter, the U.S. Department of the Interior – Fish and Wildlife Service (USFWS) stated that about 24 ko'oloa'ula plants will be lost due to the development of the property sometime between 2005 and 2014 (Appendix A-2). The USFWS further stated that the protected colony is not expected to be affected by activity on Parcel B; however, the DHHL needs to be included in the Certificate of Inclusion for the Incidental Take License from the State DLNR. On April 8, 2004, the State Board of Land and Natural Resources unanimously approved the *Habitat Conservation Plan for Abutilon menziesii at Kapolei* and accompanying Incidental Take License and Certificate of Inclusion. The DHHL is currently working with the State Department of Transportation (SDOT) to be included in the Certificate of Inclusion for the Incidental Take License. The DHHL will also cooperate with the DLNR Division of Forestry and Wildlife (DOFAW) in the implementation of the HCP.

4.9 FAUNA

The proposed project site was surveyed as part of the *East Kapolei Master Plan Biological Survey* (1996) prepared by Kenneth M. Nagata. This survey was conducted on 1,300 acres of land for the *HCDCH East Kapolei Master Plan FEIS*. According to the survey, the only mammals known to inhabit the property are introduced species such as feral cats, dogs, rats, mice, and mongooses. No mammals were observed, although pig trails were found in several plant communities. Seventeen species of birds were observed on the property, of which 15 were introduced, one is a common migratory species (Pacific golden-plover), and one is indigenous (Black-crowned night heron).

Potential Impacts and Mitigation Measures

Existing species will be displaced by the proposed DHHL East Kapolei Development Parcel B; however, nearby natural areas and on-site landscaping will provide suitable habitat for certain species. The avian and mammalian species observed or presumed to live in the area largely consist of aliens that are harmful to native avian and plant communities. These introduced species will relocate to other habitats and may eventually return to the site after completion of the project.



LEGEND

Abutilon Menziesii Plant Clusters

Source: Habitat Conservation Plan for *Abutilon menziesii* at Kapolei

Figure 13
Abutilon menziesii Plant Clusters Map
DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

NORTH

ISLAND OF OAHU

NOT TO SCALE

PBR HAWAII

5.0 ASSESSMENT OF THE EXISTING HUMAN ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

This section presents summary background information applicable to the existing human environment. Subject areas addressed include archaeology, transportation, air quality, noise, the socio-economic environment, and visual conditions. Technical studies and analyses have been undertaken to address the potential impacts of the project and to identify appropriate mitigation measures to minimize the identified short- and long-term impacts.

5.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

The earliest detailed map of the area shows no habitation closer than the western edge of West Loch in the vicinity of Papapapuhi Point. The M.D. Monsarrat Surveyors 1878 Map of Honouliuli Taro Land documents substantial settlement at Honolulu Taro Lands (1.7 miles northeast of Parcel B) in the Papapapuhi Point area, which appears to have been the focus of population in the Honouliuli ahupua'a. Fishponds, taro lo'i, shellfish collecting, and salt drying in the area would have focused population here in prehistoric times, and the place name must have secondarily come to apply to the entire ahupua'a. The richness of the coastal Papapapuhi area is a contrast to the dry 'Ewa Plain.

While very little prehistory is known about the area in the immediate vicinity of the proposed project site, there is no indication of human occupation or any other utilization. There is also no indication of existing remains of any prehistory activity. Furthermore, no sites that are listed on the Hawai'i or National Register of Historic Places are found on the property.

The presence of any significant archaeological sites on the surface or subsurface of the property is unlikely due to the disruption caused by continuous sugarcane cultivation for nearly 70 years. This was confirmed by the *Archaeological Reconnaissance and Assessment of the HFDC – East Kapolei Development Project* (Scientific Consultant Services, Inc., November 1996) and a review of historic records, maps, and archaeological research previously conducted in the project area. A memorandum to the Hawaii Agricultural and Rural Development Program from the State DLNR Historic Preservation Division (SHPD) regarding the HCDCH East Kapolei Master Plan stated:

> *A review of our records shows that there are no known historic sites on these 1,300 acres of state lands. These lands were used for commercial sugar cane cultivation for many years and this would have destroyed any historic sites that might have been present. We believe that reclassification of these lands and their future development will have "no effect" on historic sites.*

This letter was included in the archaeological report for the *HCDCH East Kapolei Master Plan FEIS*.

Potential Impacts and Mitigation Measures

The proposed project site was part of the 1,300 acres of land on which no known historic sites

were found. According to the *Archaeological Reconnaissance and Assessment of the HFDC – East Kapolei Development Project*, the literature review, and the SHPD, there are no significant archaeological or cultural resources associated with the subject property. During the pre-consultation process for this EA, the SHPD confirmed that this project has already gone through the historic preservation review process (Appendix A-2). The SHPD stated:

> *SHPD commented on the East Kapolei Master Plan Development and on the Villages of Kapolei Nonpotable Water System Improvements which includes this parcel. Our previous comments stated that these lands were commercially cultivated with sugar cane for many years which extensively altered the land. The depth of cane cultivation exceeded the expected depth of historic sites in the area, based on site patterns in similar environmental contexts. Thus, it is unlikely that significant historic sites will be found in the project area.*

No mitigation measures are proposed as the SHPD believes that no historic properties will be affected by the project. However, should any unknown sites be uncovered during project construction, work in the area of the site will stop and the SHPD will be notified in accordance with applicable state regulations.

5.2 CULTURAL RESOURCES

As discussed in Section 5.1 Archaeological and Historic Resources, there is no indication that any remains from prehistory activities exist. The SHPD stated that there are no significant archaeological or cultural resources associated with the subject property.

A cultural impact assessment was prepared by PBR Hawaii in December 2004 to identify cultural resources and practices associated with the proposed project site. The assessment stated that sugar production would have destroyed any historic properties related to Hawaiian culture, and there should be minimal direct impact upon native Hawaiian cultural practices and beliefs. The assessment (included below in its entirety) noted that special care should be observed in the event a Hawaiian burial is discovered.

Cultural Impacts

Fragments of History of Honouliuli

The proposed Department of Hawaiian Home Lands East Kapolei project area is located in the *ahupua'a* of Honouliuli, in the 'Ewa District of O'ahu. Honouliuli includes the lands from the western boundary of Pu'uloa (Pearl Harbor) westward to the 'Ewa/Wai'anae District boundary. The coastline includes twelve miles of shallow reef, offering rich marine resources. For years, this coastline was used as an air station for the U.S. Navy. The area once known as Kalaeloa, was renamed Barber's Point.

During the late 1700's Captain Henry Barber, for whom Barbers Point was named, frequently visited O'ahu and docked at Kalaeloa. In 1795, Captain Barber had his first encounter with Kamehameha I. An account of this incident is found in *Sites of O'ahu* (Sterling and Summers, 1978):

> *In October 1795 Captain Henry Barber made one of several trips to Oahu. At this*

> *time Kamehameha I was on Oahu and he and Captain Barber became very friendly. When Barber departed he gave Kamehameha gifts. He intended giving him a keg of brandy but after thinking it over decided to that to give the heathen king a whole keg of brandy which he wouldn't appreciate was a great waste. He therefore had the keg half drained and filled up with water and sent this watered brandy to the king.*
>
> *On leaving Oahu he ran aground at Kalaeloa and when the natives saw the ship's plight they swarmed out to it taking everything they could lay their hands on. In the meantime, Kamehameha had left for Kona and Barber seeking his help to recover the stolen goods went to Kona to see him. There he was treated cordially and a large feast was prepared. When the awa was passed around Barber was surprised that his awa cup held nothing but watered awa, thus did Kamehameha remind Barber that he was not a fool. In spite of Barber's treatment of Kamehameha the king sent him back with kapu sticks and orders that the Hawaiians must return all which had been stolen. When the Hawaiians saw that Barber came with authority they immediately returned all that had been taken.*

Another noted area of settlement is Pu'u Ku'ua, the inland region of Honouliuli. In 1899, a Hawaiian Newspaper, *Ka Loea Kalaiaina*, claimed this land was "thickly populated," and a place where chiefs resided. It also states that the land was once a battlefield. The following is a story published in *Ka Loea Kalaiaina*, of how Pu'u Ku'ua has a connection to the *kauwā*, the lowest class of Hawaiians:

> *The two gods (Kāne and Kanaloa) looked down on the hollow and saw how thickly populated it was. The mode of living here was so that chiefs and commoners mixed freely and they were so like the lowest of people (Kauwā). That was what these gods said and that was the time when the term* kauwā *was first used, and was used for many years afterwards.*

In 1877, most of the lands in Honouliuli were purchased by James Campbell in the amount of $95,000. Mr. Campbell purchased the lands from the *ali'i* (high chiefess) Miriam Keahikuni Kekau'ōnohi, who was granted the land during the *māhele*, land division in 1845 and 1846, when Hawai'i was first introduced to private property and land ownership. Until 1889, the majority of Campbell's lands were used for cattle grazing, resulting in open and sparsely vegetated plains in the 'Ewa region. At one point the land was so dry and full of bottomless fissures that water would be lost and an irrigation system would seem nearly impossible.

> *The first crop, 2,849 tons of sugar, was harvested in 1892, Ewa was the first all-artesian plantation and, in spite of of early troubles...it gave an impressive demonstration of the part artesian wells were to play in the subsequent industry of Hawaiian sugar industry* (Kukendall 1967:69).

There are many oral traditions about this land that was once a very sacred area to Hawaiians. The following Hawaiian historians and culture preservationists were asked if they were aware of any current cultural practices in the project area: Ms. Momi Kamahele, Mr. Shad Kāne, and Mr. Poni Kamau'u. Both Mr. Kāne and Ms. Kamahele

were unavailable for comment. Poni Kamau'u provided the following comments about the project site.

When asked about the area of study, Poni Kamau'u, a recognized historian, shared many experiences about the area of Pu'u Ku'ua. According to Mr. Kamau'u, many burial sites exist at Pu'u Ku'ua as well as areas that have already been developed such as Ko Olina and Kapolei. Most of Kalaeloa and Kapolei were once heavily populated and were prime spots for the Hawaiian spirits to "lele" or leap to the next world, which may explain why so many burial sites can be found on this side of the island. A few Hawaiians today still go out to the leeward coast to speak to their *kūpuna* (elders).

Kamukila Campbell, the wife of Mr. James Campbell told Mr. Kamau'u many stories about Honouliuli as well as Pu'u Makakilo, a hill located just north of the project site. Mrs. Campbell informed Mr. Kamau'u of the many *ki'i pōhaku* (petroglyphs) that point the way to the *kilo* (stargazing sites, also a reader of omens). The kilo site provides a way for the people on earth to communicate with the heaven and the sky above. When the stones are aligned properly, four winds are said to appear over the site. As Mr. Kamau'u stood there near the stones, he noticed the alignment of the stones acted as a compass. Makakilo has been a common place for Hawaiian astronomy, hence, the name *Makakilo* (the observing eyes). Makakilo, is also believed to be closely watched and guarded by the eyes of a demigod that takes the form of a *pueo* (owl).

Shad Kāne is a noted cultural preservationist and has recently recommended some appropriate street names for the area of Kapolei. While Pu'uokapolei was not one of his recommended street names, he mentions that this practice of *kilo* was also observed on another hill known as Pu'uokapolei. The sun, the moon, stars and constellations with reference to geographical features, were used to determine the time of year. Pu'uokapolei is now in the center, the "piko," of the new city of Kapolei.

Honouliuli is often mentioned in the epic story of Kamapua'a. There are many references to Kamapua'a, his grandmother Kamaunuaniho (who resides at Puuokapolei), as well as his lover/enemy Pele and her sister Kapo.

Pu'u Ku'ua is also said to be where Kapo once left her *lele kohe* (flying vagina). Pele was attacked by Kamapua'a in Puna, Hawai'i, in an area known as Pua'akanu. Kapolelema'i sent her vagina to divert Kamapua'a's attention elsewhere. It landed on O'ahu and formed Kohe-lepelepe, now known as Koko Crater.

Along the highway from Pu'u Ku'ua through Nānākuli, Mr. Kamau'u recounts a story of a white dog with reddish eyes (said to be Poki, the pet dog of Pele), whose size is comparable to an automobile. In times of danger, Poki would block the pathway to restrict people from entering the danger zone. When Pele's sister, Kapo would visit O'ahu, this white dog would take the form of clouds adorning Pele's beloved sister in the shape of a lei, which is how Kapolei acquired its name.

Existing Conditions and Potential Impacts

A field inspection was conducted for the North-South Road and the Kapolei Parkway extension in April 2004 and in June 1996. Both surveys were done by Cultural Surveys Hawai'i. Findings show that most of the project area comprises of land that was used for sugar cultivation. Since the cessation of sugar production, various development has taken place including: 'Ewa Villages (located south-west of the project site), the Villages of Kapolei (located east of the project site), and the University of Hawai'i's West O'ahu campus (planned just north of the project area). According to the surveys there were no properties related to traditional Hawaiian culture. Two plantation-era structures, however, were observed (Chiojioji et al, 2004).

Most of the project area has been deserted and no longer produces commercial sugar. Sugar production would have destroyed any historic properties related to Hawaiian culture. There should be minimal direct impact upon native Hawaiian cultural practices and beliefs. Based on the statement of Mr. Poni Kamau'u, that Kapolei was once very heavily populated, and perhaps once a battlefield, special care should be observed in the event a Hawaiian burial is discovered.

5.3 NOISE

According to the *Environmental Noise Assessment Study* (1998) prepared by D.L. Adams Associates, Ltd. for the *HCDCH East Kapolei Master Plan FEIS*, the existing acoustical environment of the 1,300-acre HCDCH site, which includes the proposed Parcel B, is exposed to daytime ambient noise levels of 41 to 46 decibels (dBA). Noise in this area is generated by traffic, wind in foliage, and occasional aircraft flybys or flyovers. Within nearby residential areas, including the Villages of Kapolei and 'Ewa Villages, ambient noise levels range from 44 to 47 dBA.

Ambient noise conditions of the project area were described in the *North-South Road and Kapolei Parkway Project Noise Technical Report*, prepared for the *North South Road and Kapolei Parkway Final Environmental Assessment* (September 2004) (Appendix C). Noise levels were sampled for a 15-minute period at the future intersection of North-South Road and Kapolei Parkway (near the Ewa Villages Golf Course) on March 19, 2004 at 12:30 p.m. The measured noise level was 44 Leq. The adjusted peak hour noise level (based on comparing the 15-minute measured noise level with the noise level measured at closest 24-hour monitoring location in the same hour) was 54 Leq.

Within the project area, the day-night equivalent sound level due specifically to aircraft operations is less than 60 dBA and compatible with the SDOT residential guidelines for noise. There are no direct flyovers associated with the Honolulu International Airport, and day-night equivalent sound levels due to air traffic will be less than 60 dBA, although some overflights will be audible. This is also true for the general aviation reliever airport at Kalaeloa (formerly Naval Air Station Barbers Point). According to the master plan prepared for the reliever airport, the project area will continue to have aircraft noise levels less than 60 dBA for all alternatives considered. In addition, the noise corridors previously associated with NAS Barbers Point aircraft operations no longer apply since the Naval Air Station closed. Wind through vegetation

and birds are often the dominant sound when no aircraft activities occur.

Potential Impacts and Mitigation Measures

During project construction, noise will be generated by construction and earth-moving equipment. However, these short-term noise impacts will occur only during daytime hours and only along margins of the property that border sensitive land uses (i.e. residential use – nearest residences are approximately 400 feet away). During the pre-consultation period for this EA, the DOH Noise, Radiation & IAQ Branch stated, "project activities shall comply with the Administrative Rules of the Department of Health: Chapter 11-46, Community Noise Control" (Appendix A-2). The project will comply with State DOH noise regulations, and if construction noise exceeds the DOH "maximum permissible" property line noise levels, a permit will be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, etc. After construction, long-term noise impacts could result from vehicular traffic associated with the proposed project. These impacts, however, are not expected to be significant or more intense than noise impacts that would result from traffic generated by other residential, commercial, and park uses in the Kapolei area.

The SDOT provided comments during the pre-consultation period for this EA (Appendix A-2) and recommended conducting a noise impact assessment to reflect current conditions in the 'Ewa region. The SDOT recently completed the *North South Road and Kapolei Parkway Final Environmental Assessment* (September 2004). This latter environmental assessment included the DHHL East Kapolei Parcel B project in its description of regional land use and economic development trends, as well as in the Noise Technical Report (Appendix C).

Noise levels at existing and future noise-sensitive land uses and activities adjacent to the proposed North-South Road, the proposed Kapolei Parkway, and nearby major roadways were identified by the *North-South Road and Kapolei Parkway Project Noise Technical Report.* Figure 1 of the noise report labels the proposed project area as "Proposed DHHL". The report predicted noise levels in the year 2025 at nine locations, one of which is on the eastern side of the proposed North-South Road at its intersection with the proposed Kapolei Parkway Extension. In 2025, with the proposed roadways, noise levels at this location near the golf course are projected at 65 decibels (dBA). The proposed DHHL Parcel B site is located on the western side of the proposed North-South Road at the same intersection, and therefore, projected noise levels for both sites are expected to be similar.

The 65-dBA noise level projected by the noise technical report for the North-South Road project is "Acceptable" (with no special acoustical design consideration necessary), according to the U.S. Department of Housing and Urban Development (HUD) Site Acceptability Standards, which are shown below.

HUD Site Acceptability Standards		
Category	**Day-night Equivalent Sound Level (DNL)**	**Comments**
Acceptable	Less than or equal to 65 dBA	No special acoustical design consideration necessary
Normally Unacceptable	Greater than 65 dBA, but less than or equal to 70 dBA	5 dB additional attenuation required through the use of barriers or in design to ensure interior noise levels are acceptable
	Greater than 70 dBA, but less than or equal to 75 dBA	10 dB additional attenuation required through the use of barriers or in design to ensure interior noise levels are acceptable
Unacceptable	Greater than 75 dBA	Attenuation measures must be submitted and approved on a case-by-case basis

Interior day-night equivalent sound levels adopted by HUD are 45 dBA or less. An analysis of the *Environmental Noise Assessment Study* (1998) by D.L. Adams Associates, Ltd. (Appendix D) and the *North-South Road and Kapolei Parkway Project Noise Technical Report* (2004) determined the following:

- Residential properties could be located as close as the North-South Road right-of-way without falling into the HUD "Unacceptable" category;
- Residential properties located within 84 feet of the centerline of North-South Road would fall into the 70 to 75 dBA, "Normally Unacceptable" category. Houses would require an additional 10 dB of noise reduction over that provided by typical construction. These houses should not have jalousie windows on any side that has line-of-sight to the roadway. Casement-type windows on these sides should be double-glazed with thermally insulating glass consisting of two panes of ¼-inch thick glass separated by a ½-inch airspace. These homes should also be air conditioned to enable owners to keep windows closed.
- Residential properties located from 84 to 264 feet of the centerline of North-South Road would fall into the 65 to 70 dBA, "Normally Unacceptable" category. Houses would require an additional 5 dB of noise reduction over that provided by typical construction. Bedrooms should not have jalousie windows on their sides facing the roadway and should be designed with acoustical tile ceilings, carpeted floors, and louvered closets. These homes should be designed to allow air flow through all rooms from the north to the south in order for natural ventilation to occur even if windows facing the roadway are closed.

Other methods for attenuating traffic noise recommended by the analysis include erecting noise barriers (i.e., fence, wall, earthen berm, or combination of fence and berm) tall enough to block the line-of-sight from the residential property to vehicles along North-South Road where it fronts Parcel B. Ideally, the noise barrier should be constructed within the right-of-way, as the closer it is to either the noise source or the receiver, the better the noise attenuation. A barrier fronting Parcel B could reduce traffic noise by as much as 10 to 12 dB. Because of the timing, scheduling, and discussion of the projects with the SDOT, the DHHL expects SDOT to be responsible for the required mitigation measures.

During the pre-consultation process for this EA, the State Land Use Commission (LUC) cited LUC Docket No. A99-728/Housing and Community Development Corporation of Hawaii, State of Hawai'i, which provides 27 conditions pertaining to the development of residential and

commercial uses under which the project site was urbanized (Appendix A-2). Two of the conditions were related to noise; however, in accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County.

The Department of the Navy also provided pre-consultation comments and noted that if an air wing were to be located at Kalaeloa, it may pose a noise impact (Appendix A-2).

The SDOT also noted that portions of Parcel B are located within the contours of the Honolulu International Airport 1987 Noise Contour Map and proximate to Kalaeloa Airport. Noise impacts from the Honolulu International Airport and the Kalaeloa Airport are not expected to be significant; however, potential buyers of residential lots in Parcel B will be informed of possible noise impacts from approaching or departing aircraft.

5.4 AIR QUALITY

According to the *Air Quality Study for the Proposed East Kapolei Project* prepared by B.D. Neal & Associates in April 1998 for the HCDCH *East Kapolei Master Plan FEIS*, which includes the DHHL Parcel B site, the present air quality of the project area is relatively good and has probably improved recently with the discontinuation of sugarcane cultivation in the 'Ewa Plain. Air quality data from the nearest monitoring stations operated by the State DOH suggest that all national air quality standards are currently being met, although occasional exceedances of the more stringent State standards for ozone and carbon monoxide may occur. Air quality impacts that do occur are mostly associated with emissions from vehicular, industrial, natural and/or agricultural sources. Several industrial sources of air pollution are located a few miles southwest at Barbers Point, but the prevailing winds carry emissions away from the project site more than 80 percent of the time.

The Honouliuli Wastewater Treatment Plant (WWTP) is approximately 1.3 miles from the proposed project site. The WWTP meets DOH Cover Source Permit limits, and considering its distance from the project site, the relatively low level of odors, and the direction of prevailing winds (both tradewinds and Kona winds), any odors will be minimal. According to the air quality study, DOH standards permit 25 parts/billion of hydrogen sulfide at the boundary of Honouliuli WWTP, although some individuals can detect odors at 5 parts/billion. At the project site, these levels should be reduced approximately 1,000 times due to wind dispersion, and odors from the WWTP should not be detectable.

In the 1990s, several industrial air pollution events occurred at Campbell Industrial Park, which is located at Barbers Point, southwest of the subject property. In response, the DOH has established an extensive monitoring program to ensure that applicable air quality standards are met in the future.

The following represents the best available data of existing air quality in the region:

- Between 1991 and 1993, sulfur dioxide levels in the 'Ewa region were measured at Makaīwa Gulch and were consistently low and below the national and State 24-hour Ambient Air Quality Standards (AAQS).

- During the same period, particulate matter of less than 10 microns was measured in Kapolei, where only one exceedance of the State and national AAQS was recorded.
- Carbon monoxide measurements were measured at West Beach in 1993. One exceedance of the State standard was recorded, but no exceedance of the national standards was identified.
- Between 1990 and 1993, two to seven exceedances per year of the State AAQS for ozone were registered.

Potential Impacts and Mitigation Measures

Development of the proposed project may produce short- and long-term air quality impacts. Short-term impacts could include fugitive dust and exhaust emissions produced by construction equipment and vehicles. Long-term impacts could result from increased activity and development of the property. These impacts include increased vehicular exhaust and indirect emissions resulting from increased electrical power demand.

Based on these anticipated impacts, the following mitigation measures may be implemented.

Short-term Mitigation

- Frequent watering during construction activities to maintain dust control in active work areas at least twice daily on days without rainfall.
- Initiation of a construction phasing plan that considers wind patterns and existing and future residential land uses to minimize downwind dust impacts within the project site and surrounding residential areas.
- Grassing as soon as practicable, once grading has been completed.
- Wind screening as appropriate to limit fugitive dust.
- Application of mulch and soil stabilizers on graded areas.
- Covering trucks traveling on roadways and on-site washing to keep dirt from traveled roadways.
- Monitoring dust at the project boundary during the construction period.

Long-term Mitigation

- Reducing traffic volumes by promoting mass transit (as envisioned in the City's *Ewa Development Plan*), bus service, shuttles, and car pooling.
- Where possible, increasing buffer zones between major roadways and pedestrian facilities.
- Establishing extensive landscaping to maintain good air quality and integrate the residential development with the surrounding neighborhood.

All construction activities will comply with State of Hawai'i Air Pollution Control regulations and the provisions of *Hawaii Administrative Rules*, §11-60.1-33 on Fugitive Dust. A combination of mitigation measures will be implemented to minimize air quality impacts. During construction, these measures can be adjusted to reflect current site conditions. Impacts from exhaust emissions of construction vehicles will primarily be mitigated by the effect of winds, especially as most construction will be removed from existing residential areas or other sensitive land uses. However, particular care will be taken when construction activities do occur near existing homes, businesses, or highways. As recommended by the State DOH Clean Air

Branch in its pre-consultation comment letter, a dust control management plan will be developed to identify and address all activities that may generate fugitive dust (Appendix A-2). The plan will also identify mitigation measures to minimize the potential impact on air quality.

After construction, long-term impacts on air quality could occur as a result of emissions emanating from vehicular traffic. However, advanced technology and enhanced public transportation will mitigate long-term air quality impacts. Indirect air quality impacts could also result from the increased demand for electrical power but could be mitigated with the planned energy park to be built on 34.5 acres of Navy-owned land in 'Ewa (adjacent to the Hawaii Prince Golf Club).

The proposed project is located at the intersection of the proposed North-South Road and the proposed Kapolei Parkway Extension. Air quality impacts resulting from these proposed roadways were identified in the *North-South Road and Kapolei Parkway Project Air Quality Technical Report* prepared in June 2004 for the *North South Road and Kapolei Parkway Final Environmental Assessment* (September 2004) (Appendix E). Existing and predicted worst-case carbon monoxide (CO) levels resulting from motor vehicles using the proposed and associated roadways were estimated at seven locations, including the North-South Road and Kapolei Parkway intersection at the southwestern corner of the property. The existing one-hour carbon monoxide level at this location was recorded at 1.1 parts per million (ppm). With these proposed roadways and in the year 2020, the predicted worst-case 1-hour carbon monoxide level is 2.5 ppm, and the predicted worst-case 8-hour carbon monoxide level is 1.2 ppm. State and Federal ambient air quality standards for carbon monoxide are as follows.

Ambient Air Quality Standards for Carbon Monoxide		
	1-Hour	8-Hour
Hawai'i (State Standards)	9 ppm	4.4 ppm
Federal (National Standards)	35 ppm	9 ppm

In no case are carbon monoxide levels expected to exceed State or Federal (1-hour or 8-hour) air quality standards.

In its pre-consultation comment letter regarding the proposed DHHL Parcel B development, the State Land Use Commission (LUC) cited LUC Docket No. A99-728/Housing and Community Development Corporation of Hawaii, State of Hawai'i, which established conditions (some related to air quality) for development of the subject property (Appendix A-2). In accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County. However, the DHHL fully intends to develop its lands to meet the spirit and intent of the land use conditions by providing affordable housing in a clean and safe environment.

The SDOT provided comments during the pre-consultation period for this EA (Appendix A-2). It stated that although the 1996 HCDCH *East Kapolei Master Plan FEIS* (accepted in 1998) included an air quality impact assessment, this report should be updated to reflect the current situation in the 'Ewa region. The SDOT recently completed the *North South Road and Kapolei Parkway Final Environmental Assessment* (September 2004). This latter environmental assessment included the DHHL East Kapolei Parcel B project in its description of regional land use and economic development trends, as well as in the Air Quality Technical Report (Appendix

E), which concluded that there would be no adverse air quality impacts, and therefore, mitigation would not be necessary for the North-South Road and Kapolei Parkway projects.

5.5 MAN-MADE HAZARDS

The *Phase I Environmental Site Assessment East Kapolei Parcel B* was prepared by Environet, Inc. in October 2004 to identify "recognized environmental conditions" that may exist on the property.

Environmental legislation, laws, and regulations have been promulgated to govern hazardous and toxic wastes and materials, and the manufacture, generation, use, storage, release, and disposal of such materials. As a consequence of these laws and regulations, numerous agencies collect and disseminate information for use in evaluating recognized environmental conditions (RECs). For the proposed development of Parcel B, Environet, Inc. used Environmental Data Resources, Inc. (EDR) to search major federal, state, and local regulatory agency lists for hazards on the subject property. The EDR database is consistent with the American Society of Testing and Materials (ASTM) Practice E 1527-00, Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process. The records reviewed in the *Phase I Environmental Site Assessment East Kapolei Parcel B* include:

Records maintained by:

- U.S. Environmental Protection Agency (EPA) (see list of records below);
- State of Hawai'i, Department of Health (DOH);
- City and County of Honolulu Real Property Tax Division;
- City and County of Honolulu Department of Planning and Permitting;
- City and County of Honolulu Fire Department (HFD); and
- Oahu Civil Defense, Local Emergency Planning Committee (LEPC).

U.S. Environmental Protection Agency Records

- National Priority List (NPL);
- Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS);
- Resource Conservation and Recovery Act (RCRA) Corrective Action sites and associated permitted treatment, storage, and disposal (TSD) facilities (CORRACTS);
- RCRA permitted treatment, storage, and disposal facilities (TSD);
- RCRA registered (RCRIS) small (SQG) or large quantity hazardous waste generators (LQG); and
- Emergency Response Notification System (ERNS).

Federal ASTM Supplemental Records

- Emergency Response Notification System (ERNS) of spills;
- CERCLA Consent Decree sites;
- CERCLA Record of Decision (ROD) sites;
- De-listed NPL sites;
- Facility Index System/Facility Identification Initiative Program Summary Report (FINDS);
- Hazardous Materials Information Reporting System (HMIRS);
- Material Licensing Tracking System (MLTS);
- Mines Master Index File;
- Federal Superfund Liens;
- Polychlorinated biphenyl (PCB) Activity Database System (PADS);

- Department of Defense (DOD) List;
- RCRA Administrative Action Tracking System;
- Toxic Chemical Release Inventory System (TRIS);
- Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/Toxic Substances Control Act (TSCA) Tracking System (FFTS); and
- Section 7 Tracking System.

State of Hawai'i, Department of Health (DOH) Records

- State Hazardous Waste Sites (SHWS) (State's equivalent to CERCLIS);
- State permitted solid waste landfills, incinerators, or transfer stations (SWLF);
- Release Notification Report (State spills list) compiled by Hazard Evaluation and Emergency Response Office (HEER); and
- Environmental Management Division (including the following branches):
    - Clean Air;
    - Clean Water;
    - Safe Drinking Water;
    - Wastewater; and
    - Solid and Hazardous Waste
        - Leaking Underground Storage Tanks (LUST);
        - Registered Underground Storage Tanks (UST); and
        - Solid and Hazardous Waste Branch records.

A review of these historical records revealed that the property has been historically used for sugarcane cultivation, which ceased in the area in the mid-1990s. The property has remained undeveloped, with the exception of a paved utility access road in the southern portion. Historical records have also shown that widespread use of pesticides in the 'Ewa Plain has resulted in varying degrees of pesticide contamination in soil and/or groundwater. Excessive pesticide contamination in sugarcane areas is typically associated with pesticide mixing areas. The State DOH indicated that there are no reports of potential hazardous material release or other violations on the property; however, a search of DOH records revealed the presence of a former pesticide mixing plant on the adjacent parcel (TMK 9-1-017:071), about 1.5 miles northeast of Parcel B. Elevated levels of arsenic, dioxin, pentachlorophenol (PCP), ametryn, and atrazine were discovered at the former Ewa Sugar Mill/Oahu Sugar Company mixing plant during a site inspection in 2000. The site inspection determined that no further Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) evaluations were necessary as no drinking water or surface water resources exist in the vicinity of the site. There is a potential for contaminated soil and dust to migrate; however, it is not anticipated that Parcel B will be adversely affected due to its topographic nature and distance from the former mixing plant. A site inspection of Parcel B did not reveal any evidence of environmental concerns such as dumped household or construction debris, or abandoned vehicles or drums.

The Honolulu Fire Department stated that there are no records of hazardous materials incidents on the property, and the Oahu Civil Defense Agency, Local Emergency Planning Committee (LEPC) stated that no Tier 2 reports, which contain information on facilities that store, use, or generate hazardous material/substances, are filed for the property.

Potential Impacts and Mitigation Measures

During the pre-consultation comment period for this project, the DBEDT OP recommended that the HCDCH *East Kapolei Master Plan Final Environmental Impact Statement* be updated to

address the potential presence of contaminated soils from agricultural chemicals (Appendix A-2). The *Phase I Environmental Site Assessment East Kapolei Parcel B* was prepared by Environet, Inc. in October 2004 to identify "recognized environmental conditions" that may exist on the property. The assessment revealed no evidence of environmental concerns either on the property or on adjacent properties that are anticipated to adversely impact Parcel B. As such, no potential impacts from hazardous industrial operations are anticipated and no mitigation measures are proposed.

5.6 VISUAL RESOURCES AND OPEN SPACE

The DHHL Parcel B site is relatively flat and has been cultivated for sugarcane production for several decades by the Oahu Sugar Company, Limited. The average slope throughout the property is approximately 1.5 percent. The property is bordered to the north by the site of the proposed University of Hawai'i West O'ahu Campus (as yet undeveloped), to the east by vacant land proposed for the North-South Road and its related utility and transit corridor, to the south by vacant land owned by the State and the DHHL that was part of the East Kapolei Master Plan, and to the west by the Kapolei Golf Course. All of these adjoining lands are similarly flat.

Because of the flat topography of the project area, there are no ocean views from within the property. The most prominent views from within the project area are of the Wai'anae Mountain Range. The Ko'olau Mountain Range and Diamond Head are also visible from the project site, as are the 138 kilo-volt (KV) power lines that run from Farrington Highway, along the proposed North-South Road alignment (and along the site) toward Renton Road.

The proposed project site is visible from the H-1 Freeway, Farrington Highway, the Ewa Villages Golf Course, and the Kapolei Golf Course. In the future, the site will also be visible from the proposed North-South Road and Kapolei Parkway Extension.

To assess visual resources on O'ahu, the City and County of Honolulu has conducted a comprehensive view shed assessment documented in the *Coastal View Study, City and County of Honolulu Department of Land Utilization* (1987). This study inventoried, prioritized, and documented the existing visual resources of the entire O'ahu coastline. According to the City's *Coastal View Study*, the 'Ewa view shed consists of generally flat terrain and the absence of predominant land features. Views are decentralized with no particular focus. The only significant roadway view identified in the study is makai from Farrington Highway and portions of the H-1 Freeway. Views from future internal roadways will be given consideration to the extent possible. However, because the proposed project site is relatively flat, views that do exist will be impacted primarily by the siting of residential structures, commercial buildings, the park, and landscaping. Eventually, the structures of the proposed UHWO Campus may be the most visible man-made elements from the project site.

Potential Impacts and Mitigation Measures

The visual appearance of the subject property will change from vacant scrub vegetation to a landscaped residential community with commercial and park areas. Landscaping, view corridors, and sensitive architectural design will add to the visual character of the area. Considering the current views of vacant scrub vegetation, significant portions of the proposed

project site will dramatically change from a visual perspective with the residential development and landscaping. From the H-1 Freeway and Farrington Highway, views of a developed UHWO Campus will have greater visual prominence than development on the DHHL East Kapolei Parcel B.

During the pre-consultation process for this EA, the LUC noted the conditions of LUC Docket No. A99-278/Housing and Community Development Corporation of Hawaii, State of Hawai'i regarding a conceptual Urban Design Plan (Appendix A-2). In accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County. However, the DHHL fully intends to develop its lands to meet the spirit and intent of the land use conditions by providing affordable housing in a livable community that offers residents the opportunity to live, work, and play and is within walking distance to existing and proposed schools.

5.7 POPULATION

According to the City DPP, the year 2000 population of the Ewa Development Plan Area (DPA) was 68,718 (http://honoluludpp.org/planning/demographics/cp-toc.pdf, December 2002). This comprised an increase of 60.1 percent from its 1990 population of 42,931. The City expects the population of the Ewa DPA to increase to 124,775 by the year 2020. In comparison, the population for the City as a whole increased only 4.8 percent from 836,231 to 876,156 between 1990 and 2000. The City is expected to experience a population growth of 21.9 percent (234,995 persons) from 836,231 to 1,071,226 total residents during the same 30-year period.

Potential Impacts and Mitigation Measures

The proposed DHHL East Kapolei Development Parcel B will provide native Hawaiians with much needed single-family residences within the growing population of Leeward and Central O'ahu. The population increase caused by the proposed project is compatible with the "second city" concept for the Kapolei region.

5.8 HOUSING

Most of O'ahu's new housing stock is planned for development in the 'Ewa and Central O'ahu regions of the island. This trend is expected to continue over the next several decades to accommodate the anticipated population growth and housing demand on O'ahu. The 'Ewa region offers the island's major opportunity for home ownership at relatively reasonable prices because of lower land costs.

Potential Impacts and Mitigation Measures

The proposed project will provide approximately 92 acres of land for single-family residential, office, park, and community recreational facility uses for native Hawaiians in an area close to existing and proposed schools. The project will help to meet the high demand for homes in O'ahu and will provide home ownership opportunities for native Hawaiians, especially with escalating housing prices. The Parcel B development will also help the DHHL to fulfill its

mandate to develop and deliver "homesteads" to native Hawaiians by creating a livable neighborhood.

During the pre-consultation process for this EA, the HCDCH stated that it is in support of this project since it provides opportunities for housing (Appendix A-2). The HCDCH further stated:

> *Parcel B is part of 200 acres within the 1,300-acre State Land Bank earmarked for conveyance to the Department of Hawaiian Home Lands, and the proposed uses will be similar to the original development plan described in the HCDCH East Kapolei Master Plan FEIS (accepted in 1998).*

In its pre-consultation comment letter, the State LUC discussed the conditions (one related to housing) under which the project site was urbanized (LUC Docket No. A99-728/HCDCH, State of Hawai'i) (Appendix A-2). In accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County. However, the DHHL fully intends to develop its lands to meet the spirit and intent of the land use conditions by providing affordable housing in a clean and safe environment with the improvements, including water, sewer, and drainage, being built to City and State standards.

5.9 LIFESTYLE/CHARACTER OF THE COMMUNITY

Many of the components of a developing secondary urban center have emerged in Kapolei. Kapolei now includes a regional park, a preschool, a private school, a library, a police station, a State office building, a City office building, a high school, and a middle school. Nearby, the Ko Olina Resort & Marina is a 652-acre major resort with hotel, timeshare, commercial, recreational, and residential uses. The *Ewa Development Plan* projects that by 2020 the City of Kapolei will house more than 7,000 residents and provide work sites for 25,000 private jobs and 5,000 City and State jobs, many of which will be located in the Civic Center and the State office building. Many residents live and work in the Kapolei area, but most still commute to work or to the University of Hawai'i at Mānoa. However, as new employment centers are established, the 'Ewa region will evolve into a self-contained community with less dependence on Honolulu for essential services and employment opportunities.

Potential Impacts and Mitigation Measures

Major social impacts associated with the project are expected to include:

- Provision of residential homes for native Hawaiians;
- Improved and diversified community resources and facilities (i.e., office facility, park, and community recreational facility); and
- Transformation of the 'Ewa region from a bedroom community to a second city.

The regional identity of 'Ewa as the secondary urban center will continue to evolve as the DHHL Parcel B site is transformed from vacant agricultural land to a residential community. As the Ewa Development Plan Area achieves build-out, 'Ewa will evolve into truly a secondary urban center.

The City Department of Community Services (DCS) stated that the proposed project will have

no impact on any of its plans, programs, or projects (Appendix A-1 and A-2).

5.10 ECONOMIC CHARACTERISTICS

Employment, Personal Income and Expenditures. The subject property currently consists of vacant agricultural land and produces no employment or income.

Economic Factors/Government Revenues. Presently, the project area generates little demand for public facilities and services requiring government revenue.

Potential Impacts and Mitigation Measures

Employment, Personal Income and Expenditures. The proposed project will generate direct, indirect, and induced construction-related jobs, both within the subject property and on an island-wide and statewide basis. Construction industries, as well as industries supporting construction, will benefit from the employment and economic opportunities provided by the DHHL East Kapolei Parcel B development. Various nearby businesses in the City of Kapolei would achieve significant economic gains, as construction workers and residents of the proposed development are expected to patronize them. Over the long term, the proposed commercial area will provide various employment opportunities.

Economic Factors/Government Revenues. Numerous individuals and businesses will benefit from increased personal income and expenditures made possible by construction of the DHHL East Kapolei Parcel B. The State will also benefit from the proposed project through the generation of income tax and general excise tax revenues.

6.0 ASSESSMENT OF THE EXISTING INFRASTRUCTURE AND PUBLIC SERVICES, AND POTENTIAL IMPACTS AND MITIGATION MEASURES

This section discusses the existing infrastructure of the project area and the proposed infrastructure improvements and mitigation measures to address potential impacts. Various agencies provided comments during the pre-consultation comment period for this EA. The City Department of Facility Maintenance stated that it has no existing or proposed projects, plans, or other programs that will impact this project (Appendix A-2). The DBEDT OP also commented and stated that the DEA should update substantive elements of the HCDCH *East Kapolei Master Plan Final Environmental Impact Statement*, particularly on-site and off-site drainage and stormwater management, and traffic impacts and the need for increased connectivity in the area.

6.1 TRANSPORTATION FACILITIES

Planned as a self-supporting community, the Estate of James Campbell Ewa Regional Master Plan was designed to enable residents to live, work, shop, and attend school within the same area. Jobs created at the future University of Hawai'i West O'ahu (UHWO) Campus and within the City of Kapolei will also employ people who live outside of 'Ewa in areas such as Aiea, Mililani, Nanakuli and Wai'anae homesteads, or Honolulu. The following describes the major existing roadways in the project area.

Farrington Highway is a major arterial roadway that provides regional and sub-regional mobility. The highway runs in an east-west direction, north of the proposed DHHL Parcel B site near the proposed UHWO Campus. It ends just east of the Waiawa Interchange in Pearl City, where it merges with Kamehameha Highway. Near the project area, Farrington Highway is mainly a two-lane undivided road but becomes a four-lane divided highway west of the Kapolei Golf Course driveway (adjacent to the Villages of Kapolei) and through the City of Kapolei. The posted speed limit for the highway between Fort Weaver Road and the Kapolei Golf Course driveway is 35 miles per hour (mph). The posted speed limit between the Villages of Kapolei and through the City of Kapolei is 25 mph and increases to 45 mph at the merge with the H-1 Freeway.

Fort Weaver Road/Kunia Road is currently the principal north-south arterial roadway serving the 'Ewa and 'Ewa Beach communities. The roadway is named Fort Weaver Road south of Farrington Highway and Kunia Road north of Farrington Highway. Fort Weaver Road begins at the entrance to the Iroquois Point Naval Housing as a two-lane undivided roadway. It becomes a four-lane divided roadway between North Road and Farrington Highway. Kunia Road is a six-lane expressway between Farrington Highway and the H-1 Freeway. It continues north of the H-1 Freeway to Royal Kunia as a four-lane divided roadway.

Fort Barrette Road/Makakilo Drive is a major north-south arterial roadway that provides access to the H-1 Freeway and Farrington Highway from the Villages of Kapolei, City of Kapolei, and Kalaeloa areas. Fort Barrette Road becomes Makakilo

Drive north of Farrington Highway. Makakilo Drive is a four-lane divided roadway with a posted speed limit of 25 or 35 mph, depending on the location. South of Farrington Highway, Fort Barrette Road merges with Enterprise Avenue just south of F.D. Roosevelt Avenue in Kalaeloa as a two-lane undivided roadway.

Kapolei Parkway is a partially constructed arterial roadway. It is a four-lane divided roadway between Launahele Street and the OR&L right-of-way within the Ewa Gentry Development. Kapolei Parkway is a four-lane undivided roadway within the Ocean Pointe Development and a six-lane divided roadway within the Villages of Kapolei, between Fort Barrette Road and the drainage channel east of Kapolei Middle School (the southwestern corner of the proposed project site). Kapolei Parkway has a posted speed limit of 30 mph. The proposed Kapolei Parkway Extension between Renton Road and the proposed North-South Road will ultimately be a six-lane roadway providing north-south mobility in the 'Ewa area and east-west mobility in the Kapolei area.

Oahu Transit Services is contracted by the City Department of Transportation Services (DTS) to operate TheBus on a schedule subject to the availability of resources. In Kapolei, service to Honolulu is provided by buses traveling from Mākaha (Routes C, 40, 93, and 93A), passing on Farrington Highway near the proposed UHWO Campus. Within the project vicinity, bus service is provided to and from Campbell Industrial Park (Route 413), Makakilo (Routes 411, 412, and 414), the Villages of Kapolei and 'Ewa Beach (Route 41), and the U.S. Veteran's Housing area (Route 415).

The *Oahu Regional Transportation Plan* (ORTP), prepared for the Oahu Metropolitan Planning Organization (OMPO), identifies roadway concepts necessary to support future development in the 'Ewa Plain. Major roadway improvements identified by the ORTP include completion of the Kapolei Parkway and the North-South Road. Plans are presently underway for construction of the North-South Road, which will connect the areas between Kapolei Parkway and Farrington Highway and the H-1 Freeway. Ultimately, this transportation corridor will connect to the new UHWO Campus.

Transit nodes generally consisting of future mass transit stations are planned along the proposed North-South Road and Kapolei Parkway. These bus stops and future mass transit stations (as envisioned by the City's *Ewa Development Plan*) would be located at the intersections of North-South Road with Farrington Highway, East-West Road (within the UHWO Campus), and Kapolei Parkway (near the southeast corner of the project site). The City has also proposed to locate a park-and-ride on the Koko Head side of North-South Road between Farrington Highway and the H-1 Freeway.

Potential Impacts and Mitigation Measures

The DHHL Parcel B development can be expected to increase traffic in the project vicinity, including surrounding and proposed City- and State-owned streets. However, this traffic increase would not be significant, and even without the project, other developments in the 'Ewa region would generate traffic on local, collector, and regional transportation systems as the population increases over time. As noted by the DTS in its pre-consultation comment letter, some objectives of the *Ewa Development Plan* are to create a land use pattern that allows residents to minimize the use of private automobiles and to encourage projects to be pedestrian-

friendly (Appendix A-2). In accordance with the *Ewa Development Plan*, the proposed DHHL Parcel B project includes residential, commercial, and park use – all of which would facilitate walking/bicycling and lessen reliance on cars for transportation. Additionally, the project site is conveniently located near Kapolei Middle School, Kapolei High School, and the proposed UHWO Campus, which are all educational as well as employment centers. The proposed project includes on-site commercial use, which will also provide employment and reduce the need for some project residents to commute to work by car. In the project vicinity, the *Ewa Development Plan* Public Facilities Map indicates a future bike lane on Kapolei Parkway and a future bike path on North-South Road (Figure 14). Proposed measures to improve safety near existing and proposed schools include the installation of lower speed signs (possibly with flashing lights) and signs indicating pedestrian crosswalks. For the elementary school, intersections may be manned by volunteer supervisors to monitor and assist pedestrian crossings before and after school.

Major transportation improvements in the project area, including the proposed North-South Road and Interchange by the SDOT, would eventually help to mitigate traffic in the project vicinity. The North-South Road would be a major regional roadway bordering the length of the entire project site and ultimately connecting the 'Ewa Beach and 'Ewa Marina areas with the H-1 Freeway. The DHHL is required by the City to build the entire section of Kapolei Parkway Extension in order to subdivide the road lot. The DHHL has committed to building the section of the road from the lower channel bridge to the North-South Road intersection.

The *Ewa Smart Growth Design Code* (Draft) includes examples of alternative development patterns and standards including parking, community design and walkability, street design, and street networks. Recommendations proposed by the code have been reviewed. All improvements will be designed in accordance with the applicable standards of the City and State.

Pursuant to Section 220, Hawaiian Homes Commission Act, the roadways within Parcel B will be owned by the DHHL with a license issued to the City for maintenance purposes. The North-South Road and Interchange would be State facilities and Kapolei Parkway would remain under the jurisdiction of the City. As previously mentioned, the DHHL will comply with Chapter 33A, ROH, which includes the establishment of an 'Ewa highway improvement trust fund or account to be used exclusively for traffic and roadway improvements including North-South Road and Kapolei Parkway.

The City Department of Facility Maintenance (DFM) requested that the EA include analysis of the effects of the proposed improvements on existing resources within the Division of Road Maintenance corporation yard, which will be tasked to maintain the improvements (Appendix A-1 and A-2). Without data regarding the division's existing capacity or current workload, the DHHL is unable to make such an analysis. The DFM also requested that the EA indicate maintenance responsibility for the proposed drainage channel within the North-South Road right-of-way. However, the DHHL cannot make the determination of who will be responsible for maintenance of the proposed drainage channel, as it is neither the owner of the land on which the channel will be sited, nor responsible for constructing the channel. The DFM stated that the North-South Road, "...will be a State facility and maintenance of the channel should rest with the State" (Appendix A-1).

The SDOT provided comments during the pre-consultation period for this EA (Appendix A-2). The SDOT suggested an update of the traffic impact analysis report (TIAR) for the 1996

HCDCH *East Kapolei Master Plan FEIS* to reflect the current situation in the 'Ewa region. The SDOT recently completed the *North South Road and Kapolei Parkway Final Environmental Assessment* (September 2004). This latter environmental assessment included the DHHL East Kapolei Parcel B project in its description of regional land use and economic development trends, as well as in Section 3.3.1 Transportation (Appendix F), which concluded that the North-South Road and Kapolei Parkway projects would provide additional roadway capacity in a high-growth area and would relieve congested key parallel corridors. A thorough analysis of the interchanges and freeway is included in the *North South Road and Kapolei Parkway Final Environmental Assessment*, and with regard to "Impact Fees for Traffic and Roadway Improvements in Ewa," the DHHL will comply with Chapter 33A, Revised Ordinances of Honolulu (ROH).

State Senator Brian Kanno (19th District) also commented on the project's impact on traffic (Appendix A-2). The Senator noted that residents of the Villages of Kapolei are concerned that serious traffic issues will result if the proposed project (including the extension of Kapolei Parkway) is developed before completion of the North-South Road and H-1 Freeway Interchange. The safety of students at Kapolei Intermediate and High schools (located on the makai side of Kapolei Parkway) may be an issue if Kapolei Parkway is extended before the North-South Road and H-1 Freeway Interchange are completed, due to increased traffic in front of the schools.

6.2 WATER SUPPLY FACILITIES

Existing Board of Water Supply (BWS) infrastructure in the area includes 30-inch and 36-inch water mains running along Farrington Highway and connecting a series of reservoirs at elevations of 215 and 228 feet. The 228-foot-elevation Honouliuli reservoir sustains pressure for much of 'Ewa Villages and provides water to the Barbers Point 215-foot-elevation reservoir as well as the Kapolei 215-foot-elevation reservoir via the Honouliuli booster pumps. There is also a 12-inch water main at the end of the existing Kapolei Parkway.

The Honouliuli Water Recycling Facility (HWRF) produces R-1 recycled water for irrigation and RO or reverse osmosis recycled water for industrial uses. R-1 recycled water is the highest quality recycled water, having gone through filtration and disinfection to make it safe for use on lawns, golf courses, parks, and other places that people frequent. The HWRF is designed to generate 12 million gallons of recycled water per day.

Potential Impacts and Mitigation Measures

Parcel B will be served by the Kapolei 215-foot-elevation water system. Proposed reservoir requirements include a 215-foot-elevation reservoir with a capacity of 4.0-million-gallons (mg) and 30-inch, 24-inch, 20-inch, 16-inch, and 12-inch transmission and distribution mains. A new transmission main will connect to the existing 36-inch water main in Farrington Highway to feed the new 215-foot-elevation reservoir. The new transmission main will also connect to the existing 12-inch main at the end of the existing Kapolei Parkway. A water master plan was submitted to the BWS in November 2004. The DHHL will install necessary water system improvements (i.e., reservoir, transmission mains) to serve the project. Improvements will be designed in accordance with the applicable standards of the City, BWS, State, and public utility

EWA DEVELOPMENT PLAN

Public Facilities Map

Urban Area

Non-Urban Area

Urban Growth Boundary

EXISTING FUTURE

Highways, Arterial & Major Collector Streets

Grade Separated Interchange

Transit Corridor

Transit Node

Historic Railway/Bikeway Corridor

PR Park and Ride Site

HOV (High Occupancy Vehicle) Lane

Bike Lane

Bike Path

PK/GC Parks and Golf Courses

Shoreline Access

Airfield

Commercial Harbor

Civic Center

Electric Power Plant

Wastewater T.P.

Intermediate School

High School

U.H. West Oahu

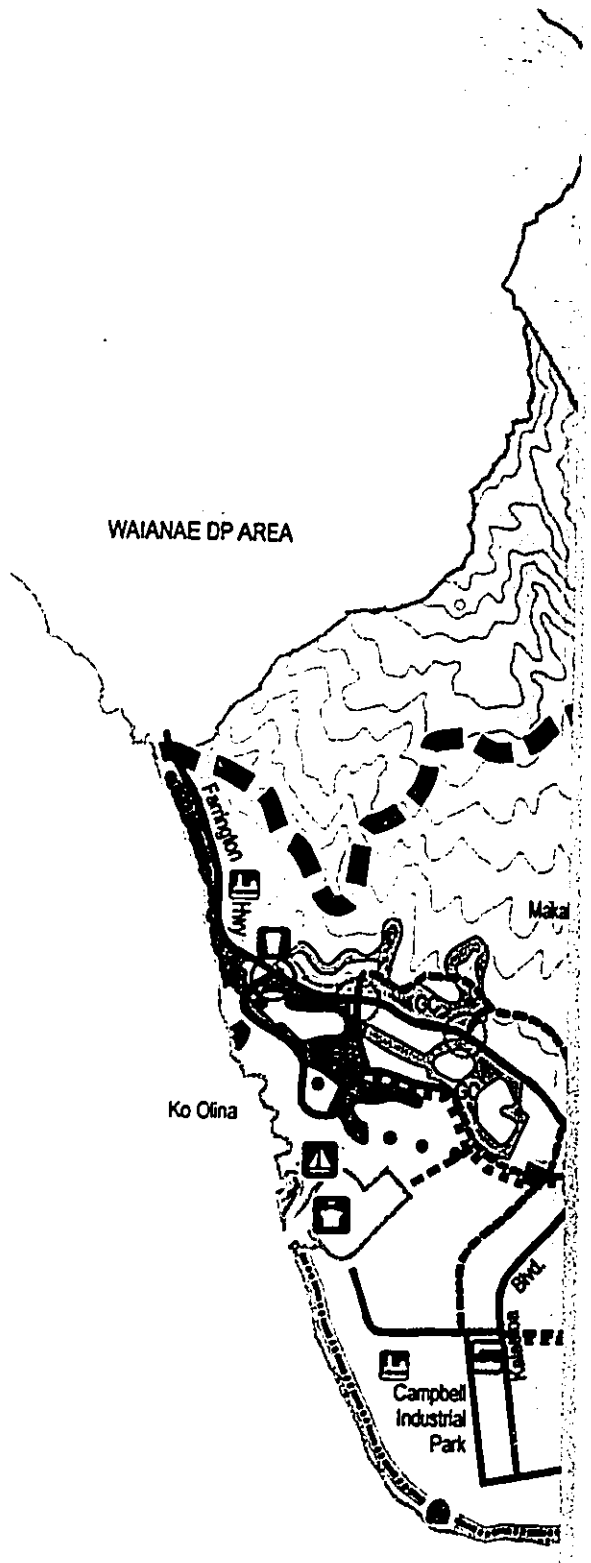
Hospital

Small Boat Marina

Corporation Yard

Landfill

Desalinization Plant



Source: City & County of Honolulu Department of Planning and Permitting

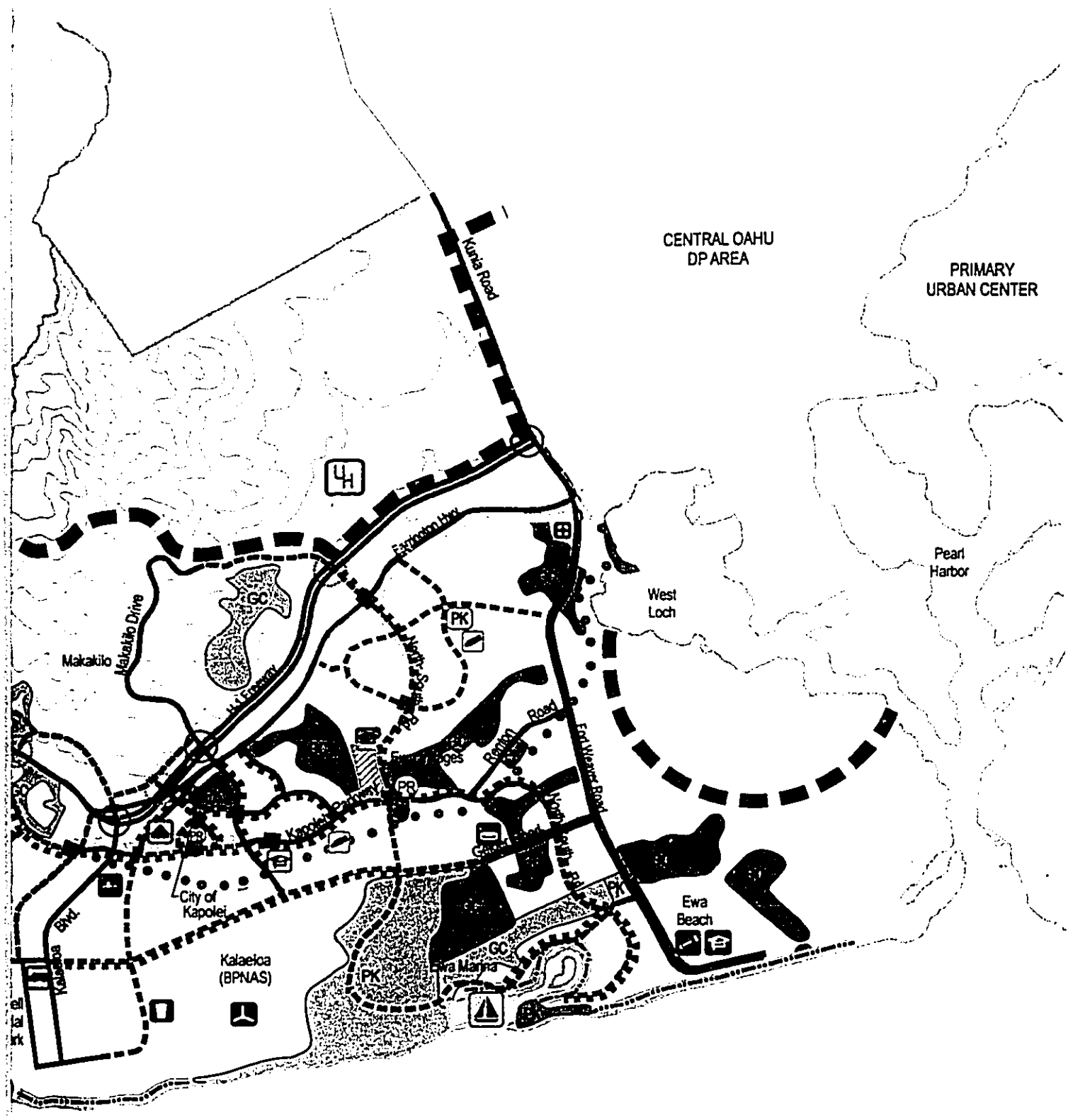


Figure 14
'EWA DEVELOPMENT PLAN
PUBLIC FACILITIES MAP

DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

ISLAND OF OAHU

NOT TO SCALE

PBR HAWAII

companies. Since the project only requires construction of water storage and transmission lines, a Well Construction Permit and/or a Pump Installation Permit will not be required. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is usually required from the CWRM. However, the BWS has the authority to allocate the use of water from this system (within limits approved by the CWRM) for municipal purposes. According to the CWRM, the DHHL currently has a reservation for 1.350 mgd, which may be converted to a Water Use Permit to serve the project (Appendix A-1).

The average daily demand for the DHHL Parcel B development will be approximately 0.28 million gallons per day (mgd) of potable water. Maximum daily demand generated by the project is estimated at 0.42 mgd for the ultimate residential population of 1,768. When Parcel B is fully developed, the total storage requirement will be 0.4 mgd.

As with any newly-developed area, the rate of development cannot exceed the rate of expansion of the potable water source, storage, and distribution system that will be necessary to support the master planned development. With the proposed East Kapolei water master plan improvements, Parcel B will be accommodated by the BWS 215-foot-elevation system and will not adversely affect the existing water system facilities

Non-potable water will also be used to supplement the potable water system in meeting the total water demand for the project. Dual water systems are not allowed by the BWS within single-family residential areas; therefore, the average daily non-potable water demand for the proposed park, business, and community center uses in Parcel B is estimated at 0.0472 mgd, based on the water master plan prepared for the HCDCH East Kapolei Master Plan. No new wells will be developed to obtain non-potable water, which will be provided by the Honouliuli Water Recycling Facility. The non-potable system will utilize R-1 recycled or brackish water for irrigation purposes primarily within road right-of-ways and large landscaped open spaces, including the proposed park. The potable and non-potable water systems will be completely separate and fully comply with all applicable State DOH regulations. The BWS is proposing to construct a non-potable storage reservoir the 215-foot-elevation and install distribution mains along North-South Road. The scheduling for this project is unknown at this time.

In compliance with the Honolulu Fire Department requirements, a private water system, in which all appurtenances, hydrant spacing, and fire flow requirements meet the BWS standards, will be provided. Coordination with the City will take place to incorporate this project into the City's Water Use and Development Plan. Coordination will also take place with the DLNR Engineering Division to incorporate this project into the State Water Projects Plan.

6.3 WASTEWATER FACILITIES

There are no existing wastewater facilities on the proposed project site. The property is not presently serviced by the City and the closest sewer collection system is the Makakilo Interceptor located along the OR&L railroad tracks, which eventually end at the Honouliuli Wastewater Treatment Plant (WWTP). The Makakilo Interceptor is currently over capacity.

The Honouliuli WWTP is located approximately 1.3 miles from the project site at the corner of North Hanson Road and Geiger Road. Based on average daily flows, the WWTP has a primary

treatment capacity of 38 million-gallons per day (mgd), with future plans to expand to 51 mgd. The primary means of disposal is through a deep ocean outfall with a design capacity of 112 mgd. The WWTP was recently upgraded to produce 12 mgd of R-1 quality effluent, which is suitable for irrigation reuse. The water recycling facility was purchased by the Board of Water Supply and currently distributes recycled water to the West Loch and Ewa Villages Golf Course, 'Ewa Mahiko District Park, and Fort Weaver Road.

Potential Impacts and Mitigation Measures

A new 42-inch Kapolei Interceptor will be constructed and will parallel the existing 30-inch Makakilo Interceptor along the northern boundary of Kalaeloa. The Kapolei Interceptor is expected to be operational by July 2005 and will service the Makakilo Community, the Villages of Kapolei, Kapolei City, and East Kapolei, including Parcel B. The Kapolei Interceptor will be dedicated to the City, which will be responsible for its operation and maintenance. A 30-inch stub-out connection to East Kapolei is being provided under the Kapolei Interceptor project. A portion of the regional sewer system will be installed under this project. The sewer line will run through Kapolei Parkway Extension and HECO's 75-foot easement in Parcel A. A 15-foot easement will be provided to grant the City access to the new line. The remainder of the regional sewer system is dependent on construction of the proposed North-South Road sewer line, which runs from the H-1 Freeway to Kapolei Parkway Extension.

Based on estimates prepared by Community Planning, Inc., maximum design flows generated by Parcel B, as well as the entire East Kapolei Development, are projected at 1.159 mgd and 7.965 mgd, respectively. The Honouliuli WWTP presently has a remaining capacity of approximately 13 mgd available. Therefore, at its current capacity, the Honouliuli WWTP is expected to be able to accommodate projected flows from the proposed project. Off-site improvements required for the DHHL Parcel B development include a wastewater transmission main to the Kapolei Interceptor Sewer. Improvements will be designed in accordance with applicable standards of the City, State, and public utility companies.

The State DOH Wastewater Branch confirmed that wastewater treatment and disposal for this development will be through the City's sewer service system via connection to the Kapolei Interceptor Sewer (Appendix A-2). The DOH recommended that R-1 recycled water be used for landscape irrigation, where possible. New off-site recycled water lines will be provided as part of the off-site improvements. The recycled water lines will be owned and maintained by the BWS and will be used to transport recycled water from a new reservoir to East Kapolei. All wastewater plans will conform to applicable provisions of the DOH Administrative Rules, Chapter 11-62, "Wastewater Systems," and may be reviewed by the DOH.

6.4 DRAINAGE FACILITIES

The proposed project site is not currently graded and floodwaters sheet flow over and off of it. Kalo'i Gulch flows through a portion of this site and flood protection measures will be required in order to develop the project. Because the property is not graded, low-lying areas are subject to shallow inundation. The *East Kapolei Drainage Master Plan* was prepared in 1998 for the HCDCH East Kapolei Master Plan. As recommended by the State Office of Planning and the SDOT in pre-consultation comment letters (Appendix A-2), this drainage plan will be updated by

a drainage report to be prepared for the proposed project upon completion of construction plans. The drainage report will be consistent with the Kalo'i Gulch and North-South Road drainage plan.

Flooding associated with Kalo'i Gulch has limited development mauka of the OR&L railroad track, except for the 'Ewa Villages Revitalization Project. The regional drainage system still lacks an ocean outlet, and the intended ocean outlet, the 'Ewa Marina, is not expected to be completed until some time after 2008 or 2010. Until then, retention basins will be required to mitigate the increased 100-year flood runoff.

Kalo'i Gulch presently enters the northern portion of the site and continues down into the northeastern corner of the site. Kalo'i Gulch was used by Oahu Sugar Company (OSCo) to carry irrigation water down to the lower fields. The "stream" has built-up banks that are higher than the adjacent ground. The peak discharge of Kalo'i Gulch is calculated to be 7,075 cubic feet per second (cfs).

Potential Impacts and Mitigation Measures

Kalo'i Gulch, the main regional drainage facility, is planned to be diverted to along the east side of the proposed North-South Road, within a portion of the right-of-way (Figure 15). The proposed realignment of Kalo'i Gulch will reduce the existing flood potential within Parcel B. The channel will extend from the upper boundary of the 'Ewa Villages Golf Course to the H-1 Freeway. The channel will be improved to convey the City's Plate 6 (estimated 100-year storm) flows and eliminate flooding in the area. Such improvements include a combination of grass and CRM-lined channels and detention basins. Excess runoff that is retained in the basins will be slowly discharged via small drainage piping after storms have subsided. Similar facilities have been constructed at the 'Ewa Villages and 'Ewa by Gentry.

6.5 SOLID WASTE DISPOSAL FACILITIES

On O'ahu, most residential and general commercial trash is disposed of at H-POWER (Honolulu Program of Waste Energy Recovery), the City's waste-to-energy plant located at Campbell Industrial Park. The facility processes over 600,000 tons of solid waste annually, reducing the volume of solid waste going into landfills by 90 percent. H-POWER also generates about 7 percent of O'ahu's electricity. The electricity generated is bought under a purchase power agreement with Hawaiian Electric Company, Inc. (HECO). Ash and non-processibles are transported and buried at the Waimanalo Gulch Landfill.

Waimanalo Gulch Landfill, which opened in 1989, is located approximately five miles northwest of the project site. The land is owned by the City and landfill is operated by Waste Management, Inc. The site accepts ash and residue from the H-POWER waste-to-energy facility, industrial wastes, and non-combustible construction and demolition debris. Commercial haulers pay $72.75 per ton to dispose of solid waste at the facility.

Potential Impacts and Mitigation Measures

As the population of O'ahu grows, demand on the H-POWER facility and the Waimanalo Gulch

Landfill will increase irrespective of where new development occurs. With the *General Plan* island-wide population projection of 1,012,073 persons for the year 2010 (an increase of 175,842 persons from the 1990 population of 836,231), at some point in the future the H-POWER plant will need to be expanded or increased recycling efforts will be needed to dispose of the increased solid waste generated. According to the City and County of Honolulu, approximately 15 percent of residential solid waste is recyclable newspaper, aluminum, glass, and plastic; and 25 to 30 percent is compostable yard trimming.

The proposed DHHL Parcel B development will generate solid waste during the construction of backbone infrastructure and as the project achieves build-out. Once the site is fully developed, the projected solid waste generated by the residential development is estimated to average approximately 3 tons per day.

Single-family: 4 persons x 400 units = 1,600 persons
3.37 lbs per person per day x 1,600 persons = 5,392 lbs per day or **2.70 tons per day**

The quantity of solid waste generated will vary with different construction activities, and some wastes may require separate and special disposal methods. However, the project is not expected to have a significant impact on the H-POWER facility or the Waimanalo Gulch Landfill, which together receive all of O'ahu's solid waste. Since the majority of beneficiaries on the DHHL O'ahu Residential Waitlist currently reside on O'ahu, the amount of solid waste generated and transferred to existing facilities after build-out should not increase significantly. To further mitigate any impact on solid waste facilities, project construction will conform to the State DOH and the City Department of Public Works' program goals and objectives of the Integrated Solid Waste Management Act, Chapter 342G, *Hawaii Revised Statues*. Construction will also comply with the City's approved integrated solid waste management plans under a schedule and time frame satisfactory to the DOH.

During the pre-consultation process, the DBEDT Strategic Industries Division (SID) provided the following recommendations for recycling and recycled-content products (Appendix A-2):

- Develop a job-site recycling plan for construction and recycle as much construction and demolition waste as possible;
- Incorporate provisions for recycling into the project – a collection system and space for bins for recyclables; and
- Specify and use products with recycled content such as: steel, concrete aggregate fill, drywall, carpet and glass tile.

6.6 ELECTRICAL AND COMMUNICATIONS FACILITIES

Electrical Facilities. The proposed project site currently has no electrical service. Electricity for the surrounding area is provided by Hawaiian Electric Company, Inc. (HECO). HECO's available generation capacity (peak demand) is 1,669 megawatts (MW). HECO owns and maintains a pole line along Farrington Highway that supports two 138-kilo-volt (KV) lines and two 12.47-KV lines (with provisions for a 46-KV line in the future). This pole line runs from HECO's Ewa Nui Substation to about where it intersects with Palehua Road. One of the two 12.47-KV lines ends just before the intersection, while the second line continues along Farrington Highway to Kapolei. Both 138-KV lines turn south at the intersection and follow the

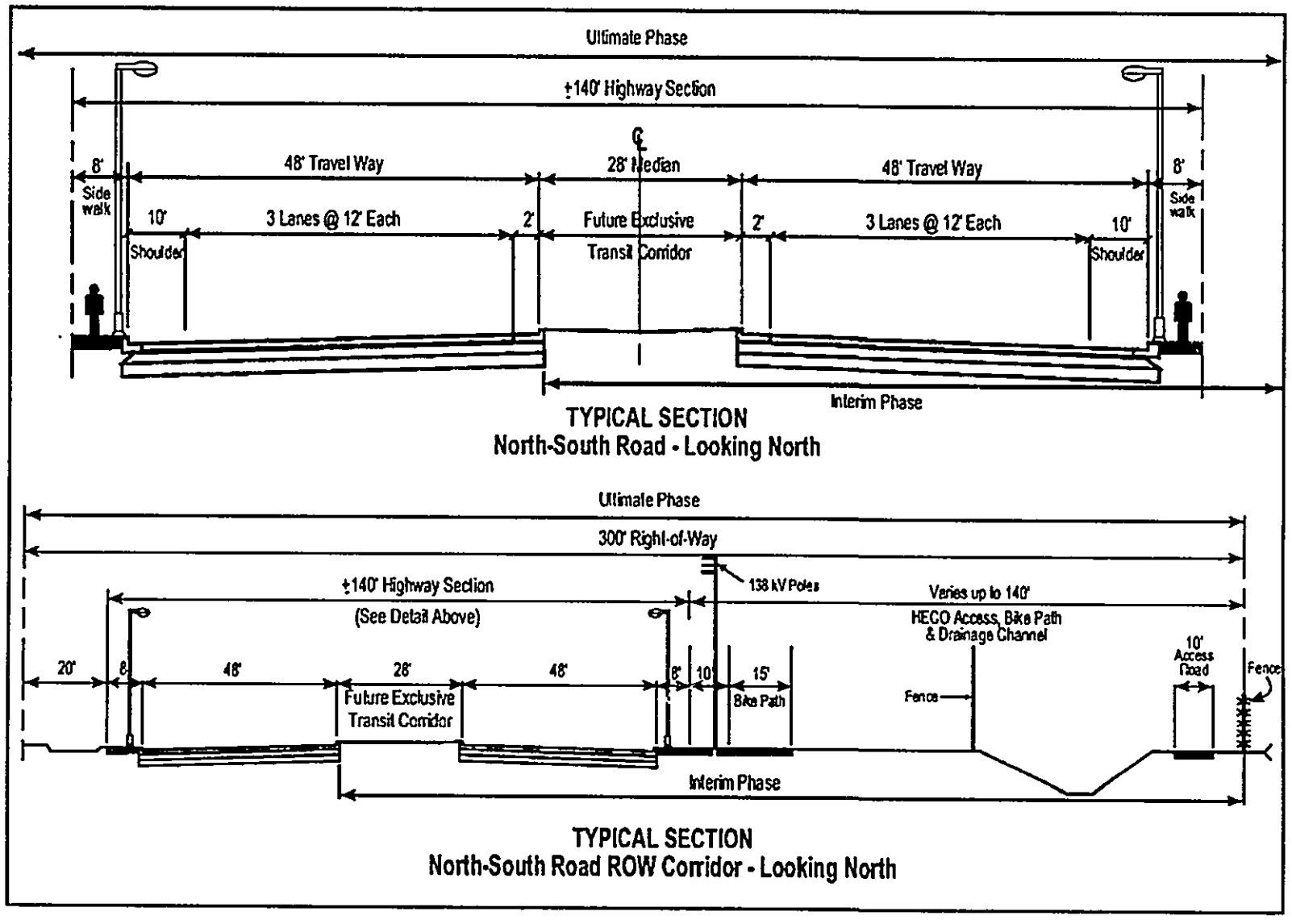


Figure 15
North-South Road Typical Section

DHHL EAST KAPOLEI DEVELOPMENT
PARCEL B

ISLAND OF OAHU

NOT TO SCALE

Source: North-South Road and Kapolei Parkway Project
Final Environmental Assessment Figure 2.1-3
Parsons Brinckerhoff Quade & Douglas

Disclaimer:
This graphic has been prepared for
general planning purposes only.

alignment of the future North-South Road to the OR&L right-of-way. In addition, two 138-KV pole lines from the HECO Kahe Power Plant pass to the north of the project site, mauka of the H-1 Freeway. An existing 46-KV circuit that is supported on wood poles follows the alignment of the H-1 Freeway. On the Honolulu-side of Pu'u Makakilo, a spur continues across the H-1 Freeway to the Pacific Concrete & Rock Substation, while the main branch of the pole line continues to parallel the H-1 Freeway alignment and heads toward the Ewa Nui Substation. HECO also has a 12.47-KV wood pole line which follows the North-South Road corridor to service the existing Ewa Villages Golf Course maintenance facility.

Communications Facilities. Telephone and communications service is not currently provided at the proposed project site. Sandwich Isles Communications, Inc. (SIC) currently provides telephone service to DHHL properties in the Kapolei area and will be the service provider for this project. Oceanic Time Warner Cable has an agreement with Verizon Hawaii for the use of its poles and has attached cables to extend their facilities to Kapolei. Oceanic Time Warner Cable also has a conduit occupancy agreement with SIC, allowing it to extend service into DHHL properties.

Potential Impacts and Mitigation Measures

Electrical Facilities. The DHHL Parcel B development is expected to generate a peak electrical demand of 21,039 kilowatt-hour (kwh) per day, based on an ultimate residential population of 1,768. This increase in demand is not expected to affect the ability of HECO to provide service to other areas. In addition, much of this demand would be offset if the solid waste generated daily by the project is burned at the City's H-POWER plant. The H-POWER plant can produce 1 megawatt (MW) of electricity for every 35 tons of solid waste burned.

During the pre-consultation process for this EA, the DBEDT Strategic Industries Division (SID) made reference to the State's energy conservation goals and provided the following recommendations (Appendix A-2):

- Establish the building on an east-west axis;
- Minimize east- and west-facing glass;
- Use natural ventilation to increase comfort of occupants;
- Maximize use of natural lighting without heat gain;
- Use high efficiency compact fluorescent lighting;
- Use insulation/radiant barrier for an equivalent R-19 value in ceiling;
- Use ceiling fans;
- Use solar water heating; and
- Use landscaping for dust control and to minimize heat gain to area.

In compliance with *Hawaii Revised Statutes*, Chapter 344 (State Environmental Policy) and Chapter 226 (Hawaii State Planning Act), all project buildings, activities, and site grounds will be designed with energy-saving considerations. The SID also encouraged recycling and recommended that the City's Energy Code and HECO's demand-side management programs be considered. Energy-efficient design practices and technologies will be specifically addressed in the design phase of the proposed project. As requested by HECO in its pre-consultation comment letter, two sets of plans will be forwarded to HECO for its review, should any HECO facilities become affected (Appendix A-2). HECO will continue to have access to its facilities in the project area.

Communications Facilities. The proposed development will increase the demand for telephone/communication service. However, no significant impacts to telephone or cable service are anticipated, and no mitigation measures are proposed for the expansion of existing service. The existing wood pole line along Farrington Highway is probably substandard, and Verizon Hawaii and Oceanic Time Warner Cable may have to relocate its lines to new poles along Farrington Highway. SIC has an exclusive license to provide telecommunications services to new developments on Hawaiian home lands and intends to extend its existing facilities in Kapolei Parkway to Kama'aha Avenue and will install lines to support Parcel B. A small 12-foot by 24-foot building that will house telecommunications equipment will be installed by SIC. All telecommunications infrastructure including underground conduit, handholes, and cabling will be installed by SIC at no cost to DHHL. The DHHL Kapolei properties will be connected to SIC's fiber optic network within the next two years. SIC will be installing fiber optic cables along Kapolei Parkway and North-South Road, connecting Kapolei Villages 6, 8, and East Kapolei by the end of 2005.

Electrical and communications improvements necessary to support the development can be served by utility companies, with some off-site work required. The off-site improvements are ongoing activities for the utility companies and should not have an adverse effect on their ability to service other areas. Cables and ducts will be suitable for underground applications and will be tolerant of both wet and dry conditions. All electrical and communications utility systems will be constructed and maintained according to approved utility standards. On-site facilities will have minimal impact on the environment, as noise, aesthetic, and safety considerations will be within normally applied guidelines.

6.7 EDUCATIONAL FACILITIES

Public schools in the immediate vicinity of the proposed project site include Kapolei High School and Kapolei Middle School along Kapolei Parkway. The 2004-2005 school year enrollments for these schools as well as others in the project area are listed in the following table.

School Name	2004-2005 School Year Enrollment
Kaimiloa Elementary	678
Kapolei Middle School	1,699
Kapolei High School	2,162
Barbers Point Elementary	494
Campbell High School	2,009
'Ewa Beach Elementary	601
'Ewa Elementary	878
Holomua Elementary	1,428
Ilima Intermediate	1,246
Kapolei Elementary	1,173
Makakilo Elementary	521
Mauka Lani Elementary	582
Pohakea Elementary	556

Source: State of Hawai'i, Department of Education, September 2004

After reviewing the DEA, the State Department of Education (DOE) provided the following table that lists the ten schools closest in proximity to Parcel B. One school will not open until the 2006-2007 school year, and of the remaining nine schools, four have exceeded their facility capacity and six more are expected to do so by the 2007-2008 school year.

School	Capacity 2003	Active Enrollment 2003	Active Enrollment 2004	Additional Students 2004	Projected Enrollment 2005	Projected Enrollment 2007	Projected Enrollment 2009	2009 Enrollment Less 2003 Capacity
Middle and High Schools – Kapolei Complex								
Kapolei High	1,853	1,928	2,162	234	2,412	2,668	2,712	859
Kapolei Middle	1,387	1,698	1,699	1	1,704	1,730	1,715	328
Elementary Schools – Kapolei Complex								
Barbers Point	636	381	510	129	422	445	426	-210
Kapolei	1,198	1,165	1,187	22	1,228	1,240	1,246	48
Elementary Schools – Campbell Complex								
Ewa	659	850	896	46	863	899	893	234
Holomua	1,184	1,344	1,437	93	1,424	1,462	1,457	273
Iroquois Point	878	455	485	30	409	367	343	-535
Kaimiloa	740	691	686	-5	633	621	618	-122
Pohakea	635	563	560	-3	578	656	826	191
Ocean Point	650	--	--	--	--	462	674	24

Source: State of Hawai'i, Department of Education, March 2005

The proposed University of Hawai'i – West O'ahu Campus (UHWO) site bounds the proposed DHHL Parcel B development to the north. The objective of the UHWO is to create a campus which will: 1) accommodate the overall educational program needs of the University for an initial campus of 2,750 students (and approximately 510 faculty and staff) and a long-range capacity of 7,600 students (and 850 faculty and staff). and 2) provide educational opportunities to the communities within the UHWO geographic service area. The UHWO will eventually become a four-year campus offering degrees in liberal arts and selected professional studies. The current Long Range Development Plan for the proposed UHWO includes an elementary school site. This school abuts the northern boundary of the DHHL East Kapolei Parcel B site.

Potential Impacts and Mitigation Measures

The DOE estimates that approximately 112 elementary, 57 middle, and 62 high school students will reside in Parcel B when 400 homes are built (Appendix A-1). Based on the table provided by the DOE, in 2009, three elementary schools (Barbers Point, Iroquois Point, and Kaimiloa) will be under capacity by approximately 867 students, and Kapolei Middle School and Kapolei High School will be over capacity by 328 and 859 students, respectively.

The DHHL Parcel B development will likely introduce school-aged children who will enroll in

nearby public schools. Although some schools in the Campbell and Kapolei Complexes are quickly reaching their capacity, some residents of the proposed Parcel B may already reside and attend public schools in the area, and others may attend private schools elsewhere. Additionally, in March 2005, the U.S. Census Bureau reported that the number of children aged 5 to 13 in Hawai'i declined 5.5 percent from 151,841 in April 2000 to 143,522 in July 2004. Hawai'i's high school-aged population (14- to 17-years-old) increased less than one percent in five years.

During the pre-consultation period, the DOE stated that it had determined the need for one high school, one middle school, and two elementary schools within East Kapolei (Appendix A-2). As previously mentioned, an elementary school site is proposed on the UHWO Campus, just north of the proposed Parcel B. The DOE is in ongoing discussions with the DLNR regarding sites for a middle school and high school in the area (Appendix A-1).

State Senator Brian Kanno (19th District) was also consulted about this project. The Senator stated, "timing of the construction of new developments in this area must be carefully designed and planned so as to ensure that the residents of Kapolei are provided with safe and adequate roads and facilities to meet the growing needs of the area" (Appendix A-2). The Senator noted his concerns for traffic and safety in areas fronting Kapolei Intermediate and High schools, if the Kapolei Parkway Extension is opened prior to the construction of the proposed North-South Road. The proposed project does not rely on the completion of Kapolei Parkway to Renton Road, just the extension of Kapolei Parkway to the access road to Parcel B.

Available demographic data indicate a growth in the college-aged population in Hawai'i, and growth rates in the UHWO service area exceed those for the rest of O'ahu. The UHWO, which is located north of the proposed project, will accommodate the growing college-aged population. The residential, commercial, and park uses proposed for the project site are not expected to adversely impact the facilities, functions, environment, or students and workers at the UHWO Campus.

6.8 POLICE PROTECTION

The proposed project is within the City Police Department's District 8, which encompasses the leeward coast and the 'Ewa Plain. There are approximately 100 field officers assigned to this district. Response time for the entire district fluctuates between five and seven minutes. In order to meet the growing needs of the 'Ewa Plain communities, in 2000, the City opened the Kapolei District Station at 1100 Kamokila Boulevard. A storefront station is located at the intersection of Fort Weaver Road and Renton Road. The only substation in this district is located in Wai'anae.

Potential Impacts and Mitigation Measures

With the proposed Parcel B development, there will be an increased demand for police service. During the pre-consultation period for this EA, the City and County of Honolulu Police Department (HPD) wrote (Appendix A-2):

> *The addition of large numbers of residential units, commercial areas, and parks will have an overall impact on the services to be provided by the Honolulu Police Department. There will inevitably be more calls for police service. Additionally, we are concerned about traffic in the area, which is caused by the overly congested existing roadways and*

the impact this has on calls for police service.

Using HPD's staffing guideline (two officers for a population of 1,000) and the anticipated Parcel B residential population of 1,768, approximately three or four new officers and staff will be required to provide police service to the proposed DHHL East Kapolei Parcel B development. According to the HPD, the nature of calls for this district generally requires more than one officer to respond, and six to eight more officers may be needed to respond effectively (Appendix A-1). The HPD can be expected to expand as Kapolei develops into the Second City, and traffic and police response time in the area are likely to improve with the future construction of North-South Road and eventual completion of Kapolei Parkway.

6.9 FIRE PROTECTION

Presently, the vacant scrub vegetation and low rainfall characteristic of the region create a potential fire hazard. Fire protection in the Ewa Development Plan area is provided by the City and County of Honolulu Fire Department (HFD) 'Ewa Beach Fire Station (an engine company), Makakilo Fire Station (an engine company), and Kapolei Fire Station (an engine and ladder company, and the Battalion 4 Headquarters). Located in Kapolei Business Park, Kapolei Fire Station was completed in 1995 to serve the expanding development on the 'Ewa Plain.

Potential Impacts and Mitigation Measures

With the proposed project, urban structures and landscaping will eliminate the potential fire hazard from scrub vegetation. However, the potential for fires in residential structures will increase where none currently exists. Consequently, there will be an occasional and unavoidable demand for fire protection services, which will be provided by three existing fire stations in the 'Ewa region. According to the *Ewa Development Plan*, to meet the projected population and economic growth in 'Ewa by 2020, three fire stations at 'Ewa Villages, Ko 'Olina, and Makaīwa Hills are planned, but service dates have not been determined. Within the proposed project site, access for fire apparatus, water supply, and building construction will be in conformance with existing codes and standards.

In compliance with the HFD requirements noted during the pre-consultation period (Appendix A-2), the proposed project will provide a fire department access road within 150 feet of the first floor of the most remote structure. Such access will have a minimum vertical clearance of 13 feet and 6 inches, be constructed of all-weather driving surface complying with DTS standards, be capable of supporting the minimum 60,000-pound weight of fire apparatus, and be of a gradient not exceeding 20 percent. The unobstructed width of the fire apparatus access road will meet the requirements of the City, and all dead-end fire apparatus access roads in excess of 150 feet in length will be provided with an approved turnaround radius complying with DTS standards. In addition, civil drawings will be submitted to the HFD for review and approval.

6.10 HOSPITALS/HEALTH CARE FACILITIES

St. Francis Medical Center – West is the nearest hospital facility to the proposed DHHL East

Kapolei Development Parcel B. Ambulance service is coordinated with the City and the hospital has a helipad. The medical center offers general hospital services including emergency care, outpatient care, lab and imaging services, and medical offices. St. Francis Medical Center – West has 79 licensed beds available, and bed capacity will soon be expanded to 84 beds. The hospital is operating at about 80% occupancy with available space for a total of 136 beds. Emergency medical and surgical services are also provided by Pali Momi Medical Center (116 beds) in Aiea and Wahiawa General Hospital (162 beds, of which 93 are for long-term care).

Non-emergency medical services are offered at the Kaiser Permanente Punawai Clinic in Waipahu and major hospital facilities in urban Honolulu, about a 30-minute drive from the subject property. Additionally, the Kapolei Medical Park, located across the Kapolei Shopping Center at the corner of Farrington Highway and Fort Barrette Road, opened in 2000. The 50,000-square-foot facility provides rental space for tenants including Ambulatory Services Inc., Hawaii Medical Services Association, Kaiser Permanente, and Straub Kapolei Family Health Center.

Potential Impacts and Mitigation Measures

There will be an occasional and unavoidable demand for emergency medical services by residents of the proposed DHHL Parcel B development. However, it is unlikely that this demand will impact the level of service provided to other O'ahu residents. Access to the property for emergency medical service providers appears to be adequate with the future construction of the North-South Road and Interchange and widening improvements underway for Farrington Highway. St. Francis Medical Center – West and other hospitals and healthcare facilities nearby should be able to accommodate an increased demand for emergency medical services and other healthcare services.

6.11 RECREATIONAL FACILITIES

Recreational facilities in the 'Ewa area include regional parks, community parks, neighborhood parks, and beach/shoreline parks. Regional parks are large recreational complexes. According to the City Department of Parks and Recreation (DPR), community parks serve an approximate population of 10,000 people and normally include play fields, courts, and a recreation building. Neighborhood parks serve an approximate population of 5,000 people and usually include play fields, courts, and a comfort station. Beach/shoreline parks are day use parks primarily for swimming, sunbathing, and picnicking. Existing parks in the 'Ewa area are listed in the following table.

Name	Type	Size (acres)
Barbers Point Beach Park	Beach	7.39
'Ewa Beach Community Park	Community	13.25
'Ewa Beach Park	Beach	4.88
'Ewa Mahiko Neighborhood Park	Neighborhood	6.33
Kahe Point Beach Park	Beach	4.47
Kamokila Park	Community	5.89
Kapolei Community Park	Community	12.00
Kapolei Regional Park	Regional	69.39

Name	Type	Size (acres)
Makakilo Community Park	Community	8.50
Makakilo Neighborhood Park	Neighborhood	4.01
Mauka Lani Neighborhood Park	Neighborhood	4.40
One'ula Beach Park	Beach	30.00
Pu'uloa Neighborhood Park	Neighborhood	4.34
West Beach Shoreline Park, North	Beach	10.00
West Beach Shoreline Park, South	Beach	18.26

Source: *State Comprehensive Outdoor Recreation Plan*, State of Hawai'i, Department of Land and Natural Resources, May 2003

Potential Impacts and Mitigation Measures

The proposed DHHL East Kapolei Development Parcel B includes 4.5 acres for park use and 10.7 acres for a community center to be developed and operated by the Salvation Army. The proposed 10.7-acre Kroc community center could include a swimming pool, performing arts center, child care center, gymnasium, education center, game and recreation areas, and other multi-use spaces. The proposal to locate the Kroc community center at Parcel B is one of 20 to 25 to be considered by the Salvation Army western territory headquarters. While the DHHL believes there is a good chance that the center will be developed in East Kapolei, a decision is not expected until mid-2006. Therefore, the actual elements that would be included in the community center parcel cannot be specified at this time. The facilities would be available to homestead families as well as the general public.

The 'Ewa region is one of the fastest growing in O'ahu, and this project will help to meet the demand for additional recreational facilities in the region. Existing parks in the 'Ewa area may be visited by new residents of the proposed development; however, this increase in park usage is not expected to be significant or to adversely impact the recreational facilities.

After reviewing the DEA, the DPR wrote:

> *The Department of Hawaiian Home Lands is exempt from the Park Dedication Ordinance of the City and County of Honolulu but we wish to complement them on the inclusion of a 4 acre park site and a 10.7 acre community center...that will be available to the general public as well as the homestead families.* (Appendix A-1)

Specific details of the park will be determined during the design phase of the project, and the DPR will be consulted at that time. The LUC made reference to the conditions under LUC Docket No. A99-728/HCDCH, State of Hawai'i related to recreational facilities (Appendix A-2). In accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County. However, the DHHL fully intends to develop its lands to meet the spirit and intent of the land use conditions by providing affordable housing in a clean and safe environment with a park and recreational facility.

6.12 PUBLIC TRANSPORTATION

Oahu Transit Services is contracted by the DTS to operate TheBus on a schedule subject to the availability of resources. In Kapolei, service to Honolulu is provided by buses traveling from

Mākaha (Routes C, 40, 93, and 93A), passing on Farrington Highway near the proposed UHWO Campus. Within the project vicinity, bus service is provided to and from Campbell Industrial Park (Route 413), Makakilo (Routes 411, 412, and 414), the Villages of Kapolei and 'Ewa Beach (Route 41), and the U.S. Veteran's Housing area (Route 415).

The *Ewa Development Plan* Public Facilities Map shows future transit nodes along Kapolei Parkway and the proposed North-South Road (Figure 14). Transit nodes are planned to facilitate TheBus system and any mass transit system that may be planned in the future. Farrington Highway, Kapolei Parkway (including the proposed Kapolei Parkway Extension), and the proposed North-South Road are designated as transit corridors. According to §4.1.4.2 Planned Rapid Transit Corridor, ROH, a rapid transit corridor is planned to connect the City of Kapolei with Waipahu and onward to the Primary Urban Center. The corridor could provide for shuttle service, express bus service, or even higher-speed dedicated transit service. The 'Ewa rapid transit corridor is planned to run from Waipahu along the Farrington Highway right-of-way to the City of Kapolei.

In 2003, the State proposed to build a $2.6 billion light-rail transit system that would stretch from Kapolei to Iwilei along an elevated line on a 22-mile route that would primarily follow Farrington Highway, then Kamehameha Highway, and finally Nimitz Highway. The light-rail system would eventually link to the proposed $200 million elevated highway ("Nimitz Highway Flyover").

The proposed project is conveniently located at the intersection of the proposed North-South Road and the proposed Kapolei Parkway Extension, near these planned transit nodes and corridors.

Potential Impacts and Mitigation Measures

A long-term increase in the number of cars on existing roadways will result from the addition of residents living at the proposed Parcel B development. However, traffic over the long term will be eased as planned public transportation systems are implemented. The *Oahu Regional Transportation Plan* (ORTP), prepared for the Oahu Metropolitan Planning Organization, identifies roadway concepts needed to support the future development planned for the 'Ewa and Central O'ahu region. Major roadway improvements included in the ORTP are the North-South Road and completion of Kapolei Parkway. Plans are presently underway for the construction of the North-South Road, which will connect the areas between Kapolei Parkway, Farrington Highway, and the H-1 Freeway. A 28-foot future exclusive transit corridor is planned within the 300-foot North-South Road right-of-way (Figure 15).

The DHHL is required by the City to build the entire section of Kapolei Parkway Extension in order to subdivide the road lot. The DHHL has committed to building the section of the road from the lower channel bridge to the North-South Road intersection. With future transit nodes located nearby, including one at the site's southeast corner, residents of the proposed development and other nearby subdivisions will be encouraged to use public transportation systems to commute. The use of public transit will help balance bus service in the morning and evening, to and from Kapolei, and lessen traffic into Honolulu.

Additionally, future development in the project vicinity (including such areas as the City of

Kapolei, Kalaeloa, Campbell Industrial Park, Ko 'Olina, and within Parcel B itself) will provide opportunities for 'Ewa residents to work within the 'Ewa region and use public transportation. Near the proposed DHHL East Kapolei Parcel B site, the proposed UHWO Campus and elementary school on the campus, and the existing Kapolei Middle and High schools will enable residents to attend school or work in 'Ewa, rather than commuting to Leeward O'ahu or Honolulu. Commercial use proposed by the project will also offer employment opportunities to 'Ewa residents.

Expanded service areas of TheBus and additional buses and financial resources will eventually be needed to service the growing population of Kapolei. Bus ridership may increase if Parcel B residents use TheBus, although some future residents may already reside in the area and ride TheBus. Additional buses are not expected to be required as a result of the proposed Parcel B project alone. Roads within Parcel B will be designed to accommodate the movement of a 60-foot bus for future bus routes. Increased use of public transportation will decrease the number of vehicles on roads and alleviate traffic on streets in the project area as well as on the H-1 Freeway. With fewer vehicles on local, collector, and regional roads, the demand for road maintenance (i.e., filling potholes, cleaning up garbage) may be reduced, thereby enabling more financial resources to be used for public transportation systems.

6.13 COMMUNITY SERVICES

Community services and public facilities in the vicinity of the project site include the following:

- Several public schools (with Kapolei Elementary, Kapolei Middle, and Kapolei High Schools nearby) [Section 6.8];
- Private schools (Friendship Christian Schools, Island Pacific Academy, Lanakila Baptist Schools – High School, Messiah Lutheran School, and Our Lady of Perpetual Help School);
- Kapolei Police Station [Section 6.9];
- Three fire stations in the 'Ewa region ('Ewa Beach, Kapolei, and Makakilo) [Section 6.10];
- Several churches;
- Shopping centers in Kapolei and Makakilo;
- Public libraries in Kapolei and 'Ewa Beach;
- Post offices in Kapolei and 'Ewa;
- Hospitals/healthcare facilities (St. Francis Medical Center – West and Kapolei Medical Park) [Section 6.11]; and
- Several recreational facilities [Section 6.12].

Potential Impacts and Mitigation Measures

The proposed DHHL East Kapolei Parcel B project is not expected to have any adverse impact on community services. Anticipated impacts on public schools, HPD and HFD facilities, hospitals and healthcare facilities, and recreational facilities were previously discussed in this chapter. Mitigation measures were also identified to minimize potential impacts. The proposed 10.7-acre Kroc community center within Parcel B could include a child care center, chapel and worship center, education center, commercial kitchen and dining areas, family service offices, and a variety of adaptable multi-use spaces, in addition to recreational facilities. The facilities

would be available to homestead families as well as the general public. The proposed DHHL "headquarters" on 9.3 acres within Parcel B will include office space for major "Ali'i Trusts" and programs that benefit native Hawaiians. During the pre-consultation and DEA comment period, the DCS stated that the proposed project will have no impact on any of its plans, programs, or projects (Appendix A-1 and A-2). The DCS also stated that the proposed project will "strengthen Kapolei as Oahu's secondary urban center through the development of new housing, community facilities, and employment opportunities."

7.0 ALTERNATIVES TO THE PROPOSED ACTION

7.1 ALTERNATIVES CONSIDERED

Under *Hawaii Administrative Rules*, Title 11, Chapter 200, Environmental Impact Statement Rules, Section 11-200-10(6), the alternatives to the proposed action considered are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. The feasible alternatives must also address the project's economic characteristics while responding to the surrounding land uses that will be impacted by the project. In conformance with applicable regulations, the following alternatives, including alternative sites and uses of the property, have been identified and investigated.

7.2 ALTERNATIVE SITES

The DHHL has a limited amount of developable land for housing its beneficiaries. On O'ahu, the largest developable area for housing is located in East Kapolei. The proposed project site is one of several properties the DHHL plans to develop in East Kapolei. The properties will include a variety of land uses and will provide native Hawaiians with the opportunity for home ownership:

- ***Parcel A*** – 100 acres for commercial use between the proposed Kapolei Parkway and Renton Road;
- ***Parcel C*** – 331.8 acres for mixed use (175.8 acres for single-family residential, 93 acres for multi-family residential, 30 acres for school, 28 acres for park, 5 acres for a community center) adjacent to the proposed North-South Road and north of Tenney Village and Renton Village;
- ***Parcel H*** – 72 acres for single-family and 4 acres for park uses between Farrington Highway and the H-1 Freeway.

This EA has been prepared for the proposed development of Parcel B. With its proximity to Kapolei Parkway and the Kapolei Interceptor Sewer, Parcel B will be easily developed.

7.3 "NO-ACTION" ALTERNATIVE

The mission statement of the DHHL is to manage the Hawaiian Home Lands trust effectively and to develop and deliver land to native Hawaiians. The "no-action" alternative would prevent the DHHL from fulfilling its mission and would also be inconsistent with State and City policies of directing future growth toward the 'Ewa Plain. Under this alternative, the site would remain as vacant agricultural land, underutilized in terms of meeting the demand for residential, commercial, and park land uses in the growing 'Ewa region. Maintaining the site in its present condition would forego home ownership opportunities in the secondary urban core of Kapolei. The social and economic benefits of developing the DHHL East Kapolei Parcel B outweigh the loss of vacant agricultural land, and therefore the "no-action" alternative has been rejected.

7.4 ALTERNATIVES RELATED TO DIFFERENT DESIGNS OR DETAILS OF THE PROPOSED ACTIONS WHICH WOULD PRESENT DIFFERENT ENVIRONMENTAL IMPACTS

The environmental impacts of primarily residential uses in the project area were studied in the HCDCH *East Kapolei Master Plan Development Project Final EIS*, which was accepted in 1998. The Villages of Kapolei is an existing subdivision similar to the proposed development. It consists of a variety of urban and residential land uses, public facilities, and a golf course on similarly flat terrain.

Different designs related to density and design capacity could be applied to the proposed project and would result in different environmental impacts. For example, a higher density development would reduce the buildable area and quantity of surface runoff. However, buildings would be larger and higher. The quantities of water used and solid waste, wastewater, and traffic generated would also be greater with a higher density design. With a lower density than what is proposed, infrastructure costs would be greater since the development would be spread out.

7.5 ACTIONS OF A SIGNIFICANTLY DIFFERENT NATURE WHICH WOULD PROVIDE SIMILAR BENEFITS WITH DIFFERENT ENVIRONMENTAL IMPACTS

There are no known actions significantly different than the proposed DHHL East Kapolei Parcel B development that would provide the same level of housing opportunities for native Hawaiians. In other areas of the State, depending on the environmental conditions and the availability of infrastructure, DHHL lands are used for agricultural (including ranching), industrial, or public use (such as community centers and preschools). All of these uses would benefit DHHL programs and beneficiaries, but each would have different environmental impacts. East Kapolei has been master planned for residential, commercial, park, and school use.

7.6 THE ALTERNATIVE OF POSTPONING ACTION PENDING FURTHER STUDY

Development of the project area and the 'Ewa Plain as O'ahu's "Second City" has been planned and studied for many years. Additionally, the HCDCH East Kapolei Master Plan included the subject property and studied the impacts of residential, commercial, park, and school land uses in this area. Further study of the area would not achieve the overall project objective and would delay the provision of housing opportunities to native Hawaiians.

8.0 DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

This EA has evaluated the potential primary, secondary, and cumulative environmental impacts, both short-term and long-term, that could result from the proposed DHHL East Kapolei Development Parcel B. Mitigation measures have also been proposed to address potential impacts resulting from the project. Based on this EA, the DHHL has determined that the proposed project will not have a significant adverse impact on the existing natural, physical, or human environment, and, as the Accepting Authority, the DHHL will issue a finding of no significant impact (FONSI).

8.1 SIGNIFICANCE CRITERIA

According to the DOH, *Hawaii Administrative Rules* (HAR) (§11-200-12 Significance Criteria), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects and its short and long-term effects. The HAR establish a "significance criteria" to determine whether significant environmental impact will occur as a result of a proposed action. An action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;

No endangered or threatened avian or mammalian species are expected to be affected by the Parcel B development. Clusters of the endangered plant species, *Abutilon menziesii*, were found on Parcel B and will need to be removed. The *Habitat Conservation Plan for Abutilon menziesii at Kapolei* (HCP) (Appendix B) has been developed and successful implementation of the HCP would significantly increase the number of new plants on O'ahu and improve the quality of the existing population.

During the pre-consultation process for this EA, the SHPD confirmed that this project has already gone through the historic preservation review process (Appendix A-2). The SHPD believes that no historic properties will be affected by the project, and as such, no mitigation measures are proposed. Should any unknown sites be uncovered during project construction, work in the area of the site will stop and the SHPD will be notified in accordance with applicable State regulations. The cultural impact assessment stated that sugar production would have destroyed any historic properties related to Hawaiian culture, and there should be minimal direct impact upon native Hawaiian cultural practices and beliefs. The assessment noted that special care should be observed in the event a Hawaiian burial is discovered.

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

The DHHL East Kapolei Development Parcel B site is within the State Urban district and is consistent with State and City policies to direct development to the 'Ewa region. The project

will help to meet the growing demand for residential land by providing much needed single-family residential units for native Hawaiians. The project will also help to ease the statewide shortage of housing, as residences will become available to the general population once DHHL beneficiaries move to their homestead lots.

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

The proposed project is consistent with the environmental policies, goals, and guidelines established in Chapter 344, HRS, as it addresses such issues as: natural resources conservation (to the extent possible); enhancement of the quality of life; population; land, water, mineral, visual, air, and other natural resources; flora and fauna; parks, recreation, and open space; economic development; transportation; energy; community life and housing; education and culture; and citizen participation. This environmental assessment addresses the aforementioned, as well as other issues.

(4) Substantially affects the economic or social welfare of the community or state;

The DHHL East Kapolei Development Parcel B project will positively affect the economic and social welfare of the native Hawaiian community by providing housing and employment opportunities on-site. Parcel B will include single-family residential units with office, park, and recreational facility uses. This project will also affect the economic and social welfare of the State by adding to the statewide inventory of housing (directly for eligible native Hawaiians). Once DHHL beneficiaries move to their homestead lots, vacated residences will become available to the general population.

Construction of Parcel B will also benefit the State by creating temporary jobs and increasing sales within the construction industry. Income taxes and sales taxes from the expenditure of construction employees' wages will be generated as a result of this development.

(5) Substantially affects public health;

Construction of Parcel B may pose the potential for temporary impacts to noise and air and water quality levels; however, these potential impacts will be short-term and are not expected to substantially affect public health, as the site is currently surrounded by open space and the nearest existing residences are located 400 feet away. All construction activities will comply with applicable regulations and will implement appropriate mitigation measures as necessary. After construction, Parcel B should have minimal impact on ambient noise levels or air and water quality.

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

The proposed DHHL East Kapolei Development Parcel B will provide eligible native Hawaiians with much needed single-family residences. The population increase caused by the proposed project is compatible with the "second city" concept for the Kapolei region. As the region develops into the second city, public facilities (i.e., roads, schools, police, fire, etc.) will be

expanded to accommodate the growing population. Since the majority of DHHL beneficiaries on the O'ahu Residential Waitlist currently reside on O'ahu, demand for energy and water, as well as solid waste and wastewater generation, should not increase significantly, either regionally or island-wide.

(7) Involves a substantial degradation of environmental quality;

The proposed project is not expected to substantially degrade environmental quality. The site and surrounding area were historically used for agricultural cultivation, which extensively modified the land. Potential impacts to the environment resulting from development within the 'Ewa region have been identified in several recent environmental reports including the HCDCH *East Kapolei Master Plan FEIS* and the *North South Road and Kapolei Parkway Final Environmental Assessment*, which have been referenced throughout this EA.

No endangered or threatened avian or mammalian species are expected to be affected by the Parcel B development. Construction activities would remove the existing population of *Abutilon menziesii* (or ko'oloa'ula); however, successful implementation of the *Habitat Conservation Plan for Abutilon menziesii at Kapolei* (HCP) (Appendix B) would significantly increase the number of new plants on O'ahu and improve the quality of the existing population, compared to the existing *in situ* disturbed cane field conditions at the Kapolei property.

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

Since much of the 'Ewa region has been historically used for agricultural purposes that altered the natural environment, the DHHL East Kapolei Development Parcel B project and other developments planned in the area are not expected to have a cumulative or considerable adverse impact on the environment. One endangered plant species, *Abutilon menziesii* or ko'oloa'ula, has been identified on the Parcel B site and nearby areas. The species will be relocated and is expected to significantly increase with successful implementation of the HCP.

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

No endangered or threatened avian or mammalian species are expected to be affected by the Parcel B development. Construction activities would remove the existing population of *Abutilon menziesii* (or ko'oloa'ula); however, successful implementation of the HCP would significantly increase the number of new plants on O'ahu and improve the quality of the existing population.

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

Construction activities for development of Parcel B could potentially impact noise and air and water quality levels (i.e., fugitive dust from grading work, noise and exhaust emissions from construction equipment and vehicles). However, these potential impacts will be short-term and are not expected to be detrimental. All construction activities will comply with applicable regulations and will implement appropriate mitigation measures as necessary.

After construction, Parcel B is not expected to adversely impact ambient noise levels or water and air quality. Although impervious surfaces will be created on currently undeveloped land,

any increase in runoff would be accommodated by proposed drainage improvements and should not detrimentally affect water quality. The project will also introduce motorized vehicles, which could impact noise levels and air quality. However, no long-term regional air quality impacts are anticipated, as new technologies, increasingly stringent federal air pollution control regulations, and increasing use of alternative forms of transportation (i.e., bicycles, public transportation) may offset potential increases in air pollution.

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

The DHHL East Kapolei Parcel B is located over 9,000 feet shoreline and is not in an environmentally-sensitive area. The majority of Parcel B (northern portion) is located in Zone D, which are areas of undetermined but possible flood hazards, as designated by the FIRM (Figure 9). This designation is likely due to the location of Kalo'i Gulch, which enters and exits the parcel at the northeastern corner. Proposed drainage improvements are likely to reduce the flood hazard potential of this portion. The southern portion of the parcel is designated Zone X, which are areas determined to be outside of the 500-year floodplain.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies;

The only significant roadway view identified in the City's *Coastal View Study* is makai from Farrington Highway and portions of the H-1 Freeway. This view is not expected to be impacted by Parcel B (which at its nearest point would be located over a half-mile from Farrington Highway and nearly three-quarters of a mile from the H-1 Freeway), especially given plans for the UHWO Campus, which is located between these highways and the proposed project site. Parcel B will alter the visual appearance of the site from vacant scrub vegetation to a landscaped residential community with commercial and park areas.

(13) Requires substantial energy consumption.

Construction of the DHHL East Kapolei Development Parcel B is not expected to require substantially more energy than other projects of similar size and scale. Structures will be designed to incorporate energy-saving technologies, and since the majority of beneficiaries on the O'ahu Residential Waitlist currently reside on O'ahu, demand for energy should not increase significantly.

8.2 DETERMINATION

Based on the significance criteria established by the *Hawaii Administrative Rules*, the assessment of potential environmental impacts, and the public agency and community comments received, the DHHL (Accepting Authority) has determined that the proposed project will not have a significant effect on the environment. Pursuant to Chapter 343, HRS, the DHHL has issued a Finding of No Significant Impact (FONSI).

9.0 CONSULTED PARTIES AND PARTICIPANTS IN THE EA PROCESS

9.1 AGENCIES CONSULTED IN THE PREPARATION OF THE FEA

The DEA was published in the February 8, 2005 issue of the OEQC *The Environmental Notice* and sent to the parties listed in the following table. The 30-day public comment period ended on March 9, 2005. Comment and response letters have been reproduced and included in Appendix A-1.

	AGENCY	DEA Mail Date	Date of Comments
State			
1	Department of Business, Economic Development and Tourism – Land Use Commission	01-31-05	--
2	Department of Business, Economic Development and Tourism – Office of Planning	01-31-05	03-09-05
3	Department of Business, Economic Development and Tourism – Strategic Industries Division	01-31-05	02-17-05
4	Department of Education	01-31-05	03-01-05
5	Department of Health – Environmental Planning Office	01-31-05	--
6	Department of Health – Office of Environmental Quality Control	01-31-05	03-07-05
7	Department of Human Services – Housing and Community Development Corporation of Hawaii	01-31-05	--
8	Department of Land and Natural Resources	01-31-05	03-03-05
9	Department of Land and Natural Resources – Historic Preservation Division	01-31-05	--
10	Department of Transportation	01-31-05	--
11	Office of Hawaiian Affairs	01-31-05	--
12	State Legislature – Senator Brian Kanno, 19th District	01-31-05	--
13	University of Hawaii – Environmental Center	--	03-09-05
14	Kapolei Public Library	01-31-05	--
15	Ewa Beach Public and School Library	01-31-05	--
Federal			
16	U.S. Army Corps of Engineers	01-31-05	--
17	U.S. Department of the Interior – Fish and Wildlife Service	01-31-05	--
18	U.S. Department of the Navy	01-31-05	--
City			
19	Board of Water Supply	01-31-05	02-14-05
20	Department of Community Services	01-31-05	02-22-05
21	Department of Facility Maintenance	01-31-05	03-21-05
22	Department of Parks and Recreation	01-31-05	02-16-05
23	Department of Planning and Permitting	01-31-05	--
24	Department of Transportation Services	01-31-05	03-24-05
25	Fire Department	01-31-05	02-25-05
26	Police Department	01-31-05	03-02-05
27	Ewa Neighborhood Board, No. 23	01-31-05	--

	AGENCY	DEA Mail Date	Date of Comments
28	Makakilo/Kapolei/Honokai Hale Neighborhood Board, No. 34	01-31-05	--
Other Organizations/Individuals			
29	Hawaiian Electric Company, Inc.	01-31-05	--
30	Sandwich Isles Communications, Inc.	01-31-05	--
31	The Estate of James Campbell	01-31-05	--

9.2 AGENCIES CONSULTED IN THE PREPARATION OF THE DEA

In August 2004, letters requesting pre-consultation comments on the proposed project were sent to the parties listed in the following table. Comment and response letters have been reproduced and included in Appendix A-2.

	AGENCY	Letter Date	Date of Comments
State			
1	Department of Business, Economic Development and Tourism	08-17-04	--
2	Department of Business, Economic Development and Tourism – Land Use Commission	08-17-04	08-26-04
3	Department of Business, Economic Development and Tourism – Office of Planning	08-17-04	10-14-04
4	Department of Business, Economic Development and Tourism – Strategic Industries Division	08-17-04	08-26-04
5	Department of Education	08-17-04	09-07-04
6	Department of Health	--	--
7	Department of Health – Clean Air Branch	--	09-13-04
8	Department of Health – Clean Water Branch	08-17-04	09-10-04
9	Department of Health – Office of Environmental Quality Control	--	--
10	Department of Health – Noise, Radiation and IAQ Branch	--	09-07-04
11	Department of Health – Wastewater Branch	08-17-04	09-07-04
12	Department of Human Services – Housing and Community Development Corporation of Hawaii	08-17-04	08-24-04
13	Department of Land and Natural Resources	08-17-04	--
14	Department of Land and Natural Resources – Historic Preservation Division	08-17-04	09-07-04
15	Department of Transportation	08-17-04	08-26-04
16	Department of Transportation – Airports Division	08-17-04	--
17	State Legislature – Representative Mark Moses	08-17-04	--
18	State Legislature – Senator Brian Kanno, 19th District	08-17-04	09-08-04
Federal			
19	U.S. Army Corps of Engineers	08-17-04	--
20	U.S. Coast Guard	08-17-04	--
21	U.S. Department of the Interior – Fish and Wildlife Service	08-17-04	10-08-04
22	U.S. Department of the Navy	08-17-04	10-13-04
City			
23	Board of Water Supply	08-17-04	09-14-04
24	Department of Community Services	08-17-04	08-27-04

	AGENCY	Letter Date	Date of Comments
25	Department of Design and Construction	08-17-04	--
26	Department of Environmental Services	08-17-04	--
27	Department of Facility Maintenance	08-17-04	09-13-04
28	Department of Parks and Recreation	08-17-04	08-27-04
29	Department of Planning and Permitting	08-17-04	--
30	Department of Transportation Services	08-17-04	10-12-04
31	Fire Department	08-17-04	09-14-04
32	Police Department	08-17-04	08-24-04
33	Ewa Neighborhood Board, No. 23	08-17-04	--
34	Makakilo/Kapolei/Honokai Hale Neighborhood Board, No. 34	08-17-04	--
Other Organizations/Individuals			
35	Gentry Companies	08-17-04	--
36	Haseko Homes, Inc.	08-17-04	--
37	Hawaiian Electric Company, Inc.	08-17-04	10-06-04
38	Schuler Homes	08-17-04	--
39	The Estate of James Campbell	08-17-04	09-27-04
40	Villages of Kapolei Association	08-17-04	--

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10.0 REFERENCES

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Appendix A-1

Draft Environmental Assessment Comment
and
Response Letters

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
ACTING DEPUTY DIRECTOR
MARY LOU KOBAYASHI
ADMINISTRATOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

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

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-10834

March 9, 2005

Mr. Vincent Shigekuni
PBR Hawaii
ASB Tower
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: Draft Environmental Assessment (DEA)
Department of Hawaiian Home Lands (DHHL)
East Kapolei Development, Parcel B (TMK Nos. 9-1-016: 108 por.)
Ewa, Oahu, Hawaii

The Department of Hawaiian Home Lands (DHHL) proposes to develop approximately 92.1 acres of land within the State Land Use Urban District identified within the East Kapolei Development Master Plan as Parcel B. Parcel B is bounded by the proposed development for the University of Hawaii's West Oahu Campus to the north, Kapolei Golf Course on the west, Kapolei Parkway on the south, the proposed alignment for the North-South Road, and the Ewa Villages Golf Course to the east. A DEA was prepared to assess the environmental impacts from developmental of the parcel. The DEA evaluated potential impacts that could result from the project and based upon the 13 Significant Criteria under Hawaii Administrative Rules (HAR) Section 11-200-12, a finding of no significant impact (FONSI) has been anticipated for the project.

The parcel represents a portion of a 1,300-acre land area that was reclassified from the State Land Use Agricultural District to the Urban District on September 8, 1999. The purpose of the reclassification was to establish a land bank of urban reserves. It was intended that the lands would be used to develop a master planned community that would provide residential and recreational uses, generate income to support the University of Hawaii West Oahu Campus (UHWOC), and provide approximately 200 acres to the Department of Hawaiian Home Lands. The East Kapolei Development Parcel B represents a portion of that allotment and is the first project from DHHL's land holdings in East Kapolei.

Development of the 92.1-acre site includes approximately 67.6 acres for 400 single-family lots, 9.3 acres for a building with 40,000 square feet of office space for approximately 150 DHHL employees, 10.7 acres for a community center to be developed and operated by the Salvation Army, and approximately 4.5 acres for a park. These uses identified for the 92.1-acre parcel, although at lower densities than the East Kapolei Master Plan, are consistent with the uses designated in HCDCH's East Kapolei Plan.

A portion of the Kaloi Gulch system exits the northeastern portion of the East Kapolei Parcel B site into the Ewa Villages Golf Course. According to the information provided in the DEA, drainage from the Kaloi Gulch above Farrington Highway will be realigned to the North-South Road utility corridor. The Final EA should include information regarding the impact of the realignment on the project, and elements of the drainage master plan that will be coordinated with the development of the West Oahu Campus.

The provision of adequate transportation and drainage infrastructure and their schedules for completion within the context of on-going and future planned developments are major concerns for Oahu's Second City. The Office of Planning supports the proposed uses, provided that compliance with applicable State and City and County regulations, and infrastructure and public service needs are met.

Thank you for including us in the Draft Environmental Assessment Pre-Assessment Consultation process. If you have any questions, please contact Judith Henry at 587-2803.

Sincerely,

Mary Lou Kobayashi
Administrator
Office of Planning

c: Anthony Ching, Land Use Commission
Office of Environmental Quality Control
Department of Hawaiian Home Lands

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 18, 2005

TO: Mary Lou Kobayashi, Administrator, Office of Planning
Department of Business, Economic Development & Tourism

FROM: Micah A. Kane, Chairman
Hawaiian Homes Commission

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 9, 2005. We offer the following responses to your comments:

1. We acknowledge that the proposed uses for Parcel B are consistent with the uses designated in HCDCH's East Kapolei Plan.

2. The Final EA will include information regarding the impact of the Kaloi Gulch realignment on the proposed project. It will also discuss elements of the drainage master plan that will be coordinated with development of the University of Hawaii - West Oahu Campus.

3. We acknowledge that the Office of Planning supports the proposed uses, provided that the project complies with applicable State and City regulations, and infrastructure and public service needs are met.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

LINDA LING
GOVER
THEODORE E. L
DIRECT
MARK K. ANDERS
ACTING DEPUTY DIRECT

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

STRATEGIC INDUSTRIES DIVISION
235 South Beretania Street, Leiopapa A Kamehameha Bldg., 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-38
Fax: (808) 587-38
Web site: www.hawaii.gov/dbedt/

February 17, 2005

PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Vincent Shigekuni

Subject: Draft Environmental Assessment
DHHL East Kapolei Development Parcel B
Tax Map Key: Portion of (1) 9-1-016:)108 (portion)

Dear Mr. Shigekuni:

On August 26, 2004, we responded to your requests for comments on your notice for the Draft Environmental Assessment (DEA) for this project. We note that some of our recommendations were incorporated in the DEA dated January 31, 2005. We have no further comments.

Sincerely,

for Maurice H. Kaya
Chief Technology Officer

c: OEQC

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

March 18, 2005

TO: Maurice H. Kaya, Chief Technology Officer
Strategic Industries Division
Department of Business, Economic Development & Tourism

FROM: Micah A. Kane, Chairman
Hawaiian Homes Commission

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated February 17, 2005. We acknowledge that the Strategic Industries Division has no comments in addition to pre-consultation comments provided on August 26, 2004.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF BUSINESS SERVICES

March 1, 2005

Mr. Vincent Shigekuni
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Department of Hawaiian Home Lands
Draft Environmental Assessment for East Kapolei Parcel B
Ewa, Oahu: TMK: 9-1-016: por. 108

The Department of Education (DOE) has reviewed the Draft Environmental Assessment (DEA) for the Department of Hawaiian Home Lands (DHHL) Parcel B project on 92 acres within the former Housing and Community Development Corporation of Hawaii (HCDCH), East Kapolei site.

The DOE estimates that approximately 112 elementary, 57 middle school, and 62 high school students will reside in Parcel B when 400 homes are built in the project. If more than one house is permitted per lot, the student population could be larger.

The DOE also notes that Parcel B is the first phase of four different DHHL East Kapolei project areas. It would be helpful for the DOE to be continually informed of the total number of residences that are currently being considered for DHHL land in East Kapolei.

The DOE is concerned that students in Parcel B will be required to attend schools that already exceed their facility capacities, particularly Kapolei Middle and Kapolei High schools.

The DEA lists the 2004-2005 enrollments for 12 different schools in the Kapolei and Campbell school complexes. A table is attached showing the ten schools closest in proximity to the East Kapolei Parcel B. One of the ten will not open until the 2006-2007 school year. The table indicates that all but two of the remaining nine schools saw increases in their enrollment this year.

As of 2004, four of the nine schools closest to Project B have exceeded their facility capacity. By the 2007-2008 school year, six of the nine schools are expected to exceed their facility capacity.

The DEA mentions that plans for the University of Hawai'i - West Oahu campus include a 12-acre site for an elementary school. There will also be a need for a middle school and high school in the area. We are in ongoing discussions with the Department of Land and Natural Resources regarding sites for these schools.

The impact of developing East Kapolei Parcel B on the public schools in the Leeward District area will be to further congest schools which are already crowded and still growing.

If you have any questions, please call me at 586-3444 or Heidi Meeker of the Facilities and Support Services Branch at 733-4862.

Sincerely,

Rae M. Loui
Assistant Superintendent

RML:hy

Attachment

c: Mamo Carreira, CAS, Campbell/Kapolei/Waianae Complex Area

Possible Schools for East Kapolei in the Campbell and Kapolei Complexes

	Capacity 2003	Act. Enroll 2003	Act. Enroll 2004	Additional students in 2004	Projected Enroll 2005	Projected Enroll 2007	Projected Enroll 2009	09 Enroll less '03 Capacity
Kapolei High	1853	1928	2162	234	2412	2668	2712	859
Kapolei Mid	1387	1698	1699	1	1704	1730	1715	328
Elementary schools								
Kapolei Complex								
Barbers Point	636	381	510	129	422	445	426	-210
Kapolei El	1198	1165	1187	22	1228	1240	1246	48
Campbell Complex								
Ewa	659	850	896	46	863	899	893	234
Holomua	1184	1344	1437	93	1424	1462	1457	273
Iroquois Point	878	455	485	30	409	367	343	-535
Kaimiloa	740	691	686	-5	633	621	618	-122
Pohakea	635	563	560	-3	578	656	826	191
Ocean Point	650					462	674	24

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

March 24, 2005

TO: Rae M. Loui, Assistant Superintendent
Department of Education

FROM: Micah A. Kane, Chairman
Hawaiian Homes Commission

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 1, 2005. We offer the following responses to your comments:

1. We acknowledge DOE estimates for approximately 112 elementary, 57 middle, and 62 high school students residing in Parcel B when 400 homes are built. Only one single-family residence will be permitted on each lot.

2. The DOE will continue to be consulted about other DHHL East Kapolei projects as details become available.

3. We acknowledge that students from Parcel B may be attending DOE schools that already exceed their capacity, but please note that some of the residents of the proposed project may already reside in the area and currently attend these schools.

4. We will note in the Final Environmental Assessment that the DOE is in ongoing discussions with the Department of Land and Natural Resources regarding sites for a middle school and a high school in the area.

5. We acknowledge your assessment that the impact of the project on public schools will be to further congest schools which are already crowded and still growing.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

March 7, 2005

Mr. Larry Sumida
Department of Hawaiian Home Lands
State of Hawai'i
P.O. Box 1879
Honolulu, Hawai'i 96732

Mr. Vincent Shigekuni
PBR Hawaii
ASB Tower
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813

Dear Messrs. Sumida and Shigekuni:

The Office of Environmental Quality Control has reviewed the draft environmental assessment for the East Kapolei Development Parcel B situated at Tax Map Key (1st) 9-1-16-108, in the judicial district of 'Ewa, and offers the following comments for your consideration and response.

1. **Guidelines Available on OEQC's Internet Site:** Please make use of guidelines concerning sustainable building design and landscaping with native plants in the implementation of the project. Please refer to http://www.state.hi.us/health/oeqc/index.html for more information.

If there are any questions, please call Mr. Leslie Segundo, Environmental Health Specialist, at (808) 586-4185.

Sincerely,

for GENEVIEVE SALMONSON
Director

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 18, 2005

TO: Genevieve Salmonson, Director
Office of Environmental Quality Control

FROM: Micah A. Kane, Chairman
Hawaiian Homes Commission

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 7, 2005. We offer the following responses to your comments:

Guidelines concerning sustainable building design and landscaping with native plants will be considered during implementation.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

February 4, 2005

LD/NAV
DHHLEASEKAPOLEIPBR.CMT

Suspense Date: 2/16/05

MEMORANDUM:

TO: XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
XXX Land-Oahu District Land Office

FROM: Warren F. Wegesend Jr., Administrator
Land Division

SUBJECT: DHHL East Kapolei Development Parcel B
Island of Oahu, Hawaii

Please review the document [redacted] pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments. (X) Comments attached.

Signed: [signature] Date: 2/7/05

Name: ERIC T. HIRANO, CHIEF ENGINEER Division: Engineering

FEB 08 '05 08:44 ENGINEERING

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

March 3, 2005
DHHLEASEKAPOLEIPBR.RCM

LD-NAV

BR Hawaii
Vincent Shigekuni
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

SUBJECT: Draft Environmental Assessment (DEA)
DHHL East Kapolei Development Parcel B
Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the subject matter.

A copy of DEA pertaining to the subject project was transmitted or made available to the following Department of Land and Natural Resources' Divisions for their review and comment.

- Engineering Division
- Division of State Parks
- Division of Forestry and Wildlife
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Oahu District Land Office

Enclosed please find a copy of the Division of Forestry & Wildlife, Engineering Division and Commission on Water Resource' comments and a copy of the Division of State Parks response.

The Department of Land and Natural Resources has no other comment to offer on the subject matter.

Should you have any questions, please contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0384.

Very truly yours,

[signature]

WARREN F. WEGESEND JR.
Administrator

C: ODLO

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LA/NAV

Ref.: DHHLEASEKAPOLEIPBR.CMT
Oahu.481

COMMENTS

(X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zones D and X. Zone D are areas of undetermined but possible flood hazards, while Zone X are areas determined to be outside of the 500-year floodplain.

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 2/17/05

46533

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

RECEIVED
FEB -1 P 4:02
DEPT OF LAND AND NATURAL RESOURCES

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 4, 2005

TO:
___ADMINISTRATOR
___ASST ADMIN
___DIVEN
___PLAN BR
___RES MGT BR
___CLERICAL
___ADMIN ASST
___INTERP BR
___CIRC/POST/STAFF RM
___COMMENTS & REC
___DRAFT REPLY
___FILE
___FOLLOW UP
___INFO
___RUN COPIES
___RUSH DUE
___SEE ME
___FAX/SEND COPY TO

Date: 2/16/05

LD/NAV
DHHLEASEKAPOLEIPBR.CMT

MEMORANDUM:

TO: XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
XXX Land-Oahu District Land Office

FROM: Warren F. Wegesend Jr., Administrator
Land Division

SUBJECT: DHHL East Kapolei Development Parcel B
Island of Oahu, Hawaii

Please review the document [redacted] pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(✓) We have no comments. ( ) Comments attached.

Signed: _____ Date: 2/8/05

Name: David S. Quinn Division: State Parks

Division of Forestry & Wildlife

1151 Punchbowl Street, Rm. 325 • Honolulu, HI 96813 • (808) 587-0166 • Fax: (808) 587-0160

February 8, 2005

MEMORANDUM

TO: Nick Vaccaro, Land Agent
Land Division

THRU: Warren F. Wegesend, Administrator
Land Division

FROM: Paul J. Conry, Administrator
Division of Forestry and Wildlife

SUBJECT: **DHHL East Kapolei Development Parcel B, Island of Oahu, Hawaii.**

DOFAW has remained consistent in its review of projects in the Kapolei-Kalaeloa-Ewa plains area. We know of three endangered plants: 1) *Achyranthes splendens spp rotundata*, 2) *Chamaesyce skottsbergii* and 3) *Abutilon menziesii* that are present in this area. Please mitigate the potential threats that this project may have on these plants by doing an on-site survey prior to the construction of this development. Although botanical surveys may show no evidence for endangered plants in the area, DOFAW has seen these plants emerge from the wild following actual project construction. Additional information can be obtained by calling Ms. Vickie Caraway, State Botanist at 587-0165 if you have questions regarding the endangered plants in this area. Thank you for the opportunity to comment on your project proposed at East Kapolei, West Oahu.

C: Vickie Caraway, DOFAW

RECEIVED
2005 FEB -9 A 10:41

LINDA LINGLE
GOVERNOR OF HAWAII

05 FEB 0 A 9:31

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

TYVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

February 4, 2005

LD/NAV
DHHLEASEKAPOLEIPBR.CMT

Suspense Date: 2/16/05

MEMORANDUM:

TO: XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
XXX Land-Oahu District Land Office

FROM: Warren F. Wegesend Jr., Administrator
Land Division

SUBJECT: DHHL East Kapolei Development Parcel B
Island of Oahu, Hawaii

Please review the document (EA) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments. (Y) Comments attached.

Signed: [signature] Date: 2-8-05

Name: LENORE Y. NAKAMA Division: DOFAW

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON

MEREDITH J. CHING
CLAYTON W. DELA CRUZ
JAMES A. FRAZER
CHIYOME L. FUKINO, M.D.
LAWRENCE H. MIKE, M.D., J.D.
STEPHANIE A. WHALEN

YVONNE Y. IZU
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

RECEIVED
2005 FEB 14 P 3:48

February 14, 2005

Ref: dhhl east Kapolei dea dr

TO: Mr. Warren Wegesend, Jr., Administrator
Land Division

FROM: Yvonne Y. Izu, Deputy Director
Commission on Water Resource Management (CWRM)

SUBJECT: DHHL East Kapolei Development Parcel B, Draft Environmental Assessment

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas, which are important for the maintenance of streams and the replenishment of aquifers.

[X] We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.

[X] We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

[ ] We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

[X] A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.

[X] The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.

[ ] Groundwater withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

[ ] We are concerned about the potential for degradation of instream uses from development on highly erodible slopes adjacent to streams within or near the project. We recommend that approvals for this project be conditioned upon a review by the corresponding county's Building Department and the developer's acceptance of any resulting requirements related to erosion control.

[ ] If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).

[ ] If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.

[X] OTHER:

The report indicates that potable water will be obtained from the Board of Water Supply (BWS). BWS has the authority to allocate the use of water from their system within the limits approved by the CWRM for municipal purposes. DHHL also has reserved 1.358 mgd of ground water from the Waipahu-Waiawa Aquifer System, which may be converted to a water use permit to serve this development.

The report should provide an estimate of the non-potable water demand. If new wells are developed to obtain non-potable water, well construction, pump installation, and water use permits from the Commission are required. The Commission supports the viable and appropriate reuse of reclaimed water, particularly over the Ewa Caprock Aquifer that has been declared a nonpotable water resource by the Commission, in so far as it does not compromise beneficial uses of existing water resources.

If there are any questions, please contact Lenore Y. Nakama at 587-0218.

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 24, 2005

TO: Warren F. Wegesend, Jr., Administrator, Land Division
Department of Land and Natural Resources

FROM: Micah A. Kane, Chairman
Hawaiian Homes Commission

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 3, 2005. We understand that the Draft EA was distributed to the following divisions:

Engineering Division (see responses to comments below);
Division of State Parks (no comments);
Division of Forestry and Wildlife (see responses to comments below);
Commission on Water Resource Management (see responses to comments below);
Office of Conservation and Coastal Lands (no comments received); and
Land - Oahu District Land Office (no comments received).

In response to the Engineering Division comments:

1. We acknowledge your confirmation that the project site is located in Zones D (areas of undetermined but possible flood hazards) and X (areas determined to be outside of the 500-year floodplain), according to the Flood Insurance Rate Map.

In response to the Commission on Water Resource Management (CWRM) comments:

1. We acknowledge that the CWRM strongly promotes the

efficient use of water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. The CWRM also encourages the protection of water recharge areas, which are important for the maintenance of streams and the replenishment of aquifers.

2. Coordination with the City and County of Honolulu will take place to incorporate this project into the City's Water Use and Development Plan.

3. Coordination with the Engineering Division of the DLNR will take place to incorporate this project into the State Water Projects Plan.

4. The project only requires construction of water storage facilities and transmission lines, not the development of water sources. Therefore there will be no need for a Well Construction Permit and/or Pump Installation Permit.

5. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is usually required from the CWRM prior to use of this source. However, we understand from your letter that the BWS has the authority to allocate the use of water from their system within the limits approved by the CWRM for municipal purposes. We also understand from your letter that the DHHL has a reservation for 1.350 MGD, which may be converted to a Water Use Permit to serve the development.

6. The average non-potable water demand for the project is estimated at .0472 MGD (maximum daily demand: 0.0707 MGD). This will be included in the Final EA. No new wells are to be developed to obtain non-potable water. R-1 quality effluent from the Honouliuli Waste Water Treatment Plant will be used for irrigating large landscape areas such as parks, schools, and street landscaping areas. The BWS is proposing to construct a non-potable storage reservoir at the 215' elevation and install distribution mains along NS Road. The scheduling of this project is unknown at this time.

In response to the Division of Forestry and Wildlife (DFW) comments:

1. As noted in the Draft Environmental Assessment, the endangered species *Abutilon menziesii* (ko'oloa'ula, or red ilima) has been identified within the project site. DHHL will cooperate with DFW in the implementation of the Habitat Conservation Plan for *Abutilon menziesii* at Kapolei which was approved by the Board of Land and Natural Resources on April 8, 2004.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

UNIVERSITY OF HAWAI'I
ENVIRONMENTAL CENTER

A UNIT OF THE WATER RESOURCES RESEARCH CENTER

March 9, 2005
EA : 0314

Mr. Larry Sumida
State Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawai'i 96813

Dear Mr. Sumida:

Draft Environmental Assessment (DEA)
East Kapolei Development Parcel B
'Ewa, Oahu

The State of Hawai'i, Department of Hawaiian Home Lands (DHHL) proposes to develop a community in Kapolei on approximately 92.1 acres of mostly vacant agricultural land. Of these 92.1 acres, 67.6 acres will be devoted to providing 400 lots for single-family residential use. These lots will be designated for qualifying native Hawaiian beneficiaries. A DHHL "headquarters" office will occupy 9.3 acres. This office facility would allow for up to 150 employees and comprise 40,000 square feet. A community center that will be open to all homestead families as well as the general public will occupy 10.7 acres. This center would be developed and operated by the Salvation Army. The remaining 4.5 acres of land will be designated park use. The cost of the project is split between on-site improvements approximating $26 million and off-site improvements at approximately $12 million. The project area was included in the accepted 1998 East Kapolei Master Plan Final Environmental Impact Assessment (FEIS).

The Environmental Center conducted an in house review of this draft EA with the assistance of Kerry Halford.

General Comments

The Department of Hawaiian Home Lands (DHHL) is proposing this project for the benefit of native Hawaiians. The Environmental Center commends the DHHL in this quest; nevertheless, we note a number of concerns for the underlying assumptions in this draft EA, including but not limited to the primary and secondary impacts to traffic, educational provisions, and questionable use of modal auxiliaries.

Traffic

As a proposed mitigating measure for the added traffic congestion in the 'Ewa area due to this project, the DHHL plans to "include residential, commercial, and park use -- all of which would facilitate

KRAUSS ANNEX 19 • 2500 DOLE STREET • HONOLULU, HAWAI'I 96822 • (808) 956-7361 • FAX (808) 956-3980
AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER

walking/bicycling and lessen reliance on cars for transportation." As the Estate of James Campbell Ewa Regional Master Plan was designed, part of the plan was to create job opportunities in the area to lessen citizen's reliance on automobiles thereby limiting traffic. Although this is the stated goal of the Ewa area, it can be seen that traffic conditions, especially during peak hours, leave the area congested and add to the frustration of many long time residents. A current, complete traffic study of the area should be included in the final EA. This should include a full assessment of the additional traffic congestion resulting from the proposed housing development, both during and after the project's construction phase.

Schools

On pages 71 and 72 a brief description of the proposed educational supplement for the additional school aged population is discussed. As mentioned in this section: "Kapolei schools are quickly reaching their capacity; however, it is expected that some students will attend private schools elsewhere." In the absence of substantive income and socioeconomic data to support this assumption, the net beneficial relief of private school enrollment to the acknowledged impact of the proposed new community on the overburdened school system is speculative at best. The same paragraph later states, "...as the Kapolei area develops, additional educational facilities are expected to be provided." However, a portion of the increased population that will require additional educational facilities will materialize as a direct result of the proposed DHHL housing. Thus, it is incumbent on the agency to demonstrate exactly how educational needs will be met, and unsubstantiated expectations of new educational facilities are an insufficient recourse in the context of this draft EA. Without prior plans for new educational facilities, this project does not ensure its citizens adequate educational facilities. The new elementary school site is a proposal that is included in the University of Hawai'i West Oahu EIS, for which no explicit development timetable has been offered. Even with this elementary school development, high school and intermediate school aged children will need an educational facility. These issues should be fully discussed and resolved before consideration of this new development.

Word Usage

On page 75 the community center that is to be developed and operated by the Salvation Army is discussed. The description of the center leaves questions about the intended use of the facility: "The proposed 10.7-acre Kroc community center could include a swimming pool, performing arts center," The use of the modal auxiliary "could" makes one conclude the DHHL has not drawn up final plans for the center. Words usage of this sort should be carefully considered in the final EA.

Thank you for the opportunity to review this Draft EA.

Sincerely,

John T. Harrison, Ph.D.
Environmental Coordinator

cc: OEQC
PBR
James Moncur, WRRC
Kerry Halford

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 24, 2005

Mr. John T. Harrison, Ph.D., Environmental Coordinator
University of Hawaii Environmental Center
Krauss Annex 19
2500 Dole Street
Honolulu, Hawaii 96822

Dear Dr. Harrison:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 9, 2005. We offer the following responses to your comments:

1. The *North South Road and Kapolei Parkway Final Environmental Assessment* (September 2004) provided a thorough analysis of the interchanges and freeway and included the Parcel B project. Section 3.3.1 Transportation of the *North South Road and Kapolei Parkway EA* was appended to the *DHHL East Kapolei Development Parcel B Draft Environmental Assessment*.

2. The State Department of Education (DOE) reviewed the Draft EA and estimated that approximately 112 elementary, 57 middle, and 62 high school students will reside in Parcel B when 400 homes are built. Of these numbers, we are unable to determine how many of these will be new students, as some may already be residing in this area and will want to relocate to the DHHL East Kapolei Parcel B project. We understand that the University of Hawaii is preparing an Environmental Impact Statement which would include the 12-acre elementary school within the University of Hawaii West Oahu property. The Final EA will note that the DOE is in ongoing discussions with the Department of Land and Natural Resources regarding sites for a middle school and high school in the area.

3. The proposal to locate the Kroc community center at Parcel B is one of 20 to 25 to be considered by the Salvation Army western territory headquarters. While we believe that East Kapolei has a good chance to be selected as a site for the community center, a decision is not expected until mid-2006. Therefore, the actual elements that would be included in the community center parcel cannot be specified at this time.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

February 14, 2005

MUFI HANNEMANN, Mayor

EDDIE FLORES, JR., Chairman
CHARLES A. STED, Vice-Chairman
HERBERT S. K. KAOPUA, SR.
CAROLYN H. LENDIO

RODNEY K. HARAGA, Ex-Officio

CLIFFORD S. JAHNKE
Manager and Chief Engineer

DONNA FAY K. KIYOSAKI
Deputy Manager and Chief Engineer

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Your letter of January 31, 2005 on the Draft Environmental Assessment for Department of Hawaiian Home Lands East Kapolei, Parcel B, TMK: 9-1-16:108

Thank you for the opportunity to comment on the proposed development.

The water master plan for the East Kapolei Development should be submitted for our approval.

The developer will be required to install the necessary water system improvements to serve the proposed development, including a reservoir and transmission mains.

Non-potable water should be used for the irrigation of large landscape areas.

If you have any questions, please contact Joseph Kaakua at 748-5442.

Very truly yours,

KEITH S. SHIDA
Principal Executive
Customer Care Unit

Cc: OEQC
DHHL

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

STATE OF HAWAII

DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

March 24, 2005

Mr. Keith S. Shida, Principal Executive
Customer Care Unit
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Shida:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated February 14, 2005. We have reviewed your letter and provide the following comments:

1. The East Kapolei Development Master Plan Water System Study was submitted to the Board of Water Supply (BWS) in November 30, 2004. Comments from the BWS were received on January 4, 2005. The master plan is currently being revised for final submittal to BWS.

2. The Department of Hawaiian Home Lands will install the necessary water system improvements to serve the East Kapolei Development Parcel B. Such improvements include a reservoir and transmission mains.

3. R-1 quality effluent from the Honouliuli Waste Water Treatment Plant will be used for the irrigation of large landscape areas, where permitted by the State Department of Health regulations. We understand that the BWS is proposing to construct a non-potable storage reservoir at the 215' elevation and install distribution mains along NS Road. The scheduling of this project is unknown at this time.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 • HONOLULU, HAWAII 96813 • AREA CODE 808 • PHONE: 527-5311 • FAX 527-5498

MUFI HANNEMANN
MAYOR

DEBORAH K. MORIKAWA
ACTING DIRECTOR

JOHN R. SABAS
DEPUTY DIRECTOR

February 22, 2005

Mr. Vincent Shigekuni, Principal
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: Draft Environmental Assessment
East Kapolei Development Parcel B

The Department of Community Services appreciates the opportunity to review and comment on the subject draft environmental assessment. Based on our review, we have determined that the proposed project will have no impact on any programs or services provided by the Department of Community Services.

The proposed project will strengthen Kapolei as Oahu's secondary urban center through the development of new housing, community facilities, and employment opportunities. As noted in Section 3.2 of the draft environmental assessment, although the proposed project will principally benefit Department of Hawaiian Home Lands beneficiaries, the project will have a beneficial impact on Oahu's housing market as a whole by the addition of approximately 400 new single family residences.

Thank you again for the opportunity to provide these comments. Questions regarding this matter may be directed to Mr. Keith Ishida at 527-5092.

Sincerely,

DEBORAH K. MORIKAWA
Director

DKM:dk

cc: Office of Environmental Quality Control
Mr. Larry Sumida, Department of Hawaiian Home Lands

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 14, 2005

Ms. Deborah K. Morikawa, Director
Department of Community Services
City and County of Honolulu
715 South King Street, Suite 311
Honolulu, Hawaii 96813

Dear Ms. Morikawa:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated February 22, 2005. We acknowledge that the proposed project will have no impact on any programs or services provided by the Department of Community Services. We also concur with your agency's assessment that the proposed project will strengthen Kapolei as Oahu's secondary urban center through the development of new housing, community facilities and employment opportunities.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 215, KAPOLEI, HAWAII 96707
TELEPHONE : (808) 692-5054 FAX: (808) 692-5857
Website: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LAVERNE HIGA, P.E.
ACTING DIRECTOR AND CHIEF ENGINEER

GEORGE K. MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 05-200

March 21, 2005

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: **Department of Hawaiian Home Lands (DHHL)**
East Kapolei Development Parcel B
Draft Environmental Assessment (DEA)

Thank you for the opportunity to review and comment on the DEA dated January 2005 for the subject project.

We request that the DEA include an analysis of the effects of the proposed improvements on existing resources within the Division of Road Maintenance (DRM) Pearl City Corporation Yard that will be eventually tasked with the maintenance of the improvements. Although the roadways and drainage improvements will be owned by DHHL, the City will probably be tasked with maintenance responsibility. The DEA makes mention of this concern on Page 63, "Potential Impacts and Mitigation Measures," but no analysis as to the need to increase resources is presented.

The DEA should indicate maintenance responsibility of the proposed drainage channel within the North-South Road right-of-way for diverting Kaloi Gulch. This roadway will be a State facility and maintenance of the channel should rest with the State.

Should you have any questions, please call Charles Pignataro of our Division of Road Maintenance, at 484-7697.

Very truly yours,

LAVERNE HIGA, P.E.
Acting Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Hawaiian Home Lands

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 24, 2005

Ms. Laverne Higa, P.E., Acting Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

Dear Ms. Higa:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 21, 2005 (reference number DRM 05-200). We offer the following comments:

1. You requested that the environmental assessment provide an analysis of the effects of the proposed improvements on existing resources within the Division of Road Maintenance (DRM) Pearl City Corporation Yard. Unfortunately, we have no data regarding the DRM's existing capacity or current workload on which to base such an analysis.

2. The DHHL cannot make the determination of who will be responsible for maintenance of the proposed drainage channel. The DHHL is neither owner of land on which the channel will be sited nor responsible for constructing the channel. However, we will note in the Final EA that during the public review period, the Department of Facility Maintenance wrote that the North-South Road "...will be a State facility and maintenance of the channel should rest with the State."

Thank you again for your participation in the Environmental

Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 309 • KAPOLEI, HAWAII 96707
PHONE: (808) 692-5561 • FAX: 692-5131 • INTERNET: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LESTER K. C. CHANG
ACTING DIRECTOR

DANA L. TAKAHARA-DIAS
DEPUTY DIRECTOR

February 16, 2005

Mr. Vincent Shigekuni
PBR Hawaii
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: Draft Environmental Assessment
DHHL East Kapolei Development Parcel B

Thank you for the opportunity to review and comment on the Draft Environmental Assessment relating to the Department of Hawaiian Home Lands proposed development of approximately 400 residential units and commercial park on a 92.1 acre parcel located mauka of the proposed West Oahu Site of the University of Hawaii in Kapolei.

The Department of Hawaiian Home Lands is exempt from the Park Dedication Ordinance of the City and County of Honolulu but we wish to complement them on the inclusion of a 4 acre park site and a 10.7 acre community center that will include a swimming pool, gymnasium and other recreation facilities that will be available to the general public as well as the homestead families.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

LESTER K. C. CHANG
Acting Director

LKCC:mk
(92806)

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 23, 2005

Mr. Lester K.C. Chang, Acting Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

Dear Mr. Chang:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated February 16, 2005. We greatly appreciate your comments that while the Department of Hawaiian Home Lands is exempt from the Park Dedication Ordinance of the City and County of Honolulu, the proposed project will include a four acre park site and may include a 10.7 acre community center that will be available to the general public as well as the homestead families.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425 • HONOLULU, HAWAII 96819-1869
TELEPHONE: (808) 831-7761 • FAX: (808) 831-7750 • INTERNET: www.honolulufire.org

MUFI HANNEMANN
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

February 25, 2005

Mr. Vincent Shigekuni, Principal
PBR Hawaii
American Savings Bank Tower
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: Draft Environmental Assessment
Department of Hawaiian Home Lands
East Kapolei Development, Parcel B
Kapolei, Oahu, Hawaii
Tax Map Key: 9-1-016: 108 (Portion)

We received your letter dated January 31, 2005, requesting our comments on the above-mentioned subject.

The Honolulu Fire Department has no additional comments. Please refer to our letter of September 14, 2004, for previous comments.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 831-7778.

Sincerely,

ATTILIO K. LEONARDI
Fire Chief

AKL/SY:bh

cc: Office of Environmental Quality Control
Department of Hawaiian Home Lands

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

March 18, 2005

Mr. Attilio K. Leonardi, Fire Chief
City and County of Honolulu
Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Dear Chief Leonardi:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated February 25, 2005. We acknowledge that the Honolulu Fire Department has no comments in addition to pre-consultation comments provided on September 14, 2004.

Thank you again for your participation in the Environmental Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 · AREA CODE (808) 529-3111
http://www.honolulupd.org
www.honolulu.gov

MUFI HANNEMANN
MAYOR

BOISSE P. CORREA
CHIEF

GLEN R. SAJITANA
PAUL D. PUTZULU
DEPUTY CHIEFS

OUR REFERENCE CS-KP

March 2, 2005

Mr. Vincent Shigekuni
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Department of Hawaiian Home Lands East Kapolei Development Parcel B.

In reference to page 72, Item 6.8, Police Protection, please be advised that the Honolulu Police Department's Kapolei District Station is located at 1100 Kamokila Boulevard. There is a storefront station located at the intersection of Fort Weaver Road and Renton Road. The only substation in this district is in Waianae at 85-939 Farrington Highway.

We concur with the statement on page 72 that there will be an increased demand for police services. Additionally, we would like to comment on the statement found on page 73, which states:

> *Using HPD's staffing guideline (two officers for a population of 1,000) and the anticipated Parcel B residential population of 1,768, approximately three or four new officers and staff will be required to provide police service...*

This may be true for the majority of the police districts on Oahu. However, for this particular district, we have found that the nature of the calls generally require more than one officer to respond. Therefore, we would like to comment that six to eight more officers may be needed to respond effectively.

If there are any questions, please call Major Michael Tamashiro of District 8 at 692-4253 or Ms. Carol Sodetani of the Support Services Bureau at 529-3658.

Sincerely,

BOISSE P. CORREA
Chief of Police

By
KARL GODSEY
Assistant Chief of Police
Support Services Bureau

cc: Ms. Genevieve Salmonson, OEQC
Mr. Larry Sumida, Department of Hawaiian Home Lands

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
PO BOX 1879
HONOLULU, HAWAII 96805

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION
BEN HENDERSON
DEPUTY TO THE CHAIRMAN
KAULANA H. PARK
EXECUTIVE ASSISTANT

March 24, 2005

Mr. Karl Godsey, Assistant Chief of Police
City and County of Honolulu
Police Department
Support Services Bureau
801 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Godsey:

SUBJECT: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Final Environmental Assessment/ Finding of No Significant Impact (FONSI)

Thank you for your letter dated March 2, 2005. We offer the following responses to your comments:

1. *Section 6.8 Police Protection* will be revised as follows:

   In order to meet the growing needs of the Ewa Plain communities, in 2000, the City opened the Kapolei District Station at 1100 Kamokila Boulevard. A storefront station is located at the intersection of Fort Weaver Road and Renton Road. The only substation in this district is located in Waianae.

2. *Section 6.8 Police Protection - Potential Impacts and Mitigation Measures* will be revised as follows:

   According to the HPD, the nature of calls for this district generally requires more than one officer to respond, and six to eight more officers may be needed to respond effectively.

Thank you again for your participation in the Environmental

Assessment process. If you have any questions regarding this project, please call Darrell Ing of our Land Development Division at 586-3844.

Aloha and mahalo,

MICK

Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Anson Murayama, Community Planning and Engineering, Inc.
Vincent Shigekuni, PBR Hawaii

Appendix A-2

Pre-consultation Comment and Response Letters

LINDA LINGLE
GOVERNOR

ANTHONY J.H. CHING
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
PO Box 2359
Honolulu, Hawaii 96804-2359
Telephone: 808-587-3822
Fax: 808 587-3827

August 26, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Department of Hawaiian Home Lands East Kapolei Development Parcel B
Draft Environmental Assessment (DEA)

We are in receipt of your letter dated August 17, 2004, requesting our review of the subject project. We understand that the project will consist of single-family residential, commercial, and park uses on approximately 94 acres of land. Based on this understanding, we have the following comments for your consideration:

1) The project site, as generally represented on the East Kapolei Conceptual Development Plan, is designated within the boundary of the State Land Use Urban District. We suggest that the DEA include a map showing the project site in relation to the State land use districts.

2) The project site was urbanized pursuant to LUC Docket No. A99-728/ Housing and Community Development Corporation of Hawaii, State of Hawaii, subject to 27 conditions, including but not limited to the following conditions pertaining to the development of residential and commercial uses:

   1. Petitioner, its successors, and assigns shall provide affordable housing opportunities for residents of the State of Hawai'i in accordance with applicable affordable housing requirements of the City and County of Honolulu. The location and distribution of the

affordable housing or other provisions for affordable housing shall be under such terms as may be mutually agreeable between Petitioner, its successors, and assigns, and the City and County of Honolulu.

6. Petitioner, its successors, and assigns shall not construct residential components within areas exposed to noise levels of 60 Ldn or greater.

8. Petitioner shall attenuate the noise sensitive areas within commercial components of the Property that are exposed to exterior noise levels of 60 Ldn (day-night average sound level) by a minimum of 25 decibels.

13e. Petitioner, its successors, and assigns, agrees to work with the City to implement interim and long-range regional drainage solutions as follows:

   e. Should Petitioner sell various residential or commercial components prior to the completion of the construction of the master infrastructure, any such sale shall be conditioned upon the completion of the appropriate master infrastructure improvements for that portion of the residential or commercial component.

16. Prior to construction of any residential or commercial uses within the Petition Area, Petitioner, or its successors and assigns, shall submit a Regional Park, Open Space and Pedestrian/Bikeway Master Plan to the City for its review and approval.

17. Prior to construction of any residential or commercial uses within the Petition Area, Petitioner, or its successors and assigns, shall submit a conceptual Urban Design Plan to the City for its review and approval. The Urban Design Plan shall depict the overall design theme and architectural character of streetscapes, residential neighborhoods and town centers. The Plan shall also include a

conceptual landscape plan showing treatment of Project entries, major roadways, and common areas.

19. Petitioner, its successors, and assigns shall facilitate an air quality monitoring program as specified by the State Department of Health. Petitioner, its successors, and assigns shall notify all prospective buyers of property, and buyers of individual lots or homes of the potential odor, noise and dust pollution resulting from surrounding agricultural and other uses, said notification to include a reference to potential odors emanating from the Honouliuli Wastewater Treatment Plant.

21. Residential and commercial components of the project will not be developed and major site work for those areas shall not be undertaken until master drainage and infrastructure improvements for those components are completed.

3) As your letter notes, the project site, then identified in the 1998 East Kapolei Master Plan Final Environmental Impact Statement as Parcels D, E, F and G, was originally planned for 70.2 acres of single-family residential, 10.5 acres of multi-family residential, 8 acres of commercial, and 5.5 acres of park uses. While the current project includes more acreage in park and less acreage in commercial, the DEA should specifically address the deletion of the multi-family residential component of the project in favor of additional single-family residential uses and how such a change in the residential composition would impact the region's infrastructure.

4) By letter dated January 21, 2003, our office provided comments during the scoping process for the University of Hawaii-West Oahu Draft Environmental Assessment/Environmental Impact Statement Notice of Preparation. Based on the information provided in that process, we understand that the UH West Oahu campus, which was previously planned mauka of the H-1 Freeway, is now proposed to be located within the East Kapolei site on an approximately 500-acre parcel. Given the proximity of the project site to the new campus site, the DEA should discuss the project's impacts upon the campus.

We request that a copy of the DEA be forwarded to our office as soon as it becomes available. We have no further comments to offer at this time.

Thank you for the opportunity to comment on the subject project. Please feel free to contact Bert Saruwatari of my office at 587-3822, should you require clarification or any further assistance.

Sincerely,

ANTHONY J. HIGHING
Executive Officer

c: Office of Environmental Quality Control

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

WM. FRANK BRANDT, FASLA
CHAIRMAN

THOMAS S. WITTEN, ASLA
PRESIDENT

R. STAN DUNCAN, ASLA
EXECUTIVE VICE-PRESIDENT

RUSSELL Y.J. CHUNG, ASLA
EXECUTIVE VICE-PRESIDENT

VINCENT SHIGEKUNI
PRINCIPAL

JAMES LEONARD, AICP
PRINCIPAL
HILO OFFICE

GRANT MURAKAMI, AICP
SENIOR ASSOCIATE

TOM SCHNELL, AICP
ASSOCIATE

RAYMOND T. HIGA, ASLA
ASSOCIATE

KEVIN NISHIKAWA, ASLA
ASSOCIATE

HONOLULU OFFICE
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ASB TOWER, SUITE 650
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TEL: (808) 521-5631
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101 AUPUNI STREET
HILO LAGOON CENTER, SUITE 310
HILO, HAWAI'I 96720-4262
TEL: (808) 961-3333
FAX: (808) 961-4989
E-MAIL: pbrhilo@lava.net

WAILUKU OFFICE
2123 KAOHU STREET
WAILUKU, HAWAI'I 96793-2204
TEL: (808) 242-2878
FAX: (808) 242-2902
EMAIL: pbrmaui@lava.net

January 20, 2005

Mr. Anthony J.H. Ching, Executive Officer
State of Hawaii
Department of Business, Economic Development & Tourism
Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804-2359

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Ching:

Thank you for your letter dated August 26, 2004. We offer the following responses to your comments.

1) The *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* (DEA) will include a map showing the project site in relation to the State land use districts.

2) In accordance with the Hawaiian Homes Commission Act, 1920, as amended, Hawaiian home lands are not subject to zoning or other land use controls by the State or County. However, the DHHL fully intends to develop its lands to meet the spirit and intent of the land use conditions by providing affordable housing in a clean and safe environment with the improvements, including water, sewer, and drainage, being built to City and State standards.

3) The HCDCH East Kapolei Master Plan originally planned the project area for 70.2 acres of single-family residential, 10.5 acres of multi-family residential, 8 acres of commercial, and 5.5 acres of park use. The proposed DHHL Parcel B project includes 67.6 acres of single-family residential, 9.3 acres of office, 10.7 acres of community center, and 4.5 acres of park use. With the deletion of the multi-family residential component, Parcel B would be lower in density and roads, water, and sewer facilities within the region would be less impacted compared to a higher-density development.

4) The DEA will also discuss the project's impact on the proposed University of Hawaii – West Oahu Campus.

5) A copy of the DEA will be sent to the LUC office as soon as it is available.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.
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DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
STEVE BRETSCHNEIDER
DEPUTY DIRECTOR
MARY LOU KOBAYASHI
ADMINISTRATOR
OFFICE OF PLANNING

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

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-10660

October 14, 2004

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Prep Notice for Draft Environmental Assessment,
East Kapolei Development Parcel B, TMK No. 1-9-1-016: por 108
Department of Hawaiian Home Lands

The Office received your request for comments regarding the preparation of a draft Environmental Assessment for the proposed Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Project, which is planned for a 94-acre site on the proposed North-South Road corridor. The project proposes approximately 80.4 acres of single-family residential use, 7.2 acres of commercial use, and 6.4 acres of park use. The project area was included under a different land use configuration as part of the East Kapolei Master Plan Development Project Environmental Impact Statement (EIS) accepted in 1998.

The proposed project complements other DHHL activities to assess, remediate, and redevelop brownfields sites in the area, which the Office is following and assisting in conjunction with the Department of Health.

The draft Environmental Assessment (EA) should update the substantive elements of the 1998 EIS, with particular attention paid to on-site and off-site drainage and stormwater management, traffic impacts and the need for increased connectivity in the area, and the potential for the presence of contaminated soils from agricultural chemicals and any attendant public health risks. We recommend that "smart growth" principles be considered in assessing how alternative designs and building practices might contribute to mitigating environmental and traffic impacts of the proposed project and increasing the livability of the community created.

The Environmental Assessment should also recap how the proposed project conforms with and conflicts with the goals, objectives, and policies of the Coastal Zone Management Act, Chapter 205A, Hawaii Revised Statutes (HRS), and those of the Hawaii State Plan, Chapter 226, HRS, and the State Functional Plans prepared pursuant to Chapter 226, HRS.

Thank you for the opportunity to comment on your proposed project. If you have any questions, please call Ruby Edwards of the Land Use Division at 587-2817.

Sincerely,

Mary Lou Kobayashi
Administrator

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

WM FRANK BRANDT, FASLA
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THOMAS S. WITTEN, ASLA
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EXECUTIVE VICE-PRESIDENT

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VINCENT SHIGEKUNI
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HILO OFFICE

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SENIOR ASSOCIATE

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ASSOCIATE

KEVIN NISHIKAWA, ASLA
ASSOCIATE

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2123 KAOHU STREET
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TEL: (808) 242-2878
FAX: (808) 242-2902
EMAIL: [illegible]

January 20, 2005

Ms. Mary Lou Kobayashi, Administrator
State of Hawaii
Department of Business, Economic Development & Tourism
Office of Planning
P.O. Box 2359
Honolulu, Hawaii 96804

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Ms. Kobayashi:

Thank you for your letter dated October 14, 2004 (your reference number P-10660). We offer the following responses to your comments:

1. The *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* (DEA) will include updated information of the substantive elements of the 1998 HCDCH *East Kapolei Master Plan Development Project Final Environmental Impact Statement*. Traffic and connectivity in the project area are discussed in the *North South Road and Kapolei Parkway Revised Environmental Assessment* (2004), which included the DHHL Parcel B in its description of regional land use and economic development trends. Updated technical reports on transportation, noise, and air quality will be included in the DEA. The *Phase I Environmental Site Assessment East Kapolei Parcel B* (2004) revealed no environmental concerns (such as the potential presence of contaminated soils) either on the project site or on adjacent properties that are anticipated to affect the site. A drainage master plan will be prepared for the proposed project once plans for addressing the runoff in/from Kaloi Gulch and for North-South Road are finalized.

2. "Smart growth" principles will be considered during the design phase to increase the livability of the proposed project, but please note that this is a mixed-use project that promotes "live/work/play/school" on or within walking distance (schools). The DHHL is attempting to develop a livable and healthy community, not just providing "homesteads" or adding to a suburb of Downtown Honolulu.

3. The DEA will discuss how the proposed project conforms to the goals, objectives, and policies of the Coastal Zone Management Act (Chapter 205A, *Hawaii Revised Statutes* (HRS)), the *Hawaii State Plan* (Chapter 226, HRS), and the *State Functional Plans* prepared pursuant to Chapter 226, HRS.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.
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DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
STEVE BRETSCHNEIDER
DEPUTY DIRECTOR

STRATEGIC INDUSTRIES DIVISION
235 South Beretania Street, Leopapa A Kamehameha Bldg., 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, HI 96804-2359

Telephone: (808) 587-3807
Fax: (808) 587-3820
Web site: www.hawaii.gov/dbedt/sert

August 26, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment
DHHL East Kapolei Development
Tax Map Key: Portion of (1) 9-1-016: portion 108)

Dear Mr. Shigekuni:

In response to your August 17, 2004, notice, thank you for the opportunity to provide comments on the Draft Environmental Assessment for the Department of Hawaiian Home Lands (DHHL) East Kapolei Development. This project includes construction of a 6.4 acre park, 7.2 acres of commercial use, and the remainder of the site for single-family residential. We would like to call your attention to: (1) State energy conservation goals, (2) energy saving design practices and technologies, and (3) recycling and recycled-content products.

1. **State energy conservation goals.** Project buildings, activities, and site grounds should be designed with energy saving considerations. The mandate for such consideration is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226 ("Hawaii State Planning Act"). In particular, we would like to call to your attention HRS 226 18(c)(4) which includes a State objective of promoting all cost-effective energy conservation through adoption of energy-efficient practices and technologies.

   We recommend that you consider the City & County of Honolulu Energy Code early on in your project. Hawaiian Electric Co., Inc., (HECO) may also have demand-side management programs that offer rebates and/or incentives for installation of energy efficient technologies.

2. **Energy saving design practices and technologies.** We recommend that energy efficient design practices and technologies be specifically addressed. Energy efficiency is improved with effective building location, orientation and massing,

and the placement of vegetation for shade or wind protection. Some of the methods and technologies that could be considered, as appropriate, include:

- Establish the building on an east-west axis;
- Minimize east- and west-facing glass;
- Use natural ventilation to increase comfort of occupants;
- Maximize use of natural lighting without heat gain;
- Use high efficiency compact fluorescent lighting;
- Use insulation/radiant barrier for an equivalent R-19 value in ceiling; use ceiling fans;
- Use solar water heating; and
- Use landscaping for dust control and to minimize heat gain to area.

3. **Recycling and recycled-content products.**
   - Develop a job-site recycling plan for construction and recycle as much construction and demolition waste as possible;
   - Incorporate provisions for recycling into the project – a collection system and space for bins for recyclables; and
   - Specify and use products with recycled content such as: steel, concrete aggregate fill, drywall, carpet and glass tile.

If you need clarification of any of the above, please do not hesitate to contact me.

Sincerely,

Maurice H. Kaya
Chief Technology Officer

c: OEQC
Anson Murayama (Community Planning, Inc., 745 Fort Street, Ste. 400, Honolulu, Hawaii 96813)

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

WM. FRANK BRANDT, FASLA
CHAIRMAN

THOMAS S. WITTEN, ASLA
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R. STAN DUNCAN, ASLA
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January 20, 2005

Mr. Maurice H. Kaya, Chief Technology Officer
State of Hawaii
Department of Business, Economic Development & Tourism
Strategic Industries Division
P.O. Box 2359
Honolulu, Hawaii 96804-2359

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Kaya:

Thank you for your letter dated August 26, 2004. We offer the following responses to your comments.

1. Project buildings, activities, and site grounds will be designed to incorporate energy-saving practices and technology. Parcel B includes office/commercial and park/recreational uses and is conveniently located near educational facilities, employment centers, and public transit corridors, thus encouraging walking, bicycling, and other alternate forms of transportation. The City and County of Honolulu Energy Code, as well as Hawaiian Electric Company, Inc., demand-side management programs will be considered early on in this project.

2. Energy-efficient design practices and technologies will be considered and specifically addressed in the *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* (DEA).

3. Recycling and recycled-content products will also be considered for this project and addressed in the DEA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

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

SEP 10 2004

OFFICE OF BUSINESS SERVICES

September 7, 2004

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

SUBJECT: Department of Hawaiian Home Lands
East Kapolei Parcel B, Ewa, Oahu; TMK: 9-1-016: por. 108

The Department of Education (DOE) appreciates being consulted during the scoping process for the Department of Hawaiian Home Lands's (DHHL) Parcel B project on 94 acres within the former Housing and Community Development Corporation of Hawaii (HCDCH) East Kapolei site.

The DOE had determined that it will need one high school, one middle school, and two elementary schools within East Kapolei. It has been six years since the acceptance of the Final Environmental Impact Statement for East Kapolei Master Plan in 1998. In that time, the Kapolei Intermediate and Kapolei High schools both opened and reached enrollment capacities very quickly. Those schools can no longer be expected to serve students living in East Kapolei.

The new proposals for residential development by DHHL and the University of Hawaii West Oahu have so far failed to acknowledge the need to supply school sites for the residents. We are aware that DHHL has no legal obligation to provide school sites. We have also been unsuccessful in any of our efforts to get voluntary contributions from DHHL projects that significantly impact area schools.

We are concerned that DHHL is providing Parcel B with off-site improvements such as water reservoirs and transmission mains, all designed to applicable standards, but has not considered the educational needs of the students of East Kapolei.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

We feel there is a need for all of those currently involved in the planning for East Kapolei to meet with us to begin to determine where the schools can be located and when they need to be constructed. We would appreciate DHHL's willingness to acknowledge the need for cooperative and meaningful planning of East Kapolei.

Thank you for the opportunity to offer early comments on your plans for Parcel B. If you have any questions, please call me at 586-3444 or Heidi Meeker of the Facilities and Support Services Branch at 733-4862.

Sincerely,

Rae M. Loui
Assistant Superintendent

RML:jmb

c: Mamo Carreira, CAS, Campbell/Kapolei/Waianae Complex Area

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
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January 20, 2005

Ms. Rae M. Loui, Assistant Superintendent
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Ms. Loui:

Thank you for your letter dated September 7, 2004. We acknowledge your concern for the educational needs of the students of East Kapolei. The project's impact on nearby educational facilities will be addressed in the *DHHL East Kapolei Development Draft Environmental Assessment.*

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to
File:

September 13, 2004

04-830A CAB

Mr. Vincent Shigekuni, Principal
PBR HAWAII
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

SUBJECT: Pre-Environmental Assessment for the proposed Department of Hawaiian Home Lands East Kapolei Parcel B Development Project

This letter is to transmit the following comments on the subject document:

Control of Fugitive Dust:

There is a significant potential for fugitive dust emissions during all phases of construction. Proposed construction activities will occur in proximity to existing residences, public areas and major thoroughfares, thereby exacerbating potential dust problems. It is recommended that a dust control management plan be developed which identifies and addresses all activities that have a potential to generate fugitive dust. Implementation of adequate dust control measures during all phases of development and construction activities is warranted.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust.

The contractor should provide adequate measures to control dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Plan the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Provide an adequate water source at the site prior to start-up of construction activities;
c) Landscape and provide rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimize dust from shoulders and access roads;
e) Provide adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Control dust from debris being hauled away from the project site.

If you have any questions, please contact Mr. Barry Ching of my staff at 586-4200.

Sincerely,

WILFRED K. NAGAMINE
Manager, Clean Air Branch

BC:jhm

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. Wilfred K. Nagamine, Manager
State of Hawaii
Department of Health
Clean Air Branch
P.O. Box 3378
Honolulu, Hawaii 96801-3378

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Nagamine:

Thank you for your letter dated September 13, 2004 (your reference 04-830A CAB). We acknowledge your concern for potential fugitive dust emissions during all phases of construction. To mitigate this potential impact, a dust control management plan will be developed and implemented. As stated in your letter, the implementation of adequate dust control measures (including those you suggested) is warranted during all phases of development and construction. In addition, construction activities will comply with the provisions of *Hawaii Administrative Rules*, §11-60.1-33 on Fugitive Dust.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
GOVERNOR OF HAWAII

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

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to
EMD/CWB

09031PKP.04

September 10, 2004

Mr. Vincent Shigekuni
Principal
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Department of Hawaiian Home Lands East Kapolei Development Parcel B Draft Environmental Assessment

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(a)(1) of the Federal Water Pollution Control Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters...."

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:

   a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

   b. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.**

   c. Discharges of treated effluent from leaking underground storage tank remedial activities.

   d. Discharges of once through cooling water less than one (1) million gallons per day.

   e. Discharges of hydrotesting water.

f. Discharges of construction dewatering effluent.

g. Discharges of treated effluent from petroleum bulk stations and terminals.

h. Discharges of treated effluent from well drilling activities.

i. Discharges of treated effluent from recycled water distribution systems.

j. Discharges of storm water from a small municipal separate storm sewer system.

k. Discharges of circulation water from decorative ponds or tanks.

The CWB requires that a Notice of Intent (NOI) to be covered by an NPDES general permit for any of the above activities be submitted at least 30 days before the commencement of the respective activities. The NOI forms may be picked up at our office or downloaded from our website at:
http://www.hawaii.gov/health/environmental/water/cleanwater/index.html

3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters and/or coverage of the discharge(s) under the NPDES general permit(s) is not permissible (i.e. NPDES general permits do not cover discharges into Class 1 or Class AA State waters). An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at:
http://www.hawaii.gov/health/environmental/water/cleanwater/index.html

4. Hawaii Administrative Rules, Section 11-55-38, also requires the applicant to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD.

If you have any questions, please contact Ms. Kris Poentis of the Engineering Section, CWB, at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

KP:bt

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. Denis R. Lau, P.E., Chief
State of Hawaii
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, Hawaii 96801-3378

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Lau:

Thank you for your letter dated September 10, 2004 (your reference number EMD/CWB 09031PKP.04). We offer the following responses to your comments:

1. The U.S. Army Corps of Engineers will be contacted to determine whether a federal license or permit (including a Department of Army permit) is required. A Section 401 Water Quality Certification will be obtained if it is determined that the proposed project will involve any activity that may result in any discharge into navigable waters.

2. A National Pollutant Discharge Elimination System (NPDES) permit will be obtained prior to construction to address non-point source discharges. In addition, a Notice of Intent (NOI) will be submitted, as required by the Clean Water Branch, at least 30 days before the commencement of construction activities such as clearing, grading, and excavation or any discharges.

3. While we presently do not foresee any instances in which the following may occur, we understand that an individual NPDES permit may be required if any activity discharges wastewater into State waters and/or if the discharge(s) is not permissible under the NPDES general permit. If required, the application for the individual NPDES permit will be submitted at least 180 days before the commencement of such activities.

4. As required by Hawaii Administrative Rules, Section 11-55-38, a copy of the NOI or NPDES permit application will be submitted to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or the Department of Health will confirm that the project, activity, or site is being reviewed by the SHPD. Please note that the SHPD provided written comments during the pre-consultation process and wrote that this project has already been through the historic preservation review process and that SHPD believes that no historic properties will be affected.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

LINDA LINGLE
GOVERNOR OF HAWAII

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

DEPT OF HAWAIIAN HOME LANDS
SEP 10 1 34 PM '04

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
File

September 07, 2004

Chairman
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

Dear Chairman:

SUBJECT: **Comments to the Consultation on Proposed East Kapolei Development Parcel B**
Tax Map Key: 9-1-016: 108
Kapolei, Oahu

Our comments should be printed as follows:

"Project activities shall comply with the Administrative Rules of the Department of Health:

- Chapter 11-46 Community Noise Control.

Should there be any questions, please contact me at 586-4701.

Sincerely,

for Russell S. Takata
Program Manager
Noise, Radiation & IAQ Branch

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. Russell S. Takata, Program Manager
State of Hawaii
Department of Health
Noise, Radiation & IAQ Branch
P.O. Box 3378
Honolulu, Hawaii 96801-3378

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Takata:

Thank you for your letter dated September 7, 2004. The Draft Environmental Assessment will include the following:

During the pre-consultation period for this DEA, the State Department of Health – Noise, Radiation & IAQ Branch stated, "project activities shall comply with the Administrative Rules of the Department of Health: Chapter 11-46, Community Noise Control."

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
GOVERNOR OF HAWAII

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

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to
EMD / WB

September 7, 2004

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W11 w5040773

Mr. Vincent Shigekuni
PBR Hawaii
Honolulu Office
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: **Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Draft Environmental Assessment**
TMK: (1) 9-1-016: 108 70.2 acres

Thank you for allowing us the opportunity to review the subject project documents. We have reviewed the letter and map of the East Kapolei Conceptual Development Plan submitted.

We have the following comments to offer on behalf of the Wastewater Branch. As wastewater treatment and disposal will be through the City's sewer service system via connection to the Kapolei Interceptor Sewer, we have no objections to the proposed zone change and concur with the application. We also recommend that R-1 recycled water be used for landscape irrigation wherever possible. The owner may wish to contact the Honolulu Board of Water Supply for availability of the R1- water.

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules.

Should you have any questions, please contact the Planning & Design Section of our Branch at 586-4294.

Sincerely,

HAROLD K. YEE, P.E., CHIEF
Wastewater Branch

LNKM:crm

c: June Harrigan Lum, EPO

PBR HAWAII
LAND PLANNING
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January 20, 2005

Mr. Harold K. Yee, P.E., Chief
State of Hawaii
Department of Health
Wastewater Branch
P.O. Box 3378
Honolulu, Hawaii 96801

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Yee:

Thank you for your letter dated September 7, 2004 (your reference EMD/WB). We offer the following responses to your comments:

1. We acknowledge that the Wastewater Branch has no objections to the proposed project.

2. We also acknowledge your recommendation that R-1 recycled water be used for landscape irrigation wherever possible.

3. All wastewater plans will conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems," and it is acknowledged that the Wastewater Branch has the right to review detailed wastewater plans for conformance to applicable rules.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent R. Shigekuni

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

STEPHANIE AVEIRO
EXECUTIVE DIRECTOR

PAMELA DODSON
EXECUTIVE ASSISTANT

IN REPLY REFER TO
04:DEV/0370

August 24, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, HI 96813-3484

Dear Mr. Shigekuni:

Subject: Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Draft Environmental Assessment

The Housing and Community Development Corporation of Hawaii (HCDCH) is in receipt of your letter dated August 17, 2004 regarding the subject matter. Parcel B is part of 200 acres within the 1,300-acre State Land Bank earmarked for conveyance to the Department of Hawaiian Home Lands, and the proposed uses will be similar to the original development plan described in the HCDCH East Kapolei Master Plan Development Project Final Environmental Impact Statement (accepted in 1998). As such, we have no comments to provide at this time. However, since this project provides opportunities for affordable housing, the HCDCH is in support of this development.

If there are any questions, please call Leo Domingo, Project Coordinator, at 587-3170.

Sincerely,

Stephanie Aveiro

Stephanie Aveiro
Executive Director

PBR HAWAII
LAND PLANNING
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January 20, 2005

Ms. Stephanie Aveiro, Executive Director
State of Hawaii
Department of Human Services
Housing and Community Development Corporation of Hawaii
677 Queen Street, Suite 300
Honolulu, Hawaii 96813

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Ms. Aveiro:

Thank you for your letter dated August 24, 2004 (your reference number 04:DEV/0370). We acknowledge that the Housing and Community Development Corporation of Hawaii is in support of this development and has no comments to offer at this time.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent R. Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
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

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

HAWAI'I HISTORIC PRESERVATION DIVISION REVIEW

SEP - 7 2004

Doc #:0408EJ27
Log #: 2004.2658

Applicant/Agency:	Vincent Shigekuni Principal
Address:	PBR Hawaii 1001 Bishop Street ASB Tower, Suite 650 Honolulu, Hawaii 96813-3484
SUBJECT:	Chapter 6E-8 Historic Preservation Review-Pre-DEA Consultation on the Department of Hawaiian Home Lands (DHHL) East Kapolei Development, Parcel B
Ahupua'a:	Honouliuli
District, Island:	'Ewa, O'ahu
TMK:	(1) 9-1-016: 108

1. ___ This project has not gone through the historic preservation review process. Please submit documentation _____

2. ✓ This project has already gone through the historic preservation review process.
   ___ a. mitigation has been completed
   ✓ b. other SHPD commented on the East Kapolei Mater Plan Development and on the Villages of Kapolei Nonpotable Water System Improvements which includes this parcel. Our previous comments stated that these lands were commercially cultivated with sugar cane for many years which extensively altered the land. The depth of cane cultivation exceeded the expected depth of historic sites in the area, based on site patterns in similar environmental contexts. Thus, it is unlikely that significant historic sites will be found in the project area.

3. ___ We have not been consulted on this undertaking, however we believe there are no historic properties present, because:
   ___ a) intensive cultivation has altered the land
   ___ b) residential development/urbanization has altered the land
   ___ c) previous grubbing/grading has altered the land
   ___ d) an acceptable archaeological assessment or inventory survey found no historic properties
   ___ e) other:

✓ Thus, we believe that "no historic properties will be affected" by this undertaking.

Aloha,

for Holly McEldowney

P. Holly McEldowney, Administrator
State Historic Preservation Division

EJ: sky

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
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Email: pbrmaui@lava.net

January 20, 2005

Ms. P. Holly McEldowney, Administrator
State of Hawaii
Department of Land and Natural Resources
Historic Preservation Division
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Ms. McEldowney:

Thank you for your letter dated September 7, 2004. We acknowledge your confirmation that this project has already been through the historic preservation review process and that the State Historic Preservation Division believes that no historic properties will be affected.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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LINDA LINGLE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
LINDEN H. JOESTING
BRIAN H. SEKIGUCHI

IN REPLY REFER TO

STP 8.1337

August 26, 2004

Mr. Vincent Shigekuni
Principal
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Department of Hawaiian Homelands (DHHL) East Kapolei
Development Parcel B – Pre-Assessment Consultation for
Draft Environmental Assessment (DEA)
TMK: (1) 9-1-016: portion 108

Thank you for requesting our early review of the subject project. The proposed changes and developments in the application have a significant impact on our facilities. We have the initial comments and concerns:

1. While the 1996 Final Environmental Impact Statement (accepted in 1998) includes a traffic impact analysis report (TIAR), drainage report, and an air and noise impact assessment, we feel that it needs to be updated to reflect the current situation in the Ewa region.

2. The TIAR should be updated and included in the DEA. Recommended traffic mitigation measures the applicant will perform should be included. A comprehensive review and/or plan should be included as an appendix or supplement to determine appropriate mitigation measures.

3. A thorough analysis of the interchanges and freeway is needed to determine traffic impacts and mitigation measures.

4. In order to ensure that required roadway improvements can be implemented or completed in a timely manner by the responsible party or parties, coordination between agencies, developers and other interested entities will be necessary. HDOT believes that each developer of a parcel or portion thereof should be responsible for implementing required and recommended improvements and traffic mitigation measures, including coordination

among and cost sharing arrangements with neighboring developers, especially those with similar conditions of land use and/or common impacts.

5. With the subject application and the lands proposed to be developed being only one of several projects in the area and with other similar projects in the region coming up, the interrelationships between each project and the cumulative effects of any group or the collective total will require a thorough study and review of a project, as well as the interconnections between any other project.

6. Additionally, the developers should be required to participate and contribute to their fair share of regional roadway improvements.

7. Portions of the development are located within the contours of the Honolulu International Airport 1987 Noise Contour Map and the proximity of the development to Kalaeloa Airport require that disclosure to potential buyers be made that the area can be impacted by noise from approaching or departing aircraft.

We appreciate the opportunity to provide our preliminary comments. When the applicant is more definitive in his plans and submits them to our office, we can provide more specific comments and requirements.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation

c: Eric Crispin, Planning and Permiting Department, C&C Honolulu
Anthony Ching, Land Use Commission
Mary Lou Kobayashi, Office of Planning, DBEDT

PBR HAWAII
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January 20, 2005

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

**SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL)
EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT
ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION
COMMENTS**

Dear Mr. Haraga:

Thank you for your letter dated August 26, 2004 (your reference number STP 8.1337). We offer the following responses to your comments:

1. The proposed DHHL East Kapolei Development Parcel B project was included in the recently completed *North South Road and Kapolei Parkway Revised Environmental Assessment* (July 2004). The description of the regional land use and economic development trends included in this environmental assessment are applicable to the Parcel B project, and the Noise Technical Report, Air Quality Technical Report, and section discussing transportation will be included in the *DHHL East Kapolei Development Parcel B Draft Environmental Assessment*. A drainage master plan will be prepared for the proposed project once plans for addressing the runoff in/from Kaloi Gulch and for North-South Road are finalized.

2. Section 3.3.1 Transportation of the *North South Road and Kapolei Parkway Revised Environmental Assessment* will be included as an appendix to the *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* (DEA). Recommended traffic mitigation measures that will be performed by DHHL will be discussed in the Parcel B DEA.

3. A thorough analysis of interchanges and freeway was conducted for the *North South Road and Kapolei Parkway Revised Environmental Assessment*, which included Parcel B.

4. Coordination between agencies, developers, and other interested entities will take place to ensure that required roadway improvements are implemented or completed in a timely manner. The DHHL, as the developer of East Kapolei Parcel B, will be responsible for implementing required improvements and traffic mitigation measures.

5. The *East Kapolei Master Plan Development Project Final Environmental Impact Statement* addressed the transportation impacts of residential and other land uses within the 1,300-acre area, which includes the proposed DHHL East Kapolei Parcel B development. This assessment considered that several projects, many related, would be developed in the area. The FEIS studied the cumulative effects of these projects on the physical, social, and economic environment.

6. The DHHL will comply with "Impact Fees for Traffic and Roadway Improvements in Ewa," Chapter, 33A, *Revised Ordinances of Honolulu*.

7. Noise impacts from the Honolulu International Airport and the Kalaeloa Airport are not expected to be significant. However, potential buyers of residential lots in the DHHL Parcel B will be informed of possible noise impacts from approaching or departing aircraft.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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The Senate
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813

September 8, 2004

Mr. Vincent Shigekuni
Principal
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Thank you for your letter of inquiry seeking comments and feedback regarding the Department of Hawaiian Home Lands (DHHL) East Kapolei Development Parcel B Environmental Assessment which you are preparing. As you are aware, the development of this area will be highly beneficial to the people of Kapolei, provided, however, that the proper infrastructure is in place. The continued expansion of this area will result in increased population, which will in turn require the construction of adequate roadways to accommodated additional traffic, as well as sufficient educational facilities.

Several different projects, undertaken by varying entities, are currently being contemplated for this area. Residents of the Villages of Kapolei are greatly concerned that serious traffic issues will result should the Parcel B project, which will include the extension of the Kapolei Parkway from the Villages of Kapolei to the new North-South Road, be constructed prior to the completion of the new North-South Road and H-1 Freeway interchange. The construction of this interchange, which would include construction of both the North-South Road, extending from H-1 to Kapolei Parkway, and a portion of Kapolei Parkway, continuing from North-South Road and ending at Renton Road, is essential to meet the anticipated roadway needs of the newly developed area. I believe that the status of this project must be closely monitored in order to ensure that the proper infrastructure exists prior to the undertaking and completion of the Parcel B project.

Kapolei Middle School and Kapolei High School are located on the makai side of Kapolei Parkway. The vast majority of homes in the Villages of Kapolei are located on the mauka side of Kapolei Parkway. Currently, a number of Honolulu-bound drivers from Ewa and Ewa Beach travel to Kapolei to access the H-1 Freeway in order to avoid

The Senate
State of Hawaii

the traffic on Fort Weaver Road, even though this adds a number of miles to their trip. Should Kapolei Parkway be opened prior to the opening of the new North-South Road Interchange, the traffic traveling in front of Kapolei Middle School and Kapolei High School will increase drastically. There are already concerns about safety fronting the two schools. These safety concerns must be addressed prior to the undertaking and completion of the Parcel B project.

Additionally, as previously indicated, the need for additional educational facilities for the children of Kapolei is of the utmost importance. The increased population will exacerbate the already critical problem of overcrowded classrooms. Timing of the construction of new developments in this area must be carefully designed and planned so as to ensure that the residents of Kapolei are provided with safe and adequate roads and facilities to meet the growing needs of the area.

Your consideration of the concerns of the residents of Kapolei is greatly appreciated. Thank you for the opportunity to provide comments on this exciting new development. Please feel free to contact my office should you have any questions or require any further information.

Mālama pono,

Brian Kanno

Brian Kanno
State Senator, 19th District

PBR HAWAII
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January 20, 2005

Senator Brian Kanno
The Senate
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Senator Kanno:

Thank you for your letter dated September 8, 2004. We acknowledge your concern for increased traffic and sufficient educational facilities with the continued expansion of East Kapolei and offer the following responses to your comments:

1. Traffic impacts of the project will be addressed and mitigation measures will be identified in the *DHHL East Kapolei Development Draft Environmental Assessment* (DEA). Consultation with the Department of Transportation has already taken place.

2. The Department of Education has also been consulted about this development. The project's impact on nearby educational facilities will also be addressed in the DEA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To
TES 1-2-2004-0048

OCT -8 2004

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Thank you for your letter dated August 18, 2004, regarding the preparation of an Environmental Assessment for the proposed Department of Hawaiian Home Lands (DHHL) East Kapolei Parcel B project and your request for our comments or concerns regarding impacts this project may have on endangered or threatened species.

The federally listed endangered plant species *Abutilon menziesii* occurs on the property in question. There are currently about 24 plants that will be lost due to development of the property. According to the "Habitat Conservation Plan for Abutilon menziesii at Kapolei" (HCP) sponsored by the State of Hawaii Department of Transportation (DOT), it is expected that all 24 individuals will be lost sometime from 2005 to 2014. The HCP temporarily sets aside 18 acres to protect the largest colony of *A. menziesii* on state property until one outplanted site has met the short term success criteria described in the HCP. The protected colony is not expected to be affected by activity on DHHL Parcel B but DHHL needs to be included in the certificate of inclusion for the incidental take permit from the State Department of Land and Natural Resources, Division of Forestry and Wildlife. This inclusion needs to be worked out with DOT directly.

We would like to receive a copy of your Environmental Assessment when it is available for review.

TAKE PRIDE IN AMERICA

If you require additional information, please contact Dr. Gregory A. Koob of my staff at (808) 792-9400.

Sincerely,

Jeff M. Newman
Acting Field Supervisor

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. Jeff M. Newman, Acting Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Newman:

Thank you for your letter dated October 8, 2004 (your reference number TES 1-2-2004-0048). Although the protected colony of *Abutilon menziesii* is not expected to be affected by the project, the DHHL will coordinate with the Department of Transportation to be included in the certificate of inclusion for the incidental take permit from the Department of Land and Natural Resources. Please be assured that your agency will receive a copy of the *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* when it is available for review.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR HI 96860-5101

11011
Ser N46B00162
13 OCT 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii, Honolulu Office
1001 Bishop Street
Pacific (ASB) Tower, Suite 650
Honolulu, HI 96813-3483

Dear Mr. Shigekuni:

SUBJECT: DEPARTMENT OF HAWAIIN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT

This responds to your letter of August 17, 2004, requesting comments on the impact of the proposed East Kapolei Development, Parcel B project.

Currently the Navy and Pacific Fleet are examining where our forces are homeported and distributed. No decision has been made to locate a carrier strike group in Hawaii. We are studying what additional support and infrastructure improvements would be necessary to homeport a carrier and air wing in Hawaii. There are several air wing issues that would have to be examined, including location and environmental impacts (e.g., noise). Kalaeloa (former Naval Air Station Barbers Point) is being studied as a possible home airfield for the air wing. This is a data-gathering informational study only and is not a formal Environmental Assessment or Environmental Impact Statement. The decision whether and where to shift homeport for a carrier and air wing, will likely be tied with the realignment portion of the 2005 Base Realignment and Closure decision which is not expected until late in 2005.

These circumstances prevent us from providing specific comments on the proposed project at this time. However, we would appreciate receiving a copy of the Environmental Assessment when it is complete.

Should you have any questions regarding this matter, please contact CDR Dennis Carlson at (808) 473-3575 or email dennis.carlson@navy.mil.

Sincerely,

R. D. ROTH
Captain, U. S. Navy
By direction of
Commander, Navy Region Hawaii

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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RUSSELL Y.J. CHUNG, ASLA
Executive Vice-President

VINCENT SHIGEKUNI
Principal

JAMES LEONARD, AICP
Principal
Hilo Office

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January 20, 2005

Captain R.D. Roth
U.S. Department of Defense
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Captain Roth:

Thank you for your letter dated October 13, 2004 (your reference number 11011, Ser N46B00162). We understand that the Navy and Pacific Fleet are examining where their forces are homeported and distributed, and cannot provide specific comments on the proposed project at this time.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. When complete, a copy of the Draft Environmental Assessment will be sent to you. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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September 14, 2004

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Deputy Manager and Chief Engineer

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street, #650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Your Letter of August 17, 2004 on the Draft Environmental Assessment for Department of Hawaiian Home Lands East Kapolei, Parcel B

Thank you for the opportunity to comment on the proposed development.

The water master plan for the East Kapolei Development should be submitted for our approval.

The developer will be required to install the necessary water system improvements to serve the proposed development, including a reservoir and transmission mains.

A water allocation will be required from the Department of Hawaiian Home Lands.

Nonpotable water should be used for the irrigation of large landscape areas.

If you have any questions, please contact Joseph Kaakua at 748-5442.

Very truly yours,

KEITH S. SHIDA
Principal Executive
Customer Care Unit

PBR HAWAII
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LANDSCAPE ARCHITECTURE
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January 20, 2005

Mr. Keith S. Shida, Principal Executive
City and County of Honolulu
Board of Water Supply
Customer Care Unit
630 South Beretania Street
Honolulu, Hawaii 96843

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Shida:

Thank you for your letter dated September 14, 2004. We offer the following responses to your comments:

1. A water master plan was submitted to the BWS on November 30, 2004.

2. The developer, Department of Hawaiian Home Lands, will install the necessary water system improvements to serve the East Kapolei Development Parcel B. Such improvements include a reservoir and transmission mains.

3. The DHHL will request a water allocation through the Water Facility Application process.

4. Non-potable water will be used for the irrigation of large landscape areas, where permitted by the State Department of Health regulations.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
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JEREMY HARRIS
MAYOR

MICHAEL T. AMII
DIRECTOR

JOHN R. SABAS
DEPUTY DIRECTOR

August 27, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: East Kapolei Development Parcel B
Draft Environmental Assessment

We appreciate the opportunity to participate in the consultation process prior to the preparation of the draft environmental assessment for the subject project. The proposed project will have no impact on any plans, programs, or projects of the Department of Community Services. Questions regarding this matter may be directed to Mr. Keith Ishida at 527-5092.

Sincerely,

MICHAEL T. AMII
Director

MTA:dk

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. Michael T. Amii, Director
City and County of Honolulu
Department of Community Services
715 South King Street, Suite 311
Honolulu, Hawaii 96813

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Amii:

Thank you for your letter dated August 27, 2004. We acknowledge that the DHHL East Kapolei Development Parcel B project will have no impact on any plans, programs, or projects of the Department of Community Services.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 215, KAPOLEI, HAWAII 96707
TELEPHONE: (808) 692-5054 FAX: (808) 692-5857

JEREMY HARRIS
MAYOR

LARRY J. LEOPARDI, P.E.
DIRECTOR AND CHIEF ENGINEER

ALVIN K. C. AU
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 04 - 783

September 13, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: **Department of Hawaiian Home Lands (DHHL)**
East Kapolei Development Parcel B
Draft Environmental Assessment

The Department of Facility Maintenance does not have any existing or proposed projects, plans or other programs that will impact the East Kapolei Development Parcel B project.

We request that the Draft Environmental Assessment include an analysis of the effects of the proposed improvements on existing resources within the Division of Road Maintenance (DRM) corporation yard that will be eventually tasked with the maintenance of the improvements.

Should you have any questions, please call Charles Pignataro of DRM at 484-7697.

Very truly yours,

LARRY LEOPARDI, P.E.
Director and Chief Engineer

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
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January 20, 2005

Mr. Larry Leopardi, P.E., Director and Chief Engineer
City and County of Honolulu
Department of Facility Maintenance
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Leopardi:

Thank you for your letter dated September 13, 2004 (your reference number DRM 04-783). We acknowledge that the Department of Facility Maintenance has no existing or proposed projects, plans, or other programs that will impact the project. The *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* will include an analysis of the effects of the proposed improvements on existing resources within the Division of Road Maintenance.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
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JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

EDWARD T. "SKIPPER" DIAZ
DEPUTY DIRECTOR

August 27, 2004

Mr. Vincent Shigekuni
PBR Hawaii
1001 Bishop Street
Pacific Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Notice of Preparation of Draft Environmental Assessment
Department of Hawaiian Home Lands (DHHL) East Kapolei
Development Parcel B

Thank you for the notice of your firm's preparation of a Draft Environmental Assessment relating to the development of East Kapolei Development Parcel B by the Department of Hawaiian Home lands.

The Department of Parks and Recreation has no comment at this time but is interested in the ultimate size and configuration of the proposed 6.4 acre park and wishes to remain a consulted party to the EIS process.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

WILLIAM D. BALFOUR, JR.
Director

WDB:mk
(73465)

PBR HAWAII
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ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. William D. Balfour, Jr., Director
City and County of Honolulu
Department of Parks and Recreation
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

**SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL)
EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT
ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION
COMMENTS**

Dear Mr. Balfour:

Thank you for your letter dated August 27, 2004. We acknowledge that the Department of Parks and Recreation has no comments to offer at this time and is interested in the ultimate size and configuration of the proposed 4.5-acre park. In addition to this park, a 10.7-acre community center is proposed within Parcel B. The center would be developed and operated by the Salvation Army. Financing for the center would be provided by a gift from the late Joan Kroc. The community center could include facilities such as a swimming pool, performing arts center, child care center, gymnasium, craft room, chapel and worship center, education center, game and recreation areas, commercial kitchen and dining areas, family service offices, and other adaptable multi-use spaces. The facilities would be available to homestead families as well as the general public.

We will continue to consult with your department throughout the environmental assessment process.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS
MAYOR

GEORGE "KEOKI" MIYAMOTO
ACTING DIRECTOR

ROBERT J. FISHMAN
DEPUTY DIRECTOR

TP8/04-73406R

October 12, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: DHHL East Kapolei Development Parcel B

In response to your August 17, 2004 letter, we reviewed the project information provided and would like to offer the following comments for your consideration:

1. Section 4.1.4 **Transit** of the Ewa Development Plan [August 1997 (Revised May 2000)] discusses proposed transit improvements for the area, such as a park-and-ride near the future North-South Road/Kapolei Parkway intersection and a rapid transit corridor in North-South Road and the median of Kapolei Parkway.

   The plan specifies that provisions should be made for transit stations/park-and-ride facilities at each of the transit nodes along the transit corridor (one node is shown at the intersection of North-South Road and Kapolei Parkway). Further, the plan states that appropriate sized right-of-way for the rapid transit corridor will be required to be set aside.

   Although the Ewa Development Plan is presently in the process of being updated and the proposed transit improvements are likely to be reviewed, the current plan should be addressed in the environmental assessment. In addition, the State had previously indicated that it would be interested in developing a light rail system that would utilize Farrington Highway. This should also be discussed in the document that is being prepared.

2. The proposed project involves the construction of single-family residential uses, park use and commercial use. One of the objectives of the Ewa Development Plan is to create a land use pattern that would allow residents to minimize the use of the private automobile and encourage the use of transit for longer trips. It also encourages projects to be pedestrian-friendly; allowing for pedestrian pathways, etc. that would connect and link land uses.

   Therefore, the proposed project should provide convenient routes for public transit service, use the more traditional "grid" patterns for street systems to facilitate bus routes, provide supporting facilities and amenities for public transit use, and support high density and high traffic land uses along the rapid transit corridor, especially within a quarter-mile of the centers of the transit nodes.

3. A traffic impact study should be conducted as part of the environmental assessment effort and identify needed traffic improvement measures. The study should discuss what roads will be constructed as part of the development and the development's impact on the surrounding City or proposed City roadways. The study should also discuss whether the streets within the development would remain under the DHHL's jurisdiction.

We look forward to reviewing the draft environmental assessment. Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

for GEORGE "KEOKI" MIYAMOTO
Acting Director

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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January 20, 2005

Mr. George "Keoki" Miyamoto, Acting Director
City and County of Honolulu
Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Miyamoto:

Thank you for your letter dated October 12, 2004 (your reference number TP8/04-73406R). We offer the following responses to your comments.

1. The *DHHL East Kapolei Development Parcel B Draft Environmental Assessment* (DEA) will discuss proposed transit improvements (Figures 15 and 16 of the DEA) including "the State's interest in developing a light rail system."

2. Parcel B is conveniently located near Kapolei Middle School, Kapolei High School, the proposed UH West Oahu Campus, and the proposed elementary school on the UH West Oahu Campus. Parcel B also includes on-site commercial/office and park (or recreational facility) uses – all of which would facilitate walking/bicycling and less reliance on cars for transportation.

3. The DEA will address traffic impacts resulting from the proposed development and identify measures to mitigate such impacts. Pursuant to Section 220, Hawaiian Homes Commission Act, 1920 (HHCA), the roadways within Parcel B will be owned by the DHHL with a license issued to the City for maintenance purposes. The North-South Road and Interchange would be State facilities and the Kapolei Parkway would remain under the jurisdiction of the City and County of Honolulu.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
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TELEPHONE (808) 831-7761 • FAX (808) 831-7750 • INTERNET www.honolulufire.org

JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

September 14, 2004

Mr. Vincent Shigekuni, Principal
PBR Hawaii
American Savings Bank Tower
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Draft Environmental Assessment
Department of Hawaiian Home Lands
East Kapolei Development, Parcel B
Kapolei, Oahu, Hawaii

We received your letter dated August 17, 2004, requesting our comments on the above-mentioned project.

The Honolulu Fire Department (HFD) requires that the following be complied with:

1. Provide a private water system where all appurtenances, hydrant spacing, and fire flow requirements meet Board of Water Supply standards.

2. Provide a fire department access road within 150 feet of the first floor of the most remote structure. Such access shall have a minimum vertical clearance of 13 feet 6 inches, be constructed of an all-weather driving surface complying with Department of Transportation Services (DTS) standards, capable of supporting the minimum 60,000-pound weight of our fire apparatus, and with a gradient not to exceed 20%. The unobstructed width of the fire apparatus access road shall meet the requirements of the appropriate county jurisdiction. All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround having a radius complying with DTS standards.

3. Submit civil drawings to the HFD for review and approval.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 831-7778.

Sincerely,

ATTILIO K. LEONARDI
Fire Chief

AKL/SK:bh

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

WM. FRANK BRANDT, FASLA
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E-MAIL: pbrmaui@lava.net

January 20, 2005

Mr. Attilio K. Leonardi, Fire Chief
City and County of Honolulu
Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Chief Leonardi:

Thank you for your letter dated September 14, 2004. We offer the following responses to your comments:

1. A water system in which all appurtenances, hydrant spacing, and fire flow requirements meet the Board of Water Supply standards will be provided for this project.

2. A fire department access road will be provided and will meet all of the Fire Department requirements listed in your letter.

3. Civil drawings will be submitted to the Fire Department for review and approval.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
http://www.honolulupd.org
www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

GLEN R. KAJIYAMA
ACTING CHIEF

PAUL B. PUTZULU
DEPUTY CHIEF

OUR REFERENCE CS-KP

August 24, 2004

Mr. Vincent Shigekuni, Principal
PBR HAWAII
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Thank you for your letter of August 17, 2004, regarding the Draft Environmental Assessment for the proposed Department of Hawaiian Home Lands East Kapolei Development Parcel B project.

The addition of large numbers of residential units, commercial areas, and parks will have an overall impact on the services to be provided by the Honolulu Police Department. There will inevitably be more calls for police service. Additionally, we are concerned about traffic in the area, which is caused by the overly congested existing roadways and the impact this has on calls for police service.

If there are any questions, please call Captain Gregory Lefcourt of District 8 at 692-4253 or Ms. Carol Sodetani of the Support Services Bureau at 529-3658.

Sincerely,

GLEN R. KAJIYAMA
Acting Chief of Police

By KARL GODSEY
Assistant Chief of Police
Support Services Bureau

Serving and Protecting with Aloha

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
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PRINCIPAL

JAMES LEONARD, AICP
PRINCIPAL
HILO OFFICE

GRANT MURAKAMI, AICP
SENIOR ASSOCIATE

TOM SCHNELL, AICP
ASSOCIATE

RAYMOND T. HIGA, ASLA
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EMAIL: pbrmaui@lava.net

January 20, 2005

Mr. Boisse P. Correa, Police Chief
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

**SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL)
EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT
ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION
COMMENTS**

Dear Chief Correa:

Thank you for your letter dated August 24, 2004 (your reference CS-KP). We acknowledge your concern for increased traffic and additional calls for police service as a result of this project. With the future construction of North-South Road and completion of Kapolei Parkway, traffic and police response time in the area are likely to improve.

These and other potential environmental, social, and economic impacts will be addressed in the Draft Environmental Assessment, which will also identify mitigation measures to minimize impacts related to the proposed project.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

GEN-6 (EIS/EA)

October 6, 2004

Mr. Vincent Shigekuni
Principal - PBR Hawaii
650 ASB Tower
1001 Bishop Street
Honolulu, HI 96813-3484

Dear Mr. Shigekuni,

Re: Notice of Preparation of EA
East Kapolei Development Parcel B
Department of Hawaiian Home Lands (DHHL)
TMK: (1) 9-1-016: portion 108

Thank you for the opportunity to comment on the above-referenced project. We have reviewed the information provided in your August 17, 2004 notice of preparation of DEA and have no comments at this time.

Please continue to keep us informed as the project develops. In the event HECO facilities become affected, please forward two sets of plans for our review as soon as possible so that we may evaluate potential impacts of the project. In the meantime, HECO will need continued access to our facilities in the area for maintenance purposes.

Our apologies for this late response. Your August 17 correspondence was routed to another department. Sherri-Ann Loo is the current Manager of HECO's Environmental Department, and we ask that future requests for EA review be forwarded to her attention.

Our point of contact for this project, and the originator of these comments, is Michael S. Ho, Lead Engineer, Transmission & Distribution Division, Engineering Department. I suggest dealing directly with Michael (543-7785) to coordinate HECO's continuing input in this project. Again, thank you for the opportunity to comment on this project.

Sincerely,

Kirk S. Tomita
Senior Environmental Scientist

cc: M. Ho

WINNER OF THE EDISON AWARD
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KEVIN NISHIKAWA, ASLA
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January 20, 2005

Mr. Kirk S. Tomita
Senior Environmental Scientist
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Attn: Mr. Michael S. Ho

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Tomita:

Thank you for your letter dated October 6, 2004. We acknowledge that HECO has no comments to offer at this time. In the event that HECO facilities are affected by the project, two sets of plans will be forwarded to Mr. Michael S. Ho, Lead Engineer for review.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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---

THE ESTATE OF JAMES CAMPBELL

September 27, 2004

Mr. Vincent Shigekuni
Principal, PBR Hawaii
1001 Bishop Street
American Savings Building, Suite 650
Honolulu, HI 96813

Dear Vince:

It has come to our attention that PBR is preparing an Environmental Assessment for the proposed DHHL East Kapolei Parcel B project. On the Development Plan that was forwarded to us for that project, a "future high school" is shown on lands owned by the Estate (copy attached).

The Estate has made no plans nor has any agreements with the DOE to place a high school as shown. Consequently, we respectfully request that the plan not show any uses on Estate land that do not currently exist.

Thank you for your cooperation. Please call me at 674-3209 with any questions or comments.

Sincerely,

Howard R. Schwiebert
Asset Manager, Hawaii Land Management

jo:01036300\K10032

1001 Kamokila Boulevard, Kapolei, Hawaii 96707 Phone (808) 674-6674 Facsimile (808) 674-6111 Website: www.kapolei.com

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EMAIL: pbrmaui@lava.net

January 20, 2005

Mr. Howard R. Schwiebert
Asset Manager, Hawaii Land Management
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

SUBJECT: DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) EAST KAPOLEI DEVELOPMENT PARCEL B DRAFT ENVIRONMENTAL ASSESSMENT – PRE-CONSULTATION COMMENTS

Dear Mr. Schwiebert:

Thank you for your letter dated September 27, 2004. We apologize for any confusion the graphic accompanying our request for pre-consultation comments may have caused. It was intended to show that the proposed project "mirrors" what had been proposed previously under the HCDCH East Kapolei Master Plan for the project site. Please be assured that any graphics in the upcoming Draft and Final Environmental Assessments will not show any uses on Estate land that do not currently exist.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

PBR HAWAII

Vincent Shigekuni
Principal

cc Anson Murayama/Community Planning, Inc.

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Appendix B

Habitat Conservation Plan for *Abutilon menziesii* at Kapolei

Habitat Conservation Plan for Abutilon menziesii at Kapolei

State of Hawai'i
Department of Transportation

FINAL HCP
March 2004

Habitat Conservation Plan for Abutilon menziesii at Kapolei

State of Hawaii
Department of Transportation

Prepared by:

Yukie Ohashi
with
PBR HAWAII
for
Parsons Brinckerhoff
and
State of Hawaii
Department of Transportation

FINAL HCP
March 2004

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HABITAT CONSERVATION PLAN 1

(1) Identify the geographic area encompassed by the plan; the ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan; and the endangered, threatened, proposed, and candidate species known or reasonably expected to be present in those ecosystems, natural communities, or habitat types in the plan area 1

(2) Describe the activities contemplated to be undertaken within the plan area with Sufficient detail to allow the department to evaluate the impact of the activities on the particular ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan habitat types in the plan area 9

(3) Identify the steps that will be taken to minimize and mitigate all negative impacts, including without limitation, the impact of any authorized incidental take, with consideration of the full range of the species on the island so that cumulative impacts associated with the take can be adequately assessed; and the funding that will be available to implement those steps 19

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(4) Identify those measures or actions to be undertaken to protect, maintain, restore, or enhance the ecosystems, natural communities, or habitat types within the plan area; a schedule for implementation of the actions or measures, including monitoring, that are to be undertaken in accordance with the schedule 49

(5) Be consistent with the goals and objectives of any approved recovery plan for any endangered species or threatened species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area 50

(6) Provide reasonable certainty that the ecosystems, natural communities, or habitat types will be maintained in the plan area, throughout the life of the plan, in sufficient quality, distribution, and extent to support within the plan area those species typically associated with the ecosystems, natural communities, or habitat types, including any endangered, threatened, proposed, and candidate species known or reasonably expected to be present in the ecosystems, natural communities, or habitat types within the plan area 52

(7) Contain objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration, or enhancement of the ecosystems, natural communities, or habitat types; time frames within which the goals are to be achieved; and provisions for monitoring (such as field sampling techniques) and evaluating progress in achieving the goals quantitatively and qualitatively 53

(8) Provide for an adaptive management strategy that specifies the actions to be taken periodically if the plan is not achieving its goals 56

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PREFACE

The preparation of the *Habitat Conservation Plan for Abutilon menziesii at Kapolei* ("HCP") was initiated in 1996 with two State sponsored development proposals. The first proposal involved the 1,300-acre East Kapolei Master Plan project proposed by the Housing and Community Development Corporation of Hawaii ("HCDCH") under a right-of-entry agreement with the Department of Land and Natural Resources ("DLNR"). The second proposal by the Department of Transportation ("DOT") involved the North-South Road arterial highway which would bisect the 1,300-acre property. The earlier drafts of the HCP were therefore co-sponsored by DOT and HCDCH.

In actions by the Board of Land and Natural Resources in September 2002, the 1,300 acres of State land have been re-assigned to other State of Hawaii entities. The University of Hawaii has received 500 acres for the development of the University of Hawaii West Oahu campus ("UHWO") and the Department of Hawaiian Home Lands has acquired 200 acres for residential homestead development. The remaining 600 acres are again under the control of the DLNR. Thus, HCDCH no longer holds an interest to these Kapolei lands.

Abutilon menziesii has also been found on adjacent lands owned by the City and County of Honolulu. The City has therefore, requested that its land be included in the subject HCP to allow the construction of a proposed roadway segment and other potential future urban uses. Thus, the Final HCP incorporates an additional 81 acres for a total of 1,381 acres of land.

As described herein, DOT has assumed sole sponsorship of the HCP for the total population of *Abutilon menziesii* at the Kapolei property. DOT has also assumed mitigation responsibility as described in a Memorandum of Agreement ("MOA") with DLNR.

And finally, a request for an Incidental Take License for the Kapolei population will involve coordination and cooperation between DOT and other stakeholder parties through future agreements (i.e., MOA, Certificate of Inclusion) when other properties are ready to be developed.

EXECUTIVE SUMMARY

A population of *Abutilon menziesii* was discovered in late 1996 at Kapolei in the Ewa area, island of Oahu, State of Hawaii, on former sugarcane land. Hence, this population is referred to as the "Kapolei population". *A. menziesii* of the Mallow Family (Malvaceae) is also known by its Hawaiian name Kooloaula and its common name "red ilima". It has been a federally listed endangered species since 1986 and is protected under the provisions of the federal Endangered Species Act of 1973, as amended, and Chapter 195D, *Hawaii Revised Statutes*, as amended. *A. menziesii* is one of nine species included in the *Lanai Plant Cluster Recovery Plan* (US Fish and Wildlife Service, 1994).

This habitat conservation plan is prepared pursuant to Chapter 195D-21, HRS, as amended. Accordingly, the HCP provides a description of the development actions proposed on the 1,300-acre State-owned property and an adjacent 81-acre City and County of Honolulu ("City") property at Kapolei (referred herein as the "Kapolei property"). The HCP describes the impact of development actions on the Kapolei population and proposes a series of mitigative strategies that would provide a net gain of *A. menziesii* to further the recovery of the species.

The preparation of this HCP began in 1997, with drafts prepared in 1997, 1999, 2001, and 2003 and reviewed by the Department of Land and Natural Resources Division of Forestry and Wildlife ("DLNR DOFAW"), the Endangered Species Recovery Committee ("ESRC"), and the US Fish and Wildlife Service ("USFWS"). The present HCP incorporates the actions which have been undertaken as interim mitigation measures and describes the mitigation measures for the Kapolei population that are planned over a period of approximately 20 years.

The sponsor of this HCP is the State Department of Transportation ("DOT"), which will be acquiring a portion (approximately 24.6 acres) of the Kapolei property from DLNR for the proposed North-South Road. The Housing and Community Development Corporation of Hawaii ("HCDCH") had also previously contributed substantially to the development of the HCP and its Interim Management Plan.

The Presence of Abutilon menziesii on the Kapolei Property

For nearly a century, the Kapolei property was cultivated in sugarcane. According to the Oahu Sugar Company, sugarcane was last harvested on the property in 1994, prior to the permanent closure of the company in Spring 1995. Typical of sugarcane grown in Hawaii, the cane was a two-year crop and harvesting practices involved burning to reduce the leaf bulk before the cane stalks were mechanically harvested. Generally, the cane fire in each field lasted 20 to 30 minutes. The now abandoned fields at the Kapolei property were exposed to cane fires every two years during nearly ten decades of cane cultivation.

Botanical surveys of the Kapolei property have been conducted by Kenneth Nagata (1996) and Char & Associates (1996, 1997, 2003, 2004). The survey reports are attached as Appendices A, B, C, D, and E, respectively.

The property is described as a disturbed site characterized by the dominance of alien weed species interspersed with remnant sugar cane. Therefore, the discovery of *A. menziesii* in September 1996 by Nagata approximately two years after the last cane harvest is seen as an enigma (Nagata 1996). Nagata's 1996 reconnaissance survey covered 80 percent of the State property. A subsequent survey by Char in December 1996 following an unusually wet period in November and December 1996 recorded 88 plants. In December 1997 Nagata conducted a second comprehensive survey and recorded 86 plants on-site. One plant was observed off-site to the south of the project site at Renton Road. The December 1997 survey produced taxonomic data and a precise mapping of the plants. A subsequent GPS based map was produced by DLNR. In 2004, Char completed a survey of the City property and discovered an additional 7 plants.

The plants are spatially distributed in five clusters in the central and southern portions occupying approximately 25 percent of the Kapolei property and are described as Clusters A, B, C, D, and E. Through attrition the present number of plants has been reduced to between 30 and 50 (DLNR 2001) but new seedlings have recently been recorded (DLNR 2003); however, this HCP is generally based on the baseline number of 93 plants.

Landownership

The State-owned Kapolei property, consisting of approximately 1,300 acres, was previously leased to Oahu Sugar Company, Limited until 1995; upon its closure, the land was transferred back to the State of Hawaii under the jurisdiction of DLNR Land Division. Through a right-of-entry agreement with HCDCH the property was reclassified in 1998 for urban uses to further the development of Kapolei as the secondary urban center of the City and County of Honolulu and the State of Hawaii. The land tenure however, was changed in late 2002 and 500 acres were transferred to the University of Hawaii for a new West Oahu campus. In addition, 200 acres will be transferred to the Department of Hawaiian Home Lands ("DHHL") for residential development. Both the University of Hawaii and the DHHL have received right-of-entry to their properties and HCDCH's right-of-entry has been revoked. The remaining 600 acres have reverted to DLNR.

A portion of the proposed North-South Road property is owned by DLNR and a portion is owned by the Estate of James Campbell. *A. menziesii* is present only on the State-owned portion. The planned development of the North-South Road will require property conveyance from DLNR and the Estate of James Campbell to DOT. The land conveyance actions are anticipated to be accomplished in 2004 prior to the commencement of construction.

The 81-acre City and County of Honolulu property is comprised of portions of two larger parcels of land which include the adjacent existing Ewa Villages Golf Course to the north. The City's Kapolei Parkway roadway segment and future urban development are anticipated on this vacant land.

The Proposed Developments

Developments proposed by public agencies include the North-South Road, the Kapolei Parkway segment, and the University of Hawaii West Oahu campus. In addition, DHHL will develop residential homesteads for native Hawaiian beneficiaries. Collectively, the HCP refers to these

developments as the "Kapolei projects". The remaining DLNR land area has also been planned for urban uses, however, no specific development proposal is under consideration at this time.

North-South Road

The Department of Transportation is proposing to develop the North-South Road, a federal-aid highway, which would be a principal arterial roadway providing support to the regional network of roadways and to the Interstate Route H-1 ("H-1 Freeway"). The North-South Road would bisect and provide access to the land developments at the Kapolei property and also provide an alternate access roadway for other Kapolei and Ewa communities.

The North-South Road would traverse the Kapolei property between the H-1 Freeway (located to the north) and the City's segment of Kapolei Parkway (located to the south).

Kapolei Parkway Extension

The Kapolei Parkway segment is a 0.7 mile major collector roadway which will link the North-South Road and Renton Road and existing segments of the Kapolei Parkway. The subject roadway project will traverse the City's Ewa Villages property and will provide an alternative regional access to the H-1 Freeway. Regional access to Interstate H-1 is currently limited to Fort Weaver Road. The Kapolei Parkway segment is also a federal-aid highway project.

Department of Hawaiian Home Lands

DHHL is mandated to develop and deliver homesteads to qualified native Hawaiians. The development of 200 acres of DHHL lands would include approximately 1,000 residential homesteads and potentially some commercial and community facility uses to serve its new subdivisions. The first phase is planned for occupancy in 2006 and buildout expected in approximately 8 to 10 years. These uses have been described as part of the East Kapolei Master Plan. The DHHL parcels are to the west of North-South Road, with one parcel to the north of UHWO and the other to the south of UHWO.

A new segment of Kapolei Parkway will bisect the DHHL parcel. This segment will connect to the existing Kapolei Parkway to the west and to the City's proposed Kapolei Parkway segment (described above) and the North South-Road.

University of Hawaii West Oahu

The UH West Oahu campus will be a major educational facility in Kapolei, primarily serving the Leeward and Central Oahu region. The University is currently exploring options for the development of the campus and at present is planning an approximately 100-acre campus which will be developed in phases to an ultimate student population of 7,600. Additionally, about 150 acres of land will be allocated on the property for future campus expansion beyond the 7,600 student population. The University is also considering a number of land use options for the remaining 250 acres of land within the 500-acre property to serve the campus and surrounding region. Construction of the initial phase of the campus could begin in the latter part of 2005, with a completion date of

Fall 2007. The initial phase of campus development would be located in the northeastern portion of the property, in close proximity to Farrington Highway.

Department of Land and Natural Resources

The 600 acres of land under the authority of the DLNR Land Division have been previously planned for residential and school facilities as well as open space areas, which would serve as drainage detention basins as part of the East Kapolei Master Plan. The ultimate specific uses of these lands will be determined in the future.

Habitat Conservation Plan Goals and Objectives

Pursuant to Chapter 195D, the habitat conservation plan shall contain sufficient information for the Board of Land and Natural Resources ("BLNR") to ascertain with reasonable certainty the likely effect of the plan upon any endangered, threatened, proposed, or candidate species in the plan area and throughout its habitat range. Thus, the goal of this HCP is to initiate and sustain a program which would result in an overall net gain in the number of *Abutilon menziesii* on Oahu, thus, contributing towards the recovery of the species as required by HRS Chapter195D-30. HRS Chapter195D-2 defines "Recovery" or "recover" to mean that "the number of individuals of the protected species has increased to the point that the measures provided under this chapter (Chapter 195 HRS) or the Federal Endangered Species Act are no longer needed."

The objectives of the HCP are threefold: (1) describe the existing conditions of the Kapolei population; (2) describe the potential impacts of the Kapolei projects on *Abutilon menziesii*; and (3) describe the strategies and actions to mitigate the impacts. The major strategy designed to mitigate impacts and to benefit the species is the creation of three protected off-site wild populations on Oahu from the single degraded Kapolei population.

To test whether new populations could be established from Kapolei stock of *A. menziesii*, an Interim Management Program was initiated in 1998 and funded by HCDCH. This program has successfully been implemented by DLNR. A complete representation of 630 plant progeny were propagated from the Kapolei population and outplanted at Koko Crater Botanical Gardens, Kaena Point State Park, and Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. The Interim Management Program is described in detail in Strategy (1) of Section 3 and in the DLNR Draft and Final Interim Management Report for *Abutilon menziesii* (2001, 2003), attached as Appendix F and Appendix G.

The HCP is formatted according to the guidelines set forth in HRS Chapter 195D-21. In addition, recommendations received from DLNR, the Endangered Species Recovery Committee, and the US Fish and Wildlife Service have been incorporated.

Impacts and Mitigative Measures

The development of the Kapolei projects is expected to result in incidental take of the entire Kapolei population during an approximately 20-year development period. Therefore, a series of actions are proposed that will produce three new offsite "wild" populations, protect the genetic diversity of the existing population, and protect existing individuals by relocating them to the new population

locations. This HCP also proposes long-term management that would occur concurrently with project development to ensure that benefits are realized for *A. menziesii*.

The duration of the HCP implementation and active management period is approximately 20 years and is tied to the accomplishment of the measurable goals that include the establishment of a minimum of three offsite self-sustaining populations. The successful implementation of the HCP would significantly increase the numbers of new plants on Oahu as well as improve their quality compared to the *in situ* disturbed canefield conditions at the Kapolei property.

Funding and Implementation

The primary funding mechanism is a trust fund for endangered species as promulgated in Chapter 195D-31, HRS. DOT will provide the funding to implement the HCP. The North-South Road, as planned, would affect approximately 25 percent of the population, and the other Kapolei projects would affect the remaining 75 percent. As agreed by DOT and DLNR in a Memorandum of Agreement, DOT on March 14, 2001 made available funds in the amount of $250,000 for the initial five years of HCP implementation. These initial funds are being utilized (since approximately August 2001) by DLNR to manage and implement the HCP strategies. The MOA also stipulates that the subsequent 15 years will also be funded by DOT. An additional $750,000 will also be delegated to DLNR upon the approval of the HCP by the Board of Land and Natural Resources (or the Hawaii Legislature, as appropriate) and the Governor's release of the funds for a total not to exceed $1 million over a maximum period of 20 years.

DOT will also establish a contingency fund and has developed a process for third party developers ("Cooperators") to utilize the Incidental Take License through a Certificate of Inclusion. The Cooperators would pay into a contingency fund for the following purposes: 1) to finance unanticipated costs incurred by DLNR in the implementation of the HCP measures; and 2) to fund the management and monitoring of three "wild" populations beyond 20 years. The total initial amount of the Contingency Fund is $200,000. To ensure this fund DOT will deposit the full $200,000 amount following the approval of the HCP.

SECTION 1

Identify the geographic area encompassed by the plan; the ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan; and the endangered, threatened, proposed, and candidate species known or reasonably expected to be present in those ecosystems, natural communities, or habitat types in the plan area.

(1a) Geographic Area Encompassed by the Plan

The location of the existing plants is at Kapolei, Ewa District, Oahu, Hawaii (Figure 1). The property is bounded on the north by Farrington Highway and H-1 Freeway, to the west by the Villages of Kapolei and Kapolei Golf Course, to the south and southeast by Ewa Villages and Renton Road, and to the east by diversified agricultural fields and fallowed sugarcane land. It encompasses former sugar cane lands from approximately 60 feet above mean sea level ("AMSL") at Renton Road up to 200 feet MSL at the H-1 Freeway. The site also contains an existing Hawaiian Electric Company, Inc. ("HECO") powerline easement. Since 1999, BLNR has leased approximately 550 acres of the property to Aloun Farms, Inc. and A.M. Enterprise, LLC on a month-to-month basis for crop farming. The leased parcels are not known to have any *A. menziesii* on the premises. Kaloi Gulch and the Hunehune tributary, both intermittent ephemeral streams, traverse the property from the north to the southeast boundary. There are no known *A. menziesii* plants in the gulch and tributary.

New offsite populations of *Abutilon menziesii* have been initiated at the City and County of Honolulu Koko Crater Botanical Garden (Outplant Site #1), Kaena Point State Park (Outplant Site #2, Wild Site #1), and Honouliuli National Wildlife Refuge (Outplant Site #3, Wild Site #2). The Koko Crater site is not considered a "wild site"; however, its value is as a protected repository for the full genetic stock of the Kapolei population.

Additional outplant wild sites will be initiated within the region of the Kapolei population as well as other suitable areas on Oahu as described in Section 3, Strategy (4). Candidate sites include Diamond Head State Park, Lualualei Naval Reserve (at the Radio Transmission Facility), Kealia Trail, Kalaeloa Northern Trap and Skeet Range, Kalua Kauila (near Makua Valley), area mauka of Yokohama Beach and Makapuu Head. These sites are also described in Section 3, Strategy (4).

(1b) Ecosystems, Natural Communities, or Habitat Types within the Plan Area

The Ewa Plain experiences light rainfall with a mean annual rainfall of about 20 inches per year, most of which occurs between the months of November and April. Based on more than 50 years of data collected at Oahu Sugar Company (and its predecessor, Ewa Plantation), average annual daily minimum and maximum temperatures in the project area are 65 degrees F and 84 degrees F, respectively. On the arid Ewa plain, the fallow agricultural land and the low levels of evapo-transpiration which occurs from scrub vegetation produces little cooling effect.

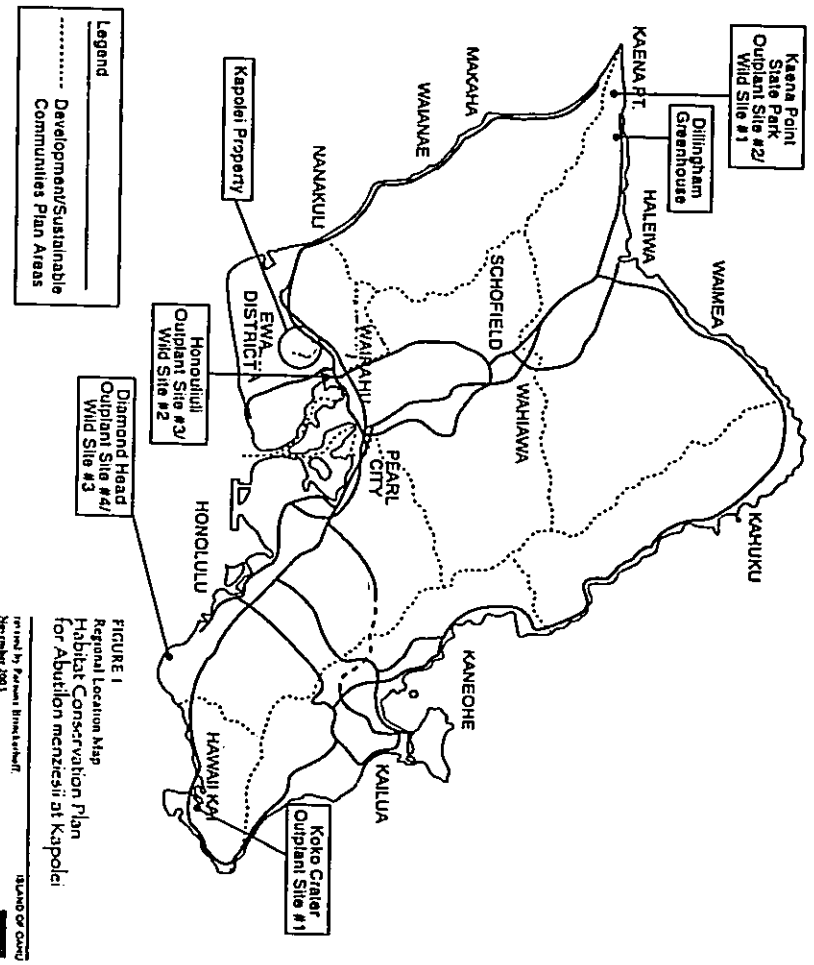


FIGURE 1
Regional Location Map
Habitat Conservation Plan
for Abutilon menziesii at Kapolei

Revised by Parsons Brinckerhoff
November 2003

ISLAND OF OAHU

March 2004

PBR HAWAII

HABITAT CONSERVATION PLAN
FOR *ABUTILON MENZIESII* AT KAPOLEI

The project area was formerly cultivated as sugarcane land and is now characterized as a disturbed coastal dry ecosystem. The vegetation of the region is generally lowland shrub with a coastal fringe of kiawe trees. In the past several years the Kapolei property and surrounding lands have been taken out of sugar cane cultivation and put to other uses (e.g. urbanization, diversified agriculture, fallowed fields).

The vegetation in the region is largely determined by the history of cultivation (or disturbance) on each parcel of land. Nagata (1996) has identified eight plant communities within the State's 1,300-acre project area: 1) Abandoned Cane Fields, 2) Fallowed Fields Mixed Herb Association, 3) Fallowed Fields Grassland Association, 4) Abandoned Fields, 5) Cultivated Fields, 6) Grasslands, 7) Gulch Association, and 8) Roadside Vegetation.

Within the Kapolei Parkway area, Char (2004, Appendix E), documents the dominant vegetation type as koa haole / buffel grass scrub.

Within the Kapolei property there are 80 to 100 plant species common to former sugar cane lands (Appendices A and B). Only two species are indigenous (*Sida fallax* or ilima and Jacquemontia *ovalifolia* or pauohiiaka), two are probably indigenous (*Waltheria indica* or uhaloa and *Abutilon incanum* or hoary abutilon), that is, they are native to the Hawaiian islands and elsewhere; and one, the subject plant, *Abutilon menziesii* or kooloaula is endemic, or native only to the Hawaiian Islands. The vast numbers of plants are non-native.

As previously mentioned, *Abutilon menziesii* is not known to be present on the areas which are in crop cultivation.

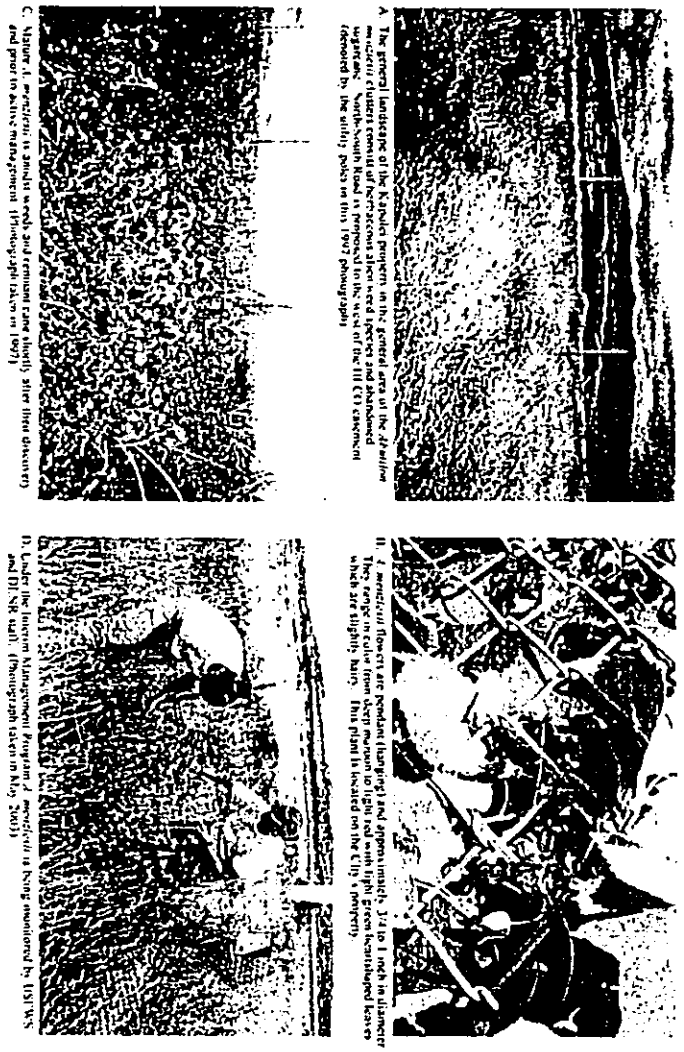
The Kaloi Gulch and Hunehune tributary gulch are intermittent and originate north, or mauka, of the H-1 Interstate Freeway. As stated above, past and recent surveys have found no *A. menziesii* within or directly adjacent to the gulches (Nagata 1996 and Char 1997, 1997, 2003, 2004).

(1c) The endangered, threatened, proposed, and candidate species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area.

Except as noted above, *A. menziesii* has been found throughout the natural communities and ecosystems of the Kapolei property.

Abutilon menziesii, also known by its Hawaiian name kooloaula, is a shrub in the Mallow Family (Malvaceae) with light green heart-shaped leaves and characteristic small dark red to maroon flowers; hence, the plant is also commonly referred to as the red ilima. Photographs in Figure 2 show *A. menziesii* in the Kapolei habitat.

Abutilon menziesii was federally listed as an endangered species in 1986 and is now protected under the provisions of the federal Endangered Species Act of 1973, as amended, and Chapter 195D, *Hawaii Revised Statutes* ("HRS"), as amended. It is one of nine endangered species included in the *Lanai Plant Cluster Recovery Plan* (US Fish and Wildlife Service, 1994).



C. Mature *A. menziesii* in shrub weeds and remnant cane (briefly after first discovery and prior to active management [Photograph taken in 1997])

A. The general landscape of the Kapolei property in the central area of the *A. menziesii* clusters consists of herbaceous alien weed species and abandoned sugarcane. North-South Road is proposed in the west of the H1 (E) extension (denoted by the utility poles in this 1997 photograph)

D. Under the Interim Management Program *A. menziesii* is being monitored by DLNR and DLNR staff. (Photograph taken in May 2003)

B. *A. menziesii* flowers are pendant (hanging) and approximately 3/4 to 1 inch in diameter. They range in color from deep maroon to light red with light green hairs/haired leaves which are slightly hairy. This plant is located on the City's property.

FIGURE 2
Photographs: *Abutilon menziesii* at Kapolei Property

Habitat Conservation Plan
for Abutilon menziesii at Kapolei

ISLAND OF OAHU

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Of the nine taxa described in the Lanai Recovery Plan, *A. menziesii* was assigned a high probability of recovery due to its larger population size, its resistance to some of the current threats, and the relative ease of propagation. The Lanai Recovery Plan does not describe the Kapolei population; the populations which are identified are on Lanai, Hawaii, and Maui.

At the time of the Nagata survey in September 1996, 38 individuals were recorded in a reconnaissance survey covering 80 percent of the State property. After the unusually heavy rains of November 1996, Char (1997) in a 100 percent survey of the areas described by Nagata recorded 86 plants at approximately the same locations as Nagata. In December 1997 Nagata performed a detailed survey and count which was followed by precise mapping. The survey and count resulted in 87 plants, 86 on the subject property and one (1) plant at an off-site location on City and County of Honolulu property at Renton Road adjacent to the southern boundary of the State property.[1] Additional plants were identified by Char in 2004 on the City property. The plants are in four clusters (Clusters A, B, C, and E) one additional plant (Cluster D) was also identified (Figure 3). In October 2003, DLNR DOFAW produced an updated map (Figure 3A) depicting the baseline and 16 new plant locations. The new plants occur in close proximity of a mature plant and fall within the known and mapped clusters.

Since the previous baseline year of 1997 the numbers of individuals on the State-owned property have fluctuated with rainfall levels and it is anticipated that the number of individuals will continue to be dynamic. Therefore this HCP covers the entire population of *A. menziesii* within the State and City lands as depicted in Figure 5. To attempt to quantify the development impacts, a baseline population number of 93 (revised in 2004 to include City land) individuals has been assigned. This baseline of 93 individuals is differentiated from the approximate number of 50± currently existing plants. Table 1 describes the baseline distribution of *A. menziesii*.

Table 1. Baseline Population of *Abutilon menziesii* at Kapolei, 1997 (Revised to Include Cluster E, 2004)

Cluster	No. of Plants
A	10
B	14
C	61
D	1
E	7
TOTAL	93

Cluster A consists of 10 individuals and is located at the southern end of the State project site. An existing dirt road situated in an east to west direction provides access to this cluster.

[1] The Kapolei population is distributed on State and City lands.

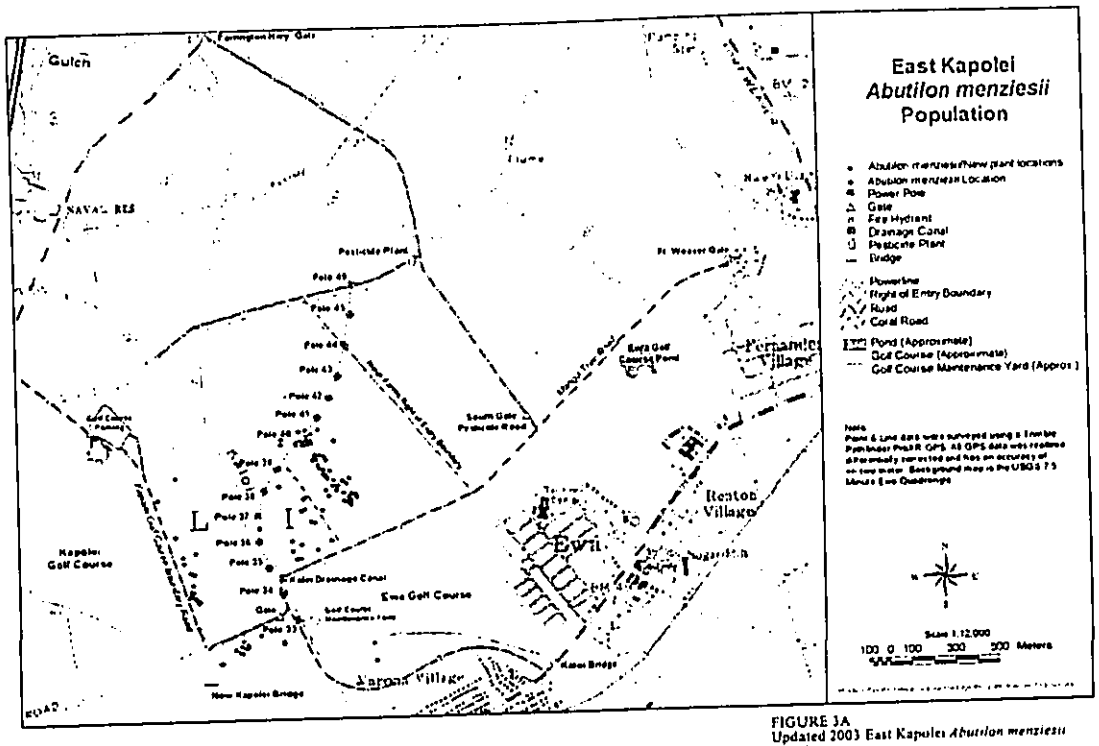

FIGURE 3A
Updated 2003 East Kapolei *Abutilon menziesii* Population
Habitat Conservation Plan
for Abutilon menziesii at Kapolei
ISLAND OF OAHU
revised by Parsons Brinckerhoff,
November 2003
PBR
November 2003

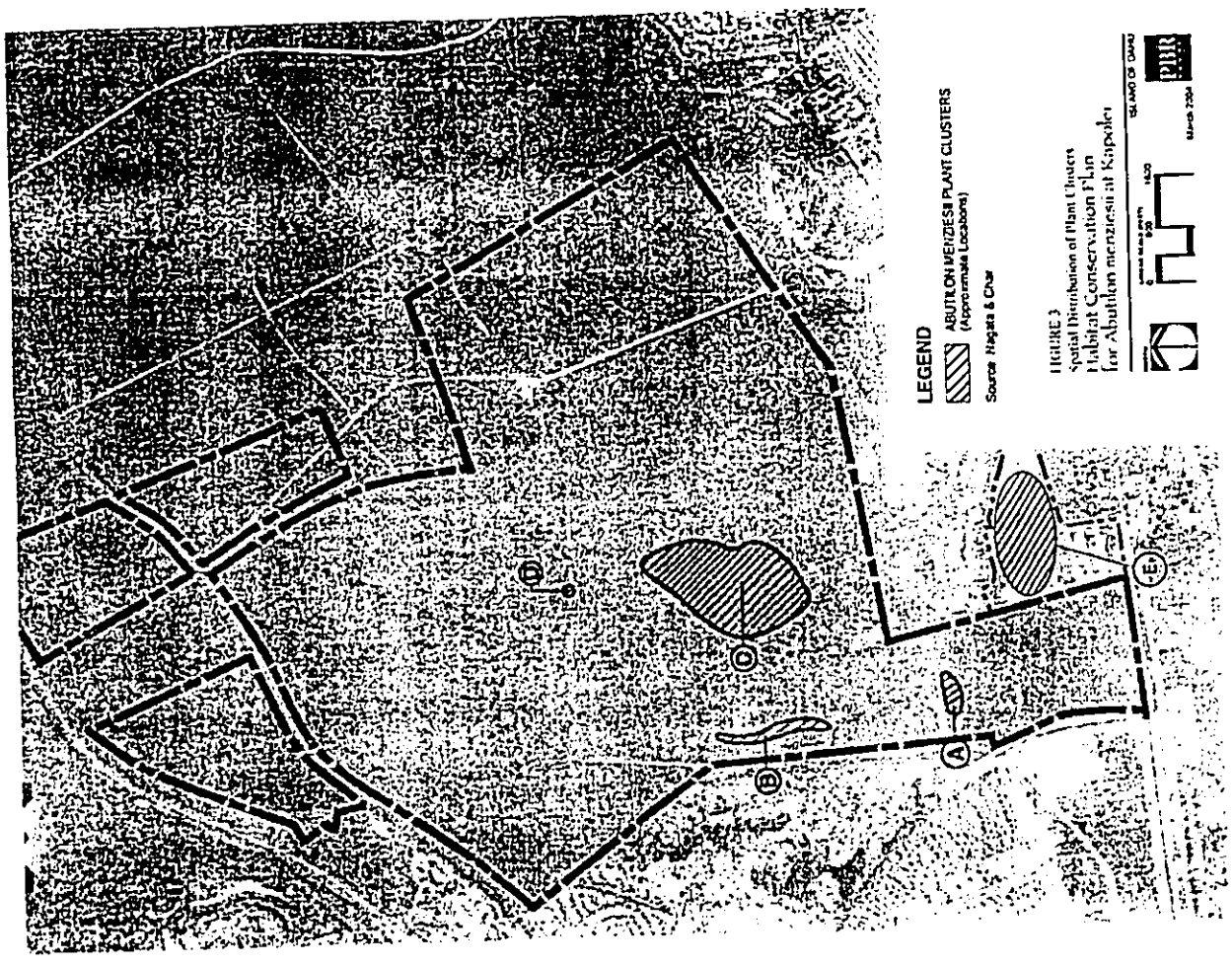

FIGURE 3
Spatial Distribution of Plant Clusters
Habitat Conservation Plan
for Abutilon menziesii at Kapolei
ISLAND OF OAHU
PBR
March 2004

Cluster B consists of 14 individuals located along the western boundary of the State property which is marked by a chain-link fence. Individuals in this cluster are spread in a north-south direction and are accessed from the dirt road near Cluster A at the southern end of the property.

Cluster C, the largest cluster consisting of 61 plants occurs in the general area of the HECO powerline easement and primarily to the east of the powerline easement. The cluster is accessed from Mango Tree Road which is situated in an east-west direction. Several land uses would affect Cluster C, therefore three sub-areas identified as C-1, C-2 and C-3 have been designated.

Table 2. Cluster C (Sub-Areas)

Sub-Area	No. of Plants	Land Use
C-1	14	North-South Road
C-2	7	Drainage/Open Space Corridor
C-3	40	Residential, other urban uses
TOTAL	61	

Cluster D consisted of a single plant in the central area of the State site; however, this individual has not been seen since the initial recording.

The individuals in Cluster E are spread over an 81-acre area and occur as single plants, except at one location along a fence line at the property boundary and access roadway. At this location, there is a large, multi-stemmed plant, a young single-stemmed plant, and a seedling. Cluster E is accessed from the dirt road which leads to the Ewa Villages Golf Course Maintenance Facility. A segment of Kapolei Parkway and future urban uses are planned at this location.

At the time of the 1997 Nagata survey, plants in the population were 1 to 3.5 feet in height and included juveniles and mature individuals. Approximately 74% of the population were taller than 3 feet, 20% were between 2 to 3 feet, and only 6% were between 1 to 2 feet. No seedlings or small plants were identified. In December 1997, 37% of the plants were flowering and/or fruiting (Nagata 1997).

Present Status. Through natural senescence and accidental take (1997 to 2001), the number of plants has declined to 30 to 50 plants (DLNR 2001): however, in 2003, DLNR recorded 16 new plants in close proximity of existing mature plants (DLNR 2003). The actual number of plants is difficult to determine due to the dry conditions at Kapolei; plants which may appear to be dead may possibly revive during the wet season (DLNR 2001).

Contributing to the decline of the Kapolei population was a January 2000 incident in which approximately four plants were crushed/destroyed (by being plowed) and seedlings were killed (DLNR DOFAW/V. Caraway, personal communication).

SECTION 2

Describe the activities contemplated to be undertaken within the plan area with sufficient detail to allow the department to evaluate the impact of the activities on the particular ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan habitat types in the plan area.

(2a) Description of the activities to be undertaken within the plan area in sufficient detail

The Kapolei projects include North-South Road, a segment of Kapolei Parkway, University of Hawaii West Oahu campus, Department of Hawaiian Home Lands residential homestead development, and unspecified urban uses on the DLNR lands. The projects are shown in a Conceptual Land Use Plan in Figure 4. Land ownership is shown in Figure 5 and described in Table 3.

Table 3. Landownership of the Parcels at the Kapolei Property

Project	TMK Number	Acres*
DOT / North-South Road**	9-1-16: 109 Campbell Estate portion	24.6 39.1
City & County of Honolulu Kapolei Parkway and Urban Uses	9-1-17: por. 069 9-1-17: por. 075	***41.0 / 6.3 ***40.0 / 2.7
DHHL	9-1-16: 108**** 9-1-18: 003	165.466 44.235
UHWO	9-1-16: por. 108 and 9-1-16: 120	500.327
DLNR	9-1-16: 008 9-1-17: 071 9-1-17: 088 9-1-17: 086 9-1-18: 005	31.915 204.254 200.000 40.619 65.999

* Approximate area. (NOTE: Information gathering is still in process due to recent changes in land disposition.)
** North-South Road alignment is under State DLNR and Campbell Estate ownership; to be transferred to DOT in 2004. Legal subdivision is still pending.
*** Approximately 81 acres of the vacant City property was surveyed by Char (2004); however, only approximately 9 acres comprise the Kapolei Parkway segment ROW. The remaining land is anticipated to be urbanized.
**** Parcel 108 includes another future segment of Kapolei Parkway; this roadway segment is to be sub-divided out of Parcel 108. The net area to DHHL will be approximately 200 acres.

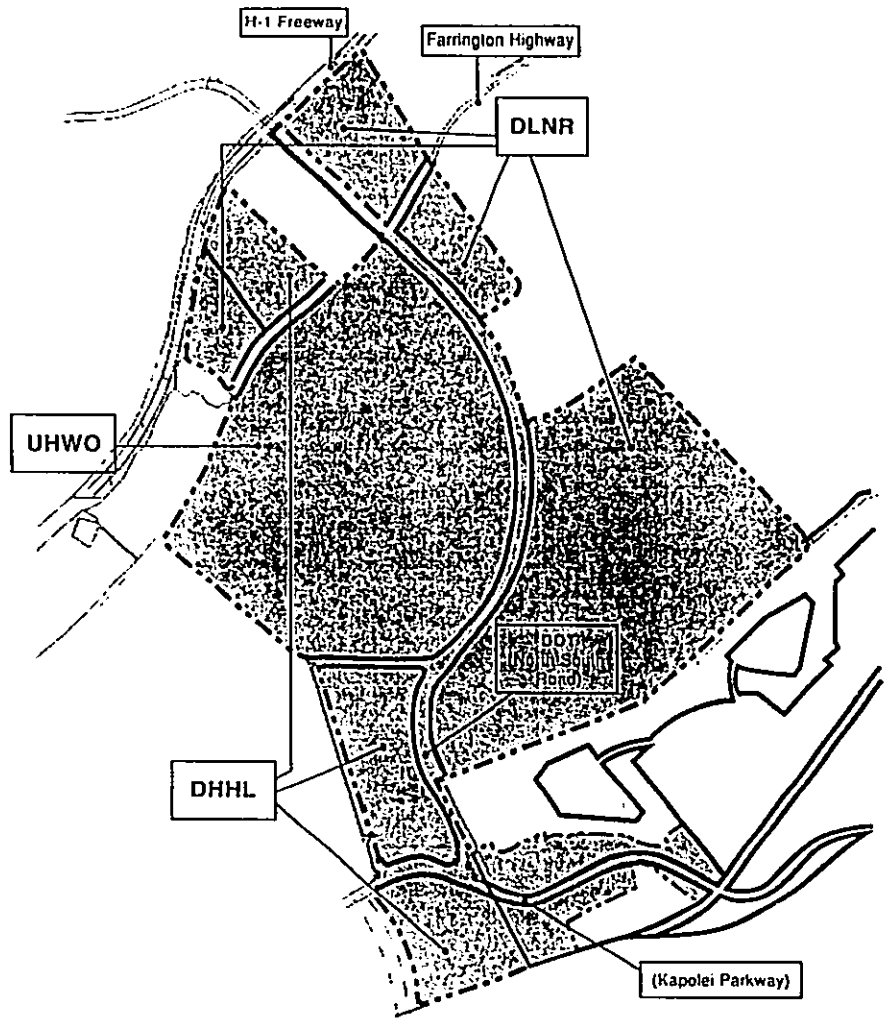

FIGURE 4
Conceptual Land Use Plan
Kapolei Property
Habitat Conservation Plan
for Abutilon menziesii at Kapolei

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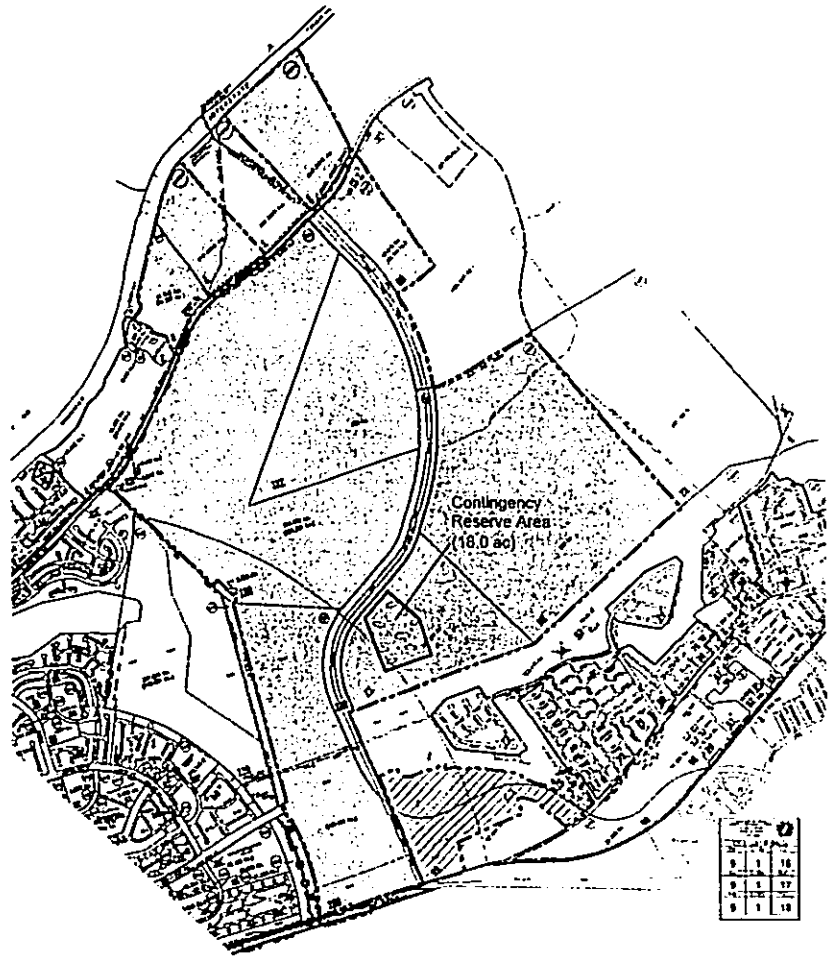

LEGEND
State Lands
City Lands
Contingency Reserve Area

FIGURE 5
Landownership Map
Habitat Conservation Plan
for Abutilon menziesii at Kapolei

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The distribution of *A. menziesii* on the Kapolei property, and more specifically, within the development parcels, is shown in Figure 6. Surveys conducted since 1996 have not identified A. menziesii in Kaloi and Hunehune Gulches (Nagata 1996, 1997; Char 1997, 2003, 2004 and DLNR 2001, 2003); thus the HCP is not affected by activities proposed at either gulch location.[2] The approximate numbers of individuals are described in Table 4 following the descriptions of the proposed projects.

North-South Road

The North-South Road, a new 6-lane major collector roadway, will traverse the Kapolei property and will provide regional access to the Interstate H-1 Freeway, connecting the Interstate Route H-1 ("H-1 Freeway") (at the north end) to a future segment of Kapolei Parkway (at the south end), a distance of approximately 3.6 km (2.2 miles). Its alignment is adjacent to and toward the west of the corridor delineated by the existing HECO power line electrical easement. The new roadway is designed with three vehicular lanes in each direction, a planting median, and sidewalks on both sides with an overall width of 116 feet.

The overall schedule for the North-South Road began with the initial planning in 1994 and an anticipated completion in 2008:

Planning:	June 1994 to September 2004
Design:	Aug 1997 to Sept 2004
Construction:	Dec 2004 to Dec 2008

The North-South Road construction is planned to be built in two phases:

- Phase 1 (late 2004 - 2007) - Mass grading for six (6) lanes and drainage improvements; construction of three (3) highway lanes from Kapolei Parkway to H-1 Freeway.

- Phase 2 (late 2005 - @2008) - Construction of additional three (3) lanes; construction of drainage detention basins, construction of intersections at Kapolei Parkway and Farrington Highway; construction of interchange at H-1 Freeway.

The Phase 1 component includes roadway and drainage grading and the construction of three (of the six) lanes on the Kapolei property. The impact to *A. menziesii* is anticipated in Phase 1.

The Phase 2 components include the construction of the additional three lanes and intersections on the Kapolei property. The off-site construction of the Interchange at the H-1 Freeway will also be completed in Phase 2. The Interchange would provide an access to the Kapolei downtown area and the Ewa plain. There are no known *A. menziesii* within the area of the Interchange, therefore,

[2] DOT will coordinate with the US Department of the Army Corps of Engineers on matters related to Kaloi and Hunehune gulches.

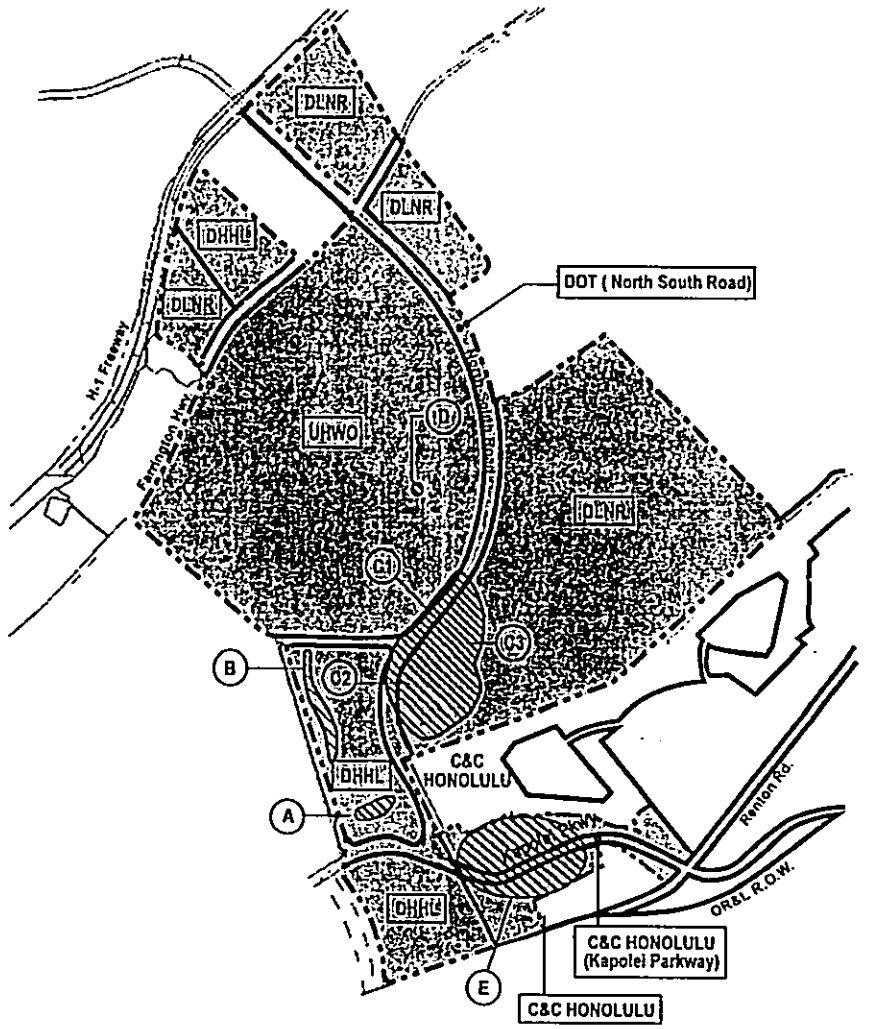

FIGURE 6
Overlay of Plant Clusters
On the Kapolei Projects
Habitat Conservation Plan
for Abutilon menziesii at Kapolei

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references to the North-South Road development is understood to be the segment through the Kapolei property.

A staging area and construction transit area approximately 50 feet to 75 feet wide along the west boundary of the North-South Road corridor is required; however, no known plants are present along this strip.

As a federal-aid highway, the North-South Road is undergoing a National Environmental Policy Act ("NEPA") review and Endangered Species Act, Section 7 consultation. The subject HCP will be submitted to USFWS as a component of the required biological assessment for the Section 7 process.

Kapolei Parkway Segment

The Kapolei Parkway, a new 6-lane major collector roadway, will traverse the City's Ewa Villages property and will provide alternate regional access to the H-1 Freeway, connecting the North-South Road at the north end to Renton Road at the south end; a distance of approximately 0.7 miles. The new roadway is designed with three vehicular lanes in each direction, a planting median, and sidewalk on one side and a multiuse (pedestrian and bicycle) pathway on the other side with an overall width of 116 feet. The project will include underground utilities (including water, sanitary sewer, electrical, and communication systems), storm drainage system, street lighting system, and landscape irrigation system.

The overall schedule for this segment of Kapolei Parkway began with initial planning in 1994, and the City anticipates completion in 2008:

Planning:	June 1994 to September 2004
Design:	December 2001 to December 2005
Construction:	June 2006 to December 2008

The Kapolei Parkway roadway is planned for construction in two phases:

- Phase 1 (mid 2006 - 2007) - Mass grading for six (6) lanes; construction of three (3) makai travel lanes from North-South Road to Renton Road.

- Phase 2 (late 2007 - 2008) - Construction of additional three (3) mauka lanes. The construction of these lanes is to be coordinated with completion of the North-South Road.

The Phase 1 components include roadway and drainage grading, the construction of three (of the six) lanes, and a portion of the underground utilities, storm drainage system, street lighting system, and landscape irrigation system on the Ewa Villages property. The impact to *A. menziesii* is anticipated in Phase 1.

The Phase 2 components include the construction of the additional three lanes and the balance of the underground utilities, storm drainage system, street lighting system, and landscape irrigation system on the Ewa Villages property.

A staging and construction transit area is required; it will be located where no known plants are present.

As a federal-aid highway, this segment of Kapolei Parkway is undergoing a NEPA review and Endangered Species Act, Section 7 consultation. The subject HCP will be submitted to USFWS as a component of the required biological assessment for the Section 7 process.

The City is planning to schedule construction of an additional three (3) lanes for the Kapolei Parkway segment from the Renton Road intersection (at the north end) to its connection to the existing Kapolei Parkway in the vicinity of the OR&L track right-of-way (at the south end) in coordination with the above Phase 2 segment and North-South Road completion. There are no known *A. menziesii* plants within this area (Char 2004). This latter construction activity will complete this 6-lane major collector roadway segment with the same typical roadway section with an overall width of 116 feet, matching the segment proposed above the Renton Road intersection.

University of Hawaii West Oahu

In September 2002, the BLNR conveyed in fee approximately 500 acres of land to the University of Hawaii for its West Oahu campus. The BLNR also issued to the University a right-of-entry to the property for planning purposes. The UH West Oahu property is bordered by the proposed North-South Road to the east, Farrington Highway to the north, the Kapolei Golf Course and Villages of Kapolei to the west, and DHHL lands to the south. The Kaloi Gulch and Hunehune Gulch traverse this parcel.

At the present time, portions of the UH West Oahu property are being leased for agricultural crop farming under revocable permits. A small portion of the 500-acre property (.826 acres) is also presently encumbered by revocable permit to Kapolei People's Inc. dba Kapolei Golf Course for their parking lot. Approximately two-thirds of the leased area has been cleared and plowed in preparation for planting.

The UH West Oahu will be a major educational facility in Kapolei, primarily serving the Leeward and Central Oahu region. The University is currently exploring options for the development of the campus and at present is planning for an approximately 100-acre campus which will be developed in phases to an ultimate student population of 7,600. Additionally, about 150 acres of land will be allocated on the property for future campus expansion beyond the 7,600 student population. Finally, the University is considering a number of land use options for the remaining 250 acres of lands within the 500-acre property to serve the campus and surrounding region. Construction of the campus could begin in the latter part of 2005, with a completion date of Fall 2007. The initial phase of campus development would be located in the northeastern portion of the property, in close proximity to the Farrington Highway.

There are very few *Abutilon menziesii* on this area of the Kapolei property. A recent survey in June 2003 by Char (Appendix D) confirms that there are two to three individuals from Cluster C at the south boundary and the one individual in Cluster D is no longer alive. However, Char (2003) notes that seeds may be present in the soil.

Department of Hawaiian Home Lands

In November 2002, BLNR granted DHHL a right-of-entry to approximately 200 acres at the Kapolei property and commenced the process to transfer those parcels to DHHL. The two parcels are to the west of the proposed North-South Road and at the northern and southern points of the Kapolei property. The northern property, Parcel 3, is approximately 49 acres and located between Farrington Highway and the H-1 Freeway. Directly to the south is the proposed UHWO property. The southern property, Parcel 108 (portion), is approximately 165 acres and directly adjacent to the UHWO southern boundary. Kapolei Golf Course and the Villages of Kapolei are to the west with the North-South Road to the east and DLNR lands beyond that. A portion of Parcel 108 will require future subdivision for the Kapolei Parkway extension in an east-west orientation. This latter subdivision will bisect the property into two non-contiguous parcels.

The mission of DHHL is to develop and deliver homesteads to qualified native Hawaiians pursuant to the Hawaiian Homes Commission Act. The acquisition of these parcels will allow DHHL to plan and develop approximately 1,000 residential homesteads and potentially some commercial and community facility uses to serve the new subdivision over a 8 to 10 year period from 2006-2016. Conceptually, the first increment is targeted to be completed in 2006. Ownership by DHHL and development of these uses have been described in the EIS for the East Kapolei Master Plan.

Abutilon menziesii is present on DHHL's Parcel 108 (portion) at Clusters A and B. Based on the baseline population, 10 individuals comprise Cluster A and 14 individuals comprise Cluster B. The development sequence will affect Cluster B initially followed by Cluster A.

Department of Land and Natural Resources

The remaining unassigned parcels (formerly part of the East Kapolei Master Plan) total approximately 600 acres in five parcels; the parcels are now under the authority of the DLNR Land Division and are to the east of the proposed North-South Road and the north of Farrington Highway.

The Environmental Impact Statement for the East Kapolei Master Plan designates urban uses including residential, public schools, parks, roadways as well as roadways and open space areas on these parcels which would serve as drainage detention basins. The ultimate uses of these lands will be determined in the future when a development proposal is again proposed by the State or other non-governmental entity.

More than half of the *A. menziesii* in Cluster C occur on the DLNR lands.

Kapolei Projects Conceptual Development Schedule

The commencement of construction for the North-South Road is planned for late 2004 with completion in 2008. The other Kapolei projects are in the early stages of planning and schedules have not yet been determined. Thus, Table 4 below is conceptual and may be changed. The impact to the full population of *A. menziesii* is assumed over 20 years as described in this HCP. However, even if development plans are delayed, the HCP strategies and mitigation measures will be

completed in its entirety. Moreover, in accordance with the expiration date of the incidental take license, any remaining in situ plants after July 31, 2021, will remain within the Kapolei property.

Table 4. Conceptual Development Phasing and Impacts to Plant Clusters

Development Phase* (Conceptual)	Plant Cluster	No. of Plants**	Land Use (Conceptual)
2004-2007 North South Road (Phase 1)	C	14+ 7 =21	Roadway (Initial Lanes 1-3, Drainage basins)
2005-2008 North-South Road (Phase 2)		0	Roadway (Lanes 4-6; intersections; interchange); phasing of drainage channel
2006 – 2007 Kapolei Parkway (Phase 1)	E	3	Roadway (Mass grading for 6 lanes; Lanes 1-3)
2007 – 2008 Kapolei Parkway (Phase 2)		0	Roadway (Lanes 4-6)
___ - ___ City Land / Future Urban Uses***	E	4	Future Urban uses
2006-2016 DHHL (Parcel 108 por.)	A B	10 14	Residential Residential
2005 -2007 UHWO (Phase 1)		0	University campus
___ - ___ UHWO (Phase 2)*		0	University campus extension
___ - ___ UHWO (Future Phase)*	C, D	4	Other related uses (to be determined)
___ - ___ DLNR lands*	C****	37	Ultimate Uses*****: Residential, Schools, Parks, Roadways

* Development phases are conceptual and development schedules have yet to be determined at this time.
** The number of plants is estimated and is based on the baseline population of 93 plants.
*** Future urban uses may include residential development by DHHL.
**** Sub-population includes plants within the 18-acre contingency reserve site.
***** Ultimate uses are as proposed by HCDCH for the East Kapolei Master Plan.

(2b) Evaluation of the impact of the activities on the particular ecosystems, natural communities, or habitat types within the plan area

The ultimate development of the Kapolei projects would result in incidental take of all *A. menziesii* plants and the plants are unlikely to survive in their current locations. Much of the non-native plant community on the proposed development sites will also be heavily impacted.

In anticipation of the impacts, an Interim Management Program has been implemented through an agreement between HCDCH and DLNR, and subsequently DOT, as described in Section 3, Strategy (1). Under Strategy (1), the following have been accomplished: 1) DOFAW successfully propagated the genetic representation of the Kapolei population[3], 2) DOFAW initiated outplanting at three sites:

[3] Propagules for genetic representation, including cuttings and seeds, of Kapolei population individuals, were collected from plants mature enough (multi-stemmed of fruiting) or alive at the commencement of collection. Immature individuals and the recently integrated City property individuals are yet to be genetically represented. The genetic resource of expired individuals not yet represented would attempt to be reclaimed through the soil seed bank.

Koko Crater (2000), Kaena Point (2002), and Honouliuli (2002), and 3) monitoring of those sites has been ongoing. The primary purpose of the HCP is the survival of East Kapolei's *Abutilon menziesii* and this will be accomplished through various identified measures including the "relocation" of the basic plan area of this species.

As the agency to implement the HCP, DLNR will pursue use of additional appropriate outplanting sites, and outplanting will occur after all required clearances have been obtained. The selection of appropriate outplanting sites is described in greater detail in Section 3 Strategy (4).

The HCP also establishes an 18-acre contingency reserve site (see Figures 5 and 11) which temporarily protects a colony of Cluster C from development until the short-term success criteria (as described in Section 7) are met at one wild site. Management of this area may include measures such as temporary fencing and firebreaks. If an outplanting site does not meet the short-term success criteria, this reserve site could be considered as a wild site.

SECTION 3

Identify the steps that will be taken to minimize and mitigate all negative impacts, including without limitation the impact of any authorized incidental take, with consideration of the full range of the species on the island so that cumulative impacts associated with the take can be adequately assessed; and the funding that will be available to implement those steps.

Described below are the details of the core elements of this HCP, including the mitigative steps and strategies for the impacts to *Abutilon menziesii* on the Kapolei property.

(3a) Full range of the species

Abutilon menziesii is uncommon and local in dry forests between elevations 200-520 meters on Lanai, East Maui, and Hawaii (Wagner 1999). On Oahu, a collection (Char 81.002, BISH) from an abandoned canefield at Barbers Point, Ewa, was made in 1981 and believed to represent an escapee from cultivation. At that time all cultivated plants on Oahu were descendent from plants derived from individuals propagated on the island of Hawaii. Differences in leaf morphology of progeny from this plant suggest that the Barbers Point plant may represent a distinct population (USFWS 1994). A single individual plant has recently been documented on Navy property at Lualualei (Moribe 1998 and Miyashiro 2001, personal communication). *A. menziesii* is also present in several botanical collections on Oahu including the Waimea Arboretum & Botanical Garden, the Honolulu Botanical Gardens, and Amy B. Greenwell Botanical Garden in Kealakekua in South Kona.

A database search by the Hawaii Natural Heritage Program for *A. menziesii* on Oahu resulted in the subject Kapolei population only.

The relationship of Kapolei plants and island of Hawaii plants is unknown at this time. Prior to the discovery of the Kapolei population, the area was not commonly known as a habitat for *A. menziesii*. Thus, DLNR botanists believe that the abundance and spatial distribution suggest that the Kapolei plants are probably natural remnants of a once more extensive Oahu population (Garnett 2001, personal communication) and not an escapee from cultivation as previously theorized. Moreover, the Kapolei population is the larger of the two known populations and accounts for approximately 99 percent of the known wild plants on Oahu (USFWS, L. Gibson).

(3b) Steps and strategies that will be taken to minimize and mitigate all negative impacts, including, without limitation, the impact of any authorized incidental take.

The strategies under consideration in this Habitat Conservation Plan include off-site and on-site measures which would be implemented, as listed in Table 5:

Table 5. Strategies to Assess and Mitigate the Development Impacts on *Abutilon menziesii* at Kapolei

Strategy	Mitigation Steps and Strategies
1	Interim Management Program (October 1998 to March 2000, extended to October 2001): Establish two test outplant wild population sites
2	Funding for the implementation of the HCP
3	Development schedule and mitigation phasing sequence
4	Establish new populations at three off-site locations
5	Long-term protection and maintenance of permanent *A. menziesii* populations
6	Appropriate research
7	Kapolei population strategies

Strategy (1) Interim Management Program (October 1998 to October 2001)

Through funding provided in 1998 by the Housing and Community Development Corporation of Hawaii ("HCDCH"), HCDCH and DLNR established an agreement to implement a pre-construction period Interim Management Program to test the viability of establishing *Abutilon menziesii* at two offsite locations on Oahu.

On March 14, 2001, DOT delegated the expenditure of $250,000 to DLNR for the implementation of the HCP strategies for Years 1 through 5. Funds became available in August 2001 and are subsequently being used by DLNR to complete Strategy (1) (Interim Management Program) of the HCP and to transition to HCP implementation to accomplish the overall HCP implementation strategies (described below).

The preliminary results of the Interim Program indicate that propagation of the species from cuttings and seed is highly successful in the nursery environment. Outplanting to offsite locations has also been successful in the first year. The *Interim Management Report for Abutilon menziesii* (DLNR 2001) and the *Final Interim Management Report for Abutilon menziesii* (DLNR 2003) are attached as Appendix F and Appendix G.

The Scope of Services of the Interim Management Program include the following tasks:

Task 1: Maintain in-situ population through monitoring, maintenance, and security (fire protection).

Known Kapolei plants have been marked with permanent stakes and mapped to a GIS layer. The existing plants are being maintained by weeding around them, and the application of herbicide, pesticide, and fertilizer, as necessary. A fire management strategy consisting for the following measures is being implemented to ensure that the plants are not accidentally destroyed.

- Identification of fire fighting resources available near the Kapolei population;
- Provide information to fire stations to assist them in protecting *A. menziesii* from fire;
- Identification of water resources near the Kapolei population.

The details of the fire management strategies are described in the Final Interim Management Report for *Abutilon menziesii* (DLNR DOFAW 2003, Appendix G).

Task 2: Propagate a total representation of plants through seeds and cuttings from the Kapolei Abutilon menziesii population. These plants will be used to maintain genetic representation of stock and provide stock for outplanting purposes. Work will be done at the existing State DLNR, Division of Forestry and Wildlife (DOFAW) nurseries.

All the known Kapolei population plants have been propagated through cuttings resulting in 630 first generation progeny from 62 in situ individuals.[4] In addition, 220 seedlings have been produced from seed collected from the first generation nursery plants (grown from cuttings). Additional seeds have been distributed to Lyon Aboretum, the National Seed Storage Laboratory in Fort Collins, Colorado, and the Pahole Rare Plant Facility.

Task 3: Establish two new populations of Abutilon menziesii in appropriate habitat to allow for natural establishment and long term viability. Each outplanting site was planted with a representative sub-sample of the Kapolei population and each individual plant has been tagged with a permanent metal tag.

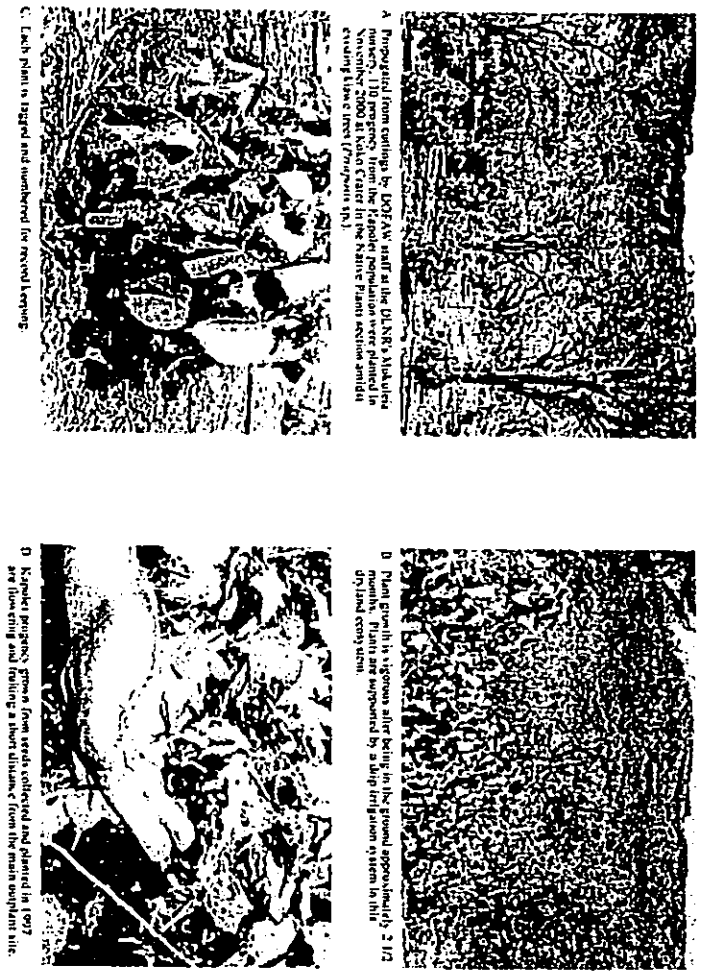
Three outplant populations of *Abutilon menziesii* have been initiated.

Outplant Site #1: Koko Crater Botanical Garden (Figure 7)

Through an agreement with DLNR DOFAW, the City and County of Honolulu Koko Crater Botanical Garden provided a 100 ft x 100 ft (10,000 sf) site for the initial planting. In November 2000, 140 *Abutilon menziesii* were planted in the 10,000 sf site, representing two complete sets of each of the original Kapolei plants. The *Abutilon* plot is in a public display area supported with drip irrigation. Hence, plants are lush and thriving. Koko Crater Botanical Garden staff will provide the long term care of these plants and will be propagating *Abutilon menziesii* from materials taken from these plants. Although this site is not being considered as a "wild site" its intent is as a living genetic repository of the full Kapolei population. DLNR will continue to coordinate the management regime (e.g. irrigation requirements, etc.) with Koko Crater Botanical Garden.

The outplant site is within a public garden setting and located in close proximity of one individual of another endangered *Abutilon* species (*A. eremitopetalum*) creating concerns about hybridization. Therefore, propagules from the Koko Crater outplanting will be limited to cuttings. Recent observations of this site indicate flowering, fruiting, and setting of seeds (personal communication, N. Sugii). The outplantings will be monitored for seedling recruitment, however due to the potential for hybridization with *A. eremitopetalum*, propagules for outplanting will be limited to cuttings.

[4] The baseline number of in situ plants at the Kapolei population numbered 93 individuals; however, through natural causes, the number had declined to 62 individuals at the time Task 2 was implemented, resulting in a genetic representation of only those existing at that time. Propagation of any subsequent "new" in situ plants (and including the plants on City property) which would constitute parental stock is also being undertaken by DLNR.



A. Propagated from cuttings by DOFAW staff at the DLNR's Mokuleia nursery. 110 progeny from the Kapolei population were planted in November 2000 at Koko Crater in the Native Plants section amidst existing klawe trees (*Erythrina* sp.).

B. Plant growth is vigorous after being in the ground approximately 2 1/2 months. Plants are supported by a drip irrigation system in this dryland ecosystem.

C. Each plant is tagged and numbered for record keeping.

D. Kapolei progeny grown from seeds collected and planted in 1997 are flowering and fruiting a short distance from the main outplant site.

FIGURE 7
Photographs: Koko Crater Botanical Gardens (Outplant Site #1)
Habitat Conservation Plan
for *Abutilon menziesii* at Kapolei

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Outplant Site #2: Kaena Point State Park (Wild Site #1) (Figure 8)

The Kaena Point outplanting site was started in April 2001. The land is under the jurisdiction of the DLNR, Division of State Parks (TMK: 6-9-01: 4).

The approximately 3-acre outplanting site was established with two distinct planting areas separated by a four-wheel drive road. The site is completely protected from four-wheel drive vehicles by a rock barrier along the dirt road fronting the outplanting site. Site preparation included clearing the non-native brush and grass with weedeaters and with hand tools and treating the area with herbicide to prevent regrowth. A total of 142 *Abutilon menziesii* plants have been planted in the Kaena Point outplanting site. In addition, 20 other native species have been planted to create a coastal strand community.

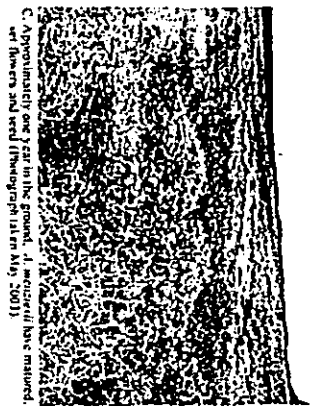
The plants were irrigated at the site to promote their establishment and to encourage the production of a maximum amount of seed to allow the build up of the seed bank and natural establishment of seedlings. The survival rate for plants at this site has been 98%. The 142 plants at this site represent a total of 44 of the original East Kapolei plants. Two *Abutilon* seedlings have grown naturally from seed produced by plants outplanted at this site. These seedlings have grown large enough to be considered part of this population.

The DLNR received permission from the U. S. Air Force to tap into the 4-inch water main that runs adjacent to the outplanting site allowing the construction of a complete irrigation system and including a galvanized steel water tank with a capacity of approximately 3,000 gallons to provide a water reserve for irrigating the plants. This tank is necessary because the 4-inch water main is pressurized only two days a week for 4 hours per day.

The threats to the Kaena Point outplanting site include the rapid growth of weeds and wild fires. This site was established in area with deep soil that was dominated by Guinea grass (*Panicum maximum*) and koa haole (*Leucaena leucocephala*). DLNR staff have had difficulty keeping up with the weed threat presented by these species and others at this outplanting site. To control weeds in the outplanting site, DLNR has used a variety of labor including regular Natural Area Reserves System employees, temporary workers such as the Emergency Environmental Workforce, and volunteers.

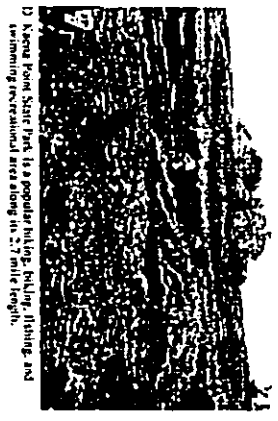
The other major threat to this outplanting site is fire. The fire strategy and fire fighting resources includes the installed water tank, the installed 2-inch outlet to allow fire engine hookup near the road, and the planting of native plants along the perimeter of the outplanting site to serve as a fuel break.

On August 20, 2003, a brush fire started by a vehicle about ¾ mile away burned a total of 160 acres along the coastal flats up to the nearby Kuaokala Game



C. Approximately one year in the ground, *A. menziesii* have matured, set flowers and seed (Photograph taken May, 2001).

A. Kaena Point State Park is a remote wild coastline along the northwestern most flanked by the Waianae Mountain range. The *Abutilon menziesii* outplant site is on 3 acres.



D. Kaena Point State Park is a popular hiking, biking, fishing, and swimming recreational area along its 7 mile length.

B. In 2002, volunteers planted *Abutilon menziesii*, and other native plants which are adapted to the coastal location.

FIGURE 8
Photographs: Kaena Point State Park
(Outplant Site #2 Wild Site #1)
Habitat Conservation Plan
for *Abutilon menziesii* at Kapolei

March 2004

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Management Area at about 1,100 feet elevation. This fire started late at night and was fanned by winds of 25 to 35 mph and burned to the edge of the outplanting site and around it. The fire moved so quickly that Honolulu Fire Department engine companies were unable to engage the fire near the ignition point or near the outplanting site resulting in a burn of approximately 30 percent of the 3-acre outplanting site. The effects of the fire on the *Abutilon menziesii* plants at the site are unknown at this time. An assessment will be made when the rainy season commences and there is sufficient moisture for growth.

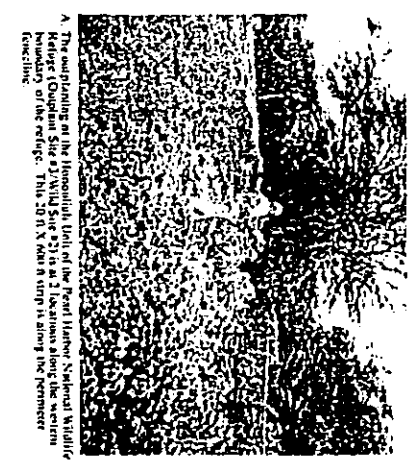
The plants along the edge were affected by the flames but not completely consumed. It is possible that many of these *Abutilon menziesii* plants will survive. The fire did burn many of the other native species planted in the area to serve as a fuel break along the front of the outplanting site. This fire would have been more damaging if these plants had not been in place. These fuel break plants will need to be replaced. The fire did destroy all irrigation pipes in the area and will need replacement. The lesson learned from this experience is that the fuel break plantings are perhaps, the most useful part of the fire strategy. The fuel break portion of this fire management strategy needs to be replaced and developed further with a wider buffer of fire resistant species established to encompass the entire outplanting site.

Outplant Site #3: Honouliuli Unit of the Pearl Harbor National Wildlife Refuge (Wild Site #2) (Figure 9)

A third outplanting site has been developed at the Honouliuli Unit of the US Fish and Wildlife Service Pearl Harbor National Wildlife Refuge which borders the West Loch of Pearl Harbor (TMK: 9-1-17). USFWS has a cooperative agreement with the Navy to manage the site as a refuge in perpetuity. This 37-acre unit is mostly a fresh water wetland managed for a variety of endangered water birds. The entire Honouliuli Unit is enclosed in an eight-foot chain link fence that provides predator control for the birds and security for the plants. DLNR DOFAW has selected and planted an upland area within this Unit and installed an irrigation system to assist with the initial establishment of plants.

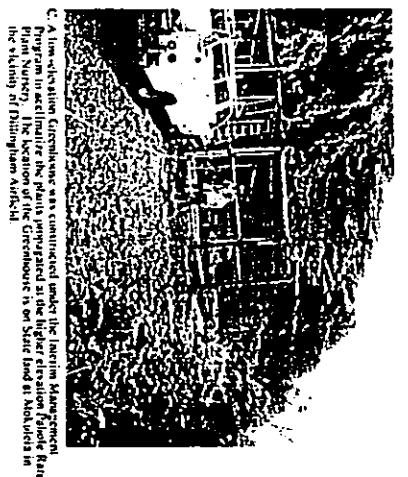
There are two separate areas being used for outplanting within the refuge. The first consists of a narrow strip, approximately 20 by 600 feet, while the second site is approximately 60 by 300 feet. The first planting commenced on March 15, 2002 in the 20 by 600-foot site. Work at the second location began in January of 2003. Both locations are on an irrigation system and are managed entirely by DLNR DOFAW staff.

At this time the planting includes a total of 61 *Abutilon menziesii* plants at the Honouliuli Unit with a survival rate of 96 percent of the outplants. Plants from cuttings from 21 of the original East Kapolei plants are represented here. In addition, 21 seedlings of known parentage and 10 seedlings of unknown parentage that were removed from the East Kapolei population in the spring of 2002 have been planted here.



B. The second Honouliuli Refuge outplanting site (60 ft x 300 ft) overlooks the U.S.F.W.S. managed endangered waterbird refuge. Planting commenced at Honouliuli in March 2002.

A. The outplanting at the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge (Outplant Site #3/Wild Site #2) is at 2 locations along the western boundary of the refuge. This 20 ft X 600 ft strip is along the perimeter fence line.



C. A low-elevation Greenhouse was constructed under the Interim Management Program to accommodate the propagation of the plants at the higher elevation Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. The Greenhouse is on State land at Makakilo in the vicinity of Dillingham Airfield.

FIGURE: 9
Photographs: Honouliuli NWR (Outplant Site #3/Wild Site #2) and Dillingham Greenhouse

Habitat Conservation Plan
for Abutilon menziesii at Kapolei

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A small number of the seedlings produced at the Kapolei population (approximately 10%) during the spring of 2002 were left there and subsequently perished. Three plants produced from seed were also planted at Honouliuli. The amount of area covered by this outplanting site is approximately ½ acre. There is sufficient area to add many more plants to this site.

The fire threat at this site is minimal. The eight-foot chain link fence provides a barrier to most of the possible ignition sources. A buffer of approximately 6 feet of bare ground is in place just inside most of the perimeter fence of this unit to serve as a barrier to predators of the endangered water birds. This buffer strip also serves as a firebreak to the outplanting site. The portion of the fence that doesn't have this buffer has fresh water marsh just inside the fence. The fire management strategy for this site is to ensure that this buffer strip remains in place.

Task 4: Research the biology of the species and determine seed storage requirements, salt and pathogen influence, and the best herbivore control methods.

Granular diazinon has been tested to determine success at controlling ants and azatin and dursban have been tested on a few plants to determine toxicity. Seed have been stored in an appropriate seed bank facility. Additional research is discussed under Strategy (6) below.

Task 5: Provide partial funding for the construction of a low-elevation greenhouse dedicated to growing A. menziesii and other threatened and endangered plant species on Oahu. This greenhouse would serve as a long-term greenhouse, to be owned and operated by the Division of Forestry and Wildlife, for low elevation threatened and endangered plant species on Oahu, including A. menziesii from the Kapolei population for the duration of HCP implementation.

The construction of the Dillingham Greenhouse by DLNR DOFAW has been completed (see Figure 9).

A 6,000 square foot nursery dedicated to the propagation of *Abutilon menziesii* and other threatened and endangered plant species on Oahu is located near the base of the Kealia Trail head, just behind the western end of Dillingham Airstrip in Mokuleia. The land falls under the control of the DLNR Land Division and is in the process of being transferred to DOFAW. The construction included the installation of the water and electrical systems. The greenhouse is 130 feet long by 40 feet wide by 12 feet tall. It is divided into an upper and a lower section along the entire length. All propagation of *A. menziesii* is now at this new facility.

Strategy (2) Funding for the Implementation of the HCP

The HCP's active mitigation effort will span a period of 20 years. The HCP is intended to provide adequate funding for the 20-year period beginning August 1, 2001 to July 31, 2021. Following the completion of 20 years of active mitigation, the HCP will provide additional funds for management of three wild outplanted sites.

The allotment for active mitigation over 20 years is valued at $1,000,000 averaging $250,000 over each five-year increment. This amount is pledged by DOT through funds which have already been delegated ($250,000) and funds which are to be released and delegated upon the approval of the HCP ¡$750,000).

Additional funds for the 20-year active mitigation period and for the post-Year 20 management period are from two sources: (1) Contingency Fund ($200,000) and (2) Interest earned on monies delegated (preliminary calculation of $440,000). Both of these fund sources are dynamic in nature and subject to change. The Contingency Fund of $200,000 would include an initial deposit of the full amount by DOT in 2005 and then be augmented by Cooperators. Cooperators are defined as other Kapolei property developers who would become sub-permittees of DOT's Incidental Take License through a Certificate of Inclusion. The Interest earned is subject to the prevailing interest rates and actual drawdown of the principle.

The funding sources for the HCP are summarized in Table 6.

Table 6. Funding Sources for the Habitat Conservation Plan (2001 to 2021+)

	HCP Phase / Time Period	Cost (in 2004 Dollars)	Source
(1)	Interim Management Program October 1998 – October 2001	$67,850 ($40,000 only has been remitted)	Special Funds by HCDCH
(2)	HCP Mitigation Period (2001 – 2021) Year 1 to Year 5 August 1, 2001 – July 31, 2006	$50,000/yr for five years. ($250,000 deposited March 14, 2001, with funds available August 1, 2001)	DOT funds
(3)	HCP Mitigation Period (2001 – 2021) Year 6 to Year 20 August 1, 2007 – July 31, 2021	$750,000 for 15 years. (Equivalent of $50,000 average per year for 15 years)	DOT funds (Funds appropriated by State Legislature, pending HCP approval & Governor's release of funds, about June 2004)
(4)	HCP Mitigation Period and Contingency Period (2005 – 2021+) Year 4 to Year 20+	$200,000 (Initial full deposit of $200,000 by DOT in 2005)	Contingency Fund (Fund to be augmented by Cooperators)
(5)	Post Year 20+ Management of Three (3) Wild Outplant Sites August 1, 2021 – Undetermined future	This amount is anticipated to be available from the remaining amount of the Contingency Fund and Interest income.	Remaining Contingency Fund and Interest earned on Items (3) and (4)

Funding for Years 1 – 20 of HCP Implementation

The provision for the establishment of the endangered species trust fund to be administered by DLNR is described in HRS Chapter195D-31. It states "the funds shall be held separate and apart from all other moneys, funds, and accounts in the state treasury, provided the moneys received as deposits or contributions from private sources shall be deposited and accounted for in accordance with the conditions established by the agencies or persons making the contribution. Earnings on the investment of the assets of the fund shall become part of the fund. Any balance in the fund at the end of a fiscal year shall be carried forward to the next fiscal year."

DOT intends to delegate a total of $1,000,000 for implementation of the HCP over a 20-year period from August 1, 2001 to July 31, 2021.

Contingency Fund - Funding After the 20th Year

Funding is provided for unanticipated events and for the management of three wild sites in the years following the 20-year HCP period.

DOT will establish a $200,000 contingency fund for the following purposes: 1) to finance unanticipated costs incurred by DLNR in the implementation of the HCP measures; and 2) to fund the management and monitoring of three "wild" populations beyond 20 years. The initial $200,000 deposit by DOT in 2005 will be augmented by Cooperators in the Incidental Take License, who have filed a certificate of inclusion with DOT.

Certificate of Inclusion

A Certificate of Inclusion would indicate the following:

a. DOT will be the holder of the Incidental Take License ("ITL").
b. Other agencies who propose to develop projects at the Kapolei property may have the protection of the ITL by obtaining a fully-executed Certificate of Inclusion and filing this document with DLNR.
c. The DOT, in consultation with DLNR, may require that other agencies contribute their various resources in order to sustain the mitigation effort of this HCP.

Memorandum of Agreement

DOT and DLNR have prepared a Memorandum of Agreement ("MOA") to implement the HCP. The MOA describes and states the following:

1. On August 1, 2001, DLNR shall implement the tasks set forth in "Exhibit A", attached hereto and incorporated herein. DLNR shall provide reasonable safeguards to secure the existence of at least three (3) "wild" *Abutilon menziesii* populations in appropriate protected habitats.

2. These populations will be maintained and managed beginning on the 1st day of August, 2001, and ending on the 31st day of July, 2021 or until all of the "success criteria" of the HCP has been accomplished.

3. DOT has delegated the expenditure of $250,000 from Act 328, SLH 1997, Item C0135, as amended by Act 116, SLH 1998, North-South Road, Kapolei Parkway to Interstate Route H-1, Oahu, to DLNR for the purpose of implementing mitigative strategies for the endangered *Abutilon menziesii*, thereby insuring funds to finance the HCP mitigative strategies costs for its first five years.

4. DOT shall also delegate to DLNR an additional lump sum amount of $750,000, which is intended to provide adequate funding for a period of fifteen (15) years from August 1, 2006. The precise amount needed to finance the mitigation effort will be estimated by DLNR and approved by DOT. The estimate shall not exceed $250,000 for 5 years, and funding will be used specifically to cover the expenses of DLNR, which relate to the mitigation of impacts to the Kapolei *Abutilon menziesii*. Interest earned on the funding, as delegated to DLNR, shall be retained by DLNR, be reserved to finance any additional mitigation beyond the term of the HCP, and be utilized in accordance with the purposes of the HCP. If a portion of the funding is unexpended due to an early termination of this MOA or the HCP, such funding shall be returned to DOT.

   DOT shall also delegate to DLNR an additional lump sum of $200,000 to serve as a "contingency fund", available over the term of the HCP. The contingency fund shall be used for emergency response, site development costs or other unanticipated expenditures required to fulfill the purposes of the HCP. The contingency fund is subject to legislative appropriation.

   All funding as directly or indirectly transferred by DOT to DLNR, shall be retained by DLNR, for the planned recovery of the *Abutilon menziesii*, until the "success criteria" is fully attained. If it is determined that all of the "success criteria" have been satisfactorily accomplished, the unexpended funds as of the date of the determination, shall be returned to DOT.

   In the event that additional funds for continued implementation of the HCP are needed, the DOT will seek alternative funding sources, including, but not limited to, transfers from the project's construction budget, participation by other State departments, and a separate legislative appropriation.

5. The MOA shall be null and void if the Board of Land and Natural Resources (or the State Legislature, as necessary) does not approve the HCP for the *Abutilon menziesii* in Kapolei.

6. The MOA may be terminated at any time by written consent of the parties of this agreement and any respective remaining funds shall be returned to DOT.

7. The MOA may be amended at any time by written consent of the parties of this agreement.

Strategy (3) Development schedule and mitigation phasing sequence

The period from 1997 to 2004 for the preparation of the HCP was unforseen at the start of the HCP planning period. The delay has been attributed to a number of factors including funding issues, real estate market conditions, analyses of regional drainage issues, and most recently, legislative amendments to the HCP law (Chapter 195D) to enable public agencies / landowners to participate in the HCP process.

This delay has provided an opportunity to test the HCP mitigation measures, specifically, the viability of propagating this species and to initiate outplant populations of *A. menziesii*. A further unanticipated consequence of the prolonged delay is the changes in land uses and ownership of parcels at the Kapolei property.

The decision of the Endangered Species Recovery Committee in the 2002 review established a review period of 15 years with a cap at 20 years for the subject HCP. However, presently, a 20-year implementation and active management time period is anticipated, followed by any necessary management at three wild sites after the conclusion of the 20th year.

A tentative conceptual schedule which represents the best information available at this time is provided in Table 7 to determine the order of impact of development on the Kapolei population. Once construction has commenced the impacts would occur incrementally over approximately 20 years during the Kapolei projects development period. The area of greatest impact is in the south of the property where *A. menziesii* are concentrated.

Table 7. Conceptual Development Phasing and Impacts to Plant Clusters

Development Phase* (Conceptual)	Cluster	No. of Plants	Land Use
2005 to 2008 (North-South Road)	C-1 C-2	14 7	Roadway Drainage basins
2006 to 2008 (Kapolei Parkway Segment) Future Urban Uses (undetermined schedule)	E E	3 4	Roadway Infill Residential Uses (Future)
2005 to 2014 (DHHL Homesteads)	A B	10 14	Residential
200_ to 20__ (UHWO)**	C C, D	0 3	Campus Campus related uses
20-- to 2020 (DLNR other lands)	C-3***	38	Residential, Parks, Schools, etc.,

* Development phases are conceptual and development schedules have yet to be determined at this time.
** UHWO development schedule has not yet been established.
*** Sub-cluster C-3 incorporates the 18-acre contingency reserve which will remain in place until the short-term success criteria are met at one outplant wild population.

The implementation of the mitigation measures described herein and a phasing sequence and conceptual schedule is shown in Table 8. The schedule assumes a favorable approval of the HCP.

Table 8. HCP Implementation Schedule (Conceptual)

Phases	Actions
Interim Management Program 1998 – 2001 (Extended to 2003)	HCDCH funds Interim Management Programs - Implemented by DLNR -Test Outplant Site #1 (Koko Crater) planted (130 plants / November 2000) -Test Outplant Site #2 / Wild Site #1 (Kaena State Park) planted (April 2001) -Test Outplant Site #3 / Wild Site #2 (Honouliuli National Wildlife Refuge) (2002-2003) -Dillingham Greenhouse under construction (2002-2003) DOT deposits initial $250,000 for Years 1-5 (2001 – 2006 – in part, to conclude the interim program and to initiate the first five-year increment of HCP implementation) to DLNR to implement the HCP. [NOTE: Funds were available in August 2001 for Year 1.] -DLNR hires staff to implement the HCP
HCP Review and Approval / Federal Section 7 Consultation 2003-2004	-BLNR review/approval of HCP -DOT/DLNR establish MOA -Approval of Incidental Take License -DOT delegates $750,000 to Years 6-20 funding -Section 7 consultation initiated and concluded with USFWS
HCP Implementation 2001 – 2021	- Establish the 18-acre contingency reserve at the in situ Kapolei population - Initiate and manage additional appropriate outplanting sites - Annual reporting - analyze success criteria, reporting of progress, and applying adaptive management strategies, as appropriate - Implement all other measures identified in the HCP - Annual fiscal reporting to DOT by DLNR - Development of Kapolei projects (Conceptually described in Table 7)
Long-term Management (After 2021)	- Appropriately manage 3 established outplant wild sites

The basis for this mitigation phasing sequence, although conceptual, is the result of the initial results of the Interim Program. This is based on the successful nursery propagation and initial outplanting to the three outplanting sites (Koko Crater, Kaena Point State Park, and Honouliuli National Wildlife Refuge).

Strategy (4) Establish new populations at three off-site locations

The HCP outlines a strategy to take cuttings and collect seeds from the existing *Abutilon menziesii* plants at the Kapolei property prior to their removal and to use these materials to: 1) maintain genetic representation of the original population by growing cuttings in nurseries and placing seeds in seed storage facilities; and 2) to establish three new wild populations in protected areas elsewhere on Oahu.

Described below are the following: 1) Criteria for wild site selection, and 2) Candidate sites for outplanting

(4) 1. Criteria for Wild Site Selection

Wild sites for *A. menziesii* re-introduction is generally considered to be an area where the species, after initial planting, with the support of temporary active management measures (e.g. irrigation, control of threats, etc.), will become self-sustaining and will naturally reproduce.

To establish criteria for site selection of appropriate candidate sites on Oahu for *A. menziesii* a brief summary description of the extant populations on Lanai and Maui was made. The physical characteristics, including vegetation type/plant communities, soils, elevation, rainfall, overall site characteristics, and identified threats were analyzed.

These sites are at Kaumalapau and Puu Mahanalua on Lanai and Kalialinui Gulch and Puu o Kali on Maui. Table 9 summarizes the findings and a preliminary analysis of the findings is summarized below.

Table 9. Summary description of extant Lanai and Maui populations of *Abutilon menziesii*

Site (Location)	Site Characteristics	Vegetation type/ Plant communities	Soil type	Elevation & Annual Rainfall	Threats
Kaumalapau (Lanai)	*Abutilon menziesii* occur in scattered colonies numbering approximately 400± in the area north of Kaumalapau Road to Paliamao Gulch. The area is formerly grazed by cattle and makai of overgrown abandoned pineapple fields.	Guinea grass (2 ft. to 3 ft. tall); scattered clumps of koa haole in swales	Molokai silty clay loam (MuC) Well-drained, deep soils on uplands	1,050 ft. to 1,150 ft. amsl 20 - 25 inches between Nov. and April; hot, dry summers	-Weeds -Fire
Puu Mahanalua "Twin Peaks" (Lanai)	*A. menziesii* is found at the base of the most mauka puu along abandoned pineapple field dirt roads. Mature colony of 35± plants (observed in 2001) with plant heights ranging from 4 ft. to 7 ft. Blossoms are unique in color (pale peach) and are upright (not pendant).	Guinea grass (6 ft. to 7 ft. tall)	Uwala silty clay loam (UwC) Well-drained soils on uplands, formed in material derived from basalt. Soil temperature of 70 degrees.	1,200 ft. amsl 15 - 25 inches between Nov. and April; very little rainfall in summer	-Weeds -Fire
Kalialinui	Plants occur along the top	Open scattered koa	Keahua silty clay	690 ft. to 750	-Weeds

Gulch (Central Maui)	banks of gulch adjacent to cane haul road. Fields are in active cultivation. Population in 3 colonies. 3 mature colonies *of A. menziesii* with plants reaching heights of 7 ft. to 8 ft. tall	haole/Guinea grass	loam (KnB) Well-drained reddish brown soils on uplands weathered from basic igneous rock; 20 to 40 inches deep	ft. amsl 15 to 25 inches	-Grazing -Fire
Puu o Kali (Kihei, Leeward Maui)	Plants occur on shallow pockets of soil on aa lava flow. Generally open with scattered stands of wiliwili (*Erythrina sandwicensis*).	Native Lowland dry shrubland	Very Stony Land (rVS). Young aa lava that has a thin covering of volcanic ash that extends deep into cracks and depressions.	500 ft. to 1,400 ft. amsl 30 to 40 inches	-Weeds -Grazing -Fire -Ungulates A fencing project is underway to control the deer grazing threat.

A preliminary analysis of the extant Lanai and Maui populations is summarized in Table 10.

Table 10. Preliminary analysis of physical characteristics of extant Lanai and Maui populations

Site Characteristics	Vegetation type/ Plant communities	Soil	Elevation & Rainfall
-Leeward or southern location -Located between actively or formerly cultivated fields and scrubland -Threats include weeds, fire, and ungulates. -At Puu o Kali, deer browsing threat to seedlings (being controlled through fencing) -Fire threats, species indicated to be somewhat fire tolerant (i.e. the Kapolei population)	-Presence of and abundance of alien grasses surround stands of *A. menziesii* -Natural recruitment of seedling establishment unknown over time due to alien grass cover	-Well drained deep soils	-Elevation ranges: 500 – 1,400 amsl -Annual rainfall range generally averages 20 inches; -USFWS (1995) notes that all known populations are frequently exposed to severe drought and flooding

In addition, the following set of guidelines for re-introduction is from the World Conservation Union[5]:

Choice of re-introduction site and type

- Site should be within the historic range of the species. For a re-introduction, there should be no remnant population to prevent disease spread, social disruption and introduction of alien genes. In some circumstances, a re-introduction may have to be made into an area which is

[5]Website: www.iucnsscrsg.org

fenced or otherwise delimited, but it should be within the species' former natural habitat and range.

- An introduction outside its historical range should be undertaken only as a last resort when no opportunities for re-introduction into the original site or range exist and only when a significant contribution to the conservation of the species will result.
- The re-introduction area should have assured their long-term protection (whether formal or otherwise).

Evaluation of re-introduction site

- Availability of suitable habitat: re-introductions should only take place where the habitat and landscape requirements of the species are satisfied, and likely to be sustained for the for-seeable future. The possibility of natural habitat change since extirpation must be considered. Likewise, a change in the legal/ political or cultural environment since species extirpation needs to be ascertained and evaluated as a possible constraint. The area should have sufficient carrying capacity to sustain growth of the re-introduced population and support a viable (self-sustaining) population in the long run.
- Identification and elimination, or reduction to a sufficient level, of previous causes of decline: could include disease; over-hunting; over-collection; pollution; poisoning; competition with or predation by introduced species; habitat loss; adverse effects of earlier research or management program; competition with domestic livestock, which may be seasonal. Where the release site has undergone substantial degradation caused by human activity, a habitat restoration program should be initiated before the re-introduction is carried out.

[End: World Conservation Union text]

(4) 2. Candidate Sites

Three new populations of *A. menziesii* have been initiated and are tentatively expected to persist. As evidenced by the successful propagation by DLNR in the Interim Management Program (Strategy (1), plants grown from cuttings and seed from the in situ Kapolei population thrive and produce fruit and viable seed under nursery conditions. The results of the Koko Crater Botanical Garden (Outplant Site #1), Kaena Point State Park (Outplant Site #2 / Wild Site #1), and Honouliuli National Wildlife Refuge (Outplant Site #3 / Wild Site #2) will provide critical information for the selection of additional candidate Wild Sites. It is anticipated a total of three viable wild sites will be determined from planting at several (e.g. more than three) outplant sites to achieve the long-term goal of this HCP, therefore, additional appropriate locations will be pursued and planted while monitoring the sites already planted.

DLNR DOFAW, ESRC, and DOT have had considerable discussion from 1997 to the present (2004) in evaluating potential outplant (or release) sites. Trials at several sites for wild site viability have been initiated and have resulted in outplanting at two sites, Kaena Point State Park and the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge.

These and each future outplanting site will require active management over a 5-year period to before a determination is made on success or failure. Additional sites will continue to be pursued while existing sites are monitored, to yield three successful wild sites.

The discussions for the selection of additional wild sites include the following priority candidate site and other possible sites:

1. Priority Candidate Site
   - Diamond Head State Monument (Approved for outplanting by DLNR Division of State Parks)
2. Other Possible Sites
   - Honouliuli Kaluaa (The Nature Conservancy)
   - Kalaeloa (former Barber's Point Naval Air Station) Northern Trap and Skeet Range
   - Kalua Kauila (near Makua Valley)
   - Kealia Trail area (State DLNR) (Test planted by DOFAW)
   - Lualualei Naval Reserve
   - Makapuu Head
   - Yokohama Beach (mauka area)

The candidate site locations are shown in Figure 10 and Table 11 summarizes the sites which have been considered as candidate outplanting sites. The physical site characteristics, threats such as invasive weeds and the potential for fire, and land ownership and availability have been assessed to determine the suitability of each site as a permanent habitat for *A. menziesii*.

Table 11. Candidate sites for outplanting of *Abutilon menziesii*

Site Name/ Location	Ownership	Size (Outplant Site)	Site Characteristics	Threats / Other Relevant Comments
Diamond Head State Monument Waikiki, East Honolulu	State DLNR Division of State Parks	1 to 2 acres	-Within DLNR control -Convenient site accessibility -Controlled access -State parks master plan designates areas which are not within heavy "public transit areas" -Dry environment -Fairly deep soils -Waterline available in near proximity	-Fire -Weeds --- -Presently requires MOU between National Guard and DLNR; -National Guard to relocate from Diamond Head @ 2007-2010 -High Priority candidate site to be planted in 2004
Honouliuli Kaluaa Kunia, Waianae Mountains	Campbell Estate (The Nature Conservancy of Hawaii, Le.)	@ 0.5 acre	-Site accessible by rough dirt road and on foot -Not a public access area; however, site is used by hunters, hikers -Dry mesic forest -No waterline available	-Fire -Weeds --- -Low Priority site due to uncertainty of lease renewal
Kalaeloa Northern Trap and Skeet Range Former Barbers Point Naval Air Station, Ewa	Federal Navy	---	-Convenient site accessibility -Controlled access (to some degree) -Site is scheduled for remediation to remove hazardous materials -Dry coastal lowlands -Presence of Ewa Plains 'Akoko (Chamaesyce skottsbergii, an endangered species -Shallow soil layer on karst substrate (to be exacerbated by remediation) -Unknown Waterline availability	-Fire -Weeds, Buffel grass --- -Site is planned to be remediated to remove lead shots; top layer of soil to be removed. -Low Priority site
Kalua Kaulla Near Makua Valley	Federal Department of the Army	---	-Site access by foot -Controlled site access	-Fire -Weeds --- - Army is unwilling to allow more T&E species on its lands at this time
Kealia Trail Mokuleia (near Dillingham Nursery)	State DLNR	0.5 to 1.0 acre	-Convenient site accessibility -Public hunting and recreational area -Dry, forested environment -Moderate depth soils	-Fire -Invasive weeds --- -DOFAW's initial test planting at this site is not too positive;

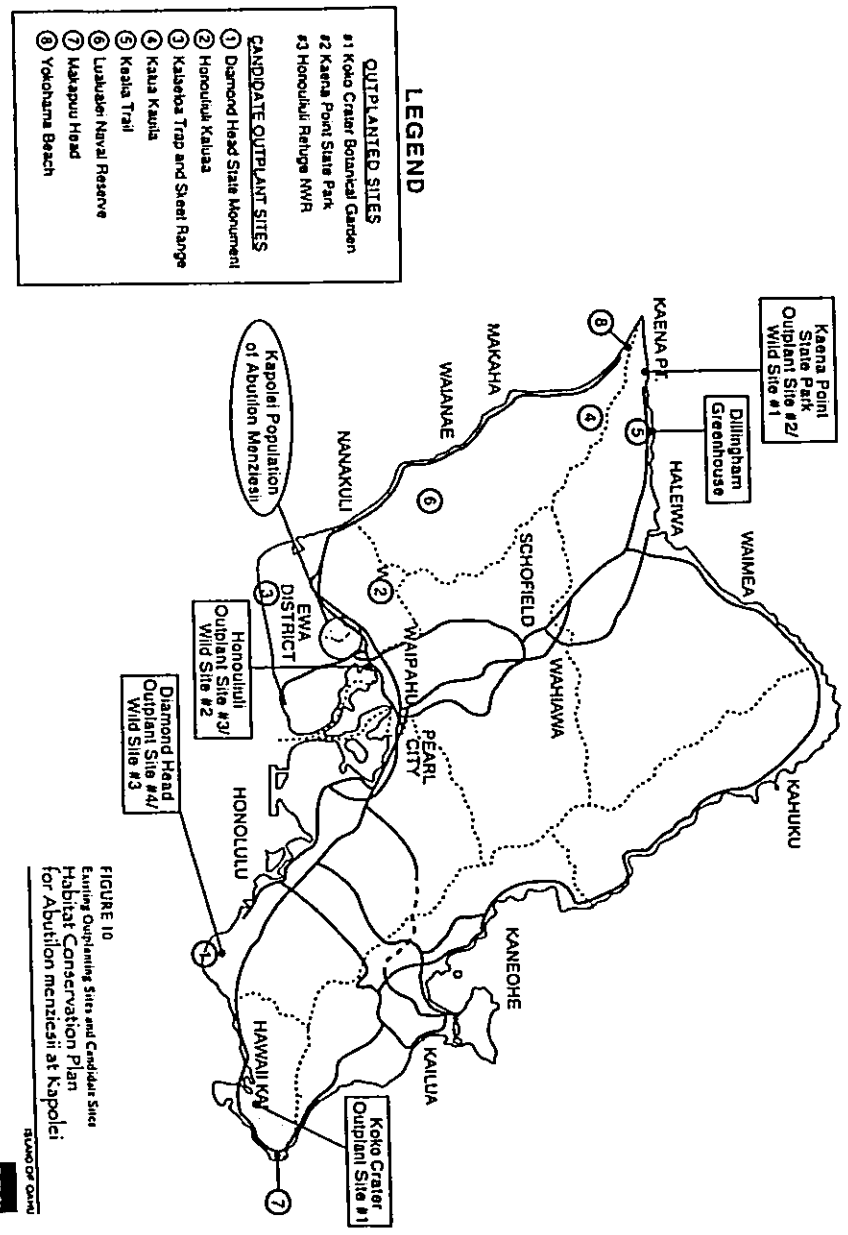


FIGURE 10
Existing Outplanting Sites and Candidate Sites
Habitat Conservation Plan
for Abutilon menziesii at Kapolei

ISLAND OF OAHU

March 2004

			-No Waterline available	-2nd site will be test planted in 2004
Lualualei Naval Reserve Waianae	Federal Navy	---	-Convenient site accessibility -Controlled access -Dry environment -Presence of *A. menziesii* (2 known) -Deep soils -Waterline available in proximity	-Fire -Weeds, Guinea grass -Navy is currently unwilling to collaborate and allow additional T&E species on its lands
Makapuu Head	State DLNR Division of State Parks	---	-Relative convenient site accessibility -Public recreational area -Dry coastal environment - Pockets of deep soils -Scattered pockets of native plant communities, including T&E species -Unknown Waterline availability	-Fire threat -Weeds, koa haole scrub, Guinea grass -Limited salt spray -Uncontrolled access (public recreational area)
Yokohama Beach (Within Kaena Point State Park) Leeward Coast (North of Makaha)	State DLNR Division of State Parks	0.5 to 1.0 acres	-Convenient site accessibility -Public recreational area -Dry coastal environment - Deep soils -Unknown Waterline availability	-High fire threat -Weeds, Guinea grass -Uncontrolled access (public recreational area) -Salt spray during kona weather

The priority candidate site, Diamond Head State Monument, is located at Waikiki in East Honolulu and is under DLNR Division of State Parks jurisdiction. The Diamond Head State Monument Master Plan includes areas which will remain as wildlands which may be appropriate for *A. menziesii* introduction. This site has been approved by the Division of State Parks.

From a biological perspective, the Lualualei Naval Reservation environment is a preferred site with appropriate microclimate, soil conditions, and protected status. Moreover, the site is believed to be an historic range of *Abutilon menziesii* with two individuals present at the NCTAMS PAC Radio Transmission Facility and is monitored by Navy staff (R. Miyashiro, personal communication). However, the current position of the Navy precludes the introduction of additional protected species at this location. Follow-up communication with the Navy will resume after the approval of the HCP.

Important considerations in the selection of each site include the following:

- Generally all sites may be exposed to fire threats, therefore, a site specific fire protection plan will be developed for each site – as part of the site assessment /selection process. The fire plan will include identification of the following: 1) fire fighting resources, 2) response responsibilities, 3) location of water resources, and 4) plans for fire breaks and fuel control.

- All sites that persist are to be considered permanent sites, therefore, future urbanization within and adjacent to the sites must be analyzed and landowner commitments for preservation must be secured.

Strategy (5) Long term protection and maintenance of permanent *Abutilon menziesii* populations

As described in this HCP and in the MOA between DOT and DLNR (Appendix H), the funds for a 20-year period for active management, protection, and maintenance of three permanent outplant sites have been partially delegated by DOT and will be supplemented after the approval of the HCP. Additionally, DOT agrees with the need for management of three wild sites beyond 20 years. Therefore, as described in Strategy (2), the funds for such management will be derived from two sources: 1) Interest earned (estimated at $440,000) on the delegated amounts of $950,000, and 2) Contingency Fund revenues (a portion of $200,000).

A further responsibility for long-term protection and maintenance of the permanent outplant sites after the HCP active management period of 20 years requires the commitment of Landowners of three outplant sites. The property owners will be required to commit to maintaining land uses that are compatible with the protection and management of the *Abutilon menziesii* populations on their property. Thus, the site selection process has analyzed criteria such as landownership status and potential future urbanization pressures on the candidate sites.

The MOA funher states, "DLNR has the knowledge, expertise, and permanent presence needed to implement the mitigation of threatened and endangered species and agrees to implement the mitigation of threatened and endangered species and agrees to implement the management of the *A. menziesii* mitigation populations as outlined in the HCP".

Protection and Management of Wild Sites. The protection and management of the of the wild sites 3 will be funded through the monies contributed by DOT and earmarked for *A. menziesii* and as described in the MOA "Exhibit A - Scope of Services" includes the following:

A. Maintain three wild populations. The purpose of the populations is to allow for natural seedling recruitment and establish long-term viability of all three populations.

B. Propagation of a total representation of plants through cuttings from the Kapolei *Abutilon menziesii* population. These plants will be used to maintain genetic representation of stock and provide stock for outplanting purposes.

C. Administration: 1) Prepare biannual reports of progress and findings, and 2) Maintain adaptive management strategy as needed to improve plant recovery and success.

D. At the end of the contract period, DLNR shall prepare a summary final report, providing recommendations for future actions and possible alternatives, if any, based upon documented findings and results.

Strategy (6) Appropriate research

The research component would augment the research and testing measures described in Task 4 of Strategy (1): Interim Management Program which includes biological research, testing, and identification of testing parameters.

Research would focus on the "cultivation methods" of *A. menziesii* to attain the goal of establishing three viable new outplant sites. A review of past research studies would be made and appropriately applied to this project as situations arise at the various outplant site. The need would be determined by DLNR.

Research may include studies of various aspects of life history, habitat, pollinators, reproductive biology, optimum requirements for growth, requirements for population viability, and control of threats to better understand the requirements necessary for perpetuation of these plants. Such additional knowledge would allow more appropriate management and assessment techniques to be developed.

6.1 Collect diagnostic data on crucial associated ecosystem components.

1) Composition of flora and invertebrate, bird, and other fauna populations within the existing clusters to gain an understanding of any relationships between these organisms and *A. menziesii*.

2) Comparison of such information collected over time correlated with data from monitored populations of *A. menziesii* in known locations to provide insight into the required and/or preferred habitat for the species.

6.2 Study various aspects of growth of *A. menziesii*.

1) Growth and mortality of seedlings, cuttings, transplanted parent plants;

2) Growth of mature plants, including seasonal changes, optimum conditions and limiting factors;

3) Seasonal differences in temperature and light needs;

4) Water sources and requirements; and

5) Soil and nutrient requirements.

6.3 Study reproductive viability.

1) Breeding systems including self-compatibility;

2) Pollination vectors; and

3) Preferred conditions for flowering and seed set.

6.4 Determine the degree of threats posed by the nature of interactions with selected diseases/ introduced species.

Determine mechanisms of impact of diseases or pests. If diseases or introduced pests with negative impacts on *A.menziesii* are discovered, effects and mechanisms of each would be

determined. Research into mechanisms of impact of alien species, and any others that may be threats, would be performed as deemed necessary.

6.5 Determine effective control methods to combat insect pests that may adversely affect the species.

6.5.1 *Determine effective control methods for pests.* If the pests are determined to pose a threat to *A. menziesii*, research into effective control methods for these pests would be undertaken, ensuring that the control measures do not adversely affect this species.

6.5.2 *Determine effective control methods for hibiscus scale on Abutilon menziesii.* If the hibiscus scale is determined to pose a threat to *A. menziesii*, research into effective control methods for the hibiscus scale on the appropriate *A. menziesii* species would be undertaken, ensuring that the control measures do not adversely affect this species.

6.6 Other appropriate research to be considered.

Potential research would also be considered for the following:

1) Testing adult plants, seedlings, and seeds for salt tolerance via soil and salt spray; and

2) Conducting studies (or researching) off-island populations of *A. menziesii* to gain an understanding of how these populations function.

The decision to implement any additional research would be subject to other funding availability and a determination that these studies would directly significantly benefit the Kapolei population and the outplant sites as described in this HCP.

6.7 Currently ongoing research.

A research project by the University of Hawaii (Cliff Morden, principal investigator) is currently ongoing as a research component of the HCP. The research is to assess the extent of the genetic variation within the Ewa population of *Abutilon menziesii*. A genetic analysis of all plants from the Ewa population (at the Kapolei site or at outplanting/nursery sites) will be carried out. A limited number of individuals from other populations of *A. menziesii* (Lualualei, Oahu; Lanai, and Hawaii) will be sampled to determine affinities of the Ewa population. This research will address the extent of the genetic variation of the Ewa population, if this population is genetically distinct from other existing populations, and if genetic distance among plants correlate with the physical distance between plants. Random amplified polymorphic DNA (RAPD) markers will be used to assess the genetic diversity among individual plants. All population genetic distances will be statistically evaluated and will be compared to results from similar studies. Assessment of the genetic variation of the Kapolei population of *A. menziesii* will provide information allowing managers to make more informed management decisions concerning selection of source material for outplanting, collection, and storage of propagules to ensure representation of existing genetic material. The final report will include the following items:

1) Collection information for individuals
2) Description of methods
3) Results and discussion of genetic analyses

4) Statement regarding intra-population variation of *Abutilon menziesii* and its genetic relation to other populations

The requirements of soil collection and storage may not be practical or feasible and collection is unproven as a means to mitigate the seed bank when compared to the successful collection of seeds and vegetative cuttings from the Kapolei population. Therefore, soil collection and banking is left to be exercised at the discretion of DLNR.

SECTION 4

Identify those measures or actions to be undertaken to protect, maintain, restore, or enhance the ecosystems, natural communities, or habitat types within the plan area; a schedule for implementation of the actions or measures, including monitoring, that are to be undertaken in accordance with the schedule.

(4a) Measures or actions to be undertaken to protect, maintain, restore, or enhance the ecosystems, natural communities, or habitat types

Short-term and long-term measures and actions which would affect the existing *Abutilon menziesii* population have been described in detail in Section 3. The strategies outline the measures and actions of the HCP for the existing habitat, the interim management period, and the long-term period at the offsite outplant mitigation populations.

(4b) A schedule for implementation of the proposed measures and actions.

The schedule for implementation of the proposed measures and actions is described in detail in Section 3, Strategy (3).

All of the populations of *A. menziesii* have been and will be periodically monitored throughout each of the phases of the HCP Implementation Schedule. Monitoring of the *in situ* and reintroduction populations will be conducted to determine progress toward attaining taxon stability. Monitoring will also be conducted to assess the status of the management unit relative to control of alien taxa and to habitat restoration. In addition, monitoring is an essential and integral part of adaptive management, which will be undertaken and is more thoroughly described in Section 8.

Strategy (7) Kapolei Population strategies

An objective of the HCP over its 20-year program would allow the removal of the Kapolei population and relocating the full genetic resource to three offsite protected locations on Oahu. To assure that the short-term success criteria are met before the full population is removed (as described in Section 7 Table 13) an 18-acre area within the Kapolei population is established as a temporary contingency reserve. This area is shown in Figure 11, as well as on Figure 5.

An additional "Special Condition" to the State Incidental Take License to be issued to accompany the "Habitat Conservation Plan for Abutilon menziesii at Kapolei" would state, "No take or development can occur within the 18-acre area that surrounds the core *Abutilon menziesii* concentration within the area identified as Cluster C3 in the "Habitat Conservation Plan for *Abutilon menziesii* at Kapolei" until such time that one outplanting site has met short-term success criteria described in the HCP."

Management of the 18-acre reserve may include measures such as temporary fencing and firebreaks. If an outplanting site does not meet the short-term success criteria, this could be considered as a wild site.

Incidental Take

DLNR, as the property owner, will be responsible for the Kapolei population until the Kapolei projects are fully entitled and prior to the transfer of land to the Kapolei project developers. A stipulation of the transfer of the property would be the issuance of an Incidental Take Permit by DLNR to enable the removal of the Kapolei population plants to the outplant sites. The cost to remove and upkeep these "original plants" will be from the funds provided by DOT or from contributions to the Endangered Species Trust Fund. The costs associated with the transplanting of original plants would be from the allocations to each of the three wild sites.

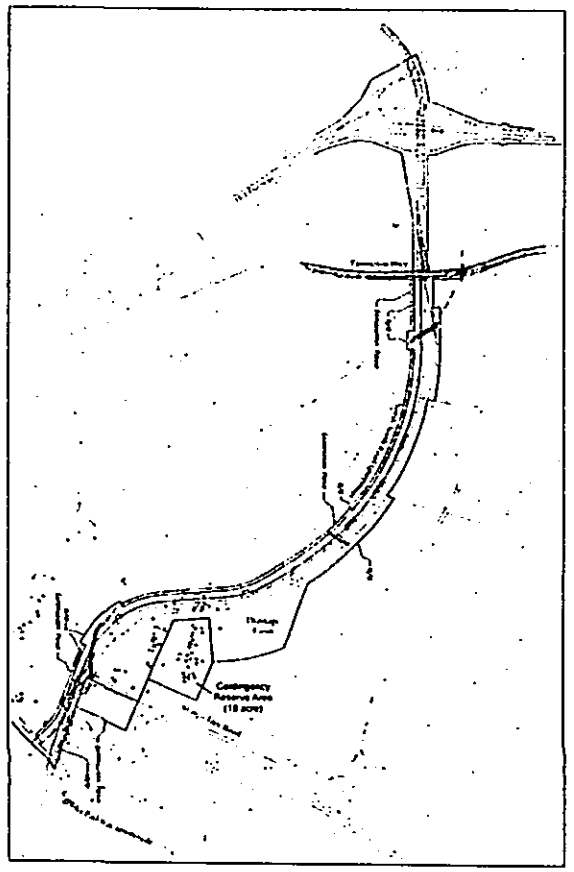
The City and County of Honolulu will issue a right-of-entry permit to DLNR DOFAW to collect propagules and conduct appropriate monitoring of the *A. menziesii* individuals (as described in this HCP) on the City property. However, the City will have overall responsibility for the plants on its property.

Prior to the construction of the North-South Road and removal of *A. menziesii*, DOT personnel will be consulting with DLNR regarding the location and treatment of the endangered plants along the project corridor.

Mitigation of the Seed Bank

To mitigate the seed bank at Kapolei, DOFAW has collected seeds and cuttings from approximately 75±% of all baseline plants. The uncollected 25±% is the due to plants lost through attrition, etc..

Mitigation of the seed bank will focus on seed storage at Lyon Arboretum, vegetative propagation at the new Dillingham Nursery, and the living genetic bank at Koko Crater Botanical Garden. The documentation of the Lyon Arboretum collection is accessed at the following website: http://www.hawaii.edu/scb/docs/science/seed/seedtabl.html



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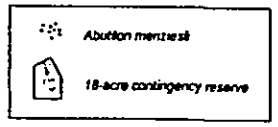
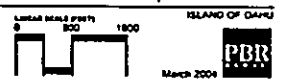


Source: R.M. Towill Corporation

FIGURE 11
18-Acre Contingency Reserve Area
Habitat Conservation Plan
for Abutilon menziesii at Kapolei



SECTION 5

Be consistent with the goals and objectives of any approved recovery plan for any endangered species or threatened species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area.

The preparation of the subject HCP involved the review of the *Lanai Plant Cluster Recovery Plan* (USFWS 1994) which includes *Abutilon menziesii* as one of nine endangered taxa. Appropriate guidelines are incorporated into the strategies contained herein.

Abutilon menziesii is considered to be a "long-lived" perennial and known or believed to have a life-span greater than 10 years (USFWS 1994, page 69). Conversely, "short-lived" perennials are those known or believed to have life spans greater than 1 year but less than 10 years. There are fewer than 700 *A. menziesii* individuals on Lanai, Maui and Hawaii; Oahu is listed as a possible location (USFWS 1994).

The Lanai Recovery Plan states the most serious threats as browsing and trampling by introduced ungulates, and competition from alien plants. Other threats include fire, seed predation, loss of pollinators and disease. Additional threats noted on Maui and Hawaii include agricultural and urban development.

The presence of the Kapolei population validates that the Leeward Oahu (and possibly Lualualei) and Ewa areas as historic ranges for the species. Threats to the subject population at Kapolei included agricultural cultivation until 1994 and impending urbanization as described herein.

The Lanai Recovery lists five necessary actions: 1) Protect habitat of current populations and manage threats, 2) Conduct research essential to conservation of the species, 3) Expand current populations, 4) Establish new populations as needed to reach recovery objectives, and 5) Validate and revise recovery objectives.

The total estimated cost of recovery for one (of nine) species in the Lanai Recovery Plan is estimated at $3,000,000 over a period of 20 years. The date of recovery (for all nine species) for downlisting to Threatened would be in 2015, if recovery criteria are met (USFWS 1994, page v.).

The Kapolei population is expected to be taken and relocated to the three new outplant sites where threats will be actively managed, research conducted, and populations expanded over the 20 year period. To implement the HCP measures, a funding commitment has been made, as described in the Memorandum of Agreement (Exhibit G) between DOT and DLNR for approximately $50,000 per year for a period of 20 years. Moreover, a commitment to implement the strategies of the HCP has been made by DLNR.

As indicated, there are no other endangered or threatened species in the East Kapolei area. However, remaining, in situ *Abutilon menziesii* will be maintained and protected onsite by DLNR until they are to be taken and relocated to the wild, outplanted sites, as described under Task 1 of Section 3, Strategy (1). In addition, an objective of this plan is the establishment of outplanting sites, which may become "plan areas" which may have other endangered species, and the coordination of these recovery efforts will also be performed by DLNR.

The mitigative measures of this HCP will contribute towards the USFWS Recovery Objective to delist this species. The criteria to meet the Recovery Objective of delisting are summarized below.

Table 12. Recovery Objectives of the Lanai Recovery Plan and HCP Objectives

Objectives	Lanai Recovery Plan	Associated HCP Actions
Interim Objectives	Stabilizing the existing populations: To be considered stable, each taxon must be managed to control threats (e g. fenced) and be represented in an ex situ collection. In addition, a minimum total of three populations should be documented on Lanai and, if possible, at least one other island where they now occur or occurred historically. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 25 mature individuals per population for long-lived perennials.	HCP goal is to establish 3 new ex situ wild populations on Oahu from the original degraded canefield population at Kapolei. At the new populations, threats from fire, vehicles, insect and weed pests, are to be controlled.
Downlisting	Taxon may be downlisted when a total of five to seven populations are documented on Lanai and at least one other island where it now occurs or occurred historically. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with minimum of 100 mature individuals per population for long-lived perennials. Each of these populations must persist at this level for at least 5 consecutive years before downlisting is considered.	Presently, 830 progeny from cuttings and seeds, representing the full range at Kapolei have been propagated and planted at two outplant sites (Kaena Point and Honouliuli) and at Koko Crater Botanical Garden, which serves as a repository for the full genetic range of the Kapolei population. The next outplant site is anticipated to be on State land at Diamond Head Monument. Additional sites are being evaluated and will be selected for outplanting after all clearances are received. The goal is to achieve at least three sites which meet the success criteria described herein.
Delisting	Taxon may be delisted when a total of 8 to 10 populations are documented on Lanai and at least one other island where it now occurs or historically occurred. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 100 mature individuals per population for long-lived perennials. Each population should persist at this level for at least five consecutive years before delisting is considered.	The funding for the HCP is provided by DOT and implementation of the HCP is by DLNR as described herein.

SECTION 6

Provide reasonable certainty that the ecosystems, natural communities, or habitat types will be maintained in the plan area, throughout the life of the plan, in sufficient quality, distribution, and extent to support within the plan area those species typically associated with the ecosystems, natural communities, or habitat types, including any endangered, threatened, proposed, and candidate species known or reasonably expected to be present in the ecosystems, natural communities, or habitat types within the plan area.

The ecosystems, natural communities or habitat types of the Kapolei property are described in Section 1(b). Studies by Nagata (1996) and Char (1997, 1997, 2003, 2004) indicate that, for the most part, the landscape and ecological conditions are typical of fallowed sugarcane fields at other Oahu locations. It should also be noted that other listed, endangered species have not been discovered in this area, and the interdependency of any organism with *A. menziesii* has not been established at this point.

As described in Section 3, Strategies (1) and (4), the establishment of three new outplant wild populations is a major goal of this HCP, as such, there will ultimately be three "plan areas". Several more potential outplant sites are planned, in order to achieve a minimum of three successful sites.

A primary purpose of the Interim Management Program was to preserve the genetic resource at the Kapolei population and to test the viability of outplanting at appropriate offsite locations. This represents the initial task towards providing a reasonable certainty that the natural Kapolei community of *A. menziesii* will be maintained. The initial results of the Interim Management Program are a positive indication that new plants can successfully be grown from seeds and cuttings and potentially, new populations can be established at appropriate offsite locations to maintain a habitat for this species. At the Kaena Point outplant site, a coastal strand community including approximately 20 native species has been initiated and seedling recruitment has been reported.

The initial results indicate that with continued management there is reasonable certainty that *A. menziesii* from the original Kapolei population could be established as a natural community. However, a final assessment will require continued management over time.

SECTION 7

Contain objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration, or enhancement of the ecosystems, natural communities, or habitat types; time frames within which the goals are to be achieved; and provisions for monitoring (such as field sampling techniques) and evaluating progress in achieving the goals quantitatively and qualitatively.

(7a) Objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration or enhancement of the ecosystems, natural communities, or habitat types

The primary objective of the HCP is the continued survival of the Kapolei genetic stock of *Abutilon menziesii* through the establishment of three offsite wild populations and one offsite repository site from the degraded canefield population at Kapolei. To achieve this goal, several sites will be outplanted, managed, and monitored for a period of five years before a determination is made whether a site has met the success criteria described herein. The short- and long-term goals are summarized in Table 13:

Table 13. HCP Short-term and Long-term Goals

	Goals
Short-Term Goals	1) Propagate the full complement of lineages of the in situ Kapolei population of *Abutilon menziesii*. 2) Establish a cultivated repository of the full complement of lineages of Kapolei *A. menziesii* at Koko Crater Botanical Garden. 3) Establish two test outplantings of *A. menziesii* at appropriate sites. 4) Represent the full complement of lineages of the in situ Kapolei population at all sites. 5) Establish and maintain an 18-acre contingency reserve area within the Kapolei population until the short-term success criteria are met at one wild outplant site.
Long-Term Goals	1) Maintain three new stable wild populations of *A. menziesii* by out-planting at several (more than three) appropriate sites. 2) For each wild population maintain an effective population of 120 flowering and seed producing plants (minimum of 100 mature individuals) over the term of the HCP. This number will assure an approximate 75 to 100 percent increase of the original population in each location and is five times that recommended by the Hawaii and Pacific Plants Recovery Coordinating Committee (as cited in USFWS 1998). 3) Monitoring of the outplanted populations will be conducted to determine progress toward attaining population stability. 4) The goal for seedling survival rate will be on average in the 10 - 25 percent range over a five year period taking into consideration the many variables related to achieving stability of reintroduced populations. "Survival rate" is defined as survival of individual plants for a minimum of one year. 5) Natural recruitment shall occur in all wild populations not dependent upon artificial management such as irrigation.

(7b) Time frame within which goals are to be achieved

At this time, the goals are anticipated to be achievable within the 20-year timeframe of the HCP. Following the 20-year period of active implementation and management, subsequent monitoring and any necessary management actions would be undertaken through a separate agreement with DLNR (or other qualified organization), for a period of time to be specified by DLNR and the Endangered Species Recovery Committee, until the final determination is made that the three outplant sites are firmly established.

(7c) Provisions for monitoring and evaluating progress in achieving the goals quantitatively and qualitatively

The criteria to measure success of the HCP actions include short-term, long-term, and overall criteria as described in Table 14.

Table 14. Measurable Criteria for Monitoring and Evaluating Progress of Goals

	Success criteria
Measurable Short-Term success criteria	1) At least 25% of the full complement of lineages outplanted in a population must survive for 2 years after irrigation is ceased. 2) During the first 5 years after each wild population is established there must be (a) recruitment of seedlings that survive through the dry season, and (b) seed production by at least 25 % of the full complement of outplanted lineages after irrigation is ceased.
Measurable Long-Term Success Criteria	1) At least 80 reproducing adult plants will be present in each population, averaged over a five-year period after irrigation is ceased. 2) The number of seedlings recruiting into the mature age class must be greater than the mortality rate of existing adult plants, averaged over a five-year period after irrigation is ceased.
Overall Success Criteria	If both Long-Term Success Criteria are met and there are more than 120 reproducing adult plants present at the end of a 5-year period at a site (including at least 40 plants recruited from the seed bank on site) then no additional management action will be required for that site as part of the HCP and only monitoring need continue over the following 5-year period.

Strategies which have been completed or are in progress - including Strategies (1) and (4) - have demonstrated promising initial results of the HCP actions. Approximately 850 plants have been propagated by DLNR and outplanted to three sites. At this time the 1,000 percent increase in total number of Kapolei-derived plants over the original baseline of 93 plants is a positive preliminary indicator of establishing three ex situ wild populations.

An annual reporting process is required by Chapter 195D-21(f), HRS, which states, "Participants in habitat conservation plan shall submit an annual report to the department within 90 days of each fiscal year ending June 30, that includes a description of activities and accomplishments, analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the HCP, areas needing technical advice, status of funding, and plans and management objectives for the next fiscal year, including any proposed modifications thereto." In addition, monitoring will occur throughout the term of the HCP (as described in Section 8 below) and a report will be issued annually with a major assessment at each 5th year increment.

DOT intends to engage the services of DLNR to implement the strategies described in this HCP. DLNR, through the implementation of Strategy (1), has demonstrated the viability of propagating *Abutilon menziesii* and documented this in a progress report (Appendix F) and a final report (Appendix G).

SECTION 8

Provide for an adaptive management strategy that specifies the actions to be taken periodically if the plan is not achieving its goals.

Adaptive management is a strategy that allows for the change of management activities described in the HCP to ensure that the goals and accompanying success criteria of the HCP are achieved. Information from monitoring activities and other sources (e.g., research) will be used to evaluate whether the biological goals and success criteria of the HCP are being achieved and may be used to refine the design, scope, or implementation of the management actions described in the HCP.

Monitoring of the outplanting sites, which are intended to be self-sustaining, wild populations of *Abutilon menziesii*, as well as propagation and outplanting methods, and an examination of threats will be conducted to determine progress toward attaining the short-term and long-term goals and success criteria of the HCP. Monitoring will also be conducted of the Kapolei population of *A. menziesii* to track (e.g., survival, mortality, reproduction) live plants, including new recruits, remaining on site in order to maintain a complete representation of the genetic diversity of this population. Modifications to the management of the Kapolei population and outplanting sites will be made based on the results of the monitoring program and as research results in new information regarding *A. menziesii* (e.g., crucial ecosystem components, growth aspects, reproductive viability, outplanting methods, threat control methods, salt tolerance, genetics, seed bank dynamics).

The monitoring protocols are for various aspects of the HCP, as modified from the Makua Implementation Plan's Appendix E. Each monitoring protocol provides a description of the: 1) monitoring objectives; 2) monitoring methods and data analysis; 3) monitoring activity; and 4) potential management activities to be implemented in response to the information gathered.

Final decisions to change certain management actions will be approved by the DOT and DLNR DOFAW. DLNR DOFAW will determine which actions require additional recommendations by the ESRC.

There are five monitoring protocols which are described below:

- ***MONITORING PROTOCOL 1 – Monitor Individuals of Abutilon menziesii in the Kapolei Population***
- ***MONITORING PROTOCOL 2 – Conduct Phytosanitation Monitoring in Greenhouse Facilities***
- ***MONITORING PROTOCOL 3 – Assess Status and Stability of Outplanted Populations***
- ***MONITORING PROTOCOL 4 – Conduct Phytosanitation Monitoring at Outplanted Populations***
- ***MONITORING PROTOCOL 5 – Monitor Success of Outplanted Individuals***

The monitoring protocols are described in detail below.

MONITORING PROTOCOL 1 – Monitor Individuals of Abutilon menziesii in the Kapolei Population

Type of activity: Monitoring – As a goal of the Habitat Conservation Plan for *Abutilon menziesii* at Kapolei ("HCP") to provide a complete representation of the genetic diversity and survival of the Kapolei population of *A. menziesii*.

Description: Conduct monitoring of the survival of the Kapolei population; to determine phenology; and to collect propagules for storage, propagation, or experimentation.

Applicable for: *Abutilon menziesii* within the Kapolei population.

Management goals: Determine a window when collection of propagules is highly probable. Successfully collect an adequate number of propagules to achieve the goals for the HCP (e.g., complete representation of the genetic diversity of the Kapolei population). Manage to maintain the existence of the Kapolei population (i.e., survival of existing individuals and additional recruits until take occurs).

Preliminary sampling objectives: Be sure that the window for collection will ensure successful seed collection if plants reproduce.

Management response: Adjust schedule according to phenology patterns of *A. menziesii* for seed collection.

Area to monitor: The Kapolei population of *A. menziesii*, with the purpose of locating mature individuals from which propagules will be collected.

Monitoring framework: Conduct a complete survey of all individuals in the Kapolei population to determine if or when they would be flowering or fruiting.

Data to collect: Data will be collected following the Hawaii Rare Plant Restoration Group ("HRPRG") rare plant monitoring format. Record location information (map and/or GPS coordinates) as needed for any new mature individuals of *A. menziesii* found in the Kapolei population.

1. Record reproductive status of all individuals – record presence of fruit (mature or immature), and flower (buds or opened) and numbers of individuals with each.
2. Collection information – Record any collections made, assign numbers to plants sampled, designate purpose for collection before collecting. This information should follow all propagules throughout its life.

Data analysis methods: No statistical analyses are needed for this protocol. All data resulting from the field surveys should be entered into a database and GIS.
Data collection interval: Visit the Kapolei population quarterly to determine phenology or visit at

time of year when reproduction expected.

MONITORING PROTOCOL 2 – Conduct Phytosanitation Monitoring in Greenhouse Facilities

Type of activity: Monitoring - A component of the HCP to establish three wild, self-sustaining *A. menziesii* populations on Oahu.

Description: Maintain phytosanitation monitoring at the nursery designated for out-planting to ensure it is not contaminated with new pathogens or other pests of concern (Appendix 2.2 Phytosanitation Standards and Guidelines from the Makua Implementation Plan may be used as a reference).

Applicable for: Plants to be outplanted as part of establishing a wild, self-sustaining population of *A. menziesii* on Oahu.

Management goal: To prevent any introduction of pathogens or other pests of concern from the greenhouse (*ex situ*) environment into the out-planted site.

Preliminary sampling objectives: Be certain that pathogens or other pests of concern do not visibly contaminate the majority of the greenhouse plants proposed for outplanting.

Management response: If pathogens or pests are discovered within the lot of plants designated for outplanting, treat all of the plants with an appropriate pesticide and quarantine for longer period of time; reexamine the plants prior to any future outplanting.

Group to monitor: All of the individual plants proposed for outplanting.

Monitoring framework: Examine all individual plants proposed for outplanting.

Data to collect:

1. Presence or absence of pathogens or pests of concern – Record outbreaks of pathogens or pests of concern.

2. Identify type of pathogen present – Identify type of pathogen present. If pathogen is not controlled, then make a further identification by identifying pathogenic symptoms, document via photo and collect sample for analysis.

Data analysis methods: No statistical analyses are needed for this protocol. However, it is essential that a proper random sample be taken of all of the plants that are in the proposed outplanting lot unless all plants are to be examined.

Data collection interval: Data must be collected during the growing period and prior to outplanting. Monitoring should be conducted during the life of the plant in the propagation growing facility at least bi-weekly. The sampling must be done just before planned outplanting date because any lag between inspection and planting may allow for new pathogens to become established.

MONITORING PROTOCOL 3 – Assess Status and Stability of Outplanted Populations

Type of activity: Monitoring - A component of the HCP to establish three wild, self-sustaining *A. menziesii* populations on Oahu.

Description: Conduct initial baseline survey and continuing monitoring program for *A. menziesii* within each outplanted population to assess its status relative to the goals and success criteria identified in the HCP. Additionally, determine if the demographic structure of each outplanted population will be able to meet the overall goal and long-term success criteria of the HCP. Data will be collected on the distribution, abundance, status (vigor), population structure, and phenology of plants sampled, as well as evidence of damage by alien animal species (e.g., insects, rats, slugs) within an outplanted population.

Applicable for: Each outplanted population of *A. menziesii* on Oahu intended to be a wild, self-sustaining population.

Management goal: Manage each outplanted population to achieve the specified number of mature, reproducing individuals, and duration as specified in the HCP.

Preliminary sampling objectives:

1. Be certain that the number of mature plants capable of reproduction in each outplanted population is equal to or greater than the minimum number specified in the HCP to achieve the short-term success criteria.
2. Determine if demographic structure of outplanted population appears to be adequate to sustain a viable population of *A. menziesii* over time based on comparison of number of individuals in life-stage classes with predicted model of a stable population for *A. menziesii*.

Management response: If population stability is not achieved, one or more of the following responses are appropriate: 1) continue with the same management program for a longer time, 2) intensify threat control, 3) implement species augmentation, or 4) select another location to establish a wild, self-sustaining population.

Area to monitor: Systematic survey of all of the individuals in each outplanting population. Individuals must be within 500 meters of another plant of the same taxon to be considered to be part of that population.

Pilot studies: It is important to emphasize that the suggestions that follow regarding monitoring framework, data to collect, and data analysis methods are preliminary suggestions that need to be developed following completion of pilot studies in the outplanting populations. Pilot studies will be used to collect data that will be used to refine the protocol relative to variables which will be sampled, plot size and shape, sampling framework, number of samples to be taken, monitoring interval, and data analysis methods to be used.

Sample unit: Outplant population.

Monitoring framework: Either of several survey strategies may be used initially to establish the monitoring framework for this protocol. Continue to use that strategy for subsequent monitoring of the population.

1. Census of plants in the outplanted population. All individuals within an outplanted population will be located and data collected as specified below.

Data to collect: The fields described below are included in the HRPRG's Rare Plant Field Data Form, which may be used for data collection in this monitoring protocol.

1. Location of individuals – this would be quadrat number if sampling conducted along contiguous-plot belt transect, or GPS coordinates (UTM Zone 4, NAD 83 datum base) if using cluster sampling strategy. Some of the individuals in the population may be uniquely identified and tagged to help with collection of propagules or to allow for the collection of data on the progress of individuals through size or stage classes. Where GPS points cannot be used to locate individuals, the position of individuals will be hand-drawn in relationship to local landmarks and topography.

2. Number of individuals - use the following life-stage classes as defined for *A. menziesii*: *seedlings*; *immature individuals*; and *reproductively mature individuals*. Each of these classes must be determined for *A. menziesii*. For most outplanted populations, all of the mature plants will be located and counted.

3. Vigor of all individuals in the following classes: *healthy* – foliage appears green and vigorous, less than 10% dead leaves or defoliation; *moderate* – some chlorosis or deformity (e.g., curled, extremely small, insect damage) may be seen in the leaves, 10-50% dead leaves or defoliation; *poor* – most leaves may be dead or chlorotic or deformed, 50% dead leaves or defoliation; *dead* – no live foliage or woody tissue.

4. Evidence of damage from alien animals: data will also be recorded on the presence or sign of damage on the sampled plants from alien animals, particularly invertebrates, rats, or slugs.

5. Phenological stage: record data on the presence of *buds, flowers, immature fruits, mature fruits,* or *vegetative state* for each plant, or if the plant is *vegetative*, or *dormant*. This information will be summarized for the population as a whole.

Data analysis methods:

1. In many cases all of the individuals within an outplanted population will be enumerated so direct comparisons of the resulting numbers will be made with the specified short-term and long-term goals and success criteria of the HCP.

Data collection interval: Data should be collected on the status of each outplanted population annually. It would be ideal if data collection could coincide with time of fruiting by the plants to better evaluate seed set and to allow for collection of additional propagules, if needed, at the same

time. In any case data should always be collected at the same month of the year for a specific outplanted population.

MONITORING PROTOCOL 4 – Conduct Phytosanitation Monitoring at Outplanted Populations

Type of activity: Monitoring - A component of the HCP to establish three wild, self-sustaining *A. menziesii* populations on Oahu.

Description: Maintain baseline inventory for pathogens at outplanted populations and phytosanitation monitoring on outplanted individuals to determine if they are contaminated by new pathogens or other pest species of concern (Appendix 2.2 Phytosanitation Standards and Guidelines from the Makua Implementation Plan may be used as a reference).

Applicable for: All outplanting sites on Oahu and outplanted individuals of *A. menziesii*.

Management goal: To detect and control any introduction of a pathogen from the greenhouse (*ex situ*) environment into the outplanted site.

Preliminary sampling objectives: Be certain that all outplanted individuals are not visibly contaminated by pathogens or other pest species of concern, and other individuals within the vicinity of the outplanting site are not contaminated above the baseline as a result of the outplanting. Pathogens or pest species of concern must be identified by an expert.

Management response: If pathogens or other pest species of concern are discovered on outplanted individuals, there are options: !) eliminate the problem with an appropriate control technique and continue to monitor in the field, or 2) remove contaminated plants from reintroduction site and treat the contaminated planting sites with an appropriate pesticide to eliminate the problem in the field. Additionally, if contaminated plants are found in the field, it is necessary to reevaluate the greenhouse phytosanitation monitoring protocol to determine why it failed and to make modifications to that protocol if needed.

Group to monitor: All of the individual plants that were outplanted, as well as a sample of other plant taxa within the outplanting area.

Monitoring framework: 1) Examine all individual plants that were outplanted. 2) Conduct a pilot study to determine the extent and number of plants to be examined for pathogens or other pest species of concern within the study area.

Data to collect:

1. Presence or absence of pathogens or pests of concern – Record outbreaks of pathogens or pests of concern.

2. Identify type of pathogen present – Identify type of pathogen present. If pathogen is not controlled, then make a further identification by identifying pathogenic symptoms, document via photo and collect sample for analysis.

Data analysis methods: No statistical analyses are needed for this protocol.

Data collection interval: Data should be collected on the status of plants at each outplanting site monthly for the first three months and then every three months to complete first year.

MONITORING PROTOCOL 5 – Monitor Success of Outplanted Individuals

Type of activity: Baseline survey and monitoring – A component of the HCP to achieve the short-term and long-term goals and success to achieve three wild, self-sustaining populations *A. menziesii* populations on Oahu.

Description: Monitor germination and/or survival, growth, reproduction, and phenology of all individual plants that have been outplanted or introduced as seeds for *A. menziesii* in an area. The results of this short-term monitoring will be used to develop or refine techniques that maximize the survival of individual plants that are outplanted into the wild. Additionally the information will be the basis for determining how many individuals need to be planted if augmentation of the outplanted population is needed.

Applicable for: Plants or seeds outplanted to sites intended to meet the goal of being a wild and self-sustaining population. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Management goals: 1) Determine germination and/or survival of plants, and 2) document horticultural methods used for propagation and outplanting (i.e., cuttings, mound layering, seeding, size of pot, etc.).

Preliminary sampling objectives: 1) Track lineages of outplanted individuals to aid in determining if complete genetic diversity of the Kapolei population is represented in the outplanted populations. 2) Track survival rate of outplanted individuals.

Management response: 1) The results of monitoring plant growth relative to the different horticultural treatments will be used to help predict or refine the results of the plant survival analysis. The results of the analysis of survival will also be used to determine or refine the projected number of individuals to outplant for *A. menziesii* to achieve a specified number of plants that will become part of the reproductive pool.

Area to monitor: Complete outplanted population.

Monitoring framework: All outplanted individuals will be maintained.

Data to collect:

1. Percent germination of planted seeds: When seeds are planted as a outplanting strategy, the number of individuals that germinate will be counted in a specific seed sowing block within the

outplanted site. Percent germination will be calculated by dividing the number of germinants by the total number of seeds planted.

2. Vigor will be recorded for all sampled individuals in the following classes: *healthy* – foliage appears green and vigorous, less than 10% dead leaves or defoliation; *moderate* – some chlorosis or deformity (e.g., curled, extremely small, or insect damage) may be seen in the leaves, 10-50% dead leaves or defoliation; *poor* – most leaves may be dead or chlorotic or deformed, 50% dead leaves or defoliation; *dead* – no live foliage or woody tissue.

3. Phenological stage: Record data if the plant is vegetative, reproductive, or dead.

4. Damage to Plants: Any obvious damage to the plants from ungulates, rodents, or insects will be identified and recorded when each of the sampled plants is examined and measured. This information may be useful in helping to understand reduced vigor or death of some of the plants that have been outplanted.

Data analysis methods:

1. Data collected in general will be used as a measure of the short- and long-term goals and the measurable short- and long-term success criteria, and vigor or survival of individual plants will be analyzed using a contingency table design.

Data collection interval: The first data collection time for this protocol will be just prior to moving plants out of the greenhouse and into the outplanting sites. During the first six months, data on germination (if seeds are used for outplanting) and/or survival of the plants will be assessed at least three times during this initial period. The next sampling time will be 12 months after seed sowing or planting, and thereafter the plants will be monitored annually.

Adaptive management options to consider include, but are not limited to:

- increasing or decreasing the number of plants outplanted into a site annually during the initial reintroduction phase
- (re)initiating reintroduction or augmentation efforts for a particular population unit;
- intensifying or changing post-planting care (e.g., watering)
- increasing or decreasing the control of specific threats as indicated by threat monitoring

Final decisions to change management actions must be approved by the DOT and DLNR DOFAW. In addition, detailed adaptive management strategies will continue to be prepared in consultation with DLNR and USFWS.

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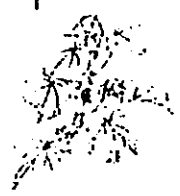
Personal Communications: Vickie Caraway, William Garnett, Randy Miyashiro, Joel Moribe, Nelli Sugii

Appendix A
Biological Survey
K. Nagata
(September 1996)



EAST KAPOLEI MASTER PLAN
BIOLOGICAL SURVEY

Prepared by: Kenneth H. Nagata
For: PBR Hawaii
17 September 1996

INTRODUCTION

The project site occupies approximately 1300 acres in Honouliuli, Ewa District, Oahu. It encompasses the former sugar cane lands mauka of Varona Village from approximately 60' elevation, up to Farrington Highway. Two sections extend mauka to the H-1 Freeway. The west is bordered by the Kapolei development and the east boundary runs through abandoned sugar cane fields.

Ripperton and Hosaka (1942) classified the vegetation of the region as one of lowland shrub with a coastal fringe of kiave trees (Prosopis pallida). Because of the arid conditions of the region the vegetation cover is generally sparse. Dominant shrubs include klu (Acacia farnesiana), koa-haole (Leucaena leucocephala) and 'ilima (Sida fallax) and the herb layer generally consists of annual grasses such as bristly foxtail (Setaria verticillata), swollen fingergrass (Chloris barbata) and feather fingergrass (Chloris virgata). In the foothills mauka of the flat lowlands where rainfall is more abundant the vegetation is denser and the herb layer includes Spanish needle (Bidens pilosa), false mallow (Malvastrum coromandelianum), cockelbur (Xanthium strumarium) and pili (Heteropogon contortus) in addition to the annual grasses of the lowlands.

Several recent surveys have been conducted in certain portions of the subject property and in the adjacent lands. In 1990 Funk completed a biological survey of the land immediately east and makai of the project site, including the village of Ewa (Funk 1990). Among the vegetation types recognized were Sugar Cane Fields, Ruderal Fields and Fallow Fields. These communities were characterized by actively cultivated sugar cane fields, abandoned cane fields, common "weedy" introduced plants and lowland wayside species including those mentioned by Ripperton and Hosaka (1942). Similer vegetation was found in the region immediately east of the subject property where common wayside species including koa-haole, Guinea grass (Panicum maximum) and cultivated and abandoned sugar cane fields were found to be prevalent (Funk 1994). Many of these same species were also present in the area between Varona Village and the golf course just makai of the project site (Nagata 1996) and in Kaloi Gulch (Nagata 1994).

METHODS AND MATERIAL

A walk-through survey was conducted in all plant communities between mid-September and early October, 1996 to determine the floristic compostition of the project site. Transects were established throughout the site and all plants observed were recorded and their relative abundance determined. In conjunction

with the plant survey ancursory inventory of animals was also made. All birds and mammals observed along the transects were recorded and listening posts were established at regular intervals. No quantitative analyses was attempted, however, and nests were not investigated.

RESULTS

FLORA

Virtually all of the lowlands and foothills in the Ewa-Honouliuli region has been altered by the cultivation of sugar cane. In the past several years certain lands have been taken out of sugar and put to other use, eg. diversified agriculture, urbanization, fallowing. Consequently, the vegetation of these lands are entirely secondary and the vegetation in the region is largely determined by the history of cultivation (or disturbance) on each individual parcel of land, ie. how long the cane field has been abandoned, whether the land was recently tilled, etc. Based mostly on these criteria, eight plant communities were recognized. Although these are drawn with discreet boundaries on the vegetation map it must be remembered that such finite boundaries do not exist in nature. Rather, each community exists as a continuum wth one blending into another. Furthermore, the survey was conducted during the dry season. Species composition and vegetational cover will differ somewhat during the rainy season.

Abandoned Cane Fields (ACF)

This is the largest vegetation type in the project site, representing the most recently abandoned sugar cane fields. Here, sugar cane generally accounts for about 50% of the total vegetational cover. In some areas the cane is 15' tall, robust and still very dense. In most areas, however, the cane is senile, less than 7' tall and accounts for as little as 30% of the total vegetational cover. In fields that have been abandoned for a longer period or where growing conditions were not optimal the clumps of cane are mostly dead or dying. Even in these fields these decrepit clumps are still in distinct rows. The vegetation between clumps usually consist of a mixed herb cover of 'ilima, Guinea grass, radiate fingergrass (Chloris radiata), 'uhaloa (Waltheria indica), hoary abutilon (Abutilon incanum), fuzzy rattlepod (Crotalaria incana), peria (Momordica charantia var. abbreviata) and nut grass (Cyperus rotundus). Total vegetational cover is generally about 75-90%; only where the cane is vigorous and dense is the cover up to 100%.

In some areas such as along the Ewa boundary fence the abundance of cane

is very low and the vegetation approaches that of the Fallow Fields. Here the vegetation is more open with more exposed ground. 'Ilima, 'uhaloa, peria, hoary abutilon and little bell (Ipomoea trilobs) are abundant.

Fallowed Fields

The Fallowed Fields are those sugar cane fields which have been abandoned for such a long time that almost no living cane remain. Dead and dying clumps generally constitute less than 5% of the total cover. Dead cane stalks may litter the ground and planting furrows may still be evident but these fields are often difficult to recognize as sugar cane fields without close examination. Two Fallowed Fields subcommunities were recognized depending on the relative abundance of grasses.

(7) Fallowed Fields Mixed Herb Association (Fmh)

Typically the vegetation in this community is less than 4' tall and consists of a mixture of 'uhaloa, radiate fingergrass, 'ilima, hoary abutilon, false mallow, buffelgrass (Cenchrus ciliaris), golden crown-beard (Verbesina encelioides) and coat buttons (Tridax procumbens). Small isolated stands of dying cane occur in certain portions of this community. Small patches of Guinea grass and/or radiate fingergrass can also be found. These grasses along with swollen fingergrass (Chloris barbata), sourgrass (Digitaria insularis) and Natal redtop (Rhynchelytrum repens) are especially common in the mauka portions of this community. Along the road delineating the makai boundary the vegetational cover is only about 50%. Pa'uohi'iaka (Jacquemontia ovalifolia) is common in this open area. Several stands of dead or dying cane also occur here.

(3) Fallowed Fields Grassland Association (Fg)

In certain areas the fallowed cane fields are dominated by Guinea grass and/or radiate fingergrass. Almost no standing cane remain although the furrows are still more or less intact and fallen cane stalks are occasional throughout the community. In most areas the grass cover is 100% but small communities and individuals of 'ilima, hoary abutilon and false mallow are scattered through certain portions and swollen fingergrass and sourgrass are common in other areas.

(A) Abandoned Fields (A)

Several former cane fields in the mauka portion along Palehua Road and between Farrington Highway and the H-1 Freeway have been tilled or graded sometime in the past. The ground is quite level with few stones and although some sugar cane is resprouting the planting furrows are gone. These fields were probably planted in some crop in years past but are now overgrown with mostly 'uhaloa, fuzzy rattlepod,

nut grass and little bell. In one field mauka of Farrington Highway Guinea grass is abundant but in most of the Abandoned Fields this species is not quite so prevalent. Re-sprouting sugar cane is also common in the mauka portion of this field. Golden crown-beard, peria and hoary abutilon are common in some of the fields.

(C) Cultivated Fields (C)

Cultivated Fields are fields which have been recently plowed, actually planted in a crop (other than sugar cane), or which have been put to some urban use. Of the five fields designated as Cultivated Fields, three have been recently plowed. The vegetation in these consist mostly of seedling little bell, peria, fuzzy rattlepod, 'uhaloa, castor bean (Ricinus communis), graceful spurge (Chamaesyce hypericifolia) and re-sprouting nut grass. Vegetational cover is about 25-50%. In two fields watermelons (Citrellus lanatus) have been planted and along the Ewa boundary fence an approximately two-acre site has been graded and turned into a parking lot. Approximately half of this field has been paved with gravel. Most of the vegetation in this portion consist of Amaranthus viridis and nut grass. The vegetation in the ungravelled portion consist of peria, nut grass, 'uhaloa, radiate fingergrass, false mallow and re-sprouting sugar cane.

(6) Grasslands (GR)

Grasslands represent those lands which apparently have not been tilled, graded or planted in any crop including sugar cane. This community exists only on the steepest slopes just makai of the H-1 Freeway and is the smallest of all the vegetation types in the project site. The vegetation is one of Guinea grass 1-2' tall with emergent klu, koa-haole, and kiawe. On eroded slopes, 'ilima, false mallow, 'uhaloa, Beorhavia coccinea, garden spurge (Chamaesyce hirta) and virgate mimosa (Desmanthus virgatus) are found in small numbers.

(1) Gulch Association (GU)

Kaloi Gulch together with its tributary Hunehune Gulch represents the only natural drainage system in the project site. The vegetation in the gulches is characterized by extremely dense stands of Guinea grass 5-10' tall. So dense is this layer that very few other species are present. In the makai portion the predominant arborescent species is castor bean which grows to about 15' height. Koa-haole 20-30' tall replaces castor bean as the dominant overstory in the mauka sections of the gulch system. In the mauka portion of Hunehune Gulch ivy gourd (Coccinea grandis) is abundant, often completely enshrouding the Guinea grass and koa-haole. Paragrass (Brachiaria mutica), wood rose (Merremia tuberosa),

moon flower (Ipomoeaalba) and peria are also found but only in small to moderate numbers.

(4) Roadside Vegetation (R)

Numerous plant species are found along the paved and gravel roads. More species are found in this community than in any other in the project site. Guinea grass and radiate fingergrass are abundant,. 'Uhaloa and nut grass are also found in large numbers and many other species including castor bean, fuzzy rattlepod, buffelgrass, graceful spurge, virgate mimosa, peria, lion's ear (Leonotis nepetifolia), Australian saltbush (Atriplex semibaccata), goosegrass (Eleusine indica), Natal redtop (Rhynchelytrum repens) and stinkgrass (Eragrostis cilianensis) are found in smaller numbers. This is not considered a significant plant community and its total area is very small.

Native Plant Communities

As a result of decades of sugar cultivation, virtually all of the vegetation in the project iste is secondary in nature. Of the 99 plant species recorded two are indigenous ('ilima, pa'uohi'iaka), two are probably indigenous ('uhaloa, hoary abutilon) and one is endemic (ko'oloa'ula, Abutilon menziesii). Of these, 'ilima, 'uhaloa and hoary abutilon are dominant or co-dominant in several plant communities and are significant elements in the vegetation in the site as a whole. Pa'uohi'iaka is found in small to moderate numbers in four vegetation types and is common in certain areas in the Fallowed Fields Mixed Herb community. It frequently grows in association with 'ilima, 'uhaloa and hoary abutilon. They do not, however, represent native plant communities. Rather, these native or possibly native species are well adapted to arid lowlands and are able to recolonize disturbed sites.

Except for ko'oloa'ula, all of the native species in the site are common lowland species in Hawaii. Ko'oloa'ula, on the other hand, is a rare and endangered species once endemic to Lanai, Maui, Oahu and Hawaii. It is now extinct on Hawaii.

Endangered Species

At least 38 individuals of the federally listed endangered species ko'oloa'ula were recorded from the site. Most of these (28) were in the Abandoned Cane Fields, six were in the Fallowed Fields Mixed Herb Association and four were in the Fallowed Fields Grassland Association. Approximate locations are indicated on Figure 2. All of these plants were healthy and most were flowering and/or fruiting.

Ko'oloa'ula was first submitted for listing as an endangered species in 1976 (Fed. Reg. 1976). The Endangered Species Act Amendments of 1978 required that the list of candidates for endangered status be withdrawn after two years and in 1979 ko'oloa'ula was withdrawn from consideration (Fed. Reg. 1979). In 1980 it was resubmitted as a top priority Category 1 Candidate (Fed. Reg. 1980) and in 1985 the U.S. Fish and Wildlife Service proposed to list it as an endangered species (Fed. Reg. 1985). On Sept. 26, 1986 it was formally listed (Fed. Reg. 1986) and is now protected under the provisions of the Endangered Species Act of 1973, as amended, and the Hawaii State Revised Statutes.

Significant wild populations of ko'oloa'ula are found on Lanai and Maui but its occurrence on Oahu is somewhat of an enigma. It was known from a single plant discovered in an abandoned sugar cane field mauka of Hawaii Raceway Track at Barbers Point in 1981 and more recently from another individual at the Lualualei Naval Magazine (D. Herbst, pers. comm.). Both of these occurrences as well as the current discovery are from highly disturbed environments. The Barbers Point location is approximately four miles from the project site and the Lualualei site is at least 15 miles away. Ko'oloa'ula was not found in any of the prior surveys in the immediate area (Funk 1990, 1994; Nagata 1994, 1996).

FAUNA

Mammals

No mammals were observed in the site. It is probable, however, that field mice (Mus musculus), mongoose (Herpestris auropunctatus) and one or more species of rats (Rattus spp.) are found in the property. In addition, pig trails were observed in several plant communities.

Birds

Seventeen species of birds were observed in the site. To be considered a sighting, the individual must be observed perched or on the ground and not merely flying overhead. In addition, owl pellets were found in the Fallowed Fields Grassland Association community. It is not known, however, whether these are from the barn owl (Tyto alba) or pueo (Asio flammeus). Fifteen species are introduced, one is a common migratory species (Pacific golden-plover) and one is indigenous (Black-crowned night heron).

ARDEIDAE

Cattle egret (Bubulcus ibid)

Eight individuals were observed in the Abandoned Fields mauka of Farrington

Highway. On 4 October the Abandoned Field community immediately makai of the Cultivated Field east of Palehua Road was being plowed. Nearly 100 cattle egrets were seen feeding in the freshly tilled ground.

Black-crowned night heron (Nycticorax nycticorax)

Two young birds were flushed out of Hunehune Gulch near Plantation Road. As there was no water in either Hunehune Gulch or Kaloi Gulch it is not known whether these individuals are residents of the area or whether they are transients. The black-crowned night heron is indigenous to Hawaii.

CHARADRIIDAE

Pacific golden-plover (Pluvialis dominica)

The Pacific golden-plover is a migratory species which commonly spends its winters in Hawaii. Many were observed in the site. Thirty-two were counted in exposed areas in the Abandoned Cane Fields. Most of these were in the open site near the Ewa boundary. Twenty-six were observed in various areas in the Fallowed Fields Mixed Herb Association - six of them from the exposed areas near the makai boundary road. Twenty-six were seen in the Cultivated Areas. Of these, 20 were in the "parking lot" at the Ewa boundary.

COLUMBIDAE

Rock dove (Columba livia)

Three were observed in the exposed sections of the Fallowed Field Mixed Herb Association in the makai portion of the site.

Barred dove (Geopelia striata)

Many were seen in all but two vegetation types. They were most abundant along the paved roads.

Lace-neck dove (Streptopelia chinensis)

This is the most widespread species in the property. It was found in moderate numbers in all vegetation types.

FRINGILLIDAE

Red-crested cardinal (Paroaria coronata)

Three individuals were seen in koa-haole shrubs along Plantation Road.

Kentucky cardinal (Richmondena cardinalis)

One individual was seen in the Fallowed Fields Mixed Herb Association.

PHASIANIDAE

Francolin (Francolinus sp.)

About a dozen were seen in the Abandoned Cane Fields near Kaloi Gulch in the makai portion of the property. These birds ran and hid too quickly for a positive identification to species.

Ring necked pheasant (Phasianus colchicus)

Three pairs were flushed from the Abandoned Cane Fields and one pair was flushed from the Abandoned Fields along Palehua Road.

PLOCEIDAE

House finch (Carpodacus mexicanus)

About 20 were seen in the property, mostly along the roadways.

Orange-cheeked waxbill (Estrilda melpoda)

These were seen in small numbers in the Fallowed Fields Mixed Herb Association, Abandoned Fields and along the roadways.

Black-headed mannikin (Lonchura malacca)

Black-headed mannikins were seen in moderate numbers in the Abandoned Cane Fields, Fallowed Fields communities and along the roadways.

Rice bird (Lonchura punctulata)

Rice birds were seen in moderate to small numbers in all but two plant communities. They were most common along the roadways and in the Fallowed Fields Grassland Association.

PYCNONOTIDAE

Red-vented bulbul (Pycnonotus cafer)

The red-vented bulbul was the second most widespread species in the site. It was found in small to moderate numbers in all vegetation types except the Cultivated Fields.

STURNIDAE

Common mynah (Acridotheres tristis)

Only three were seen in the Abandoned Cane Fields in the makai portion of the property.

ZOSTEROPIDAE

Japanese white-eye (Zosterops japonicus)

Japanese white-eyes were found in small numbers mostly along the roadways.

SUMMARY

The vegetation in the project site consists of sugar cane, lowland shrubs and herbs and grasses. The vast majority of the 99 species recorded from the property is non-native. Only three native species (one endemic, two indigenous) and two possibly indigenous species were encountered but with the exception of the endemic ko'oloa'ula these were present in moderate to large numbers. Native species constitute a rather significant element of the vegetation. However, no native plant communities are present. As a result of decades of sugar cultvation the vegetation is entirely secondary and the native ('ilima, pa'uohi'iaka) or possibly native (hoary abutilon, 'uhaloa) species which are so common in the site are merely recolonizing an already completely altered habitat. According the the U.S. Fish and Wildlife Service the endangered species ko'oloa'ula can also be included as secondary in origin.

The various plant communities in the site serve as an excellent refuge and feeding site for 17 bird species. Fifteen are introduced urban, field or game birds, one is indigenous (black-crowned night heron) and one is a common migratory species (Pacific golden-plover). Many of the birds including the plover are present in moderate to large numbers.

The proposed project will result in the loss of large numbers of 'ilima, pa'uohi'iaka, 'uhaloa and hoary abutilon. These are all common lowland species and theirs is not considered a significant loss to the native flora. The project will also result in the loss of habitat for a large number of Pacific golden-plovers and two black-crowned night herons. At least 38 individuals of the endangered ko'oloa'ula will be affected by the project. The disposition of these will be determined through consultation with the State of Hawaii Division of Forestry and Wildlife as prescribed by the Hawaii Endangered Species Law.

RECOMMENDATIONS

Because of the presence of the federally endangered ko'oloa'ula in the project site, consultation with the Hawaii State Department of Land and Natural Resources Division of Forestry and Wildlife is required under the provisions of the State Endangered Species Law before any grubbing can commence. Similar discussions with the U.S. Fish and Wildlife Service is also recommended. These consultations will essentially determine the fate of the proposed project and what mitigating measures will be required to preserve the ko'oloa'ula.

The plant survey was conducted at 80% coverage and although a more intensive search was conducted in the vicinity of each ko'oloa'ula there is a high probability that more individuals are present in the site. It is therefor recommended that a 100% survey be undertaken in selected areas as indicated in Figure 2.

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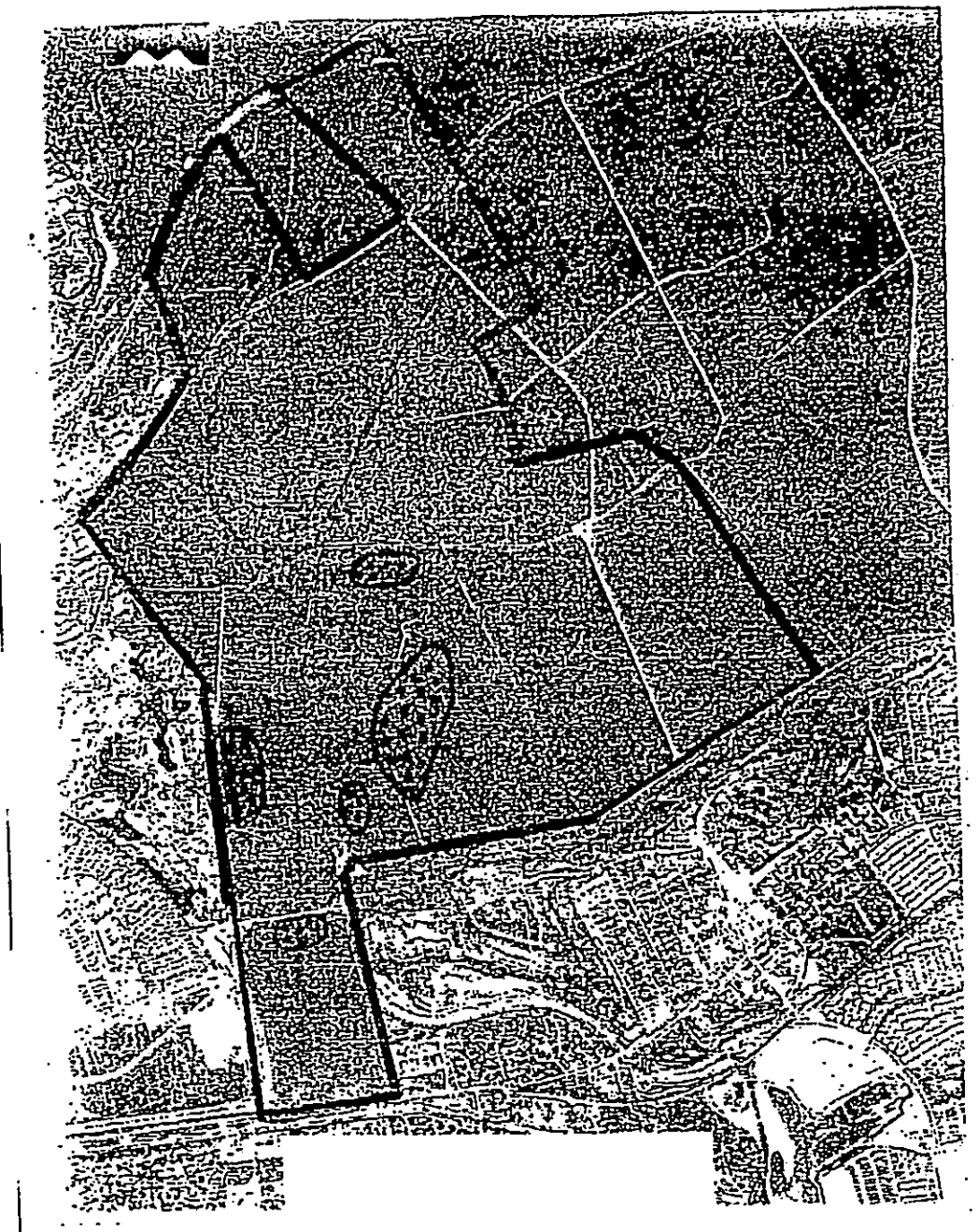

PLANT SPECIES CHECKLIST

Families are arranged alphabetically in two groups: Monocotyledons and Dicotyledons. Genera and species are arranged alphabetically within each family. Taxonomy, common names and status follow those of Neal (1965), St. John (1973) or Wagner et. al. (1990). The abundance determinations are relative and are subject to the judgement of the investigator.

EXPLANATION OF SYMBOLS

Species Status:

- E – Endemic to the Hawaiian Islands, ie. occurring naturally nowhere else in the world.
- I – Indigenous, ie. native to the Hawaiian Islands but also occurring naturally elsewhere.
- X – Exotic (alien), ie. plants introduced after the Western discovery of the islands.
- P – Polynesian introductions; ie. plants introduced before the Western discovery of the islands.

Relative Abundance Ratings:

- A – ABUNDANT, generally the major or dominant species in a given area.
- C – COMMON, generally distributed throughout a given area in large numbers.
- O – OCCASIONAL, generally distributed through a major portion of a given area, but in small numbers.
- U – UNCOMMON, observed uncommonly but more than 10 times in a given area.
- R – RARE, observed 2 to 10 times in a given area.

Vegetation Types:

- ACF – Abandoned Cane Fields
- Fmh – Fallowed Fields Mixed Herb Association
- Fg – Fallowed Fields Grassland Association
- A – Abandoned Fields
- C – Cultivated Fields
- GR – Grasslands
- GU – Gulch Association
- R – Roadside Vegetation

ANIMAL SPECIES CHECKLIST

Families are arranged alphabetically and genera and species are arranged alphabetically within each family. Taxonomy follows that of Berger (1981). Quantitative techniques were not employed and thus only presence is recorded in each vegetation type.

EXPLANATION OF SYMBOLS

Species Status:

- M – Migratory species.
- I – Indigenous, ie. native to the Hawaiian Islands but also occurring naturally elsewhere.
- X – Exotic (alien), ie. animals introduced after the Western discovery of the islands.

Vegetation Types:

- ACF – Abandoned Cane Fields
- Fmh – Fallowed Fields Mixed Herb Association
- Fg – Fallowed Fields Grassland Association
- A – Abandoned Fields
- C – Cultivated Fields
- GR – Grasslands
- GU – Gulch Association
- R – Roadside Vegetation

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS	RELATIVE ABUNDANCE							
			ACF	Fab	Fd	A	C	CS	CU	E
CYPERACEAE										
Cyperus rotundus L.	Nut grass	I	-	-	-	-	-	-	-	C
POACEAE			R	C	O	C	C	-	-	C
Bothriochloa saccharoides (Sw.) A. Camus	Pitted beardgrass	I	-	-	-	-	-	-	-	-
Brachiaria mutica (Forssk.) Stapf	Paragrass	I	R	-	-	-	-	-	-	-
Cenchrus ciliaris L.	Buffelgrass	I	-	R	-	-	-	-	-	-
Chloris barbata (L.) Sw.	Swollen fingergrass	I	-	-	-	-	-	-	-	-
C. radiata (L.) Sw.	Radiate fingergrass	I	C	C	C	C	C	R	C	C
Cynodon dactylon (L.) Pers.	Bermuda grass	I	C	C	C	C	C	R	C	C
Digitaria insularis (L.) Mez ex Ekman	Sourgrass	I	-	-	-	-	-	-	C	-
Echinochloa crus-galli (L.) P. Beauv.	Barnyard grass	I	C	C	C	C	C	-	C	C
Eleusine indica (L.) Gaertn.	Goosegrass	I	C	C	C	C	C	-	C	C
Eragrostis cilianeusis (All.) Link	Stinkgrass	I	C	C	C	C	C	-	C	C
E. tenella (L.) P. Beauv. ex Roem. & Schult.	Japanese lovegrass	I	-	-	-	-	-	-	-	-
Leptochloa panicea (R. Brown) Ohwi.		I	R	-	-	-	-	-	-	-
Panicum maximum Jacq.	Guinea grass	I	-	-	-	-	-	-	-	-
Paspalum conjugatum Berg.	Natal redtop	I	C	C	C	A	C	-	C	C
Rhynchelytrum repens (Willd.) Hubb.	Sugar cane	I	C	C	C	A	C	-	C	C
Saccharum officinarum L.	Weedy foxtail	I	-	-	-	-	-	-	-	-
Setaria verticillata (L.) P. Beauv.	Johnson grass	I	-	-	-	-	-	-	-	-
Sorghum halepense (L.) Pers.		I	-	-	-	-	-	-	-	-
DICOTYLEDONS										
ANACARDIACEAE										
Schinus terebinthifolius Raddi	Hog plum	I	C	C	C	C	C	-	C	C
Spondias purpurea L.	Christmas berry	I	-	-	-	-	-	-	-	-
Toxicodendron striatum (Ruiz & Pav.) Kuntze		I	-	-	-	-	-	-	-	-
ASCLEPIADACEAE										
Calotropis gigantea (L.) W.T. Aiton	Crown flower	I	-	-	-	-	-	-	-	-
ASTERACEAE			R	R	-	-	-	-	-	-
Bidens pilosa L.	Spanish needle	I	-	-	-	-	-	-	-	-
B. pilosa var. *minor* (Bl.) Sherff		I	-	-	-	-	-	-	-	-
Conyza bonariensis (L.) Cronq.	Hairy horseweed	I	C	C	C	C	C	-	C	C
Emilia fosbergii Nicolson	Flora's paintbrush	I	C	C	C	C	C	-	C	C
Pluchea carolinensis (Jacq.) G. Don		I	-	-	-	-	-	-	-	-
Sonchus asper (L.) Hill	Prickly lettuce	I	-	-	-	-	-	-	-	-
S. oleraceus L.	Indian fleabane	I	-	-	-	-	-	-	-	-
Tridax procumbens L.		I	C	C	C	C	C	-	C	C
Youngia japonica (L.) DC.	Smartweed	I	C	C	C	C	C	-	C	C
Zinnia peruviana (L.) L.	Prickly poo chinella	I	C	C	C	C	C	-	C	C

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS	RELATIVE ABUNDANCE							
			ACF	Fab	Fd	A	C	CS	CU	E
ASTERACEAE										
Bonchus oleraceus L.	Sow thistle	I	R	-	-	-	-	-	-	-
Tridax procumbens L.	Coat buttons	I	C	C	C	C	C	-	C	C
Verbesina encelioides (Cav.) Benth. & Hook.	Golden crown-beard	I	C	C	C	C	C	-	C	C
Xanthium strumarium L.	Cocklebur	I	R	-	-	R	-	-	-	R
BIGNONIACEAE										
Spathodea campanulata Beauv.	African tulip	I	R	R	-	-	-	-	-	-
BORAGINACEAE										
Heliotropium procumbens var. *depressum* (Chan.) Fosb.		I	-	-	-	-	-	-	U	-
CAPPARACEAE										
Cleome gynandra L.	Wild spider flower	I	-	-	-	-	-	-	-	U
CHENOPODIACEAE										
Atriplex semibaccata R. Br.	Australian saltbush	I	-	-	-	R	-	-	-	-
B. suberecta Verd.		I	-	-	-	R	-	-	-	-
CONVOLVULACEAE			C	U	-	-	-	-	-	U
Convolvulus arvensis L.	Field bindweed	I	-	-	-	-	-	-	-	-
Ipomoea alba L.	Moon flower	I	C	C	-	-	U	-	-	U
I. cairica (L.) Sweet	Lemis	I	C	C	-	-	U	-	-	U
I. obscura (L.) Ker-Gawl.		I	C	C	-	-	U	-	-	U
I. triloba L.	Little bell	I	C	C	-	-	U	-	-	U
Jacquemontia ovalifolia (Choisy) M. Hallier	Fo'ooki'oiki	I	C	C	-	-	U	-	-	U
Merremia aegyptia (L.) Urb.	Hairy merremia	I	C	C	-	-	U	-	-	U
M. tuberosa (L.) Rendle	wood rose	I	C	C	-	-	U	-	-	U
CUCURBITACEAE										
Citrullus lanatus (Thunb.) Matsum. & Nakai	Watermelon	I	-	-	-	-	-	-	-	-
Cucumis anguria (L.) Naud.	Tyo squash	I	-	-	-	-	-	-	-	-
Cucumis dipsaceus Ehrenb. ex Spach	Vanual squash	I	-	-	-	-	-	-	-	-
Momordica charantia L. var. *abbreviata*	Paria	I	-	-	-	-	-	-	-	-
FABACEAE										
Chamaecrista hirta (L.) Miller	Garden senna	I	-	-	-	-	-	-	-	-
C. hrevicalycina (L.) Miller	Graceful senna	I	-	-	-	-	-	-	-	-
C. nictitans (L.) Moench		I	-	-	-	-	-	-	-	-
Leucaena esculenta J.A. Harms	Mexican tree plant	I	-	-	-	-	-	-	-	-
L. leucocephala (Lam.) de Wit	Kaliko	I	-	-	-	-	-	-	-	-
Pisiana grandis L.	Castor bean	I	-	-	-	-	-	-	-	-
FABACEAE										
Acacia farnesiana (L.) Willd.	Klu	I	-	-	-	-	-	-	-	-
Cassia sp.		I	-	-	-	-	-	-	-	-
Chamaecrista nictitans (L.) Moench	Jumpseed top	I	-	-	-	-	-	-	-	-
Crotalaria incana L.	Fuzzy rattlepod	I	-	-	-	-	-	-	-	-
C. pallida Aiton	Smooth rattlepod	I	-	-	-	-	-	-	-	-
Desmanthus virgatus (L.) Willd.	Virgate plumep	I	-	-	-	-	-	-	-	-

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS			RELATIVE ABUNDANCE							
					ACP	Fab	Fg	A	C	CR	CU	R
FABACEAE												
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	I			-	-	-	-	-	-	-	U
Erythrina sp.		I			-	-	-	-	-	-	R	R
Indigofera spicata Forsk.	Creeping indigo	I			-	-	-	-	-	-	-	U
I. suffruticosa Mill.	Indigo	I			U	U	U	R	-	-	-	U
Lablab purpureus (L.) Sweet	Bractath bean	I			R	R	-	-	-	-	-	U
Leucaena leucocephala (Lam.) de Wit	Ice-hawk	I			U	U	U	U	-	O	A	R
Macroptilium lathyroides (L.) Urban	Cow pea	I			U	U	-	-	U	-	-	R
Pithecellobium dulce (Roxb.) Benth.	'Oyiama	I			R	R	-	-	-	-	-	R
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	Kiawe	I			-	R	-	-	-	R	-	U
Senna occidentalis (L.) Link	Coffee senna	I			-	R	-	-	-	-	-	-
Vigna sesquipedalis Wight	Long bean	I			R	-	-	-	-	-	-	-
LAMIACEAE												
Leonotis nepetifolia (L.) R. Br.	Lion's ear	I			O	U	R	U	U	U	-	U
MALVACEAE												
Abutilon grandifolium (Willd.) Sweet	Hairy abutilon	I			-	-	-	-	-	U	-	U
A. incanum (Link) Sweet	Hairy abutilon	II			C	C	C	O	R	U	-	-
A. mauritani Benn.	Ko'olau'ola	I		ENDANGERED	U	R	-	-	-	-	-	-
Malvastrum coromandelianum (L.) Garcke	False mallow	I			O	C	O	O	C	U	-	O
Sida ciliaris L.		I			-	-	-	-	-	-	-	U
S. fallax Walp.	'Ilima	I			C	A	C	U	-	U	-	U
S. rhombifolia L.	Cuba jute	I			-	U	-	-	-	-	-	U
S. spinosa L.	Prickly sida	I			-	U	-	R	-	U	-	U
MORACEAE												
Morus sp.		I			R	-	-	-	-	-	-	-
NYCTAGINACEAE												
Boerhavia coccinea Mill.		I			O	O	R	U	U	U	-	U
PASSIFLORACEAE												
Passiflora foetida L.	Love-in-a-mist	I			U	-	U	O	R	U	-	U
PORTULACACEAE												
Portulaca oleracea L.	Pigweed	I			U	U	U	R	U	U	-	-
PRIMULACEAE												
Anagallis arvensis L.	Scarlet pimpernel	I			R	-	-	-	-	-	-	-
SOLANACEAE												
Datura stramonium L.	Jimson weed	I			-	-	-	-	-	-	R	-
Lycopersicon pimpinellifolium Mill.	Currant tomato	I			U	R	-	U	U	-	-	R
Nicotiana glauca R.C. Graham	Tree tobacco	I			U	R	R	-	-	-	-	U
STERCULIACEAE												
Waltheria indica L.	'Uhaloa	II			C	A	O	C	O	U	-	C

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS			RELATIVE ABUNDANCE							
					ACP	Fab	Fg	A	C	CR	CU	R
VITIACEAE												
Trimeferta semitrilobe Jacq.	Sacramento bur	I			-	-	-	-	-	-	-	R
VIGONIACEAE												
VIGNIUM TRIPPERIUS ?	Puncture vine	I			-	R	-	-	R	-	-	O

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS	RELATIVE ABUNDANCE							
CHECKLIST OF ANIMALS			ACP	Tab	Fg	A	C	CR	CU	R
ARDEIDAE										
Bubulcus ibis	Cattle egret	Y	-	-	-	X	X	-	-	-
Nycticorax nycticorax	Black-crowned night heron	X	-	-	-	-	-	-	-	X
CHARADRIIDAE										
Pluvialis dominica	Pacific golden-plover	M	X	X	-	-	X	-	-	-
COLUMBIDAE										
Columba livia	Rock dove	X	-	X	-	-	-	-	-	-
Geopelia striata	Barred dove	X	X	X	X	X	X	-	-	X
Streptopelia chinensis	Lace-neck dove	X	X	X	X	X	X	X	X	X
FRINGILLIDAE										
Paroaria coronata	Red-crested cardinal	X	-	-	-	-	-	-	-	X
Richmondena cardinalis	Kentucky cardinal	X	-	X	-	-	-	-	-	-
PHASIANIDAE										
Francolinus sp.	Francolin	Y	Y	-	-	-	-	-	-	-
Phasianus colchicus	Ring-necked pheasant	X	X	-	-	X	-	-	-	-
PLOCEIDAE										
Carpodacus mexicanus	House finch	Y	Y	-	-	-	-	-	-	X
Estrilda melpoda	Orange-cheeked waxbill	X	-	X	-	X	-	-	-	X
Lonchura malacca	Black-headed mannikin	Y	X	X	X	-	-	-	-	X
L. punctulata	Rice bird	Y	X	X	X	X	-	X	-	X
PYCNONOTIDAE										
Pycnonotus cafer	Red-vented bulbul	Y	Y	Y	Y	Y	-	X	X	X
STURNIDAE										
Acridotheres tristis	Common myrah	Y	X	-	-	-	-	-	-	-
ZOSTEROPIDAE										
Zosterops japonicus	Japanese white-eye	Y	Y	Y	-	-	-	-	-	X

Appendix B
Botanical Survey
W. Char
(January 1997)

CHAR & ASSOCIATES
Botanical/Environmental Consultants
4471 Puu Panini Ave.
Honolulu, Hawaii 96816
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January 1997

SUMMARY OF FINDINGS
KO'OLOA'ULA ON EAST KAPOLEI PROJECT SITE
'EWA DISTRICT, ISLAND OF O'AHU

INTRODUCTION

The ko'oloa'ula (Abutilon menziesii), a member of the hibiscus or mallow family (Malvaceae), is a much-branched shrub up to 6 to 9 ft. tall, which is covered by velvety, stellate pubescence. The heart-shaped leaves are silvery-green and the attractive flowers are maroon. It is uncommon and occurs in dryland habitats (Wagner et al. 1990). Today, the largest population is found on Lana'i (about 600 plants) in koa haole scrub. Five small populations occur on Maui on 'a'a lava and also on red soils in a large gulch adjacent to sugar cane fields. One population occurs at Puako on the island of Hawai'i. On O'ahu, a single plant was found in abandoned sugar cane fields near the Campbell Industrial Park. Recently, a single plant was found on the Navy's Lualualei facility in kiawe/Guinea grass scrub.

In 1986, the species was federally listed as endangered. All plants on the federal list are automatically added to the state endangered species list. In its natural habitat the ko'oloa'ula plants are threatened by browsing animals (cattle, goats, axis deer), competition from weedy introduced plants, fires, predation by introduced insects, loss of native pollinators, and development (U.S. Fish and Wildlife Service 1994).

Because the plant is attractive and is easy to cultivate (seeds and cuttings), it was once sold by several plant nurseries as "red 'ilima" prior to its listing.

A new populaion of the ko'oloa'ula was recently discovered by Nagata while conducting a survey of the HFDC's East Kapolei project site in September and October 1996. Nagata recorded at least 38 ko'oloa'ula plants from the southwest corner of the project site (Figure 1). Collections of the plants were deposited by Nagata at the Bishop Museum.

A survey to verify and to more accurately inventory and map the plants found by Nagata was conducted in December 1996. This survey followed an unusually heavy rainfall in November 1996 which lasted for about 10 days.

RESULTS

Three colonies of plants were identified in the field and mapped (Figure 2). We could not locate the northern-most colony mapped by Nagata.

Colony A: This colony consists of 6 large, mature (flowering/budding) plants, 2 to 6 ft. tall, and 2 juvenile (young, immature) plants, 1 to 1.5 ft. tall.

Colony B: This colony is found along the golf course fence. About half (11 plants) are composed of juvenile plants, most of which have probably sprouted and grown since the November rains. The remaining plants (10) are mature individuals.

Colony C: This is the largest colony and is found near the power

FIGURE 1. LOCATION OF KO'OLOA'ULA (from Nagata 1996).

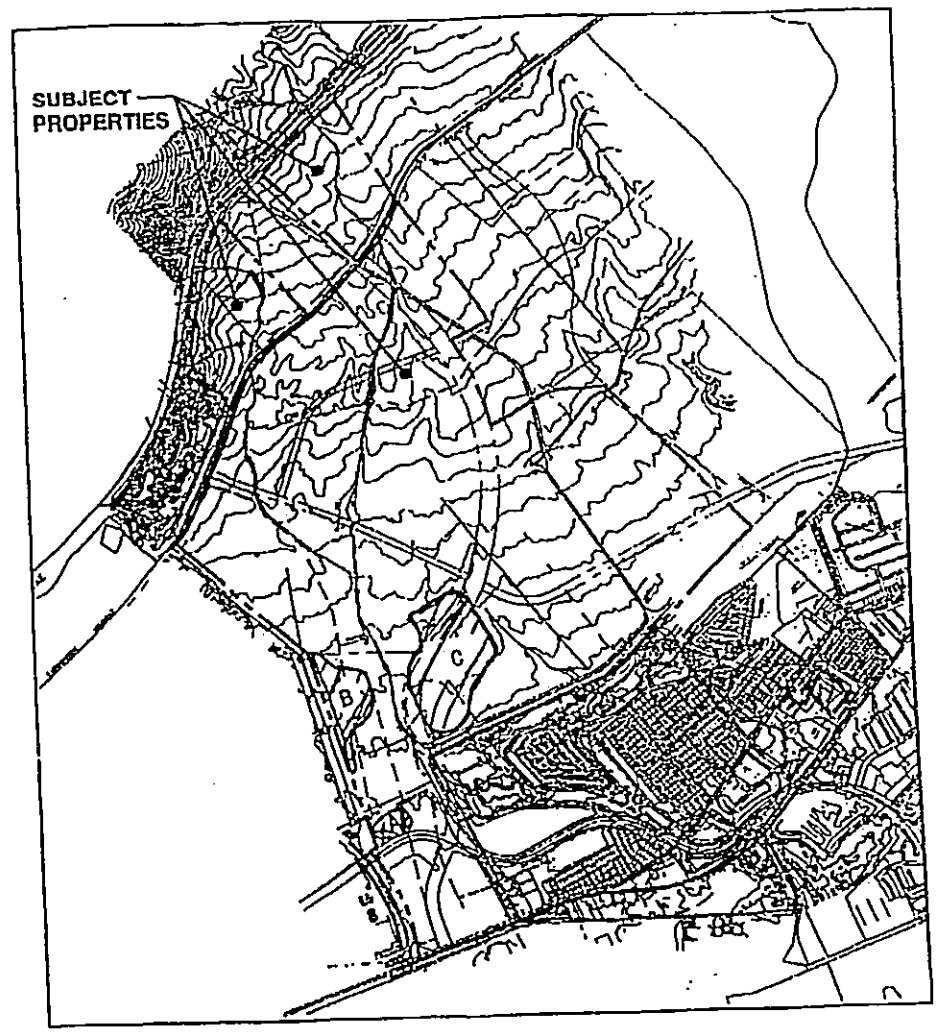

FIGURE 2

LOCATION OF KO'OLOA'ULA DURING THIS SURVEY.

line. Nagata maps it as two separate colonies. But after the more intensive survey, we located plants between the two colonies and have thus lumped them into one larger colony. The majority of the plants are centered around an overgrown, coral-lined cane haul road. A few plants cross under the power line and extend north of the power line for a short distance. The colony consists of 55 large, mature plants (many of them 4 to 6 ft. tall), and 4 juvenile plants.

DISCUSSION AND RECOMMENDATIONS

A total of 88 ko'oloa'ula plants were found during the recent study to flag and inventory the plants on the East Kapolei site. There are a large number of juvenile plants, most of which sprouted and established themselves since the unusually heavy rainfall in November 1996. The number of plants will most likely increase during this rainy season (November 1996 to about February 1997).

It is recommended that a mitigation plan be initiated as soon as possible as the mature plants will continue to set seeds and the colonies will continue to expand in area.

The larger plants can be easily cultivated from seeds and cuttings while the smaller plants can be dug up and transplanted. It is recommended that an area be set aside for the conservation of these plants. An excellent location would be within the power line corridor. A greenway or belt of vegetation with the ko'oloa-'ula could be established here. A few plants already occur within this corridor.

References

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Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and B.P. Bishop Museum Press, Honolulu. B.P. Bishop Museum Special Publication 83.

Appendix C
Botanical Survey
W. Char
(October 1997)

NORTH-SOUTH ROAD CORRIDOR STUDY

Ewa, Oahu, Hawaii
Project No. HWY-0-01-92

BOTANICAL SURVEY REPORT

October 1997

PB 100 YEARS
PARSONS BRINCKERHOFF
KAKU ASSOCIATES
R.M. TOWILL CORPORATION

NORTH-SOUTH ROAD CORRIDOR STUDY
Ewa, Oahu, Hawaii
Project No. HWY-0-01-92

Botanical Survey Report

Prepared for:

State of Hawaii
Department of Transportation
669 Punchbowl Street
Honolulu, Hawaii 96813

City and County of Honolulu
Department of Transportation Services
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Submitted by:

Parsons Brinckerhoff Quade & Douglas, Inc.
Pacific Tower, Suite 3000
1001 Bishop Street
Honolulu, Hawaii 96813

October 1997

PBQD Reference: 16218A - Product 8.6A

BOTANICAL RESOURCES STUDY
NORTH-SOUTH ROAD CORRIDOR
(H-1 FREEWAY TO KAPOLEI PARKWAY)
'EWA DISTRICT, ISLAND OF O'AHU

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for:
PARSONS BRINCKERHOFF

October 1997

BOTANICAL RESOURCES STUDY
NORTH-SOUTH ROAD CORRIDOR
(H-1 FREEWAY TO KAPOLEI PARKWAY)
'EWA DISTRICT, ISLAND OF O'AHU

INTRODUCTION

The botanical resources found on the North-South road corridor from its proposed interchange with Interstate Route H-1 to its terminus at the proposed Kapolei Parkway is presented in this report. The majority of the alignment crosses sugar cane fields which are no longer in cultivation. Although sugar cane cultivation ceased two to three years ago, there are still a few remnant clumps of sugar cane in the area between Farrington Highway and Waimanalo Road. However, in most places the former fields are now overgrown with Guinea grass or mixed scrub vegetation. A narrow band of koa haole scrub can be found along old irrigation ditches, drainageways, and roadways.

A reconnaissance-level field study was conducted in June 1996, and later in December 1996 during the rainy season. The primary objectives of the field studies were to:

1) provide a description of the vegetation found on the undeveloped portions of the corridor;
2) inventory the flora;
3) search for threatened and endangered plants as well as species of concern; and
4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

One Federal and State listed endangered species, the ko'oloa'ula (Abutilon menziesii), was found during the field studies and is discussed in more detail in the "Endangered Plants" section of the report.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. The roadway alignment maps and a recent colored aerial photograph of the study area were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. Notes were made on plant distributions and associations, substrate types, drainage, topography, exposure, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium (University of Hawai'i, Manoa - HAW), and for comparison with the recent taxonomic literature.

The species recorded during the field studies are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the studies. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual taxa.

DESCRIPTION OF THE VEGETATION

In the U.S. Fish and Wildlife Service sponsored 'Ewa Plains' Botanical Survey (Char and Balakrishnan 1979), the vegetation along the roadway corridor was mapped as "C", sugar cane fields.

On areas which were not actively cultivated, koa haole shrubland and mixed grass-shrubland were found. Since that survey, O'ahu Sugar Company, Ltd., has ceased cultivating the fields, and much of the 'Ewa Plains has been developed for the second city of Kapolei.

In the discussion below, the vegetation along the proposed North-South road corridor is described from mauka to makai, that is, from its proposed interchange with Interstate Route H-1 to its makai terminus at Kapolei Parkway. Locations are referenced to existing roads and landmarks as the corridor had not been flagged and staked at the time of the field studies. A checklist of all those plants inventoried during the field work is presented at the end of the report.

Vegetation along the corridor

At the interchange with H-1, dense koa haole shrubs (Leucaena leucocephala) border the highway and cover the southwest portion of the interchange. Clumps of Guinea grass (Panicum maximum), 3 to 5 ft. tall, form a thick cover between the shrubs. Scattered through this koa haole/Guinea grass scrub are trees of kiawe (Prosopis pallida) and 'opiuma (Pithecellobium dulce). Along Kalo'i Gulch, there are a few Java plum (Syzygium cumini) and kukui (Aleurites moluccana) trees among the koa haole thickets. Upslope of the highway are former sugar cane fields now overgrown with Guinea grass and buffel grass (Cenchrus ciliaris).

Between Interstate Route H-1 and Farrington Highway, the former sugar cane fields are now overgrown with buffel grass. A few clumps of the taller Guinea grass can be seen scattered here and there. Koa haole shrubs and a few kiawe trees line the edges of the grassy fields. A few of the fields had been planted earlier

with other crops such as watermelons, but in December these fields were overgrown with low mats of pink bindweed (Ipomoea triloba) and clumps of other weedy species such as cocklebur (Xanthium strumarium), apple of Peru (Nicandra physalodes), kaliko (Euphorbia heterophylla), etc.

On the State-owned lands between Farrington Highway and Waimanalo Road, the cane fields were the most recently fallowed and so there are still a few areas with remnant clumps of sugar cane plants (Saccharum officinarum), from 5 to 7 ft. tall. Where the plants collect runoff water in low lying areas, the sugar cane cover is somewhat dense. Where the soil is drier and cracked, there are only dead, dried out clumps of cane. The abandoned fields have been invaded by a mixed scrub composed of swollen fingergrass (Chloris barbata) and a number of other weedy species which include 'uhaloa (Waltheria indica), 'ilima (Sida fallax), hoary abutilon (Abutilon incanum), currant tomato (Lycopersicon pimpinellifolium), Guinea grass, lion's ear (Leonotis nepetifolia), coat buttons (Tridax procumbens), pink bindweed, castor bean (Ricinus communis), etc. In some places, Guinea grass has formed a dense cover, 3 to 6 ft. tall, with only a few other species present. Kalo'i and Makakilo Gulches, now reduced to somewhat narrow drainage channels, support koa haole shrubs and thick tangles of ivy gourd vine (Coccinia grandis).

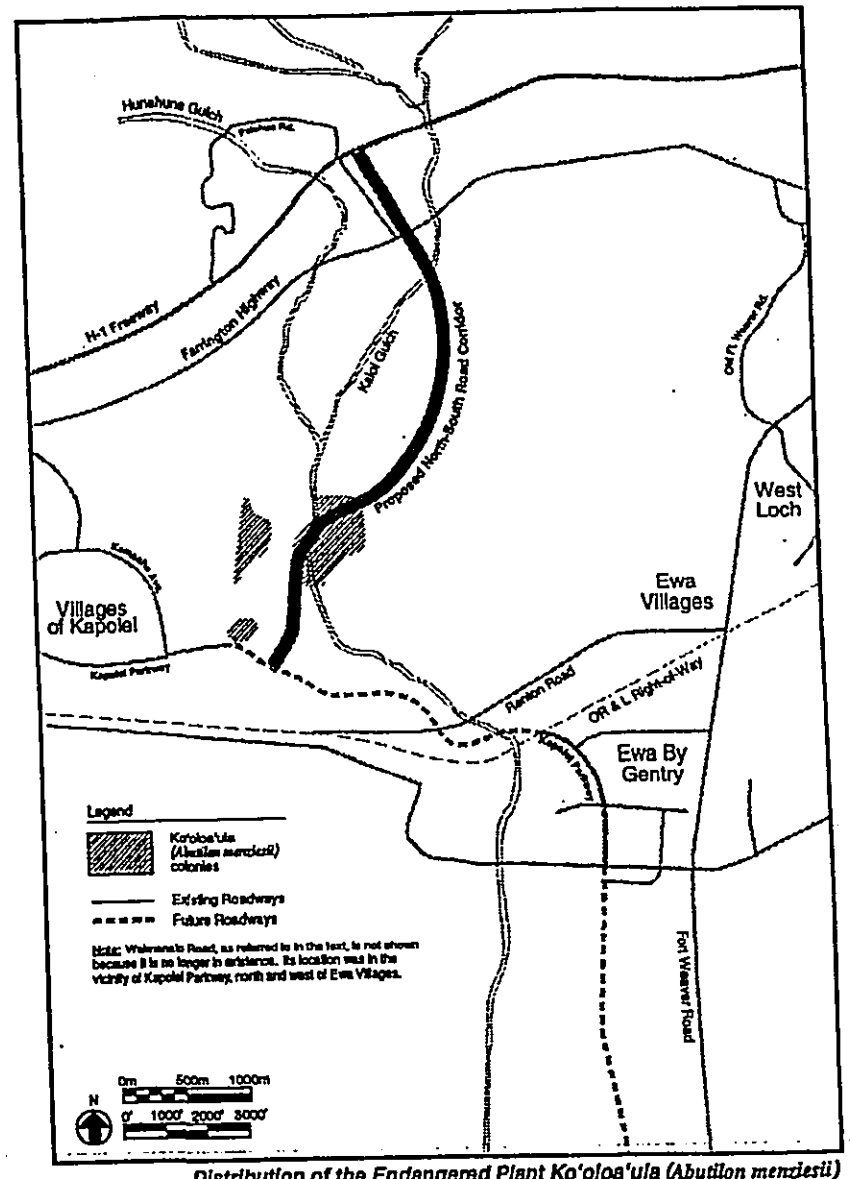
ENDANGERED PLANTS

Because the 'Ewa Plains have been extensively disturbed by agricultural activities for such a long period of time, there are few places which support native plant communities. The few places with native plants tend to be found on areas with karst or limestone topography; since these areas do not have soil they were unsuitable for agriculture. Two listed endangered species which occur today in such habitats are the 'Ewa Plains 'akoko (Chamaesyce

skottsbergii) and Achyranthes rotundata. Both are found only on limestone sites within Campbell Industrial Park and Barbers Point Naval Air Station (Char and Balakrishnan 1979; Traverse Group, Inc., 1988). One plant of the endangered ko'oloa'ula (Abutilon menziesii) was found in an overgrown sugar cane field near Kalaeloa Boulevard in the industrial park (Char and Balakrishnan 1979; Wagner et al. 1990; U.S. Fish and Wildlife Service 1994). There are historical records of two listed endangered species, the 'awiwi (Centaurium sebaeoides) and 'ihi'ihi (Marsilea villosa), and two species of concern, the 'ihi (Portulaca villosa) and pu'uka'a (Torulinium odoratum ssp. auriculatum), in the vicinity of the proposed corridor (B. Harper, USFWS, 01 February 1996 letter).

During the field studies for the State Housing Finance and Development Corporation's (HFDC) East Kapolei project, in September and October 1996, 38 plants of the endangered ko'oloa'ula were found by Ken Nagata, botanist, on the southwest corner of the HFDC project site. The plants occur primarily in mixed scrub and also in areas with remnant clumps of sugar cane. A survey to verify the findings and to more accurately inventory and map the plants was conducted in December 1996 (Char 1997). This December survey followed an unusually heavy period of rainfall in November 1996 in which the 'Ewa area received more than 20 inches of rainfall in about 10 days; average rainfall for the 'Ewa area is 20 inches per year.

A total of 88 ko'oloa'ula plants were flagged and inventoried; the plants occur in three colonies, located fairly close to each other. A large number of juvenile plants which had sprouted after the November rains were found. Some of the ko'oloa'ula plants lie within the proposed North-South road corridor where it follows near the existing HECO powerline (Figure 1).



Distribution of the Endangered Plant Ko'oloa'ula (Abutilon menziesii)
NORTH-SOUTH ROAD CORRIDOR STUDY
Botanical Survey Report
FIGURE 1

DISCUSSION AND RECOMMENDATIONS

The majority of the proposed North-South Road corridor will cross over former sugar cane fields now overgrown with weedy scrub and scattered koa haole thickets. These areas have little of botanical interest as they have been disturbed (under cultivation) for a long period of time and are dominated by introduced or alien plant species. The only area of concern is that portion of the corridor which will cross through the endangered ko'oloa'ula population.

A mitigation plan which would relocate the affected ko'oloa'ula plants is being prepared.

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SPECIES LIST -- North-South Road Corridor
(H-1 Freeway to Kapolei Parkway)

The following checklist is an inventory of the plants observed on the undeveloped lands within the proposed roadway corridor. The plants are arranged alphabetically by families within each of two groups: Dicots and Monocots. The taxonomy and nomenclature of the flowering plants follow the most recent treatment of the Hawaiian flora by Wagner et al. (1990) and new additions to the flora in Wagner and Herbst (1995).

The following information is provided for each species:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   - E = endemic = native only to the Hawaiian Islands.
   - I = indigenous = native to the Hawaiian Islands and also elsewhere throughout the Pacific and/or tropics.
   - I? = questionably indigenous = data not clear if introduced or if arrival here by natural means, but weight of evidence suggests probably indigenous.
   - P = Polynesian = plants originally of Polynesian introduction prior to Western contact (Cook's discovery of the islands in 1778).
   - X = introduced or alien = all those plants brought to the islands by humans, intentionally or accidentally, after Western contact (1778).
   - X? = questionably introduced = dates of introduction unclear or very early, may be indigenous or of Polynesian introduction.

Scientific name	Common name	Status
DICOTS		
ACANTHACEAE (Acanthus family)		
Asystasia gangetica (L.) T. Anders.	Chinese violet	X
AIZOACEAE (Fir-marigold family)		
Trianthema portulacastrum L.		X
AMARANTHACEAE (Amaranthus family)		
Achyranthes aspera L.		X
Amaranthus spinosus L.	spiny amaranth, pakai kuku	X
Amaranthus viridis L.	slender amaranth, pakai	X
ANACARDIACEAE (Mango family)		
Schinus terebinthifolius Raddi	Christmas berry	X
ASCLEPIADACEAE (Milkweed family)		
Calotropis procera (Aiton) W.T. Aiton	blue crown flower	X
ASTERACEAE (Daisy family)		
Bidens pilosa L.	Spanish needle, beggars tick, ki	X
Conyza bonariensis (L.) Cronq.	hairy horseweed, 'ilioha	X
Emilia fosbergii Nicolson	Flora's paintbrush, red pualele	X
Pluchea indica (L.) Less.	Indian pluchea	X
Pluchea carolinensis (Jacq.) G. Don	pluchea, sourbush	X
Sonchus oleraceus L.	common sowthistle, pualele	X
Tridax procumbens L.	coat buttons	X
Verbesina encelioides (Cav.) Benth. & Hook.	golden crownbeard	X
Vernonia cinerea (L.) Less.	little ironweed	X
Xanthium strumarium var. canadense (Mill.) Torr. & A. Gray	cocklebur, kikania	X
BIGNONIACEAE (Bignonia family)		
Spathodea campanulata P. Beauv.	African tulip tree	X
CHENOPODIACEAE (Goosefoot family)		
Atriplex suberecta Verd.	saltbush	X
Chenopodium murale L.	'aheahea	X

Scientific name	Common name	Status
CONVOLVULACEAE (Morning-glory family)		
Ipomoea obscura (L.) Ker-Gawl.	field bindweed	X
Ipomoea triloba L.	pink bindweed, little bell	X
Merremia aegyptia (L.) Urb.	hairy merremia, koali kua hulu, kuahulu	X?
CUCURBITACEAE (Gourd family)		
Coccinia grandis (L.) Voigt	ivy gourd, scarlet-fruited gourd	X
Momordica charantia L.	wild bittermelon	X
EUPHORBIACEAE (Spurge family)		
Aleurites moluccana (L.) Willd.	kukui, tutui	P
Chamaesyce hirta (L.) Millsp.	hairy spurge	X
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	X
Chamaesyce prostrata (Ait.) Small	prostrate spurge	X
Euphorbia heterophylla L.	kaliko	X
Phyllanthus debilis Klein ex Willd.	niruri	X
Ricinus communis L.	castor bean, pa'aila, koli	X
FABACEAE (Pea family)		
Crotalaria incana L.	fuzzy rattlepod, kukae-hoki	X
Crotalaria pallida Aiton	smooth rattlepod, pika-kani	X
Desmanthus virgatus (L.) Willd.	slender mimosa	X
Indigofera suffruticosa Mill.	indigo, 'iniko	X
Indigofera spicata Forssk.	creeping indigo	X
Leucaena leucocephala (Lam.) de Wit	koa haole	X
Macroptilium lathyroides (L.) Urb.	wild bean, cow pea	X
Phaseolus sp.		X
Pithecellobium dulce (Roxb.) Benth.	'opiuma	X
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X
Senna pendula (Humb. & Bonpl. ex Willd.) H. Irwin & Barneby	senna	X
LAMIACEAE (Mint family)		
Leonotis nepetifolia (L.) R. Br.	lion's ear	X
MALVACEAE (Mallow family)		
Abutilon grandifolium (Willd.) Sweet	hairy abutilon, ma'o	X
Abutilon incanum (Link) Sweet	ma'o, hoary abutilon	I?

Scientific name	Common name	Status
Abutilon menziesii Seem.	ko'oloa'ula	E
Malvastrum coromandelianum (L.) Garcke	false mallow	X
Sida fallax Walp.	'ilima	I
Sida rhombifolia L.		X
MYRTACEAE (Myrtle family)		
Syzygium cumini (L.) Skeels	Java plum	X
NYCTAGINACEAE (Four-o'clock family)		
Boerhavia coccinea Mill.	red-flowered boerhavia	X
PASSIFLORACEAE (Passion flower family)		
Passiflora foetida L.	running pop, pohapoha	X
PORTULACACEAE (Purslane family)		
Portulaca oleracea L.	pigweed, 'akulikuli kula	X
SOLANACEAE (Nightshade family)		
Lycopersicon pimpinellifolium (Jusl.) Mill.	currant tomato	X
Nicandra physalodes (L.) Gaertn.	apple of Peru	X
Nicotiana glauca R.C. Graham	tree tobacco, paka	X
Solanum americanum Mill.	glossy nightshade, popolo, 'olohua	I?
STERCULIACEAE (Cacao family)		
Waltheria indica L.	'uhaloa, hi'aloa, kanakaloa	I?
ZYGOPHYLLACEAE (Creosote bush family)		
Tribulus terrestris L.	puncture vine, goat head	X
MONOCOTS		
COMMELINACEAE (Dayflower family)		
Commelina benghalensis L.	hairy honohono	X
CYPERACEAE (Sedge family)		
Cyperus rotundus L.	nut sedge, nutgrass	X
POACEAE (Grass family)		
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	X
Brachiaria mutica (Forssk.) Stapf	California grass	X

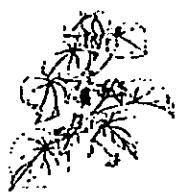
Scientific name	Common name	Status
Brachiaria subquadriparia (Trin.) Hitchc.		X
Cenchrus ciliaris L.	buffel grass	X
Cenchrus echinatus L.	common sandbur, 'ume'alu, mau'u kuku	X
Chloris barbata (L.) Sw.	swollen fingergrass, mau'u lei	X
Chloris radiata (L.) Sw.	plush grass	X
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X
Dactyloctenium aegyptium (L.) Willd.	beach wiregrass	X
Digitaria insularis (L.) Mez. ex Ekman	sourgrass	X
Eleusine indica Gaertn.	goose grass, wire grass	X
Leptochloa uninervia (Presl.) Hitchc. & Chase	leptochloa	X
Melinis repens (Willd.) Zizka	Natal redtop, Natal grass	X
Panicum maximum Jacq.	Guinea grass	X
Panicum maximum var. trichoglume Eyles ex Robyns	green panicgrass	X
Saccharum officinarum L.	sugar cane, ko	X
Setaria verticillata (L.) Beauv.	bristly foxtail	X
Sorghum halepense (L.) Pers.	Johnson grass	X

Appendix D

Botanical Survey

W. Char

(August 2003)



BOTANICAL SURVEY
UNIVERSITY OF HAWAI'I WEST O'AHU
EAST KAPOLEI, 'EWA DISTRICT, O'AHU

by

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: PBR HAWAII

August 2003

BOTANICAL SURVEY
UNIVERSITY OF HAWAI'I WEST O'AHU
EAST KAPOLEI, 'EWA DISTRICT, O'AHU

INTRODUCTION

In mid-September 2002, the University of Hawai'i Board of Regents selected the 500-acre Kapolei Makai site as the permanent site for the University of Hawai'i West O'ahu campus. The 500-acre project site is bounded by Farrington Highway to the north; the proposed North-South Road to the east; overgrown, former sugar cane lands to the south; and the Kapolei residential area and Kapolei Golf Course to the west. A large portion of the 500-acre project site has recently been cleared for vegetatable crops or is already under cultivation by Aloun Farms. The Kalo'i and Honehone Gulches cross the property. Scrub vegetation is found on the former cane fields on the lower southern portion of the site. A few plants of the endangered ko'oloa'ula (Abutilon menziesii) are associated with the scrub vegetation.

Field studies to assess the botanical resources on the proposed University of Hawai'i West O'ahu campus site were conducted from 17 to 20 June 2003. The primary objectives of the field studies were to:

1) prepare a general description of the vegetation on the site;
2) inventory the flora;
3) search for threatened and endangered species as well as species of concern; and
4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Topographic maps and a recent, colored aerial

photograph (1" = 200') were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

The areas with scrub and gulch vegetation were surveyed more intensively as they were more likely to harbor native plants. A few plants of the endangered ko'oloa'ula (Abutilon menziesii) occur on the project site; larger clusters of plants are found on the adjacent lands. All of the ko'oloa'ula plants, both on and off the project site, have been mapped and/or flagged during earlier studies. The plants are monitered periodically by staff from the State Division of Forestry and Wildlife (DOFAW). Actively cultivated farm lands were not surveyed in detail as rare plants were not likely to occur in such areas.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, disturbances, topography, exposure, drainage, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium, and for comparison with the most recent taxonomic literature.

The species recorded are indicative of the season ("dry" vs. "rainy") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight differences in the species list, especially of the weedy, annual plants.

DESCRIPTION OF THE VEGETATION

Nagata (1996) conducted a biological survey (flora and fauna) for the approximately 1,300-acre East Kapolei Master Plan project site. This study covered the proposed 500-acre UH West O'ahu property. It was during the field survey in September and October 1996 that Nagata discovered the endangered ko'oloa'ula plants (see "Endangered Species" section in this report for discussion). In the 1996 study, large portions of the East Kapolei site supported abandoned sugar cane fields with sugar cane (Saccharum officinarum) making up 30 to 50% of the total

vegetation cover. In other places, sugar cane made up less than 5% of the cover with mixed herbs and grasses abundant. A botanical survey for the proposed North-South Road (Char 1997) recorded similar vegetation types.

Today, large areas with sugar cane are no longer present on the study site, having been replaced by a scrub vegetation composed primarily of swollen fingergrass (Chloris barbata), mixed herbaceous species, and small shrubs (subshrubs). The lands on the northern portion of the site, adjacent to Farrington Highway, are under cultivation by Aloun Farms.

Three vegetation types are recognized on the UH West O'ahu site in this report. An inventory of all the plant species observed during the field studies is presented at the end of the report.

Agricultural/Farm

Actively cultivated fields make up the agricultural farm lands vegetation type which covers the majority of the 500-acre project site. Most of the large fields bordering Farrington Highway have recently been bulldozed to clear them of woody growth and were being disked during our field survey in June. Short stumps of koa haole shrubs (Leucaena leucocephala) could be observed here and there in these fields. On the planted fields on the eastern portion of the site, hybrid sweet corn (Zea mays) covers large areas. Other crops observed include bell pepper (Capsicum annuum cv. "Grossum"); eggplant (Solanum melongena); a number of different melon cultivars such as watermelon and thai watermelon (Citrullus lanatus), and canteloupe and honeydew (Cucumis melo); cultivars of Cucurbita pepo -- zucchini, pumpkin, kabocha; and yard-long bean (Vigna unguiculata).

A few weedy species such as swollen fingergrass, field bindweed (Ipomoea obscura), spiny amaranth (Amaranthus spinosus), and pigweed (Portulaca oleracea) can be found growing among the crop plants. Most of the weedy plants, however, occur along the uncultivated areas which border the fields; these weedy patches receive runoff from the cultivated fields so the weeds tend to

be lush and green, and 2 to 4 ft. tall in some places. Weedy species found here include clumps of Guinea grass (Panicum maximum), field bindweed, lion's ear (Leonotis nepetifolia), young koa haole shrubs, graceful spurge (Chamaesyce hypericifolia), Trianthema portulacastrum), milkweed (Sonchus oleraceus), cheese weed (Malva parviflora), etc. The native 'ilima (Sida fallax) is locally common in some places. One new species not recorded from the island of O'ahu, Russian thistle or tumbleweed (Salsola tragus), was collected and deposited at the Bishop Museum herbarium.

Scrub Vegetation

This vegetation type occupies the southern portion of the project site and is usually 1 to 3 ft. tall. Long dead stalks of sugar cane are scattered throughout this vegetation type. At the time of this survey, the project site was very dry with plant cover 50 to 60%. Bare soil areas with large, knee-deep cracks were prominent and made surveying difficult.

Swollen fingergrass is the most abundant species forming fairly large patches. In some places, buffelgrass (Cenchrus ciliaris) becomes locally abundant and forms a thick mat, 2 to 3 ft. tall. Four herbaceous species are abundant to common; these are false mallow (Malvastrum coromandelianum), coat buttons (Tridax procumbens), fuzzy rattlepod (Crotalaria incana), and golden crown-beard (Verbesina encelioides). Small shrubs of hoary abutilon (Abutilon incanum), 'uhaloa (Waltheria indica), and 'ilima are abundant; these small shrubs have fuzzy, gray to bluish-gray leaves, and give a grayish-blue cast to the vegetation where they form extensive patches, 1 to 3 ft. tall.

Scattered through this scrub cover are taller shrubs of koa haole and sourbush (Pluchea carolinensis), 3 to 10 ft. tall. Other woody components found here in small numbers are young kiawe (Prosopis pallida) and 'opiuma (Pithecellobium dulce) trees, 7 to 12 ft. tall. Interestingly, a few species usually used as landscaping material have established themselves within these former cane fields; these are the small crown flower (Calotropis procera), carrion flower (Stapelia

gigantea), and Sebesten plum (Cordia dichotoma).

On the old, crushed coral-covered cane haul roads and along irrigation ditches, the vegetation is somewhat denser. Koa haole shrubs and Guinea grass are common. Other species forming fairly large patches here include saltbush (Atriplex suberecta), 'uhaloa, slender mimosa (Desmanthus pernambucanus), Macroptilium atropurpureum, Natal redtop grass (Melinis repens), 'ilima, and swollen fingergrass.

Along the lower boundary (makai end), especially along the North-South Road corridor, there are a few plants of the endangered ko'oloa'ula within the project site. A more detailed discussion of the ko'oloa'ula plants on the project site is presented in the "Endangered Species" section of the report.

Gulch Vegetation

Kalo'i Gulch and Hunehune Gulch cross the project site. In most places, the gulches are shallow and narrow, however, Kalo'i Gulch becomes 25 to 45 ft. deep and wider along its eastern segment. A large plunge pool with standing water was found during the field studies. The intermittent streams along the bottom of each of the gulches have eroded down to the hardpan parent material.

The vegetation within the gulches (sides and bottom) is characterized by dense, robust clumps of Guinea grass, 5 to 10 ft. tall. The dense Guinea grass cover tends to exclude other species, but a few patches of California grass (Brachiaria mutica), sourbush, castor bean (Ricinus communis), wild bittermelon (Momordica charantia), comby hyptis (Hyptis pectinata), and cocklebur (Xanthium strumarium) are found where the Guinea grass cover is thin and the soil exposed.

Along the top banks of the gulches, buffelgrass forms a thick mat up to 3 ft. tall, but Guinea grass can also be abundant in places. Koa haole shrubs, 10 to 20 ft. high, occur as scattered stands or can sometimes become very dense and form small thickets, especially along the eastern section of Kalo'i Gulch.

Tangled mats of coccinia vine (Coccinia grandis) are frequently observed climbing up and over the koa haole shrubs. A few kiawe trees, 20 to 25 ft. tall, are also found along the top of the gulches.

ENDANGERED SPECIES

The ko'oloa'ula (Abutilon menziesii) is a member of the hibiscus or mallow family (Malvaceae). It is a much-branched shrub covered by velvety, silvery hairs. The heart-shaped leaves are silvery-green and the small 'ilima-like flowers range in color from pale peach to dark red. Abutilon is found in dry, lowland habitats on the islands of O'ahu, Maui, Lana'i, and Hawai'i (Wagner et al. 1990). In 1986, the species was federally listed as endangered and is protected under the provisions of the Endangered Species Act of 1973, as amended, and Chapter 195D, Hawaii Revised Statutes, as amended. In its natural habitat the plants are threatened by browsing animals, competition from weedy introduced species, fires, predation by insects, loss of native pollinators, and development (U.S. Fish and Wildlife Service 1994).

In September 1996, Nagata found 38 Abutilon menziesii plants on the East Kapolei project site; the reconnaissance survey covered roughly 80% of the property. After the unusually heavy rains in November 1996, Char (1997) conducted an intensive inventory of the plants in December and recorded a total of 88 plants. A year later, in December 1997, Nagata performed a detailed survey flagging and attaching numbered tags to the plants; survey engineers then mapped the plants. The 1997 survey recorded 87 plants, 86 from the East Kapolei site and North-South Road corridor and one plant within the fenceline of the adjacent City and County-owned golf course.

In 1998, a Habitat Conservation Plan (HCP) was prepared for the East Kapolei Master Plan; the HCP is an "umbrella plan" that includes the East Kapolei project as well as the North-South Road project. The HCP provides a description of the development actions which would impact the Abutilon plants and proposes a series of mitigative strategies to address the impacts (PBR 1998).

A few of the endangered Abutilon plants occur on the proposed UH West O'ahu site. These represent the most mauka extension of the Cluster C population. One plant remained at the Cluster D site in Nagata's 1997 study, but it has subsequently died (V. Caraway, DOFAW, pers. comm.); there may still be seeds of Abutilon present in the soil around Cluster D. The Abutilon population is periodically monited by the Division of Forestry and Wildlife (G. Hansker, pers. com.).

DISCUSSION AND RECOMMENDATIONS

The proposed 500-acre UH West O'ahu site was under sugar cane cultivation for nearly a century with the last harvest occurring in 1994, prior to permanent closure of Oahu Sugar Company in 1995 (PBR 1998). Today, only dead stalks of sugar cane and faint traces of planting furrows remain. Weedy scrub vegetation consisting of a mixture of swollen fingergrass and buffelgrass, herbaceous species, and small shrubs covers the former cane fields on the southern half of the property, while the northern portion is actively cultivated for various fruit and vegetable crops by Aloun Farms. The gulches which cross the site support dense Guinea grass and stands of koa haole shrubs.

The vegetation on the project site is dominated by introduced or alien species. A total of 95 plant species were observed during this study. Of these 89 (94%) are introduced; introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's arrival in the islands in 1778. Four species are indigenous or presumably indigenous, that is, they are native to the islands and elsewhere; these are the 'ilima (Sida fallax), hoary abutilon (Abutilon incanum), 'uhaloa (Waltheria indica), and popolo (Solanum americanum). Two species are endemic, that is, they are native only to the Hawaiian Islands; these are the endangered ko'oloa'ula (Abutilon menziesii) and pa'uohi'iaka (Jacquemontia ovalifolia subsp. sandwicensis).

None of the plants found on the project site, with the exception of the

ko'oloa'ula, is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et al. 1999). Almost all of the plants can be found in dry, lowland, disturbed habitats throughout the islands. Some of the natives such as the 'ilima, hoary abutilon, and 'uhaloa are common to abundant throughout the scrub vegetation on the project site and elsewhere.

A Habitat Conservation Plan for the endangered ko'oloa'ula plant on the 'Ewa site has already been prepared. Plant material from this population has been propagated and a few outplantings have been made at other locations. The University will need to work closely with the agencies involved in the Habitat Conservation Plan.

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APPENDIX A

PLANT SPECIES LIST -- U.H., West O'ahu

The following checklist is an inventory of all the plants observed on the project site during the field studies. The plants are arranged alphabetically by families into each of two groups: Dicots and Monocots. The taxonomy and nomenclature of the flowering plants, Dicots and Monocots, are in accordance with Wagner et al. (1990) and Wagner and Herbst (1999). The few recent name changes are those reported in the Hawaii Biological Survey series (Evenhuis and Eldredge, editors, 1999-2002).

For each species, the following information is provided:

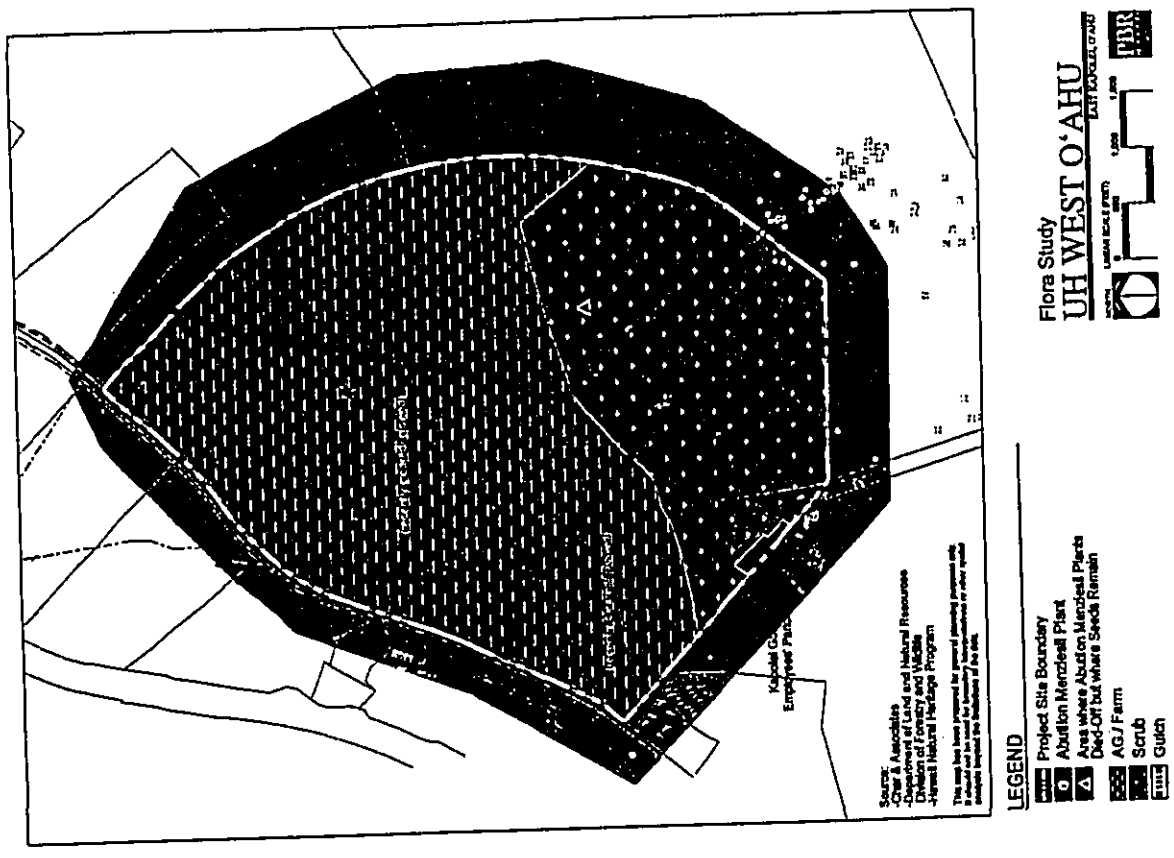
1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   - E = endemic = native only to the Hawaiian Islands;
   - I = indigenous = native to the Hawaiian Islands and elsewhere;
   - I? = questionably indigenous = data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably natural;
   - X = introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is Cook's arrival in the islands in 1778;
   - X? = questionably introduced = dates of introduction are very early/unclear; may be indigenous or of Polynesian introduction.
4. Presence (+) or absence (-) of a particular species within each of three vegetation types recognized on the project site (see text for discussion):
   - a = Agricultural/Farm Lands
   - s = Scrub Vegetation
   - g = Gulch Vegetation

Scientific name	Common name	Status	Vegetation type a	s	g
BORAGINACEAE (Borage family)					
Cordia dichotoma Forst. f.	Sebesten plum	X	-	+	-
CAPPARACEAE (Caper family)					
Cleome gynandra L.	wild spider flower, hchohina	X	+	-	-
CHENOPODIACEAE (Goosefoot family)					
Atriplex suberecta Verd.	saltbush	X	+	+	+
Chenopodium murale L.	'aheahea	X	+	+	-
Salsola tragus L.	Russian thistle, thumbleweed	X	+	+	-
CONVOLVULACEAE (Morning glory family)					
Ipomoea cairica (L.) Sweet	koali 'ai, koali	X?	-	-	+
Ipomoea obscura (L.) Ker-Gawl.	field bindweed	X	-	+	+
Ipomoea triloba L.	little bell, pink bindweed	X	+	+	-
Jacquemontia cvalifolia ssp. sandwicensis (A. Gray) K. Robertson	pa'uohi'iaka	E	-	+	-
Merremia aegyptia (L.) Urb.	hairy merremia, koali kua hulu	X?	+	+	-
CUCURBITACEAE (Gourd family)					
Citrullus lanatus (Thunb.) Matsum. & Nakai	watermelon	X	+	-	-
Coccinia grandis (L.) Voigt	coccinia, ivy gourd	X	+	-	+
Cucumis melo L. various cultivars	cantaloupe, honeydew	X	+	-	-
Cucurbita pepo L. various cultivars	zucchini, pumpkin, kabocha	X	+	-	-
Momordica charantia L.	wild bittermelon	X	+	-	+
EUPHORBIACEAE (Spurge family)					
Chamaesyce hirta (L.) Millsp.	hairy spurge, garden spurge	X	-	+	+
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	X	+	+	+
Chamaesyce hyssopifolia (L.) Sm.		X	+	-	+
Euphorbia heterophylla L.	Mexican fireweed	X	+	-	-
Ricinus communis L.	castor bean, koli	X	+	+	+

Scientific name	Common name	Status	Vegetation type a	s	g
FLOWERING PLANTS					
DICOTS					
AIZOACEAE (Fir-marigold family)					
Trianthema portulacastrum L.		X	+	+	+
AMARANTHACEAE (Amaranth family)					
Amaranthus spinosus L.	spiny amaranth, pakai kuku	X	+	+	-
Amaranthus viridis L.	slender amaranth, pakai	X	+	+	-
ANACARDIACEAE (Mango family)					
Schinus terebintifolius Raddi	Christmas berry	X	-	+	-
ASCLEPIADACEAE (Milkweed family)					
Calotropis procera (Aiton) W.T. Aiton	small crown flower	X	-	+	-
Stapelia gigantea N.E. Brown	carrion flower, Zulu-giant	X	-	-	+
ASTERACEAE (Daisy family)					
Bidens alba var. radiata (Schultz-Bip.) Ballard ex Melchert		X	+	-	-
Bidens pilosa L.	Spanish needle, ki, ki nohe	X	+	-	+
Emilia fosbergii Nicolson	flora's paintbrush, pualele	X	+	+	-
Pluchea carolinensis (Jacq.) G. Don	sourbush, pluchea	X	+	+	+
Pluchea indica (L.) Less.	Indian fleabane	X	+	+	-
Sonchus oleraceus L.	sowthistle	X	+	+	-
Tridax procumbens L.	coat buttons	X	-	+	+
Verbesina encelioides (Cav.) Benth. & Hook.	golden crown-beard	X	+	+	-
Xanthium strumarium var. canadense (Mill.) Torr. & A. Gray	cocklebur, kikania	X	-	-	+
BIGNONIACEAE (Bignonia family)					
Spathodea campanulata P. Beauv.	African tulip tree	X	-	+	-

Scientific name	Common name	Status	Vegetation type a	s	g
NYCTAGINACEAE (Four-o'clock family)					
Boerhavia coccinea Mill.		X	-	+	-
PASSIFLORACEAE (Passion flower family)					
Passiflora foetida L.	running pop, poha poha	X	-	+	-
PORTULACACEAE (Purslane family)					
Portulaca oleracea L.	common purslane, pigweed	X	+	-	-
SOLANACEAE (Nightshade family)					
Capsicum annuum L. cultivar "Grossum"	bell pepper	X	+	-	-
Datura stramonium L.	Jimson weed, la'au hano	X	-	+	-
Nicandra physalodes (L.) Gaertn.	apple of Peru	X	+	-	+
Nicotiana glauca R.C. Graham	tree tobacco	X	-	+	-
Solanum americanum Mill.	popolo, glossy nightshade	I?	+	+	-
Solanum lycopersicon var. cerasiforme (Dunal) Spooner, Anderson & Jansen	currant tomato, wild tomato	X	+	+	-
Solanum melongena L. various cultivars	eggplant, long eggplant	X	+	-	-
STERCULIACEAE (Cacao family)					
Waltheria indica L.	'uhaloa, hi'aloa, kanakaloa	I?	-	+	-
VERBENACEAE (Verbena family)					
Lantana camara L.	lantana, lakana	X	-	+	-
Stachytarpheta cayennensis (Rich.) Vahl	nettle-leaved vervain, owi, oi	X	-	+	-
MONOCOTS					
MUSACEAE (Banana family)					
Musa X paradisiaca L.	banana, mai'a	X	-	-	+
CYPERACEAE (Sedge family)					
Cyperus rotundus L.	nutgrass, nut sedge	X	+	-	-

Scientific name	Common name	Status	Vegetation type a	s	g
FABACEAE (Pea family)					
Acacia farnesiana (L.) Willd.	klu	X	+	+	-
Cassia sp.		X	-	+	-
Chamaecrista nictitans (L.) Moench	partridge pea, lauki	X	-	+	-
Crotalaria incana L.	fuzzy rattlepod, kukaohoki	X	+	+	-
Crotalaria pallida Aiton	smooth rattlepod, pikakani	X	+	-	-
Desmanthus pernambucanus (L.) Thellung	slender mimosa	X	+	+	+
Indigofera hendecaphylla Jacq.	creeping indigo	X	-	+	-
Indigofera suffruticosa Mill.	indigo, 'iniko	X	+	+	-
Leucaena leucocephala (Lam.) de Wit	koa haole, ekoa	X	+	+	+
Macroptilium atropurpureum (DC) Urb.		X	-	+	-
Macroptilium lathyroides (L.) Urb.	wild bean, cow pea	X	+	-	-
Pithecellobium dulce (Roxb.) Benth.	'opiuma	X	-	+	+
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X	+	+	+
Senna occidentalis (L.) Link	coffee senna, 'auko'i	X	+	-	-
Vigna unguiculata ssp. sesquipedalis (L.) Verdc.	yard-long bean	X	+	-	-
LAMIACEAE (Mint family)					
Hyptis pectinata (L.) Poit.	comb hyptis	X	+	-	+
Leonotis nepetifolia (L.) R. Br.	lion's ear	X	+	+	+
MALVACEAE (Mallow family)					
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	X	+	-	-
Abutilon incanum (Link) Sweet	hoary abutilon, ma'o	I?	+	+	+
Abutilon menziesii Seem.	ko'oloa'ula	E	-	+	-
Malva parviflora L.	cheese weed	X	+	-	-
Malvastrum coromandelianum (L.) Garcke	false mallow, hauuoi	X	+	+	-
Sida ciliaris L.		X	+	+	-
Sida fallax Walp.	'ilima	I	+	+	+
Sida spinosa L.	prickly sida	X	+	+	-
MELIACEAE (Mahogany family)					
Melia azedarach L.	Chinaberry, pride of India	X	-	+	-



Scientific name	Common name	Status	Vegetation type a	s	g
POACEAE (Grass family)					
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	X	-	+	-
Brachiaria mutica (Forssk.) Stapf	California grass	X	-	-	+
Cenchrus ciliaris L.	buffelgrass	X	+	+	+
Cenchrus echinatus L.	common sandbur, 'ume'alu	X	+	-	-
Chloris barbata (L.) Sw.	swollen fingergrass, mau'ulei	X	+	+	+
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X	-	+	-
Digitaria insularis (L.) Mez ex Ekman	sourgrass	X	+	-	+
Digitaria sp.	crabgrass	X	-	+	-
Eleusine indica (L.) Gaertn.	wiregrass, goosegrass	X	+	-	-
Eragrostis amabilis Wight & Arnott	lovegrass	X	-	+	-
Eragrostis cilianensis (All.) Link	stinkgrass	X	-	+	-
Melinis repens (Willd.) Zizka	Natal redtop, Natal grass	X	-	+	+
Panicum maximum Jacq.	Guinea grass	X	+	+	+
Panicum maximum var. trichoglume Eyles ex Robyns	green panicgrass	X	-	-	+
Saccharum officinarum L.	sugar cane, ko	X	-	+	-
Setaria verticillata (L.) P. Beauv.	bristly foxtail, mau'u pilipili	X	+	-	+
Sorghum bicolor (L.) Moench	sorghum	X	+	+	-
Zea mays L.	hybrid corn	X	+	-	-

Appendix E
Botanical Survey
W. Char
(March 2004)

BOTANICAL RESOURCES ASSESSMENT STUDY

KAPOLEI PARKWAY EXTENSION FROM NORTH-SOUTH ROAD TO OR&L RIGHT-OF-WAY

KAPOLEI, O'AHU

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: PARSONS BRINCKERHOFF

Revised March 2004

BOTANICAL RESOURCES ASSESSMENT STUDY
KAPOLEI PARKWAY EXTENSION FROM NORTH-SOUTH ROAD
TO OR&L RIGHT-OF-WAY
KAPOLEI, O'AHU

INTRODUCTION

The proposed Kapolei Parkway Extension will connect the proposed North-South Road with the OR&L right-of-way (ROW) where the existing Kapolei Parkway currently ends. A botanical survey for this extension of the Kapolei Parkway was conducted in two sections (Figure 1).

The first section of Kapolei Parkway is from the proposed intersection with North-South Road to the proposed intersection with Renton Road. The botanical survey area for this section consists of approximately 80 acres of City and County-owned lands located between Varona Village and Kalo'i Gulch/'Ewa Villages Golf Course (Figure 2). For the most part, the proposed parkway follows along or close to an existing paved road which accesses the golf course maintenance facility. In other places, it crosses koa haole/buffel grass scrub vegetation. The endangered Abutilon menziesii, common names ko'oloa'ula and red 'ilima, is known to occur on the adjacent State-owned lands; some Abutilon have also been recorded on the City and County-owned lands (Ohashi and PBR Hawaii 2003).

The second section of Kapolei Parkway is from the proposed intersection with Renton Road to the OR&L right-of-way (ROW). The botanical survey area for this section is an approximately 20-acre area bound by Renton Road to the west, the existing 'Ewa Mahiko Park to the north, the 'Ewa Gentry subdivision and a portion of the OR&L ROW to the east, and Kalo'i Gulch and the OR& L ROW to the south (Figure 3). This property is also owned by the City and County of Honolulu. The proposed parkway follows along an existing paved cane haul road. Except for Kalo'i Gulch, most of the site appears to have been graded in the past.

Field studies to assess the botanical resources on the ±80-acre study site including the proposed Kapolei Parkway corridor from North-South Road to Renton Road were conducted on 09 January 2004 by a team of two botanists. The Renton Road to OR&L ROW section was surveyed on 02 February 2004. The primary objectives of the field survey were to:

1) prepare a general description of the vegetation on the study sites; and
2) search for Abutilon menziesii as well as other threatened and endangered species and species of concern.

SURVEY METHODS

For the North-South Road to Renton Road section of Kapolei Parkway, a colored aerial photograph (roughly 1" = 250') was used, while the design and construction plans were

used for the Renton Road to OR&L ROW section. These were examined prior to the field studies to familiarize the botanists with vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

The proposed parkway corridor on the ±80-acre site was flagged and staked by the survey engineers before our field survey. Thirty (30)-foot wide transects were made through the koa haole/buffel grass scrub found between the existing paved road and the edge of the golf course. This is identified as "Area E" on Figure 1; plants of Abutilon are known from this portion of the study site. Less intensive transects were conducted for the more recently disturbed area makai of the existing paved road; this is identified as "Varona Village Extension" on Figure 1.

The survey for the proposed parkway corridor on the ±20-acre site between Renton Road to OR&L ROW focused on the less disturbed Kalo'i Gulch area. Notes were made on plant associations and distribution, disturbances, substrate types, topography, exposure, drainage, etc.

DESCRIPTION OF THE VEGETATION

The plant names used in this report follow Wagner et al. (1990) and Wagner and Herbst (1999). The few recent name changes are those reported in the Hawaii Biological Survey series (Evenhuis and Eldredge, eds., 1999-2002). The vegetation is described on each of the two areas within the ±80-acre site (Area E and Varona Village Extension), and on the ±20-acre Renton Road to OR&L ROW section.

Area E

Koa haole (Leucaena leucocephala)/buffel grass (Cenchrus ciliaris) scrub covers the portion of the study site located between the existing paved road and the golf course. Short-statured thickets of koa haole, 3 to 5 ft. tall, are scattered throughout this vegetation type. Buffel grass, 1 to 2 ft. tall, forms dense mats to loose tussocks between the thickets. Locally common are scattered patches of swollen fingergrass (Chloris barbata), stinkgrass (Eragrostis cilianensis), 'ilima (Sida fallax), Guinea grass (Panicum maximum), 'aheahea (Chenopodium murale), and hoary abutilon (Abutilon incanum). A few young trees of kiawe (Prosopis pallida), Chinaberry (Melia azedarch), and monkeypod (Samanea saman) can be observed here and there. Old bulldozer tracks and areas with coralline substrate are occasionally encountered. Scattered patches of false mallow (Malvastrum coromandelianum), Trianthema portulacastrum, swollen fingergrass, little bell (Ipomoea triloba), spiny amaranth (Amaranthus spinosus), 'aheahea, Macroptilium atropurpureum, and castor bean (Ricinus communis) are common on these more recently disturbed areas.

Along the edge of the golf course (slopes of Kalo'i Gulch), the woody components become very dense. Koa haole thickets are 7 to 12 ft. tall and there are small, scattered stands of emergent kiawe, monkeypod, Eucalyptus, and 'opiuma (Pithecellobium dulce) trees. Shrubs of hairy abutilon (Abutilon grandifolium), klu

(Acacia farnesiana), and sourbush (Pluchea carolinensis) are common. Robust clumps of Guinea grass, 5 to 6 ft. tall, and buffel grass, up to 3 ft. tall, form a dense cover between the woody components.

Four of the Abutilon menziesii locations occur on Area E in open koa haole/ buffel grass scrub (see Rare Plants section of this report).

Varona Village Extension

This portion of the study area located makai of the existing paved road has been bulldozed somewhat recently. Remnants of old house sites, old mango (Mangifera indica) and kalamungai (Moringa oleifera) trees, overgrown garden plots, and rusted parts of refrigerators, stoves, sheet metal, and a Suzuki Samurai vehicle can be found here. The vegetation is composed primarily of weedy, annual plants. Swollen fingergrass is the dominant component. Lion's ear (Leonotis nepetifolia), little bell, field bindweed (Ipomoea obscura), feather fingergrass (Chloris virgata), and saltbush (Atriplex suberecta) are locally abundant. Other weeds observed here include golden crown-beard (Verbesina encelioides), Spanish needle (Bidens pilosa), smooth rattlepod (Crotalaria pallida), 'uhaloa (Waltheria indica), castor bean, and wild tomato (Solanum lycopersicon).

Where the property borders the HECO easement, open, grassy fields of buffel grass are found. The woody components make up less than 5% of the cover; these include short-statured koa haole shrubs and young trees of kiawe and 'opiuma. Three medium-sized kiawe trees line the makai side of the existing paved road near the HECO easement. One plant of Abutilon is found associated with these trees. Also in this area are numerous clumps of Russian thistle or tumbleweed (Salsola tragus).

On the southwest corner of the property, there are large piles of coral rubble and boulders. This was the staging area for a sewer line at one time. The piles of excavated material are covered here and there with patches of tree tobacco shrubs (Nicotiana glauca), mats of Sida ciliaris and saltbush, and shrubs of 'ilima, 'uhaloa, and sourbush.

Renton Road to OR&L ROW Section

The proposed parkway alignment in this section follows along a former cane haul road. It consists of a thin layer of asphalt over crushed coral with patches of asphalt missing in many places. Along the open, grassy field of the park boundary is a narrow band of weedy vegetation with patches of reddish-colored soil. The weedy vegetation consists of a mixture of swollen fingergrass, buffel grass, green panicgrass (Panicum maximum var. trichoglume), and saltbush. A few scattered koa haole shrubs, 3 to 4 ft. tall, occur here. This area appears to have been graded when the parks playing field was installed.

On the makai side of the cane haul road, koa haole scrub borders the roadside and extends down the slopes into Kalo'i Gulch. Along the roadside, the shrubs are 6 to 10 ft. tall, but become somewhat taller, 10 to 15 ft. tall, within the gulch. Scattered through the koa haole scrub are emergent trees of kiawe and 'opiuma, 20 to 25 ft. tall. Other woody components include sourbush and castor bean. Buffel grass and Guinea grass form dense clumps up to 3 ft. tall in most places.

On parts of the gulch slope, there are areas with exposed reddish-colored soil; a number of dirt bike trails also are found within the gulch. These open areas support a weedy mixture of plants which include castor bean, cocklebur (Xanthium strumarium), golden crown-beard, hairy merremia (Merremia aegyptia), spiny amaranth, false mallow, and Jimson weed (Datura strumonium). 'Uhaloa is locally abundant on these exposed areas. Other native species observed in the gulch area are 'ilima and hoary abutilon.

Along the gulch bottom, the vegetation is primarily Guinea grass and buffel grass with scattered koa haole shrubs and young kiawe and 'opiuma. In some places, there are small pools of standing muddy water; California grass (Brachiaria mutica) and primrose willow (Ludwigia octovalvis) are associated with these areas. Parts of the gulch adjacent to the bridge are concrete lined.

RARE PLANTS

The approximate locations of Abutilon menziesii are plotted on Figure 2. Only single plants are found at locations 2 to 5. At location 1, there is a large, multi-stemmed plant about 5 ft. tall; a young, single-stemmed plant about 2.5 ft. tall; and a seedling, 4 inches tall. No Abutilon menziesii was found in the Renton Road to OR&L ROW section.

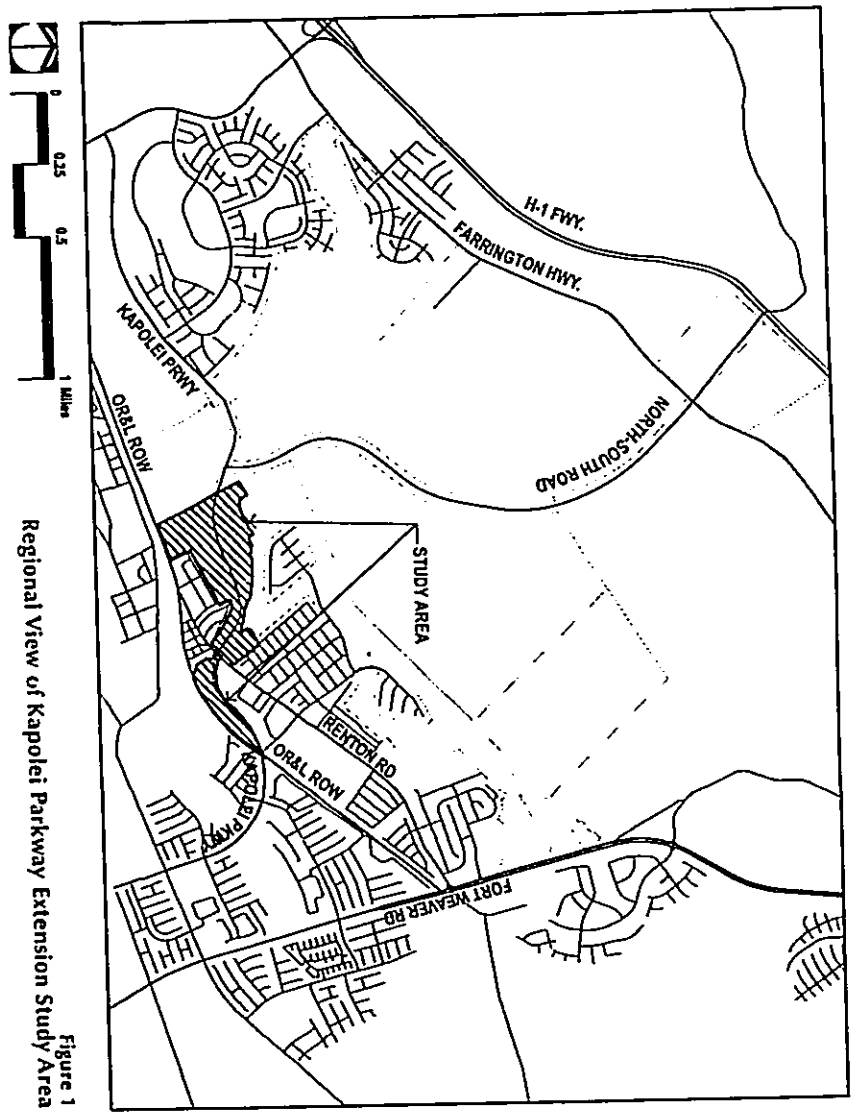
The plants as well as the area around the plants have been flagged with blue and white stripped flagging. G. Mansker, Division of Forestry and Wildlife, will more accurately map the plants using a GPS unit later on.

No other threatened and endangered species or species of concern (U.S. Fish and Wildlife Service 1999; Wagner et al. 1999) were found during the field studies. The other native species which were observed on the study site are common species which can be found throughout the islands. These are the 'ilima (Sida fallax), 'uhaloa (Waltheria indica), hoary abutilon (Abutilon incanum), popolo (Solanum americanum), and pa'uohi'iaka (Jacquemontia ovalifolia ssp. sandwicensis).

DISCUSSION

The vegetation on the City and County-owned lands are dominated by introduced or alien species such as koa haole, buffel grass, kiawe, swollen fingergrass, etc. For the most part, the proposed Kapolei Parkway alignment follows along an existing paved road. None of the plants found on the property, with the exception of the Abutilon menziesii, is a threatened and endangered species or a species of concern.

The City and County will need to work closely with the other agencies involved in the Habitat Conservation Plan which has been prepared for the endangered Abutilon on the Kapolei site. Plant material from the five locations within the study site will need to be collected for propagation and included in future outplantings.



Regional View of Kapolei Parkway Extension Study Area

Figure 1

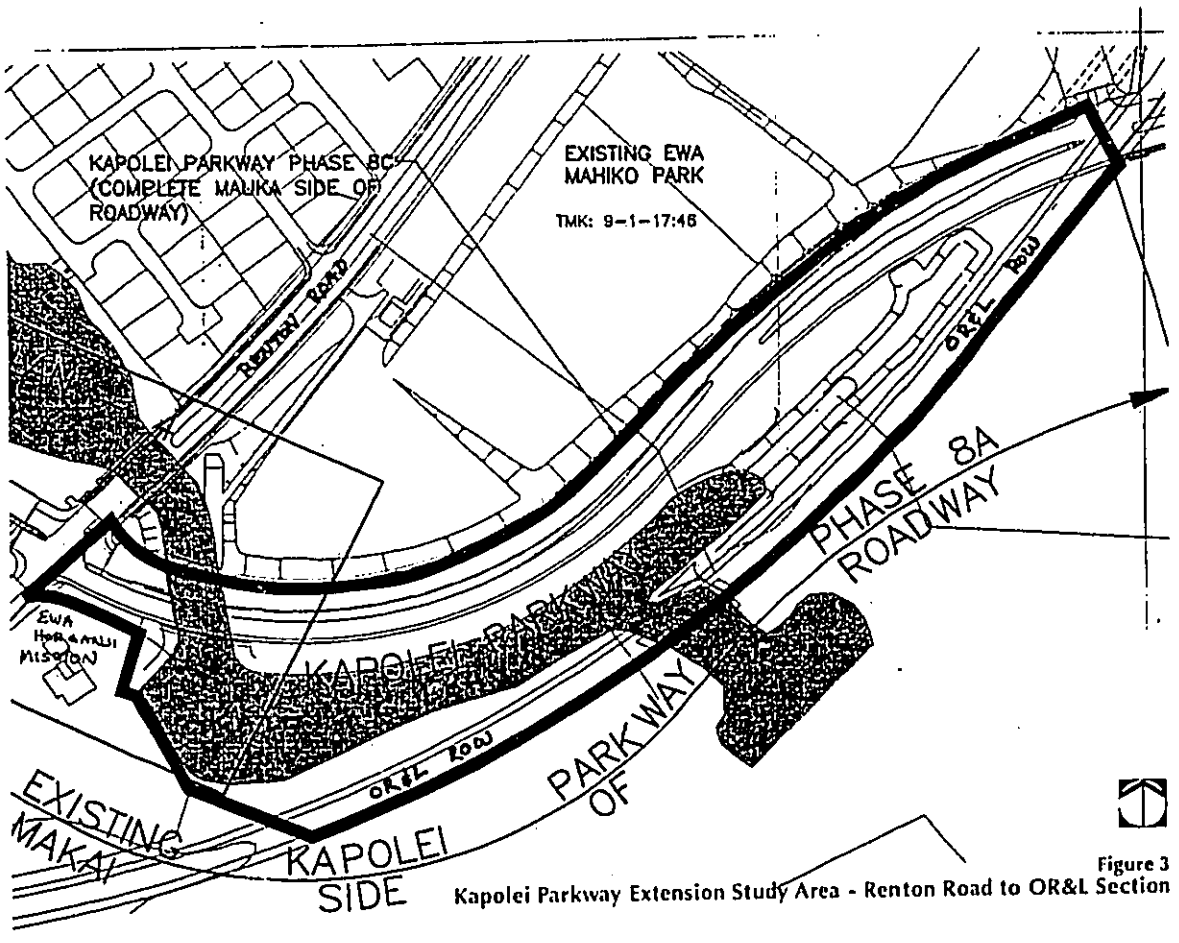


Figure 3
Kapolei Parkway Extension Study Area - Renton Road to OR&L Section

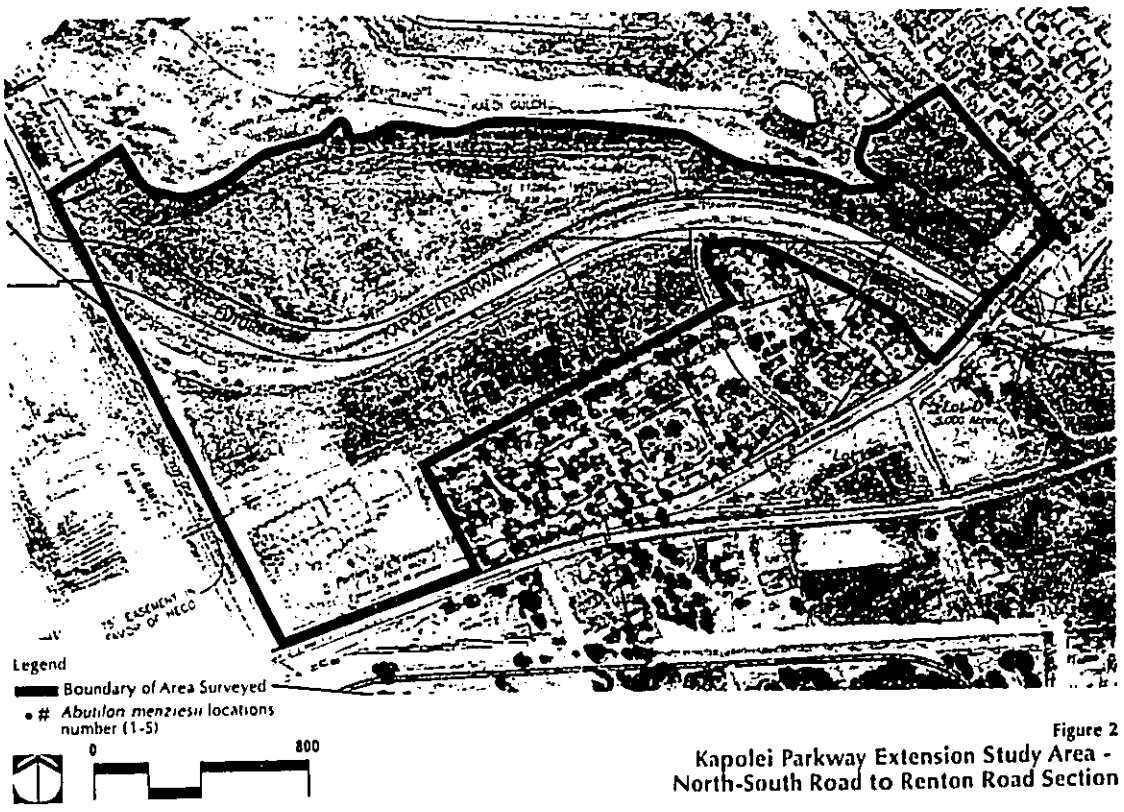


Figure 2
Kapolei Parkway Extension Study Area -
North-South Road to Renton Road Section

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Appendix F
Interim Management Report for Abutilon menziesii (April 24, 2001)

Department of Land and Natural Resources
Division of Forestry and Wildlife
Natural Area Reserve System

Interim Management Report for *Abutilon menziesii*
April 24, 2001

The following is a summary of activities implemented by the Department of Land and Natural Resources (DLNR) under the agreement, East Kapolei –Interim Mitigation Plan for the Endangered species, *Abutilon menziesii*, during the 31-month October 1, 1998 to April 24,2001. This report will summarize the activities completed during each of the 10 quarters during that period. We have not completed all activities set forth in the agreement. The only task that remains is the construction of a greenhouse (Task # 5). This is not a final report. A final report will be submitted when all tasks have been completed.

Task 1: Maintain existing population of Abutilon menziesii on State land at East Kapolei, Oahu, Hawaii. This work will include the following:

1. Monitoring

A total of 76 visits were made to the *Abutilon menziesii* plants at Kapolei between October 1998 and March 2000. Two DLNR staff conducted most of the site visits. The breakdown of the visits per quarter can be found in Table 1 below. Each plant was given a number and a permanent tag. The numbers given to plants followed those assigned during the survey done by Kenneth Nagata in December 1997, where appropriate. New numbers were assigned to plants not located during the Nagata surveys. As part of the monitoring process, four mature plants not found in the original survey were discovered; three are outside the project area near the Ewa golf course maintenance building and one adjacent to population C-1. Therefore the number of original plants in the East Kapolei population was the 86 found during the December 1997 survey by Kenneth Nagata, plus the 4 new plants discovered during the site visits made by DLNR staff during this project, for a grand total of 90 plants. We were successful in propagating clones from 62 of the 90 plants. In the Interim Report of 20 June 2000 we stated that there were 62 remaining plants. Several of these plants have since died due to natural senescence. The number of plants still alive is between 30 and 50. Determining whether an *Abutilon menziesii* is still alive is difficult. The plant may appear to be only dead sticks but a heavy rain will cause the plant to suddenly sprout green leaves. Therefore it is difficult to give a definitive total on the plants still alive in East Kapolei. We have contracted with Hawaii Natural Heritage Program to produce a detailed GIS map of all known *Abutilon menziesii* plants and plant locations. This map will be provided in the final report for this project.

Table 1. Site visits to East Kapolei *Abutilon menziesii* plants

Quarter	Number of Site Visits	Total Person Days
October 1998 - December 1998	13	26
January 1999 - March 1999	6	12
April 1999 - June 1999	7	16
July 1999 - September 1999	8	16
October 1999 – December 1999	7	14
January 2000 – March 2000	8	16
April 2000 – June 2000	8	8
July 2000 – September 2000	5	5
October 2000 – December 2000	6	6
January 2001 – March 2001	8	8

2. Maintenance

Plants were watered during each visit and treated six separate times with systemic insecticide to control hibiscus snow scale, ants, and mealy bugs. Vegetation immediately adjacent to each plant was removed during each visit to keep potential fire fuels away from the plant. Plants were not fertilized because of a concern of encouraging soft growth in the wild plants that could not be sustained without the installation of a permanent irrigation system.

3. Security

A fire plan has been implemented for the area that: creates a fire break around the *Abutilon menziesii* populations and individual plants; identifies the fire fighting resources available near the East Kapolei *Abutilon menziesii* population; and provides information to these resources to assist them with protecting these plants from fire. We have contracted the Hawaii Natural Heritage Program to produce a detailed GIS map of all the known *Abutilon menziesii* plants and the key fire resources in the area. This map will be provided to all the Fire Department Stations listed in this fire plan for their reference in case of a fire. This map will be a part of the final report. The TMK for the East Kapolei area where the plants are found is Oahu 9:1:6, parcel 109. The nearest Fire Station to the area is Kapolei Fire Station (Station 40). Station 40 is approximately 2.5 miles from the *Abutilon menziesii* populations.

The potential ignition sources for fires in the East Kapolei area are accidental ignitions from children playing with fire, careless smoking, vehicles in dry flashy fuels, misuse of fireworks, and intentionally set arson fires. Fireworks are prevalent during the New Years and Fourth of July holidays and illegal aerial fireworks are becoming more prevalent during these times. The potential of fireworks as an ignition source in Kapolei is quite high. Illegal motorcycle use of the parcel occurs and is another likely source for fires in the area. To mitigate for the potential for fire we have removed all fuel immediately adjacent to each plant. In late June 2000, we contracted an agricultural disc to create a 30-foot barrier of bare soil around each plant or each cluster of plants. This firebreak is still in place because we have not received any significant rainfall in the area since the establishment of this firebreak.

The fire fighting resources available at Station 40 in Kapolei are an Engine, a Ladder truck, and a Brush Fire truck. A Honolulu Fire Department Battalion Chief is stationed at Station 40. The next closest fire units are at Station 12 in Waipahu. Station 12 has an Engine, a Ladder truck, and a Water Tender. Station 35 in Makakilo is the third closest unit to the area and it has an Engine on site. Station 28 in Makakilo is the fourth closest unit with an Engine and a Water Tender on station. The GIS map we developed shows all the access routes to the main population clusters. This map will be provided the above Fire Stations.

Task 2: Propagate a total representation of plants through seeds and cuttings from the East Kapolei <u>Abutilon menziesii</u> population.

Task 2 of the agreement has been completed. All the known East Kapolei Abutilon menziesii plants have been propagated through cuttings. Figure 1 shows some of the 630 plants we have propagated from cuttings so far. The bullets below detail the propagation work we have done. Table 2 below details the cuttings taken from the East Kapolei ***<u>Abutilon menziesii</u>*** plants per quarter. Each cutting taken from an East Kapolei plant can be divided into up to six cuttings. We attempt to produce a plant from each cutting but not all are successful. Figure 2 is a photo of many ***<u>Abutilon menziesii</u>*** plants ready for outplanting.

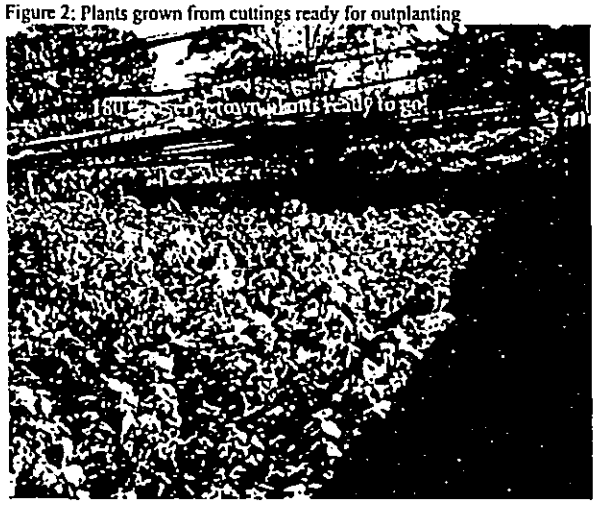
- A total of 630 plants have been propagated from cuttings of 62 East Kapolei individuals.
- 220 seedlings have been produced from seed. This seed was collected from nursery plants grown from cuttings of the East Kapolei population.
- Research on optimum germination method is ongoing. We are using a heating mat under the seeding tray to speed germination rate. This method has been successful in speeding germination time from 3 to 4 months with regular germination technique to 2 to 3 weeks using this technique.
- We have sent over 800 seeds to Dr. Alvin Yoshinaga at Lyon Arboretum. A percentage of these are sent to the National Seed Storage Lab in Fort Collins, Colorado. These seeds are from nursery plants.
- We have seeds from 39 of the East Kapolei plants in storage at the Pahole Rare plant facility.

Table 2: Cuttings taken of East Kapolei <u>Abutilon menziesii</u>

Quarter	Number of Cuttings Taken
October 1998 - December 1998	120
January 1999 - March 1999	200
April 1999 - June 1999	70
July 1999 - September 1999	30
October 1999 – December 1999	36
January 2000 – March 2000	28
April 2000 – June 2000	40
July 2000 – September 2000	0
October 2000 – December 2000	0
January 2001 – March 2001	70

Figure 1: *Abutilon menziesii* cuttings

Figure 2: Plants grown from cuttings ready for outplanting



Appendix C

Noise Technical Report

NORTH-SOUTH ROAD AND KAPOLEI PARKWAY PROJECT

Noise Technical Report

Prepared by:

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

July 2004

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1. INTRODUCTION

The purpose of this report is to analyze the traffic noise impacts of the proposed North-South Road and Kapolei Parkway project in Ewa, Oahu, Hawaii. This study was prepared in accordance with Federal Highway Administration (FHWA) rules and procedures and the State of Hawaii Department of Transportation (HDOT) Noise Analysis and Abatement Policy. Its elements include:

1. Measurements of existing noise levels at representative noise sensitive receivers;
2. Prediction of future traffic noise levels;
3. Comparison of existing and predicted future traffic noise levels with the FHWA Noise Abatement Criteria (NAC);
4. Preparation of noise contours to provide guidance for future developments;
5. Recommendations to reduce noise impacts;
6. Evaluation of possible noise barriers; and
7. The effects of construction noise and proposed mitigation measures.

2. PROJECT DESCRIPTION

The HDOT and the FHWA propose to construct North-South Road in Ewa, Oahu, Hawaii (see Figure 1). The proposed roadway would be a principal arterial highway, that would connect Interstate Route H-1 (H-1 Freeway) to the proposed Kapolei Parkway, and is approximately 2.2 miles in length. The North-South Road project also includes the construction of: (1) a major interchange at its junction with the H-1 Freeway; (2) the North-South Road/Kapolei Parkway intersection; and (3) various drainage features, such as a drainage channel and detention basin associated with the proposed highway, as well as two bridges over Kalol Gulch The roadway section of concern for the Kapolei Parkway is approximately 0.7 miles in length and is a proposed federal-aid, arterial roadway which would connect the proposed North-South Road to other existing, southerly portions of the Kapolei Parkway. North-South Road would be a State facility; Kapolei Parkway is proposed as a City facility, to be constructed by the City's Department of Design and Construction (DDC).

The following alternatives are under consideration.

1. No-Build Alternative – The future No-Build Alternative assumes the roadway improvements in the TOP 2025, except the North-South Road Interchange and North-South Road, describing a future roadway network that includes some improvements for the Ewa Plain. No-Build Alternative assumes that Kapolei Parkway is complete from Ewa Beach through the City of Kapolei by year 2025, including the segment between Renton Road and North-South Road. However, that segment of Kapolei Parkway would not be in place within the late 2007 to early 2008 time frame, to match initial implementation of the proposed North-South Road. The inclusion of this segment of the Kapolei Parkway is consistent

Task 3: Establish two wild populations of <u>Abutilon menziesii</u> in appropriate habitat

Two outplanting sites have been identified as the initial sites for the establishment of new wild populations of <u>*Abutilon menziesii*</u>. The first site is on unencumbered State land on the Mokuleia side of Kaena Point and the second is on City and County of Honolulu land in Koko Crater.

The first ouplanting site is located at the Koko Crater Botanical Garden. The Honolulu Botanical Gardens provided a 100 x 100 foot site set aside for the plant for the initial planting. On 16 November 2001, 140 <u>*Abutilon menziesii*</u> were planted at the site provided. These plants represent 2 complete sets of each of the original East Kapolei plants. The planting was accomplished with Honolulu Botanical gardens staff, DLNR staff, and several volunteers. The plants have been irrigated with a drip irrigation system and are thriving. Koko Crater Botanical Gardens staff will provide the long term care of these plants and will be propagating <u>*Abutilon menziesii*</u> from materials taken from these plants.

The Kaena Point outplanting site was initiated in April 2001. The outplanting area is about ¼ mile to the west of the site identified in the June 20, 2000 report. The approximately 3-acre outplanting site was established with two distinct planting areas separated by a four-wheel drive road. The site is completely protected from four-wheel drive vehicles by a rock barrier along the dirt road fronting the outplanting site. We prepared the site by clearing the non-native brush and grass with weedeaters and with hand tools. We treated the area with herbicide to prevent regrowth of these non-natives. A total of 61 <u>*Abutilon menziesii*</u> plants were planted by 6 April 2001. We will be planting more plants in the Kaena Point outplanting site by the end of May 2001. When planting is complete we will have two representatives of each of the 62 East Kapolei plants we have propagated. We also planted over 300 other native coastal plants of 20 different species in this site.

A complete irrigation system was constructed at the Kaena Point outplanting site to provide the initial irrigation for these plants. The DLNR received permission from the U. S. Air Force to tap into the 4-inch water main that runs adjacent to the outplanting site. We contracted a plumber to tap into the line and provide a pressure reducing valve, a backflow preventer, a water meter, and a 1-½ inch stub to attach our irrigation system to. We also installed a valve to supply water for fire suppression in the area. We constructed a corrugated galvanized steel water tank with a capacity of approximately 3,000 gallons to provide a water reserve for irrigating the plants. This tank is necessary because the 4-inch water main is pressurized only two days a week for 4 hours per day. The cost of the irrigation water will be an ongoing expense for this project. We consulted with DLNR Historic Preservation Division and they declared that the construction of the outplanting site would have no effect on significant historical sites. We checked with the City and County about the need for a Special Management Area permit. They confirmed that this site is within the Special Management Area. However, the work of developing the outplanting site did not require a permit because was not considered development.

Each outplanting site was planted with a representative sub-sample of the wild plants from East Kapolei and each individual plant will be tagged with permanent metal tags. Maintenance of these sites will be done during the establishment of these plants via weeding, application of herbicide, pesticide, and fertilizer.

As part of the national program to preserve rare species, replicates of all wild individuals will be planted in the living collections at Waimea Arboretum. It is hoped that this will provide seeds for further out plantings and for distribution. We have not done this yet because of the current staffing levels at the Waimea Arboretum

When the above sites are established we will consider other outplanting sites including:

- U. S. Navy land in Lualualei
- Barbers Point
- Kaena Iki/Yokohama Bay
- Diamond Head Crater
- Makapu'u/Queen's Beach
- A current outplanting site on State land near Kealia Trail

Task 4: Research into the biology of the Abutilon menziesii population.

1. ***Document Past Research***
The University of Hawaii has not yet been contracted to document past research on the <u>*Abutilon menziesii*</u> population.

2. ***Testing***

a) Test granular diazinon for use in controlling ants.
This was done on all plants and it is a very effective treatment in controlling ants.

b) Test Azatin and encapsulated Dursban on a few plants to determine toxicity.
These pesticides provide good control of scale and mealy bugs with no toxicity to *Abutilon*. The first trial was conducted on 6 plants in October 1998. The treatment was shown to be effective in this trial and about one month later the treatment was done on the remaining East Kapolei plants.

c) Test seed storage in appropriate facilities
Seeds have been collected from 39 individual East Kapolei plants and are being stored at the DLNR rare plant seed storage facility. Approximately 700 seeds have been collected from the East Kapolei plants. We have collected over 1,000 seeds from nursery plants grown from cuttings. We provided over 800 seeds to Dr. Alvin Yoshinaga at Lyon Arboretum for seed storage research. Some of these seeds have been sent to the National Seed Storage Lab in Fort Collins, Colorado for long term storage.

We will continue to work on finding the most effective germination technique for <u>*Abutilon menziesii*</u> seeds.

Task 5: Provide partial funding for the construction of a low-elevation greenhouse dedicated to growing A. menziesii and other threatened and endangered plant species on Oahu.

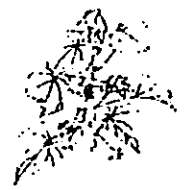
We have been working on getting a site for a nursery for <u>*Abutilon menziesii*</u> that is near the outplanting site and the DLNR rare plant nursery. The preferred site for the low-elevation nursery facility was identified behind Dillingham airfield. We had discussions with the Department of Transportation over a 6-month period and eventually were told that they were unable to lease any portion of the airfield for a use not associated with aviation.

The second site we identified for the nursery is on a portion of land owned by DLNR and leased by YMCA Camp Erdman. This six-acre site is immediately adjacent to the Camp on the Kaena Point side makai of Farrington Highway. YMCA Camp Erdman indicated keen interest in cooperating in the placement of this nursery here. This site is attractive because it is close to a

water and power source. Camp Erdman offers the benefits of 24-hour security and the potential as an educational outreach site for rare native plants. This site is considered a backup site because of the amount of work involved in removing the many iron wood trees on the site. The other negatives are that because the site is so close to the ocean the nursery would receive heavy salt spray and would be threatened by salt water during periods of high surf.

The primary site identified for the nursery is on land owned by the State of Hawaii, and leased to Mr. Ron Weidenbeck of Fish Farms Hawaii. The parcel is located in Lot 3 of TMK 6: 9: 01. Mr. Weidenbeck has approved DLNR removing a portion of Lot 3 to establish a nursery. The advantages of this site are: within a hundred yards of a water source; within a hundred yards of a power source; within a 8 foot high chain link perimeter fence; located away from the direct influence of the waves and salt spray; and above a planned caretakers cabin which will provide oversight of the area. We are currently working with Ms. Charlene Unoki of the Division of Land Management, DLNR to convert the lease of this parcel to the Division of Forestry and Wildlife from Mr. Weidenbeck. We expect to complete the transfer of this property and begin construction soon. We will submit the final report for the Housing and Community Development Corporation of Hawaii when we have completed the construction of this greenhouse.

Appendix G
Final Interim Management Report
for Abutilon menziesii
(October 31, 2003)



Department of Land and Natural Resources
Division of Forestry and Wildlife
Natural Area Reserves System

Final Interim Management Report for *Abutilon menziesii*

Actions completed by the Division of Forestry and Wildlife
October 31, 2003

The following is a summary of activities implemented by the Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW), for the Endangered species, *Abutilon menziesii*, during the 30-month period from April 24, 2001 to October 31, 2003. This is a final report on the interim management activities completed by DOFAW. The Habitat Conservation Plan (HCP) for *Abutilon menziesii* is nearly complete. The Board of Land and Natural Resources must approve the HCP before the plan is considered complete. All future reporting on the management of *Abutilon menziesii* will be done in relation to the HCP.

Project Background

The East Kapolei *Abutilon menziesii* population was discovered in 1996 by Kenneth Nagata during a biological survey conducted for PBR Hawaii, a consulting firm hired by the State of Hawaii agency then known as the Housing Finance and Development Corporation. This survey was done for the East Kapolei Master Plan project that proposed a mixture of residential and community development projects for the area. The East Kapolei area was in sugar cane cultivation for over a century when agricultural operations ceased in spring 1995. The State of Hawaii, Department of Transportation, and the City and County of Honolulu, Department of Transportation Services commissioned another botanical survey by Char and Associates, Botanical Associates, for a proposed highway. The corridor of this proposed highway, known as the North-South Road, passes directly through a significant portion of the East Kapolei Abutilon *menziesii* population. These surveys are documented in previous versions of the East Kapolei Master Plan Habitat Conservation Plan for *Abutilon menziesii*.

In 1999, the State of Hawaii, Housing Finance and Development Corporation, which had changed its' name to the Housing and Community Development Corporation of Hawaii (HCDCH), entered into an agreement with the DLNR/DOFAW for the interim mitigation of the East Kapolei *Abutilon menziesii* population. This agreement (found in Appendix A), which was signed September 15, 1999, was to cover tasks that DLNR/DOFAW completed from October 1, 1998 to March 31, 2000. This agreement was to provide $67,850.00 to complete 5 main tasks in relation to the protection of the East Kapolei *Abutilon menziesii* population and the conservation of the species. The main tasks were: 1) Maintain existing population of *Abutilon menziesii* on State land at East Kapolei, Oahu, Hawaii; 2) Propagate a total representation of plants through seeds and cuttings from the East Kapolei *Abutilon menziesii* population; 3) Establish two wild populations of *Abutilon menziesii* in appropriate habitat; 4) Research into the biology of the *Abutilon menziesii* population; 5) Provide partial funding for the construction of a low-elevation greenhouse dedicated to growing *Abutilon menziesii* and other threatened and endangered plant species on Oahu. A report entitled, Interim Management Report for *Abutilon menziesii*, dated April 24, 2001 documented the work done by DLNR/DOFAW from October 1, 1998 until the report date. DLNR/DOFAW was paid $40,125 for the work accomplishments documented in that

FINAL INTERIM MANAGEMENT REPORT – DLNR/DOFAW
October 31, 2003

report. All phases of tasks 1, 2, and 4 were accomplished during that period. We were unable to complete all phases of tasks 3 and 5 of the original agreement. We were unable to complete task 3, the establishment of two wild populations of *Abutilon menziesii*, because we had difficulty finding landowners who had suitable habitat and were willing to allow a new population of endangered plant species to be established on their land. The difficulty we had in completing task 5, the establishment of a low-elevation greenhouse, was finding a suitable parcel of State owned land where building a nursery was feasible with a small budget.

A second agreement between HCDCH and DLNR/DOFAW was signed on January 30, 2001 (see Appendix B). This agreement was signed to complete the actions that were not fully completed in the first agreement. This agreement covered actions to complete the establishment of two wild populations, construction of a greenhouse, and the completion of a final report. In this agreement DLNR/DOFAW was to complete the remaining tasks during the period from November 1, 2000 to October 31, 2001. DLNR/DOFAW continued to work through the problems associated with completion of the tasks identified in the second agreement. However, we were not able to complete them all by October 31, 2001. In October 2001, HCDCH was no longer seeking to complete the East Kapolei Master Plan and the agreement was not extended. DLNR/DOFAW did not receive the $27,725.00 that was set aside to complete the tasks in this second agreement. This report will document the completion of all tasks completed by DLNR/DOFAW since April 24, 2001 that were identified in the original agreement. DLNR/DOFAW staff used a variety of funding sources to complete the second outplanting site and complete the nursery. The HCDCH only paid about 60% of the $67,850.00 they had originally pledged to complete the mitigation measures for the conservation of *Abutilon menziesii*.

The North/South Road project of the State of Hawaii, Department of Transportation (DOT), and the City and County of Honolulu, Department of Transportation Services, has become the lead project in the development of the HCP for the East Kapolei population of *Abutilon menziesii*. The DOT has set aside funds to continue work on the conservation of *Abutilon menziesii* until the HCP is finalized, and beyond. These funds have paid for part of the salary of a Horticulturist working for DLNR/DOFAW to work on the completion of the tasks mentioned above. That Horticulturist was hired in March 2001 and he continues to work on the conservation of *Abutilon menziesii*. The DOT funds have also been used to complete the nursery and support tasks related to the conservation of this species.

ACCOMPLISHMENT OF TASKS

Task 1: Maintain existing population of Abutilon menziesii on State land at East Kapolei, Oahu, Hawaii. This work will include the following:

1.Monitoring

A total of 30 visits were made to the *Abutilon menziesii* plants at Kapolei between April 2001 and October 2003. The Horticulturist DLNR/DOFAW hired to work on *Abutilon menziesii* did all the monitoring. The Horticulturist visited the East Kapolei population once a month, or three times per quarter. Each plant has been given a number and a permanent tag. The numbers given to plants followed those assigned during the survey done by Kenneth Nagata in December 1997, where appropriate. The total number of *Abutilon menziesii* at the time of the last report was 90. The DOFAW Horticulturist has found 16 new *Abutilon menziesii* plants in the East Kapolei area since the last report. New numbers were assigned to plants. We have not taken any cuttings from any of these plants. The plants are still too small to be able to withstand the stress of cuttings being

taken from them. One of the 16 new plants has produced seed. That seed has been collected and stored.

The East Kapolei area has been in drought conditions since April 2001. In the spring of 2002, the area did receive a few significant rains. In surveys done at East Kapolei by DLNR/DOFAW in March through May 2002 many *Abutilon* seedlings were found. The Horticulturist decided that the survival of these seedlings was more likely if they were transplanted when they were still small. A total of 31 seedlings from the East Kapolei population were dug up and transplanted in the nearby outplanting site at the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. 21 seedlings of known parentage and 10 seedlings of unknown parentage that were removed from the East Kapolei population have been planted there. A small portion of the seedlings produced at the East Kapolei population (approximately 10%) during the spring of 2002 were left at East Kapolei and subsequently perished.

In the time since April 24, 2001, several of the original 86 plants have died due to natural senescence. The number of plants still alive is between 25 and 40. Determining whether an *Abutilon menziesii* is still alive is difficult. The plant may appear to be only dead sticks but a heavy rain will cause the plant to suddenly sprout green leaves. Therefore it is difficult to give a definitive total on the plants still alive in East Kapolei. In Appendix C, we have a map with all the *Abutilon menziesii* plants and plant locations noted in relation to existing infrastructure and boundaries. In Appendix D, we provide a map with all known *Abutilon menziesii* plant locations, existing infrastructure, and boundaries overlaid on an aerial photo from PBR Hawaii that was in HCDCH HCP.

2. Maintenance
Irrigation was provided to the 16 new plants to enhance their establishment. A small amount of fertilizer was given to all the live plants. Weeding was done around the base of all plants, including the plants that have died, to discourage the deposition of weed seeds around the mother plant and to reduce competition from weedy species

3. Security
A fire plan has been implemented for the area that created a fire break around the *Abutilon menziesii* populations and individual plants; identifies the fire fighting resources available near the East Kapolei population; and provides information to these resources to assist them with protecting these plants from fire. We have contracted the Hawaii Natural Heritage Program to produce a detailed GIS map of all the known plants and the key fire resources in the area. This map (in Appendix C) will be provided to all the Fire Department Stations listed below for their reference in case of a fire. The TMK for the East Kapolei area where the plants are found is Oahu 9:1:6, parcel 109.

The potential ignition sources for fires in the East Kapolei area are accidental ignitions from children playing with fire, careless smoking, vehicles in dry flashy fuels, misuse of fireworks, and intentionally set arson fires. Fireworks are prevalent during the New Years and Fourth of July holidays and illegal aerial fireworks are becoming more prevalent during these times. The potential of fireworks as an ignition source in Kapolei is quite high. Illegal motorcycle use of the parcel occurs and is another likely source for fires in the area. In late June 2000, we contracted an agricultural disc to create a 30-foot barrier of bare soil around each plant or each cluster of plants. We have not had any significant heavy rains since then to increase the fuel near the plants. Currently this firebreak is still in place. This method of firebreak creation may be more detrimental

than beneficial to the East Kapolei population. The use of the agricultural disc can disturb seeds in the soil bank around the existing plants, which could be detrimental to their germination.

At this time (October 2003) the fuel in the entire project area is light and discontinuous. It is highly unlikely a brush fire could be sustained in the East Kapolei *Abutilon menziesii* population area at this time. The area should be monitored regularly because an extended period of above average rainfall could increase fuel levels sufficiently to present a fire threat.

The nearest Fire Station to the area is Kapolei Fire Station (Station 40). Station 40 is approximately 2.5 miles from the *Abutilon menziesii* populations. The fire fighting resources available at Station 40 in Kapolei are an Engine, a Ladder truck, and a Brush Fire truck. A Honolulu Fire Department Battalion Chief is stationed at Station 40. The next closest fire units are at Station 12 in Waipahu. Station 12 has an Engine, a Ladder truck, and a Water Tender. Station 35 in Makakilo is the third closest unit to the area and it has an Engine on site. Station 28 in Makakilo is the fourth closest unit with an Engine and a Water Tender on station. The GIS map shown in Appendix C shows all the access routes to the main population clusters. This map will be provided the above Fire Stations.

Task 2:Propagate a total representation of plants through seeds and cuttings from the East Kapolei Abutilon menziesii population.

Task 2 was completed before April 24, 2001. The 16 plants discovered since that time have not been propagated from cuttings. These plants are still to small to sustain cuttings being taken from them.

We have not propagated any new plants from seed since April 24, 2001. We have continued to collect seed from the East Kapolei population. There are 52 plants from the East Kapolei population represented in the seed collection at the Lyon arboretum seed storage facility. This total includes seeds from one of the 16 new plants discovered since April 24, 2003.

Task 3: Establish two wild populations of Abutilon menziesii in appropriate habitat

The Interim management report of April 24, 2001 identified two outplanting sites that were the initial sites for the establishment of new wild populations of *Abutilon menziesii*. The first site is on City and County of Honolulu land in Koko Crater and the second is on State land on the Mokuleia side of Kaena Point. Since that report we have completed a third ouplanting site at the Honoululi Unit of the U. S. Fish and Wildlife Service Pearl Harbor National Wildlife Refuge.

1. Koko Crater
The first ouplanting site is located at the Koko Crater Botanical Garden. The Honolulu Botanical Gardens provided a 100 x 100 foot site set aside for the plant for the initial planting. On 16 November 2001, 140 *Abutilon menziesii* were planted at the site provided. The planting was accomplished with Honolulu Botanical gardens staff, DLNR staff, and several volunteers. The plants have been irrigated with a drip irrigation system since then and are thriving. Koko Crater Botanical Gardens staff will provide the long term care of these plants and will be propagating *Abutilon menziesii* from materials taken from these plants. DLNR has provided support to weed the Koko Crater population on periodic visits to the site. This site met the criteria for the establishment of wild

populations under the first interim mitigation plan agreement between HCDCH and DLNR/DOFAW when it was initially established. However, since the establishment of this site, we have received comments from the Endangered Species Recovery Committee and others. These comments have caused DLNR/DOFAW to reconsider the appropriateness of this population to be considered a wild population. DLNR/DOFAW agrees that since this site is within a public display garden that it should not be considered as a wild population for the purposes of the Habitat Conservation Plan. In addition, the plants at Koko Crater have been on drip irrigation since they were planted. This has caused the plants to grow taller and have more luxuriant growth than they would in a truly wild population. DLNR/DOFAW views this population as a living collection representation of the genetic stock of the East Kapolei *Abutilon menziesii* population. DLNR/DOFAW will work with the staff at Koko Crater Botanical Gardens to coordinate the management of this population.

2. Kaena Point

The Kaena Point outplanting site was started in April 2001. The outplanting area is about ½ the distance between the end of the paved Farrington Highway and the vehicle barrier at the entrance to the Kaena Point Natural Area Reserve. The land is under the jurisdiction of the DLNR, Division of State Parks (TMK 6:9:01, Parcel 4). The DLNR Historic Preservation Division declared that the construction of the outplanting site would have no effect on significant historical sites. The City and County of Honolulu Planning Section confirmed that this site is within the Special Management Area. However, the work of developing the outplanting site did not require a permit because was not considered development.

The approximately 3-acre outplanting site was established with two distinct planting areas separated by a four-wheel drive road. The site is completely protected from four-wheel drive vehicles by a rock barrier along the dirt road fronting the outplanting site. The initial cost of installing this barrier was nearly $4,000. This barrier has been challenged by off-road vehicles occasionally and we have improved the barrier in areas where vehicles have attempted to breech the barrier. We prepared the site by clearing the non-native brush and grass with weedeaters and with hand tools. We treated the area with herbicide to prevent regrowth of these non-natives. A total of 61 *Abutilon menziesii* plants were planted by 6 April 2001. We have planted 81 additional plants since April 2001. A total of 142 *Abutilon menziesii* plants have been planted in the Kaena Point outplanting site. The plants were irrigated at the site to promote their establishment. The approach we plan to take at this site is to irrigate the plants to encourage the production of a maximum amount of seed to allow the build up of the seed bank and natural establishment of seedlings. The survival rate for plants at this site has been 98%. The 142 plants at this site represent a total of 44 of the original East Kapolei plants. Two *Abutilon* seedlings have grown naturally from seed produced by plants outplanted at this site. These seedlings have grown large enough to be considered part of this population.

A complete irrigation system was constructed at the Kaena Point outplanting site to provide the initial irrigation for these plants. The DLNR received permission from the U. S. Air Force to tap into the 4-inch water main that runs adjacent to the outplanting site. We contracted a plumber to tap into the line and provide a pressure reducing valve, a backflow preventer, a water meter, and a 1-½ inch stub to attach our irrigation system to. We also installed a valve to supply water for fire suppression in the area. We constructed a corrugated galvanized steel water tank with a capacity of approximately 3,000 gallons to provide a water reserve for irrigating the plants. This tank is necessary because the 4-

inch water main is pressurized only two days a week for 4 hours per day. The cost of the installation of this irrigation system was nearly $12,000 to complete these tasks.

The Kaena Point outplanting site has been a difficult one to maintain. This site was established in area with deep soil that was dominated by Guinea grass (*Panicum maximum*) and koa haole (*Leucaena leucocephala*). We have had difficulty keeping up with the weed threat presented by these species and others at this outplanting site. DLNR/DOFAW has used a variety of labor including regular Natural Area Reserves System employees; temporary workers such as the Emergency Environmental Workforce; and volunteers to control weeds in the outplanting site. This additional labor has barely allowed us to keep pace with the weed threat at this site. The money provided under the HCDCH agreement was used to establish the irrigation system at this site and pay a portion of the first year of the salary for the Horticulturist assigned to work on all the activities concerning the conservation and recovery of *Abutilon menziesii*. Money provided by the State of Hawaii DOT has continued to support this position since 2001. This Horticulturist position has spent the majority of his time working on construction of the nursery dedicated to growing *Abutilon menziesii*. We would not have been able to keep up with the weed threat at this site without the additional labor supplied by regular DLNR/DOFAW employees. We will not be able to continue to support the weed threat control at this site at this level. This is due to other important projects taking precedence and a hiring freeze that has left the Oahu Branch with three vacant positions. It will be very difficult for the Horticulturist to keep up with the weed threat at this outplanting site.

The other major threat to this outplanting site is fire. The fire plan that has been in place at this site is the installation of the water tank that serves as a resource for fire fighting in addition to being part of the irrigation system, installation of a 2 inch outlet to allow fire engine hookup near the road as another fire fighting resource, and the planting of native plants along the perimeter of the outplanting site to serve as a fuel break. These tasks were accomplished. However, the fuel break portion of this fire plan needs to be developed further with a wider buffer of fire resistant species established.

On August 20, a brush fire started by a vehicle about ¾ mile away burned a total of 160 acres along the coastal flats up to the nearby Kuaokala Game Management Area at about 1,100 feet elevation. This fire started late at night and was fanned by winds of 25 to 35 mph. The fire burned to the edge of the outplanting site and around it. The fire moved so quickly that Honolulu Fire Department engine companies were not able to engage the fire near the ignition point, or near the outplanting site. They did fight the fire to prevent its' spread in the Kuaokala GMA on August 21. The fire burned approximately 30 percent of the 3-acre outplanting site. The effects of the fire on the *Abutilon menziesii* plants at the site are unknown at this time. We will not know how many were killed by the fire until the rainy season commences and there is sufficient moisture for growth. The plants along the edge were affected by the flames but not completely consumed. It is possible that many of these *Abutilon menziesii* plants will survive. The fire did burn many of the other native species planted in the area to serve as a fuel break along the front of the outplanting site. This fire would of caused more damage if these plants had not been in place. These fuel break plants will need to be replaced. The fire did destroy all irrigation pipes in the area. The cost to replace this pipe will be about $3,000. The lesson that DLNR/DOFAW has learned from this experience is that the fuel break plantings are the most useful part of the fire plan. The fuel break at the Kaena Point outplanting site needs to be replaced and improved to encompass the entire outplanting site.

The HCP should set aside enough funds to cover the full costs of developing and maintaining an outplanting site. The money provided under the agreement with HCDCH provided funds to install the vehicle barrier and the irrigation system, and provided some funds towards the first year of the Horticulturists' salary. The total cost to establish this outplanting site was more than $20,000. This does not include the cost of staff time of DLNR/DOFAW employees. The cost would have been significantly higher if the site was further from a water source.

The initial establishment of outplanting sites will be the most expensive phase of the project. Future outplanting sites should be chosen with that in mind. Several important factors need to be considered when developing an outplanting site for wild *Abutilon menziesii* populations: 1) The site should have a water source or irrigation method identified and accounted for in the budget; 2) It is important that the weed threat at the site is manageable with limited staffing or, if that is not possible, the work force and the resources necessary to combat the weed threat should be identified up front; 3) The fire threat to the site should be addressed with fuel break plantings; 4) The site must not be too remote as to require significant travel time and effort to get personnel and tools and equipment there; 5) The protection of the site from human impact needs to be considered and addressed in the establishment of the site. The HCP should front load the first few years of the budget to address the costs associated with initial development of outplanting sites.

3. Honouliuli Unit of Pearl Harbor National Wildlife Refuge
A third outplanting site has been developed at the Honouliuli Unit of the U. S. Fish and Wildlife Service Pearl Harbor National Wildlife Refuge that borders the West Loch of Pearl Harbor (TMK 9:1:17). This 37-acre unit is mostly a fresh water wetland managed for a variety of endangered water birds. The entire Honouliuli Unit is enclosed in an eight-foot chain link fence that provides predator control for the birds and security for the plants. There is an upland area within this Unit that we felt was suitable for planting *Abutilon menziesii*. We installed an irrigation system at the site to assist with the initial establishment of plants there at a cost of approximately $2,500.

We have planted a total of 61 *Abutilon menziesii* plants at the Honouliuli Unit. The survival rate of the plants outplanted there is 96%. Plants from cuttings from 21 of the original East Kapolei plants are planted here. In addition, 21 seedlings of known parentage and 10 seedlings of unknown parentage that were removed from the East Kapolei population in the spring of 2002 have been planted here. A small portion of the seedlings produced at the East Kapolei population (approximately 10%) during the spring of 2002 were left at East Kapolei and subsequently perished. Three plants produced from seed were also planted at Honouliuli. The amount area covered by this outplanting site is approximately ½ an acre. There is sufficient area to add many more plants to this site.

The threat to this outplanting site from fire is minimal. The eight-foot chain link fence provides a barrier to most of the possible ignition sources. A buffer of approximately 6 feet of bare ground is in place just inside most of the perimeter fence of this unit to serve as a barrier to predators of the endangered water birds. This buffer strip also serves as a firebreak to the outplanting site. The portion of the fence that doesn't have this buffer has fresh water marsh just inside the fence. The only fire plan we have for this site is to make sure this buffer strip remains in place.

Task 4: Research into the biology of the Abutilon menziesii population.

No further research activities have been conducted on the biology of the *Abutilon menziesii* population. We have continued to collect seed produced by 52 of the original East Kapolei plants. Over 20,000 seeds have been collected.

Task 5: Provide partial funding for the construction of a low-elevation greenhouse dedicated to growing A. menziesii and other threatened and endangered plant species on Oahu.

We have completed the construction of a 6,000 square foot nursery dedicated to the propagation of *Abutilon menziesii* and other threatened and endangered plant species on Oahu. The nursery is located above the Kaena Point end of Dillingham Air Field on the North Shore of Oahu. The nursery is located is located in Parcel 3 of TMK 6: 9: 01. This parcel is owned by the State of Hawaii, managed by the Land Division of the DLNR, and was leased to Mr. Ron Weidenbeck of Fish Farms Hawaii. We are still in the process of getting the parcel under the jurisdiction of DLNR/DOFAW. There have been issues related to some of the other parcels leased to Mr. Weidenbeck in the area that have slowed this process.

This task has been the most difficult one to complete. The most difficult phase was locating suitable parcel of State owned land where building a nursery was feasible with a small budget. We looked at sites on DOT land closer to the Dillingham Airfield and a parcel near Camp Erdman in addition to others. The selection of a nursery site was not complete until October 2001. The site needed a significant amount of groundwork before it was usable as a nursery. The leveling of the site included hauling 300 tons of rock to the site. We finally completed the groundwork in March 2002. The next difficulty was developing construction specifications and getting bids for the construction of the main part of the nursery. This phase took from April 2002 until June 2002. We completed the construction of the main part of the nursery in the fall of 2002. Once the construction of the nursery was complete we installed the shade cloth with the help of DLNR/DOFAW staff and volunteers. The next to the last phase of the project was the completion of the electrical hook up which included the installation of a new power pole, electrical meter, and safety switch. We also had to wire the pumps for the water system, provide power in the nursery for lights, and outfit the storage containers we had moved to the site with lights and power outlets. The final phase of the nursery project was the installation of a water system. This phase required obtaining permission to tap into a line at a nearby concrete reservoir tank, the installation of a 10,000 gallon storage tank, installation of a 1,000 gallon booster tank, installation of pumps to lift water to the upper storage tank and pressurize the nursery supply lines, and installation of the irrigation system within the nursery. These final two phases were completed by the end of August 2003.

The original agreement with HCDCH set a budget of $10,000 to contribute towards the construction of a nursery dedicated to growing *Abutilon menziesii*. The total cost for completing all phases of this nursery was over $68,000.00. We utilized a variety of funding sources to complete the nursery. We utilized $13,189.53 of the funds set aside by DOT for *Abutilon menziesii* during the nursery construction phase of the project. The nursery alone cost more than the entire amount originally budgeted to complete all tasks in the first Interim Mitigation plan for the Endangered Species, *Abutilon menziesii*, between DLNR/DOFAW and HCDCH. The Horticulturist hired with a majority of his salary coming from DOT funds has spent 80% of his work time since October 2001 working on completion of this nursery. The monetary value of his time is not included in the total listed above.

APPENDIX A

BENJAMIN J. CAYETANO
GOVERNOR

DONALD K.W. LAU
EXECUTIVE DIRECTOR

SHARYN L. MIYASHIRO
EXECUTIVE ASSISTANT

FAX: (808) 587-0600

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813

TO: Department of Land and Natural Resources
Division of Forestry and Wildlife
Oahu Branch

DATE: September 16, 1999
ATTENTION: Randy Kennedy

RE: East Kapolei – Interim Mitigation Plan for the Endangered Species, Abutilon Menziesii

WE ARE SENDING YOU X ATTACHED
___ UNDER SEPARATE COVER VIA _____ THE FOLLOWING ITEMS

COPIES	DATE	NO.	DESCRIPTION
1	9/15/99		Executed Agreement for the East Kapolei interim mitigation plan

THESE ARE TRANSMITTED as checked below:

___ For approval
X For your use
___ As requested/required
___ For review and comment
___ FOR BIDS DUE _____.

___ Approved as submitted
___ Approved as noted
___ Returned for corrections

___ Resubmit
___ Submit
___ Return

___ copies for approval
___ copies for distribution
___ corrected prints

REMARKS: _____

IF THERE ARE ANY QUESTIONS, PLEASE CONTACT: Leo Domingo TELEPHONE NO. 587-3170

SIGNED: _____
Project Coordinator

COPY TO: _____

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.

DHS 4308/ (8/87)

AGREEMENT

THIS AGREEMENT is made this 15th day of September, 1999, by and between the HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII ("HCDCH"), a public body and body corporate and politic of the State of Hawaii, whose post office address and principal place of business is 677 Queen Street, Suite 300, Honolulu, Hawaii 96813, and the DEPARTMENT OF LAND AND NATURAL RESOURCES ("DLNR"), State of Hawaii, whose address is 1151 Punchbowl Street, Honolulu, Hawaii 96813, and

WHEREAS, the Department of Land and Natural Resources (DLNR), has title to that certain real property situated at Honouliuli, Ewa, Oahu, Hawaii, containing an area of 1,300.000 acres, and identified as tax map keys: 9-1-016:008, 9-1-016:108, 9-1-016:109, 9-1-017:086, 9-1-017:071, 9-1-018:003, and 9-1-018:005 (collectively referred to as "East Kapolei State Land Bank,") and

WHEREAS, DLNR is in the process of transferring title of the East Kapolei State Land Bank to HCDCH for development purposes in order to satisfy legislative and administrative goals and objectives, specifically to generate funds for the University of Hawaii West Oahu Campus, to facilitate the development of private sector housing units, and to provide off-site infrastructure for the 200-acre site to be transfefred to the Department of Hawaiian Home Lands, and

WHEREAS, HCDCH is the designated master plan developer for the East Kapolei Master Planned Development Project, which encompasses the East Kapolei State Land Bank, and

WHEREAS, HCDCH has filed a Final Environmental Impact Statement (FEIS) for the East Kapolei State Land Bank. The FEIS was accepted by the Governor of the State of Hawaii on September 23, 1998, conditioned upon satisfying the requirements of Chapter 343, Hawaii Revised Statutes, and specifically to implement the Habitat Conservation Plan for the endangered abutilon menziesii in accordance with the requirements of the U.S. Fish and Wildlife Service and the State Department of Land and Natural Resources;

WHEREAS, DLNR has the capability of performing the plant mitigation and has the knowledge and expertise to administer the mitigation of the endangered Abutilon Menziesii, and is willing to provide services for the interim mitigation of the endangered Abutilon Menziesii,

NOW THEREFORE, in consideration of the premises above, the parties mutually agree as follows:

1. DLNR shall perform the tasks set forth in "Exhibit A", attached hereto and incorporated herein. DLNR shall provide reasonable safeguards to secure the existence of the endangered Abutilon Menziesii, to maintain the existing plant population, to establish a new "wild" population, and to perform research into the biology of the endangered Abutilon Menziesii.

2. HCDCH will pay to DLNR the total sum of $67,860.00 as set forth in "Exhibit B", attached hereto and incorporated herein. Quarterly payments will be made upon submission of written quarterly reports of progress to HCDCH.

3. DLNR will perform the tasks during an 18-month period, beginning from October 1, 1998 and ending on March 31, 2000.

4. This Agreement shall be null and void if the Habitat Conservation Plan is not approved by DLNR.

5. This Agreement may be terminated at any time by written consent of both parties.

IN WITNESS WHEREOF, the undersigned have executed these presents as of the day and year first written above.

APPROVED AS TO FORM:

Deputy Attorney General

HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII

Donald K. W. Lau
Its Executive Director

DEPARTMENT OF LAND AND NATURAL RESOURCES

Timothy E. Johns, Chairperson
Board of Land and Natural Resources

Exhibit "A"

SCOPE OF SERVICES

A. Task 1

Maintain existing population of Abutilon Menziesii on State lands at East Kapolei, Oahu, Hawaii. This work will include the following:

1. Monitoring

   a. Place permanent stakes for sequence shots.
   b. Record GPS data in notebook and on video soundtrack.
   c. Create a new map with GPS points using GIS.

2. Maintenance

   Maintain existing population by weeding, and applying herbicide, pesticide and fertilizer.

3. Security

   Develop and implement a fire protection plan for the population.

B. Task 2

Propagate a total representation of plants through seeds and cuttings from the Abutilon Menziesii population. These plants will be used to maintain genetic representation of stock and provide stock for outplanting purposes. Work will be done at the existing State DLNR, Division of Forestry and Wildlife (DOFAW) nurseries or at appropriate co-operating nurseries.

C. Task 3

Establish two wild populations of Abutilon Menziesii in appropriate habitat to allow for natural establishment and long term viability. Prepare and implement fire protection plan for the population. Secure wild population from off-road vehicles using boulder barriers.

D. Task 4

Research into the biology of the Abutilon Menziesii population.

1. Contract the University of Hawaii to document past research on the Abutilon Menziesii population.

2. Perform testing and identify testing parameters as follows:

   a. test granular diazinon for use in controlling ants;
   b. test Azatin and encapsulated Dursban on a few plants to determine toxicity;
   c. test seed storage in appropriate facilities in the event of problems with wild populations;
   d. establish testing parameters for outplanting site selection to include, but not limited to, salt influence, occasional storm wave wash influence, associated soil organisms, and accompanying pests.

E. Task 5

Construct a greenhouse dedicated to growing Abutilon Menziesii endangered plant species. The greenhouse would serve as a long-term greenhouse for threatened and endangered plant species on Oahu. Task 5 includes the following scope:

1. Site Preparation

   a. clear and grade the greenhouse site, having approximately 0.5 acres in size; and
   b. construct an eight-foot high chain link fence.

2. Water Supply

   a. develop a permanent water source for greenhouse irrigation;
   b. purchase and construct a 5,000 gallon tank for emergency backup water supply; and
   c. provide irrigation system for greenhouse.

3. Greenhouse Construction

   a. construct a greenhouse using a prefabricated greenhouse kit;
   b. construct two shade structures for preparing nursery stock for outplanting; and
   c. purchase benches, pots, and equipment necessary to operate the greenhouse.

F. Administration

Document findings and prepare quarterly reports of progress. At the end of the contract period, prepare a summary final report which provides a recommendation of action and possible alternatives, if any, based upon documented findings and results.

DEV 21000.19

Exhibit "B"

COMPENSATION

Payment will be made upon DLNR's submission of quarterly reports to HCDCH. Final payment will be made upon DLNR's submission of a final report to HCDCH. Compensation is based upon the following cost breakdown:

Task 1	in the amount of	$18,300.00
Task 2	in the amount of	$10,950.00
Task 3	in the amount of	$16,600.00
Task 4	in the amount of	$ 7,500.00
Task 5	in the amount of	$10,000.00
Administration	in the amount of	$ 4,500.00
	TOTAL COMPENSATION	$67,850.00

DEV 21000.19

APPENDIX B

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813

SHARYN L. MIYASHIRO
ACTING EXECUTIVE DIRECTOR

ROBERT J. HALL
ACTING EXECUTIVE ASSISTANT

FAX: (808) 587-0600

TO: DLNR – Division of Forestry and Wildlife
2135 Makiki Heights Drive
Honolulu, HI 96822

DATE: January 30, 2001
ATTENTION: Brent Liesemeyer

RE: East Kapolei – Interim Mitigation Plan for the Abutilon Menziesii

WE ARE SENDING YOU X ATTACHED
___ UNDER SEPARATE COVER VIA _____ THE FOLLOWING ITEMS

COPIES	DATE	NO.	DESCRIPTION
1			Inter-agency Agreement (Executed copy)

THESE ARE TRANSMITTED as checked below:

___ For approval	___ Approved as submitted	___ Resubmit	___ copies for approval
X For your use	___ Approved as noted	___ Submit	___ copies for distribution
___ As requested/required	___ Returned for corrections	___ Return	___ corrected prints
___ For review and comment			
___ FOR BIDS DUE _____			

REMARKS: _____

IF THERE ARE ANY QUESTIONS, PLEASE CONTACT: Leo Domingo TELEPHONE NO. 587-3170

SIGNED: _____
Project Coordinator

COPY TO: _____

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.

DHS 4308/ (8/87)

AGREEMENT

THIS AGREEMENT, made this 25th day of January, 2001, by and between the HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII ("HCDCH"), a public body and body corporate and politic of the State of Hawaii, whose post office address and principal place of business is 677 Queen Street, Suite 300, Honolulu, Hawaii 96813, and the DEPARTMENT OF LAND AND NATURAL RESOURCES ("DLNR"), State of Hawaii, whose address is 1151 Punchbowl Street, Honolulu, Hawaii 96813.

WHEREAS, the DLNR has title to that certain real property situated at Honouliuli, Ewa, Oahu, Hawaii, containing an area of 1,300.000 acres, and identified as tax map keys: 9-1-016:008, 9-1-016:108, 9-1-016:109, 9-1-017:086, 9-1-017:071, 9-1-018:003, and 9-1-018:005 (collectively referred to as "East Kapolei State Land Bank"), and

WHEREAS, the DLNR is in the process of transferring title of the East Kapolei State Land Bank to HCDCH for development purposes in order to satisfy legislative and administrative goals and objectives, specifically to generate funds for the University of Hawaii West Oahu Campus, to facilitate the development of private sector housing units, and to provide off-site infrastructure for the 200-acre site to be transferred to the Department of Hawaiian Home Lands, and

WHEREAS, HCDCH is the designated master plan developer for the East Kapolei Master Planned Development Project, which encompasses the East Kapolei State Land Bank, and

WHEREAS, HCDCH has filed a Final Environmental Impact Statement (FEIS) for the East Kapolei State Land Bank. The FEIS was accepted by the Governor of the State of Hawaii on September 23, 1998, conditioned upon satisfying the requirements of Chapter 343, Hawaii Revised Statutes, and specifically to implement the Habitat Conservation Plan for the endangered Abutilon Menziesii in accordance with the requirements of the U. S. Fish and Wildlife Service and the State Department of Land and Natural Resources, and

WHEREAS, the DLNR has the capability to perform the plant mitigation, has the knowledge and expertise to administer the mitigation of the endangered Abutilon Menziesii, and is willing to provide services for the interim mitigation of the endangered Abutilon Menziesii, and

WHEREAS, HCDCH had previously entered into an agreement with the DLNR for similar services for the interim mitigation of the endangered Abutilon Menziesii, in an amount of $67,860.00.

This prior agreement expired on March 31, 2000, with a balance to complete interim mitigation in an amount of $27,725.00.

NOW THEREFORE, in consideration of the premises above, the parties mutually agree as follows:

1. DLNR shall perform the tasks set forth in "Exhibit A", attached hereto and incorporated herein. DLNR shall provide reasonable safeguards to secure the existence of the endangered Abutilon Menziesii, to maintain the existing plant population, to establish a new "wild" population, and to construct a greenhouse for the propagation of endangered plants.

2. HCDCH will pay to DLNR the total sum of $27,725.00 as set forth in "Exhibit B", attached hereto and incorporated herein. Quarterly payments will be made upon submission of written quarterly reports of progress to HCDCH.

3. DLNR will perform the tasks during a twelve-month period, starting from November 1, 2000 and ending on October 31, 2001.

4. This Agreement shall be null and void if the Habitat Conservation Plan is not approved by the DLNR.

5. This Agreement may be terminated at any time by written consent of both parties.

IN WITNESS WHEREOF, the undersigned have executed these presents as of the day and year first written above.

APPROVED AS TO FORM:

Deputy Attorney General

HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII

Sharyn L. Miyashiro
Its Acting Executive Director

APPROVED AS TO FORM:

Deputy Attorney General

DEPARTMENT OF LAND AND NATURAL RESOURCES

Timothy E. Johns, Chairperson
Board of Land and Natural Resources

Exhibit "A"

SCOPE OF SERVICES

A. Task 1

Establish two wild populations of Abutilon Menziesii in appropriate habitat to allow for natural establishment and long term viability. Prepare and implement fire protection plan for the population. Secure wild population from off-road vehicles using boulder barriers.

B. Task 2

Construct a greenhouse dedicated to growing Abutilon Menziesii and endangered plant species. The greenhouse shall serve as a long-term greenhouse for threatened and endangered plant species on Oahu. Task 2 includes the following scope:

1. Site Preparation

   a. Clear and grade the greenhouse site, having approximately 0.5 acres in size; and
   b. construct an eight-foot high chain link fence.

2. Water Supply

   a. Develop a permanent water source for greenhouse irrigation;
   b. purchase and construct a 5,000 gallon tank for emergency backup water supply; and
   c. provide irrigation system for the greenhouse.

3. Greenhouse Construction

   a. Construct a greenhouse using a prefabricated greenhouse kit;
   b. construct two shade structures for preparing nursery stock for outplanting; and
   c. purchase benches, pots, and equipment necessary to operate the greenhouse.

C. Administration

Document findings and prepare quarterly reports of progress. At the end of the contract period, prepare a summary final report which provides recommendation of action and possible alternatives, if any, based upon documented findings and results.

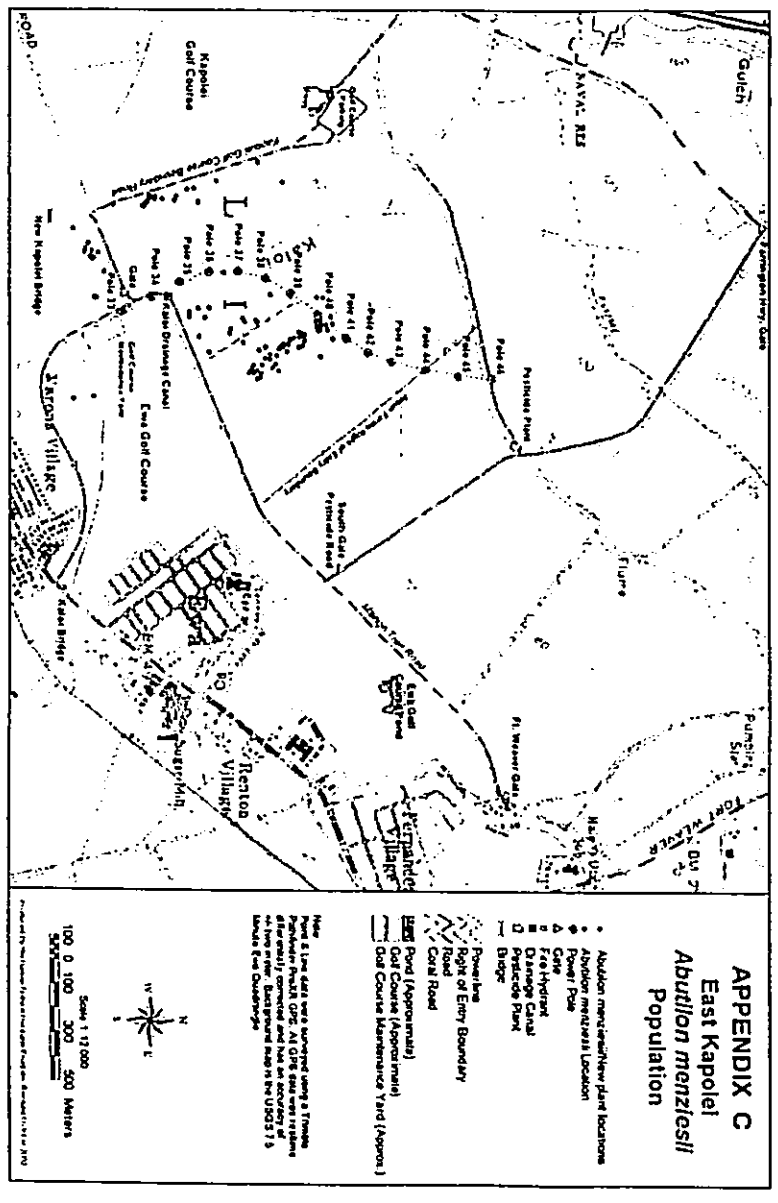
Exhibit "B"

COMPENSATION

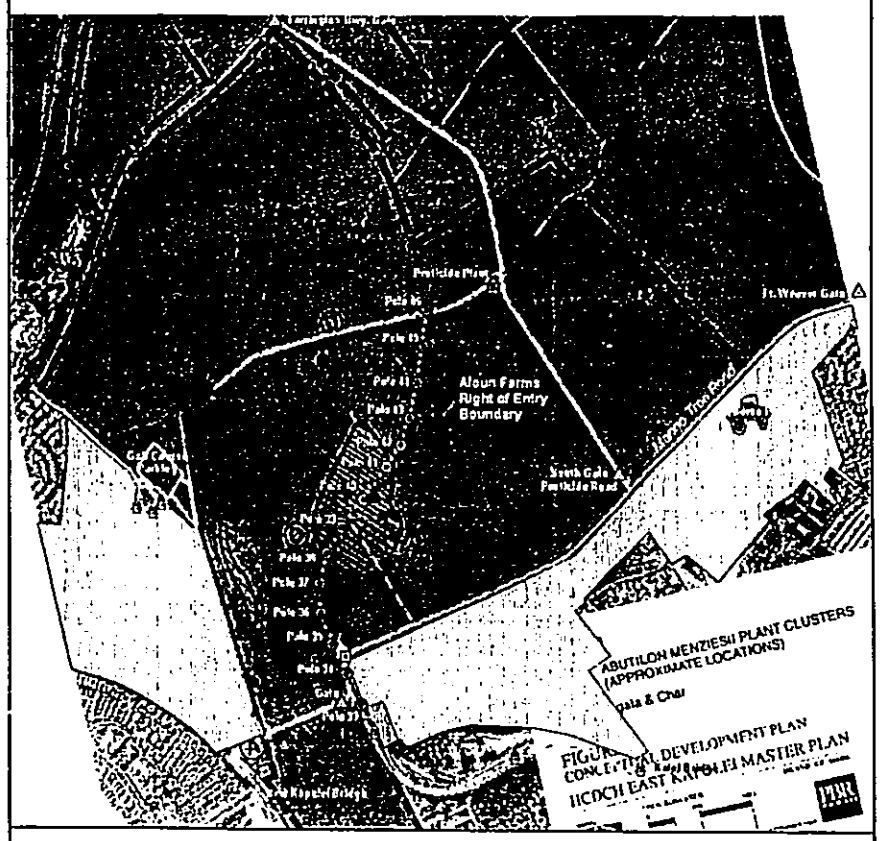
Payment will be made upon DLNR's submission of quarterly reports to HCDCH. Final payment will be made upon DLNR's submission of a final report to HCDCH. Compensation is based upon the following cost breakdown:

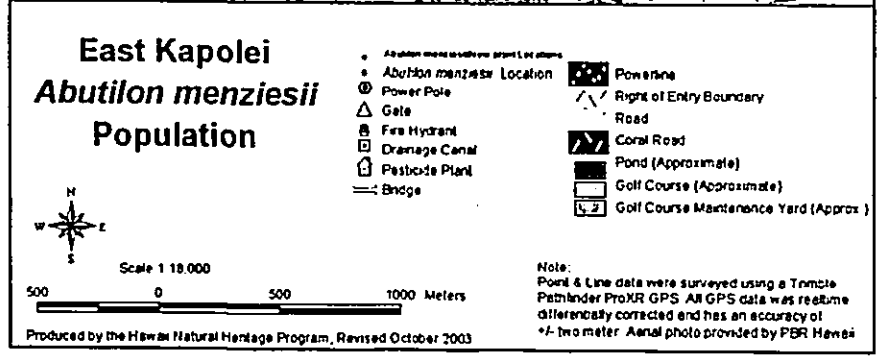
Task 1	.....	$16,600.00
Task 2	.....	$10,000.00
Administration	.....	$ 1,125.00
	TOTAL COMPENSATION	$27,725.00

DEV 21000.19


APPENDIX C
East Kapolei
Abutilon menziesii
Population
Abutilon menziesii/New plant locations
Abutilon menziesii Location
Power Pole
Gate
Fire Hydrant
Drainage Canal
Pesticide Plant
Bridge
Powerline
Right of Entry Boundary
Road
Coral Road
Pond (Approximate)
Golf Course (Approximate)
Golf Course Maintenance Yard (Approx.)
Note:
Point & Line data were surveyed using a Trimble Pathfinder ProXR GPS. All GPS data was realtime differentially corrected and has an accuracy of +/- two meter. Background image is the USGS 7.5 Minute Ewa Quadrangle
Scale 1:12,000
100 0 100 200 300 400 500 Meters
Kapolei Golf Course
Ewa Golf Course
Kapolei Village
Renton Village
Fort Weaver Rd.
Pumpkin Street
Tom Mucker Dr.
Naval Rec
Gulch
Pesticide Plant
South Gate Pesticide Road
Ft. Weaver Gate
Kapolei Village
Ewa Drainage Canal
Kapolei Bridge
Kaloi Bridge

APPENDIX D


Pesticide Plant
Ft. Weaver Gate
Alcan Farms
Right of Entry
Boundary
Fort Weaver Road
South Gate
Pesticide Road
ABUTILON MENZIESII PLANT CLUSTERS
(APPROXIMATE LOCATIONS)
Gate & Chain
FIGURE
CONCEPTUAL DEVELOPMENT PLAN
KAPOLEI MASTER PLAN
EAST KAPOLEI


East Kapolei
Abutilon menziesii
Population
Abutilon menziesii Location
Power Pole
Gate
Fire Hydrant
Drainage Canal
Pesticide Plant
Bridge
Powerline
Right of Entry Boundary
Road
Coral Road
Pond (Approximate)
Golf Course (Approximate)
Golf Course Maintenance Yard (Approx.)
Scale 1:18,000
500 0 500 1000 Meters
Note:
Point & Line data were surveyed using a Trimble Pathfinder ProXR GPS. All GPS data was realtime differentially corrected and has an accuracy of +/- two meter. Aerial photo provided by PBR Hawaii
Produced by the Hawaii Natural Heritage Program, Revised October 2003

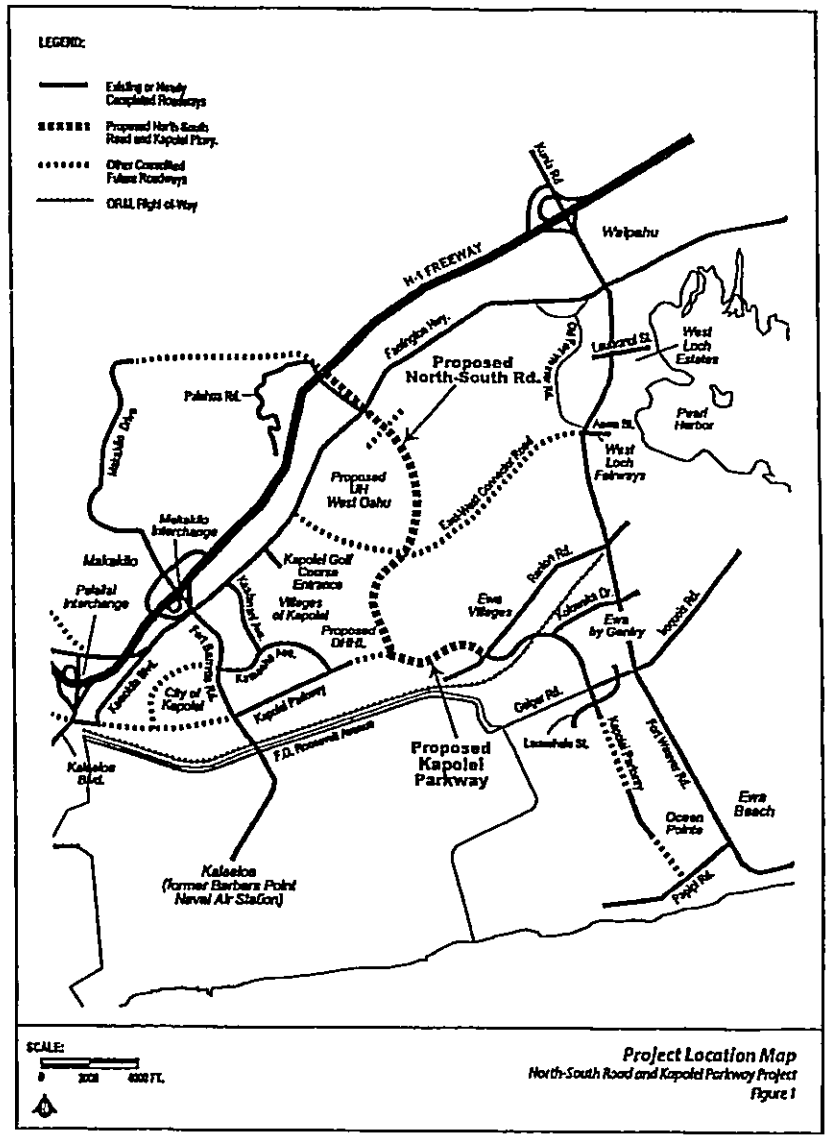
with City plans for the future completion of Kapolei Parkway, but reflects current City budgetary constraints which make the timing of this project completion uncertain. Because the City owns the property on which Kapolei Parkway is proposed, the roughly 10-acre ROW for the Kapolei Parkway is being established by subdividing the parcel and changing its designation.

The No-Build Alternative assumes a 794-bus fleet by 2025. This fleet includes the Regional Bus Rapid Transit (BRT) system proposed as part of the Primary Corridor Transportation Project, which is part of the TOP 2025. However, because North-South Road and its interchange with H-1 Freeway does not exist in the No-Build Alternative, the proposed North-South Road Park-and-Ride is also assumed not to exist. In turn, the Regional BRT and local hub and spoke bus routes that would otherwise interact with the proposed North-South Road Park-and-Ride would need to be rerouted to other transfer facilities. This assumption lowers the efficiency of transit service to the Ewa Plain area.

2. Build Alternative - The preferred Build Alternative (also called the "Palehua Corridor alignment") assumes the construction of the North-South Road and the federalization of a segment of Kapolei Parkway between North-South Road and Renton Road. North-South Road would ultimately be a six-lane, divided highway between the H-1 Freeway and Kapolei Parkway, consistent with the Kapolei Area Long-Range Master Plan (July 1993) and the TOP 2025. In order to ensure that the key 0.7-mile section of the Kapolei Parkway between Renton Road and North-South Road is completed within the same time frame as the opening of North-South Road, this segment is proposed be "federalized." The proposed segment of Kapolei Parkway would ultimately be a six-lane arterial roadway, connecting the proposed North-South Road to existing, southerly portions of the Kapolei Parkway.

North-South Road would intersect Kapolei Parkway between the existing Varona and Tenney Villages in the Ewa Villages development. The roadway would proceed north to the proposed interchange at the H-1 Freeway following an existing easement reserved for a major north-south roadway. The Build Alternative also includes a new conventional diamond configuration interchange with the H-1 Freeway, as well as intersections with the existing Farrington Highway and proposed intersections with other future roadways that would be constructed between Farrington Highway and Kapolei Parkway. The preferred Build Alternative would provide regional access to the interstate system as well as local access and circulation. The proposed road would include three lanes in each direction, a median, and sidewalks.

The right-of-way (ROW) for the Kapolei Parkway is currently owned by the City & County of Honolulu and is roughly 9.8 acres. The ROW for North-South Road would either be obtained through a Governor's Executive Order (EO) or acquired from a private landowner. The southern 104.4-acre portion of the North-South Road right-of-way is owned by the State, but would be transferred by EO from the Department of Land and Natural Resources (DLNR) to HDOT. The northern 44.7-acre portion is currently owned by the Estate of James Campbell and would have to be acquired by the State.



At the interchange, more land would be acquired than would be required solely for the conventional diamond interchange. (The diamond interchange requires approximately 14 acres. An additional 11 acres would be acquired for the loop ramp expansion.) The additional acreage would be acquired to preserve the option of a westbound to southbound loop ramp in the future, when warranted by traffic volumes. While acquisition of the additional acreage is part of the preferred alternative assessed in this Draft EA, the possible construction of a loop ramp is not addressed in this document.

3. EXISTING CONDITIONS

3.1 Background

Noise is defined as any sound that is undesirable or interferes with normal human activities. The decibel (dB) scale is used to quantify sound intensity and represents the ratio between a given sound and the faintest sound detectable by human hearing. Because sound pressure levels vary widely within the range of human hearing, the dB scale is logarithmic. The human ear is not equally sensitive to all frequencies within the entire sound spectrum. Accordingly, noise measurements are made using an A-weighting (dBA) scale to correspond to human perceptions of noise. A-scale sound levels are currently in use in many community and city noise ordinances and in state and city highway or traffic noise codes.

Time variation in noise exposure is typically accounted for as a constant energy level equivalent (L_{eq}) for a given time period. The L_{eq} is the constant noise level over some specified period of time that is equivalent in energy to a fluctuating (or brief) noise "averaged" over that period of time. L_{eq} is also a function of time and is expressed as L_{eq} (time period). For example, $L_{eq}(h)$, expressed in A-weighted decibels (dBA), is the calculated constant noise over one hour which is equivalent in total energy to the varying noise levels actually measured during that one hour.

3.2 Noise Standards

The HDOT Noise Analysis and Abatement Policy implements FHWA regulations on noise abatement (23 CFR 772) for the State of Hawaii. The regulations and policy require that a noise analysis be performed whenever potentially affected receivers exist, either as developed lands or lands that are planned, designed or programmed for future use.

The FHWA has established Noise Abatement Criteria (NAC), shown on Table 1, for different exterior and interior land use activities. The NAC do not constitute legally enforceable noise standards, but represent a yardstick for evaluating the effect of project noise on the surrounding community. The NAC have been adopted by the State of Hawaii as its standard.

Under HDOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC, or when the predicted traffic noise levels substantially

exceed the existing noise levels. "Approach" means at least 1 dBA less than the NAC, and "substantially exceed the existing noise levels" means an increase of at least 15 dBA. If the NAC are approached or exceeded, or if there is a substantial increase above the existing noise level, noise abatement measures must be considered.

Changes in traffic noise are assessed using human perceptions of sound level changes. Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, but a 10 dBA change is perceived as a doubling (or halving) of noise levels. These guidelines permit estimation of an individual's probable perception of changes in noise levels.

Table 1
Noise Abatement Criteria (NAC)

Activity Category	$L_{eq}(h)$ for Noisiest Traffic Hour, dBA	Description of Activity
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B.
D	—	Undeveloped lands
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Notes: $L_{eq}(h)$ is the one-hour energy equivalent sound level.

Interior noise level standards apply to:
1. Indoor activities for those parcels where no exterior noise sensitive land use or activities have been identified; and
2. Situations where the exterior activities are either remote from the highway or shielded, so that while the exterior activities remain undisturbed, noise nevertheless affects interior activities.

Source: Federal Highway Administration

3.3 Noise Sensitive Receivers and Existing Noise Levels

Existing and future noise sensitive land uses, and activities adjacent to the proposed corridor and nearby major roadways, were identified from site inspections and existing mapping. These land use activities include residences, recreation and park areas, and institutions such as schools and churches. All of these activities have a NAC of $L_{eq}(h)$ 67 dBA and are considered Category B.

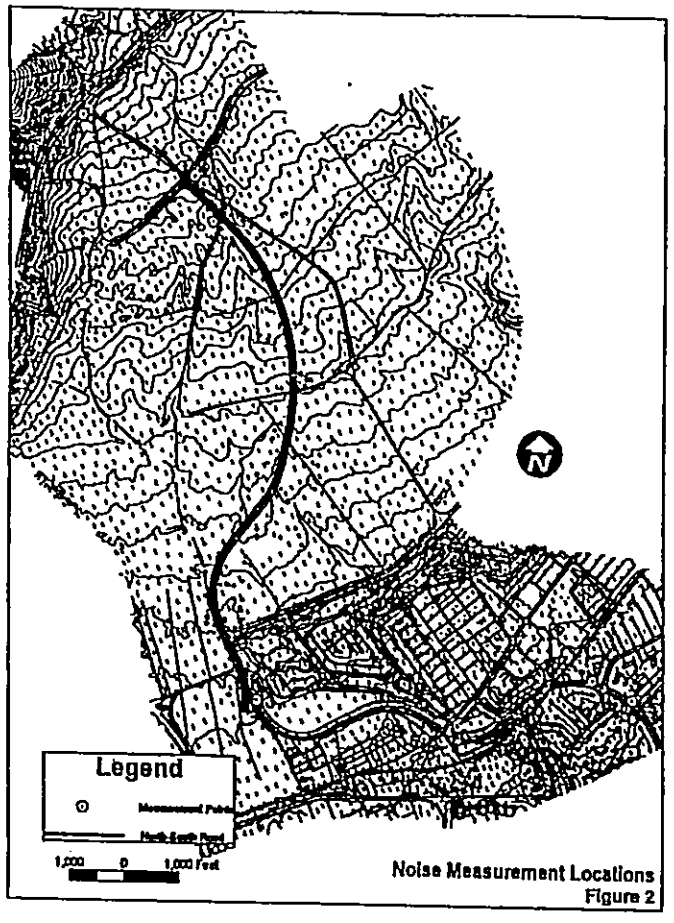
Existing noise levels in the project corridor were measured in March and April, 2004, from 9:00 a.m. to 5:00 p.m. Noise measurements were sampled for 15-minute periods at seven (7) sites considered representative of existing and future noise sensitive land uses (see Table 2). One hour noise measurements were taken at sites A and B over a 24-hour period. Sites A and B were used to identify the peak noise hour and adjust the 15-minute samples to the peak noise level (Table 2). The 15-minute sample is adjusted to peak hour by comparing the measured 15-minute noise level to that at the closest 24-hour measurement site during the same hour. The difference between the peak hour measured at the 24-hour site and the 15-minute measurement is used to determine the peak hour noise level. The locations of these sites are shown in Figure 2.

The existing peak hour noise levels at two of the nine receptor sites were above 66 dBA (Table 2), and therefore do exceed the Category B NAC. The noise levels at sites 1 and 2 are due to their close proximity to the H-1 Freeway and Palehua Road, which is heavily utilized by heavy trucks for hauling to and from the Grace Pacific Quarry, located north of the H-1 freeway.

Table 2
North South Road/Kapolei Parkway
2004 Noise Monitoring Schedule

Site No.	LOCATION	Date and Time	Measured Noise Level (Leq)	Adjusted Peak Hour Noise Level (Leq)*
	15 minute monitoring			
1	Near H-1 and Palehua Rd. Future Commercial Property.	3/19 (1:35pm)	68	72
2	Approximately 100 ft. from Farrington Hwy and Palehua Rd intersection. Taken on Farrington Hwy. Current Agriculture Property, Future Residential Area.	3/19 (2:19pm)	70	72
3	Near Future intersection of North-South Road and Kapolei Pkwy. Near Golf Course.	3/19 (12:30pm)	44	54
4	Varona Village, In Front of Corner Residenc facing Kapolei Pkwy on Kahi St.	3/24 (11:39am)	55	63
5	Varona Village Residence on Renton Rd., near Renton Rd and Kapolei Pkwy intersection	3/24 (11:03am)	56	62
6	In front of Town Homes on Kapolei Pkwy between OR&L and Kolowaka Dr	3/18 (11:18am)	50	58
7	In front of Town Homes and Golf Course on Kapolei Pkwy, near the Kolowaka Drive intersection.	3/18 (12:15pm)	61	64
	24 hour monitoring			
A	Near H-1 and Palehua Rd. Current Agriculture Property, Future Residential Area.	3/17 (8:00 am)	NA	62
B	Varona Village. Vacant lot marked by corner of Kahi St. and Lei Aloalo Pl	4/27 (4:00 pm)	NA	64

Source: Parsons Brinckerhoff, March 2004
* Peak hour Noise Level is based on comparing the 15 minute measured noise with the closest 24-hour monitoring location.



Noise Measurement Locations
Figure 2

4. FUTURE TRAFFIC NOISE IMPACTS

The noise impact analysis of the proposed project considers traffic noise levels along North-South Road and Kapolei Parkway under all the alternatives.

4.1 Prediction Methodology

4.1.1 Traffic Noise Projections for Proposed Roads

The noise impacts of the No-Build and Build alternatives were modeled at nine (9) noise sensitive sites along the North-South Road and Kapolei Parkway alignments using the FHWA Traffic Noise Model (TNM) version 2.5 (FHWA, 2004). Impacts were calculated for the Year 2025.

Input variables to noise modeling and analysis include traffic volumes, speeds and vehicle fleet mix (auto, medium truck, and heavy truck percentages). The noise analysis considers the noisiest hour of the day. This occurs when the traffic volume is at the capacity of the roadway, and vehicles operate at the allowable speed limit (level of service C). Table 3 summarizes the level of service (LOS) C traffic volumes. The traffic modeling assumptions, based on lane capacity operating at LOS C, are as follows:

Table 3
LOS C Traffic Volumes

Roadway	LOS C Volume (pcph)		Posted Speed Limit (MPH)
	Mauka/KKHD	Makai/Walanae	
H-1 Freeway	6,250	5,114	60
Farrington Highway	2,048	1,674	35
Kapolei Parkway	1,931	1,580	35
North-South Road	3,069	2,511	45

- Vehicle mix for the new roadways, Kapolei Parkway and North-South Road, is projected to be 96.5 percent autos, one percent medium trucks and one-half percent heavy trucks.
- Vehicle mix for H-1 freeway and Farrington Highway is based on traffic counts taken during the noise measurements. H-1 freeway vehicle mix is 93 percent autos, 1 percent medium trucks and 6 percent heavy trucks. Farrington Highway vehicle mix is 88 percent autos, 2 percent medium trucks and 12 percent heavy trucks.

4.2 Noise Impact Analysis

In terms of the one-hour $L_{eq}(h)$ noise descriptor, a noise impact could potentially require mitigation if either of the following conditions is predicted to occur:

- Future year traffic noise approaches or exceeds the FHWA NAC; or
- Future year traffic noise substantially exceeds (15 dBA or more) the existing ambient noise level.

Table 4 summarizes the results of noise modeling of receivers along North-South Road and Kapolei Parkway.

Table 4
Predicted Year 2025 Noise Levels

Site	Location	Existing Peak Hour	LOS C Future Noise Levels (L_{eq} (dBA))	
			No-Build	Build
A	Near H-1 and Palehua Rd. Current Agriculture Property, Future Residential Area.	69	69*	69
1	Near H-1 and Palehua Rd. Future Commercial Property.	72	72*	72
2	Approximately 100 ft. from Farrington Hwy and Palehua Rd intersection. Taken on Farrington Hwy. Current Agriculture Property, Future Residential Area.	72	72*	73
3	Near Future Intersection of North-South Road and Kapolei Pkwy. Near Golf Course.	53	53*	65
B	Varona Village. Vacant lot marked by corner of Kahi St. and Lei Alcalo Pl	64	64*	65
4	Varona Village, In Front of Corner Residence facing Kapolei Pkwy on Kahi St.	63	63*	64
5	Varona Village Residence on Renton Rd., near Renton Rd and Kapolei Pkwy Intersection	63	63*	64
6	In front of Town Homes on Kapolei Pkwy between ORAL and Kolowaka Dr	58	68	68
7	In front of Town Homes and Golf Course on Kapolei Pkwy, near the Kolowaka Drive Intersection.	64	68	68

Note: * The predicted future no build traffic noise levels at Sites A, 1, 2, 3, B, 4 and 5 result in noise levels that are the same as the existing adjusted peak hour level.

Source: Parsons Brinckerhoff, 2004

4.2.1 No-Build Alternative

Under the No-Build alternative, predicted 2025 traffic noise levels at the receptor sites are expected to be in the range of no change to a 10 dBA increase over the existing peak hour noise levels. The NAC of $L_{eq}(h)$ 67 dBA is predicted to be approached or exceeded at 5 of the 9 receptor sites.

4.2.2 Build Alternative

Under the Build alternative, predicted 2025 traffic noise levels at the receptor sites are expected to be in the range of no change to a 12 dBA increase over the existing peak hour noise levels. The NAC of $L_{eq}(h)$ 67 dBA is predicted to be approached or exceeded at 5 of the 9 receptor sites.

4.3 Noise Contour Analysis

Sixty-six dBA noise contours, modeled for Build alternatives (Figures 3, 4 and 5), were prepared as a guide for future residential development along the North South Road and Kapolei Parkway alignments. Based on the NAC, the contours identify the distance from the roadway centerline where future residential development would be acceptable without noise abatement. The "substantially exceed the existing noise levels" criterion is not applicable because it depends on existing noise level measurements which can change in future years due to other sources of noise. The 66 dBA noise contour is a useful planning tool for future development without requiring a detailed noise study.

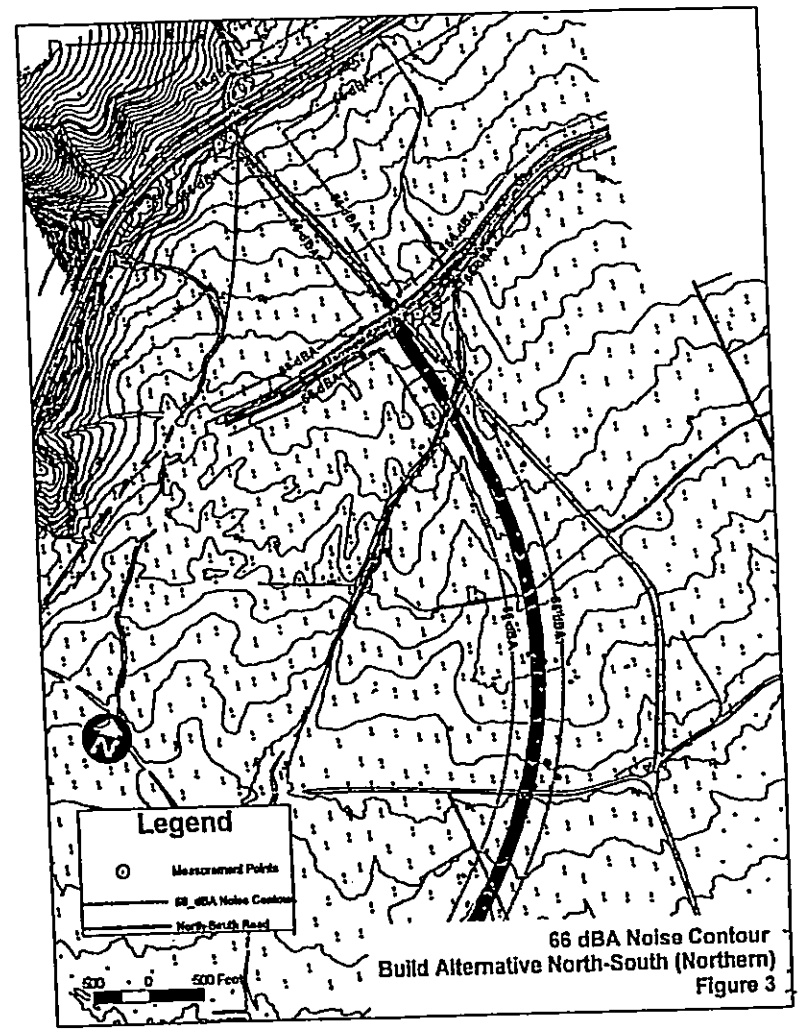
The minimum setbacks, where residential development could potentially be located without noise abatement, are listed in Table 5 as a range of distances from the roadway centerline. The variation in distances is due to changes in topography. Noise abatement measures may be required if noise sensitive activities are placed within these setback distances.

Table 5
Recommended Minimum Highway Setbacks
for Residential Developments

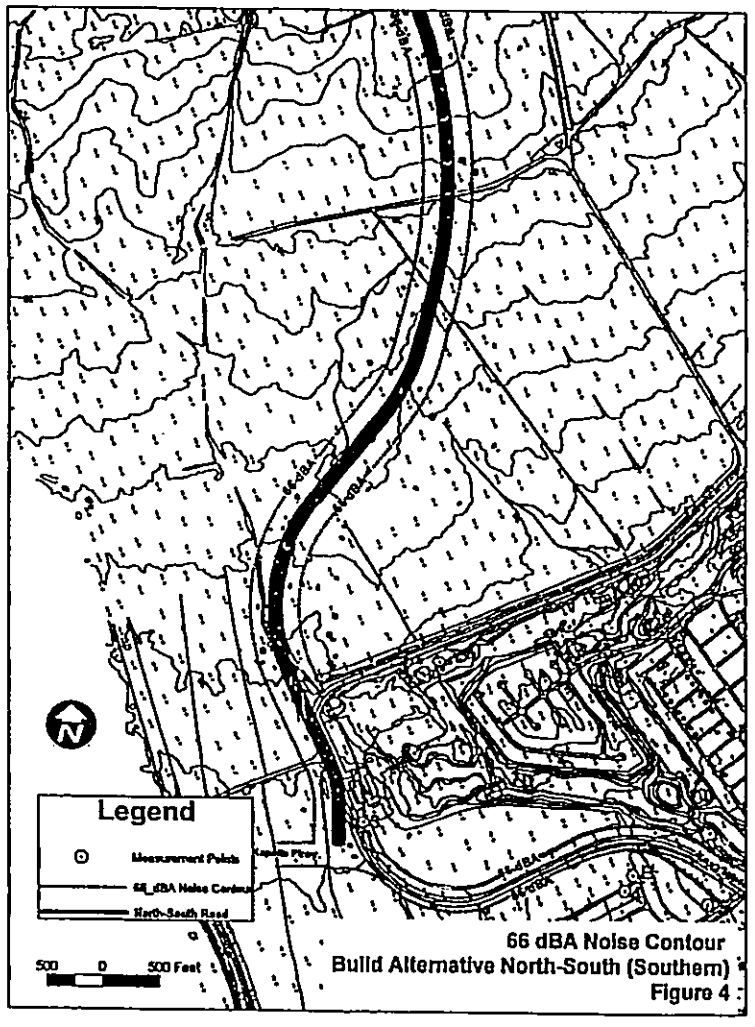
	Farrington Highway	Kapolei Parkway	North-South Road
Build Alternative	345 feet	145 to 155 feet	95 to 100 feet	200 to 220 feet

Source: Parsons Brinckerhoff, 2004

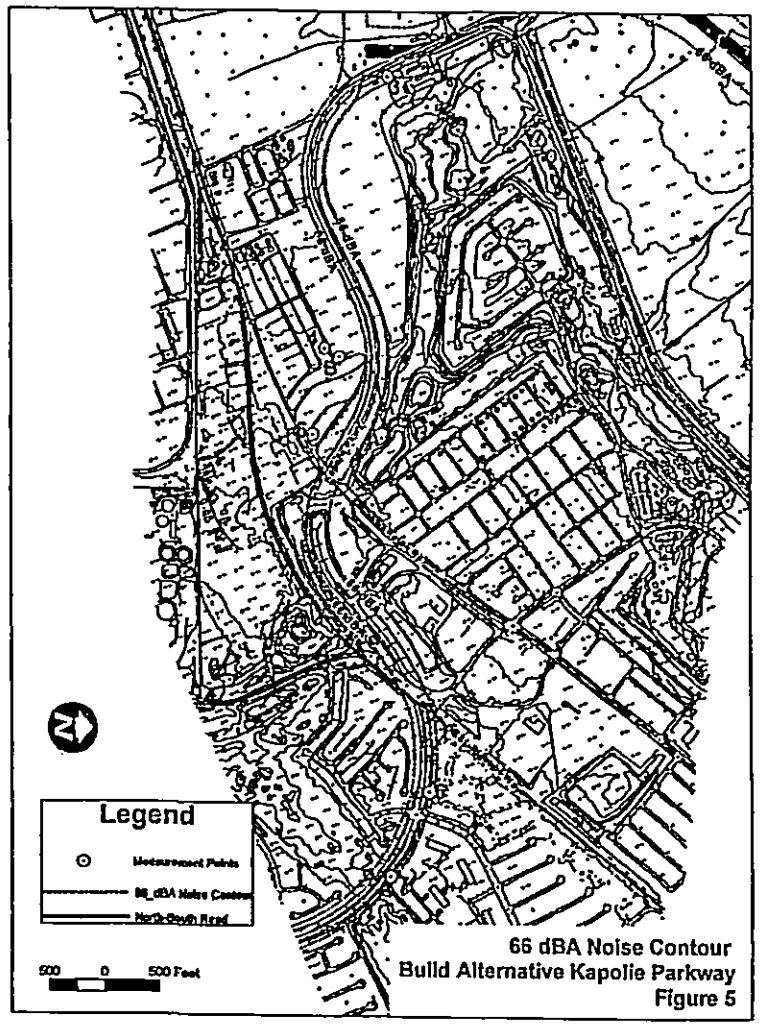
Any existing uses or future development beyond these distances would not require noise abatement. However, if a future residential project is built within these setback distances, it would be the responsibility of the developer to meet applicable standards. At this time, there are no existing developments in the setback distances that require noise abatement as part of the North-South Road and Kapolei Parkway project.



66 dBA Noise Contour
Build Alternative North-South (Northern)
Figure 3



66 dBA Noise Contour
Build Alternative North-South (Southern)
Figure 4



66 dBA Noise Contour
Build Alternative Kapolie Parkway
Figure 5

5. CONSTRUCTION NOISE IMPACTS

Construction noise represents a short term impact on the noise environment. The duration and level of construction noise depend on the phase of activity, such as:

- ground clearing, demolition and removal of existing structures, trees, rocks and soil;
- excavation;
- placement of foundations and roadbeds;
- erection of structures including retaining walls; and
- finishing, including filling, grading, paving, landscaping and cleanup operations.

The first two phases, ground clearing and excavation, typically generate the highest noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach levels from 67 dBA to 98 dBA at 15 m (50 feet). Construction equipment noise emissions are regulated by the Environmental Protection Agency's Noise Control Program (Part 204 of Title 40, Code of Federal Regulations). Presently, air compressors are the only equipment under regulation, and no new regulations are currently under consideration.

Noise levels for equipment which might be used during the excavation and construction of the proposed project are presented in Table 6. The noise levels presented are at a reference distance of 15 m (50 feet). Since construction equipment noise levels decrease at a rate of approximately 6 dBA per doubling of distance, at 30 m (100 feet) the noise levels would be about 6 dBA less than the levels shown at 15 m (50 feet). Similarly, at 60 m (200 feet) the noise levels would be 12 dBA less than shown. Intervening structures or topography can act as a noise barrier to further reduce noise levels.

Table 6
Construction Equipment Noise Levels

Source	L_{max} at 15 m (50 feet)	Model Tested
Backhoe	85 dBA	John Deere 609A
Front Loader	84 dBA	Caterpillar 980
Dozer	84 dBA	Caterpillar D7e
Grader	91 dBA	Caterpillar 16
Scraper	92 dBA	Caterpillar 660
Compressor	80-89 dBA	Various Tested
Pile Driver	95-100 dBA	Various Tested

Source: Federal Highway Administration, Highway Construction Noise: Measurement, Prediction, and Mitigation, 1978

The State Department of Health (SDOH) maintains community noise control standards that apply to construction noise. The project would not exceed the stipulated noise limits unless a variance is granted by SDOH. Two measures which would minimize adverse construction noise impacts are:

- limit activities to between 7:00 a.m. and 6:00 p.m. on weekdays and between 9:00 a.m. and 6:00 p.m. on Saturdays
- require construction equipment to have mufflers in good working order.

6. Noise Abatement MEASURES

6.1 Future Traffic Noise

Noise abatement measures must be considered as part of the project if traffic noise impacts are identified. Impacts occur at sites where traffic noise levels approach or exceed the NAC of $L_{eq}(h)$ 67 dBA or substantially exceed (15 dBA or more) the existing ambient noise levels. HDOT's Noise Analysis and Abatement Policy is used to determine whether noise abatement measures can be implemented, depending on whether these measures are reasonable and feasible based on the following criteria:

- Provide a minimum noise reduction of 5 dBA.
- Cost of noise abatement does not exceed $35,000 per residence benefited.
- Number of residences protected will include all dwelling units - owner occupied houses, rental units, mobile homes, etc. All units benefited by a 5 dBA or more noise reduction will be counted regardless of whether or not they were identified as impacted.
- Views from impacted residences are a major consideration in the reasonableness of noise abatement measures.
- Residential areas where future traffic noise levels are greater than 70 dBA or 20 dBA higher than existing noise levels will be given greater consideration.
- Residential areas along highways at a new location and residential areas constructed before an existing highway will be given greater consideration.

Noise abatement would only be considered at existing residential or planned development sites where building permit approvals have been obtained. The abatement would only apply to outdoor ground level areas.

For the Build alternative, noise impacts are not predicted, at any of the receivers analyzed. Therefore noise abatement is not required for this project. The predicted future traffic noise levels at these sites are above the NAC of $L_{eq}(h)$ 67 dBA. However, this level represents the measured existing or modeled no build noise levels at these locations. The traffic noise contribution from the proposed project does not increase the existing or no build noise levels. As a result, abatement is not required at this

location. Additionally, Site B does not require abatement because the noise levels remain below 67 dBA and the increase is below 15 dBA.

In conclusion, no noise abatement measures are necessary as part of this project.

6.2 Construction Phase

Noise control measures during construction would be required to minimize impacts on existing noise sensitive land uses. The measures recommended in this section should be re-evaluated in greater detail during preliminary design because impacts to residences cannot be accurately determined without detailed construction plans and schedules. General abatement measures presented below are recommended as guidelines in developing construction plans that consider the adverse impacts of construction noise.

1. Design Considerations - During the early stages of construction plan development, natural and artificial barriers, such as ground elevation changes and existing buildings, can be considered shields against construction noise. Strategic placement of stationary equipment, such as compressors and generators, could reduce impacts at the sensitive receivers.

2. Construction of Noise Barriers During Initial Stages - Noise barriers planned to ultimately be constructed along the right-of-way for traffic noise abatement could be constructed during the initial stages to reduce the impacts of construction. Initial construction of noise barriers would significantly reduce construction noise impacts at the sensitive receivers.

3. Alternate Construction Methods - Certain phases of highway construction work such as pile driving may produce noise levels in excess of acceptable limits, even when feasible noise reduction methods are used. These impacts may be reduced by using alternate methods of construction. In the case of pile driving, vibration or hydraulic insertion could be used. Drilled holes for cast-in-place piles are another alternative that would produce significantly lower levels of noise.

4. Source Control - The contractor shall comply with HDOT Standard Specifications and all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without a muffler.

5. Time and Activity Constraints - Noisier activities involving large machinery could be limited to daytime hours when most people normally impacted are either not present or engaged in less noise sensitive activities. Nighttime construction would require a variance. Compliance with local Noise Ordinances will mitigate impacts associated with construction noise. To comply with the ordinance, all

construction activities adjacent to residential uses will be limited to daytime hours (7:00 a.m. to 7:00 p.m.) on Monday through Saturdays.

6. Community Relations - Community meetings can be held to explain the construction work, time involved, and the control measures to be taken to reduce the impact of the construction noise.

The measures above can be incorporated into site specific construction plans to minimize noise impacts to sensitive receivers along the project corridor. Noise emission limits could be developed. Construction hours could be set, and noise level criteria could be decided upon and adhered to during construction.

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7. REFERENCES

Federal Highway Administration (FHWA): Highway Construction Noise: Measurement, Prediction, and Mitigation, 1976

Federal Highway Administration (FHWA); Procedures for Abatement of Highway Traffic and Construction Noise, Code of Federal Regulations 23CFR 772

Federal Highway Administration (FHWA); Stamina 2.0/Optima Users Manual, Report No. FHWA DP-58-1, April 1982

State of Hawaii, Department of Transportation, Highways Divisions; Noise Analysis and Abatement Policy, October, 1996

Appendix D

Letter Report from D.L. Adams Associates, Ltd.

D. L. ADAMS ASSOCIATES, LTD.
Consultants in Acoustics and Performing Arts Technologies

January 27, 2005

Mr. Derek K. Mukai, P.E.
Community Planning, Inc.
745 Fort Street, Suite 400
Honolulu, Hawaii 96813

RE: DHHL Developments in East Kapolei (DLAA No. 04-75)

Dear Mr. Mukai:

We have reviewed Appendix F, Noise Technical Report, dated July 2004, of the *Revised Draft Environmental Assessment* for the North-South Road and Kapolei Parkway project prepared by Parsons Brinckerhoff Quade and Douglas, Inc. (PBQD) relative to the proposed DHHL developments in East Kapolei and offer the following comments.

1. A comparison of the projected future 2025 traffic noise levels and recommended setbacks for noise sensitive land uses to the projected future 2020 levels and recommended setbacks reported in *Environmental Noise Assessment Study East Kapolei Master Plan Development Project*, April 1998, prepared by D. L. Adams Associates, Ltd.(DLAA) reveals some differences. These differences are no doubt the result of the input variables used to calculate future noise levels and other factors, such as:
   a. Different traffic flow data for the years 2020 and 2025.
   b. The exact alternative alignments being considered for the North-South Road were not known at the time of the earlier study.
   c. Different vehicle speeds were used on the various roadways.
   d. Different vehicle mixes were assumed (i.e., the percentage of automobiles, medium trucks, and heavy trucks) for the roadways in the study area.
   e. The effect of the terrain on attenuating traffic noise from the North-South Road could not be taken into account for the earlier study since its exact alignment was not known.

2. The recommended setbacks from the centerline of the North-South Road for noise sensitive land uses in the two reports are in general agreement. The earlier assessment presented estimated minimum setbacks of 289 feet, 205 feet and 249 feet for the northern, middle and southern portions of the North-South Road to meet the U.S. Department of Housing and Urban Develoment (HUD) "Normally Acceptable" category, which is less than or equal to a day-night equivalent sound level (DNL) of 65 dBA. The later assessment recommended

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setbacks of 200 to 220 feet from the centerline of the North-South Road, which corresponded to meeting an hourly equivalent sound level, $L_{eq}(h)$, of 66 dBA or less. Based on the 66 dBA contour at 210 feet, we calculate a setback distance of 264 feet to a level of 65 dBA.

HUD Noise Standards

With respect to the DHHL parcels and, in particular, DHHL's Parcel B located on the west side of North-South Road near of the intersection with Kapolei Parkway, the primary concern is the ability to offer federally backed mortgages (e.g., Fannie Mae and Freddie Mac) to future home owners. For federally supported housing, HUD's Site Acceptability Standards must be met. These standards, outlined in 24 CFR Part 51, are presented in the following table.

Category	DNL	Comments
Acceptable	Less than or equal to 65 dBA	No special acoustical design consideration necessary.
Normally Unacceptable	Greater than 65 dBA, but less than or equal to 70 dBA	5 dB additional attenuation required through the use of barriers or in design to ensure interior noise levels are acceptable.
	Greater than 70 dBA, but less than or equal to 75 dBA	10 dB additional attenuation required through the use of barriers or in design to ensure interior noise levels are acceptable.
Unacceptable	Greater than 75 dBA	Attenuation measures must be submitted and approved on a case-by-case basis.

As seen in the above table, "Unacceptable" sites are those where the DNL is 75 dBA or higher. The term "unacceptable" does not necessarily mean that housing cannot be built on these sites. It means that more sophisticated sound attenuation would likely be needed.

HUD has also adopted a goal for interior noise levels. This goal is a DNL of 45 dBA or less and emphasis is given to noise sensitive interior spaces such as bedrooms.

Recommended Noise Abatement

With respect to the DHHL parcels in East Kapolei, feasible methods for attenuating traffic noise and complying with the HUD standards for noise are the following.

1. Erect noise barriers (i.e., a fence or wall, an earthen berm, or a combination of fence and berm), tall enough to block line-of-sight from the residential property to vehicles, along North-

South Road where it fronts DHHL parcels. Ideally, this noise barrier should be constructed within the roadway right of way (ROW). This is due to the increased shielding afforded by a barrier the closer it is to either the noise source or to the receiver. A noise barrier fronting DHHL Parcel B could reduce traffic noise by as much as 10 to 12 dB.

2. Based on the 66 dBA contour falling at 210 feet from the centerline of North-South Road, residential lots could be located as close as the ROW without falling into the HUD "Unacceptable" category. Furthermore, residential properties located within 84 feet of the centerline of North-South Road would fall into the 70 to 75 dBA, "Normally Unacceptable" category and houses would require an additional 10 dB of noise reduction over that provided by typical construction. Properties located from 84 feet to 264 feet from the road's centerline would fall into the 65 to 70 dBA, "Normally Unacceptable" category and houses would require an additional 5 dB of noise reduction over that afforded by typical construction. To achieve these additional noise reductions, we recommend the following.

   a. For an additional 5 dB of noise attenuation, bedrooms of houses located within 84 to 264 feet of the centerline of North-South Road should not have jalousie windows on their sides facing the roadway and bedrooms should be designed with acoustical tile ceilings, carpeted floors and louvered closets. The latter will minimize the buildup of sound energy in the reverberant sound field within the bedrooms. Furthermore, these homes should be designed to allow air flow through all rooms from the north to the south so that if windows are closed on the side facing the roadway, natural ventilation will still occur.

   b. For an additional 10 dB of noise attenuation, homes located within 84 feet of the centerline of North-South Road should not have jalousie windows on any side that has line-of-sight to the roadway and casement type windows on these sides should be double-glazed with thermally insulating glass consisting of two panes of 1/4-inch thick glass separated by a 1/2-inch airspace. These homes should also be air conditioned allowing the owners to keep the windows closed.

Please contact us if you have any questions concerning the analysis and recommendations presented herein.

Sincerely,

David L. Adams, P.E.

Appendix E

Air Quality Technical Report

NORTH-SOUTH ROAD AND KAPOLEI PARKWAY PROJECT

Air Quality Technical Report

Prepared by:

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

June 2004

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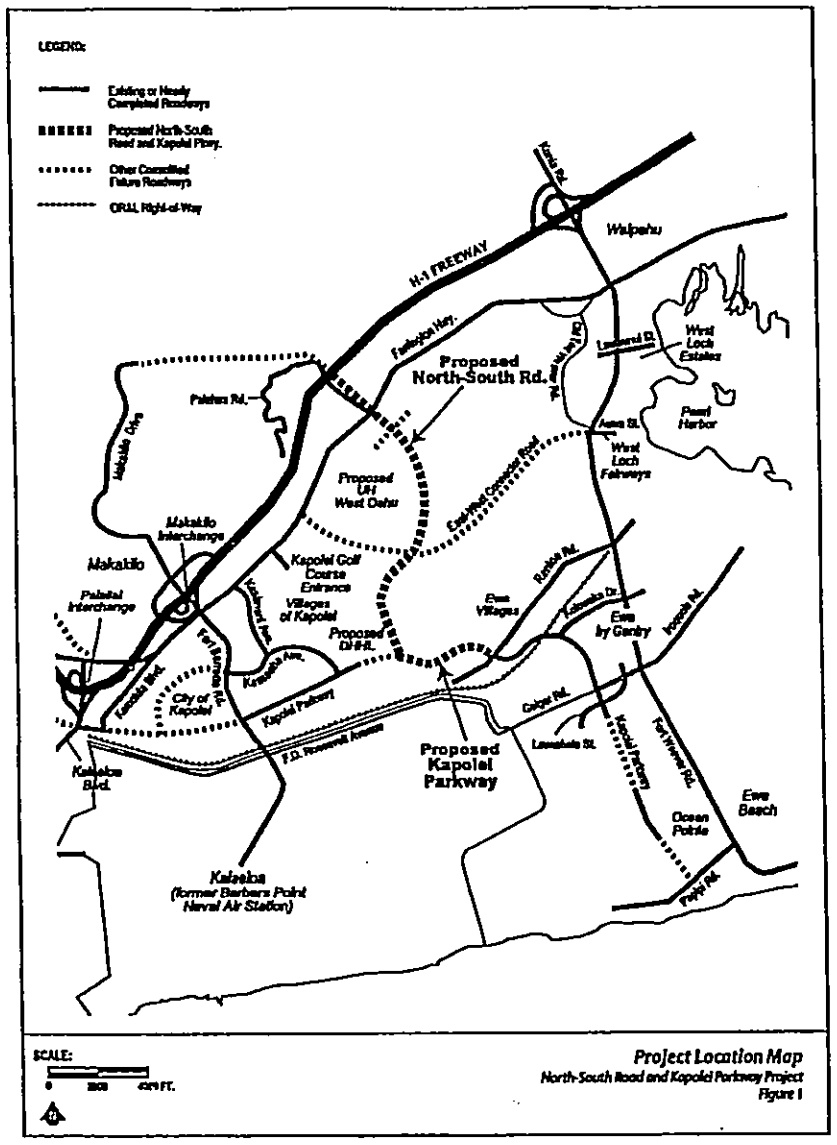
INTRODUCTION

The purpose of this report is to describe the air pollutants associated with motor vehicle exhaust, determine applicable standards and regulations, examine the existing air quality conditions in the study area, and identify and quantify the possible air quality impacts of the construction of the North-South Road and Kapolei Parkway Corridor.

PROJECT DESCRIPTION

The North-South Road would be a federal-aid, limited-access, principal arterial highway, that would connect Interstate Route H-1 (H-1 Freeway) to the proposed Kapolei Parkway, and is approximately 2.2 miles in length (see Figure 1). The North-South Road project also includes the construction of: (1) a major interchange at its junction with the H-1 Freeway; (2) the North-South Road/Kapolei Parkway intersection; and (3) various drainage features, such as a drainage channel and detention basin associated with the proposed highway, as well as two bridges over Kaloi Gulch The roadway section of concern for the Kapolei Parkway is approximately 0.7 miles in length and is a proposed federal-aid, arterial roadway which would connect the proposed North-South Road to other existing, southerly portions of the Kapolei Parkway. North-South Road would be a State facility; Kapolei Parkway is proposed as a City facility, to be constructed by the City's Department of Design and Construction (DDC).



PURPOSE AND NEED FOR ACTION

The purpose of this project is to address various types of transportation needs including:

- to meet roadway capacity need for existing travel demand;
- to respond to regional land use and economic development trends;
- to meet future transportation demand; and
- to improve sub-regional mobility.

Roadway Capacity Need for Existing Travel Demand

Traffic volumes on Ewa's arterial roadways reflect recent rapid urban development shown in Table S-1. From 1989 to 2001, growth in traffic volume on existing roadways ranged from 56 percent to 200 percent.

Fort Weaver Road repeatedly reaches near capacity conditions during both the AM and PM peak hours. In the AM peak period, approximately 85 percent of northbound vehicles on Fort Weaver Road access the eastbound H-1 Freeway via Kunia Interchange, regularly causing queues from the free way to the Fort Weaver Road/Farrington Highway Interchange. In the PM peak period, the existing traffic volumes on Fort Weaver Road have already exceeded capacity. While plans to widen Fort Weaver Road from four to six lanes in the next three years will help, it will be insufficient to accommodate planned future development in the Ewa area.

At Fort Barrette Road, traffic operations are congested during both the AM and PM peak hours. Particularly notable is the congestion at the Fort Barrette Road/Farrington Highway intersection, causing mauka-bound queues during the AM peak hour and eastbound queues during the PM peak hour.

The H-1 Freeway in the study area is affected by downstream congestion during the AM peak period. Recent improvements at the Kunia Interchange have mitigated PM peak period vehicle queues that used to back up on the westbound to makai-bound loop off-ramp and extend onto the freeway. Similarly, at the Makakilo Interchange in the westbound direction, PM peak period queuing on the westbound off-ramp that, at times, extended onto the freeway has been mitigated by recent improvements to the ramp.

Table S-1:
Traffic Volume Trends

Facility	Location	Average Daily Traffic			
		1989	2001	Percent Increase	Percent Annual Increase
Fort Weaver Road	North of Farrington Highway	45,000	70,000	56%	4%
	South of Farrington Highway	34,000	61,000	79%	5%
	At Honouliuli Bridge	33,000	57,000	73%	5%
Fort Barrette Road	South of Interstate H-1	12,000	36,000	200%	10%
Interstate H-1	East of Kunia Interchange	74,000	140,000	89%	5%

Source: HDOT, Traffic Count Data.

These recent improvements address only the existing traffic demand. It is projected that future travel demand at the Kunia and Makakilo interchanges will exceed capacity, adversely affecting conditions on the H-1 Freeway. Therefore, construction of new roadways and interchanges, as well as improvements to existing roadways and interchanges, is needed to address continuing regional urban development, as directed by current State and City policy.

The proposed North-South Road would attract mauka-makai traffic, which would otherwise flow on Fort Weaver and Fort Barrette Roads. Diverting traffic to North-South Road would improve operating conditions on Fort Weaver and Fort Barrette Roads, allowing these other roadways to serve their travel markets better. Similarly, the North-South Road interchange would relieve projected congested operations on H-1 freeway at the Kunia and Makakilo interchanges.

Regional Land Use and Economic Development Trends

The Ewa region, as defined by the Ewa Development Plan (Ewa DP), had a population of 68,718 in 2000 (as defined by the City and County of Honolulu designated Ewa DP Area), approximately 8 percent of Oahu's total population. In contrast, the estimated population of the Ewa DP Area in 1990 was approximately 42,960 persons, 5.1 percent of the island total. In 2025, the estimated population of Oahu will be approximately 1.03 million. According to the City and County of Honolulu General Plan's population guidelines, the Ewa DP Area is intended to accommodate 13 percent of Oahu's 2025 population, or roughly 133,874 persons – an increase of 95 percent from 2000 (U.S. Census, 2000; Ewa DP, Revised 2000; State of Hawaii Department of Business, Economic Development and Tourism, Population And Economic Projections For The State Of Hawaii To 2025, 2000).

It is the objective of the State and County to create a "Second City" for Oahu in the Ewa area, by providing opportunities for residential and employment growth to supplement the Primary Urban Center (PUC). The Ewa Plain will experience the largest population, employment, and housing growth over the 25-year period between 2000 and 2025. By the year 2025, total population in the Ewa Plain would be over 116,000, up 66% from 2000, with a corresponding growth in housing of 73% to over 38,000 units. Public and private developers have facilitated achievement of this objective, and a number of projects are completed, under construction, or planned, including several residential developments in Ewa, Kapolei, East Kapolei, Makakilo, and employment centers in areas such as the City of Kapolei, Campbell Industrial Park, East Kapolei, Ewa, and Ewa Beach.

Regional transportation improvements are needed to accommodate this anticipated growth in Ewa, and the North-South Road is one component of the proposed regional improvements in the TOP 2025.

Future Transportation Demand

Many residents in the Ewa region travel to and from the PUC with their primary route being the H-1 Freeway. In the base year 2000, there were approximately 150,000 daily production trips (trips originating from an area) and 114,000 daily attraction trips (trips ending in an area) in the Ewa region. Based on the City and County of Honolulu Department of Planning and Permitting's socio-economic forecasts, it was estimated that the region would generate approximately 602,800 daily production trips in the year 2025, an increase of 435 percent. The Primary Urban Center (PUC) is projected to receive approximately 60 percent of all attraction trips on Oahu in the year 2025. Socio-economic forecasts also indicate that approximately 646,900 attraction trips would be generated through employment growth in the Ewa region in 2025, an increase of 467 percent over 2000.

The TOP 2025 identified the need to increase access to the H-1 Freeway and transportation capacity in the North-South Road corridor area. It also noted the need to establish transportation links between residences in Ewa and future employment centers in the City of Kapolei. Therefore, the TOP 2025 included the construction of North-South Road, a new interchange with H-1, and the completion of Kapolei Parkway, among other future transportation improvements, such as widening Fort Barrette Road, Fort Weaver Road, and Farrington Highway.

Based on these transportation demand projections and the traffic volume trends described in Section 1.2, additional roadway and interchange capacity between existing and future residential communities and employment centers in the Ewa region and the H-1 Freeway is needed. Existing roadways and intersections connecting residential and employment areas with the H-1 Freeway are currently operating at or near their capacity and would not efficiently be able to accommodate the projected travel demand described above. Therefore, construction of North-South Road and Kapolei Parkway and a new interchange with the H-1 Freeway are needed to fully accommodate the policy-directed development in the Ewa Plain.

Sub-regional Mobility

Providing an alternative facility to Fort Weaver Road and Fort Barrette Road will reduce congestion on these roadways, improving transportation conditions for traffic in the Ewa Plain. Moreover, North-South Road and Kapolei Parkway would help improve travel between activity centers within the Ewa Plain by providing alternative routes and improving overall system operation. Currently, travelers wanting to drive between points in Ewa have limited options, forcing mauka-makai roadways such as Fort Weaver Road and Fort Barrette Road to serve both mauka-makai demand and east-west demand. East-west connectivity is provided primarily by Farrington Highway and H-1 Freeway. Providing alternative roadway connections within the Ewa Plain will relieve both existing mauka-makai and east-west roadways thereby providing better sub-regional mobility.

ALTERNATIVES

Project alternatives were identified through discussions with government agencies and input gathered at public meetings. Alignment, interchange, and roadway concept alternatives, including a Transportation System Management (TSM) alternative, were examined. A preferred Build Alternative and a No-Build Alternative were selected for detailed examination in this EA, and are described below.

No-Build Alternative

The future No-Build Alternative assumes the roadway improvements in the TOP 2025, except the North-South Road interchange and North-South Road, describing a future roadway network that includes some improvements for the Ewa Plain. Figure S-5 illustrates the 2025 No-Build Alternative roadway network. No-Build Alternative assumes that Kapolei Parkway is complete from Ewa Beach through the City of Kapolei by year 2025, including the segment between Renton Road and North-South Road. However, that segment of Kapolei Parkway would not be in place within the late 2007 to early 2008 time frame, to match initial implementation of the proposed North-South Road. The inclusion of this segment of the Kapolei Parkway is consistent with City plans for the future completion of Kapolei Parkway, but reflects current City budgetary constraints which make the timing of this project completion uncertain. Because the City owns the property on which Kapolei Parkway is proposed, the roughly 10-acre ROW for the Kapolei Parkway is being established by subdividing the parcel and changing its designation.

The No-Build Alternative assumes a 794-bus fleet by 2025. This fleet includes the Regional Bus Rapid Transit (BRT) system proposed as part of the Primary Corridor Transportation Project, which is part of the TOP 2025. However, because North-South Road and its interchange with H-1 Freeway does not exist in the No-Build Alternative, the proposed North-South Road Park-and-Ride is also assumed not to exist. In turn, the Regional BRT and local hub and spoke bus routes that would otherwise interact with the proposed North-South Road Park-and-Ride would need to be rerouted to other transfer facilities. This assumption lowers the efficiency of transit service to the Ewa Plain area.

Build Alternative

The preferred Build Alternative (also called the "Palehua Corridor alignment" and described in more detail in Chapter 2) assumes the construction of the North-South Road and the federalization of a segment of Kapolei Parkway between North-South Road and Renton Road.

North-South Road would ultimately be a six-lane, divided highway between the H-1 Freeway and Kapolei Parkway, consistent with the Kapolei Area Long-Range Master Plan (July 1993) and the TOP 2025. In order to ensure that the key 0.7-mile section of the Kapolei Parkway between Renton Road and North-South Road is completed within the same time frame as the opening of North-South Road, this segment is proposed be "federalized." The proposed segment of Kapolei Parkway would ultimately be a six-lane arterial roadway, connecting the proposed North-South Road to existing, southerly portions of the Kapolei Parkway.

North-South Road would intersect Kapolei Parkway between the existing Varona and Tenney Villages in the Ewa Villages development. The roadway would proceed north to the proposed interchange at the H-1 Freeway following an existing easement reserved for a major north-south roadway. The Build Alternative also includes a new conventional diamond configuration interchange with the H-1 Freeway, as well as intersections with the existing Farrington Highway and proposed intersections with other future roadways that would be constructed between Farrington Highway and Kapolei Parkway. The preferred Build Alternative would provide regional access to the interstate system as well as local access and circulation. The proposed road would include three lanes in each direction, a median, and sidewalks.

The right-of-way (ROW) for the Kapolei Parkway is currently owned by the City & County of Honolulu and is roughly 9.8 acres. The ROW for North-South Road would either be obtained through a Governor's Executive Order (EO) or acquired from a private landowner. The southern 104.4-acre portion of the North-South Road right-of-way is owned by the State, but would be transferred by EO from the Department of Land and Natural Resources (DLNR) to HDOT. The northern 44.7-acre portion is currently owned by the Estate of James Campbell and would have to be acquired by the State.

At the interchange, more land would be acquired than would be required solely for the conventional diamond interchange. (The diamond interchange requires approximately 14 acres. An additional 11 acres would be acquired for the loop ramp expansion.) The additional acreage would be acquired to preserve the option of a westbound to southbound loop ramp in the future, when warranted by traffic volumes. While acquisition of the additional acreage is part of the preferred alternative assessed in this Draft EA, the possible construction of a loop ramp is not addressed in this document.

RELEVANT POLLUTANTS

Air quality impacts are quantified by the determination of air pollution levels. "Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, or by reducing human or animal health.

Six air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide. These pollutants are: carbon monoxide, nitrogen oxides, ozone, particulate matter, sulfur oxides, and lead.

Carbon Monoxide

Carbon monoxide (CO) is a colorless and odorless gas which is generated in the urban environment primarily by the incomplete combustion of fossil fuels in motor vehicles. Relatively high concentrations of CO are typically found near crowded intersections and along heavily

used roadways carrying slow-moving traffic. CO chemically combines with the hemoglobin in the red blood cells to decrease the oxygen-carrying capacity of the blood. Prolonged exposure can cause headaches, drowsiness, or loss of equilibrium.

Nitrogen Oxides
Nitrogen oxides (NOx) constitute a class of compounds that include nitrogen dioxide (NO2) and nitric oxide, both of which are emitted by motor vehicles and stationary sources. Although NO2 and NO can irritate the eyes and nose and impair the respiratory system, NOx is of concern primarily because most of those compounds react in sunlight to form photochemical oxidants, including ozone. This reaction occurs comparatively slowly and ordinarily takes place far downwind from the site of actual pollutant emission.

Nitrogen oxides (NOx) constitute a class of compounds that includes nitrogen dioxide (NO_2) and nitric oxide (NO), both of which are emitted by motor vehicles. Although NO_2 and NO can irritate the eyes and nose and impair the respiratory system, NOx is also of concern primarily because of its role in the formation of ozone.

Ozone
Ozone (O_3), or photochemical oxidants, is a major cause of lung and eye irritation in an urban environment. It is formed through a series of reactions involving HC and NOx which take place in the atmosphere in the presence of sunlight. Relatively high concentrations of O_3 are normally found only in the summer.

Particulate Matter
Particulate pollution is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. In general, particulate pollution can include dust, soot, and smoke; these can be irritating but usually are not poisonous.

Particulate pollution also can include bits of solid or liquid substances that can be highly toxic. Of particular concern are those particles that are smaller than, or equal to, 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) in size. Data collected through numerous nationwide studies indicates that most of the PM_{10} comes from:

- Fugitive dust
- Wind erosion
- Agricultural and forestry sources

A small portion of particulate matter is the product of fuel combustion processes. In the case of $PM_{2.5}$, the combustion of fossil fuels accounts for a significant portion of this pollutant. The main health effect of airborne particulate matter is on the respiratory system.

Sulfur Oxides
Sulfur oxides (SOx) constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of great importance. The health effects of SOx include respiratory illness, damage to the respiratory tract, and bronchioconstriction. Relatively little SOx is emitted from motor vehicles.

Lead
Lead is a stable element which persists and accumulates both in the environment and in animals. Its principal effects in humans are on the blood-forming, nervous, and renal systems. Historically, motor vehicles constituted the major source of lead emissions to the atmosphere.

Lead levels in the urban environment from motor vehicles have significantly decreased due to the federally mandated switch to lead-free gasoline.

NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS

As required by the Clean Air Act, National Ambient Air Quality Standards ("NAAQS") have been established for six major air pollutants: carbon monoxide, nitrogen oxides, ozone, particulate matter smaller than 10 microns (PM_{10}), sulfur oxides, and lead. The State of Hawaii has also established its own standards for these pollutants. Both the National and State ambient air quality standards are summarized in Table 1. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare. The State of Hawaii issues it's ambient air quality standards in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Table 1
National and State Ambient Air Quality Standards

Pollutant	Standards		
	Hawaii State Standard	Federal Primary Standard[a] (Health)	Federal Secondary Standard[b] (Welfare)
Carbon Monoxide			
1 Hour	10 mg/m³ (9 ppm)	40 mg/m³ (35 ppm)	40 mg/m³ (35 ppm)
8 Hour	5 mg/m³ (4.5 ppm)	10 mg/m³ (9 ppm)	10 mg/m³ (9 ppm)
Nitrogen Dioxide			
1 Hour	—	—	—
24 Hour	—	—	—
Annual (Arithmetic)	70 ug/m³	100 ug/m³	100 ug/m³
Particulate Matter			
24 Hour	150 ug/m³	—	—
Annual (Arithmetic)	60 ug/m³	—	—
PM-10[c]			
24 Hour	—	150 ug/m³	150 ug/m³
Annual (Arithmetic)	—	50 ug/m³	50 ug/m³
PM-2.5[d]			
24 Hour	—	65 ug/m³	65 ug/m³
Annual (Arithmetic)	—	15 ug/m³	15 ug/m³
Ozone			
1 Hour	—	235 ug/m³	235 ug/m³
8 Hour	157 ug/m³	157 ug/m³	157 ug/m³
Sulfur Dioxide			
3 Hour	1300 ug/m³	—	1300 ug/m³
24 Hour	365 ug/m³	365 ug/m³	—
Annual (Arithmetic)	80 ug/m³	80 ug/m³	—
Lead			
3 Months (Arithmetic)	1.5 ug/m³	1.5 ug/m³	1.5 ug/m³

[a] *Designated to prevent against adverse effects on public health*
[b] *Designated to prevent against adverse effects on public welfare, including effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.*
[c] *Particulate Matter which is 10 microns or less in diameter.*
[d] *Particulate Matter which is 2.5 microns or less in diameter.*
Source: State of Hawaii, Department of Health, Clean Air Branch

AIR QUALITY REGULATIONS AND PLANNING

Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 (CAAA) and the Final Conformity Rule (40 CFR Parts 51 and 93) direct the EPA to implement environmental policies and regulations that will ensure acceptable levels of air quality.

The Clean Air Act and the Final Conformity Rule affect proposed transportation projects such as the 26 Mile Road Project. According to Title I, Section 176 (c) 2:

> "No federal agency may approve, accept or fund any transportation plan, program or project unless such plan, program, or project has been found to conform to any applicable State Implementation Plan (SIP) in effect under this act."

The Final Conformity Rule defines conformity as follows:

> Conformity to an implementations plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards; and
>
> That such activities will not:
> i. cause or contribute to any new violation of any NAAQS in any area;
> ii. increase the frequency or severity of any existing violation of any NAAQS in any area; or
> iii. delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

The determination of conformity is to be based on the most recent estimates of pollutant emissions, and such estimates are to be determined from the most recent population, employment, travel and congestion estimates as determined by the responsible metropolitan planning organizations or other agency authorized to make such estimates.

AMBIENT AIR QUALITY IN THE STUDY AREA

Local Meteorology

The climate of Hawaii is relatively moderate throughout most of the State, although some differences in certain meteorological parameters may occur from one region to another. Most of these differences are caused by the Islands' mountainous topography.

The topography of Oahu consists of two nearly parallel mountain ranges (Waianae and Koolau) trending northwest to southeast and separated by Schofield Plateau. A large, relatively flat, gently sloping coastal plain borders the plateau on the south. The Ewa Plain lies within this coastal plain.

The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the Islands. The average frequency of the northeasterly trade winds vary from more than 90 percent during the summer to 50 percent in January. This accounts for the wetter climate on the windward (north and northeast) sides

of the islands in comparison to leeward areas (south and southwest). Winds from the south are infrequent, occurring only a few days during the year and mostly in winter in association with Kona storms.

Rainfall on Oahu is highly variable depending on elevation and location with respect to the trade winds. The Ewa area has a moderately dry climate. The Waianae Coast is the driest area on Oahu, where rainfall drops to about 20 inches a year.

At the Honolulu Airport temperatures have been recorded as high as the lower 90s and as low as the lower 50s.

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kauai. However, meteorologists warn that no island is safe from hurricanes.

Attainment Status of Study Area
Section 107 of the 1977 Clean Air Act Amendment requires the EPA to publish a list of all geographic areas in compliance with the NAAQS, as well as those not attaining the NAAQS. Areas not in compliance with the NAAQS are termed nonattainment areas. Areas which have insufficient data to make a determination are unclassified, and are treated as being attainment areas until proven otherwise. The designation of an area is made on a pollutant-by-pollutant basis.

The State of Hawaii is designated as an attainment area for CO, O_3, PM_{10} and $PM_{2.5}$.

Monitored Air Quality
Air pollutant levels in Hawaii are monitored by a network of sampling stations operated under the supervision of the State Department of Health (HDOH) at various locations around Oahu. The monitoring locations used for this study are listed in Table 2, with a summary of the pollutants that are monitored at each station. Although none of the air monitoring stations are located in the project area they are relevant to the project area and the pollutant data monitored at these stations are representative of the air quality conditions within the project study limits.

IMPACT ASSESSMENT

Pollutants for Analysis
Pollutants that can be traced principally, or in large measure, to motor vehicles are those that are of relevance to evaluating the impacts of the project. These include CO, HC, NO_X, O_3. Transportation sources account for a very small percentage of regional emissions of SO_X and particulate matter (PM_{10}), and detailed analyses for these contaminants are not warranted.

Motor vehicles have historically constituted a major source of lead emissions to the atmosphere. As already noted, lead levels have decreased significantly and will continue to do so, due to the mandated decrease and elimination of lead in gasoline. Therefore, a detailed analysis of the impact of lead emissions is also not warranted.

Table 2
Air Quality Summary for Study Area Monitoring Stations – 2002

Air Pollutant	Standard/ Exceedance	Honolulu	Kapolei**	Sand Island	West Beach (Ko'Olina Golf Course)
Carbon Monoxide (CO)	Percent Recovery*	98%	NM	NM	99.6%
	Max. 1-hour Concentration (mg/m³)	3.99	2.05	NM	1.95
	Max. 8-hour Concentration (mg/m³)	1.58	1.84	NM	0.4
	# Occurrences >Federal 1-hour Std. of > 40 mg/m³	0	0	NM	0
	# Occurrences >Federal 8-hour Std. of > 10 mg/m³	0	0	NM	0
	# Occurrences >Hawaii 8-hour Std. of > 5 mg/m³	0	0	NM	0
Ozone (O_3)	Percent Recovery*	NM	NM	97%	NM
	Max. 1-hour Concentration (µg/m³)	NM	NM	106	NM
	Max. 8-hour Concentration (µg/m³)	NM	NM	89	NM
	# Occurrences >Federal 1-hour Std. of >235 µg/m³	NM	NM	0	NM
	# Occurrences >Federal 8-hour Std. of >157 µg/m³	NM		0	NM
Nitrogen Dioxide (NO_2)	Percent Recovery*	NM	70%	NM	98%
	Annual Arithmetic Mean (µg/m³)	NM	9	NM	8
	% AAM Exceeded (Federal)	NM	0	NM	0
Sulfur Dioxide (SO_2)	Percent Recovery*	97%	85%	NM	85%
	Max. 3-hour Concentration (µg/m³)	30	7	NM	11
	Max. 24-hour Concentration (µg/m³)	9	2	NM	2
	Annual Arithmetic Mean (ppm)	3	0	NM	0
	# Occurrences >Federal 3-hour Std. of >1300 µg/m³	0	0	NM	0
	# Occurrences >Federal 24-hour Std. of >365 µg/m³	0	0	NM	0
Suspended Particulates (PM_{10})	Percent Recovery*	96%	99%	NM	82%
	Max. 24-hour Concentration (µg/m³)	90	44	NM	37
	# Occurrences >Fed. 24-hour Std. of>150 µg/m³	0	0	NM	0
	Annual Mean (µg/m³)	15	13	NM	13
Suspended Particulates ($PM_{2.5}$)	Percent Recovery*	95%	49%	100%	NM
	Max. 24-hour Concentration (µg/m³)	53	15	11	NM
	# Occurrences >Fed. 24-hour Std. of>65 µg/m³	0	0	0	NM
	Annual Mean (µg/m³)	4	4	5	NM
Lead	Maximum Monthly Concentration (µg/m³)	NM	NM	NM	NM
	# Months Exceeding Federal Std.	NM	NM	NM	NM
Sulfates	Max. 24-hour Concentration (µg/m³)	NM	NM	NM	NM

Percent Recovery represents the amount of air quality data reported.
***The Kapolei station was shut down on 7/15/02 and began operation at a new site on 7/26/02. The results in this table are from the new site, starting 7/26/02.*
NM: Pollutant not monitored
Source: State of Hawaii, Department of Health, Clean Air Branch 2003, USEPA Airsdata.

CO impacts are localized. Even under the worst meteorological conditions and most congested traffic conditions, high concentrations are limited to within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Consequently, it is appropriate to predict concentrations of CO on a localized or "microscale" basis.

HC and NO_x emissions from automotive sources are of concern primarily because of their role as precursors in the formation of ozone. Ozone is formed through a series of reactions which take place in the atmosphere in the presence of sunlight. Since the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of HC and NO_x emissions are therefore generally examined on a regional or "mesoscale" basis.

MESOSCALE ANALYSIS

Changes in "pollutant burdens" (i.e. the tons of pollutants emitted each day or year) provide an indication of the general change in air quality in the region. This analysis is useful in assessing relative changes in the concentrations of CO, HC and NO_x between the build and no build alternatives. These pollutant burdens are computed based on the estimated vehicle miles traveled (VMT), vehicle hours traveled (VHT), average travel speed and vehicle types for all major roadways in the study area.

MICROSCALE AIR QUALITY ANALYSIS

The analysis of mobile sources, which must be undertaken for a localized (microscale) area, applies mathematical models that simulate physical conditions to predict carbon monoxide (CO) concentrations at specific receptor locations. Mobile source dispersion models are the basic analytical tools used to estimate carbon monoxide concentrations expected under given conditions of traffic, roadway geometry and meteorology. The mathematical expressions and formulations that comprise the various models attempt to describe an extremely complex physical phenomenon. However, because all models contain simplifications and approximations of actual conditions, most of these dispersion models are conservative.

Methodology

Microscale air quality modeling was performed using the most recent version of the EPA mobile source emission factor model (MOBILE6.2) and the CAL3QHC version 2 air quality dispersion model to estimate existing, no build, and build CO levels in the project area.

Vehicular Emissions

Vehicular Emissions were estimated using the EPA Mobile6.2 vehicular emission factor model (User's Guide to MOBILE6.2, Mobile Source Emission Factor Model, Publication No. EPA-420-R-02-08, October 2002). MOBILE6.2 is a mobile source emission estimate program that provides current and future estimates of emissions from highway motor vehicles. The latest version of MOBILE incorporates updated information on basic emission rates, more realistic driving patterns, separation of start and running emissions, improved correction factors, and changing fleet composition. It also includes the effects of new regulations recently promulgated.

Total emissions are affected by the type of vehicles using the facility. The percentages of each type of vehicle used for this analysis were based on the EPA's recommended national average fleet mix.

Emissions are also greatly affected by speed, ambient temperature, vehicle age and mileage distribution. As CO concentrations are generally greater in winter conditions, ambient January

minimum/maximum temperatures of 65/79°F were used. National average vehicle age and mileage distribution data was also used. Emission estimates used for this analysis can be found in Appendix B.

Dispersion Model

Mobile source models are the basic analytical tools used to estimate CO concentrations expected under given traffic, roadway geometry, and meteorological conditions. The mathematical expressions and formulations that comprise the various models attempt to describe an extremely complex physical phenomenon as closely as possible. The dispersion modeling program used in this study for estimating pollutant concentrations near roadway intersections is the CAL3QHC dispersion model (Version 2.0) developed by the U.S. Environmental Protection Agency. Version 2, allows a more specific determination of the traffic characteristics occurring at a roadway intersection.

CAL3QHC is a Gaussian model recommended in the *EPA Guidelines for Modeling Carbon Monoxide From Roadway Intersections* (EPA-454/R-92-005). Gaussian models assume that the dispersion of pollutants downwind of a pollution source follow a normal distribution around the center of the pollution source.

Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating and moving at different average speeds. CAL3QHC simplifies these different emission rates into the following tow components:

- Emissions when vehicles are stopped (idling) during the red phase of a signalized intersection.
- Emissions when vehicles are in motion during the green phase of a signalized intersection.

The CAL3QHC version 2 air quality dispersion model has undergone extensive testing by the EPA and has been found to provide reliable estimates of inert(non-reactive) pollutant concentrations resulting from emissions from motor vehicles. A complete description of the model can be found in the *User's Guide to CAL3QHC version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections*, EPA-454/R-92-006.

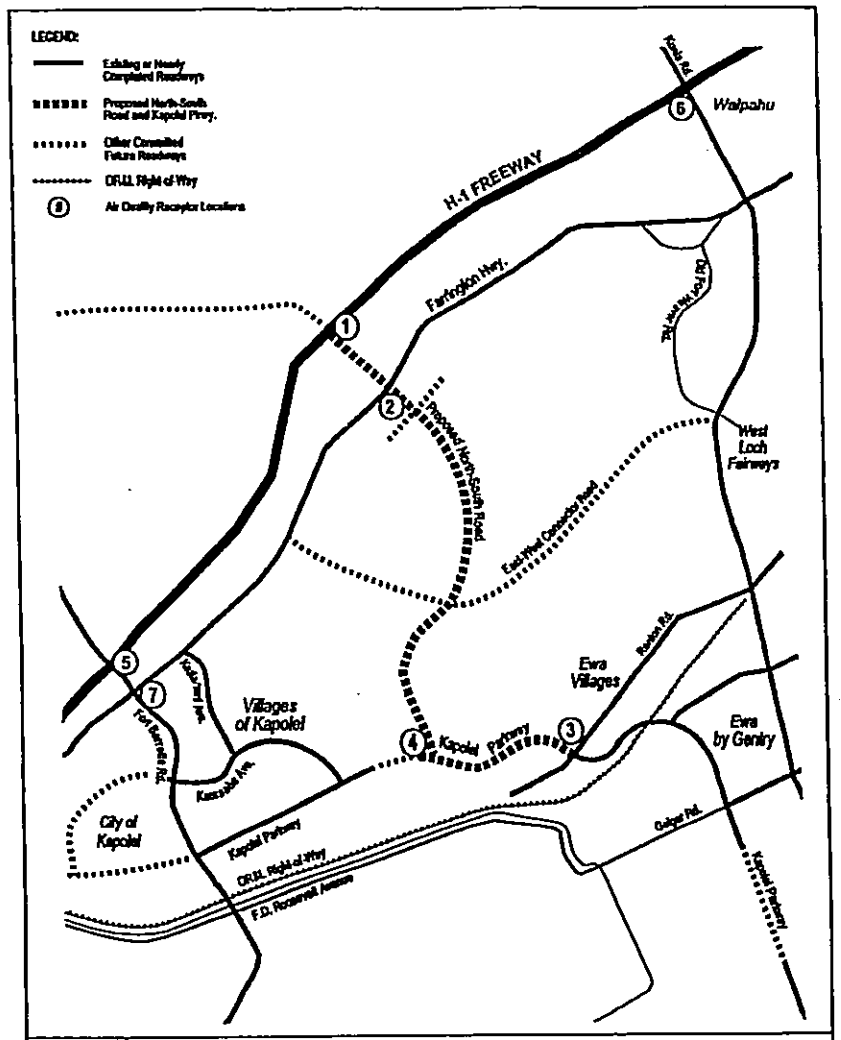
Appendix C contains all CAL3QHC version 2 data and output information.

Receptor Locations

CO levels resulting from motor vehicles using the proposed project and associated roadways were estimated at 7 locations using the CAL3QHC version 2 model (Figure 2). The analysis sites are:

1. North-South Road / H-1 Interchange
2. North-South Road / Farrington Highway
3. Kapolei Parkway / Renton Road
4. North-South Road / Kapolei Parkway
5. Makakilo / H-1 Interchange
6. Kunia / H-1 Interchange
7. Fort Barrette Road / Farrington Highway

Sites were selected on the basis of existing and estimated future traffic conditions and included the locations where the greatest project-related air quality impacts could occur. Receptors were placed in accordance with EPA's *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, EPA-454/R-92-005.



Meteorological Conditions

The transport and concentration of pollutants emitted from motor vehicles are influenced by three principal meteorological factors: wind direction, wind speed, and the temperature profile of the atmosphere. The values for these parameters were chosen to maximize pollutant concentrations at each prediction site (i.e., to establish a conservative worst case situation).

- Wind Direction. Maximum CO concentrations are normally found when the wind is assumed to blow approximately parallel to a single roadway adjacent to the receptor location. At complex intersections, however, it is difficult to predict which wind angle will result in maximum concentrations. At each receptor location, therefore, the approximate wind angle that would result in maximum pollutant concentrations was used in the analysis. All wind angles from 0° to 360° (in 5° increments) were considered.

- Wind Speed. CO concentrations are greatest at low wind speeds. Worst case conditions, as recommended by the EPA suggest the use of a wind speed of 2.2 miles per hour (1 meter per second). The lowest mean average monthly wind speed, as measured at the Honolulu Airport over the last 49 years is 9.4 miles per hour (4.2 meters per second). Given EPA general recommendation and actual monitored data, a conservation wind speed of 4.4 miles per hour (2 meters per second) was used to predict CO concentrations during the peak traffic period.

- Profile of the Atmosphere. A "mixing" height (the height in the atmosphere to which pollutants will rise) of 1000 meters, and "D" or neutral atmospheric stability conditions were used in estimating microscale CO concentrations. The selection of these meteorological parameters was based on recommendations from the Hawaii Department of Transportation and the EPA. This data was found to be the most representative of the conditions existing along the project area.

The CO levels estimated by the model will generally be the maximum concentrations which could be expected to occur at each air quality receptor site analyzed because they result from assuming the simultaneous occurrence of all worst case parameters (peak hour traffic conditions, conservative vehicular operating conditions, low wind speeds, low atmospheric temperature, neutral atmospheric conditions, and the maximizing wind direction).

Persistence Factor

Peak 8-hour concentrations of CO were obtained by multiplying the highest peak hour CO estimates by .7. This factor, recommended by USEPA, takes account of the fact that over eight hours (as distinct from a single hour) vehicle volumes will fluctuate downwards from the peak, vehicle speeds may vary, and meteorological conditions including wind speeds and wind direction will change to some degree as compared to the very conservative assumptions used for the single hour.

Analysis Years

Microscale carbon monoxide analyses have been performed for the existing year (2004) and the project's design year of 2025.

Background Concentrations

Microscale modeling is used to predict CO concentrations resulting from emissions from motor vehicles using roadways immediately adjacent to the location at which predictions are being made. A CO "background" level must be added to this value to account for CO entering the area from other sources upwind of the location at which predictions are being made.

A one-hour CO background level of 1.1 ppm and an eight-hour background level of 0.4 ppm were added to the mobile source results at each analysis site. These values are the second-highest one-hour and eight-hour readings from the West (Ewa) Beach monitoring station in the City and County of Honolulu, for the years 2001 – 2003.

Traffic Information
Traffic data for the air quality analysis was derived from traffic counts and other information developed as part of an overall traffic analysis for study. The microscale carbon monoxide analysis was performed based on data from this network for the AM peak traffic period. This is the period when maximum traffic volumes occur on local streets and when the greatest traffic and air quality impacts of the proposed project are expected.

Appendix D contains all traffic information used for the air quality analysis.

SUMMARY OF POTENTIAL IMPACTS

Mesoscale Impacts
Inasmuch as the change in regional VMT levels is predicted to be minor, no regional air quality analysis was conducted.

Microscale Impacts
Maximum 1-hour and 8-hour carbon monoxide levels were predicted at sensitive receptor sites within the proposed North-South Corridor's study area. The results of this analysis are given in Tables 3 and 4.

The levels predicted in this analysis are expected to be the highest microscale impacts due to the project within the study area. The sites analyzed are located near congested intersections that generally have elevated air quality levels due to emissions from vehicular queuing. No violations of the Federal or State one or eight hour CO standards are predicted.

As the project is predicted to not cause or exacerbate a violation of the applicable air quality standards, and is generally improving the predicted air quality levels in the study area, it conforms to the goals set forth in the New Clean Air Act.

CONFORMANCE WITH THE STATE IMPLEMENTATION PLAN (SIP) FOR AIR QUALITY

The State of Hawaii has been classified as an attainment area for O_3, PM_{10} and CO. As an attainment area, the State must demonstrate that the National Ambient Air Quality Standards will continue to be observed. The microscale analysis for the North-South Corridor demonstrates that no violations of the National Ambient Air Quality Standards are predicted. The goals set forth in the New Clean Air Act Amendments of 1990 are to insure that no violations of these standards are created or worsened. The project meets these goals and as such will not affect the State of Hawaii's current attainment status.

The North-South corridor project has been included in the State of Hawaii Fiscally Constrained Statewide Transportation Improvement Program (STIP) for Fiscal Years 2004 thru 2006, approved on December 9, 2003. The STIP is a multi-year, multi-modal transportation improvement program that has been developed using existing transportation plans and policies, and current highway, transit, and transportation programming processes as required under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).

Table 3
Predicted Worst-Case 1-Hour Carbon Monoxide Levels
(parts per million)

Site #	Description	Year 2020 Existing	No-Build	Build
1	North-South Road / H-1 Freeway Interchange	3.3	3.3	2.9
2	North-South Road / Farrington Highway	1.5	1.8	2.5
3	Kapolei Parkway / Renton Road	1.1	2.2	2.6
4	North-South Road / Kapolei Parkway	1.1	1.1	2.5
5	Makakilo Drive / H-1 Freeway Interchange	3.7	3.7	3.1
6	Kunia Road / H-1 Freeway Interchange	5.2	3.6	3.5
7	Fort Barrette Road / Farrington Highway	4.3	3.2	2.5

Note: State of Hawaii Standard: 9 ppm
Federal Standard: 35 ppm,
Background level = 1.1 ppm

Table 4
Predicted Worst-Case 8-Hour Carbon Monoxide Levels
(parts per million)

Site #	Description	Year 2020 Existing	No-Build	Build
1	North-South Road / H-1 Freeway Interchange	1.9	1.9	1.7
2	North-South Road / Farrington Highway	0.7	0.9	1.4
3	Kapolei Parkway / Renton Road	0.4	1.2	1.5
4	North-South Road / Kapolei Parkway	0.4	0.4	1.2
5	Makakilo Drive / H-1 Freeway Interchange	1.8	1.7	1.3
6	Kunia Road / H-1 Freeway Interchange	3.3	2.2	2.1
7	Fort Barrette Road / Farrington Highway	2.8	1.9	1.4

Note: State of Hawaii Standard: 4.5 ppm
Federal Standard: 9 ppm
Background Level = 0.4 ppm

MITIGATION MEASURES

Since there would be no adverse air quality impacts, mitigation would not be necessary. Measures to minimize construction emissions are suggested in the following section.

CONSTRUCTION IMPACTS ON AIR QUALITY

The air quality impacts of the proposed action would be limited to short-term increased fugitive dust and mobile source emissions during construction.

Fugitive Dust Emissions

Fugitive dust is airborne particulate matter, generally of a relatively large particulate size. Construction-related fugitive dust would be generated by haul trucks, concrete trucks, delivery trucks, and other earth moving vehicles operating around the construction sites. This would be due primarily to particulate matter resuspended ("kicked up") by vehicle movement over paved and unpaved roads and other surfaces, dirt tracked onto paved surfaces from unpaved areas at access points, and material blown from uncovered haul trucks.

Generally, the distance that particles drift from their source depends on their size, emission height, and wind speed. Small particles (30 to 100 micron range) can travel several hundred feet before settling to the ground, depending on wind speed. Most fugitive dust, however, is made up of relatively large particles (i.e., particles greater than 100 microns in diameter). These particles are responsible for the reduced visibility often associated with this type of construction. Given their relatively large size, these particles tend to settle within 20 to 30 feet of their source.

In order to minimize the amount of construction dust generated, the guidelines below should be followed. Since the project is in a PM_{10} non-attainment area, all the proposed particulate control measures related to construction activities should be followed. The following preventative and mitigative measures should be taken to minimize the possible particulate pollution problem:

I. Site Preparation

A. Minimize land disturbance;
B. Use watering trucks to minimize dust;
C. Cover trucks when hauling dirt;
D. Stabilize the surface of dirt piles if not removed immediately;
E. Use windbreaks to prevent any accidental dust pollution;
F. Limit vehicular paths and stabilize these temporary roads; and
G. Pave all unpaved construction roads and parking areas to road grade for a length no less than 50 feet where such roads and parking areas exit the construction site to prevent dirt from washing onto paved roadways.

II. Construction

A. Cover trucks when transferring materials;
B. Use dust suppressants on traveled paths which are not paved;
C. Minimize unnecessary vehicular and machinery activities; and

D. Minimize dirt track-out by washing or cleaning trucks before leaving the construction site (alternative to this strategy is to pave a few hundred feet of the exit road, just before entering the public road).

III. Post Construction

A. Revegetate any disturbed land not used;
B. Remove unused material;
C. Remove dirt piles; and
D. Revegetate all vehicular paths created during construction to avoid future off-road vehicular activities.

Mobile Source Emissions

As discussed previously, carbon monoxide (CO) is the principal pollutant of concern when considering localized air quality impacts of motor vehicles. Since emissions of CO from motor vehicles increase with decreasing vehicle speed, disruption of traffic during construction could result in short-term elevated concentrations of CO, the temporary reduction of roadway capacity, and the increased queue lengths. In order to minimize the amount of emissions generated, every effort should be made during the construction phase to limit disruption to traffic, especially during peak travel periods.

REFERENCES

1. User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections; EPA-454-R-92, United States Environmental Protection Agency, Office of Air Quality, Planning and Standards, Research Triangle Park, NC; November 1992.
2. User's Guide to MOBILE 6.2: EPA420-R-03-001, United States Environmental Protection Agency, Assessment and Standards Division, Office of Transportation and Air Quality; October, 2002.
3. United States Environmental Protection Agency, Airsdata, www.epa.gov/air/data.
3. Guideline for Modeling Carbon Monoxide from Roadway Intersections: EPA-454/R-92-005, United States Environmental Protection Agency, Office of Air Quality, Planning and Standards, Research Triangle Park, NC: November 1992.
4. U.S Congress, Clean Air Act Amendments of 1990 (P.L. 101-549)
5. State and National Ambient Air Quality Standards and Monitoring Data; State of Hawaii, Department of Health, Environmental Management Division, Clean Air Branch; June, 2004
6. Local Climatological Data for Honolulu, Hawaii - 1998: U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

North-South Road and Kapolei Parkway Air Quality Technical Report

APPENDIX A
Ambient Air Quality
Monitoring Data

Appendix B

Mobile6.2 Emissions

A copy of the full report, including this Appendix, can be viewed at the State Department of Transportation, Highway Planning Branch or the City and County of Honolulu, Department of Transportation Services

Appendix C

CAL3QHCV2 Data and Outputs

A copy of the full report, including this Appendix, can be viewed at the State Department of Transportation, Highway Planning Branch or the City and County of Honolulu, Department of Transportation Services

Appendix D

Traffic

A copy of the full report, including this Appendix, can be viewed at the State Department of Transportation, Highway Planning Branch or the City and County of Honolulu, Department of Transportation Services

A copy of the full report, including this Appendix, can be viewed at the State Department of Transportation, Highway Planning Branch or the City and County of Honolulu, Department of Transportation Services

APPENDIX F

Excerpt from the North South Road and Kapolei Parkway
Final Environmental Assessment

agricultural vehicles will be allowed on Palehua Road (during the interim phase) and on North-South Road (during the ultimate phase) to cross from the mauka to the makai side of H-1 Freeway. Time restrictions may be implemented for such travel/crossings.
- Irrigation lines within the project ROW will be maintained or relocated.
- Security will be provided during construction to prevent trespassing (construction phase only).

3.3 INFRASTRUCTURE

3.3.1 TRANSPORTATION

3.3.1.1 EXISTING CONDITIONS

3.3.1.1a Roadway System

The major east-west highways in the Ewa Plain of Oahu parallel the coastline and provide regional mobility and access for traffic oriented to and from the Primary Urban Center, which includes downtown Honolulu. The major roadways oriented in the mauka-makai or north-south direction provide the communities within the Ewa Plain access to the regional east-west roadways and also provide mauka-makai sub-regional mobility. In the vicinity of the North-South Road project, Interstate Route H-1 (H-1 Freeway) and Farrington Highway are the major west-east (Waianae-Koko Head) facilities. Kalaeloa Boulevard, Fort Barrette Road/Makakilo Drive, and Kunia Road/Fort Weaver Road are the major north-south (mauka-makai) facilities.

Figure 3.1-1 shows the existing roadway network in this area.

H-1 Freeway

H-1 Freeway is the primary facility connecting west Oahu with the Primary Urban Center (PUC). The western terminus of the H-1 Freeway is in the Ewa Plain at the Palailai Interchange where it merges into Farrington Highway, and the eastern terminus of H-1 Freeway is in east Honolulu where it merges into Kalanianaole Highway. Within the study area H-1 Freeway is a six-lane freeway with room to expand to an eight-lane facility. Access to H-1 Freeway occurs at the Makakilo Interchange and at the Kunia Interchange.

H-1 Freeway is posted at 60 miles per hour (mph) between the Kunia Interchange and the Makakilo Interchange. East of the Kunia Interchange and west of the Makakilo Interchange, the posted speed limit is 55 mph.

Farrington Highway

Farrington Highway is a major arterial roadway providing east-west regional and sub-regional mobility. Its eastern terminus is just east of the Waiawa Interchange in Pearl

City where it merges with Kamehameha Highway continuing east to Kalihi on the fringe of downtown Honolulu. Within the study area, Farrington Highway is mostly a two-lane, undivided roadway. West of the Kapolei Golf Course Driveway adjacent of the Villages of Kapolei and through the City of Kapolei, it is a four-lane, divided highway with curb, gutter and sidewalks with painted median. It becomes a four-lane, mostly undivided roadway after merging with H-1 Freeway. To the east, between the Fort Weaver Road and Pearl City, Farrington Highway is four-lane divided roadway. The posted speed limit is 35 mph between Fort Weaver Road and the Kapolei Golf Course Access, transitioning to 25 mph adjacent to the Villages of Kapolei and through the City of Kapolei. At the merge with H-1 Freeway, the posted speed increases to 45 mph.

Fort Weaver Road/Kunia Road

Currently, Fort Weaver Road/Kunia Road is the principal north-south arterial roadway serving the communities of Ewa and Ewa Beach. It provides these communities access to Farrington Highway and H-1 Freeway. This facility is named Fort Weaver Road south of Farrington Highway and Kunia Road north of Farrington Highway. Fort Weaver Road begins as a two-lane, undivided roadway at the entrance to the Iroquois Point Naval Housing, growing to a four-lane, divided roadway between North Road and Farrington Highway. Kunia Road is a six-lane expressway between Farrington Highway and H-1 Freeway and continues north of H-1 Freeway as a four-lane, divided roadway to the Royal Kunia development.

Fort Barrette Road/Makakilo Drive

Fort Barrette Road is a major north-south arterial, providing access to H-1 Freeway and Farrington Highway for the Villages of Kapolei, City of Kapolei, and Kalaeloa areas. North of Farrington Highway, Fort Barrette Road becomes Makakilo Drive, which provides access to the Makakilo community. South of Farrington Highway, Fort Barrette Road continues until it merges with Enterprise Avenue just south of F.D. Roosevelt Avenue in Kalaeloa. Fort Barrette Road is a two-lane, undivided roadway with a rural cross section south of Farrington Highway. Makakilo Drive is a four-lane, divided roadway with an urban cross section including curb and gutter. The posted speed limit is 40 mph.

Kapolei Parkway

Kapolei Parkway is a partially constructed arterial roadway. It is configured as a four-lane, divided roadway between Launahele Street and the Oahu Railway and Land Company (OR&L) ROW within the Ewa Gentry Development. The cross section of this facility has enough width to be configured as a six-lane, divided roadway when warranted. A part of Kapolei Parkway is also constructed within the Ocean Pointe Development as a four-lane undivided roadway. Within the Villages of Kapolei community, Kapolei Parkway is constructed as a six-lane, divided roadway between Fort Barrette Road and the drainage channel located east of the Kapolei Middle School. The posted speed limit is 30 mph and on-street parking is prohibited along most of Kapolei Parkway.

Kapolei Parkway between Renton Road and North-South Road would have an ultimate six-lane cross section, landscaped median and sidewalks on both sides. In the future, Kapolei Parkway would provide north-south mobility in the Ewa area and east-west mobility in the Kapolei area.

3.3.1.1b Traffic Conditions

Existing traffic conditions were inventoried and summarized within an area defined by the H-1 Freeway to the north, Fort Weaver Road/Kunia Road to the east, Fort Barrette Road/Makakilo Drive to the west, and Kapolei Parkway to the south. The Kapolei Parkway/Renton Road and Fort Weaver Road/Renton Road intersections are also included. Roadway analyses identify existing operations and establish a basis for comparison with future No-Build and Build scenarios.

Existing Traffic Volumes

Manual traffic turning movement counts were conducted from 2001 through 2002 during commuter peak periods. Counts were conducted at the ramp terminal intersections at the Kunia and Makakilo interchanges and at major intersections along the Fort Weaver Road and Fort Barrette Road corridors.

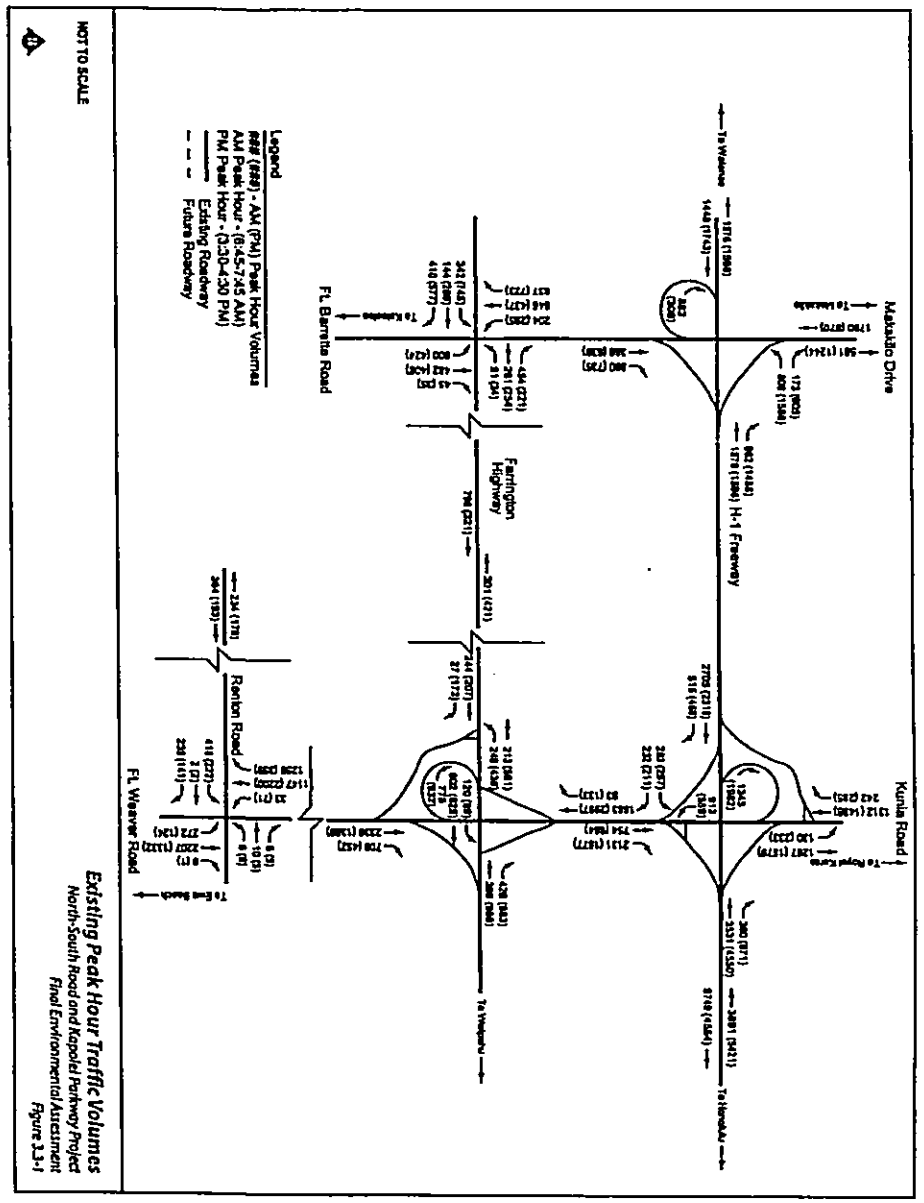
24-hour traffic volume data collected by the State of Hawaii Department of Transportation (HDOT) at their traffic count stations were obtained and reviewed. Table 3.3-1 lists these count stations and their respective locations. These data were augmented by 24-hour traffic volume data gathered by the project consultant.

Table 3.3-1:
HDOT Count Stations

Count Station	Description
C-10-L	Makakilo Dr. 0.1 Mile Northwest of H-1 Freeway Underpass
11-M	Intersection of Fort Barrette Rd. and Makakilo Dr. at Farrington Highway
C-10-W	Fort Weaver Road North of Laufaunui Street
C-10-K	H-1 Freeway 1.97 Miles West of Kunia Road
H-8-AA	H-1 Freeway 0.45 Mile East of Waikele Bridge
H-8-A	H-1 Freeway at Waikele Bridge
76-5	Ramp Volumes at the Fort Weaver Rd./Farrington Hwy. Interchange
H1-2	Ramp Volumes at the Makakilo Interchange
H1-5	Ramp Volumes at the Kunia Interchange

Source: Hawaii State Department of Transportation, Traffic Survey Data (Individual Stations), 2001

For the purposes of this study, data from 2001 and 2002 were considered the "existing" condition. The existing morning (A.M.) and afternoon (P.M.) peak hour volumes are illustrated in Figure 3.3-1.



Existing Peak Hour Traffic Volumes
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-1

Existing Interchange Configurations

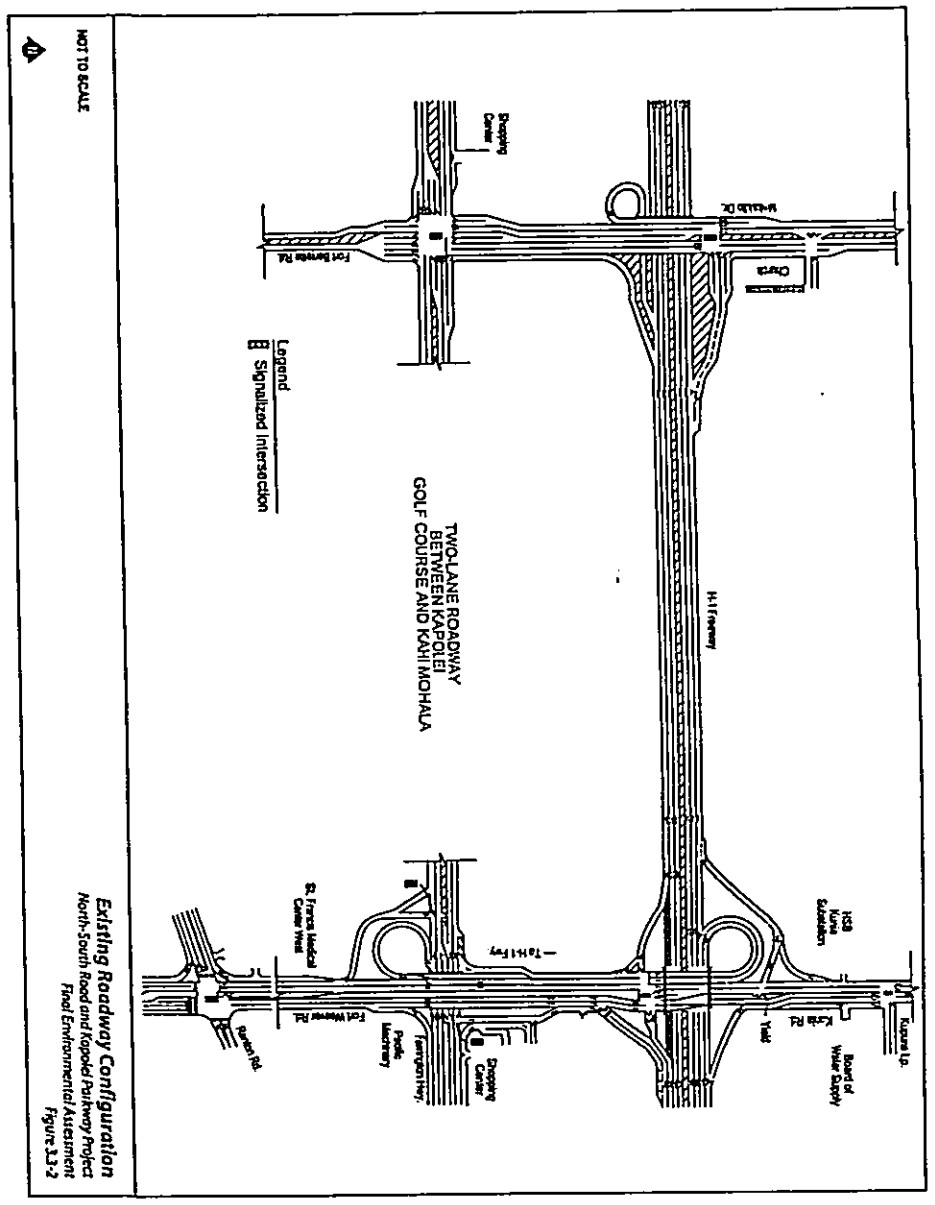
Current interchange plans for the Kunia, Makakilo, and Farrington Highway/Fort Weaver Road Interchanges were obtained from the HDOT. The plans were used to verify interchange configurations including interchange ramp terminal lane geometry and left-turn lane storage lengths.

The Kunia Interchange has been substantially modified in recent years into a high-capacity interchange. During the A.M. peak hour, traffic flow oriented to the east is considerable with over 3,000 vehicles per hour (vph) entering the H-1 Freeway. Double left-turn lanes are provided for the southbound to eastbound movement at the south ramp terminal intersection. Traffic executing this movement must merge from two lanes to one lane on the eastbound on-ramp, but the remaining lane enters H-1 Freeway without merging. Northbound traffic on Kunia Road also turns onto the eastbound on-ramp in two lanes. These two lanes do not merge with the southbound to eastbound traffic on the ramp. During the A.M. peak period, both lanes enter H-1 Freeway without merging with one lane becoming the normal outside lane and the other lane becoming the A.M. only shoulder lane. This configuration allows for three streams of traffic to simultaneously enter eastbound H-1 Freeway during the A.M. peak period. To allow this configuration to operate, one of the eastbound through lanes between the Makakilo and Kunia Interchanges terminates into the eastbound off-ramp at Kunia Interchange.

During the P.M. peak hour, the peak direction of flow reverses and the westbound off-ramps handle about 2,800 vph. A two-lane loop ramp provides for the more major westbound to makai-bound traffic movement. Both loop ramp lanes enter southbound Kunia Road without merging. The westbound to northbound traffic movement is accommodated through a "free right" at the ramp terminal intersection, allowing vehicles to turn onto northbound Kunia without stopping.

The Makakilo Interchange is configured with ramps oriented to and from the east. Currently, traffic cannot directly enter or exit H-1 Freeway to the west of the Makakilo Interchange. This interchange has also been modified in recent years to improve its capacity to handle traffic. During the A.M. peak hour, traffic oriented to the east totals almost 1,800 vph with traffic from north of the interchange and traffic from the south of the interchange about evenly split. The traffic from north of the interchange utilize a loop ramp to enter eastbound H-1 Freeway while traffic from the south of the interchange enter eastbound H-1 Freeway via a ramp that merges with the H-1 Freeway immediately after the loop ramp merge. Previously, during the P.M. peak hour lane geometry constraints at the Makakilo Interchange westbound off-ramp caused the off-ramp to queue onto the westbound H-1 Freeway lanes. About 2,200 vph exit at the Makakilo Interchange during the P.M. peak hour. Modifications to ramp geometry helped reduce the queuing, so that it no longer queues onto H-1 Freeway.

Figure 3.3-2 summarizes the existing roadway configurations of the interchanges, roadways and intersections within the study area.



Freeway and Highway Level-of-Service

Roadway segment level-of-service was evaluated for segments of roadway with relatively uninterrupted traffic flow such as H-1 Freeway between interchanges, Farrington Highway between Fort Weaver Road and the Villages of Kapolei area, and Fort Weaver Road as it crosses Farrington Highway. Methodologies documented in the 2000 Highway Capacity Manual (HCM) were used for these evaluations. Operating conditions are expressed as levels-of-service (LOS) with letter designations from A to F, representing free-flow to over-capacity conditions. The LOS index indicates the roadway segment's ability to accommodate the traffic demand placed on it during the A.M. and P.M. peak periods. Figure 3.3-3 summarizes the existing A.M. and P.M. peak period roadway segment LOS.

H-1 Freeway

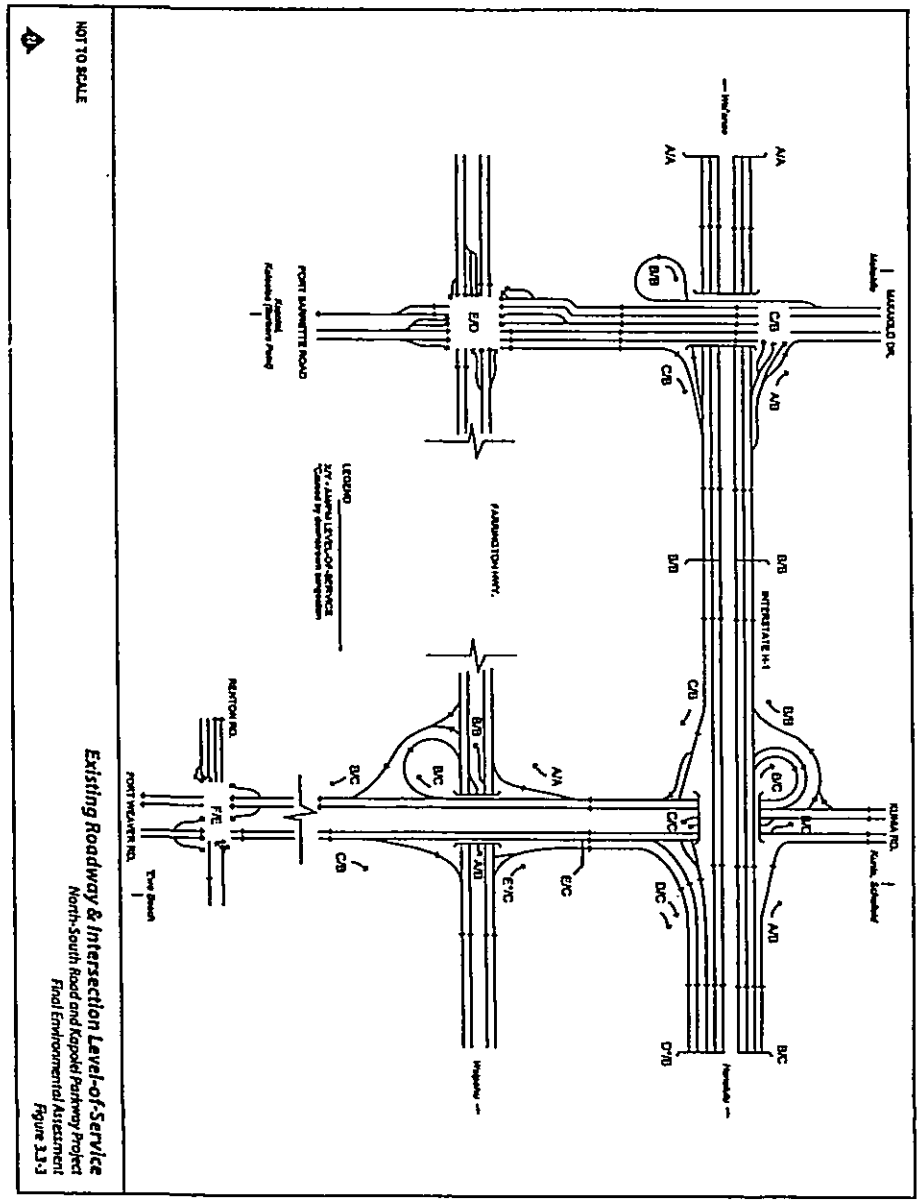
H-1 Freeway segments were evaluated starting east of the Kunia Interchange to west of the Makakilo Interchange. Table 3.3-2 summarizes the freeway LOS within the study area.

Table 3.3-2:
Existing (2001) H-1 Freeway Level-of-Service

Freeway Segment	Lanes A.M.(P.M.)	Direction	Existing LOS			
			A.M. Peak		P.M. Peak	
			LOS	Density	LOS	Density
Palwa IC - Kunia IC	5 (5)	WB	B	14.9	C	20.8
Kunia IC - Makakilo IC	4 (4)	WB	B	13.4	B	16.2
Makakilo IC - Palailai IC	3 (3)	WB	A	8.3	A	8.4
Palailai IC - Makakilo IC	3 (3)	EB	A	7.6	A	9.1
Makakilo IC - Kunia IC	4 (4)	EB	B	16.9	B	14.6
Kunia IC - Palwa IC	6 (5)	EB	D*	35.0	B	17.5

WB=westbound, EB=eastbound
*Caused by downstream congestion
Source: 2001 HDOT Traffic Counts

Analysis of the H-1 Freeway within the study area indicates it operates well, LOS C or better for most segments, during the A.M. and P.M. peak periods. Field observations identified some operational friction with the eastbound lane drop into the Kunia off-ramp. Drivers traveling in the eastbound makal lane merge with the through lanes at the very last-minute causing vehicles in the through lane to slow down and affecting this segment. Traffic originating west of the Kunia Interchange also experience delays as they travel east of the Kunia Interchange due to downstream congestion and the effect of drivers getting on at the Kunia Interchange and merging to the left-lane to get into the zipper lane.



Farrington Highway

Farrington Highway west of Fort Weaver Road to the Kapolei Golf Course Access operates close to uninterrupted mode. Field observations of this segment of roadway during the A.M. and P.M. peak hours indicate that, on the average, Farrington Highway operates well even during the peak periods.

Fort Weaver Road

Analysis revealed that this segment of Fort Weaver Road in the northbound direction is affected by downstream congestion during the A.M. peak hour. Manual counts indicate that approximately 75 percent of the northbound vehicles at the Fort Weaver Road/Farrington Highway Interchange access the H-1 Freeway via the eastbound on-ramp at the Kunia Interchange. Fort Weaver Road also processes very large traffic volumes during the P.M. peak period in the southbound direction. Both observations indicate that Fort Weaver Road is constrained in its ability to handle additional traffic growth.

Interchange Ramp Merge-Diverge Level-of-Service

Freeway ramps of the following interchanges are located within the study area:

- Kunia Interchange
- Makakilo Interchange
- Fort Weaver Interchange

Levels-of-service for ramp merge-diverge operation were evaluated using the methodologies outlined in the HCM. Table 3.3-3 summarizes the interchange ramp LOS. As shown in Table 3.3-3, all interchange ramps operate at an acceptable LOS (LOS D or better). Recent geometric improvements allow the interchange to operate at the acceptable level-of-service.

Kunia Interchange

As a result of the recent improvements to the Kunia Interchange, the eastbound on-ramp is configured to provide independent lane additions for southbound Kunia to eastbound H-1 and northbound Kunia to eastbound H-1 Freeway traffic. The lane additions eliminate the need for these traffic streams to merge with H-1 Freeway through traffic, and as a result, the eastbound on-ramp operates acceptably (LOS D or better) for peak period conditions. The addition of an A.M. peak period only shoulder lane helps to accommodate traffic. Field observations indicate that very few vehicles utilize the shoulder lane, possibly due to this lane's poor roadway condition and its narrow width. Additionally, the shoulder lane is discontinuous, reducing its effectiveness.

During the P.M. peak period, improvements that implemented a free-flow right turn for the westbound H-1 Freeway to northbound Kunia Road traffic and enhanced the loop ramp for westbound H-1 Freeway to southbound Kunia Road traffic allow these ramps to

operate well (LOS C or better) during peak operations. Other ramps also operate well (LOS C or better) during peak period operations.

Table 3.3-3:
Existing (2001) Ramp Merge-Diverge Level-of-Service

Interchange	A.M.		P.M.	
	LOS	Density	LOS	Density
Kunia Interchange				
WB Kunia Off-Ramp Diverge	A	4.4	B	13.5
WB Ewa Off-Ramp Diverge	B	14.6	C	25.6
WB Kunia On-Ramp Merge	B	15.5	B	17.8
EB Off Ramp-Lane Drop	C	11.4	B	10.4
EB On Ramp-Lane Add	D	30.4	C	24.0
Makakilo Interchange				
EB Makakilo On-Ramp Merge	B	17.0	B	13.4
EB Kapolei On-Ramp Merge	C	21.5	B	16.5
WB Off-Ramp Diverge	A	9.3	B	10.6
Fort Weaver Interchange				
NB Off-Ramp Diverge	C	25.3	B	13.7
NB On-Ramp Lane Add	E*	36.5	C	26.3
SB Off-Ramp Lane Drop to WB	A	2.7	A	3.8
SB Off-Ramp Diverge to EB	B	13.2	C	23.9
SB On-Ramp Merge	B	13.5	C	25.5
NB Kunia/H-1 Weave	E	36.5	C	27.1

WB=westbound, EB=eastbound,NB=northbound SB=southbound
*Caused by downstream congestion
Source: 2001 HDOT Traffic Counts

Makakilo Interchange

Recent modifications to the Makakilo Interchange improved traffic operations. Previously, the westbound off-ramp operated in very congested mode during the P.M. peak hour. Congestion at the ramp terminal intersection created a queue that extended onto the H-1 Freeway, creating a safety hazard. The westbound off-ramp was lengthened and channelization at the ramp terminal intersection was improved. Lane balance was provided at the freeway exit, and the off-ramp now operates well during the peak periods. The on-ramps were also improved and the merge LOS during the A.M. peak hour is good.

Fort Weaver Interchange

Congestion on Kunia Road between the Kunia Interchange eastbound on-ramp and the Fort Weaver Interchange northbound on-ramp during the A.M. peak hour affects northbound traffic in this area. Approximately 75 percent of the traffic originating from Ewa and Ewa Beach during the A.M. peak period access H-1 Freeway via the Kunia

Interchange eastbound on-ramp. Northbound traffic originating from Waipahu and destined for westbound H-1 or northbound Kunia Road must execute a type B weave (vehicles originating from the Fort Weaver Interchange northbound onramp destined for northbound Kunia Road must complete a lane change, whereas other vehicles originating from Ewa and Ewa Beach destined for eastbound H-1 Freeway do not have to execute a lane change). Approximately 60 percent of the traffic originating from Waipahu executes a type-B weave during the A.M. peak period. Furthermore, the two southbound to eastbound left-turning movements are required to merge into a single lane on the on-ramp prior to entering the H-1 Freeway. Vehicles in the right lane of the on-ramp, which comprise approximately 70 percent of the total ramp traffic, tend to merge left as they enter the H-1 Freeway, despite the fact that a shoulder lane is provided for these drivers. During the P.M. peak hour, downstream congestion at the Fort Weaver Road and Laulaunui Street intersection affects the merge operation of the southbound on-ramp (LOS E), resulting in queuing on the ramp. The resultant queue has been observed to extend back to the Fort Weaver Road interchange ramp junction. Other ramps of this interchange operate acceptably (LOS D or better) during all peak hours.

Intersection Level-of-Service

The signalized interchange terminals and adjacent intersections located within the study area were analyzed using the methodologies outlined in the HCM. LOS is shown for signalized intersections in terms of overall intersection operation. The levels-of-service for unsignalized intersections are expressed for each lane of minor streets and left-turn lanes for major streets. LOS definitions are provided in Appendix D. Table 3.3-4 summarizes the existing LOS for interchange terminals within the study area. Table 3.3-5 summarizes the adjacent intersections LOS within the study area. As shown in Table 3.3-4 the south terminal at Kunia Interchange is congested during peak operations. As shown in Table 3.3-5, the adjacent intersections are also congested during peak period operations (LOS F).

Makakilo Interchange North Ramp Terminal Intersection

During the morning peak hour, all turning movements onto Makakilo Drive operate acceptably at LOS D or better. Field observations indicate that the ability to process vehicles at the north terminal is hindered due to the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection. During the P.M. peak hour, the queue at that intersection can extend north to the north terminal at Makakilo Interchange.

Kunia Interchange North Ramp Terminal Intersection

As earlier stated, recent modifications to the Kunia Interchange provided a "free right" at the end of the westbound to northbound off-ramp, allowing this movement to operate well during both the morning and afternoon peak hours. The northbound left-turn movement operates acceptably (LOS C) during the P.M. peak hour. Some delay at the north terminal is experienced because of a high volume of vehicles destined for

eastbound H-1 Freeway but this movement is regulated as a result of the traffic signal at Kupuna Loop north of the terminal.

Table 3.3-4:
Existing Interchange Terminal Level-of-Service

Interchange Terminals	A.M.		P.M.	
	LOS	Density	LOS	Density
Kunia Interchange	**110 sec cycle**		**110 sec cycle**	
H-1 EB On-Ramp/ Kunia Road	**C**	**33.2**	**C**	**27.7**
EB Left Turn	E	67.2	E	62.6
NB Through	D	41.6	D	40.1
SB Left Turn	E	60.4	D	44.9
SB Through	A	9.8	B	18.4
H-1 WB On-Ramp/ Kunia Road	**Unsignalized**		**Unsignalized**	
NB Left Turn	B	13.9	C	21.0
Makakilo Interchange	**60 sec cycle**		**60 sec cycle**	
H-1 WB Off-ramp/ Makakilo Road	**C**	**27.2**	**B**	**13.6**
WB Approach	A	6.3	A	6.7
NB Through	B	18.7	C	23.1
SB Through	D	54.4	C	21.0
Fort Weaver Interchange	**60 sec cycle**		**60 sec cycle**	
Farrington SB On-Ramp/ Fort Weaver Road	**B**	**13.1**	**B**	**13.9**
EB Through	A	5.2	A	9.7
WB Left-Turn	C	20.8	B	15.9
Farrington NB On-Ramp/ Fort Weaver Road	**A**	**8.5**	**B**	**12.8**
EB Left-Turn	B	17.7	B	10.9
WB Through	A	5.5	B	13.0

WB=westbound, EB=eastbound,NB=northbound,SB=southbound

Table 3.3-5:
Existing (2001) Adjacent Intersections Level-of-Service

Intersection	Existing			
	A.M.		P.M.	
	LOS	Delay	LOS	Delay
Farrington Hwy and Makakilo Dr/Fort Barrette Rd	**E**	**60.2**	**D**	**47.5**
Eastbound	C	33.0	C	30.2
Westbound	E	61.9	E	56.4
Northbound	E	71.7	E	68.0
Southbound	E	66.1	D	52.6
Ft Weaver Rd and Laulaunui St	**D**	**49.4**	**D**	**51.4**
Eastbound	F	98.3	F	108.6
Westbound	F	105.3	E	68.9
Northbound	E	58.7	C	26.6
Southbound	B	13.3	D	58
Ft Weaver Rd and Aawa Dr	**E**	**56.3**	**D**	**36.8**
Eastbound	F	85.1	F	93.5
Westbound	F	164	F	83.2
Northbound	E	59.9	C	23.6
Southbound	B	17.1	D	37.4
Ft Weaver Rd and Renton Rd	**F**	**80.2**	**E**	**55.6**
Eastbound	F	225.5	F	81
Westbound	F	107.7	F	106.3
Northbound	E	69.9	C	27.4
Southbound	C	31.6	E	68.3
Ft Weaver Rd and Kolowaka Dr	**E**	**58.3**	**D**	**39.3**
Eastbound	F	95.9	F	88.1
Westbound	F	203.5	F	83.9
Northbound	E*	69.9*	D	38.2
Southbound	D	37.4	C	30.5
Ft Weaver Rd and Geiger Rd	**F**	**84.8**	**E**	**60.7**
Eastbound	F	127.2	F	87.6
Westbound	F	163.6	F	106.2
Northbound	E	71.4	D	44.2
Southbound	D	39.2	D	52.5

Source: 2001 HDOT Traffic Counts
* LOS Manually adjusted to account for downstream congestion and reflect existing conditions.

Kunia Interchange South Ramp Terminal Intersection

The south ramp terminal intersection operates at LOS C during both the morning and afternoon peak hours. However, the results also show that individual movements within the intersection operate under congested conditions. These movements include the southbound to eastbound left-turns during the A.M. peak hour and the eastbound to northbound left-turns during both the A.M. and P.M. peak hours.

Fort Weaver Interchange East Ramp Terminal Intersection

The east ramp terminal intersection at the Fort Weaver Interchange operates acceptably at LOS B or better, with little delay during the morning and afternoon peak hours.

Fort Weaver Interchange West Ramp Terminal Intersection

Traffic operations at the west ramp terminal intersection of the Fort Weaver Road Interchange operates acceptably, with all turning movements experiencing little delay during both the A.M. and P.M. peak hours (LOS B and A, respectively). Adjacent intersections along the Fort Weaver Road corridor and Fort Barrette Road and Farrington Highway intersection were analyzed. Table 3.3-5 summarizes intersection LOS of key intersections along the Fort Weaver Road corridor. As shown, the Fort Weaver Road corridor is congested during the A.M. peak period. Through traffic volumes on Fort Weaver Road exceed its capacity. Long cycle lengths are used to maximize through traffic flow on Fort Weaver Road, but this results in long side street queue lengths and delays. Travel time runs in the corridor have shown delays approaching 14 minutes for northbound traffic. Future plans call for Fort Weaver Road to be widened from four to six lanes in the near future, in an effort to accommodate existing and projected traffic.

Makakilo Drive/Fort Barrette Road/Farrington Highway

Table 3.3-5 summarizes the intersection operations for the Fort Barrette Road/Makakilo Drive/Farrington Highway intersection. This intersection serves as a gateway to the City of Kapolei and to H-1 Freeway. It, therefore, is congested during both A.M. and P.M. peak hours (overall LOS E and D, respectively). As shown, key movements at the Fort Barrette Road/Farrington Highway intersection operate at LOS E. Long cycle lengths contribute to delays experienced at this intersection. A contributing factor to the heavy congestion is that Farrington Highway is the only east-west roadway in Kapolei. All traffic destined for Kapolei must enter the Fort Barrette Road/Makakilo Drive and Farrington Highway intersection.

A large portion of the green time is allotted to the eastbound to northbound left-turn movement. This results in long delays and queues on the other three approaches. Though a large portion of the green time is allotted to the eastbound to northbound left-turn movement, traffic wanting to complete this movement is hindered by the two traffic signals on Farrington Highway accessing Kapolei Shopping Center to the west of Fort Barrette Road, often holding back vehicles along the Farrington Highway corridor.

There is a considerable amount of traffic headed into Kapolei during both A.M. and P.M. peak periods and out of Kapolei during the P.M. peak. Field observations have shown that during the A.M. peak, the queue in the northbound to westbound left-turn movement can extend past the left-turn storage lane and into the through lanes blocking all northbound traffic. A large portion of the southbound traffic makes a right-turn onto Farrington Highway during both A.M. and P.M. peak periods. This movement is aided by the eastbound left-turn movement allowing them to overlap and process additional vehicles. Although this movement is allowed to overlap with the eastbound left-turn movement, queues on the southbound approach have been observed to reach the north terminal at Makakilo interchange affecting its ability to process vehicles.

Summary of Results

Figure 3.3-3 illustrates the existing level-of-service for the roadways, freeways and interchanges within the study area.

The following issues were identified in the analyses of existing conditions:

- Recent westbound ramp modifications at the Kunia and Makakilo Interchange have improved traffic operations at each respective off ramp.
- The Kunia Interchange eastbound off ramp has been observed to queue to the top of the H-1 Freeway gorge.
- Fort Weaver Road has been observed to experience high travel time delays during both the A.M. and P.M. peak periods.
- Fort Barrette Road experiences high delays during the A.M. and P.M. peak periods and have been observed to affect the queue of adjacent intersection operations.

Recent interchange improvements to the Kunia Interchange and the Makakilo Interchange have helped alleviate congestion during the morning and afternoon peak commuter periods. Most improvements have already occurred and although the interchanges are now operating acceptably, both accesses from the arterial system to the Kunia Interchange and the Makakilo Interchange are operating at or over capacity. Currently, the weave section in the northbound direction between Fort Weaver Interchange and Kunia Interchange and selected movements at the south terminal at Kunia Interchange operate at a LOS E. Field observations have shown an increase in travel time for the eastbound through movement prior to the Kunia Interchange and a queue extending from the bottom of the eastbound off-ramp to the top of the H-1 Freeway gorge.

Makakilo Interchange operates acceptably but is affected by the Farrington Highway and Fort Barrette Road/Makakilo Drive Intersection queue extending north to the north interchange terminal.

Adjacent intersections along the Fort Barrette Road and Fort Weaver Road Corridor experience severe congestion during both morning and afternoon peak periods. Delays of up to 14 minutes and the cross-streets experiencing considerable delays due to a large portion of the green time allotted to the northbound through movement have been

observed along Fort Weaver Road. Because Farrington Highway is the only east-west roadway in Kapolei, all traffic entering Kapolei must enter the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection resulting in delays at the north, south and westbound approaches.

3.3.1.1c Public Transit

The City and County of Honolulu operates an island-wide public bus transit system called TheBus. This system is a fixed-route, regularly scheduled public transit service operated by Oahu Transit Services (OTS), and is the backbone of basic transit services for the island of Oahu. In addition, the City provides transit services for semi-ambulatory and non-ambulatory persons with disabilities called TheHandi-Van.

With a fleet of 525 buses, TheBus provides 86 numbered bus routes and over 120 subroutes. The system carries over 70 million passengers annually. Figure 3.3-4 illustrates the existing public transit routes within the Ewa region. A full-range of transit service is provided for the Ewa Plain. Express buses provide peak hour commuter service to both Downtown and Waikiki. There is also skip-stop and regular trunk service along the major arterials with circulator bus service providing access to the neighborhoods.

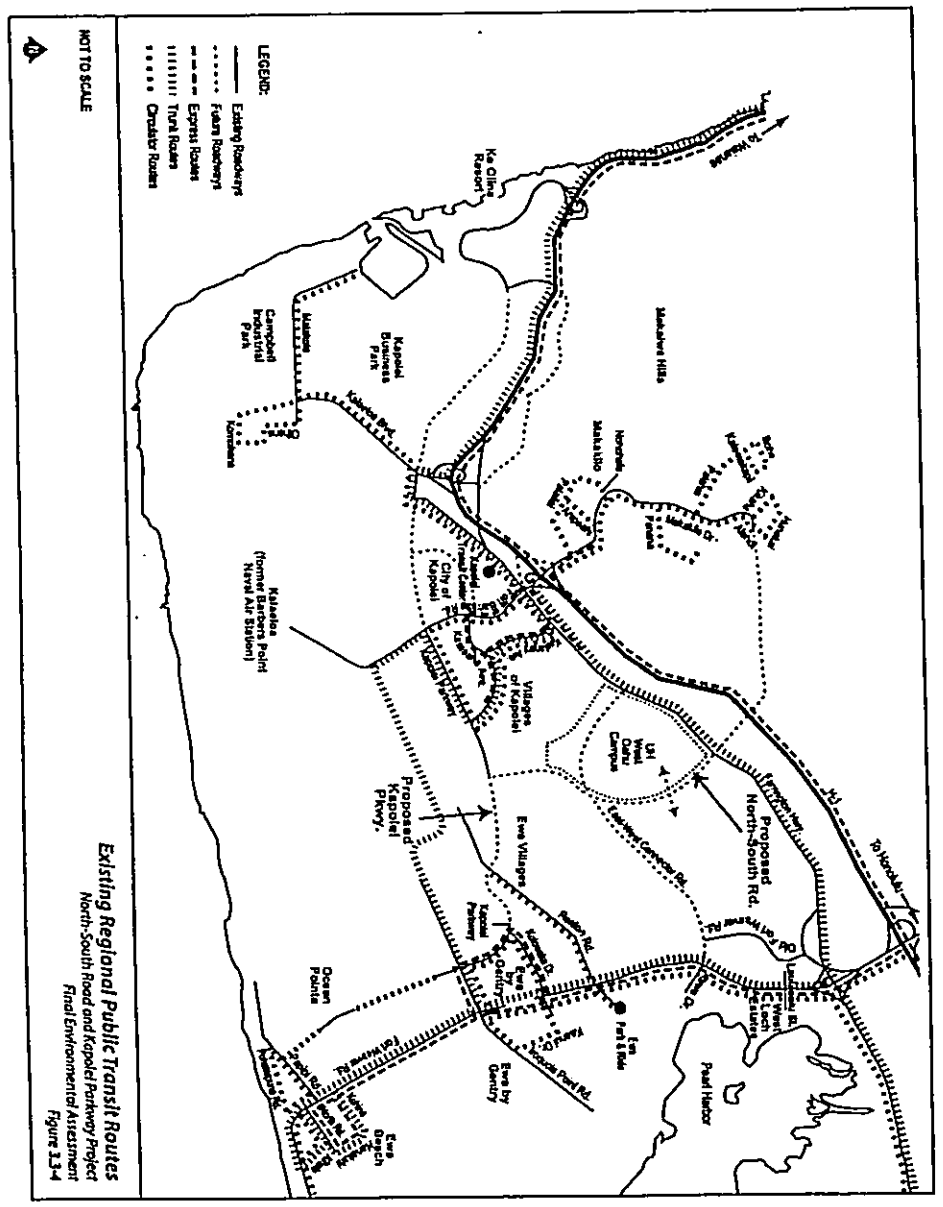
3.3.1.2 METHODOLOGY AND POTENTIAL IMPACTS

A detailed discussion of the traffic impacts of the proposed project is found in Appendix D, Traffic Study for the North-South Road and Kapolei Parkway Project Environmental Assessment (April 2004). The following information is based on that report.

The traffic impacts of the No-Build and Build Alternatives were assessed for the Year 2025 and are consistent with the ORTP 2025 (April 2001). The analysis is comprised of two sections. The first section includes level-of-service analysis for the study intersections, roadway segments, and freeway ramp junctions. The second section includes freeway mainline and weaving analyses to determine whether the proposed project would create operating problems on the H-1 Freeway.

The current Oahu Metropolitan Planning Organization (OMPO) travel demand forecasting model was used as a basis for developing forecasts of future traffic volumes for the alternatives. The No-Build Alternative was used as the baseline condition and served as the basis of comparison for the Build Alternatives. Future traffic volumes maintained consistency with interim year forecasts such as the Ewa Master Plan Impact Fee Project.

Alternatives were evaluated using the operational methodology contained in the 2000 Highway Capacity Manual (HCM), Special Report 209 (Transportation Research Board, 2000). Freeway mainline analysis, freeway/expressway ramp merge/diverge analysis, and intersection LOS analysis for projected year 2025 conditions were conducted.



Existing Regional Public Transit Routes
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-4

3.3.1.2a Projected Year 2025 Traffic Operations

Figures 3.3-5 and 3.3-6 illustrate the proposed lane configurations used in the analyses for the No-Build and Build Alternatives. Projected Year 2025 No-Build, and Build intersection, freeway, highway and ramp volumes are shown in Figures 3.3-7 and 3.3-8. Figures 3.3-9 and 3.3-10 summarizes the year 2025 No-Build and Build Alternatives projected peak hour traffic operations, respectively.

Freeway Operations

Table 3.3-6 summarizes the results of the freeway segment analysis.

Table 3.3-6:
Year 2025 Freeway Segment Level-of-Service

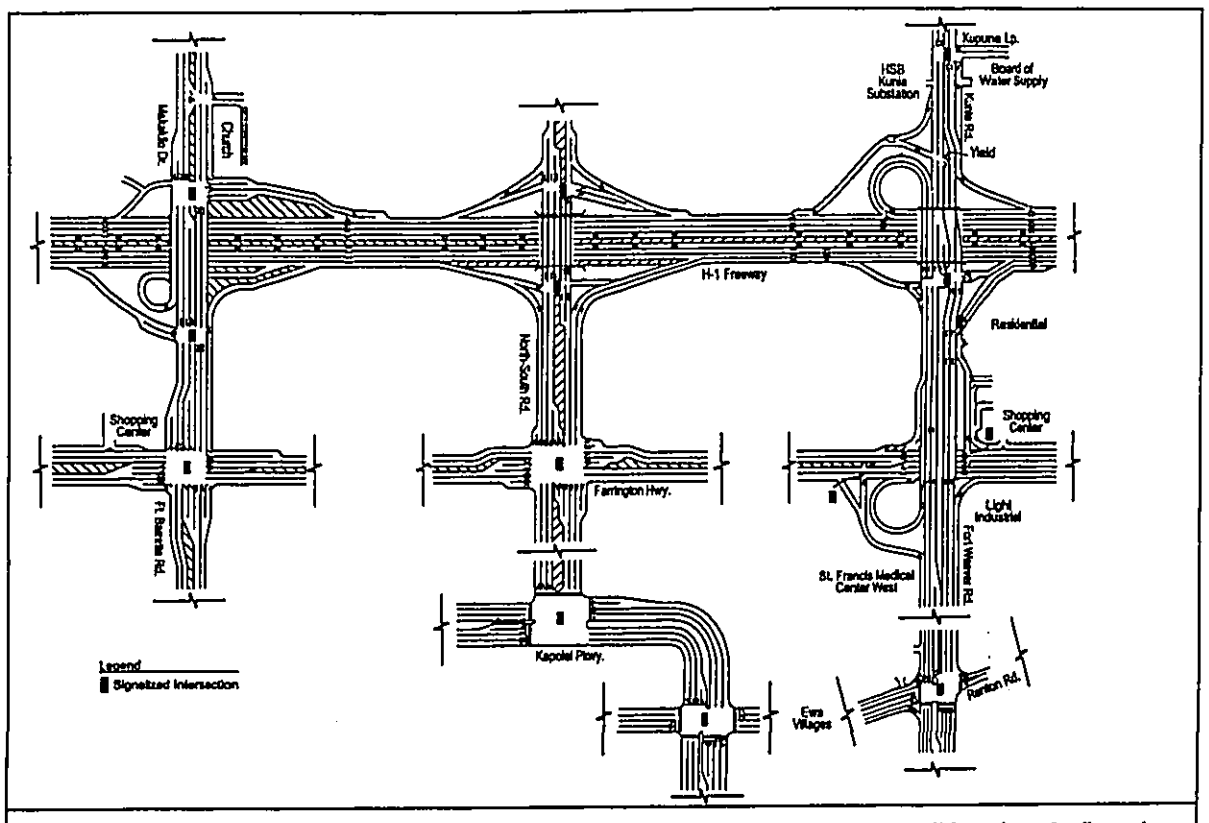
Freeway Segment	Lanes A.M. (P.M.)	Direction	A.M. Peak				P.M. Peak			
			No-Build		Build		No-Build		Build	
			LOS	Density	LOS	Density	LOS	Density	LOS	Density
Palwa IC - Kunia IC	5 (5)	WB	C	20.1	C	20.1	C	19.4	C	19.4
Kunia IC – North-South Rd IC	4 (4)	WB	C	18.4	C	22.5	B	15.6	B	17.3
North-South Rd IC - Makakilo IC	4 (4)	WB	-	-	C	18.1	-	-	B	15.2
Makakilo IC - Palailai IC	3 (3)	WB	C	19.6	C	19.6	B	14.7	B	14.7
Palailai IC - Makakilo IC	3 (3)	EB	D	28.0	D	28.0	B	11.7	B	11.7
Makakilo IC – North-South Rd IC	4 (4)	EB	D	28.3	C	25.6	B	13.0	B	11.5
North-South Rd IC	3 (3)	EB	-	-	D	35.0	-	-	B	12.9
North-South Rd IC - Kunia IC	4 (4)	EB	-	-	D	33.8	-	-	B	15.3
Kunia IC - Palwa IC	6 (5)	EB	D	27.8	D	27.8	B	16.2	B	17.3

WB=westbound, EB=eastbound, NB=northbound, SB=southbound, IC=interchange

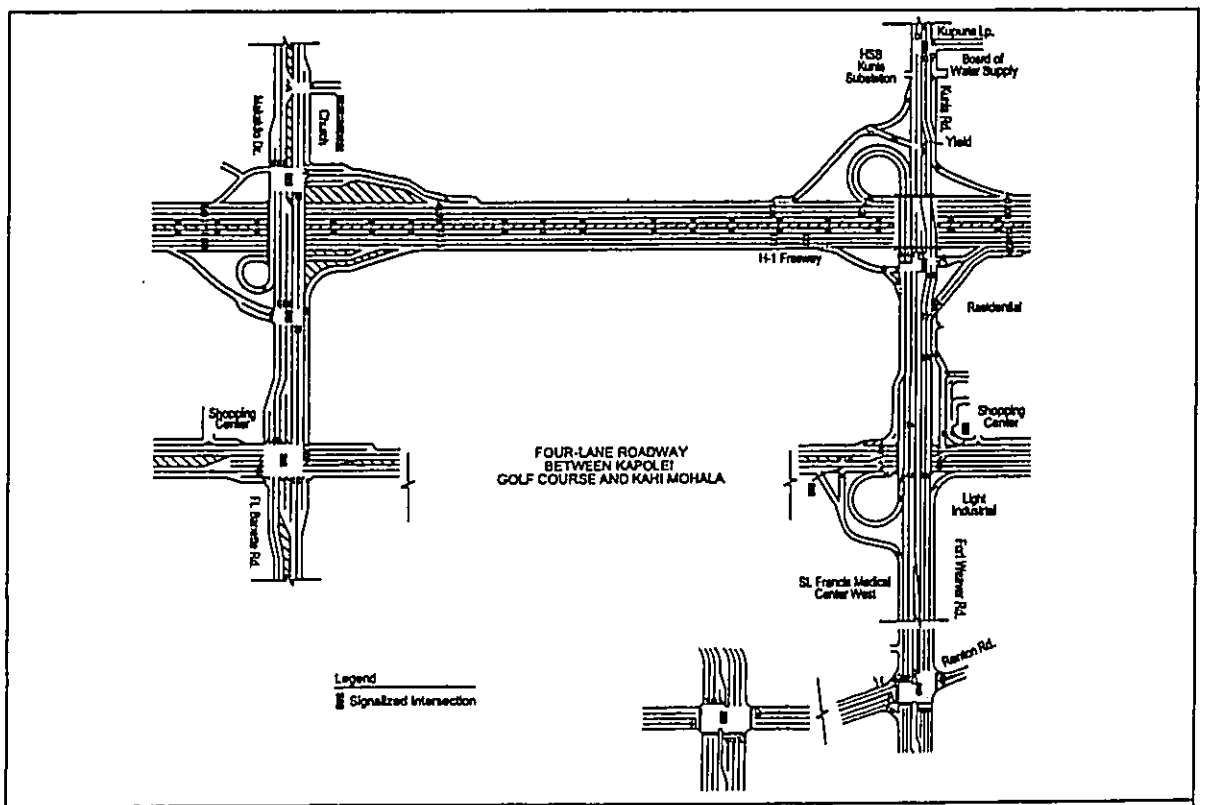
As shown in Table 3.3-6, the H-1 Freeway is projected to operate acceptably for peak hour conditions with and without the North-South Road Interchange at LOS C or better at every segment except for the eastbound segments during the A.M. peak period which operate at LOS D. This can be explained by the typical heavy morning traffic headed east for either work or school.

With the addition of the North-South Road Interchange, the freeway density is slightly higher on the segment between the North-South Road Interchange and the Kunia Interchange, in both directions, than the density on that same segment in the No-Build scenario. More vehicles are on this segment because they are using the North-South Road Interchange over the Kunia Interchange to get to their destination. However, the LOS is the same for that segment in both Build and No-Build scenarios.

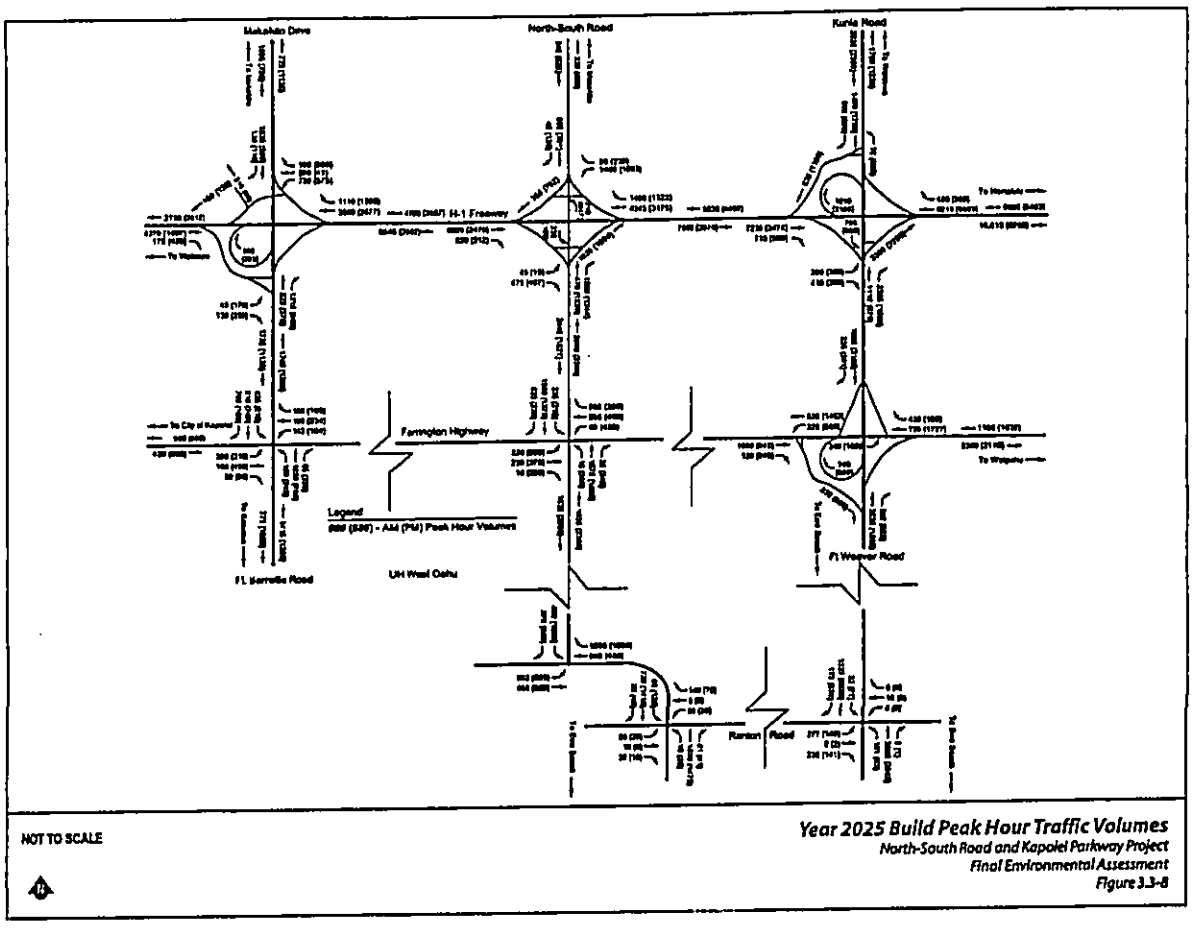
Copies of the analysis worksheets are included in Appendix D.



Year 2025 Build Roadway Configurations
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-6

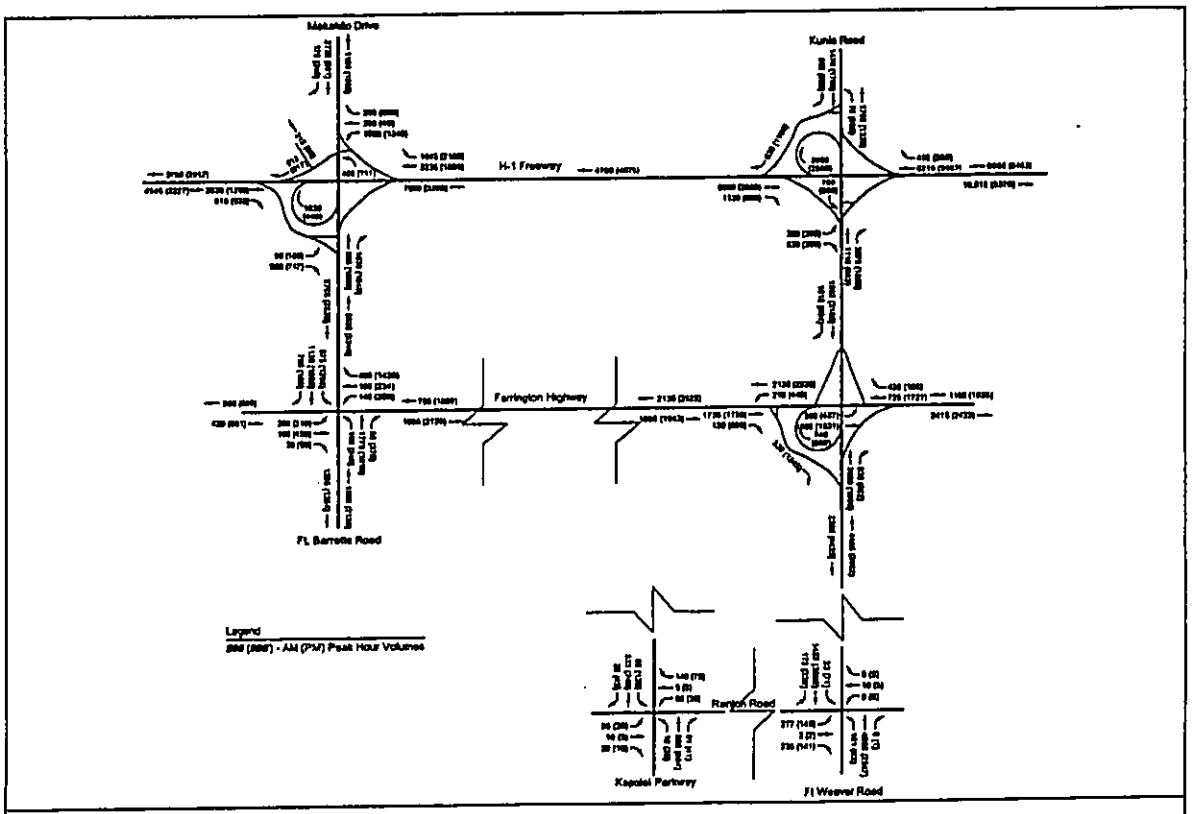


Year 2025 No-Build Roadway Configuration
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-5



NOT TO SCALE

Year 2025 Build Peak Hour Traffic Volumes
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-6



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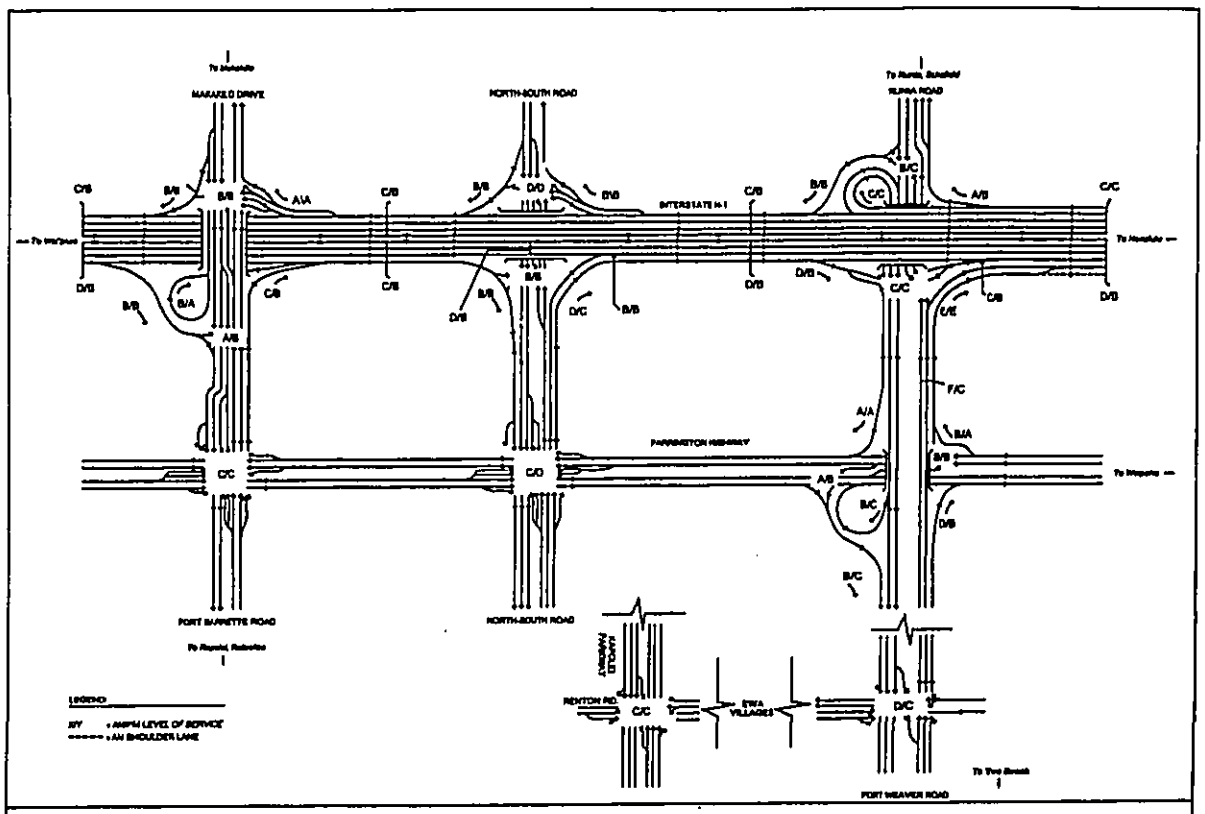
Year 2025 No-Build Peak Hour Traffic Volumes
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-7



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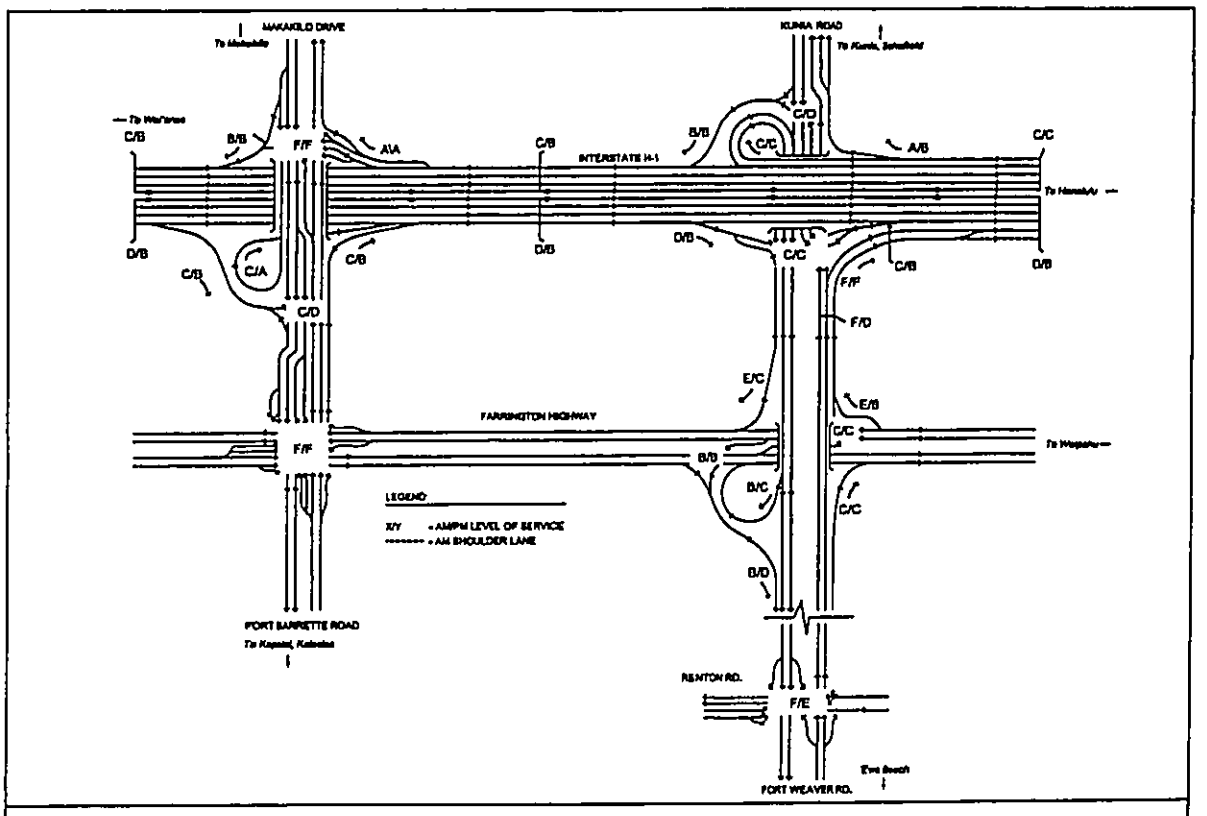
Year 2025 Build Roadway & Intersection Level-of-Service
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-10



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Year 2025 No-Build Roadway & Intersection Level-of-Service
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.3-9

Freeway Merge-Diverge Operations

Table 3.3-7 summarizes the results of the Freeway Merge-Diverge analyses. The results of the ramp analysis show that there are several problem areas in the No-Build scenario, with certain ramps operating at LOS E and F. The eastbound on-ramp at the Kunia Interchange off of Kunia Road operates at LOS F during both the A.M. and P.M. peak periods and the weave between Kunia Interchange and Farrington Highway operates at LOS F during the A.M. peak period. Both of these conditions are caused by increased traffic coming out of the Ewa and East Kapolei areas.

Table 3.3-7:
Year 2025 Freeway Merge-Diverge Level-of-Service

Intersection	A.M. Peak				P.M. Peak			
	No-Build		Build		No-Build		Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density
Kunia Interchange								
EB Off-Ramp Diverge	D	29.0	D	30.3	B	11.1	B	11.9
EB On-Ramp Merge (from Kunia)	C	21.8	C	24.7	B	14.0	B	15.5
EB On-Ramp Lane Add (from Ewa)	F	55.5	E	37.1	F	54.0	E	48.3
WB Kunia Off-Ramp Diverge	A	9.6	A	9.6	B	12.8	B	12.8
WB Ewa Off-Ramp Diverge	C	22.5	C	21.3	C	20.3	C	22.3
WB On-Ramp Merge	B	17.2	B	19.8	B	16.7	B	16.6
North-South Interchange								
EB Off-Ramp Lane Drop	-	-	B	11.6	-	-	B	11.4
EB On-Ramp Merge	-	-	B	19.7	-	-	B	13.1
EB On-Ramp Lane Add	-	-	D	30.3	-	-	C	25.6
WB Off-Ramp Diverge	-	-	B	14.5	-	-	B	10.2
WB On-Ramp Merge	-	-	B	15.2	-	-	B	15.5
Makakilo Interchange								
EB Off-Ramp Diverge	C	20.8	B	18.6	B	13.3	B	10.7
EB Makakilo On-Ramp Merge	C	20.2	B	18.8	A	9.2	A	9.6
EB Kapolei On-Ramp Merge	C	22.2	C	21.2	B	17.3	B	13.7
WB Off-Ramp Diverge	A	2.5	A	1.2	A	5.0	A	0.5
WB On-Ramp Merge	B	14.5	B	14.1	B	12.7	B	10.2
Fort Weaver Interchange								
SB Off-Ramp Lane Drop to WB	E	46.1	A	6.4	C	23.0	A	10.9
SB Off-Ramp Diverge to EB	B	13.0	B	12.3	C	24.0	C	24.0
SB On-Ramp Merge	B	13.7	B	13.7	D	30.2	C	25.9
NB Off Ramp-Lane Drop	C	23.9	C	22.9	C	25.8	B	16.1
NB On-Ramp Lane Add	E	38.0	C	27.0	B	16.9	B	11.4
NB Kunia/H-1 Weave	F	62.8	F	45.0	D	28.2	C	25.6

WB=westbound, EB=eastbound,
NB=northbound,SB=southbound

For the No-Build Alternative, at the Fort Weaver Interchange, the southbound off-ramp to Farrington Highway operates at LOS E during the A.M. peak period, as this ramp would pick up the majority of the UH West Oahu traffic. The northbound on-ramp from Farrington Highway would also operate at LOS E due to growth in the Ewa and Ewa Beach areas.

The remaining ramps at the Kunia, Makakilo, and Fort Weaver Interchanges would operate reasonably well in the No-Build scenario during both the A.M. and P.M. peak periods Operations at these ramps are at a low LOS D or better.

When the North-South Road Interchange and North-South Road are included in these analyses, overall ramp operations at every interchange improve as vehicles now have another way to access the H-1 Freeway. At the Fort Weaver Interchange, the two off-ramps operating at LOS E in the No-Build scenario, would both operate acceptably in the Build scenario. The southbound off-ramp to Farrington Highway would operate at LOS A in the Build scenario because North-South Road would provide easier access to those headed to the UH West Oahu Campus. The northbound on-ramp from Farrington Highway would operate at an acceptable LOS C.

The LOS F conditions at the Kunia Interchange in the No-Build scenario improve in the Build scenario, but drivers would still experience a lot of congestion in these areas. The eastbound on-ramp off of Kunia Road would operate at LOS E during both the A.M. and P.M. peak periods, and operations at the weave on Kunia Road between H-1 Freeway and Farrington Highway would improve to a lower LOS F. The addition of the North-South Road did relieve some of the congestion on Fort Weaver Road, but as explained earlier in this report, Fort Weaver Road is already operating over capacity. The fact that the Ewa and Ewa Beach areas are still growing/developing only adds to the problem.

Copies of the analysis worksheets are included in Appendix D.

Interchange Terminal Operations

Table 3.3-8 summarizes the results of the Interchange Terminal analysis.

As shown in Table 3.3-8, the interchange terminals at Makakilo Interchange would experience problems under the No-Build scenario. The H-1 Westbound Off-Ramp/Makakilo Drive terminal operates under a LOS of F during the A.M. peak period and the H-1 Eastbound Off-Ramp/Makakilo Drive terminal operates at LOS F during the P.M. peak period. These terminals cannot handle the increased traffic demand caused by all of the development in this area.

The interchange terminals at Kunia Interchange and Fort Weaver Interchange would operate reasonably well in Year 2025 without the North-South Road Interchange. The terminals at Fort Weaver Interchange would operate at an acceptable LOS C or better, while the terminals at Kunia Interchange would experience longer delays but still operate at LOS D or better.

Table 3.3-8:
Year 2025 Interchange Terminal Level-of-Service

Interchange Terminals	A.M. Peak				P.M. Peak			
	No-Build		Build		No-Build		Build	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Kunia Interchange	110 sec cycle				110 sec cycle			
Mauka Terminal	**C**	**22.1**	**B**	**11.31**	**D**	**41.7**	**C**	**39.9**
Northbound Approach	C	22.0	C	32.8	D	48.4	D	50.8
Southbound Approach	C	22.1	B	10.3	D	40.1	C	36.2
Makai Terminal	**C**	**25.3**	**C**	**24.7**	**C**	**30.0**	**C**	**26.6**
Eastbound Approach	D	48.6	D	48.6	D	45.6	D	35.5
Northbound Approach	D	40.8	D	36.2	C	30.1	C	28.6
Southbound Through	B	12.5	A	7.7	C	28.7	C	25.0
Southbound Left-Turn	D	39.3	D	36.2	C	29.2	C	29.2
North-South Interchange			100 sec cycle				100 sec cycle	
Mauka Terminal	-	-	**D**	**49.1**	-	-	**D**	**36.2**
Westbound Approach	-	-	D	53.8	-	-	D	40.7
Northbound Approach	-	-	D	35.4	-	-	C	28.8
Southbound Approach	-	-	D	49.8	-	-	D	47.0
Makai Terminal	-	-	**B**	**15.4**	-	-	**B**	**15.6**
Eastbound Approach	-	-	C	33.0	-	-	C	28.4
Northbound Approach	-	-	B	19.6	-	-	B	18.3
Southbound Approach	-	-	B	14.2	-	-	B	13.3
Makakilo Interchange	90 sec cycle		60 sec cycle		90 sec cycle		60 sec cycle	
Mauka Terminal	**F**	**90.0**	**B**	**15.8**	**F**	**161.4**	**B**	**18.8**
Westbound Approach	F	92.3	B	19.2	F	273.8	B	18.3
Northbound Approach	E	65.0	B	11.1	C	24.3	B	14.5
Southbound Approach	F	186.3	B	17.3	F	138.2	C	23.2
Makai Terminal	**C**	**23.1**	**A**	**6.8**	**D**	**50.8**	**B**	**10.9**
Eastbound Approach	C	30.3	B	18.6	E	57.6	B	11.4
Northbound Approach	B	16.3	A	5.3	E	63.3	B	10.9
Southbound Approach	C	24.2	A	5.4	B	16.6	B	10.3
Fort Weaver Interchange	60 sec cycle				60 sec cycle			
Waianae Terminal	**B**	**13.6**	**A**	**9.2**	**B**	**16.0**	**B**	**13.6**
Eastbound Approach	B	12.9	A	7.2	B	16.8	B	13.3
Westbound Approach	B	19.1	B	19.1	B	14.2	B	14.2
Koko Head Terminal	**C**	**21.1**	**B**	**10.3**	**C**	**24.6**	**B**	**12.1**
Eastbound Approach	B	17.8	B	16.0	C	30.0	B	19.5
Westbound Approach	C	25.0	A	8.4	C	23.0	B	11.4

Kapolei Parkway, North-South Road and North-South Road Interchange would help the adjacent interchanges, Makakilo Interchange and Kunia Interchange, by allowing an alternate location for traffic to access the H-1 Freeway. Most importantly, it would alleviate the traffic volume at the Makakilo Interchange terminals, which would all operate at LOS B or better under the Build scenario.

Adjacent Intersection Operations -

Table 3.3-9 summarizes the results of the intersection analysis.

As shown in Table 3.3-9, traffic operations at the intersection of Farrington Highway and Makakilo Drive/Fort Barrette Road in the No-Build Alternative would experience heavy congestion and long delays on several approaches during both the A.M. and P.M. peak periods. The intersection experiences overcapacity conditions due to the large increase in traffic demand caused by the planned development of the City of Kapolei, the Villages of Kapolei, and the UH-West Oahu Campus.

Given the high-level of improvements already implemented at this intersection, further geometric changes and adjustments to signal timing are unlikely to be effective. During the A.M. peak period, the mauka-bound through movement and the makai-bound left-turn movement on Fort Barrette Road are the primary movements that are over-capacity. During the P.M. peak period, the same two movements plus the Waianae-bound right-turn movement on Farrington Highway are constrained.

The North-South Road Interchange provides another regional access into the Ewa Plain thereby sharing and lessening the demand placed on the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection. With the North-South Road Interchange, the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection would operate at an improved overall LOS C during both the A.M. and P.M. peak periods.

The Farrington Highway/North-South Road intersection is projected to operate at LOS C during the A.M. peak period and at a marginal LOS D during the P.M. peak period. These level-of-service determinations are considered acceptable for urban, peak hour operations.

The intersections along the Fort Weaver Road corridor are projected to operate at a much improved level-of-service due to the additional regional access to the H-1 Freeway.

Kapolei Parkway intersections at North-South Road and at Renton Road are projected to operate acceptably in both the No-Build and Build Alternatives. The Kapolei Parkway/North-South Road intersection is anticipated to warrant signalization for both the No-Build and Build alternatives. Likewise, the Kapolei Parkway / Renton Road intersection is also anticipated to warrant signalization in both the No-Build and Build Alternatives. traffic signals will be installed. The designers of the future traffic signal at the Kapolei Parkway/Renton Road intersection will consider comments received from the State Historic Preservation Division (SHPD) in designing the signal hardware and in developing the signal timing plan. See Section 3.10.3 for a description of SHPD comments.

Table 3.3-9:
Year 2025 Intersection Level-of-Service

Intersection	A.M.				P.M.			
	No-Build		Build		No-Build		Build	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Farrington Hwy and Makakilo Dr/ Ft. Barrette Rd	(110 Sec Cycle)				(110 Sec Cycle)			
	F	122	C	34.5	F	414.7	C	33.3
Farrington Hwy EB	D	45.9	D	45.9	C	34.9	C	34.9
Left	D	48.5	D	48.5	C	33.1	C	33.1
Through	D	42.5	D	42.5	D	38.9	D	38.9
Right	C	23.9	C	23.9	C	21.2	C	21.2
Farrington Hwy WB	D	45.7	D	39.1	F	835.9	D	45.1
Left	D	49.6	D	49.6	E	66.7	D	50.5
Through	D	43.4	D	43.4	D	50	D	50
Right	D	45.2	C	27.3	F	-	C	32.2
Fort Barrette Rd NB	F	213.9	D	36.3	F	125.7	C	30.4
Left	D	38.9	D	38.9	D	45.5	D	45.5
Through	F	245.2	D	37.4	F	165.8	C	32
Right	B	10.2	B	10.1	B	16.7	B	16.3
Makakilo Dr SB	F	112.6	C	28.9	F	475.9	C	29.9
Left	F	288.9	D	47.9	F	891.1	D	44.5
Through	C	32	C	23.6	D	42	C	31
Right	C	22.1	C	22.1	A	7.9	A	7.9
Farrington Hwy and North-South Road			(110 Sec Cycle)				(110 Sec Cycle)	
	-	-	C	33.4	-	-	D	39
Farrington Hwy EB	-	-	D	44.6	-	-	D	45.7
Left	-	-	D	52.4	-	-	D	52.1
Through	-	-	D	39	-	-	D	46.1
Right	-	-	C	25.8	-	-	C	32.6
Farrington Hwy WB	-	-	D	43.5	-	-	D	45.5
Left	-	-	D	45.2	-	-	D	45.4
Through	-	-	D	48.9	-	-	D	52.1
Right	-	-	C	32.1	-	-	C	30.8
North-South Rd NB	-	-	D	39.8	-	-	D	40.8
Left	-	-	D	46.7	-	-	D	54.4
Through	-	-	D	40.3	-	-	D	42.9
Right	-	-	B	14.6	-	-	A	9.6
North-South Rd SB	-	-	C	23.4	-	-	C	28.5
Left	-	-	D	39.7	-	-	D	49.1
Through	-	-	C	23.3	-	-	C	28.5
Right	-	-	B	13.5	-	-	A	9.6

EB=eastbound,WB=Westbound,NB=northbound,SB=southbound

Table 3.3-9: (Continued)
Year 2025 Intersection Level-of-Service

Intersection	A.M. Peak				P.M. Peak			
	No-Build		Build		No-Build		Build	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Kapolei Pkwy/ North-South Rd			(110 Sec Cycle)				(110 Sec Cycle)	
	-	-	C	24.9	-	-	C	23.5
EB Left	-	-	D	39.1	-	-	D	36.2
EB Through	-	-	A	7.3	-	-	B	12.6
WB Through	-	-	D	39.1	-	-	D	35.2
WB Right	-	-	B	11.0	-	-	B	11.0
SB Left	-	-	C	33.7	-	-	D	37.8
SB Right	-	-	B	13.3	-	-	A	9.4
Kapolei Pkwy/ Renton Rd	(110 Sec Cycle)				(110 Sec Cycle)			
	B	19.1	C	25.6	C	20.3	C	24.9
EB Left	D	39.8	D	39.8	C	34.3	C	34.3
EB Through & Right	D	37.7	D	37.7	C	34.0	C	34.0
WB Through & Left	D	39.5	D	39.5	C	34.8	C	34.8
WB Right	B	18.3	B	18.3	B	14.0	B	14.0
NB Left	D	41.3	D	41.3	D	37.4	D	37.4
NB Through & Right	B	19.2	C	28.5	C	20.6	C	28.4
SB Left	C	34.1	C	34.1	C	33.3	C	33.3
SB Through & Right	B	11.0	B	11.5	B	16.6	C	20.5
Ft Weaver Rd/ Renton Rd	(110 Sec Cycle)				(110 Sec Cycle)			
	F	131.1	D	38.7	E	62.4	C	26.4
EB Left	D	54.9	D	54.9	D	45.6	D	45.6
EB Through	D	35.2	D	35.2	D	39.4	D	39.4
EB Right	C	32.7	C	32.7	C	30.0	C	30.0
WB Left & Through	D	53.8	D	53.8	D	49.0	D	49.0
WB Right	D	44.8	D	44.8	D	37.8	D	37.8
NB Left	D	50.8	D	50.8	D	47.4	D	47.4
NB Through	F	222.8	D	46.9	C	31.4	C	20.6
NB Right	A	7.0	A	7.0	A	6.9	A	6.9
SB Left	D	50.7	D	50.7	D	46.8	D	46.8
SB Through	C	21.1	C	20.5	F	96.9	C	30.6
SB Right	A	6.3	A	6.3	A	6.0	A	6.0

EB=eastbound,WB=Westbound,NB=northbound,SB=southbound

The Fort Weaver Road and Renton Road intersection is projected to be very congested in the No-Build Alternative, operating at an overall LOS F. Fort Weaver Road would experience heavy congestion and long delays in the north-south direction during both A.M. and P.M. Peaks. The intersection experiences overcapacity conditions due to the large increase in traffic destined to the H-1 Freeway caused by the shift in travel patterns from North-South Road to Fort Weaver Road. Even the future six-lane widening, adjustments to signal timing or any further geometric improvements are unlikely to accommodate the future north-south demand.

In the Build Alternative, Fort Weaver Road is projected to operate acceptably (LOS D or better). With future improvements and alternative routes provided to H-1 Freeway, traffic in the Ewa area is able to distribute to North-South Road providing alleviation to Fort Weaver Road.

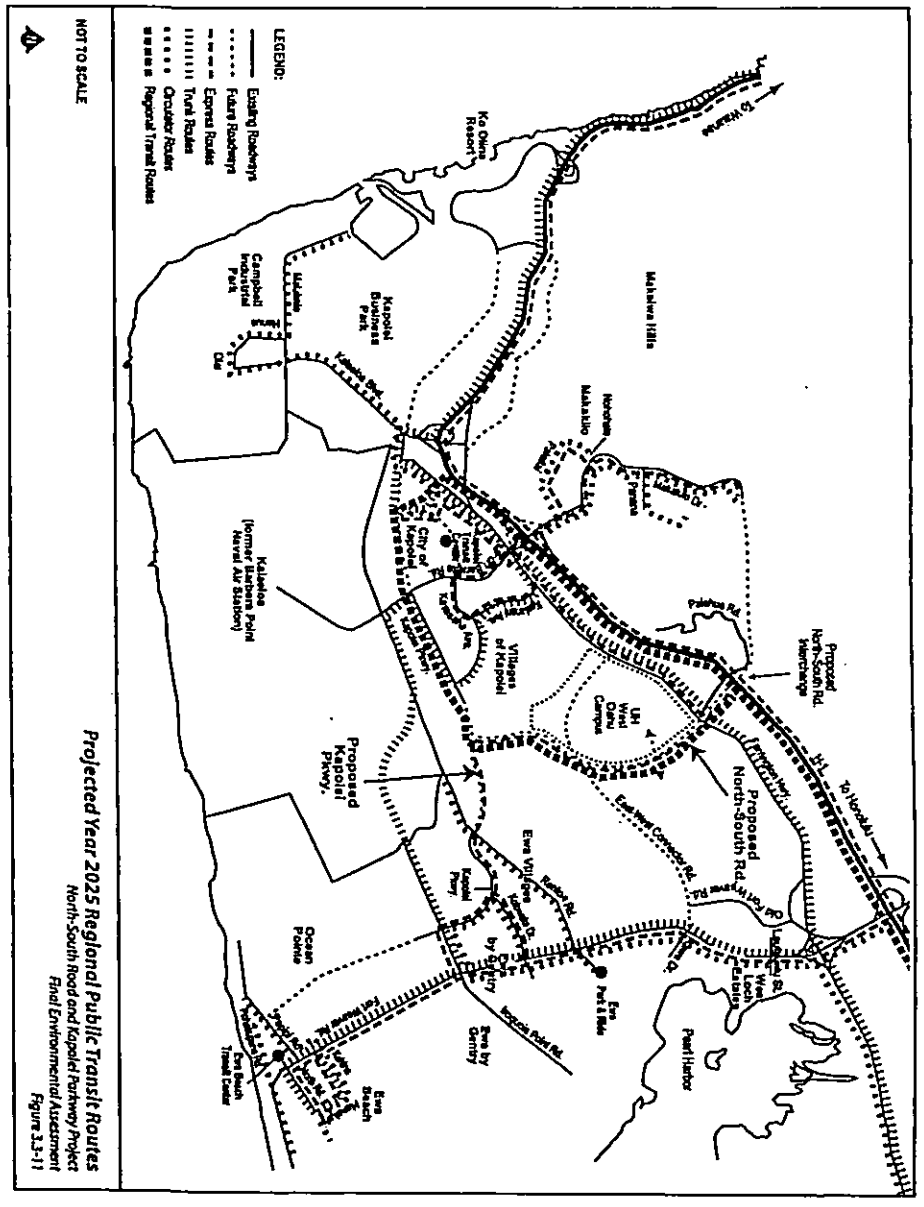
3.3.1.2b Public Transit

As described in Section 3.3.1.1c, the City and County of Honolulu was assumed to operate a 794-bus fleet by the Year 2025, which includes the regional BRT system. It currently operates a 525-bus fleet. Figure 3.3-11 shows the Year 2025 projected bus routes for the study area. The primary difference from the existing transit system is the assumed implementation of a high-capacity regional transit system that would serve the H-1 Freeway corridor.

Although, the No-Build and Build Alternatives assume similar transit systems, the Build Alternative allows the transit system to provide better service. The Build Alternative includes an exclusive rapid transit corridor that would be reserved within the 28-foot median of North-South Road. This future transit corridor would begin at H-1 Freeway and proceed makai to Kapolei Parkway. At Kapolei Parkway, the transit corridor would connect to the existing east-west rapid transit corridor located within the median of Kapolei Parkway. At select locations along North-South Road, there may be the need for future widening of the median to provide for transit stops. The City and County of Honolulu is proposing a future park-and-ride facility in the vicinity of North-South Road/ Farrington Highway intersection. A park-and-ride facility in this area would serve this growing area better and would provide transit vehicles better access to H-1 Freeway than the No-Build Alternative. The No-Build Alternative would lessen the effectiveness of a proposed North-South Road park-and-ride, requiring transit vehicles to use park-and-ride facilities targeted for other communities. The same number of transit vehicles would be provided in both alternatives, but the Build Alternative would allow more efficient service. Also, as described in Section 3.3.1.2, the Build Alternative would improve traffic conditions on certain roadways, intersections and ramps. Therefore, the Build Alternative would improve transit services if overall traffic operations improve, because transit vehicles would use the same roadways as other vehicles.

3.3.1.2c Conclusion

The traffic impact analysis conducted above indicates that implementation of the proposed North-South Road and Kapolei Parkway project would result in the following benefits:



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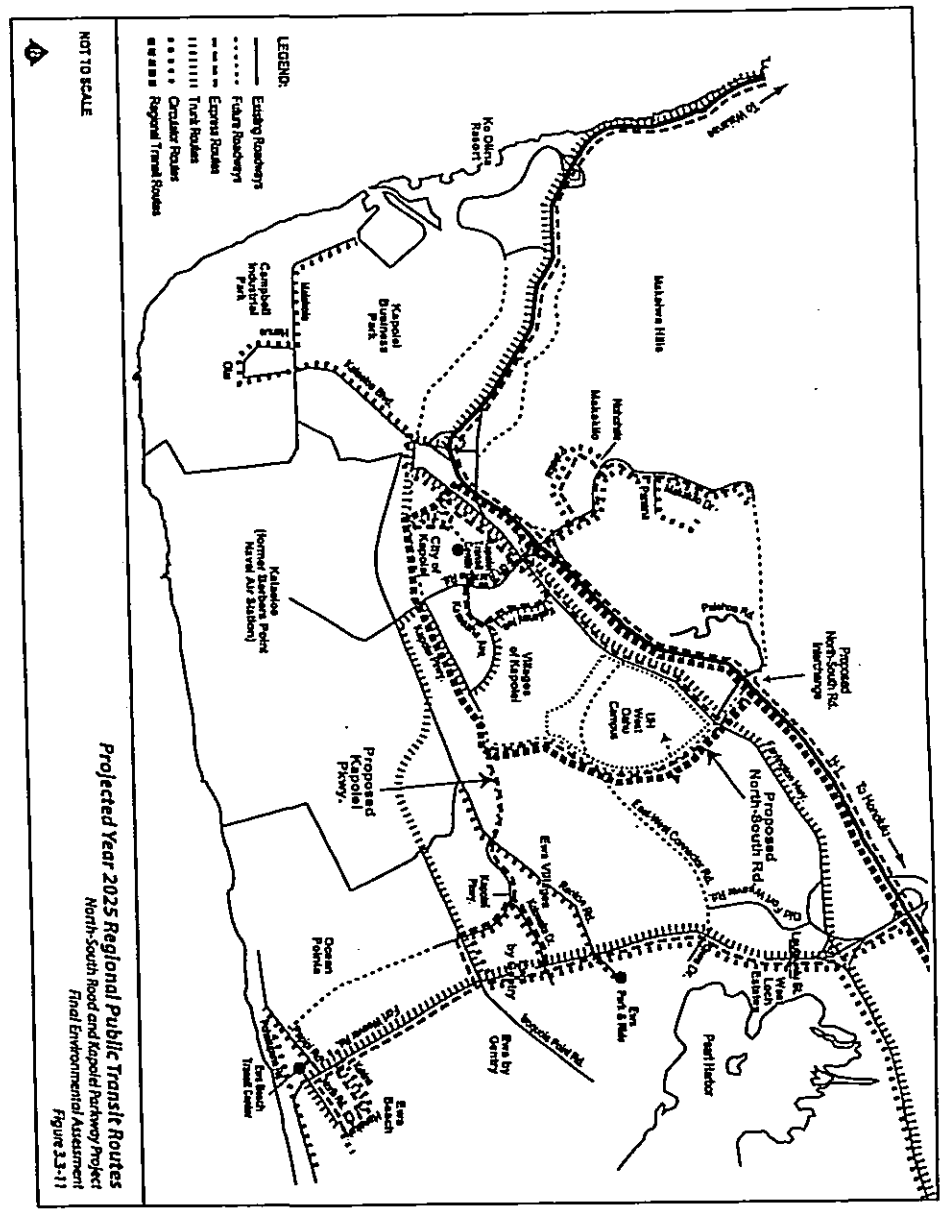

- Traffic conditions would be substantially improved along the congested Kunia Road/Fort Weaver Road corridor. Year 2025 volumes on Kunia Road between H-1 and Farrington Highway are projected to decrease by about 2,745 and 730 vph in both directions, during the A.M. and P.M. peak hours, respectively, when compared to the No-Build Alternative. In addition to improved highway operating conditions during both peak periods and in both directions of travel, each of the analyzed intersections along the Kunia Road/Fort Weaver Road corridor would benefit from the project.
  Similarly, traffic conditions would be improved along the Makakilo Drive/Fort Barrette Road corridor. With the project, Year 2025 volumes along Fort Barrette Road between H-1 Freeway and Farrington Highway are projected to decline by about 1,755 and 3,384 vph during the A.M. and P.M. peak hours, respectively, when compared to the No-Build Alternative. The intersection analysis indicated that this shift would result in improved level-of-service at the Makakilo Drive/H-1 Freeway westbound ramp terminal and Fort Barrette Road/Makakilo Drive and Farrington Highway intersection.

- With the project reductions in volume to capacity (v/c) ratios and average vehicle delays are projected for key intersections along the Kunia Road/Fort Weaver Road and Makakilo Drive/Fort Barrette Road corridors (see Appendix D).

North-South Road itself is projected to carry large traffic volumes, all of which would relieve other streets in the study area. Additionally, each of the future intersections along North-South Road and Kapolei Parkway, including those at the H-1 Freeway interchange, are projected to operate at acceptable level-of-service under the Year 2025 Build Alternative.

In summary, analyses indicate that existing freeway operations and ramp merge-diverge operations are good for peak hour conditions. Access to the interchanges, however, is constrained by the arterial intersections along the primary north-south corridors of Fort Weaver Road and Fort Barrette Road. Construction of North-South Road Interchange at the H-1 Freeway, North-South Road between the H-1 Freeway and Kapolei Parkway, and the construction of Kapolei Parkway between North-South Road and Renton Road would serve as an alternate route to access the greater Ewa area. The proposed project would provide additional roadway capacity in a high-growth area and would relieve congested key parallel corridors.

3.3.1.3 MITIGATION MEASURES

3.3.1.3a Traffic

The proposed North-South Road, North-South Road Interchange and the portion of Kapolei Parkway between Renton Road and North-South Road are expected to improve traffic operations at intersections along the Fort Weaver Road and Fort Barrette Road corridors. In general, the transportation improvements provided under the Build Alternative would provide better sub-regional mobility within the Ewa Plain than No-Build Alternative. Therefore, no mitigation measures are necessary.

a 3.3.1.3bPublic Transit

Future transit planning in the Ewa Plain identifies a future park-and-ride bus facility near the intersection of Farrington Highway and North-South Road as part of the Regional BRT system and Hub-and-Spoke system. Implementation of the North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road would be consistent with this future transit enhancement for the Ewa Plain and would be beneficial for implementation of long-range transit plans in the Ewa Plain area. Therefore, no mitigation will be needed for transit.

3.3.1.3c Pedestrian Facilities

Currently, there are no pedestrian facilities within the study corridor. All future pedestrian facilities constructed as part of this project will comply with the Americans with Disabilities Act (ADA) regulations and guidelines. As shown in Figure 2.1-3 and 2.1-4, 8-foot sidewalks will be provided along both sides of the North-South Road corridor and a 4-foot sidewalk and a 10-foot shared bike/jogging path along the Kapolei Parkway segment. Therefore, no mitigation will be needed for pedestrian facilities.

3.3.2 UTILITIES

3.3.2.1 EXISTING CONDITIONS

Water, sewer, and drainage master plans were prepared for the East Kapolei EIS. These plans took into account the mauka University of Hawaii West Oahu (UH-West Oahu) campus and Kalaeloa (Barbers Point). DHHL would revise the plans for their lands and UH-West Oahu would revise the plans for the makai campus, should they proceed with the planning and entitlement process for development of the campus in its proposed location.

The project would cross existing 30-inch and 36-inch waterlines located within the Farrington Highway ROW. Coordination with the City will be required prior to construction for review and approval.

The Honouliuli Wastewater Treatment Plant, located on the corner of North Hanson and Geiger Roads, is the treatment facility serving the Ewa region.

An easement exists for the use of Hawaiian Electric Company (HECO), which operates the existing 138-kilovolt (kV) power line that cuts through the project area. This power corridor runs parallel to the proposed North-South Road alignment, and access to power poles is currently possible via a very rough and overgrown dirt road adjacent to farmland. There is also an energy corridor, which contains oil and fuel lines along Farrington Highway.