
**Supplemental Environmental Impact Statement
Preparation Notice
(SEISPN)**

for

**REVISIONS AND UPDATES TO THE
UNIVERSITY OF HAWAI'I CENTER – WEST HAWAI'I
LONG RANGE DEVELOPMENT PLAN**

**Kalaoa, Hawai'i, Hawai'i
Tax Map Key: (3)7-3-010:042**

Proposing Agency:

University of Hawai'i
Office of Capital Improvements
1960 East West Road
Biomedical Sciences, B102
Honolulu, Hi 96822

This document is prepared pursuant to Hawai'i Revised Statutes Chapter 343, Environmental Impact Statement Law and Hawai'i Administrative Rules Chapter 200 of Title 11 Department of Health, Environmental Impact Statement Rules.

February 2009

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AAQS	Ambient Air Quality Standards
ASF	Assignable Square Feet
BMP	best management practices
BOR	Board of Regents
CDP	<i>Mapping Kona's Future, Kona Community Development Plan</i>
CIA	Cultural Impact Assessment
CIP	Capital Improvement Program
DAGS	State of Hawai'i, Department of Accounting and General Services
dBA	decibels (A-weighted)
DLNR	State of Hawai'i, Department of Land and Natural Resources
DOH	State of Hawai'i, Department of Health
DOT	State of Hawai'i, Department of Transportation
DWS	County of Hawai'i, Department of Water Supply
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
ESA	Endangered Species Act
FB	fiscal biennium
FHWA	Federal Highway Administration
FTES	Full-time Equivalent Students
GSF	Gross Square Feet
HAR	Hawai'i Administrative Rules
HITS	Hawai'i Interactive Television System
HawCC	University of Hawai'i, Hawai'i Community College at Hilo
HELCO	Hawai'i Electric Light Company
HPP	<i>Conceptual Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island</i>
HRS	Hawai'i Revised Statutes
LEED	Leadership in Energy and Environmental Design
LRDP	Long Range Development Plan
LUPAG	Land Use Pattern Allocation Guide Map
MOU	Memorandum of Understanding
msl	Mean Sea Level
NSF	Non-assignable Square Feet
OSP	Office of State Planning
SEIS	Supplemental Environmental Impact Statement
SEISPN	Supplemental Environmental Impact Statement Preparation Notice
SHPD	State of Hawai'i, Department of Land and Natural Resources, Historic Preservation Division
SMA	Special Management Area
TMK	Tax Map Key
UIC	Underground Injection Control

UH	University of Hawai'i
UHCWH	University of Hawai'i Center – West Hawai'i
U.S.	United States
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service

1.0 INTRODUCTION AND SUMMARY

1.1 NEED FOR A SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

The Proposed Action or subject of this Supplemental Environmental Impact Statement Preparation Notice (SEISPN) and subsequent Supplemental Environmental Impact Statement (SEIS) is the updated and revised plan for a permanent higher education facility for the West Hawai'i region of the Island of Hawai'i. The proposed facility is the University of Hawai'i Center – West Hawai'i (UHCWH). In this document the UHCWH also may be referred to as the University Center or Center.

The University of Hawai'i (UH), Office of Capital Improvements has determined that a SEIS needs to be prepared to address revisions to the *UHCWH Long Range Development Plan* (LRDP). The existing LRDP was prepared in 1998 and associated Environmental Impact Statement (EIS) in 2000. Changes to the long-term vision for the UHCWH, as well as changes in the West Hawai'i community and the progression of nearby development projects have necessitated an update and revision of the 1998 LRDP. These changes are discussed further in *Section 1.4 Background* of this SEISPN. **The revised and updated LRDP and the SEIS are being prepared concurrently such that issues identified during the SEIS process can be incorporated into the LRDP update and revisions process and vice versa. Therefore, what is discussed here in the SEISPN represents outcomes from the initial phases of the LRDP revision and update process—site utilization analysis, selection of the campus core location, and development of alternative campus site plans. Feedback and comments received on the SEISPN will be taken into consideration in the next phase of the LRDP update process—development of the Ultimate Campus Site Plan. The Ultimate Campus Site Plan will be the Preferred Alternative in the SEIS.**

There are two (2) major changes from the 1998 LRDP and the revised and updated LRDP currently being prepared. The first is the change in location of the campus core from the southwestern portion of the 500-acre state-owned parcel that was designated for University use, to the northwestern corner (refer to Figure 3). The second major change in the LRDP is an increase in the long-term target enrollment from 1,500 full-time equivalent students (FTES) to 3,000 FTES and the inclusion of additional instruction programs. The updated LRDP will document the steps taken and the information compiled throughout the update and revision process.

1.2 SCOPE AND AUTHORITY

This SEISPN is prepared pursuant to Chapter 343, Hawai'i Revised Statutes (HRS)—the State EIS law—and associated State of Hawai'i, Department of Health Hawai'i Administrative Rules (HAR), Title 11, Chapter 200. The use of state or county lands or government funds triggers the EIS law for the Proposed Action. The purpose of the SEISPN is to inform interested parties of the proposed changes to the LRDP and to seek comments and input as to what should be addressed in the forthcoming Draft SEIS. This SEISPN is not intended to serve as a

comprehensive environmental disclosure statement. Its intent is to identify issues of concern and define the scope of analysis to be covered in the SEIS.

1.3 PROJECT INFORMATION

General project information is listed below.

PROJECT NAME: University of Hawai'i Center - West Hawai'i Long Range Development Plan Revision and Update

APPLICANT: University of Hawai'i
Office of Capital Improvements
1960 East West Road
Biomedical Sciences, B102
Honolulu, Hawai'i 96822
Contact: Brian Minaai, Associate Vice President for Capital Improvements
(808) 956-7935, FAX (808) 956-3175
Email: bminai@hawaii.edu

SEISPN PREPARER: Wil Chee - Planning, Inc.
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Honolulu, Hawai'i 96814
Contact: Celia Shen, Project Manager
(808) 596-4688, FAX (808) 597- 1851
Email: wcpcelia@lava.net

UHCWH ADMINISTRATION: University of Hawai'i Center - West Hawai'i
81-964 Haleki'i Street
Kealakekua, Hawai'i 96750
Contact: Beth Sanders, Interim Director
(808) 322-4850, FAX: (808) 956-3175

LOCATION: North Kona, Island of Hawai'i

TMK: (3)7-3-010:042

RECORDED FEE OWNER: State of Hawai'i

LOT AREA: 500 acres (approximately 73 acres will be subdivided from the 500 acres for development of the UHCWH campus)

EXISTING USE: Vacant, undeveloped

PROPOSED ACTION: Development of the University of Hawai'i Center - West Hawai'i on the 500-acre state-owned parcel in Kalaoa

STATE LAND USE CLASSIFICATION: Urban

COUNTY GENERAL PLAN (LUPAG): University Use

COUNTY ZONING: A-5a (Agriculture) and Open

SPECIAL MANAGEMENT AREA: Not within the SMA

SPECIAL DISTRICT: Not within a Special District

AGENCIES, ORGANIZATIONS OR INDIVIDUALS TO BE CONSULTED AS PART OF THE SEIS PROCESS:

Federal

Department of the Interior, U.S. Fish and Wildlife Service

State of Hawai'i

Department of Business Economic Development and Tourism

Department of Land and Natural Resources, Division of Forestry and Wildlife

Department of Land and Natural Resources, Historic Preservation Division

Department of Hawaiian Home Lands

Department of Health, Environmental Management Division

Department of Health, Office of Environmental Quality Control

Department of Transportation

Office of Hawaiian Affairs

University of Hawai'i Center – West Hawai'i

University of Hawai'i, Hawaii Community College

University of Hawai'i, Environmental Center

County of Hawai'i

Hawai'i County Mayor's Office

Department of Public Works

Planning Department

Department of Water Supply

Civil Defense Agency

Fire Department

Police Department

Elected Officials

Congresswoman Mazie Hirono, Second U.S. Congressional District

Senator Josh Green M.D., State Senatorial District 3

Representative Robert Herkes, State House District 5

Representative Denny Coffman, State House District 6

Representative Cindy Evans, State House District 7

Council Member Brenda Cook, Hawai'i County Council District 7
Council Member Kelly Greenwell, Hawai'i County Council District 8
Council Member Peter Hoffman, Hawai'i County Council District 9

Other

Hawai'i Island Burial Council
Hawai'i Electric Light Company (HELCO)
Hawaiian Telcom
Oceanic Time Warner Cable
Kona Palisades Estate Community
Hawai'i Tribune Herald
West Hawai'i Today

ACCEPTING AUTHORITY: Governor Linda Lingle
State of Hawai'i
c/o Office of Environmental Quality Control
236 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

1.4 BACKGROUND

In 1971 the University of Hawai'i (UH), through the University of Hawai'i at Hilo (UH Hilo) Center for Continuing Education and Community Services, began offering courses in West Hawai'i relying on hotels and public schools for classroom space. In 1981 Hawai'i Community College (HawCC) also began offering courses in West Hawai'i. Administrative, instructional, and support service functions for these UH courses were consolidated and centralized at the Kealakekua Business Plaza in the fall of 1987. In the summer of 1990, the University of Hawai'i Board of Regents (BOR) commissioned the *University of Hawaii at Hilo, West Hawaii Campus Site Assessment Study* (DPD Associates, 1992). Based on this study's findings and on unanimous testimony by the affected community, the BOR in July 1991 selected the 500-acre Kalaoa site as the location for West Hawaii's future center for higher education (refer to Figure 1). This site was the preferred choice for the majority of West Hawai'i residents because of its central location between the urban center of Kailua-Kona and the resort nodes of South Kohala and North Kona, and its proximity to the airport and high tech facilities (Natural Energy Laboratory of Hawai'i and the Hawaiian Ocean Science and Technology Park) (refer to Figure 2). The rapid growth of the region and increasing demand for higher education resulted in the 1996 establishment of the UHCWH by BOR action. Since July 1, 1998, UHCWH has become the administrative responsibility of HawCC and continues to be housed at the Kealakekua Business Plaza. Among other drawbacks, the UHCWH's present location allows no room for growth, which provides further incentive to relocate and construct a permanent facility at Kalaoa for the UHCWH.

In fiscal biennium (FB) 1997-99, the State Legislature appropriated Capital Improvement Program (CIP) funds for planning and design at the Kalaoa site. In February 1996, the *University of Hawai'i Center at West Hawai'i Long Range Development Plan* was submitted to

the BOR. With the absence of an Academic Development plan (unavailable when the LRDP was being prepared), the LRDP focused on the physical and tangible aspects of the UHCWH that were considered to be constant and timeless elements. The LRDP was updated in October 1998 when *the University of Hawai'i Center at West Hawai'i: Educational Specifications* (Ed Specs) became available. The 1998 LRDP translated the program needs formulated by the HawCC into physical space, equipment, and utility requirements for each functional area and sub-area. The UHCWH's 2000 EIS was prepared based upon the 1998 LRDP.

A Project Development Report for Phase I of the UHCWH at Kalaoa was completed in 2000. Subsequently, the Department of Accounting and General Services (DAGS) contracted out the design work for Phase I. Design work was partially completed in March 2002 when work was halted pending UH Administration decisions on the future of the UHCWH.

On November 21, 2002, with the BOR's approval, the University of Hawai'i entered into a Memorandum of Understanding (MOU) with Hiluhilu Development, LLC (Hiluhilu). Hiluhilu owns the 725-acre parcel of land adjacent to the northern boundary of the 500-acre Kalaoa parcel and is developing Palamanui, a master-planned community to include single- and multi-family residential, health facilities, mixed-commercial development, a small hotel, passive and active parks, and a dry forest preserve, among other things. Hiluhilu expressed its willingness to coordinate its development with the University for the West Hawai'i campus. By the MOU, the University of Hawai'i agreed to consult and discuss joint development opportunities for the two (2) adjacent properties, with Hiluhilu providing critical infrastructure for the University's development. On April 16, 2004, the BOR approved an amended MOU, which incorporated understandings that had been reached as a result of discussions since November 2002. This MOU discussed potable water, roadway, wastewater treatment and similar infrastructure issues.

The MOU also addressed discussions about the concept of a university-centered village that Hiluhilu planned to develop on its property. The university-centered village would be a residential/commercial community with a town center (the Palamanui Village Town Center) spanning its lands and the University's property. This town center was envisioned as a walking village, which would link the University's facilities with compatible commercial, recreational and cultural facilities.

In the initial MOU discussions, the plan was for UHCWH to relocate from Kealakekua and lease space in the Palamanui Village Town Center until the University was ready to build a campus on its own property. The plans have changed, however, due to conditions placed on Hiluhilu, LLC by the County of Hawai'i; conditions that resulted from the approval in 2006 to reclassify their 725 acres from Agriculture (A-3a) and Open to Project District. It is common for the county to place conditions on developers during reclassification. These conditions, such as building parks and roadways, are intended as a means for developers to contribute to the community in return for the right to develop large tracts of land. Conditions placed on Hiluhilu relative to the UHCWH include the following:

1. The applicant [Hiluhilu] shall construct the mauka half of a 120-foot right-of-way to county-dedicable standards as a collector road [Main Street Road] and the intersection at Kaiminani Drive.
2. Applicant shall allow the University of Hawai'i to connect with its wastewater and water supply systems. Applicant shall also allow the University of Hawai'i to connect electrical and telecommunication systems to facilities installed within the project. These connectivity sites shall be to the University's satisfaction and located along its northern boundary on Road "1" [the future University Drive].
3. Build Applicant's wastewater treatment system to handle the wastewater from the initial University of Hawai'i building and design the wastewater treatment system to accommodate future expansion for wastewater from future expansion of the University of Hawai'i operations.
4. Design and construct an initial classroom and administration building of 20,000 square feet, with associated parking, at Applicant's expense. ...Applicant shall be responsible for the first \$5,000,000 and the University shall be responsible for the balance. Construction on the building shall commence as soon as the University has required the necessary consents and approvals. If the necessary consents and approvals cannot be obtained by the State, the University shall have the right to lease from Applicant appropriate space to house University of Hawaii at West Hawai'i until the necessary consents and approvals are obtained at comparable lease rates now being paid by the University of Hawaii until the 20,000 square foot building can be constructed on the State land at Applicant's expense. Applicant shall commence construction of the building, or assure its construction by a bond or other security accepted by the Planning Director and the Chancellor of Hawai'i Community College, before the issuance of a certificate of occupancy for any building, other than the DOE building, or final subdivision approval for any subdivision creating single-family residential lots. ...The location and design of the building (interior and exterior) and related improvements will be on terms determined by the University of Hawai'i. The University of Hawai'i shall consult on design of said building with Applicant.

Currently, UHCWH with assistance from Palamanui, LLC (successor to Hiluhilu, LLC), is working to create a campus that brings together the educational resources of the University of Hawai'i with the financial resources of the private sector. Palamanui will assist in building the initial complex of classrooms, offices, and support spaces at the Kalaoa site.

The new University campus will serve the needs of West Hawai'i residents who wish to pursue lifelong learning programs. The connection between Palamanui and UHCWH is a mutually beneficial private-public sector partnership that will improve the educational opportunities that will broaden and enhance the lives of West Hawai'i residents.

1.5 PROPOSED ACTION

The Proposed Action is to develop the new UHCWH campus on the 500-acre Kalaoa parcel that was set aside in 1991 for future use by the University. A detailed description of the Proposed Action is provided in Chapter 2 of this SEISPN.

1.6 PURPOSE OF AND NEED FOR ACTION

The purpose of the Proposed Action is to develop a permanent facility for the UHCWH. West Hawai'i is the only remaining major geographic area and population center in the State of Hawai'i that does not have a permanent facility for higher education. The nearest UH campus is in Hilo, over 100 miles from the center of the West Hawai'i region. The University of Hawai'i Community Colleges has responded by making the planning, design and construction of the new University Center at Kalaoa a priority. UHCWH provides access to lower division undergraduate courses and programs, which include specialized occupational and technical fields; support for baccalaureate and graduate instruction; classroom and laboratory spaces; telecommunication and computer resources; library services; academic support services; and administrative support services. UHCWH differs from other campuses in the UH system, in that it serves as a vehicle for providing services and programs from all parts of the University system. Degrees are conferred by other campuses (UH Hilo, HawCC, UH Mānoa, etc.) that provide educational programs and courses to the center. This multi-program approach from distant sources is made possible by the use of technology such as the internet, video conferencing, or the Hawai'i Interactive Television System (HITS). Distance technology can also make programs and courses from the mainland United States (U.S.) and foreign locations possible. The University Center allows residents to continue to live and work in West Hawai'i while having the benefit of educational opportunities that would have required them to attend classes in Hilo or on other islands. UHCWH is a commuter school and will not provide dormitories, faculty housing, or athletic facilities.

UHCWH's existing facilities, which are located in portions of a shopping center/business complex—the Kealakekua Business Plaza, have been described as hot, cramped, noisy and inadequate to support the instructional programs being offered and those planned. The current location poses difficulties in providing sufficient classroom, office, general study and service space (HawCC, 2006b). Further, the tenant mix at the Kealakekua Business Plaza, which includes various state and federal offices, real estate offices, doctor's offices, the County Prosecutor's offices, and a bar and grill, is not conducive to a proper academic environment. Other constraints include the Center's location in Kealakekua, which is at least a forty (40) minute drive for more than half of the population in the West Hawai'i region, with limited accessibility via public transportation. "Distance to the site" was cited by 65 percent of survey respondents as the greatest barrier to their enrollment (SSRI, 1988, as cited in HawCC, 1997). The Hawai'i County Mass Transit Agency now provides public transportation around the island through the Hele-On bus. To promote public transportation, the County now offers this bus service for free. However, frequency is limited. There are only six (6) buses a day to and from Kealakekua. Moreover, access to the current UHCWH's facilities by private vehicle is becoming increasingly inconvenient due in large part to growing traffic congestion in the area (HawCC, 2006b).

Other needs identified in the *University of Hawai'i Center: West Hawai'i Development Plan, 1998-2007* (HawCC, 1997) are described in the following paragraphs.

- Need Based on Demographic Factors. The total population of the West Hawai'i region—this includes the districts of North Kohala, South Kohala, North Kona, South Kona, and the Western portion of Kau—is expected to grow to almost 100,000 persons by the year 2010 (p. 10). This is sufficient population to justify the construction of a higher education center serving 1,200 to 1,600 students by year 2010 (p. 10).

The West Hawai'i population includes more persons in the 25 to 39 age group than either Honolulu or Kaua'i (p. 10). Course offerings, programs and delivery strategies must be developed to meet the needs of working adults in this age group.

The West Hawai'i population, in general, has a higher rate of high school graduation and a larger percentage of persons who have some college as compared to the populations in either Honolulu or Kaua'i (p. 10). Many individuals who have completed either an associate or baccalaureate degree are professionals working in the region who desire further education to maintain or upgrade existing job skills (p. 10).

Two factors may be contributing to the low (2 percent) rate of enrollment in postsecondary education by persons in West Hawai'i who are 18 years of age or older as compared to other reporting areas having a sizeable University of Hawai'i presence: the location and size of education facilities at Kealahou, and the limited range of courses and programs offered at this time (pp. 10-11).

Despite the relatively close proximity between Konawaena High School and postsecondary facilities in Kealahou, there is a low (22 percent) participation rate of students continuing from that high school to the University of Hawai'i (UH) (including its community colleges) as compared to other neighbor island high schools located near a UH campus (p. 11).

- Need Based on Employment Trends. Employment trends in the West Hawai'i region are of great importance in the planning of the UHCWH because of two factors: most students cite preparation for employment as their primary reason for pursuing postsecondary education; and access to appropriately focused education and training programs can be a tremendous boost to the economic development of a community (p. 11).

Service and sales positions account for 40 percent of the currently available jobs in West Hawai'i (p. 11). In the West Hawai'i region, there is also a prevalence of executive/managerial and professional occupations that require extensive postsecondary education for entry to these fields (p. 11). In the future, more scientific enterprises related to astronomy and ocean engineering may increase the need for professional and graduate education in West Hawai'i (p. 11).

- Need for a More Central Location within West Hawai'i. The existing location of the UHCWH is considerably south of the population center of the region. This fact, coupled with the lack of adequate facilities and necessary infrastructure will continue to interfere with the delivery of quality programs at the UHCWH (p. 15).
- Need to Meet Community Expectations. The community of West Hawai'i has advocated strongly for increased postsecondary educational opportunities over the past twenty years (p. 12).

In two (2) recent Hawai'i Community College documents, the development of a new and relocated facility for UHCWH is recognized as a priority. The *Hawai'i Community College UH Center – West Hawai'i Unit Review Report* (HawCC, 2006b) states that a permanent facility still is considered a critical need and remains a major focus for the University Center. The *Institutional Self-Study in Support of Reaffirmation of Accreditation* (HawCC, 2006a) states that “The college is greatly in need of improving sufficiency and capacity of its facilities in West Hawai'i. This community is one of the fastest growing areas in Hawai'i County, and the need for a new location to support Hawai'i Community College's programs and services has long been recognized. It is the college's hope that the significant progress made in the 2005 legislative session will provide the impetus to build a new campus in West Hawai'i in the near future...The college will strive to continue in its significant progress towards the development and construction of new campuses in East and West Hawai'i” (p. 232).

At the 500-acre Kalaoa site, the UHCWH has the opportunity to develop appropriate and adequate permanent facilities for students who are unable to travel to a specific UH campus. The proposed new UHCWH in Kalaoa would address these long-standing needs and allow students to continue to enroll in courses or credential programs offered by one or more of the accredited institutions of the University of Hawai'i. The project is in keeping with the stated mission, objectives and goals of the UHCWH.

1.7 AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED

As part of the initial phases of the LRDP revision and update process, discussions have been initiated with the County of Hawai'i Planning Department, the County of Hawai'i Department of Water Supply, the Hawai'i Island Burial Council, and the UH West Hawai'i Advisory Council. Consultation with these agencies and organizations will continue during the LRDP and SEIS preparation process, as well as with the agencies and organizations listed in Section 1.3 above.

1.8 LIST OF ANTICIPATED PERMITS OR APPROVALS

Permit or Approval	Administering Agency
Burial Treatment Plan	Hawai'i Island Burial Council
Use Permit	Hawai'i County Planning Commission
Water Supply System	County of Hawai'i, Department of Water Supply
Wastewater System	State of Hawai'i, Department of Health
Construction Permits (building, grading)	County of Hawai'i, Department of Public Works
NPDES Permit	State of Hawai'i, Department of Health
Approvals relating to road improvements, intersections and landscaping	State of Hawai'i, Department of Transportation and County of Hawai'i, Department of Public Works

2.0 DESCRIPTION OF THE PROPOSED ACTION

University of Hawai'i Board of Regents' (BOR) action in 1990 began the search for alternative sites for the UHCWH. A commissioned evaluation applied the following criteria to candidate sites: the site must comprise public land with a minimum size of 500 acres and be reasonable in shape and topography for ease of design and construction. The 500-acre University parcel in Kalaoa was selected from a total of seven (7) candidate sites in the West Hawai'i region, and was approved by the BOR in 1991. The Proposed Action is to develop the UHCWH campus core in the northwestern corner of 500-acre University parcel, proximal to the Palamanui Village Town Center. As stated previously in Section 1.1, the proposal to situate the campus core in the northwest corner represents one the major changes from the 1998 LRDP that necessitates preparation of the SEIS. **Hereafter, in this document the usage of the term “project area” is used interchangeably with “500-acre University parcel” and the term “proposed site” refers to the northwest corner of the project area that is being proposed as the new location for the UHCWH campus core.**

2.1 PROJECT LOCATION

The 500-acre site is located along the southwestern slopes of Mt. Hualālai in North Kona on the western coast of the island of Hawai'i (refer to Figure 1). The project area comprises a portion of the 2,640-acre state-owned parcel that is located approximately 4,500 feet mauka or landward of the Queen Ka'ahumanu Highway. While it is understood that the entire 500-acre parcel is set aside for University use; at present the University does not control the property, which remains under the jurisdiction of the State of Hawai'i Department of Land and Natural Resources (DLNR). No improved vehicular access to the proposed site is available at this time. The nearest existing road is Kaiminani Drive, a mauka-makai improved County roadway roughly one (1) mile south of the proposed site, near the southern boundary of the project area.

2.2 DESCRIPTION OF THE PROJECT AREA

The 500-acre University parcel (TMK 7-3-010:042) generally is trapezoidal in shape. The mauka or eastern boundary of the project area is determined by the Urban Land Use Petition boundary for the 2,640-acre State parcel and is delineated by the proposed Waena Drive road alignment. The makai or western boundary is dependent on the future Main Street Road alignment (formerly referred to as the Mid-Level Road). The Palamanui development abuts the project area along its northern boundary and will be delineated by the proposed University Drive, which will link Palamanui and the UHCWH with Queen Ka'ahumanu Highway. The Kona Palisades Subdivision lies to the immediate south of the project area. The proposed site, where the UHCWH campus core is to be located, is in the northwestern corner of the project area.

The project area is located on lava lands covered in scrub grass, small trees and shrubs. Although there is some evidence of agricultural use by ancient Hawaiians, the site has never been developed for modern use.

2.3 PLANNING AND DESIGN PROCESS

As stated in Section 1.1, this SEISPN represents outcomes from the initial phases of the LRDP revision and update process—site utilization analysis, selection of the campus core location, and development of alternative campus site plans.

Site utilization analysis is the first step in the LRDP planning and design process; the main purpose of which is to provide the University with rational information that can be used in deciding which part of the project area would be the best location for the UHCWH campus core. The analysis also illustrates other significant site considerations, such as connections to the adjacent community, connections to infrastructure and utilities, vehicle and pedestrian circulation patterns, compatibility with various site constraints, and potential impacts on the environment. Site utilization schemes are presented in the form of bubbles, which portray major site elements. These elements include major campus educational components, vehicular and pedestrian circulation patterns, parking and open space. As such a bubble, rather than an actual building footprint represents each function. As a result of the site utilization analysis, a Preferred Site Utilization Scheme is chosen following an evaluation of the alternative utilization schemes. The selection of the campus core is dictated by the Preferred Site Utilization Scheme.

The second phase of the LRDP planning and design process is the site planning phase, which consists of refining and further developing the Preferred Site Utilization Scheme (bubble diagrams) chosen as a result of the site utilization analysis. In the site planning phase, building locations and footprints rather bubbles are placed within the site in accordance with the Preferred Site Utilization Scheme. As well, other site elements are designed and laid out in more detail. Three (3) alternative campus site plans are generated and evaluated, and a Preferred Campus Site Plan is selected.

From the Preferred Campus Site Plan, an Ultimate Campus Site Plan will be developed. The Ultimate Campus Site Plan is the next phase in the LRDP planning and design process and is not discussed in detail in this SEISPN as it is currently in progress. The following sections discuss the site utilization and site planning phases, which have been completed.

2.3.1 Site Utilization

During the site utilization phase, three (3) alternative site utilization schemes were developed. The development of these schemes is based on space projections and requirements contained in the 2008 Ed Specs, a document prepared separately from the LRDP. According to this document, the five (5) major campus components are instruction, learning resources center, student services, continuing education, and institutional support. Assembly space is added into the program as an important supporting function for both the University and the community. The UHCWH space requirements contained in the 2008 Ed Specs updates the 1998 Ed Specs and LRDP effort, and are designed for three (3) campus options: 750, 1,500, and 3,000 FTES. The three (3) site utilization schemes show the incremental development of the 750 and 1,500 FTES campuses as the first phase, and the 3,000 FTES campus as the second or expansion phase of the UHCWH's full development.

For consistency, these site utilization schemes were developed using the same concept for vehicular and pedestrian circulation patterns. A perimeter roadway and central pedestrian access were adopted in all three (3) schemes. The perimeter roadway concept was selected because it promotes efficient vehicular circulation and ease of access throughout the campus. At the same time, it leaves the interior of the campus core free from vehicles. Wide pedestrian malls and walkways were laid out to form perpendicular and diagonal circulation patterns for pedestrians within the campus core.

Three (3) critical site constraints were considered in developing the alternative site utilization schemes (refer to Figure 4). These constraints include:

1) The size and configuration of the subdivision boundaries.

DLNR which has jurisdiction over the 500-acre University parcel has determined that a subdivision of seventy-three (73) acres shall be set aside for the development of the initial UHCWH campus. The subdivision is located at the northwestern corner of the 500-acre University parcel. It can be accessed from either the proposed University Drive or the proposed Main Street Road.

2) The Open Zone area.

The County of Hawai'i has designated an Open Zone line that runs along the western edge of the 500-acre University parcel. Within the makai side of this line, neither structures nor parking are allowed to be built unless they are for public use and approved by the Director of the County of Hawai'i's Planning Department.

3) Archaeological/Cultural Sites and Preserves

According to the recently completed survey by Pacific Legacy, Inc. (2008), there are two (2) archaeological sites and one (1) archaeological preserve located within the subdivision boundaries. The most critical site constraint is Archaeological Preserve 2 located on the northern portion of the project area. It contains lava tubes, human burials, and possible ceremonial sites. The lava tube system runs from the western boundary toward the northern boundary of the project area, effectively separating it into two portions. As previously recommended by the State Historic Preservation Division (SHPD), a buffer guideline of 50 meters (164 feet) is maintained on both sides of the lava tube. During the site utilization phase of the planning process, no development was proposed within these 50-meter archaeological buffers.

Despite adopting the same circulation pattern concept, sharing the same basic assumptions, and responding to the same site constraints, the three site utilization schemes have distinctive arrangements and characteristics. The following are brief descriptions of the three (3) alternative site utilization schemes:

2.3.1.1 SITE UTILIZATION SCHEME 1

Scheme 1 places the entire campus core on the northwestern corner of the 500-acre University parcel adjacent to the Palamanui Village Center. Restricted by the archaeological buffers and the

Open-zoned area, this site only has approximately twenty-eight (28) acres of developable land out of the total seventy-three (73) acres of the subdivision. The first phase of campus development for 1,500 FTE covers a land area of about twenty (20) acres and is located on the western portion (makai side) of the 28-acre area. The expansion phase for the 3,000 FTES campus takes up another 6.6 acres and is located on the eastern portion (mauka side) of the 28-acre site. Refer to Figure 5 for a plan of Scheme 1.

Scheme 1 has two vehicular access points. The main vehicular access for students and staff is from the proposed Main Street Road that runs along the western border of the 500-acre University parcel. Secondary campus access for emergency service vehicles is provided through the proposed University Drive that runs along the northern border of the 500-acre University parcel.

In terms of the spatial organization of major campus components, Scheme 1 follows the functional relationships presented in the 2008 Ed Specs. Academic Support facilities are accessible from Instruction, Institutional Support, Student Services, and Continuing Education. Institutional Support (Business Operations & Administration) and Student Services are located close to the entrance of the campus and adjacent to academic support facilities. Instruction is located on land with higher elevation at the northern and eastern portions of the campus, so it can be prominently viewed from outside the site, especially from University Drive. Institutional Support (Operations & Maintenance) is separated from Institutional Support (Business Operations & Administration) and Instruction to avoid noise and odors generated by maintenance activities.

Advantages of Scheme 1:

- Close proximity to the Palamanui Master Planned Community provides students and staff ease of access to the commercial and community facilities in the Palamanui Village Town Center.
- The closeness to Palamanui would reduce the length of utility lines (e.g., water, sewer, electrical, and telecommunications) needed to connect with Palamanui's utility systems. As a result, this will substantially reduce the infrastructure costs to develop the campus.

Disadvantages of Scheme 1:

- After deducting the Open-zoned area and archaeological buffers, the site where the entire campus core is located has the smallest developable area (only 28 acres). This limitation leads to inflexibility of the campus's physical development and architectural theme.
- The buildings will be closer together with less open space and landscaping between buildings.
- There is insufficient space for parking in both the 1,500 and 3,000 FTES campuses.
- This site doesn't allow much room for the expansion phase, so the space requirements for the 3,000 FTES campus cannot be met.

- The small land area may require two-story buildings for some educational functions in order to meet the space requirements indicated in the 2008 Ed Specs.

2.3.1.2 SITE UTILIZATION SCHEME 2 (PREFERRED SITE UTILIZATION SCHEME)

Site Utilization Scheme 2 was identified as the Preferred Site Utilization Scheme. This scheme demonstrates an effort to cope with one of the most critical site constraints—the Archaeological Preserve 2—while maintaining close proximity to the Palamanui Master Planned Community (refer to Figure 6). This scheme divides the campus into two parts: the upper and lower campuses. The upper campus is located in the northwestern corner of the project area, adjacent to the Palamanui Village Town Center. The upper campus area could accommodate the 750 and 1,500 FTES campuses. The lower campus is located below the Archaeological Preserve 2 and takes up approximately the same acreage of land as the upper campus. The lower campus represents the second or expansion phase for the 3,000 FTES campus. The 3,000 FTES campus likely will not be built for many years until educational demands and enrollment approach a level to warrant expansion. Although separated by the archaeological preserve, the two campuses could be connected by a wide pedestrian pathway located between the two overlapping buffer areas. Locating the pedestrian pathway within the buffer area is an issue that would have to be discussed with the Hawai'i Island Burial Council. To implement this 3,000 FTES campus, the University will have to request from DLNR, an additional subdivision of land.

A perimeter roadway concept and pedestrian-oriented interior space is adopted in this site utilization scheme. The perimeter roadway encircles almost the entire upper campus, except for the Palamanui Building (Culinary Arts)¹ and entry plaza. The plaza functions as the main pedestrian access to the campus and creates a visual and pedestrian link between the upper campus and the Palamanui Village Center. In the lower campus, a perimeter road is configured as another loop that contains expanding functional areas required for the 3,000 FTES campus. Via central pedestrian malls and walkways, pedestrian and bicycle use and safety is promoted within the core areas of both upper and lower campuses.

The upper campus has two (2) vehicular accesses. The main entrance for students and staff would be from the proposed north-south roadway—Main Street Road. The main entrance transitions to the campus perimeter roadway via a roundabout. The roundabout would manage traffic flow and help create a grand entry to the campus. Secondary campus access for emergency and service vehicles would be from the proposed east-west roadway named University Drive that runs along the northern border of the project area. The secondary access would be aligned with a Palamanui roadway to create a four-way intersection. The upper campus has three (3) large parking lots located on the northern, eastern, and western ends. For convenient access to all buildings, another four (4) small parking lots are provided along the perimeter road directly adjacent to major functional areas.

¹ What is being referred to as the Palamanui Building is the initial building to be constructed by Palamanui LLC as mandated by one of the conditions imposed by the County of Hawai'i for approval of their zoning reclassification. Refer to the discussion in Section 1.4 above. In the LRDP, this building is designated in the long-term for the Culinary Arts program.

In addition to these two (2) access points, another main entry from Main Street Road is proposed to access the lower campus. In the lower campus, parking lots are located in three (3) areas, along the western (close to the entrance), southern, and eastern (along the perimeter road) ends.

In terms of spatial organization of major campus components, the Preferred Site Utilization Scheme follows the functional relationships refined in LRDP. Academic Support facilities are accessible from Instruction, Institutional Support, Student Services, and Continuing Education. Institutional Support (Business Operations & Administration) and Student Services are located close to the entrance of the campus and adjacent to academic support facilities. Instruction is located on land with higher elevation at the northern and eastern portions of the campus, so it can be prominently viewed from outside the site, especially from University Drive. Institutional Support (Operations & Maintenance) is separated from Institutional Support (Business Operations & Administration) and Instruction to avoid noise and odors generated by maintenance activities.

A distinguishing characteristic of the Preferred Site Utilization scheme is that each campus has its own academic support facilities, student services, and institutional support (Operations & Maintenance). There are only two campus components, Institutional Support (Business Operations & Administration) and Continuing Education, that are not located in the lower campus, as they are simply expanded from their initial location in the upper campus.

Advantages of the Preferred Site Utilization Scheme are:

- The upper campus benefits from its close proximity to the Palamanui Master Planned Community. These benefits include convenient pedestrian access between the campus core and the Palamanui Village Center and lower infrastructure costs.
- Segregating the 3,000 FTES expansion to the lower campus will allow more area for parking as well as more open space between buildings in the upper campus.
- Noisier educational programs such as the Auto Body Repair and Painting, Auto Mechanics Technology or Diesel Mechanics; programs which are projected to be added to the UHCWH upon its expansion to an 3,000 FTES campus, can be located in more isolated areas in the lower campus which has more developable area.

Disadvantages of the Preferred Site Utilization Scheme include:

- The campus will be physically split.
- Due to its farther distance from Palamanui, the lower campus will require longer utility lines and would incur higher infrastructure costs.
- The longer distance from the lower campus to the upper campus and the Palamanui Village Center may discourage pedestrian access.

2.3.1.3 SITE UTILIZATION SCHEME 3

Scheme 3 places the entire UHCWH campus below the Archaeological Preserve 2. It is located in the southwestern portion of the project area and in the same location as the campus core

identified in the 1998 LRDP. This location is about 2,800 feet away from the Palamanui Village Center. The 1,500 FTES campus is located in the northern area of the site and covers a land area of about twenty-five (25) acres. The expansion phase for the 3,000 FTES campus is located south of the 1,500 FTES campus and requires another sixteen (16) acres. Perimeter roads encompass both the 1,500 and 3,000 FTES campuses. The 1,500 and 3,000 FTES campus would share the same Academic Support, Student Services, and Institutional Support facilities, which are located in the middle of the campus and expanded from their initial locations. Refer to Figure 7 for a plan of Scheme 3

The 1,500 FTES campus has only one main entrance for all uses, including emergency vehicles. Construction of a second entry is proposed for the 3,000 FTES campus in order to provide convenient access to expanding instructional buildings.

Advantages of Scheme 3:

- The campus would be developed as one contiguous parcel, which will benefit operations and connections.
- Developing the campus as one contiguous parcel will reduce the overall land area required for the 3,000 FTES campus. Development costs also may be reduced because of the smaller the campus the shorter the perimeter roadway.
- The campus is located on one of the flattest portions of the project area, which would require minimal grading work and subsequently reduce development costs.
- Located in the middle of the project area facing the western or makai side, the entire campus is prominently viewed from outside, especially from the Kona International Airport, which is considered to have the most expansive view of the site.

Disadvantages of Scheme 3:

- Of the three (3) alternative site utilization schemes, Scheme 3 is the farthest removed from the Palamanui Master Planned Community and will, therefore, incur the highest infrastructure costs of the three (3) schemes (assuming connection to Palamanui's systems). Other infrastructure alternatives would have to be investigated and evaluated.
- The advantages of locating adjacent to the Palamanui Village Center would be lost. The campus will no longer be in comfortable walking distance to the Village Center.

2.3.2 Site Planning

As stated in 2.3.1.2 above, Scheme 2 was selected as the Preferred Site Utilization Scheme based on an evaluation of each scheme's conformance to the academic program, existing site conditions, and infrastructure and other development factors. Subsequent to selection of the Preferred Site Utilization Scheme by UH, DLNR determined that the entire 3,000 FTES campus needed to be situated within the boundaries of the 73-acre subdivision (proposed site) as delineated by DLNR. As such, in the transition from the site utilization phase to the site planning phase, the Preferred Site Utilization Scheme required modification so that the entire

3,000 FTES campus could be situated within the subdivision boundaries. With the Open Zone and the archaeological buffers, the developable area within this 73-acre parcel is reduced to approximately 37 acres, 28.5 acres above Preserve 2 and 8.5 acres below. However, due to the 50-meter archaeological buffer, the 8.5 acres below Preserve 2 are inaccessible. Unless access can be gained to the 8.5 acres, the developable area of the 73-acre subdivision is effectively reduced to the 28.5 acres above Preserve 2.

Three (3) alternative site plans were developed and evaluated. Each alternative site plan delineates the incremental development for the 750, 1,500 and 3,000 FTES campuses and includes the following elements:

- Proposed building locations, configurations, and functions;
- Major infrastructure and appurtenances for utilities;
- Archeological and cultural sites to be preserved;
- Access and roadways;
- Service and emergency access;
- Parking lot configurations and capacities;
- Major pedestrian walkways, malls, and courtyards; and
- Open spaces and general landscape.

2.3.2.1 COMMON DESIGN ELEMENTS

Being developed from the same site utilization scheme, these three (3) alternative site plans have several common design elements.

First, in the 750 and 1500 FTES campuses, the campus core and its first nine (9) major buildings are situated in roughly the same location within the northern portion of the 73-acre parcel. This location was chosen for its proximity to the Palamanui Master Planned Community, of which the developers are required by the County of Hawai'i to finance the construction of the campus's first building. Most importantly, proximity to Palamanui can reduce the utility runs needed to connect with Palamanui's systems. This will substantially reduce the infrastructure costs to develop the campus. Proximity to the Palamanui also provides students and staff easy access to the commercial and community facilities located in the Palamanui Village Town Center.

Second, for development in the upper portion of the proposed site (above the Archeological Preserve 2), all alternatives use the same locations for the primary and secondary vehicular accesses and have a 55-foot radius roundabout at the campus entrance. Primary vehicular access to the campus is off of Main Street Road, which intersects with the roundabout. From this entry point, a view corridor is created to the archaeological preserve area. The secondary or service access is via University Drive.

Third, a large plaza and an amphitheater are sited at the northwestern corner of the proposed site, close to the Palamanui Village Town Center. The 12,000-square-foot plaza serves several important functions including pedestrian access to the campus, a main reception area, and a link between the campus core and the Palamanui Village Town Center. A sculpture could be placed at the center of the plaza to create a landmark or focal point, while a few large trees can provide shade for the paved reception area. The amphitheater would function as a gathering place for

performances and outdoor activities. Its location and orientation takes advantage of the site's topography, with the stage located on a lower elevation and the seats tiered to follow the site contours.

Fourth, the same concept for pedestrian circulation is used. Each alternative has two central pedestrian malls running north to south, and a central pedestrian walkway running east to west (mauka-makai), perpendicular to the malls. One mall connects the entry plaza and campus core, while the second connects the roundabout/vehicular drop-off to the campus core. These perpendicular pedestrian circulation elements divide the campus core into small sections in which are located the main buildings. This circulation pattern facilitates visual identification of functional areas as ones move through the campus. These pedestrian malls and walkways will be paved and would serve as emergency and maintenance vehicle access.

Fifth, several separate parking areas are provided rather than a large single parking lot. Convenient access to all major building destinations was considered to be an important site planning criteria. All major campus functions are concentrated in the middle of the 73-acre site and are accessible from the separate parking areas. There is no parking between the campus and the Archeological Preserve 2, except for the overflow and small service parking.

Sixth, the same concept for building design and orientation is used in all alternatives. Buildings are configured in a long linear shape with courtyards, and are connected to each other by walkways. The inter-space concept and collaborative learning model is utilized in both architectural design and site planning. Attention is given to the layout of walkways and courtyards as these elements can be used as outdoor classrooms and learning spaces. In all alternatives, buildings are facing in either the northwestern or the northeastern directions to maximize indirect sun exposure (north) and take advantage of prevailing breezes for natural ventilation.

The last common design element is the, landscaping concept, which includes the use of dry vegetation and the least disruption of the sloping lava terrain. Tall palms are proposed for the campus's main vehicular entrance and pedestrian mall to create a sense of welcome and visually related importance of the campus in the West Hawaii region. Coconut trees are placed on the edge of the campus's plaza and reception area to enhance the Hawaiian sense of place. The central east-west pedestrian walkway is shaded by a series of medium canopy trees. The open areas between buildings are left in natural lava and grasses to emphasize the geological origins of the site. Large canopy trees together with small flowering trees, palms and shrubs would be used in the courtyards. Medium canopy trees provide shade and break up the visual monotony of parking areas. Large canopy trees could be planted informally along the Archeological Preserve 2 to form a buffer area. There will be no large expanses of grassed lawns due to the nature of the existing environment and high cost of maintenance.

2.3.2.2 DEGREE OF COMPATIBILITY TO MAJOR SITE CONSTRAINTS

Each of the alternative site plans were developed on the basis of the varying degrees of compatibility to the three (3) major site constraints. These constraints were discussed previously in Section 2.3.1 above. After deducting the eleven (11) acres in the Open Zone and the twenty-five (25) acres that constitute the 50-meter archaeological buffer zone, two (2) separate developable areas remain: the 28.5-acre area above (north of) Preserve 2 and the 8.5-acre area below (south of) the Preserve (see Figure 4).

The underlying approach used in developing the alternative site plans is that each scheme would depict a high, moderate, and low degree of compatibility with the site constraints. Alternative Campus Site Plan B has the highest degree of compatibility to major site constraints, as no campus facilities are located within the Open Zone and the 50-meter archeological buffer zone. Alternative Campus Site Plan A has the lowest degree of compatibility. Not only is the Open Zone used for roadway and landscaped parking, but the archeological buffer is reduced to 25 meters (82 feet). The buffer reduction is necessitated by the need to accommodate the entire 3,000 FTES campus within the 73-acre subdivision, provide access to the 8.5-acre area below Preserve 2, satisfy parking requirements, and comply with UH's desire to keep all buildings to one-story in height. The Preferred Campus Site Plan represents the middle ground between Alternatives A and B. It assumes that certain non-structural site planning elements such as roadways and landscaped parking would be permitted within the Open Zone area; however, no development is proposed within the 50-meter archaeological buffer area. Alternative Campus Site Plans A and B are discussed in further detail under Section 4.1.

2.3.2.3 PREFERRED CAMPUS SITE PLAN

This Preferred Campus Site Plan respects the 50-meter archaeological buffer and no development is proposed within that area. Further, as mentioned in the introductory paragraph of Section 2.3.2 above, the 50-meter buffer does not permit access to the 8.5-acre land area below Preserve 2, essentially rendering it undevelopable. As such, only the 38.5 acres above Preserve 2, eleven (11) acres of which are in the Open Zone, are available for development. This condition, as well as the determination that the entire UHCWH had to fit within the subdivision boundaries, resulted in a Preferred Campus Site Plan that diverged from the Preferred Site Utilization Scheme. Whereas the Preferred Site Utilization Scheme divides the campus into two (2) parts—upper and lower campuses, which were to be located above and below Preserve 2—the Preferred Campus Site Plan reflects a unified campus situated entirely above Preserve 2.

The Preferred Campus Site Plan (see Figure 8) consists of fourteen (14) one-story building covering 32.5 acres. In order to comply with the University's desire to keep all buildings to one-story in height, the Preferred Campus Site Plan utilizes the 10-acre Open Zone for roadways and landscaped parking. No buildings would be located in the Open Zone. Use of the Open Zone allows maximized use of the developable 28.5-acre area for constructing major buildings to satisfy the UHCWH's space requirements. As a result, all fourteen (14) buildings can be one-story in height. Implementation of this alternative depends on an approval from the Hawai'i County's Planning Director to use the Open Zone for development of non-structural site elements.

A U-shaped roadway is utilized in the Preferred Campus Site Plan to promote the continuity of pedestrian circulation. This roadway runs counter-clockwise from the main vehicular access and roundabout located at the northwestern corner, to the parking area located on the western end, to the southern portion of the campus core (paralleling the 50-meter archeological preserve buffer), and to the eastern end of the site. The roadway then merges with the secondary vehicular access at University Drive. As a result, the entire interior of the campus core is free from vehicles.

The Preferred Campus Site Plan shows the incremental development of the 750, 1,500, and 3,000 FTES campuses. The 750 FTES campus requires thirteen (13) acres to accommodate four (4) one-story buildings—the Palamanui Building (Culinary Arts), the General Education I Building, the Health Services Building, and the Academic Support Building—and 384 parking stalls. For the 1,500 FTES campus, 24.6 acres of land are needed for five (5) additional one-story buildings (for 9 total buildings) and 754 parking stalls. When fully developed the 3,000 FTES campus takes up to 32.5 acres and contains a total of fourteen (14) one-story buildings and 977 parking stalls, which does not meet the University's parking requirements. The University's requirement stipulates one (1) stall for every 2 students (i.e., 1,500 stalls for 3,000 FTES).

Advantages of the Preferred Campus Site Plan revolve around its proximity to Palamanui. Because it is intended that the UHCWH will tie-in to the infrastructure being installed by Palamanui, containing development to the extreme northwestern corner of the project area would result in shorter utility runs and would therefore represent a cost savings to UH. In addition, the desired pedestrian-oriented relationship between the UHCWH and the Palamanui Village Town Center could be achieved.

Constraining development to the extreme northwestern corner of the project area also presents disadvantages. Without having the luxury to spread out, potentially noisier educational programs that could be introduced with expansion to a 3,000 FTES campus, such as Auto Repair and Painting, Auto Mechanics Technology, or Diesel Mechanics, cannot be isolated or segregated from the more traditional instructional facilities. Also, because of the limited developable area, deviations from desired planning and design criteria (e.g., one-story buildings) may be necessary to accommodate the 3,000 FTES campus within the subdivision boundaries.

Although the Preferred Campus Site Plan extends parking area into the Open Zone, it does not meet the required parking and is deficient by approximately 500 parking stalls. In order to satisfy parking requirements, some of the buildings may have to be increased to 2-stories in height, which would then allow a reduction in the number of buildings. The reduced number of buildings would provide more land area for parking. As well, parking requirements could be reduced by employing Leadership in Energy and Environmental Design (LEED) criteria (e.g., providing bicycle parking in exchange for a reduction in the number of required vehicular stalls). These issues will be explored in further detail and the Preferred Campus Site Plan would be modified as necessary to address these issues in the next phase of the site planning and design process—development of the Ultimate Campus Site Plan.

2.3.2.4 ULTIMATE CAMPUS SITE PLAN

As previously stated, what is discussed in this SEISPN represents outcomes of the initial phases of the LRDP revision and update process. A Preferred Campus Site Plan has been selected by UH. The next phase in the revision and update process will be development of the Ultimate Campus Site Plan. The Ultimate Campus Site Plan would be based on the Preferred Campus Site Plan, but would be modified as warranted to address specific project conditions/issues. Development of the Ultimate Campus Site Plan currently is underway and would represent the Preferred Alternative in the forthcoming Draft SEIS, where it will be discussed in further detail.

2.4 FEATURES OF THE PROPOSED ACTION

As a UH Center, the UHCWH will not be a stand-alone campus, which means it will not be a separately accredited campus in the UH system. As a consequence, the UHCWH will continue to draw significant administrative and academic support from other locations in the UH system. The UHCWH is and will continue to be a commuter school and will not provide dormitories, faculty housing, or athletic facilities. In addition to the two instructional programs (General Instruction and Culinary Arts) included in the 1998 Ed Specs, the 2008 Updated Ed Specs recommends phasing-in with the 1,500 FTES campus Business Education, Health Services, Public Services, Hawaiian Studies/Lifestyles and Technology. The Technology program would include three (3) subprograms – 1) Architecture, Engineering and CAD Technology, 2) Electrical Installation and Maintenance Technology, and 3) Carpentry. Additional technology programs could be added with the expansion to a 3,000 FTES campus. In addition to instructional programs, academic, student and institutional support needs to be provided. These have been identified in the 2008 Ed Specs as the Library and Learning Resources, Student Services, Continuing Education and Institutional Support.

Because the Proposed Action is still being planned and designed, the following discussion relative to the Proposed Action's technical, economic, social and environmental characteristics pertain to the project in general—development of a permanent facility for the UHCWH at Kalaoa. Further information on these characteristics will be developed as the project's planning and design moves forward and will be presented in the Draft SEIS.

2.4.1 Technical Characteristics

In the next phase of the LRDP an Ultimate Campus Site Plan will be developed from the Preferred Campus Site Plan. Associated ultimate plans for grading and drainage, water and wastewater, landscaping, electrical and telecommunications systems, mechanical systems, etc. also will be developed. **The Ultimate Campus Site Plan and associated plans would represent the Preferred Alternative in the forthcoming Draft SEIS.**

The Ultimate Campus Site Plan would represent the synthesis of all of the University Center's educational needs translated into physical terms. It is a culmination of site considerations, program planning, planning criteria, site utilization and site plan alternatives. The Ultimate Campus Site Plan and associated ultimate plans establish a framework and guidelines for the physical development of the UHCWH. The plans are intended to aid architects, engineers and

other design professionals who will prepare the building plans for the design and construction of the UHCWH.

Because the SEIS and the updated LRDP are being prepared concurrently, details regarding the technical characteristics of the project are not available at this time. Technical characteristics will be fully discussed in the forthcoming Draft SEIS.

2.4.2 Economic Characteristics

Because the SEIS and the updated LRDP are being prepared concurrently, details regarding the economic characteristics of the project, such as projected construction costs, are not available at this time. An Economic Impact (EI) Study is being prepared for the SEIS and the draft study will be included in the Draft SEIS. The EI will address the projected economic benefits of developing the new UHCWH at Kalaoa. Anticipated benefits would include the creation of new jobs and additional income for the West Hawai'i region, county and state. The new Center would also provide a much needed boost in post-secondary education and training capacity for the West Hawai'i region, thereby facilitating achievement of planned social and economic goals set forth in the region's Kona Community Development Plan and relevant state and county development plans. The greater education and planning capacity of the new UHCWH also would enable vitally important further diversification of the regional and county economy, bringing a wider range of vocational choice and increased stability to the economy.

2.4.3 Social Characteristics

The UHCWH will provide great social benefit to the region by providing a permanent facility for the pursuit of higher education. The University Center is not planned as a residential campus and will not include dormitories and athletic facilities. Also, given the character of the natural terrain, large grassed and landscaped areas usually associated with traditional college campuses will not be included. Instead, xerophytic landscape elements suitable to the climate and terrain will be located between buildings and around the campus to fit in with the rough lava strewn landscape. Staff and students will commute from their residences throughout the West Hawai'i region. The central location will make UHCWH accessible to all parts of the western side of the island, thus avoiding the long commute to Hilo to attend classes.

2.4.4 Environmental Characteristics

Adverse environmental concerns are primarily related to construction activities such as clearing, grading and grubbing. These activities involve earth-movement and the disturbance of on-site soil and lava rock. Exposed soil can be susceptible to erosion by both wind and surface water. Wind erosion will cause some limited soil loss, but the greater concern is silt runoff caused by storm events during construction.

The Proposed Action will increase the amount of impermeable surface area at the proposed site, thus increasing potential surface runoff. It is anticipated that on-site drainage patterns will be maintained. Additional runoff generated by impermeable surfaces is expected to be controlled at the site.

While the UHCWH's facilities have yet to be designed, initial concepts involve serious consideration of architectural and design strategies that are responsive to the topography, climate and existing site conditions. Strategies under consideration include the use of natural ventilation and daylighting, use of renewable energy solutions such as photovoltaics, the use of locally available materials, and adapting the buildings to the site topography to reduce the amount of grading and excavation necessary. Cumulatively, these strategies, if employed, could result in higher building performance, lower maintenance and operation costs, and reduced demand for energy.

As stated previously, development of the Ultimate Campus Site Plan and associated ultimate plans is being completed in concurrence with the SEIS. Additional information regarding the environmental characteristics of the Proposed Action will be discussed in the Draft SEIS.

2.5 PROJECT FUNDING

As stated earlier, Palamanui is committed to designing and constructing the first 20,000-sqft UHCWH building, up to a cost of \$5,000,000. If the cost of the first building exceeds \$5,000,000, the University is obligated to make up the difference. Funding sources to construct additional facilities as the UHCWH expands have yet to be definitively identified.

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

This section provides background or baseline information on the existing natural, man-made and socio-economic environment. Much of the information in this section pertains to the entire project area. Where information is available, the environment specific to the proposed site also is discussed. Several studies are being conducted currently, which will update the studies prepared for the 1998 LRDP and 2000 EIS, as well as address changes to the project. Results of these studies will be included in the forthcoming SEIS.

Discussions also include potential environmental impacts that could result from implementing the Proposed Action on the natural, man-made and socio-economic environments. Mitigation measures have been identified for adverse affects that are unavoidable.

As stated earlier, preparation of the SEIS is being undertaken concurrently with the planning and design processes to update the LRDP. In other words, while the proposed site and Preferred Campus Site Plan has been selected (discussed above in Section 2.3), the Ultimate Campus Site Plan is still under development. As such, the potential impacts discussed below are general in nature and relate to the overall Proposed Action—namely development of the UHCWH. The forthcoming Draft SEIS will contain detailed discussions on the Ultimate Campus Site Plan and associated ultimate plans and will provide more detailed and comprehensive discussions of potential impacts and mitigations measures.

3.1 NATURAL ENVIRONMENT

3.1.1 Climate

3.1.1.1 AFFECTED ENVIRONMENT

Most of Hawai'i is characterized by slight seasonal variations that create a climate of year-round mild and equitable temperatures, moderate humidity and predominantly northeast trade winds. By comparison, the climate at the Kalaoa site is characteristically hot and arid. The landmasses of Mauna Loa, Mauna Kea and Mt. Hualālai shelter the project area from the prevailing trade winds such that southerly and southwesterly land and sea breezes predominate in the West Hawai'i region. From season to season, coastal temperatures typically vary approximately 15 to 20 degrees Fahrenheit (°F) with an average temperature of about 75° F. Data recorded at the Kailua monitoring station (located at an elevation of 30 feet above mean sea level (msl) indicates the mean low annual temperature ranges from 60° to 65° F and the mean high annual temperature ranges from 80° to 82° F (National Weather Service, Pacific Region, 1982 in Armstrong, 1983, pp. 62 - 63). Weather data recorded at Keahole Point and Kona International Airport indicate that calm conditions prevail in the North Kona district approximately 28.8 and 23.6 percent of the time, respectively (Ibid, p. 65).

Rainfall distribution patterns for West Hawai'i closely follow the topographic contours of the land. Annual average rainfall decreases as you move from a band known as the rainfall belt of

Hualālai at 2,000 and 3,000 feet above msl, to lower elevations near the coast (Fukunaga & Associates, Inc., 1994, p. II-2). This belt receives a peak rainfall of 75 inches a year, whereas the average annual precipitation recorded at the Kailua monitoring station is 25 inches (DBEDT, 1998, p. 160). The project area is located between 300 and 600 feet above msl, well below the rainfall belt and has been estimated to receive less than 20 inches of rain per year.

In the vicinity of the project area, rainfall is more frequent during the late afternoon and evening periods. Offshore cloud masses form to the west, picking up precipitation from the ocean during the day. Sea breezes that blow from the south/southwest move this band of clouds, along with warm moist air, onto shore, pushing the clouds upslope throughout the day. As these clouds rise in elevation, the air begins to cool and condense creating a drop in pressure, causing them to drop their load in the form of rain. This mechanism is known as the orographic effect and accounts for most rainfall received at higher elevations on mountain ranges throughout the Hawaiian Islands (Juvik & Juvik, 1998).

3.1.1.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impact to the climate.

PROPOSED ACTION

Although the scope of the Proposed Action is not large enough to change or alter the climate by itself, every individual and organization leaves their carbon footprint by consuming energy both directly and indirectly, which contribute to climate change cumulatively. Carbon footprint is a "measure of the impact that human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide" (carbonfootprint.com, 2008).

3.1.1.3 MITIGATION

By implementing energy conservation programs; employing LEED criteria in building and site design; encouraging usage of distance learning through technology such as tele/video-conferencing to reduce commuting; and installing appropriate landscaping, UHCWH can effectively minimize its carbon footprint. Specific energy conservation measures will be discussed in the forthcoming Draft SEIS.

3.1.2 Soils

3.1.2.1 AFFECTED ENVIRONMENT

The soils in the project area are designated as lava flows association and are categorized as rLV or a'a flows, and rLW or pahoehoe flows (refer to Figure 9) (SCS, 1973). This soil association consists of gently sloping to steep, excessively drained, nearly barren lava flows. Coarse-textured and medium-textured soils exist. Pahoehoe lava flows make up about 40 percent of this association and a'a flows about 30 percent. This soil association is used for grazing, wildlife habitat and recreation, although the carrying capacity for grazing and wildlife is low.

Primarily, the ground surface is exposed as barren rock with soils deposited within the cracks of the hardened lava flows. For most of the project area, the surface layer of soil is thin and does

not provide the most suitable growing conditions for vegetation. This surface layer consists of approximately 4 inches of rapidly permeable black peat. A less-permeable pahoehoe lava bedrock composes the subsurface. This combination results in slow flowing surface runoff and minor erosion (Ibid, p. 48). A thin layer of brown, silty volcanic ash may reside in pockets where residual ground soils are absent. There are a few resilient species of plants that are able to grow in this type of volcanic environment due to the combination of meager soil and inhospitable terrain.

3.1.2.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impact to the soils.

PROPOSED ACTION

Impacts to soils can be anticipated from implementing the Proposed Action. Excavation and grading would occur as a result of project actions to prepare the site to construct the facilities and supporting infrastructure on the undeveloped property. Construction activities such as clearing, grading, and grubbing disturb and/or expose the earth and soils for the duration of site work periods. Exposed soils are susceptible to erosion, especially during periods of heavy rain. Wind erosion may also cause some soil loss during construction, but the greater concern is silt runoff.

As a result of the Proposed Action, there will be an increase in impermeable surfaces, which could impact soils. Increased impermeable surfaces degrade the efficiency of the land to absorb surface water, and contribute to increased run-off flow. In turn, run-off that contains sediment-bound pollutants may be carried over further distances on impermeable surfaces.

3.1.2.3 MITIGATION

Project actions would be accomplished using both temporary and permanent erosion and sedimentation control measures as warranted. The minimal or non-existent surface soil deposits in affected areas may minimize the need for erosion control devices such as cut-off ditches, detention ponds, temporary ground cover vegetation, and various soil stabilization and protection materials. Potential soil loss through wind erosion could be controlled through the implementation of a watering program. Other measures would include implementation of standard construction site Best Management Practices (BMPs). All grading activities would be conducted in compliance with dust and erosion control requirements imposed by the County of Hawai'i. In the long-term, preparation of an appropriate site drainage plan by the design civil engineers will contribute to the control of erosion. Incorporating appropriate landscaping into the Proposed Action and continued management of the property would also contribute to the long-term control of erosion.

3.1.3 Geology and Topography

3.1.3.1 AFFECTED ENVIRONMENT

The existing geomorphology in the project area is the product of large-scale eruptions from Mt. Hualālai—a now-dormant shield volcano. Large-scale eruptions from this volcano may have ceased some 130,000 years ago; however, the most recent lava flows occurred in circa 1800-

1801. Expectedly, the landscape of the North Kona area is shaped by Hualālai Volcano. The most recent flow from the 1800-1801 eruption and earlier flows created a harsh landscape that slopes toward the sea.

The project area is located within the lowlands along the southwestern slopes of Mt. Hualālai. Much of the project area is located at elevations ranging from 300 to 600 feet above msl (refer to Figure 10). Slopes in the project area vary from five (5) to ten (10) percent at lower elevations to over ten (10) percent at the upper elevations. Localized mounds and depressions, which are characteristic of lava flows, are present throughout the project area. Small ridges or high areas dominate the northwestern and southeastern boundaries of the project area. The southwestern portion of the project area contains a depression. Relative to the proposed site, elevations range from approximately 400 to 500 feet above msl.

Geomorphology of the project area, as well as the proposed site, consists of multiple interbedded pahoehoe and a'a flows. A pahoepoe flow hardens to form a generally smooth surface whereas a'a flows form splintered or jagged fragments. Multiple flows of differing ages overlap each other creating a layered landscape of varying colors, each reflecting the differences in age, chemical composition and each flow's state of weathering. The terrain is rough; rolling embankments of crusted pahoehoe flows continuously change the contour of the surface, while uneven, sharp edged a'a rocks jut out, making it difficult to traverse.

Both types of lava can contain subsurface voids like pockets, blisters, extensive lava tubes and tunnels that form as a result of residual lava draining beneath the solidified surface of cooled molten rock. Numerous lava tubes and/or voids including several prominent lava tube features have been discovered in the vicinity of the project area. A prominent lava tube feature in northwestern portion of the project area, within the proposed site, has been documented by several studies conducted over the past fifteen (15) plus years.

3.1.3.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impact to the geology and topography.

PROPOSED ACTION

Construction of the Proposed Action would have no affect on the geology of the area. It would not affect the underlying geologic composition of the affected area because construction would involve primarily surface activities that do not require the excavation or replacement of vast areas of sub-surface resources. However, localized alteration of the topography from land disturbing activities such as clearing, cutting, excavating and filling to prepare the site for construction is inevitable. These changes to the topography would occur to create level areas for project elements such as buildings, roadways, parking areas, and pedestrian paths.

3.1.3.3 MITIGATION

Mitigation consists of conforming to grading standards set forth in the Hawai'i County Code, which should keep impacts to a minimum. All clearing, cutting, excavating and filling for site

preparation will be conducted in accordance with BMPs for construction sites. It is intended that the overall design of the UHCWH will incorporate the sloping terrain of the proposed site to minimize grading and site modification to the extent practicable.

3.1.4 Water Resources

3.1.4.1 AFFECTED ENVIRONMENT

Groundwater. The project area overlies the Keauhou Aquifer System, a system of basal and high-level aquifers which consist of a fresh to brackish water lens floating on a layer of salt water. This basal aquifer presumably extends about 1.5 to 4.5 miles inland from the coastline (Fukunaga & Associates, Inc., 1994, pp. III-1 - III-3). The aquifer water is mostly brackish and non-potable for at least 1.5 miles inland with the exception of the Kahaluu Shaft (south of Kailua-Kona), which is approximately 1 mile from the coast (Ibid). The brackish water extends increasingly inland as one moves progressively northward. Brackish water is found approximately 1.5 miles inland at Holualoa, 2 miles inland at Kailua-Kona, and 3 miles inland at Keahole (Ibid).

Fresh water is found at an approximate elevation of 1,800 feet above msl. The fresh water layer becomes thinner and more saline (higher level of total chlorides) as it approaches sea level. Under ideal conditions, fresh groundwater flows downgradient from the recharge area at 2,000 feet to sea level. However, when too much ground water is extracted, the fresh water layer thins and becomes non-existent at lower elevations.

Groundwater in the vicinity of the project area is recharged by precipitation from the rain belt, which sits at approximately 2,000 feet above msl, on the slopes of Mt. Hualālai. Over one-third of the rain falls within a four- to five-mile wide belt and most of the annual 30 to 75 inches of rain percolates into the ground and recharges the aquifer (Waimea Water Services, Inc., 2003). Most of this rainfall recharges the basal aquifer that extends from the upper slopes of Mt. Hualālai to the shoreline. Seawater intrusion at the shoreline results in the creation of brackish groundwater. Perched water may exist at the upper elevations of Mt. Hualālai.

Surface Water. There are no streams and no surface water flows into the Pacific Ocean from or through the project area. The lack of streams is due to the porosity of the bedrock, which is characteristic of the interbedded pahoehoe and hardened a'a flows of the Hualālai volcanic sequence. Even during periods of heavy rainfall, surface runoff in the Kona region rarely reaches the coast in a direct manner or flows into drainage ways that reach the coast, because most of it percolates into the porous volcanic bedrock (Fukunaga & Associates, Inc., 1994, p. III-1).

The closest class AA waters are the Pacific Ocean off Keahole Point, approximately 2.5 miles from the project area. In accordance with HAR 11-54-06, the objective of Class AA waters is to preserve them "in their natural Pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality of any human-caused source or actions."

3.1.3.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain in an undeveloped state and no impacts to water resources (groundwater or surface) or water quality would occur.

PROPOSED ACTION

Groundwater. Profound impacts to an underground aquifer can occur when the amount of water pumped out is greater than the amount of water that percolates underground to recharge the aquifer. Impacts also can occur when the ground is very porous and contaminants combine with rainwater and both percolate into the aquifer. With the Proposed Action, there is some potential for surface runoff to carry contaminants, such as leaked automobile fluids, from impermeable surfaces to exposed land areas where it could potentially percolate into the aquifer.

Surface Water. The project area has no surface water bodies and is not within close proximity to the shoreline. Impacts to surface water from runoff are not a major concern due to the inherent geologic properties of the project area. No drainage ways exist on the property and runoff percolates into the porous lava rock. As such, there is very little potential for impacts to surface water as a result of the Proposed Action.

3.1.3.3 MITIGATION

Groundwater. Increased demand on the Keauhou Aquifer System will need to be closely monitored to insure that demand does not exceed the recharge of the aquifer. All development should include plans to control drainage and runoff from roads and other impermeable surfaces, with retention or settling basins provided, as warranted, to filter or settle-out contaminants from the runoff, so they do not percolate into the aquifer.

Surface Water. No impacts to surface water are anticipated as there are no surface water bodies within or near the project area. However, the use of temporary and permanent erosion and runoff controls shall be implemented as warranted, which should prevent any potential effects to surface waters.

3.1.5 Natural Hazards

3.1.5.1 AFFECTED ENVIRONMENT

There are two major sources of geologic hazards in the area; earthquakes and volcanic activity. Another minor geologic hazard is that of lava tube collapse.

Seismic Hazards. The island of Hawai'i is seismically active with most of the earthquakes occurring on the southern flank of the island. However, the Kona area is subject to earthquakes with intensities up to VIII on the Modified Mercalli Scale, which roughly corresponds to magnitudes 6.0 to 6.9 on the Richter scale. This intensity is enough to damage structures and buildings with inadequate foundations or that have not been structurally reinforced to withstand such tremors. The last major earthquake to hit Kona was on October 15, 2006. The epicenter of the quake was located approximately ten (10) miles to the west of Kiholo Bay, reaching a magnitude of 6.6 on the Richter scale (Wyss and Koyanagi, 2006). Prior to that, a 6.9 magnitude

quake hit Kona in August of 1951 causing extensive damage island-wide. Earlier, in 1929 there was a series of earthquakes that caused damage in West Hawai'i (Garcia, 2004).

Volcanic Hazards. The project area is located entirely within Lava Hazard Zone 4, which encompasses the entire region affected by Hualālai (refer to Figure 11). Hualālai is the least active volcano on the island of Hawai'i and its eruptions are infrequent and appear to occur in clusters separated by intervals of centuries. Volcanic eruptions may be preceded by a long period of localized seismic activity (Garcia, 2004).

Lava Tube Collapse. Lava tubes form when the molten pahoehoe surface flows begin to cool and crust over, eventually forming a hardened outer surface layer. As the supply of fluid magma decreases during an eruption, the level of its residual subsurface flow gradually drops as it drains from primary pathways. This essentially leaves pockets of open space between a ceiling and floor of solidified magma, forming hollow underground cavities and tunnels just below the hardened surface. The closer lava tubes are to the surface, the thinner their roofs, which make them more hazardous as they are more likely to collapse if significant weight is added at the ground surface or even just due to natural weathering processes.

Flood Potential. The project area is located in a dry and arid environment where flood risks are low. The combination of low rainfall, a thin soil layer and the porosity of the bedrock create a condition of very low to almost non-existent flood potential. During periods of heavy rainfall, ponding and some scouring by flowing surface water may occur, but normally it does not last long. Storm water rapidly percolates into the substrate and does not reach the sea. Flood maps indicate that the area is designated as Zone X, which represents areas that are determined to be outside of the 500-year floodplain.

Tsunamis. Tsunamis occur as a series of waves that strike a coastline, which can cause serious damage to coastal areas. The degree of tsunami damage is dependent upon several factors including the topography of the affected area, wave origin, and wave intensity. The general tsunami inundation lines are concentrated within short distances of the shoreline. The project area is located some 2.5 miles from the coastline of West Hawai'i and at elevations of 400 feet or more above msl. These conditions presumably place the project area outside high risk areas that are subject to a tsunami hazard.

3.1.5.2 POTENTIAL IMPACTS

NO ACTION.

Seismic Hazards. With No Action, the project area would be susceptible to seismic hazards even in an undeveloped state. However, the potential for impacts to human safety and property damage would be eliminated.

Volcanic Hazards. With No Action, the project area would be susceptible to volcanic hazards even in an undeveloped state. However, the potential for impacts to human safety and property damage would be eliminated.

Lava Tube Collapse. There are documented lava tubes within the project area, and some already have portions of roofs that have collapsed. With No Action, the project area would remain undeveloped, which would minimize the potential to contribute to the collapse of lava tubes. Also, No Action would minimize the impacts to human safety, since the likelihood of human activity within the project area would be significantly reduced.

Flood Potential. With No Action, the project area would remain undeveloped and there would be no impact to the flood potential of the area.

Tsunamis. With No Action, the project area would remain undeveloped and there would be no impact to the tsunami potential of the area.

PROPOSED ACTION

Seismic Hazards. The threat from seismic hazards will always exist because humans have little control over the frequency and intensity of these unpredictable events. The entire island of Hawai'i is subject to earthquakes and the resultant impacts to human safety and property.

Volcanic Hazards. The Kailua-Kona Area is located in Zone 4 on volcanic hazard maps. Zone 4 includes all of Hualālai where the recurrence intervals of eruptions are in the centuries. Therefore, while miniscule, implementing the Proposed Action would increase the potential for human exposure to volcanic hazards.

Lava Tube Collapse. The Proposed Action has the potential to contribute to the collapse of lava tubes. Earth movement resulting from construction activities as well general human occupation of the area could contribute to this occurrence. As well, development within the project area would increase exposure to this hazard, thus impacting human safety.

Flood Potential. The flood potential within the project area is very low to almost non-existent. Implementing the Proposed Action would not impact the flood potential of the project area.

Tsunamis. Due to the project area's distance and upslope location from the coast, the Proposed Action would not affect human safety and potential for property damage resulting from a tsunami.

3.1.5.3 MITIGATION

Seismic Hazards. Facilities would be designed and constructed in conformance with all applicable regulations and guidelines, such as the Uniform Building Code requirements for Seismic Zone 3 (which includes structural design standards for earthquake resistance).

Volcanic Hazards. There is adequate room upslope from the project area upon which to build lava diversion barriers if the technology for such devices improves and their effectiveness is proven. Otherwise, there are currently no effective mitigation measures for volcanic eruptions, other than maintaining an evacuation plan for the campus, given enough advance warning of an eruption.

Lava Tube Collapse. To eliminate any potential hazards due to the collapse of a lava tube that may be located within the Proposed Site, a geotechnical investigation should be performed. This will consist of gathering subsurface information and incorporating design elements that may consist of backfilling the lava tube or avoiding the lava tube entirely.

Flood Potential. No mitigation is required to address flooding.

Tsunamis. No mitigation is required to address tsunamis.

3.1.6 Air Quality

3.1.6.1 AFFECTED ENVIRONMENT

Air pollutants from natural, industrial, and vehicular sources influence the air quality in the project area. Volcanic out-gassing, referred to as volcanic haze or vog, is the most significant of these pollution sources since Kilauea, a very active volcano, is located only 50 miles southeast of the project area. Although the volcanic emissions are vented on the other side of a mountain barrier, some emissions do reach West Hawai'i. On days when volcanic activity is most vigorous and winds are calm, it is common for a thick layer of persistent vog to hang over the region.

A source of industrial air pollution is the Hawai'i Electric Light Company's (HELCO) Keahole Generating Station, which is approximately .7 miles southwest of the project area. Keahole Generating Station is implementing improvements to convert two (2) simple-cycle combustion turbines (CT-4 and CT-5) to a combined-cycle unit by adding two (2) heat recovery steam generators and a steam turbine generator (ST-7), as well as an air-cooled condenser to support the combined-cycle operation. The improvements will make the Keahole Generating Station more fuel efficient. Meteorological monitoring data taken at the HELCO site from March 1993 to February 1994 suggests that winds from the west/northwest, west, west/southwest, and southwest have the most potential to carry windborne pollutants from the HELCO site to the project area. These winds generally occur 4.5, 4.0, 10.0 and 8.5 percent of the time, respectively (Belt Collins Hawaii, 2005). According to the Climate and Air Quality Assessment in the *Final Environmental Impact Statement for Keahole Generating Station and Airport Substation Urban Reclassification* (Belt Collins Hawaii, 2005), air emissions from CT-4 and CT-5 in conjunction with other existing diesel and combustion turbine units will meet both federal and state Ambient Air Quality Standards (AAQS). Another potential industrial source of airborne contaminants is the Pu'u Anahulu Landfill, about 13.5 miles northeast of the project area, where smoke and noxious fumes from underground fires may impact the quality of the air.

Other sources of air pollution are motor vehicle exhaust from traffic on Queen Ka'ahumanu Highway, located less than a mile due west of the project area and Mamalahoa Highway, approximately 2 miles to the east. Both are major West Hawai'i arterial roadways in close proximity to the project area. Elevated concentrations of exhaust are generally attributed to periods of traffic congestion in limited areas near intersections during poor dispersion conditions. Since the project area is shielded from the prevailing trade winds by Mauna Kea, Mauna Loa and Mt. Hualālai, pollutants tend to persistently pervade the project area. Typically, during the day, light sea breezes from the south/southwest blow onshore and upslope, while in the evening,

offshore land breezes gently blow down slope, out to sea. This type of wind pattern can result in pooling of atmospheric bound contaminants present in the air. Therefore, traffic congestion during calm conditions, which prevail in the area between 28.8 and 23.6 percent of the time, further elevates the effects of exhaust emissions on air quality.

Currently, concentrations of man-made pollutants do not exceed state and federal AAQS. The only threat to human health from degraded air quality is due to concentrations of volcanic emissions or vog.

3.1.6.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impacts to air quality.

PROPOSED ACTION

On-site Impacts. Short-term air quality impacts would occur during grading and construction activities as a result of fugitive dust and particulate emissions. Construction vehicle activity and stop and go traffic would result during the construction period, and at times vehicular pollution concentrations could increase due to continual emissions release at the project area, as well as along affected streets.

At completion, the UHCWH would not be a major stationary source of air pollutant emissions. Anticipated air quality impacts to be generated by the UHCWH activities at the project area would be substantively similar if the same improvements were situated at Kealahou or any other site, since planned program activities and uses anticipated for the UHCWH would be the same regardless of its location. Therefore, the proposed UHCWH activities would generally result in similar air quality impacts to their respective ambient environment.

Traffic generated by the Proposed Action would contribute to non-stationary sources of pollutants in the form of vehicular emissions along existing roadways traversed by students, faculty, and staff of the UHCWH. These emissions are already being generated from the operation of existing UHCWH facilities in Kealahou. In an effort to address potential increased vehicular emissions caused by a larger student enrollment (up to 1,500 FTES, and in the long-term up to 3,000 FTES), the University Center would provide parking and loading provisions for shuttles and vans to reduce commuting by personal vehicles. Ultimately, it would be the responsibility of conscientious students, faculty, and staff to utilize carpools, public transportation, and other more environmentally friendly modes of travel as opposed to the personal vehicle. Given these considerations, no mitigation for future non-stationary impacts to air quality is proposed or deemed warranted.

Off-site Impacts. Off-site impacts may result from the operation of concrete and asphalt batching plants that produce materials needed for construction (e.g., asphalt and concrete). These plants routinely emit particulate material and other gaseous pollutants. These plants must be permitted by the State Department of Health (DOH), Clean Air Branch. Any emissions would be strictly regulated by the DOH permit which each plant must have in order to operate.

An increased demand for electrical power and the demand for solid waste disposal would generate off-site stationary source impacts in the form of pollutant emissions from the fuel that has to be burned to create electricity and the movement of heavy equipment for solid waste transport and burial at a municipal landfill.

3.1.6.3 MITIGATION

Anticipated short-term air quality impacts associated with construction activities can be effectively mitigated through the use of dust control measures during the construction period, such as the erection of dust control screens around the construction site and the frequent watering of unpaved roads and areas of exposed soils. It is also recommended that the landscaping of completed areas be accomplished as soon as possible. Construction activities would be conducted in accordance with standard BMPs for construction sites and in compliance with all applicable air quality regulations including provisions contained in HAR 11-60.1-33 *Fugitive Dust*.

Mitigation for off-site stationary source impacts associated with increased electrical demand includes incorporating energy efficient design into the Proposed Action. Relative to operation and maintenance of the UHCWH, the use of recyclable products can help mitigate impacts associated with the off-site disposal of solid waste.

3.1.7 Flora & Fauna

3.1.7.1 AFFECTED ENVIRONMENT

A Biological Resources Survey specific to the proposed site is being conducted and results from that survey will be included in the forthcoming Draft SEIS. The most recent biological survey conducted in the vicinity of the project area was performed by AECOS Consultants in 2005. This survey assessed conditions along the proposed Main Street Collector Road corridor, which forms the western boundary of the project area. Previous studies of the project area were also conducted in 1992 by Char Associates and Helber Hastert & Fee, Planners; in 1998 by Derral R. Herbst, Ph.D.; and in 1999 by AECOS Consultants. All of these studies were conducted as part of previous planning efforts for the UHCWH. The dry and arid conditions that affect most of North Kona may contribute to the low diversity of biological resources observed within the project area. Cumulative findings from all four (4) previous studies are compiled and described in the following sections.

Flora. The main objective of the four (4) previous surveys was to determine if any endangered, threatened, proposed or candidate plants, as federally listed by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) of 1973, as amended (16 United States Code [U.S.C.] 1531-1543), were located within the 500-acre University parcel.

Plant species and vegetation types present were recorded and estimates of relative abundance (abundant, common, rare, etc.) of each species were made. As of the most current study, a total of forty-two (42) different plant species were recorded within the project area. The majority of plants were alien introductions that have become naturalized at lower elevation environments along the leeward slopes of Hualālai.

The entire project area can be classified as a Lowland Vegetation Community. Included in this community are two distinctive vegetation associations: the Lowland Dry Grassland and the Lowland Dry Shrubland (Gagne and Cuddihy, 1990 as cited in Herbst 1998). The northern portion of the parcel exhibits the characteristics of the Fountain Grass Grassland subtype of the Lowland Dry Grassland community. It is a nearly monotypic stand of fountain grass (*Pennisetum setaceum*), a non-native from northern Africa that was introduced into the Kona District in the 1920s, which now dominates much of the arid, lava-strewn landscape in the project area. Sparsely scattered throughout the grassland are pockets of mostly native trees and shrubs, such as 'ilima (*Sida fallax*), alahe'e (*Psydrax odoratum*), maua (*Xylosma hawaiiensis*), naio (*Myoporum sandwicense*) and maiapilo (*Capparis sandwichiana* DC), a plant listed by the USFWS to be a species of concern. The species may be vulnerable because it is located in areas likely to be affected by urban development or human disturbances. Another native observed within the project area, ko'oko'olau (*Bidens micrantha* ssp. *Ctenophylla*), is listed as a USFWS species of concern because it is a plant "...for which there is some evidence of vulnerability, but for which there is not enough data to support listing proposals at this time." These species may be vulnerable; however, they have no legal standing at this time, but could potentially become threatened or endangered.

The southern and eastern portions of the project area may be classified as a degraded 'A'ali'i Lowland Shrubland subtype of the Lowland Dry Shrubland community; however, it is also dominated by fountain grass.

Although the proportion of native species is moderately high in comparison with most lowland locations in the rest of the Hawaiian Islands, the numbers of individuals and total biomass of native species in the area are very low in comparison to alien species numbers and biomass.

The project area lies within the historical distributional range² of several flora species included on the USFWS ESA list for threatened, endangered, and candidate threatened or endangered species such as uhiuhi (*Caesalpinia kawaiensis*), kauila (*Colubrina oppositifolia*), hala pepe (*Pleomele hawaiiensis*), and 'aiea (*Nothocestrum breviflorum*). At this time, the presence or absence of these species within the proposed site cannot be determined. A biological resources study is being conducted for the proposed site. Results from that assessment will be included in the forthcoming Draft SEIS.

Fauna. The information contained in the following section represent cumulative results from studies conducted during four (4) faunal surveys that entailed a search for invertebrates and vertebrates within the project area by various consultants, with the most recent performed by AECOS Consultants in 2005. As a whole, the main objective of the surveys was to determine if any of the faunal resources present are federally listed as threatened, endangered, or proposed threatened or endangered species. A more current faunal survey of the project area, and specifically of the proposed site, is being conducted, the results of which will be incorporated into the forthcoming Draft SEIS.

² An historical distributional range is defined as the extent or limits of a spatial region over which a population or species is scattered, arranged or located, characteristic of past records and research.

Findings of all previous surveys conducted have been fairly consistent.

Invertebrates. During a survey conducted by AECOS Consultants in 1999, no more than fifteen (15) different invertebrates were detected, with all encountered species presumably alien. Commonly encountered species included various wasps (*Polistes sp.* and *Vespula sp.*), the honey bee (*Apis mellifera*), and the garden orb-weaver spider (*Argiope sp.*). Conditions within explored caves (i.e., lava tubes) were found to be quite dry. The caves harbored bigheaded ants (*Pheidole megacephala*) and a harvestman spider (*Phalangidae* or *Pholcidae*). The sphinx moth (*Manduca blackburni*), which is listed as an endangered species under the ESA (Federal Register, 2004) may occur in the vicinity of the project area, although it is believed to be no longer present on the island of Hawai'i. Despite the absence of significant cave fauna found during the faunal survey, cave habitats may harbor unique endemic arthropods.

In 2005, Steven Lee Montgomery, Ph.D., and Eric Guinther conducted both surface and lava tube investigations during the day and again at night, preceding a period of above average rainfall. This resulted in healthy, well-developed host plants which invertebrate populations depend upon, as well as the absence or low levels of introduced predators. Searches were conducted by visual inspection, sweep net, and for two nights, light trapping.

The results of this particular study turned up only a few native arthropods. Only one (1) native snail was seen, *Succinea sp.* That individual was found on a rotting log. It is possible that if a survey was made immediately following a rain, more would be found since this genus is a very prevalent native snail.

None of the alien species of medical importance, such as centipedes (*Scolopendra subspinipes*), lesser brown scorpions (*Isometrus maculates*), widow spiders (*argyrodes sp.*), honey bee colonies, and common paper wasp (*Polistes exclamans*) nests were observed during this survey. These insects are considered to be of medical importance because some people may have a severe allergic reaction to their sting.

No native invertebrates on the federal or state endangered, threatened, proposed or candidate lists were observed. However, many invertebrates time their emergence and breeding to overlap or follow seasonal weather to coincide with growth spurts of an important plant or food. Monitoring at a different time of year may produce a longer or different list.

Vertebrates. Evidence of five (5) alien mammalian species was detected during the four (4) surveys completed between 1992 and 2005. Evidence of dogs (*Cannis f. familiaris*), cats (*Felis cattus*), goats (*Capra h. hircus*), pigs (*Sus s. scrofa*) and cattle (*Bos taurus*) was found in the area. During a 1992 survey, six (6) small Indian mongoose (*Herpestes a. auropunctatus*) were detected (Bruner, 1992). Though no rodents (*Rattus rattus*, *Mus domesticus*) were visually observed, it is almost a certainty that these species use resources in the project area. It is difficult to assess the population densities of any of

these mammals unless more comprehensive and costly studies are performed. All of these species are threats to avian and floral components of the remaining native ecosystem.

In a 1999 assessment conducted by Eric Guinther and Reginald David of AECOS Consultants, a single gecko (*Geytha mutilata*) was observed in the project area, which suggests that the environment may support populations of similar small lizards.

No endemic (or native) birds are expected to frequent the project area. The habitat found in the project area is typical of the fountain grass dominated, xeric communities of the North Kona District which are not conducive to supporting native bird species. Faunal surveys suggest that the project area contains no particularly special or unique birds, including threatened or endangered species. Species that could potentially be present, yet uncommon, to the area include the Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) and the endangered Hawaiian Hawk or 'Io (*Buteo solitarius*). The only migratory species recorded during any faunal survey was the Pacific Golden Plover (*Pluvialis fulva*). A total of fourteen (14) plovers were counted in a 1992 study (Bruner). The more abundant species were the Rock Dove (*Columba livia*), Zebra Dove (*Geopelia striata*), Warbling Silverbill (*Lonchura malabarica*), Japanese White-eye (*Zosterops japonicus*), and Nutmeg Mannikin (*Lonchura punctulata*).

Current survey techniques available for gathering information on the distribution, abundance and usage of resources in a given area by Hawaiian hoary bats (*Lasiurus cinereus semotus*), or 'ope'ape'a as they are known locally, are inadequate and/or time and cost prohibitive. Hawaiian hoary bats can be expected to fly over the project area. However, the project area currently has little to offer a passing bat due to the relative absence of suitable trees for roosting and the low diversity of volant (flying) insect life that may attract bats (David and Guinther, 2000).

3.1.7.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impacts to flora and fauna.

PROPOSED ACTION

Flora. As stated in Section 3.1.7.1, a biological survey that focuses on the proposed site is being conducted. Results of that survey will help identify potential impacts, if any, to botanical resources within the project area and in particular, the proposed site. Impacts will be fully discussed in the Draft SEIS. However, it is anticipated that implementation of the Proposed Action would result in no significant adverse impacts to botanical resources within the area.

Nonetheless, project actions would include some clearing of existing grassland and shrubland vegetation for the creation of buildings, roadways, pedestrian paths, and supporting infrastructure. To minimize construction-related losses, native botanical resources should be

flagged and locations recorded. Information should be transmitted to contractors to avoid inadvertent destruction by grading and other construction activities

Fauna. As stated in Section 3.1.7.1, a biological survey that focuses on the proposed site is being conducted. Results of that survey will help identify potential impacts, if any, to faunal resources within the project area and the proposed site in particular. Anticipated impacts and mitigation measures will be fully discussed in the Draft SEIS.

Invertebrates. Previous studies conducted within the project area have not identified any native invertebrates on federal or state endangered, threatened, proposed or candidate lists. Known lava tubes within the project area have been explored to the extent possible and no invertebrates or habitat indicative of their presence have been found; however, it is possible that unidentified lava tubes in the area could be found that support significant biota. The destruction of cave habitats from actions such as grading may in turn destroy unique endemic arthropods if any are harbored in those habitats.

Vertebrates. Implementing the Proposed Action would include installing exterior lighting that may attract moths and other flying insects, which in turn could attract the Hawaiian hoary bat. During preparation of the 2000 EIS to address the 1998 LRDP, DLNR, Division of Forestry and Wildlife stated in their letter of December 28, 1999 that the department was unaware of endangered fauna in the general vicinity of the project area; nevertheless, there is the possibility that the Hawaiian hawk or Hawaiian bat may roost in the area.

Potential impacts also could occur to endangered seabirds and shorebirds as a result of the Proposed Action. Non-shielded exterior lighting has been shown to serve as a attractant to protected seabirds and migratory shorebirds that are known to frequent the North Kona region. Specifically, the area is over-flown by populations of Newell's shearwaters as well as Dark-rumped Hawaiian Petrels. The birds are blinded by the lights thereby making collisions with powerlines, buildings, as well as the light structures themselves, more likely

3.1.7.3 MITIGATION

Flora. Mitigation for destruction of desirable plants during construction of the UHCWH should be their reestablishment within UHCWH campus. New landscaping should utilize native species as much as possible, if they are appropriate to the terrain and climate of the proposed site. Other mitigation measures will be discussed as warranted in the Draft SEIS.

Fauna. Mitigation to address potential impacts to seabirds and shorebirds include the use of down-shielded lighting. Use of compact fluorescent type luminaires, which emit short-wave ultraviolet lights and lower energy consumption, also are recommended. This type of lighting serves a dual purpose of minimizing the threat to seabirds, and complying with the Hawai'i County Code that requires the shielding of exterior lights to lower the ambient glare which affects the astronomical observatories on Mauna Kea.

Efforts to minimize the destruction of cave habitats during grading also are recommended since these habitats could potentially harbor endemic arthropod. Large caves should be preserved and protected. Smaller caves may be retained as part of the landscape where this is practical. It is likely that due to the existing terrain, the process of land grading will uncover many more small openings. It may be impractical or physically impossible to visit these small openings; however, should any large cave be uncovered which is big enough to be easily entered, an archaeologist and a biologist should investigate it. Not only can large caves yield potentially interesting ecological finds, but they also serve as archaeological and/or paleontological sources of information and should not be destroyed prior to some exploration of their contents. A qualified biologist (e.g., USFWS cave specialist) should be notified and consulted upon the discovery of a cave large enough to be easily entered.

3.2 HUMAN ENVIRONMENT

3.2.1 Acoustical Environment

3.2.1.1 AFFECTED ENVIRONMENT

Major sources of noise that may potentially affect the acoustical environment of the project area are aircraft operations at Kona International Airport, and the Keahole Generating Station. An acoustical study conducted for the Keahole Generating Station improvements indicated that the plant was clearly audible 2,000 feet northeast of the facilities (Belt Collins Hawaii, 2005); however, HELCO as part of their plant improvements will be installing noise controls measures to mitigate noise impacts in compliance with regulatory requirements.

Background ambient noise levels reflect the natural setting and the absence of vehicular traffic and development in the immediate vicinity of the project area. Existing traffic and background ambient noise levels currently do not exceed the U.S. Federal Highway Administration (FHWA) and Hawai'i State Department of Transportation Highways Division (DOT) noise abatement criteria. A noise study is being conducted, which will update the previous noise study completed for the 2000 EIS. Results from the current study will be included in the forthcoming Draft SEIS.

3.2.1.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and no noise impacts would be generated.

PROPOSED ACTION

Unavoidable, short-term and temporary noise impacts are expected to occur during the construction period. Noise from construction activities is predicted to be audible, but relatively low at nearby properties because of the distance that separates the existing subdivisions from the project area and the proposed site. At the same time, minimizing construction-related noise impacts is possible using standard curfew periods, properly muffled equipment, administrative controls and construction barriers as required.

In the long-term, the primary source of background ambient noise experienced at the project area is expected to be generated by motor vehicle traffic. Offsite noise sources, both stationary and

non-stationary are beyond the control of the UHCWH. Appropriate facility design and selection of construction materials and methods can reduce the impacts of these offsite noise sources on the UHCWH.

At completion, the University Center would not be major stationary noise source because of the absence of athletic facilities, dormitories, and faculty housing. The types of noise impacts generated by the Proposed Action would be substantively similar to the types of impacts currently generated at the existing Kealahou facilities, since the uses at either site would be similar in nature.

3.2.1.3 MITIGATION

Reducing construction noise to inaudible levels is not practical. However, with the application of typical construction noise control measures and adherence to all applicable noise control regulations (HAR 11-46, *Community Noise Control*), construction noise should be reduced to within reasonable levels. Such noise control measures would include for example the use of properly muffled equipment, locating heavy equipment and portable diesel engines and generators at least 400 to 500 feet from any residences or other sensitive noise receptors.

3.2.2 Historic, Archaeological and Cultural Resources

3.2.2.1 AFFECTED ENVIRONMENT

Historic and Archaeological Resources. Numerous archaeological surveys and assessments have been conducted for the 2,640-acre state parcel, which include the 500-acre University parcel. The most recent was completed in late November 2008 by Pacific Legacy and focuses on the proposed site.

The November 2008 assessment focused largely on mapping archaeological sites within the proposed site, with particular emphasis on Archaeological Preserve 2. Preserve 2 is a lava tube complex that stretches across the proposed site from southwest to northeast, just east of the proposed Main Street Road. In 1993, the Hawai'i State Inventory of Historic Properties designated site number 50-10-28-15298 for the western section of the lava tube, while 50-10-28-15302 was designated for the eastern section. Sixteen (16) separate openings along the length of Preserve 2 were identified, where a total of 196 archaeological features were found, most determined to probably date to the pre-Contact period. The findings suggest that the tube system was used for refuge, ceremonial and burial purposes. Evident bulldozing damage to some of the openings leading into the lava tube was visible. It is supposed that loose pahoehoe slabs at these areas were harvested for masonry.

An archaeological inventory survey was conducted in December 1992 and January 1993 by Paul H. Rosendahl, Ph.d., Inc. (PHRI) for the 500-acre University parcel. A total of eleven (11) historic sites were recommended for preservation "as is" or preservation with some level of interpretive development. The northwestern portion of the project area contains four (4) sites; six (6) sites are located in the central region; and one (1) site is located near the southern boundary.

The location of archaeological sites is considered critical to the site planning efforts for the UHCWH. As part of the previous LRDP effort, an archaeological investigation was commissioned that concentrated on the area (approximately 275 acres) that was proposed for the campus core in the southwestern portion of the 500-acre University parcel. The results of that investigation conducted by Pacific Legacy, Inc. in 1998, under the direction of Paul L. Cleghorn, Ph.D. are summarized below.

Numerous late prehistoric sites are present within the study area. These archaeological sites appear to be part of the “Kona Field System”—an extremely extensive and intensive agricultural complex in the Kona region. Archaeological sites within this area include lava tubes, modified outcrops, walls, and excavations in the pahoehoe lava flows. Primary activities in the area were presumably related to agricultural pursuits and temporary shelter. Ceremonial activities may also have been performed and selected areas may have been used for burials.

Archaeological sites in the study area are evidence of the adaptability of the early Hawaiian inhabitants. Residents apparently established productive uses on harsh and forbidding land. Lava tubes and outcrops were modified into shelters and habitats. Planting areas were created in broken and roughly circular pits on the surfaces of pahoehoe lava flows. Concentrations for planting areas were made from mountains of stone rubble on the surface of the flows. Arid-tolerant plants such as sweet potato and gourds may have been the focus of the agricultural pursuits that took place here.

The following recommendations for the establishment and management of five (5) archaeological preserves (refer to Figure 12) are excerpted from the investigation report (Cleghorn, 1998). Note that these recommendations were applicable to the location of the UHCWH campus core as proposed in the 1998 LRDP. As previously stated, the LRDP currently is being updated and revised, in part to address the proposed relocation of the campus core from the southwestern portion of the 500-acre parcel (as depicted in the 1998 LRDP) to the northwestern corner. As such, some of these recommendations may no longer be appropriate to the current proposal. Recommendations shall be revised as warranted to reflect the campus core's proposed change in location and findings from the just completed archaeological survey.

Preserve 1: This is the eastern site cluster composed of sites 15290, 15291, 15292, 15293, 15294, 15295, and 15296. This cluster consists of two extensively modified lava tubes (15292 and 15297), and several platforms, enclosures, terraces, and pavements. This cluster is an excellent example of how temporary habitations were situated and constructed in the area. This complex should be accessed by a walking trail from the proposed [University Center], and developed (using signs, brochures, etc.) into an interpretive and educational venue.

Preserve 2: This is the northern site cluster composed of sites 15298 and 15302, which are two extensively modified lava tubes. Because these sites contain human burials (15298) and possible ceremonial areas (15302), they should be barricaded or sealed and protected from public access.

- Preserve 3: This is a cluster of features in the central portion of the proposed campus. The cluster consists of site 15281, a linear portion of site 15283, site 15282, and site 15285. Sites 15281 and 15282 are temporary habitation areas, and site 15285 is a possible religious shrine. Site 15283 is a large complex of agricultural features. It is proposed that a linear preserve extending from Site 15281, through the southern portion of site 15283, and incorporating sites 15282 and 15285 be established in the central portion of the proposed campus. The sites could be accessed from sidewalks and other walkways in the campus and have interpretive signage explaining the function and antiquity of the sites and how they exemplify the original Hawaiian adaptation to this area.
- Preserve 4: This is a small cluster of two sites (15263 and 15287) located on the western edge of the study area. The cluster consists of a small temporary habitation complex and a papamu, or game board for konane, or Hawaiian checkers. This small complex could be incorporated into the campus landscaping and identified with appropriate signage.
- Preserve 5: This is a complex of lava tubes (site 6418) at the southwest corner of the study area. This complex consists of three sections – a collapsed section of lava tube, a lava tube containing a large stone platform, and a lava tube section with a platform and panels of petroglyphs. The proposed Mid-Level Road (aka the Main Street Collector Road) runs right through these sites. It is recommended that the road be rerouted to avoid these sites and that they be preserved. Interpreting these features by means of established walkways and interpretive signs may be the most feasible way of preserving these sites and protecting them from vandalism. Petroglyphs are extremely fragile and can be destroyed by even well-intentioned visitors.

The interpretive value of existing archaeological sites could be used to educate current and future residents, and visitors to West Hawai'i. The creation of interpretive venues may follow the guidelines set forth in the *Design Specifications for Outdoor Recreation* authored by the State of Hawai'i Architectural Access Committee in 1994, which are used by Hawai'i State Parks. Alternative means of experience for inaccessible venues may include an interpretive panel and photo board in a centralized and accessible portion of the campus; brochures or interpretive pamphlets describing inaccessible resources; and/or a video of the resources that may be viewed at the UHCWH. The goal with respect to historic resources and interpretive venues is to provide the same or similar life experience to all members of the community.

As an outgrowth of the 1998 archaeological study, the *Conceptual Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island* (HPP) (Cleghorn, 2000) was developed with considerable input from the University of Hawai'i Center

at West Hawai'i Advisory Council on Kalaoa Cultural Site Preservation³. The HPP offers guidance for the protection of the cultural resources located within the project area.

Cultural Resources. Pacific Legacy, Inc. conducted a Cultural Impact Assessment (CIA) for the Main Street Collector Road EA in 2005. Interviews and background research indicate that the project area does not support any current traditional cultural uses. The area is not frequented by spiritual and cultural practitioners nor does it provide for any other traditional activity. The area's only cultural significance appears to lie in its archaeological resources, which have interpretative value. Previous archaeological assessments, as well as the 2000 HPP recommended protection and preservation of these sites.

Hunting and gathering activities continue to be practiced in the area. However the locations of these practices are very general for the area and not site specific. Faunal surveys conducted on the site have turned up evidence in the likes of a goat skeleton, goat scat and donkey scat suggesting larger vertebrates once inhabited the land. The investigators did not see or hear any goats, pigs or donkeys, nor was there any recent evidence of their presence. In 1998, Derral Herbst conducted a flora survey of UHCWH site and did not find ko'oko'olau (*Bidens micrantha ssp.*), hala (*Pandanus tectorius*) and noni (*Morinda citrifolia*), each of which have important roles in cultural practices of Hawaiians.

3.2.2.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no adverse impacts to historic, archaeological or cultural resources.

PROPOSED ACTION

Due to the number and extent of archaeological resources within the project area, the Proposed Action does have the potential to impact these resources. As part of the 1998 LRDP and 2000 EIS preparation process, the *Conceptual Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island* (Cleghorn, 2000) was prepared. The Historic Preservation Plan (HPP) provided for the protection and incorporation of archeological features into the design and layout of the University Center at its then proposed location in the southwestern portion of the project area. With the proposed relocation of the UHCWH campus core to the northwestern portion of the project area, this HPP may need revisiting and updated/revised as necessary to reflect changes to the project.

Adherence to the buffer areas around the archaeological preserves should offer sufficient protection for the archaeological and cultural resources encompassed by each preserve. As stated in Section 3.2.2.1 above, an archaeological survey that focused on the proposed site (i.e., the northwestern corner of the project area) was just completed. Discussions with SHPD and the Hawai'i Island Burial Council have been initiated to identify and resolve any potential

³ The University of Hawai'i Center at West Hawai'i Advisory Council on Kalaoa Cultural Site Preservation was convened as part of the previous UHCWH LRDP/EIS effort (1998 – 2000) to provide guidance in protecting the numerous cultural resources associated with the project area. This advisory group is no longer in existence. A new advisory group has been convened to provide community input for the current LRDP effort.

archaeological, historic or cultural issues. Potential impacts to any historic, archaeological and cultural resources within the project area and in particular, the proposed site, will be fully discussed in the forthcoming Draft SEIS.

3.2.2.3 MITIGATION

Mitigation of any potential adverse impacts to historic, archaeological or cultural resources will require coordination with the Hawai'i State Historic Preservation Officer, the Hawai'i Island Burial Council, and other organizations as deemed necessary, to determine the most appropriate actions. Mitigation measures will be fully discussed in the forthcoming Draft SEIS.

3.2.3 Aesthetic Considerations

3.2.3.1 AFFECTED ENVIRONMENT

Aesthetic considerations can be described and analyzed from two (2) visual perspectives. The first perspective considers the 500-acre University parcel itself as a visual resource when viewed from outside the project area. The second perspective looks at the visual resources and view planes as seen from within the project area. Refer to Figure 13 for a diagrammatic depiction of the two (2) visual perspectives relative to the project area.

The visual character of the project area is defined by expanses of pristine lava lands that have never been developed for modern use, and are covered by scrub grass, small trees and shrubs. The best views of the project area are from the vicinity of the Kona International Airport; it is part of the initial viewshed for those arriving in West Hawai'i. Kona International Airport is a focal point that serves as a gateway for tourism to West Hawai'i, therefore anything that is part of the vista when looking out at the landscape from the airport influences a person's first impression of the island, especially if that individual is visiting for the first time.

Glimpses of the project area can also be seen from Mamalahoa Highway (located upslope of the project area) where breaks in vegetation exist, as well as at streets and private driveways, but these views do not hold the same bearing as from the airport. Although the project area can also be seen from the Queen Ka'ahumanu Highway, views are limited due to obstruction by existing topographical features. Furthermore, current land uses between the highway and the project area restrict continuous views of the property, which can only be seen intermittently as one drives along the roadway.

The other visual perspective that can be considered is the visual resources and view planes seen when looking out from the project area. The most expansive views are from the steeper, higher elevations, most notably at areas above the 500-foot elevation. At elevations below 450 feet, makai views are somewhat restricted by the HELCO power plant, the 0.5-million gallon water tank and the Keahole Agricultural Park. Localized ridges and depressions profoundly affect the quality of views at lower elevations throughout the project area. Looking makai (westward or seaward), expanses of pristine lava lands covered by scrub grass, small trees and shrubs create a distinct contrast between sparsely vegetated lava fields and the Pacific Ocean in the distance. To the east, Mt. Hualālai (mauka of the site) comprises the major visual resource seen from the project area. This feature is a chief natural element in the mauka viewshed. Overall, the expansiveness of views is determined by the specific viewing position within the project area.

3.2.3.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no adverse impacts to visual resources. As well, with No Action, the opportunity to reorganize the University Center within a cohesive design framework situated amongst the lava-strewn landscape of Mt. Hualālai would be lost. The creation of a new visual character for the UHCWH and the elevation of its status would be similarly lost.

PROPOSED ACTION

From a design concept, it is intended that the UHCWH buildings will be limited to a single story, creating a low profile compatible with the expansive setting in the lava fields of Kalaoa. Site constraints may require building heights be increased to two-stories for some of the UHCWH facilities; however, it is anticipated that the architectural design of these facilities would strive to maintain a reasonably low profile. This low profile would minimize the potential to obstruct views from either within the project area or from without. Buildings would be intentionally designed to blend into the surroundings. The new visual character of the University Center would be designed within a cohesive framework that would elevate its status as an institution of higher education. In this regard, although there will be some visual impact, it should be minimal and no mitigation measures should be required. Additional information about the design of the UHCWH will be provided in the forthcoming Draft SEIS.

From within the project area, and particularly the proposed site, no negative impacts are expected in terms of view obstruction. Development of the UHCWH should not result in any barriers that would obstruct scenic views of the coast or Mt. Hualālai.

3.2.3.3 MITIGATION

No mitigation is warranted or proposed.

3.2.4 Land Use

3.2.4.1 AFFECTED ENVIRONMENT

Surrounding the project area are various private and state-owned land uses. Land immediately north of the project area in the Kau ahupua'a is private land on which the Palamanui Master Planned Community is being developed. Mass grading and sitework has been initiated for Palamanui. Palamanui includes a mix of residential villages, a 20-acre regional park, a 120-room hotel, a small-town commercial village and a 55-acre lowland native dry forest preserve. The undeveloped parcel abutting the western border of the site is expected to include provisions for Hawaiian Homelands and possibly some state departmental uses. Along the southern border of the project area is the existing Kona Palisades residential subdivision. Another residential area is being developed just south of the Kona Palisades subdivision. Along the eastern border of the project area are undeveloped state-owned lands.

Land use controls and planning documents exist for the project area on state and county levels. The official government identification of the 500-acre University parcel is Third Tax Division (the island of Hawai'i), Zone 7, Section 3, Plat 10, Parcel 42 (7-3-010:042).

Hawaii State Plan. The Hawaii State Plan, Chapter 226, HRS (1995) was developed to serve as a guide for the future growth of the State of Hawai'i by identifying goals, objectives, policies, and priorities. The Plan provides a basis for prioritizing and allocating the state's limited resources, including public funds, services, human resources, land, energy, and water. It establishes a system for the formulation and program coordination of state and county plans, policies, programs, projects, and regulatory activities and facilitates the integration of all major state and county activities.

The Proposed Action is consistent with and furthers the aims of the following sections of the State Plan:

PART I - GOALS, OBJECTIVES, AND POLICIES

SEC. 226-10 Objective and policies for the economy – potential growth activities.

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

SEC. 226-10.5 Objective and policies for the economy – information industry.

- (b)(5) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the information industry.

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

- (b)(1) Promote the preservation and restoration of significant natural and historic resources.
- (b)(2) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

SEC. 226-13 Objective and policies for the physical environment – land, air, and water quality.

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

SEC. 226-21 Objectives and policies for socio-cultural advancement – education.

- (b)(2) Ensure the provision of adequate and accessible education services and facilities that are designed to meet individual and community needs.
- (b)(4) Promote educational programs which enhance understanding of Hawaii's cultural heritage.
- (b)(5) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.
- (b)(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.

PART III – PRIORITY GUIDELINES

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

- (5) Increase and improve the use of information technology in education and encourage programs which increase the public's awareness and understanding of the impact of information technologies on our lives.
- (6) Pursue the establishment of Hawaii's public and private universities and colleges as research and training centers of the Pacific.

State Land Use Designation. On December 9, 1993, the State of Hawai'i Land Use Commission (LUC) issued a Decision and Order to reclassify 2,640 acres of state lands in the North Kona area from the Agricultural and Conservation Districts to the Urban District. Urbanization of the area was recommended by the Office of State Planning (OSP) for the purpose of allocating sufficient land for future urban growth in West Hawai'i. This action included the proposed subdivision of the affected state lands into thirteen (13) parcels (see Figures 14 and 15). The 500-acre University parcel is identified as Parcel 5 of the subdivision. The LUC Decision and Order regarding these state lands contains 34 conditions. Condition 32 specifically designates Parcel 5 for the proposed West Hawai'i campus of the UH System.

West Hawai'i Regional Plan. This plan developed by the OSP, dated November 1989, addresses the long-range planning issues of West Hawai'i. Its main objectives are the coordination of state activities and capital improvements program within the regional planning framework of West Hawai'i. The plan designates two (2) subregional planning areas to outline the areas of most probable and desirable expansion. The goal is to concentrate future regional urbanization within these areas and provide for their planning and future development, while optimizing or mitigating subregional problems, issues and opportunities. The Northern Subregional Area includes Kawaihae Harbor and the support communities of Kawaihae, Lalamilo, Waikoloa and Signal Puako. The Southern Subregional Planning Area, of which the project area is a part, extends from Kailua-Kona to Kona International Airport and includes the support community of Kealakehe.

Agricultural Lands of Importance in the State of Hawai'i (ALISH) System. No lands within the project area are included in the ALISH system.

County of Hawai'i General Plan (2005). This is the County of Hawai'i policy document for long-range comprehensive development of the island of Hawai'i. It contains land use maps referred to as General Plan Land Use Pattern Allocation Guides (LUPAG). The project area is designated as "University Use" by the LUPAG (see Figure 16).

Keahole to Kailua Development Plan (K to K Plan). The K to K Plan was adopted by the County of Hawai'i in April 1991. This plan emphasizes the siting of major infrastructure intended to serve the region. The K to K Plan identifies three (3) north-south roadways (a Mid-Level arterial, Waena Drive and Kealakehe Street extension) and three (3) east-west roadways (University Drive, Hina Lani Drive, and Kealakehe Drive) as part of the major future road pattern mauka of the Queen Ka'ahumanu Highway. In this plan, the project area is identified for "University" uses. Its mauka and makai boundaries are defined by the proposed alignments of Waena Drive and the Mid-Level arterial (now known as the Main Street Collector Road),

respectively. This plan has been superseded by the County of Hawaii's Kona Community Development Plan (see below).

Kona Community Development Plan. Mapping Kona's Future, Kona Community Development Plan (CDP) prepared in 2008 encompasses the judicial districts of North and South Kona. This plan stresses the residents' vision for the planning of the district's future progress and provides guidance for development in accordance with that vision, accommodating expected growth and preserving valued assets. Development of the new UHCWH at Kalaoa is consistent with policies set forth in the CDP, such as the following:

Policy LU-2.3 in the CDP suggests that the goal is to use the university as a catalyst for complementary commercial opportunities surrounding the campus and to attract students, faculty and staff to live on or near campus. It is hoped that the university will be a center for cultural, performing arts, life-long learning, innovation and workforce development that will benefit the broader community.

Policy ECON-1.4: University as Workforce Development. The synergistic relationship of a university or community college at West Hawai'i with the hospital, NELHA, and Design Center will provide opportunities for the West Hawai'i residents to obtain the necessary education and training to fill jobs in the emerging skill areas of healthcare, energy, agriculture and urban design.

Hawai'i County Zoning. The majority of the project area is zoned A-5a, Agriculture – minimum 5-acres (see Figure 17). However, a portion of the project area, stretching along the western boundary and northwestern corner, is zoned Open. Under the Hawai'i County Zoning Code, neither structures or parking typically are permitted in the Open zone, unless they are for public use and approved by the Director of the Hawai'i County's Planning Department. Under Chapter 25 of the Hawai'i County Code, section 25-5-72(d)(7), schools are permitted in the Agricultural district provided that a "use permit" is issued by the Hawai'i County Planning Commission.

3.2.4.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped despite the supporting statements and policies in various state and county plans for a University Center in Kalaoa. No Action would ultimately be in conflict with these plans.

PROPOSED ACTION

Completion of the Proposed Action would be compatible with existing state policy documents (i.e., the Hawaii State Plan and Functional Plans) as evidenced by supporting statements encouraging the creation of opportunities for higher education and job training, especially with the integration of information technology in education. Statements that encourage the development of projects that preserve natural, historic and scenic resources of the physical environment further emphasize compatibility with state policy documents.

Compatibility with state and county policy documents such as the State Land Use Law, West Hawai'i Regional Plan, Hawai'i County General Plan, and the Kona Community Development Plan is evidenced by the mention and/or depiction of the University Center in Kalaoa in these policy statements and plans. Land use entitlements for the project area are consistent with the development of the University Center such that no mitigation is warranted or proposed.

3.2.4.3 MITIGATION

No mitigation is proposed or considered to be warranted.

3.2.5 Circulation and Traffic

3.2.5.1 AFFECTED ENVIRONMENT

Presently, there are no improved roadways leading up to or within the project area. Kaiminani Drive (a County of Hawai'i roadway) provides the only existing east-west (mauka-makai) roadway proximal to the project site. This roadway connects the Queen Ka'auhuanu Highway (Route 19) with Mamalahoa Highway (Route 190). The Queen Ka'ahumanu Highway provides vehicular access to the project vicinity from other parts of the island. This arterial roadway is a two-lane, Class I state highway that generally parallels the shoreline. Mamalahoa Highway is the only other trans-island roadway that provides access to the project vicinity from other parts of the island. This roadway runs roughly parallel to Queen Ka'ahumanu Highway and is more inland at the 1,600 to 1,800-foot elevation (refer to Figure 18).

What follows is a discussion of the existing roadway conditions proximal to the project area. Descriptions of the base traffic conditions are from a relatively recent study conducted by Phillip Rowell and Associates that was prepared for the Main Street Collector Road EA in 2002 and updated in 2005. A traffic study is being conducted as part of the current LRDP update process. Results of the study will be included in the Draft SEIS.

Existing peak levels of traffic are in the morning and late afternoon that coincide with commute traffic. The following discussion refers to peak levels of traffic in the Kona area. Currently, there are only two (2) ways to get to Kailua-Kona from the project area. This is to take Kaiminani Drive to the east or west to get on to either Queen Ka'ahumanu Highway or Mamalahoa Highway, both of which lead to Palani Road. One of the major bottlenecks in the region is at the intersection of Queen Ka'ahumanu Highway and Palani Road. At this intersection, the northbound left turn lane operates at a Level-of-Service (LOS) E⁴ during both morning and afternoon peak hours. Also at this intersection, the eastbound right turn operates at LOS E during the afternoon peak hour. Another intersection, Mamalahoa Highway and Kaiminani Drive, also operates LOS E during both peak hours.

3.2.5.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain in an undeveloped state and there would be no impacts to existing traffic and circulation.

⁴ As cited in the 2005 report (Phillip Rowell and Associates), Level-of-Service E is defined as "[s]evere congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements."

PROPOSED ACTION

As part of the 1998 LRDP and 2000 EIS preparation process, a traffic study was conducted to assess current conditions and estimate potential impacts that could result from the Proposed Action. Due to changes in the project and the time that has elapsed since that study was completed, an updated study is being conducted. The updated study will address changes to the project, as well as overall changes in the vicinity of the project area that have taken place since issuance of the 1998 LRDP and 2000 EIS (e.g., development of the Palamanui Master Planned Community). Results of the updated traffic study and potential impacts will be presented in the forthcoming Draft SEIS.

3.2.5.3 MITIGATION

Mitigation measures, if any, will be discussed in the forthcoming Draft SEIS.

3.3 INFRASTRUCTURE

The extension and construction of water, wastewater, drainage, electrical and communication systems are necessary for the adequate provision of these services for the Proposed Action. In the 1998 LRDP, the presumption was that extension of utilities would be toward the south to Kaiminani Drive which, at that time, was the only existing utility corridor in the vicinity of the 500-acre University parcel. Subsequently, the large planned development, Palamanui, on the northern border of the 500-acre parcel was announced. As discussed in above in Section 1.4 *Background*, in 2002, U.H. entered into a MOU with Palamanui “to consult and discuss joint development opportunities for the adjacent properties, with the developer providing initial infrastructure for UHCWH” (PBR, 2008, p. 11).

The general intent of the University is to “piggy-back” on Palamanui’s utility systems to reduce the University’s infrastructure costs as much as possible. The details of the various utility tie-ins with Palamanui are still being evaluated by the project engineers; therefore, the discussion below is necessarily in general rather than specific terms. More detailed information on utilities and infrastructure will be provided in the Draft SEIS.

No adverse short- or long-term impacts to utilities and services are anticipated since coordination with the appropriate agencies will be accomplished, and is required by the County of Hawai'i in order to implement the Proposed Action. Anticipated utility and infrastructure system approvals are listed below:

- Building Permit for Buildings, Electrical, Plumbing, Sidewalk/Driveway Work (County of Hawai'i, Department of Public Works)
- Grading, Grubbing and Stockpiling Permit (County of Hawai'i, Department of Public Works)
- Water System (County of Hawai'i, Water Supply Department)
- Wastewater System (State Department of Health and County of Hawai'i, Department of Public Works)

3.3.1 Water System

3.3.1.1 AFFECTED ENVIRONMENT

There is currently no potable water supply to the project area. The nearest water mains run down Kaiminani Drive.

3.3.1.2 POTENTIAL IMPACTS

NO ACTION

With No Action, no water system improvements would be required to serve the undeveloped property.

PROPOSED ACTION

With the proposed relocation of the UHCWH campus core to the northern end of the project area, water system improvements for the Proposed Action will be coordinated with Palamanui. Currently, Palamanui proposes to build a 16-inch underground waterline and a 343-foot elevation reservoir makai (west) of the project area.

The waterline will be approximately 5,750 feet long and will start from the existing Department of Water Supply (DWS) Keahole water tanks at the 280-foot elevation. The Keahole water tanks include one (1) 0.5-million-gallon tank and one (1) 1-million-gallon tank. From the Keahole tanks the new Palamanui waterline will run mauka across open land and will intersect and then run within the proposed Main Street Road right-of-way until it intersects with Palamanui's University Drive at the Palamanui Village Center. The proposed 343-foot elevation water tank will have a design capacity of one (1) million gallons and will be built midway between the Keahole water tanks and Main Street Road. Water for the new water tank (343-foot elevation) will be supplied by two newly outfitted wells near Mamalahoa Highway. As stated in the Palamanui Waterline EA, "The Palamanui Waterline will provide water to the University of Hawaii Center at West Hawaii (UHCWH) and Palamanui development" (PBR, 2008, p. 12). UH and the planning team have initiated discussions with the County's DWS and have been assured that sufficient water will be allocated to support the development of the UHCWH.

Another proposal being explored is for the University to build a 1-million-gallon reservoir at the 650-foot elevation on state lands mauka (east) of the project area. From there a 16-inch waterline will run down to Main Street Road supplying water for the UHCWH campus. The source of the water will be different from the wells that supply the 343-foot elevation Palamanui water tank. In consultation with DWS and Palamanui, the project design engineers are currently evaluating the best options for the UHCWH water supply system.

The development of Palamanui and UHCWH necessitate improvements to the County's DWS system including the completion of new wells, installation of pumps and new transmission lines built to DWS standards. Palamanui, UHCWH, together with DWS and other major landowners in the area will make improvements to the County DWS water supply infrastructure due to development of Palamanui and UHCWH.

3.3.1.3 MITIGATION

As a result of the above features, no mitigation for offsite impacts is proposed or deemed warranted.

3.3.2 Wastewater System

3.3.2.1 AFFECTED ENVIRONMENT

There is currently no municipal wastewater collection within the project area nor in the nearest residential communities. The Kailua-Kona municipal wastewater system does not extend to Kalaoa, and nearby residential communities use cesspools.

3.3.2.2 POTENTIAL IMPACTS

NO ACTION

With No Action, no new wastewater system or improvements to existing systems would be required to serve the undeveloped property.

PROPOSED ACTION

Since cesspools would not be permissible for a large public facility such as the UHCWH, other means of wastewater treatment and disposal were investigated in the 1998 LRDP. The cost of connecting to the existing Kailua-Kona municipal treatment system was found to be prohibitive. Mechanical sewage treatment plants were considered, but discarded because of cost and potential odors produced. The sewage lagoon was deemed to be the most environmentally efficient method of sewage treatment; however, the community voiced strong reservations about this method because of potential odor and proximity to existing residential areas. The method recommended in the 1998 LRDP was septic tanks with underground injection wells and/or leaching fields. The cost would be less than other methods considered. The State Department of Health has established an underground injection control (UIC) line above which effluent cannot be disposed of due to potential contamination of ground waters. There is however, a small area of land in the southwestern corner of the project area which is below the UIC line and suitable for injection wells and leaching fields.

The current situation has changed the location of the campus core to the northern end of the project area and the wastewater system recommended in the 1998 LRDP described above may no longer be the preferred method of wastewater treatment and disposal. Palamanui intends to build a self-contained wastewater collection treatment and disposal system. The wastewater treatment facility will be located on the western end of the development near Queen Ka'ahumanu Highway. An 18-inch sewer line would run from the UHCWH to the utility corridor in University Drive and then downhill to the Palamanui treatment facility. (Belt Collins Hawaii Ltd. 2004, p. 10). Palamanui has stated that their wastewater system would accommodate the initial UHCWH building they will construct, which is in accordance with their agreement with the County of Hawai'i. However, they also have stated that their facility would not accommodate additional facilities that may be constructed for the UHCWH. This means that UH would have to provide additional wastewater treatment facilities. Palamanui has suggested that UH construct additional facilities on state land adjacent to their treatment facility. This may provide certain economies in the construction of infrastructure including pumping stations and underground piping. UH is considering this approach for the LRDP.

Since the Palamanui Wastewater System is a self-contained private system it will not impact any of the existing wastewater systems in the area. The Palamanui Wastewater System will benefit the environment because the treatment facility is being designed to produce R-1 water, which the Department of Health has approved for irrigation purposes. This will help to conserve valuable potable water sources in West Hawai'i.

3.3.2.3 MITIGATION

As a result of the above features, no mitigation for offsite impacts is proposed or deemed warranted.

3.3.3 Solid Waste Disposal

3.3.3.1 AFFECTED ENVIRONMENT

There is currently no solid waste disposal service to the project area.

3.3.3.2 POTENTIAL IMPACTS

NO ACTION

With No Action, no solid waste disposal service would be required to serve the undeveloped property.

PROPOSED ACTION

A private disposal company would be utilized to provide solid waste disposal services for the Proposed Action. Solid waste generated by the UHCWH will be taken to County-approved solid waste disposal facilities. Pu'u Anahulu Landfill is the closest solid waste disposal facility to the project area. Greenwaste from landscape maintenance can be composted with biosolids at the Palamanui wastewater treatment plant.

3.3.3.3 MITIGATION

Recycling programs could be instituted at the UHCWH to reduce the amount of solid waste generated, which would lessen the amount of waste to be transported and disposed at solid waste disposal facilities.

3.3.4 Drainage System

3.3.4.1 AFFECTED ENVIRONMENT

The project area currently is undeveloped and there are no man-made drainage systems in place.

3.3.4.2 POTENTIAL IMPACTS

NO ACTION

With this alternative, no drainage systems would be required or constructed within the project area.

PROPOSED ACTION

Potential rainfall at the project area is less than twenty (20) inches per year and most of the storm water percolates into porous lava rock. Wherever possible, proposed University facilities and structures will be constructed on relatively level elevations (i.e., graded areas) and stormwater would be deflected and diverted around buildings to lower elevations. Once the Ultimate

Campus Site Plan is finalized and building footprints have been located for the LRDP Revision and Update, the project civil engineers will prepare an Ultimate Grading and Drainage Plan. With proper engineering and implementation of BMPs, the danger of erosion and the discharge of sediment should be minimized. Therefore, grading and drainage are not expected to have a significant negative impact on the environment.

3.3.4.3 MITIGATION

In light of these considerations, no mitigation for offsite impacts is proposed or deemed warranted.

3.3.5 Electrical and Communication Systems

3.3.5.1 AFFECTED ENVIRONMENT

The project area has no electrical power and communication services. HELCO currently has an overhead 69 kV transmission line running through the utility easement along the southern portion of the 500-acre University parcel. The line runs from Mamalahoa Highway to the Keahole Substation located near the Queen Ka'ahumanu Highway.

3.3.5.2 POTENTIAL IMPACTS

NO ACTION

With No Action, no electrical power or communication service would be required for the undeveloped property.

PROPOSED ACTION

In the 1998 LRDP, it was proposed that HELCO extend and build two 12 kV overhead lines from the existing overhead 69 kV transmission line. Telecommunication lines were proposed to connect to existing lines along Kaiminani Drive.

With the proposed change in the location of the UHCWH campus core, tying in to Palamanui's electrical and communication systems is currently being investigated. Due to Palamanui's anticipated electrical loads to serve its 725-acre site, HELCO will require Palamanui to build a new substation, which will be dedicated to HELCO (Group 70 International, Inc., 2004, p. 6-40). The UHCWH may be able to tap into this power system; however, the University will be required to pay Palamanui for the power that the campus consumes. The UHCWH power system will require a primary electrical switching station for housing equipment. Telecommunication lines for the UHCWH can be run down the proposed utility corridor in University Drive, which will connect to major trunk lines at Queen Ka'ahumanu Highway. All power and utility lines will be placed underground.

3.3.5.3 MITIGATION

Project architects for UHCWH will employ green/climate-appropriate and energy efficient design for campus buildings. Vegetation and landscaping will moderate climatic conditions and buildings would employ LEED criteria in their design to reduce energy demand.

3.4 PUBLIC SERVICES AND FACILITIES

3.4.1 Fire

3.4.1.1 AFFECTED ENVIRONMENT

The Kailua-Kona region is served by the main Kailua-Kona Fire Station, just four (4) miles south of the project area, near the intersection of Palani Road and Queen Ka'ahumanu Highway. A volunteer-operated station along Mamalahoa Highway and three (3) other fire stations in Keauhou, Waikoloa, and South Kohala also provide service to the West Hawai'i region (HHF, April 2003). The County of Hawaii is planning to construct another fire station at Makalei, which is located approximately 1.9 miles east of the project area, at the intersection of Mamalahoa Highway and Makalei Drive.

3.4.1.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impacts to fire prevention and protection services.

PROPOSED ACTION

The Proposed Action could increase the potential for wildfires in the area because of increased human activity in an area characterized by hot and arid conditions combined with the nature of the flora found in the project area.

3.4.1.3 MITIGATION

Fire prevention and protection elements, such as provision of fire lanes and hydrants at required intervals, would be incorporated into the Proposed Action as required by the Fire Code.

3.4.2 Police

3.4.2.1 AFFECTED ENVIRONMENT

Of the three (3) police stations that serve the County of Hawai'i, the Kealakehe Station has jurisdiction over the North and South Kona districts. It is located approximately 5.5 miles south of the project area, on the mauka side of Queen Ka'ahumanu Highway. In addition, substations in Keauhou and Captain Cook operate as satellite bases to the main station.

3.4.2.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impacts to police services.

PROPOSED ACTION

The Proposed Action is not expected adversely impact police service in the vicinity of the project area.

3.4.2.3 MITIGATION

No mitigation is warranted or proposed.

3.4.3 Medical Services

3.4.3.1 AFFECTED ENVIRONMENT

The Kona Community Hospital is the largest medical facility in West Hawai'i. It is located approximately seventeen (17) miles southeast of the project area, in Kealahou. Closer in proximity to the project area is the Kaiser Permanente Kona Clinic, which is located about eight (8) miles south in the business district of Kailua-Kona. Other smaller private specialty medical and dental providers are located throughout the region.

3.4.3.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the project area would remain undeveloped and there would be no impacts to medical services.

PROPOSED ACTION

The Proposed Action is not expected to impact medical service in the vicinity of the project area.

3.4.3.3 MITIGATION

No mitigation is warranted or proposed.

3.5 SOCIO-ECONOMIC CONDITIONS

3.5.1 Population

3.5.1.1 AFFECTED ENVIRONMENT

The 2000 Census gives Hawai'i County's population at 148,677 persons. In a more recent 2006 study known as the American Community Survey, conducted also by the U.S. Census Bureau, the population of Hawai'i County numbered 171,191 persons. This represents a fifteen (15) percent increase in population within a matter of six (6) years (PBR, 2008). It also accounts for thirty (30) percent of the entire state's population growth between 2000 and 2006 (U.S. Census Bureau, State & County Facts, Hawaii. <http://quickfacts.census.gov/qfd/states/15000.html>).

Most of this growth occurred within West Hawai'i, making North Kona and South Kohala among the fastest growing regions of the state. North Kona, which extends from Keahole to Waikoloa, remains the most populated region of West Hawai'i due to it being a hub for major commercial and tourism activities. In a census conducted in July 2005, the estimated population of North Kona was 31,900 and South Kona was at 10,700, totaling 42,600 for both districts (Wilson Okamoto Corporation, 2008, Volume 1). The table below shows the actual population and its percent change between the years of 1980 through 2000 for the North and South Kona districts.

Table 1. North and South Kona Population 1980 to 2000

Population	1980	1990	2000	1980-1990 % change	1990-2000 % change
North Kona	13,748	22,284	28,543	62.1	28.1
South Kona	5,914	7,658	8,589	29.5	12.2

Source: County of Hawaii General Plan, February 2005.

The current location of the UHCWH in Kealahou is considerably south of the geographic center of the region. This fact, coupled with the lack of adequate facilities and necessary infrastructure prevents growth of the UHCWH. Community sentiments over the past twenty (20) years indicate the need for increased postsecondary educational opportunities in West Hawai'i (HawCC, 1997, p. 12).

3.5.1.2 POTENTIAL IMPACTS

NO ACTION

With No Action, the inadequacies of the existing facilities in Kealahou with respect to population predictions and community concerns for higher education would not be addressed. The opportunity to provide a permanent postsecondary educational facility in Kalaoa would be lost along with the associated benefits to the community.

PROPOSED ACTION

Population predictions for the West Hawai'i region indicate sufficient population to justify the construction of a higher education center serving 1,200 to 1,600 students by year 2010 (HawCC, 1997, p. 10). Completion of the University Center at the in Kalaoa would be a great benefit to the region by providing a permanent presence for higher education. The Proposed Action is expected to generate no significant adverse impacts to population.

3.5.1.3 MITIGATION

No mitigation is warranted or proposed.

3.5.2 Economy

3.5.2.1 AFFECTED ENVIRONMENT

The districts of North and South Kona are considered the government, commercial and industrial centers of West Hawai'i. As is with the rest of the island, tourism remains the major industry in Kona. Due to the expanding growth of vacationers to North Kona, employment opportunities generated by tourism bolstered a major increase in population in the past 20 years.

The North Kona district once was considered the major visitor destination of the island, comprising of 45 percent of total hotel rooms on the island by 2005. Today, however, it shares this distinction with South Kohala, as new resorts and hotel complexes were developed along the coast of South Kohala within recent years. Over 1,300 hotels and resort-condominium style accommodations can be found in the Keauhou-Kona area. The cruise ship industry is also a contributor to tourism, bringing in a small visitor base to Kona while also boosting local agricultural economy as produce and fruit supplies are purchased locally in Kona to serve about 2,000 passengers aboard the ships daily.

Second to tourism, the agricultural industry is the next most prominent sector. Most of the island of Hawaii's coffee production is located within Kona and accounts for one-third of the coffee produced statewide. World renowned "Kona Coffee" is the signature product of Kona and has been since the 1800s. In 1997, value of gross sales for Kona coffee grown and manufactured in Kona was at \$16,200,000, and the market and price continues to grow.

While North Kona's most prominent industry is tourism, South Kona's primary economic activity is agriculture. Besides coffee, macadamia nut orchards cover approximately 4,000 acres of the district, accounting for roughly 20 to 25 percent of all macadamia nut production for the State of Hawai'i. Other agricultural commodities include a diversity of fresh fruits and vegetables, such as tomatoes, bananas, papayas, citrus crops and avocado. Raising livestock and cattle ranching are also major industries in Kona. The Hawai'i Department of Agriculture has reported gains in revenue generated by diversified agriculture in Kona since 1986.

Kona remains the retail and bank services center for West Hawai'i. It is home to "big-box" retailers such as Costco, K-Mart and Wal-Mart. Furthermore, internationally distinguished annual events held in the Kona region such as the IronMan Triathlon, the Hawaiian Billfish tournament and the Senior PGA Tournament of Champions at the Hualalai Resort also generate income for the state.

3.5.2.2 POTENTIAL IMPACTS

NO ACTION

No Action would result in the lost opportunity to develop a permanent post-secondary educational facility for West Hawai'i, which could result in adverse impacts to the region's economy. Ramifications of No Action include the potential loss in higher education and job training opportunities for West Hawai'i residents. With limited job skills, individuals may be inadequately equipped for future jobs in service and sales occupations, executive/managerial and professional occupations, and scientific enterprises related to astronomy, ocean engineering and other high technology fields.

PROPOSED ACTION

The social character of West Hawai'i in the coming years is expected to transition along with the physical environment. Factors contributing to future change include continued development of resorts along the coastline and residential communities in mauka areas. One potential benefit of the transition may be increased job opportunities in this region. Coordination between the UHCWH and industry will allow a complementary range of training programs and services to be provided that foster the skills desired by employers. In the short-term, construction employment and material expenses are expected to generate general excise tax and income tax revenues to the State of Hawai'i.

An economic study is being conducted as part of the LRDP revision and update process; results of which will provide additional information as to the economic impacts that could result from development of the new UHCWH at Kalaoa. Results of the study will be included in the forthcoming Draft SEIS; however, no significant adverse impacts to the economy are anticipated.

3.5.2.3 MITIGATION

No mitigation is warranted or proposed.

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4.0 ALTERNATIVES TO THE PREFERRED CAMPUS SITE PLAN

4.1 ALTERNATIVE CAMPUS SITE PLANS

As stated in Section 1.1, what is discussed here in this SEISPN represent outcomes resulting from the initial phases of the LRDP revision and update process—site utilization analysis, selection of the campus core location within the 500-acre University parcel; and development of alternative campus site plans. The alternative campus site plans discussed below were developed in conjunction with the Preferred Campus Site Plan.

In the next phase of the LRDP site planning process, the Ultimate Campus Site Plan will be developed. From the Ultimate Campus Site Plan associated ultimate plans for grading and drainage, water and wastewater, landscaping, electrical and telecommunications systems, and mechanical systems will be generated. The Ultimate Site Plan and associated ultimate plans will represent the Preferred Alternative in the forthcoming Draft SEIS.

4.1.1 *Alternative Campus Site Plan A*

Alternative Campus Site Plan A (see Figure 19) is the least constrained of the three (3) alternatives. It comprises sixteen (16) one-story buildings covering 39.5 acres. This alternative utilizes the Open Zone for roadways and landscaped parking. The major difference between Alternative Campus Site Plan A and Alternative Campus Site Plan B (refer to Section 4.1.1 below) is that in Alternative A the archaeological buffer around Preserve 2 is reduced to 25 meters; however, no buildings are proposed to be constructed in this area, which would be used for overflow parking and outdoor gathering space. Reduction of the archaeological buffer would provide additional developable acreage (approximately two (2) additional acres above the Preserve and eight to nine (8 - 9) acres below the Preserve).

The reduced buffer benefits site development in two ways. First, it creates a 100-foot gap between the two lava tube systems. Within this gap, a pedestrian walkway could be constructed to connect the area above (north of) Preserve 2 with the area below (south of) Preserve 2. Second, it provides a 100-foot-wide vehicular access from Main Street Road to the small developable area below (south of) the Preserve 2. Having a separate vehicular access, this 8.5-acre area can then be used for future development of the 3,000 FTES campus. Implementation of this alternative would require Hawai'i Island Burial Council and SHPD approval to reduce the archaeological buffer from 50 meters to 25.

Alternative Site Plan A depicts the incremental development of the 750, 1,500 and 3,000 FTES campuses. The 750 campus covers 13 acres of land and accommodates four (4) one-story buildings. Three separate parking areas are located on the western, northern, and eastern ends of the campus core and together provide 380 parking stalls. Primary vehicular access is from Main Street Road and connects to the secondary access via the internal roadway. The 1,500 FTES campus covers 26 acres of land, which accommodates and additional five (5) one-story buildings (nine total buildings) and 376 total parking stalls.

The major difference between the Alternative Campus Site Plan A and the other site plans clearly emerges when the campus expands to 3,000 FTES. This last phase of campus development uses 39.5 acres to accommodate a total of sixteen (16) one-story buildings and 1,500 parking stalls. The 3,000 FTES campus is divided into two parts: the upper and lower campuses. Both campuses are connected by a wide pedestrian pathway built within the gap between the two reduced archaeological buffers. The upper campus contains twelve (12) buildings and provides about 1,200 parking stalls.

The lower campus would accommodate expanded functional areas and 300 parking stalls. A linear layout is used in organizing the buildings and vehicular circulation within the lower campus with access from Main Street Road. Two (2) main parking areas are provided: one on the western end and another on the eastern end of the site. All four (4) buildings are placed in the middle of the lower campus and face the roadway. The areas between the roadway and the archeological buffer are free from vehicles such that pedestrians can safely walk between buildings and access the outdoor gathering space provided at the buffer's edge. A main plaza is located at the central area between the service building and the instructional buildings.

There are several advantages of the split-campus concept utilized in Alternative Campus Site Plan A. Like the other alternatives, the upper campus benefits from its close proximity to Palamanui. These benefits include convenient pedestrian access between the campus core and the Palamanui Village Town Center and shorter utility runs. In addition, noisier educational programs could be assigned to the lower campus, where its isolation would minimize impacts to the other instructional programs.

Alternative Campus Site Plan A has two drawbacks. First, due to its farther distance from Palamanui, development of the lower campus will require longer utility lines and will incur higher infrastructure costs. Second, the distance from the lower campus to the upper campus and the Palamanui Village Town Center may discourage pedestrian access.

4.1.2 Alternative Campus Site Plan B

Alternative Campus Site Plan B (see Figure 20) consists of ten (10) one-story buildings and two (2) two-story buildings covering 26.7 acres. Of the three (3) alternatives developed, Alternative B is the most restrictive. The entire campus is developed within the 28.5-acre area above Preserve 2. There is no development within either the Open Zone or the 50-meter archaeological buffer. Furthermore, there is no development within the 8.5-acre area below Preserve 2 because it is inaccessible from either Main Street Road or from the upper portion of the proposed site.

Alternative B also shows the incremental development of the 750, 1,500 and 3,000 FTES campuses. The 750 FTES campus covers a land area of thirteen (13) acres, which represents approximately 45.6 percent of the total 28.5-acre developable area. The 1,500 FTES campus requires 23.8 acres or 83.5 percent of the developable area to accommodate nine (9) one-story buildings and 756 parking stalls. To increase the number of parking stalls, the western parking lot is expanded to twice its initial size, and another two parking areas are added on the eastern and southeastern ends of the campus. The internal roadway also is extended to encircle the

major functional facilities except for the Culinary Arts Building and the amphitheater. Despite providing a convenient vehicular access to all buildings, the perimeter roadway concept has one critical drawback, which is the disruption of the pedestrian connection between the campus core and the Palamanui Village town Center. The perimeter roadway cuts across the pedestrian mall that links the plaza to the campus core and could result in potential conflicts between vehicles and pedestrians. The 3,000 FTES campus uses approximately 26.7 acres or about 94 percent of the developable area to accommodate 12 buildings and 680 parking stalls. However, due to the most restrictive site planning criteria, this alternative has two (2) major shortcomings. First, two (2) Instructional buildings, located on the eastern end of the campus core, would have to be two-stories in order to meet the space requirements identified in the 2008 Ed Specs. Construction of multiple-story buildings could result in higher costs as compared to a single-story building. Second, the number of parking stalls provided by this alternative does not meet the requirements for the 3,000 FTES campus and is deficient by 820 stalls.

4.2 No Action

Lack of a permanent facility for higher education in West Hawai'i would inhibit the growth and development of higher education programs in the region. The present temporary facilities at Kealakekua have several shortcomings that would be mitigated by the construction of new and permanent facilities for the UHCWH. These shortcomings include:

- 1) The location of the facilities is not centrally located within the West Hawai'i region;
- 2) The present site does not convey the proper image of a higher education institution;
- 3) The existing space is under-sized, especially the classrooms; and there is a lack of space for meetings and support activities;
- 4) The classrooms are not sound-proof (i.e. some classroom doors cannot be closed during use); and
- 5) Lease rent is being paid because the land and facilities are not owned by the State of Hawai'i.
- 6) Current facilities do not provide room for expansion of the educational program.

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5.0 FINDINGS AND DETERMINATIONS

According to the State Department of Health Rules (HAR 11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment. Project actions include all phases of the project. Expected consequences include direct and indirect effects, short-and long-term effects, and cumulative impacts taken in consideration with other projects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impacts will occur.

The University of Hawai'i, Office of Capital Improvements has determined that the Proposed Action—development of the new UHCWH at Kalaoa—requires the preparation of a Supplemental Environmental Impact Statement based on the significance criteria. Reasons supporting this determination are discussed below.

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

Resources such as fossil fuels and construction materials would be irrevocably committed for the construction of a permanent University Center in Kalaoa.

The pristine lands that would be developed for the University Center can never be returned to their pristine state. The natural vegetation at the site would be cleared and/or replaced with landscaping as a result of project actions. However, biological studies have shown that there are no plants which are candidate, proposed, or listed, threatened or endangered species as set forth in the Endangered Species Act of 1973. Also, endangered bird and bat species may over-fly the project area, but there are no food sources for these endangered species that would create a habitat for them in the project area.

Relocation of the campus core to the northwestern corner of the project area puts the Proposed Action within close proximity to lava tubes known to contain human burials and possible ceremonial sites. Discussions have been initiated with SHPD and the Hawai'i Island Burial Council to address any concerns or issues relative to the Proposed Action. It is anticipated that with development of a burial treatment plan, compliance with the HPP, and adherence to the buffer areas around the archaeological preserves, archaeological and cultural resources should be sufficiently protected. As such, it is expected that no irrevocable loss or destruction of cultural resources would occur as a result of the Proposed Action.

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

The proposed site is presently undeveloped, and construction of the UHCWH would not curtail the range of beneficial uses of the environment.

- (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 established in Chapter 344, HRS.

- (4) *Substantially affects the economic or social welfare of the community or state.*

Implementation of the Proposed Action will substantially affect the economic welfare of the surrounding community and the State of Hawai'i. The affects will for the most part be beneficial as the Proposed Action will simulate economic activity during construction and provide jobs for faculty and staff in the long-term. Further, the Proposed Action will provide a much-needed permanent higher education facility in the West Hawai'i region, which in turn will provide educational opportunities and a higher-skilled workforce.

- (5) *Substantially affects public health.*

Implementation of the Proposed Action would not affect public health.

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

The Proposed Action will have a positive secondary impact on population. By providing opportunities for educational, professional and personal development, the UHCWH will enhance educational levels and job skills leading to increased employment opportunities, thereby spurring the economy.

The Proposed Action could potentially impact traffic and roadways in the region. A traffic study is being conducted for the Proposed Action. Results of the traffic study including any potential impacts and mitigation measures will be presented in the forthcoming Draft SEIS.

- (7) *Involves a substantial degradation of environmental quality.*

Unavoidable short-term construction related impacts have been discussed in Chapters 3.0 of this document and mitigation measures proposed. In the long-run, the Proposed Action is not expected to involve a substantial degradation of environmental quality.

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

The Proposed Action is not likely to have cumulative effects on the environment, nor will it involve a commitment for larger actions.

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

The Proposed Action is not likely to substantially affect rare, threatened or endangered species or their habitats.

A faunal resources impact assessment is being prepared in conjunction with the Draft SEIS to assess the direct, indirect, and cumulative environmental impacts associated with the proposed project.

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

Short-term and temporary impacts to air quality and the acoustical environment are anticipated. These impacts generally are unavoidable and necessary for construction. Mitigation measures will be employed to control and reduce unavoidable impacts. Short-term, construction-related impacts to water quality are not expected. The overall long-term water quality, air quality, and noise quality impacts resulting from the Proposed Action are expected to be minimal.

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

The project area is located at the foot of Mt. Hualālai and is located in Lava Flow Hazard Zone 4. Lava flow hazard zones are numerically ranked based on the probability of coverage by lava flows, with "1" posing the greatest hazard and "9" posing the least. Additionally, the entirety of the West Hawai'i region lies within an earthquake zone (UBC Seismic Zone 3).

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

The one-story and possibly two-story profile of the UHCWH buildings is not anticipated to obstruct view planes either from within the project area or from without.

(13) *Requires substantial energy consumption.*

In the short-term construction activities will increase energy consumption in the area. In the long-term, energy consumption also would be increased. Maintenance of the UHCWH requires electrical power for lighting, cooling, and operation of equipment. However, while the UHCWH has yet to be designed, it is fully intended that it would incorporate design strategies that are responsive to the local climate and existing site conditions. Strategies under consideration include the use natural ventilation and daylighting, use of renewable energy solutions such as photovoltaics, the use of locally available materials, and adapting the buildings to the site topography to reduce the amount of grading and excavation necessary. Cumulatively, these strategies, if employed, could result in higher building performance, lower maintenance and operation costs, and reduced demand for energy.

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6.0 REFERENCES

- Armstrong, R.W. (Ed.). 1983. *Atlas of Hawai'i, Second Edition*.
- B.D. Neal & Associates. 1990. *Air Quality Study for the Proposed O'oma Project, North Kona, Hawai'i*. November. (Cited in HHF, 1993.)
- Belt Collins Hawai'i, Ltd. 2004, February. *Palamanui Civil Infrastructure*.
- Belt Collins Hawai'i, Ltd. 2005, January. *Hawaii Electric Light Company, Inc. Keahole Generating Station and Airport Substation Urban Reclassification*.
- Bruner, Philip L. 1992, October. *Survey of the Avifauna and Feral Mammals on State-Owned Lands in the Kailua to Keahole Region, North Kona, Hawai'i*. (Cited in HHF, 1993.)
- Char Associates. 1992 September. *Botanical Survey: West Hawai'i Boundary Review, Kailua to Keahole Region, North Kona, Hawai'i*. (Cited in HHF, 1993.)
- CH2M Hill. 1992, December. *Draft Environmental Impact Statement: Keahole Generating Station Expansion, North Kona, Hawai'i*. (Cited in HHF, 1993.)
- Cleghorn, Paul L., Ph.D. & Pacific Legacy, Inc. 1998, May & October. *Archaeological Investigations for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island*.
- Cleghorn, Paul L., Ph.D. & Pacific Legacy, Inc. 2000, July. *Conceptual Historic Preservation Plan for the Proposed University Center at West Hawai'i, North Kona, Hawai'i Island*. Prepared for Wil Chee – Planning, Inc.
- County of Hawai'i. 2005, February. County of Hawai'i General Plan.
- County of Hawai'i Ordinance No. 06 105. An Ordinance Amending Section 25-8-3 (North Kona Zone Map), Article 8, Chapter 25 (Zoning Code) of the Hawai'i County Code 1983 (2005 Edition), by Changing the District Classification from Agricultural (A-3A) and Open to Project District (PD) at Kau, North Kona, Hawai'i, Covered by Tax map Key 7-2-5:1. Approved July 17, 2006.
- David, Reginald E. and Eric B. Guinther. 2000, April. *Faunal survey of Terrestrial Species within the Proposed University of Hawai'i Center at West Hawai'i Site, North Kona, Hawai'i*.
- DPD Associates, 1992. *University of Hawaii at Hilo, West Hawaii Campus Site Assessment Study*.

- Fukunaga & Associates, Inc. 1994, November. *North Kona Water Master Plan (Draft Report)*.
- Gagne W.C. and L.W. Duddihy. 1990. Vegetation, pp. 45-114 in: W.L. Wagner, D.R. Herbst, and S.H. Sohmer. *Manual of the Flowering Plants of Hawai'i*. Honolulu, HI: University of Hawai'i Press and Bishop Museum Press. Bishop Museum Special Publication 83. (Cited in Herbst, 1998).
- Garcia, Michael. 2004. *Volcanic Hazards at the HELCO Generating Station, North Kona, Hawaii*. Volcano, HI: Geohazards Consultants International, Inc.
- Geolabs-Hawaii. 1998, June. *Preliminary Geotechnical Engineering Exploration: Proposed University of Hawai'i Center at West Hawai'i, Hawai'i Community College, Long-Range Development Plan, Kalaoa, North Kona, Hawai'i*.
- Group 70 International, Inc. 2004, September. *Final Environmental Impact Statement for Palamanui, A Project by Hiluhilu Development, North Kona, Hawaii Tax Map Key: 3-7-2-05:01*.
- Hawai'i Campus Developers. 2008, September. *Update 1998 Education Specifications, Final Report*. Prepared for Hawai'i Community College, University of Hawai'i Center at West Hawai'i.
- Hawaii Design Associates, Inc. 1998, November. *Estimated Irrigation Water Demand*.
- Helber Hastert & Fee, Planners (HHF). 1993, July. *Final Environmental Impact Statement: Urban Expansion of State Lands, Keahole to Kailua Region, North Kona, Hawai'i*.
- Heliker, C.C. 1990. *Volcanic and Seismic Hazards on the Island of Hawai'i*.
- Herbst, Derral R., Ph.D. 1998, March 27. *Botanical Survey for the University of Hawai'i Center at West Hawai'i (UHCWH), Hawai'i Community College Long Range Development Plan (LRDP), Island of Hawai'i, Hawai'i*.
- Juvik & Juvik. 1998. *Atlas of Hawai'i. Third Edition*. Honolulu, HI: University of Hawai'i Press.
- KPMG Peat Marwick. 1987. *Noise Compatibility Program, Keahole Airport, Hawai'i*. November. (Cited in HHF, 1993.)
- Macdonald, Abbott & Peterson. 1983. *Volcanoes in the Sea*. Honolulu, HI: University of Hawai'i Press.
- National Weather Service, Pacific Region, 1982. *"Average Annual Rainfall"* (in Armstrong, 1983).

- Okahara and Associates, Inc. 1998, November 19. "Water Demand Calculations."
- Paul H. Rosendahl, Ph.D., Inc. 1993, July. *Archaeological Assessment Study, Kailua to Keahole Region States Lands*, LUC Project.
- Paul H. Rosendahl, Ph.D., Inc. 1993, July. *Archaeological Inventory Survey, Kailua to Keahole Region States Lands*, LUC Project-500-Acre University Site.
- PBR Hawaii & Associates, Inc. (PBR). 2008, July. *Palamanui Waterline, 343-foot Elevation Reservoir & Main Street Collector Road Extension Final Environmental Assessment*.
- Phillip Rowell and Associates. 2006. *Traffic Impact Analysis Report for Main Street Collector Road*. Prepared for Wil Chee - Planning, Inc.
- R. M. Towill Corporation. 1989. *Keahole to Kailua Development Plan*.
- State of Hawai'i, Department of Business, Economic Development and Tourism (DBEDT). 1998. *The State of Hawaii Data Book, 1997: A Statistical Abstract*.
- State of Hawai'i, Department of Business, Economic Development and Tourism (DBEDT). 1998. *Fifth Annual Report for LUC Docket No. BR92-685 Office of State Planning/Keahole to Kailua State Lands*. December 31.
- State of Hawai'i, Department of Land and Natural Resources (DLNR). 1993. *Memorandum of Understanding (MOU) for State Water Development and Water System Improvements to Support State Projects, North Kona, Hawaii*.
- University of Hawai'i, Hawai'i Community College (HawCC). 1997, September. *University of Hawai'i Center: West Hawai'i Development Plan, 1998-2007*.
- University of Hawai'i, Hawai'i Community College (HawCC). 2006a, July. *Hawai'i Community College, University of Hawai'i: Institutional Self-Study in Support of Reaffirmation of Accreditation*.
- University of Hawai'i, Hawai'i Community College (HawCC). 2006b, November. *Hawai'i Community College UH Center – West Hawaii Unit Review Report November 13, 2006 Assessment, Period: July 1, 2003 to June 30, 2006*.
- Educational Needs Assessment. (Cited in HawCC, 1997).
- U.S. Department of Agriculture, Soil Conservation Service (SCS). 1973. *Soil Survey of Island of Hawai'i, State of Hawai'i*. Washington D.C.: Government Printing Office.

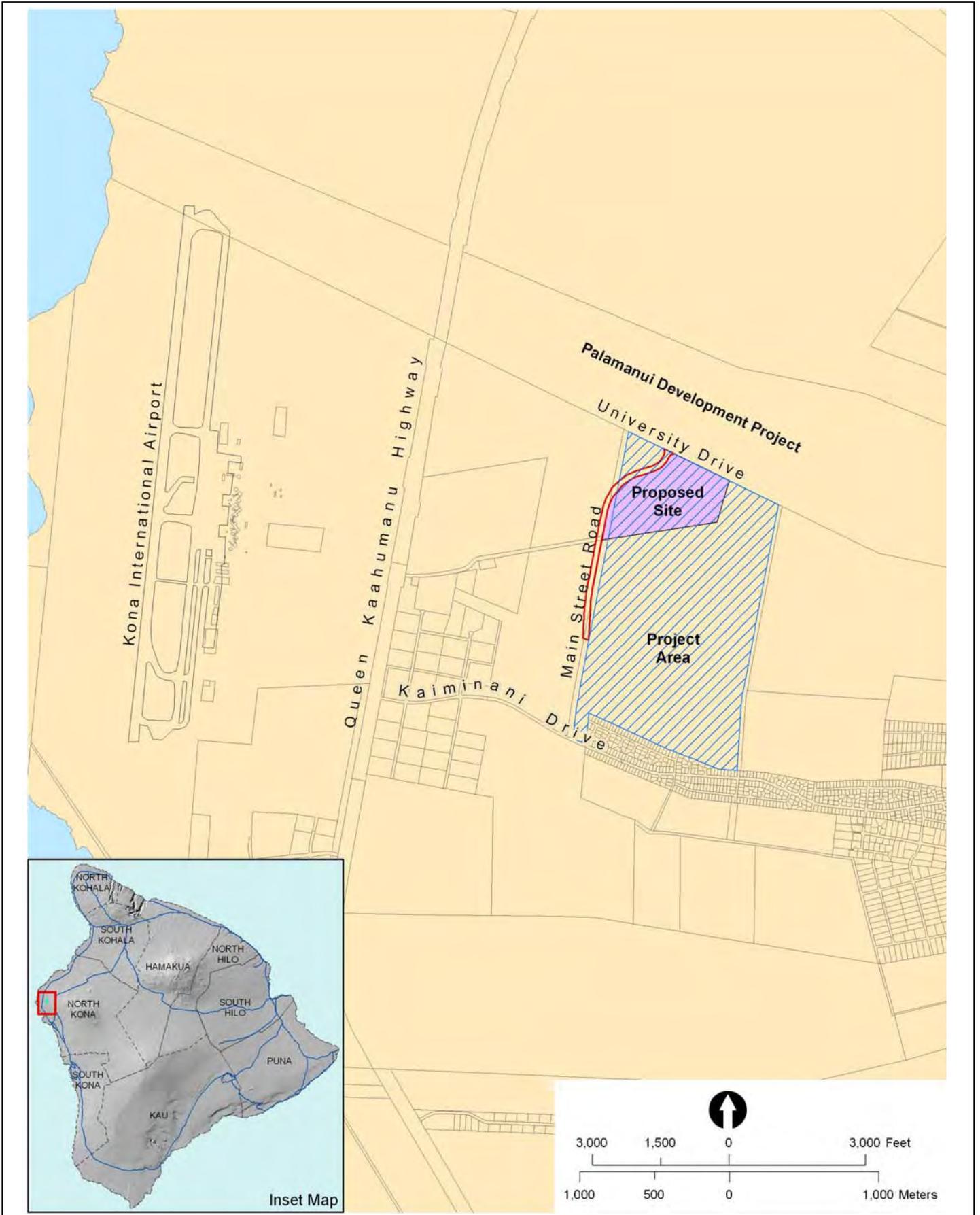
- U.S. Geological Survey (USGS). 2000. *Volcanic Air Pollution - A Hazard in Hawaii*. U.S. Department of the Interior, U.S. Geological Survey, USGS Fact Sheet 169-97, version 1.1.
- Waimea Water Services, Inc. 2003, June. *Groundwater Resources of Kau, North Kona, Hawaii. A Water Study for Hiluhilu Development, LLC*.
- Wil Chee - Planning, Inc. 1998, July. *University of Hawai'i Center at West Hawai'i: Educational Specifications*.
- Wilson Okamoto Corporation. 2008, May. *Mapping Kona's Future, Kona Community Development Plan, Volumes 1 and 2*. Prepared for the County of Hawai'i Planning Department.
- Wyss and Koyonagi. 2006. *2006 Kiholo Bay, Hawaii Earthquake, a RMS Event Report*.

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Tao Feng	Wil Chee – Planning, Inc.	Planner
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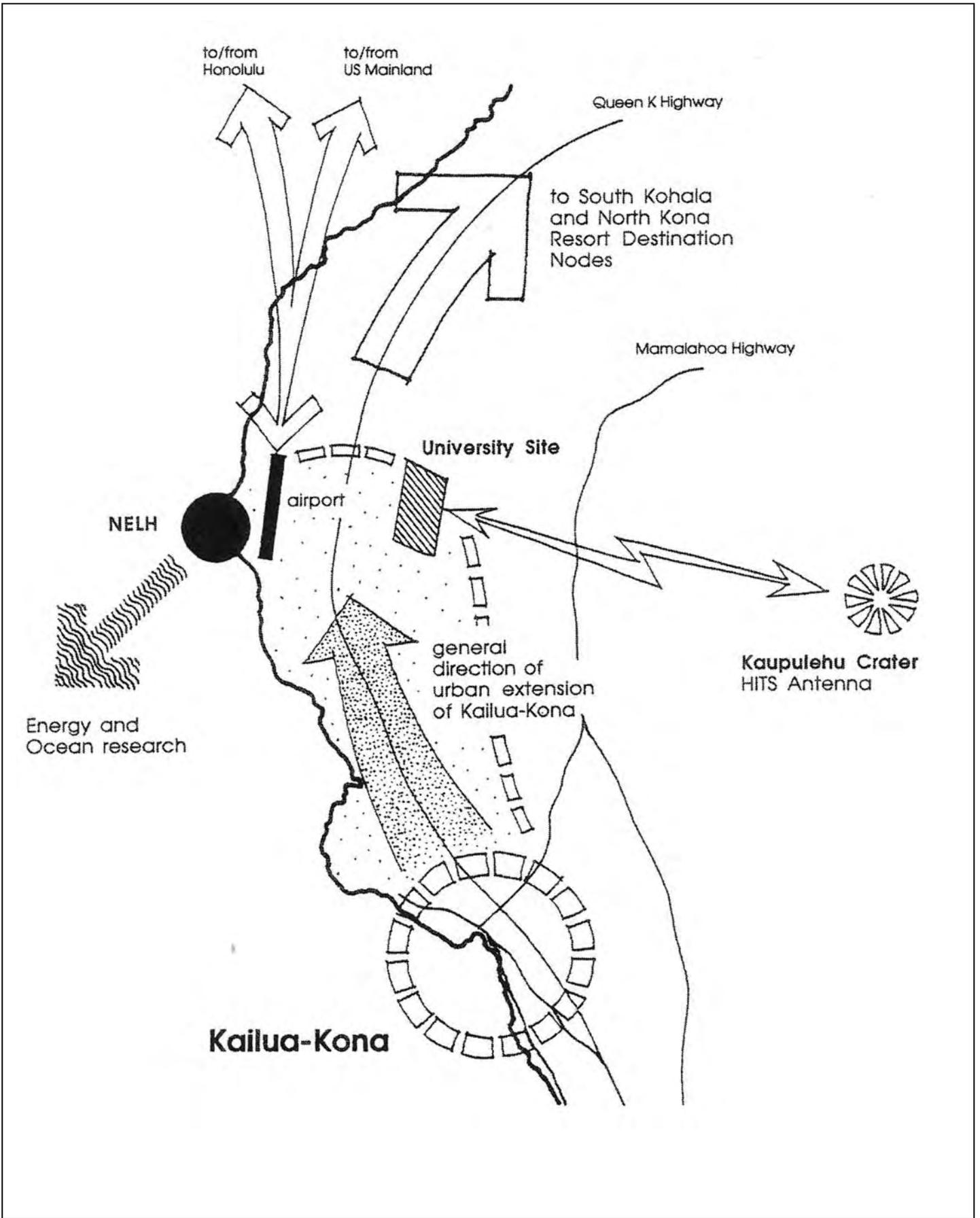
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8.0 FIGURES



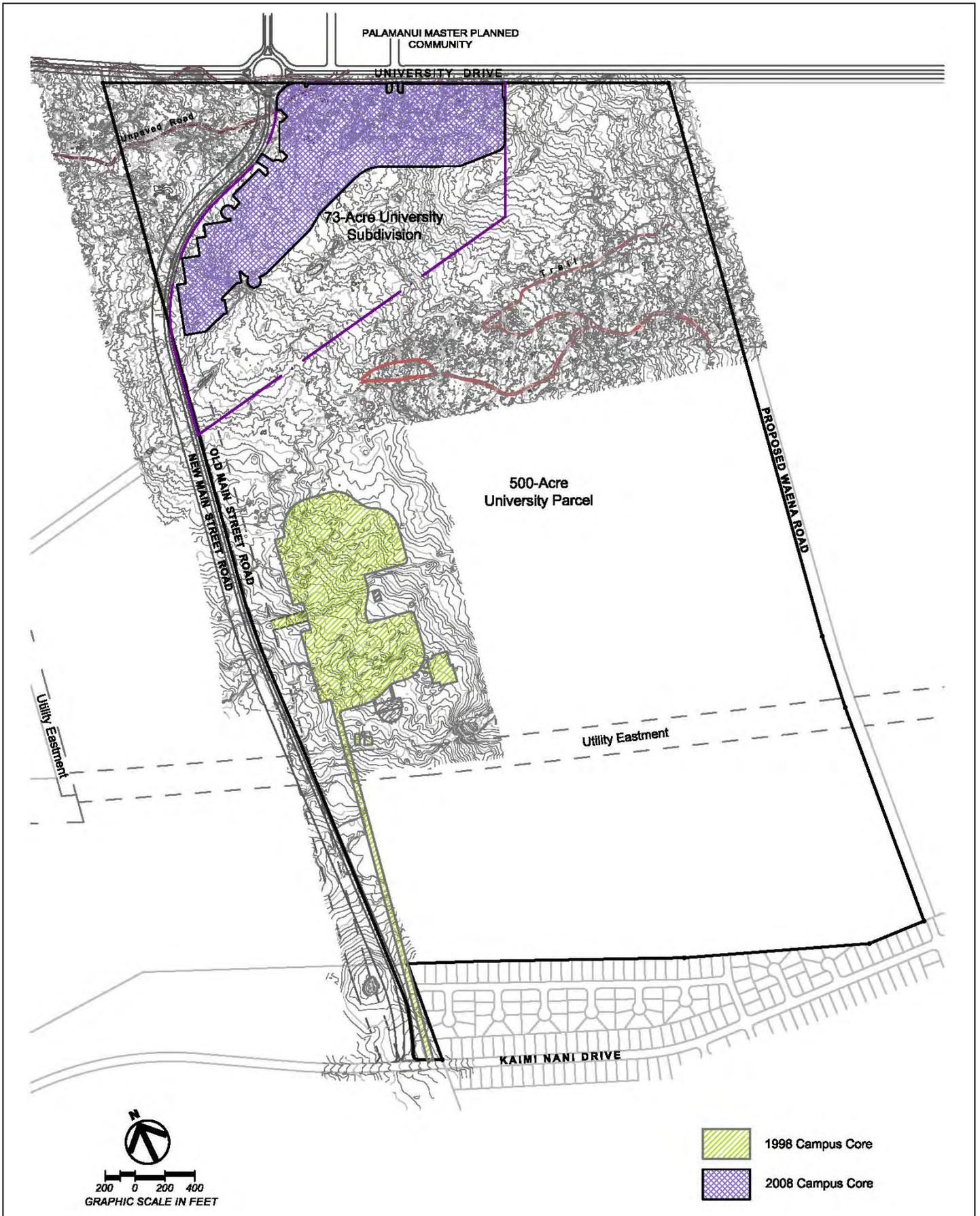
Location Map

Figure 1



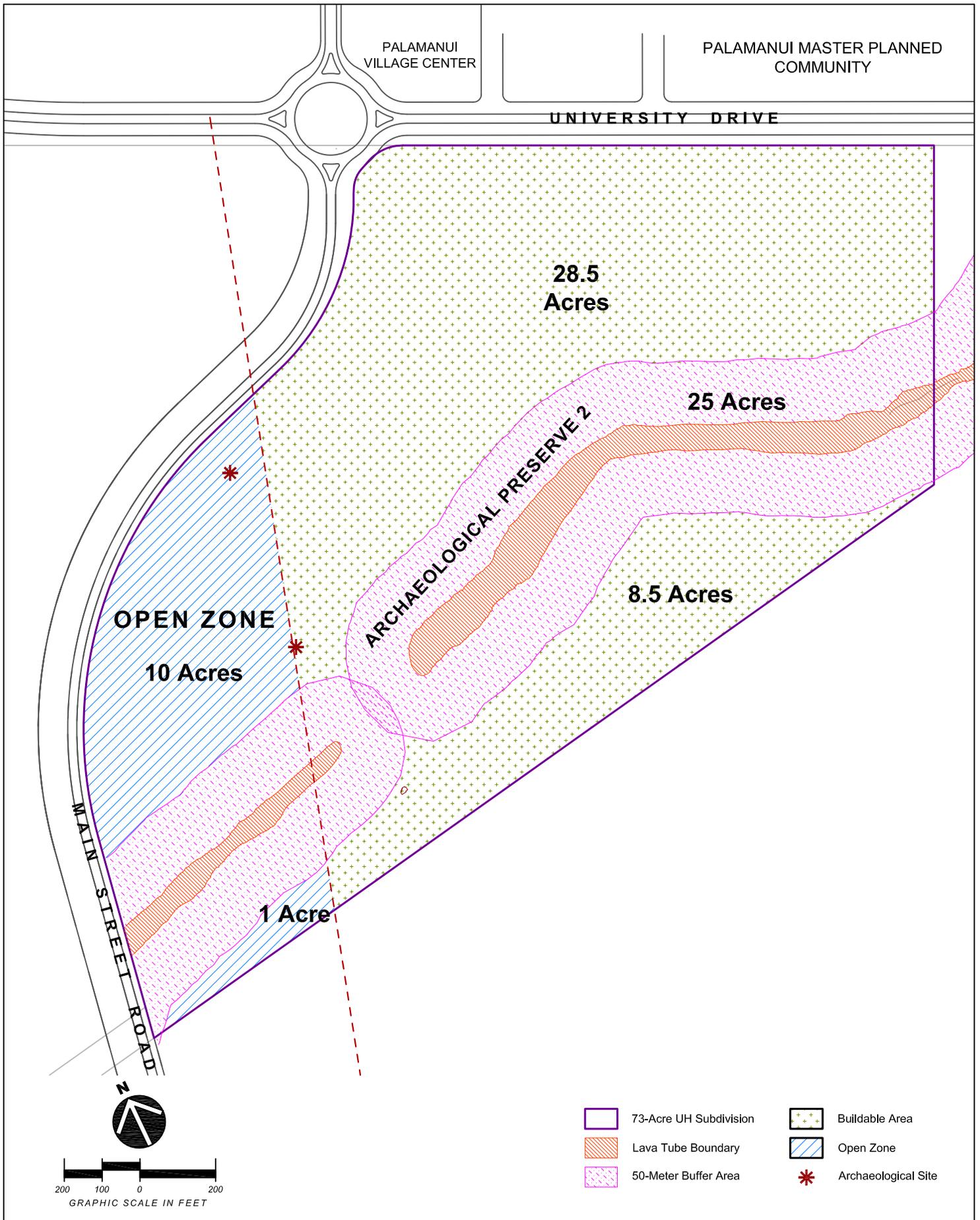
Regional Significance

Figure 2



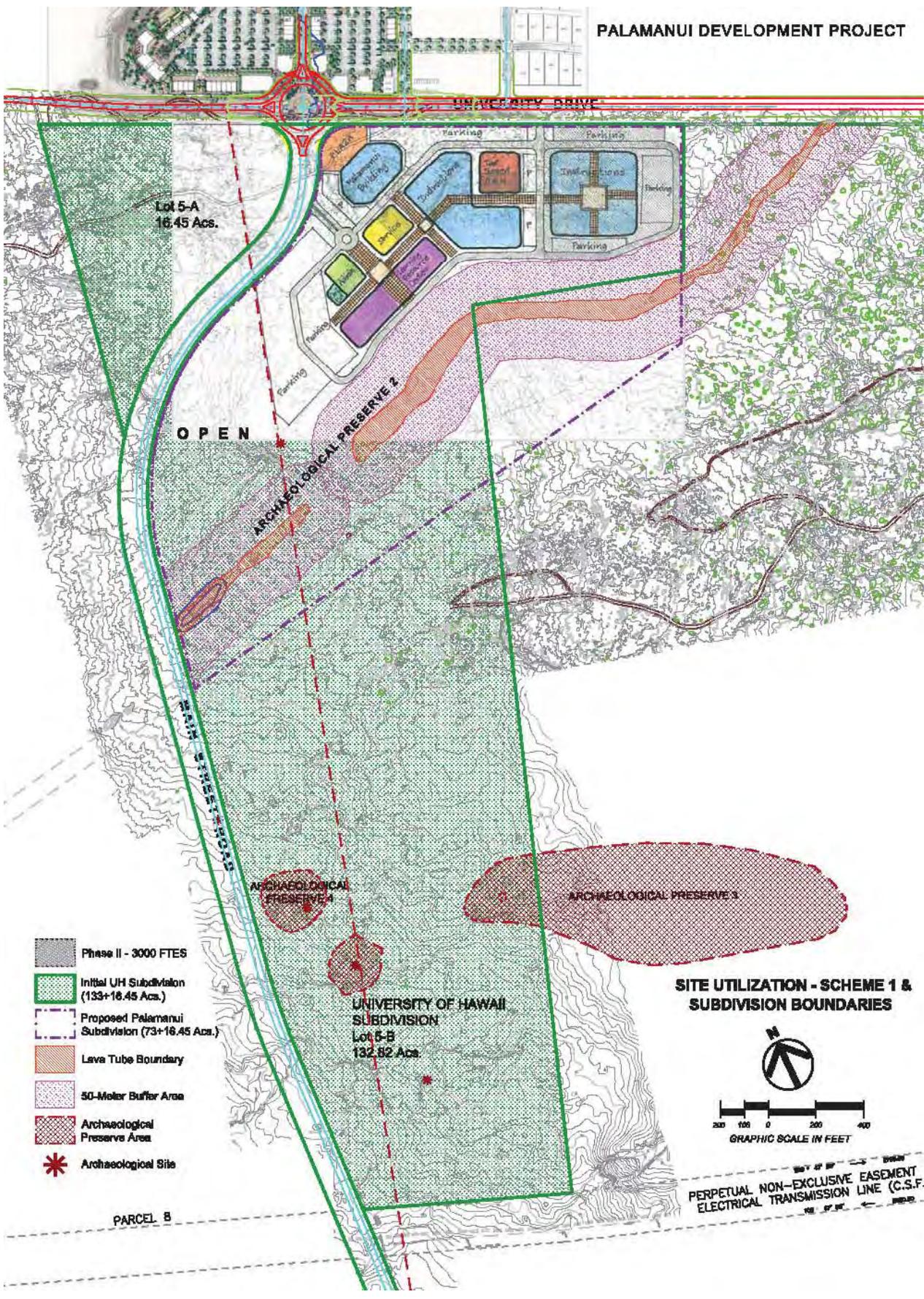
Change in Campus Core Location

Figure 3



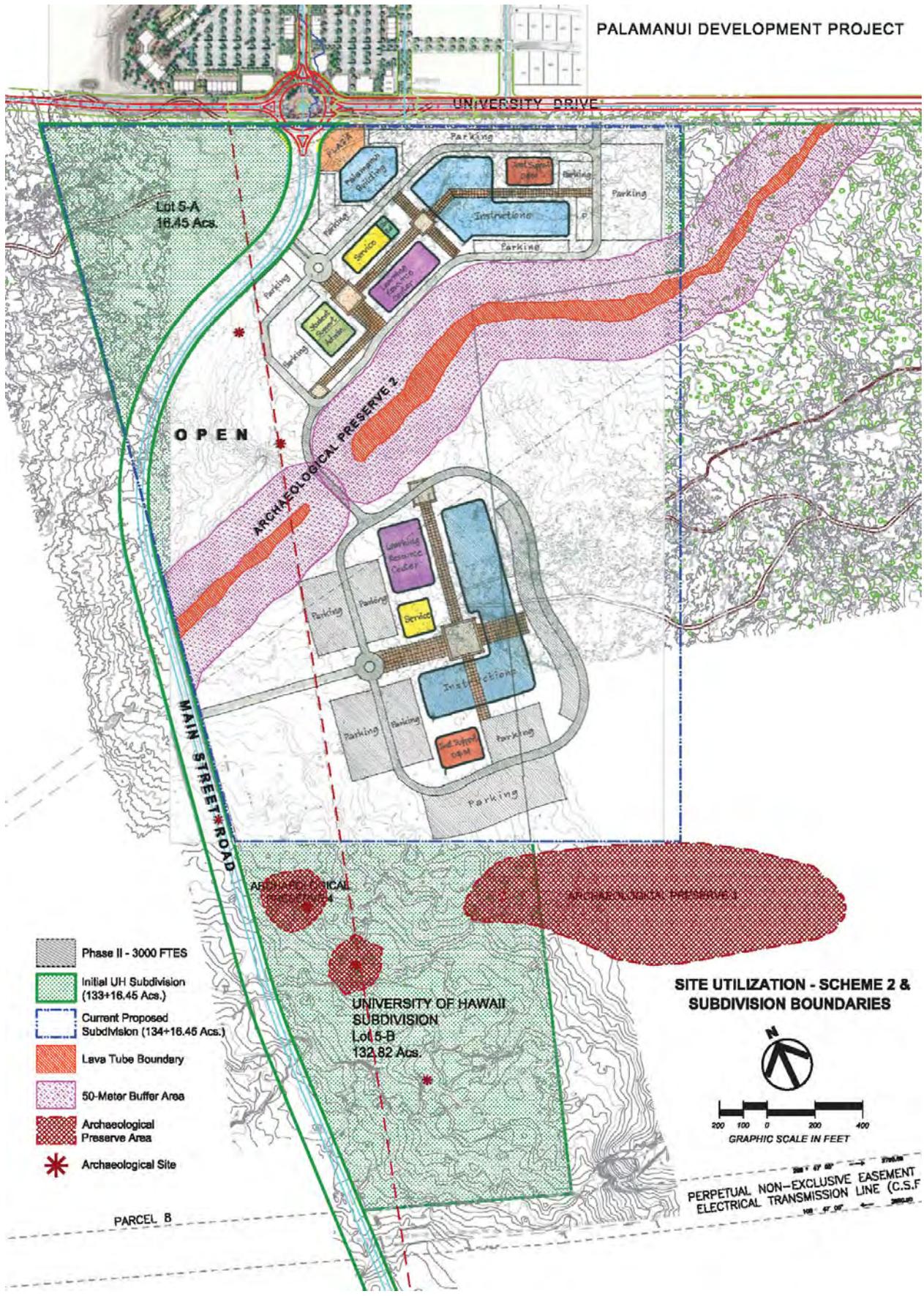
Site Constraints

Figure 4



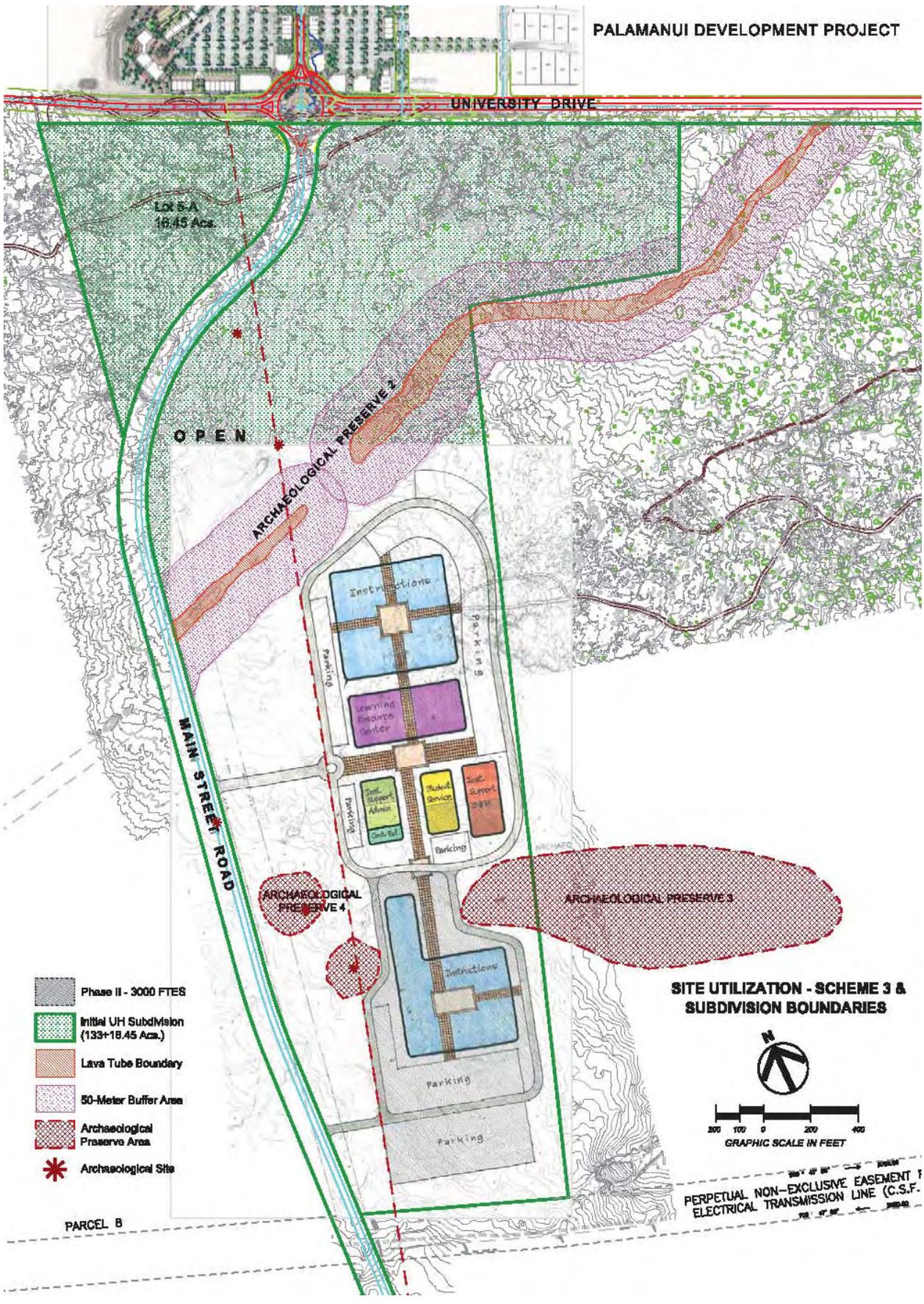
Site Utilization Scheme 1

Figure 5



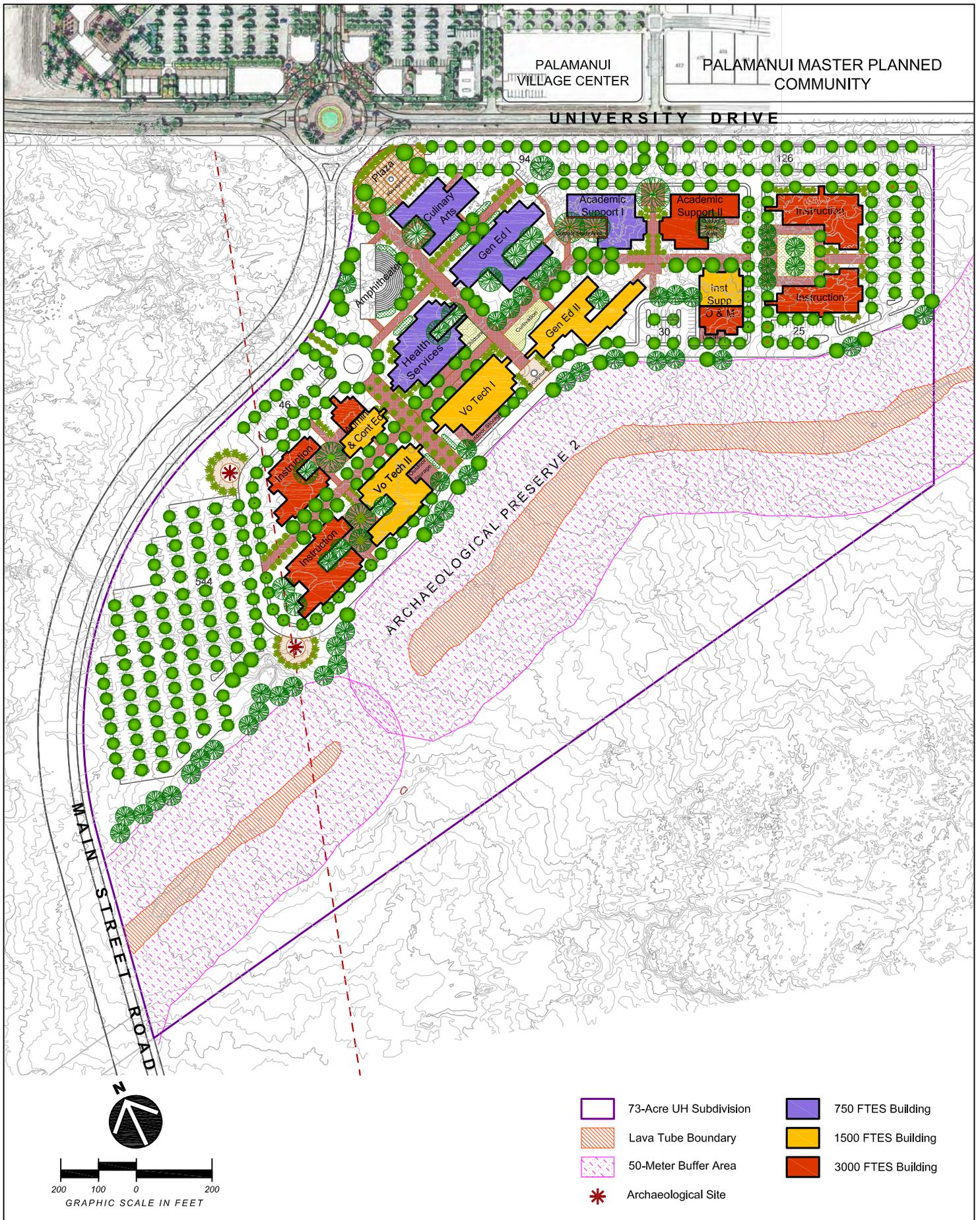
Site Utilization Scheme 2

Figure 6



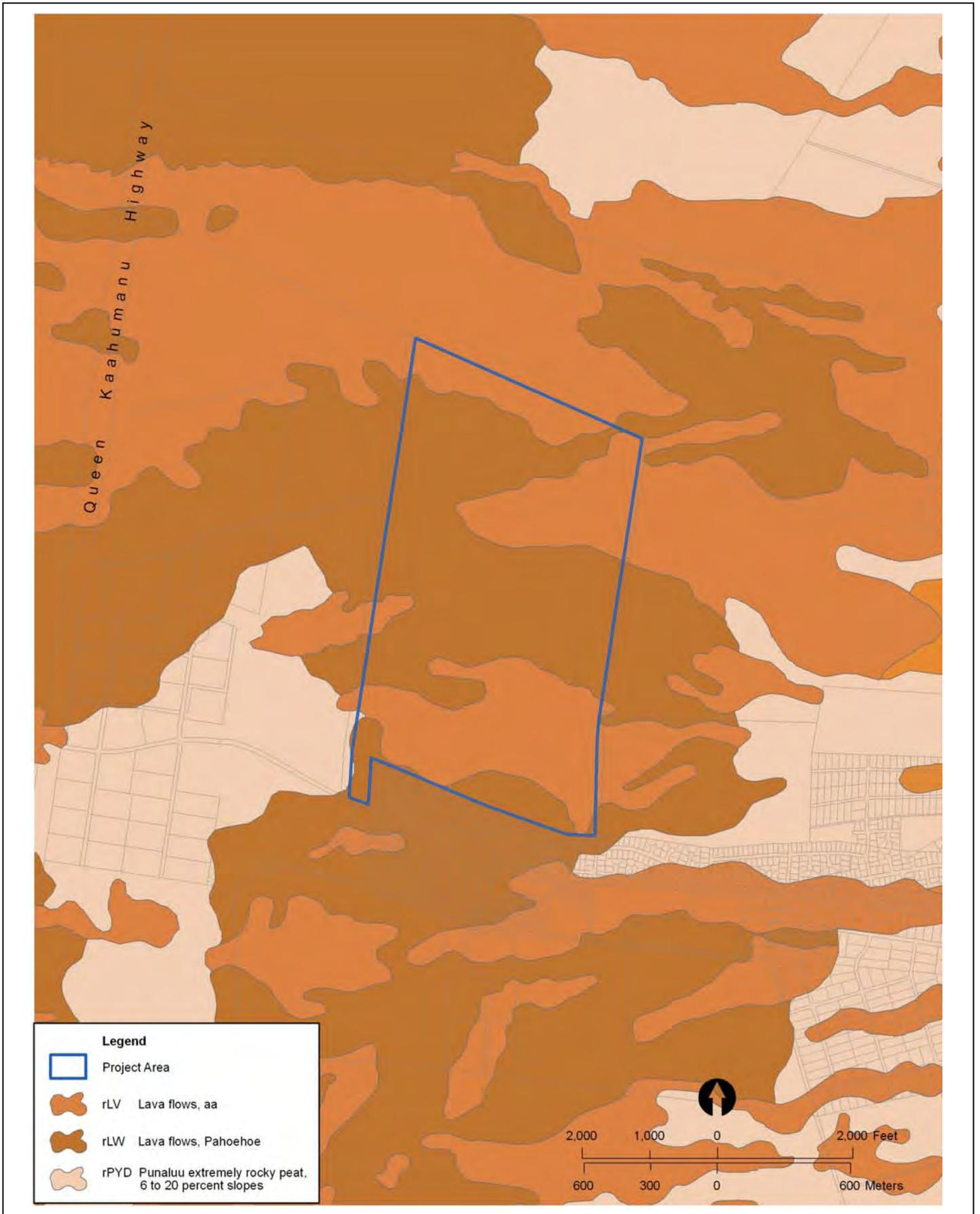
Site Utilization Scheme 3

Figure 7



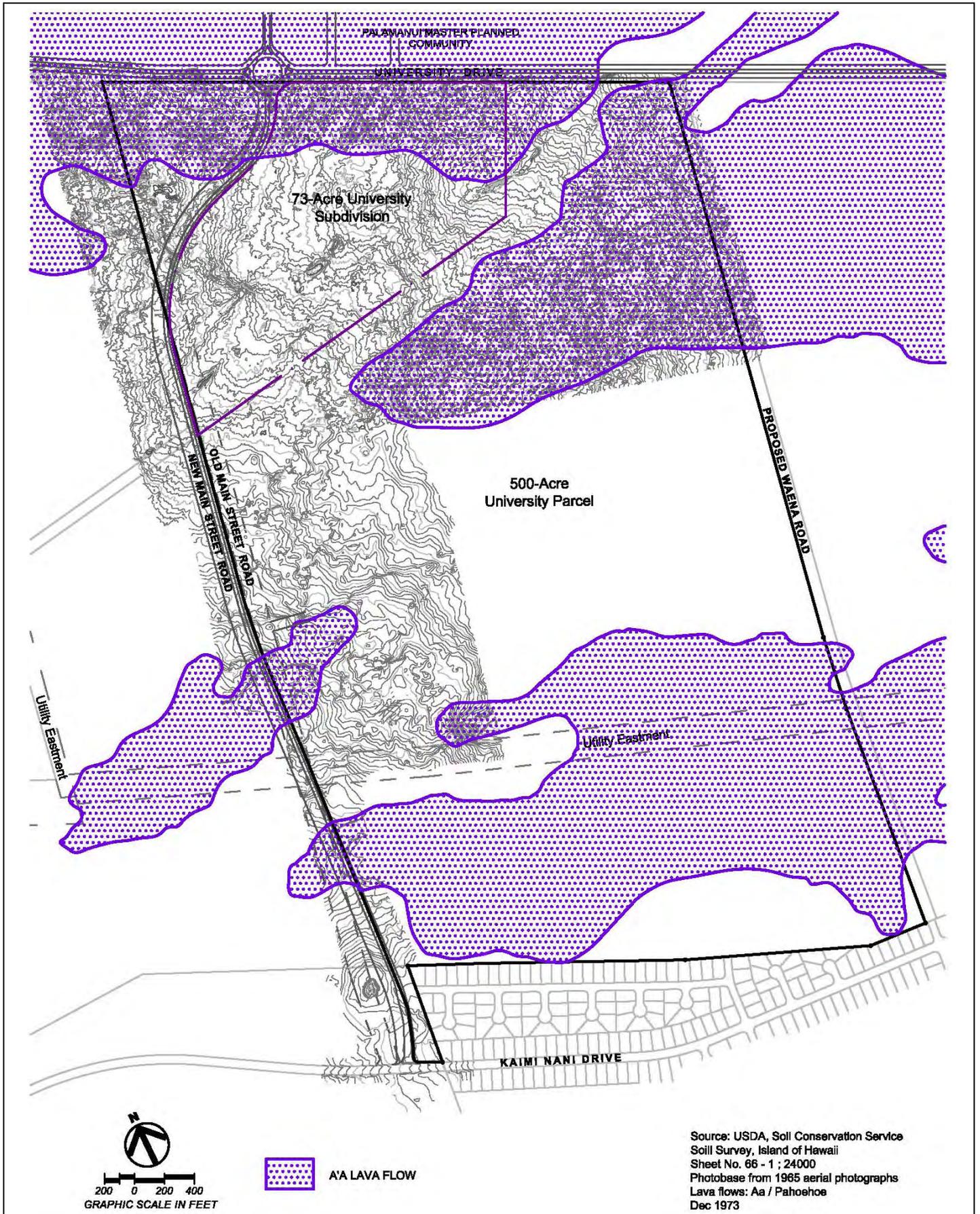
Preferred Campus Site Plan

Figure 8

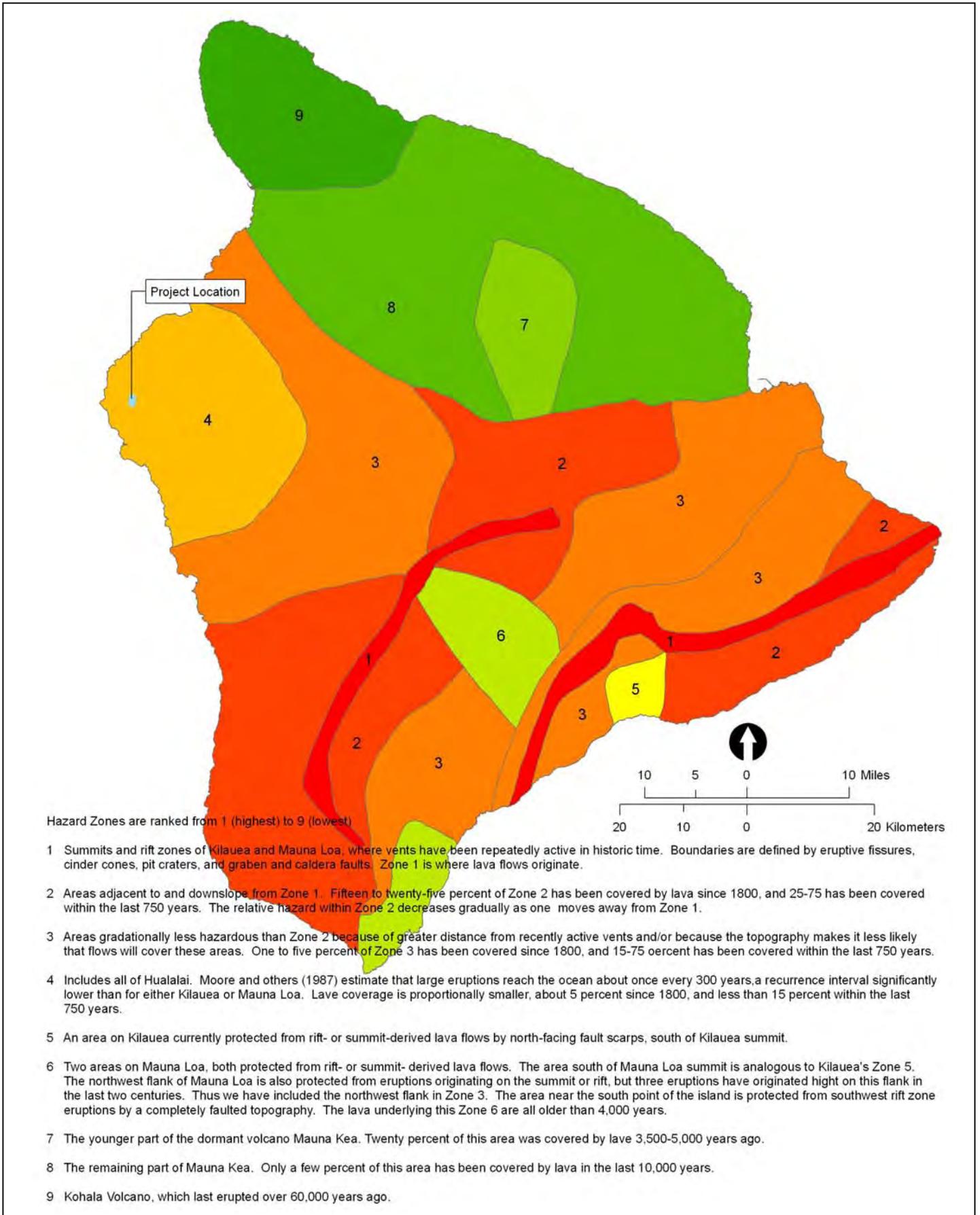


Soil Classifications

Figure 9

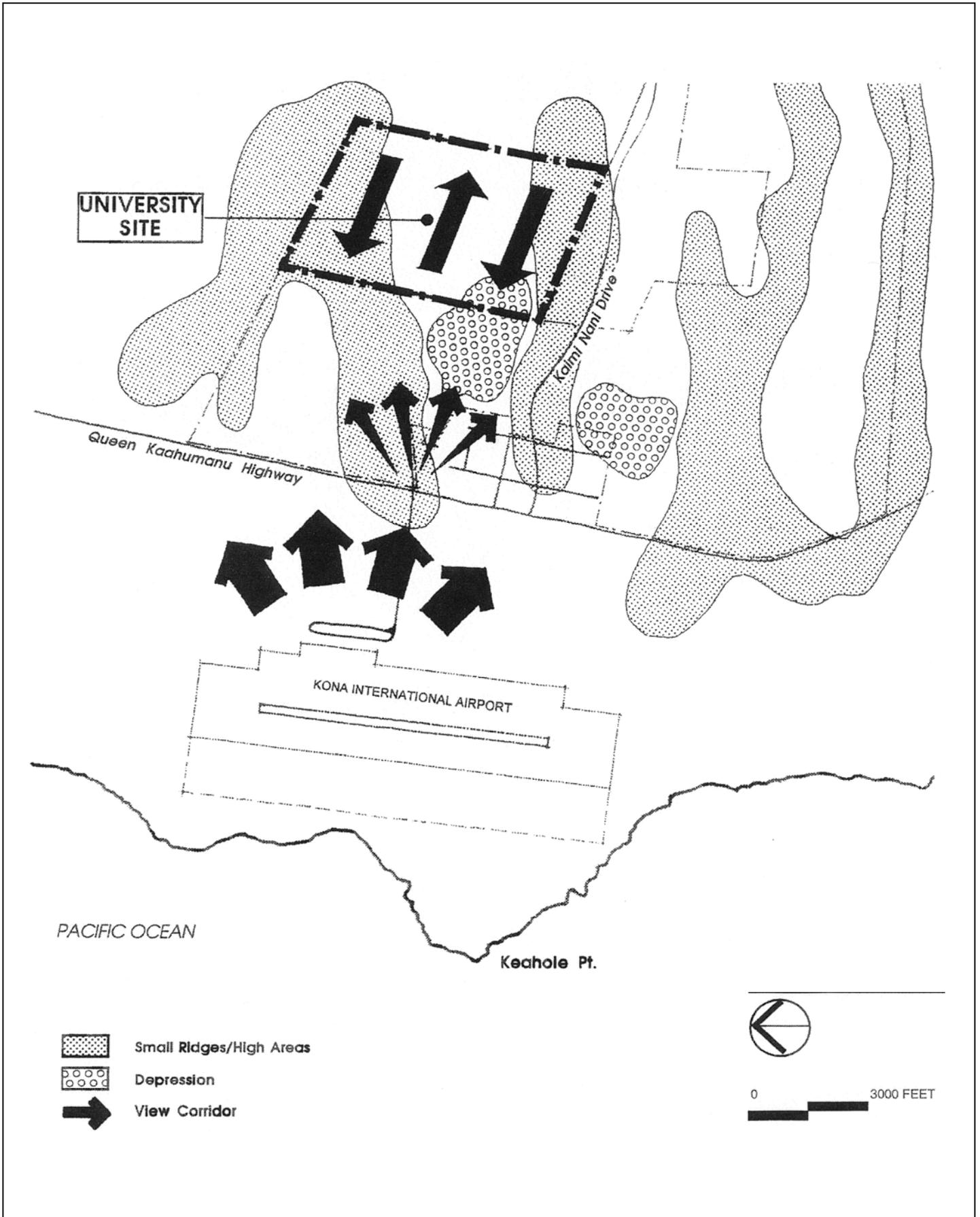


Topography and Lava Flows



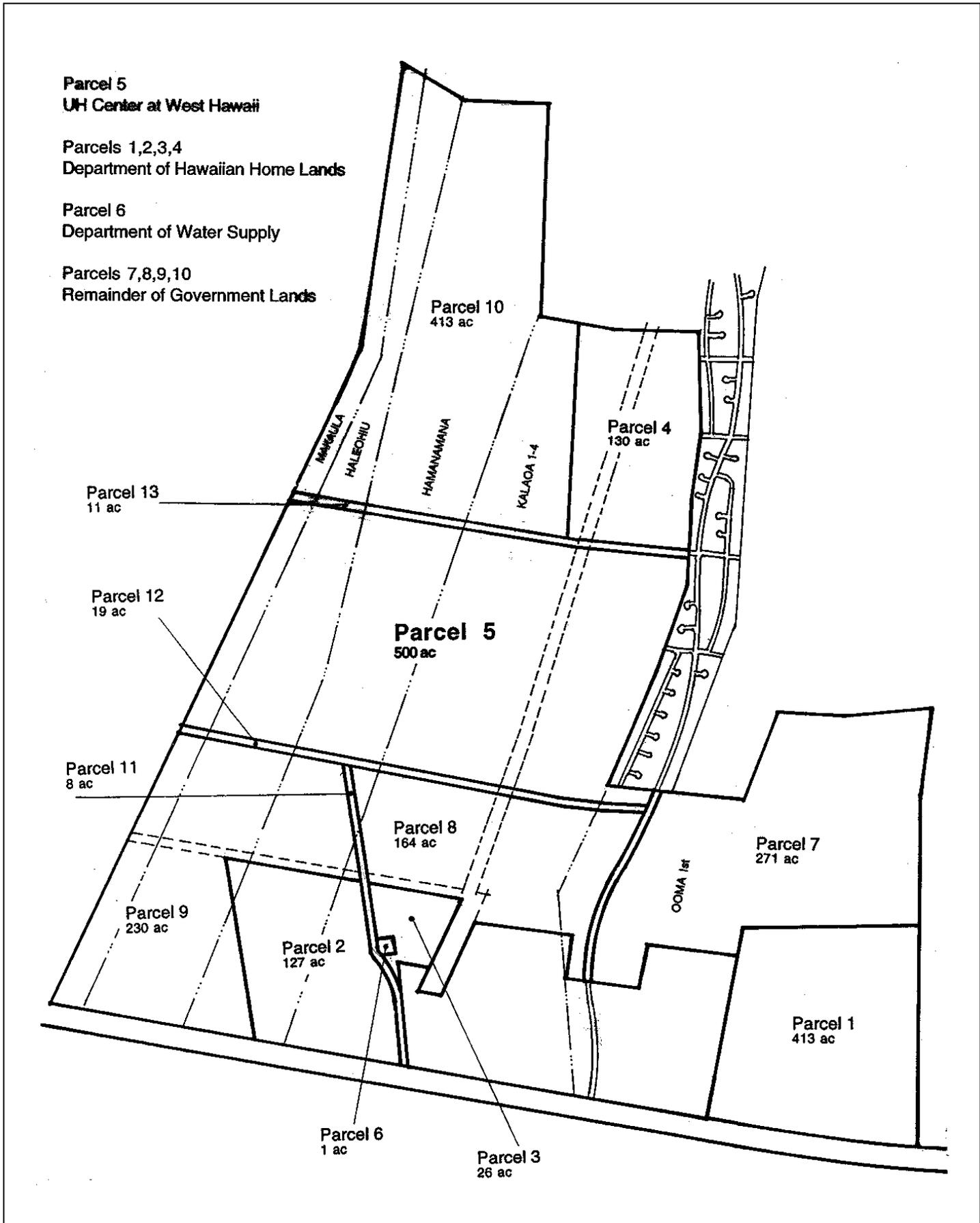
Lava Hazard Zones

Figure 11



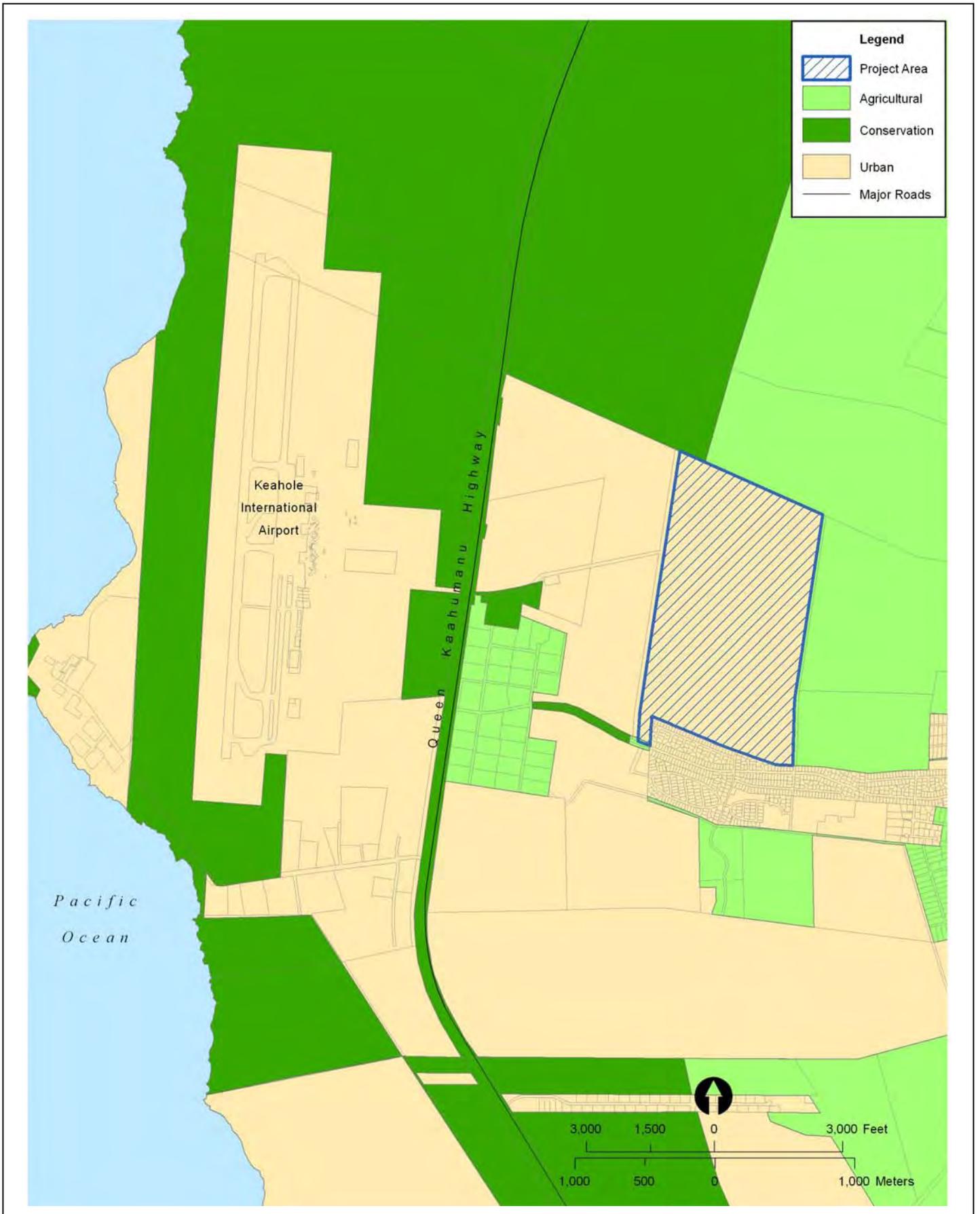
View Planes

Figure 13



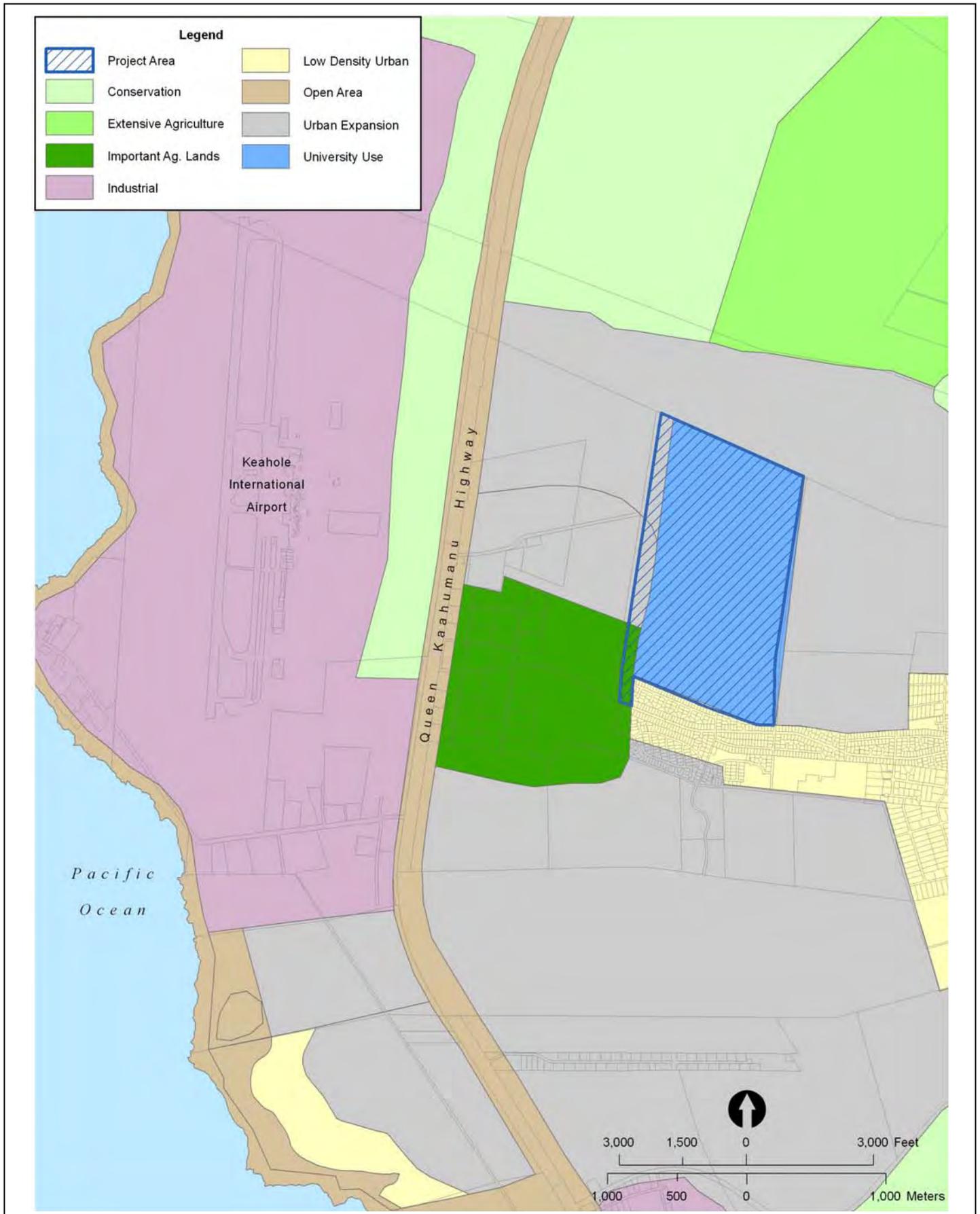
Subdivision of State Lands

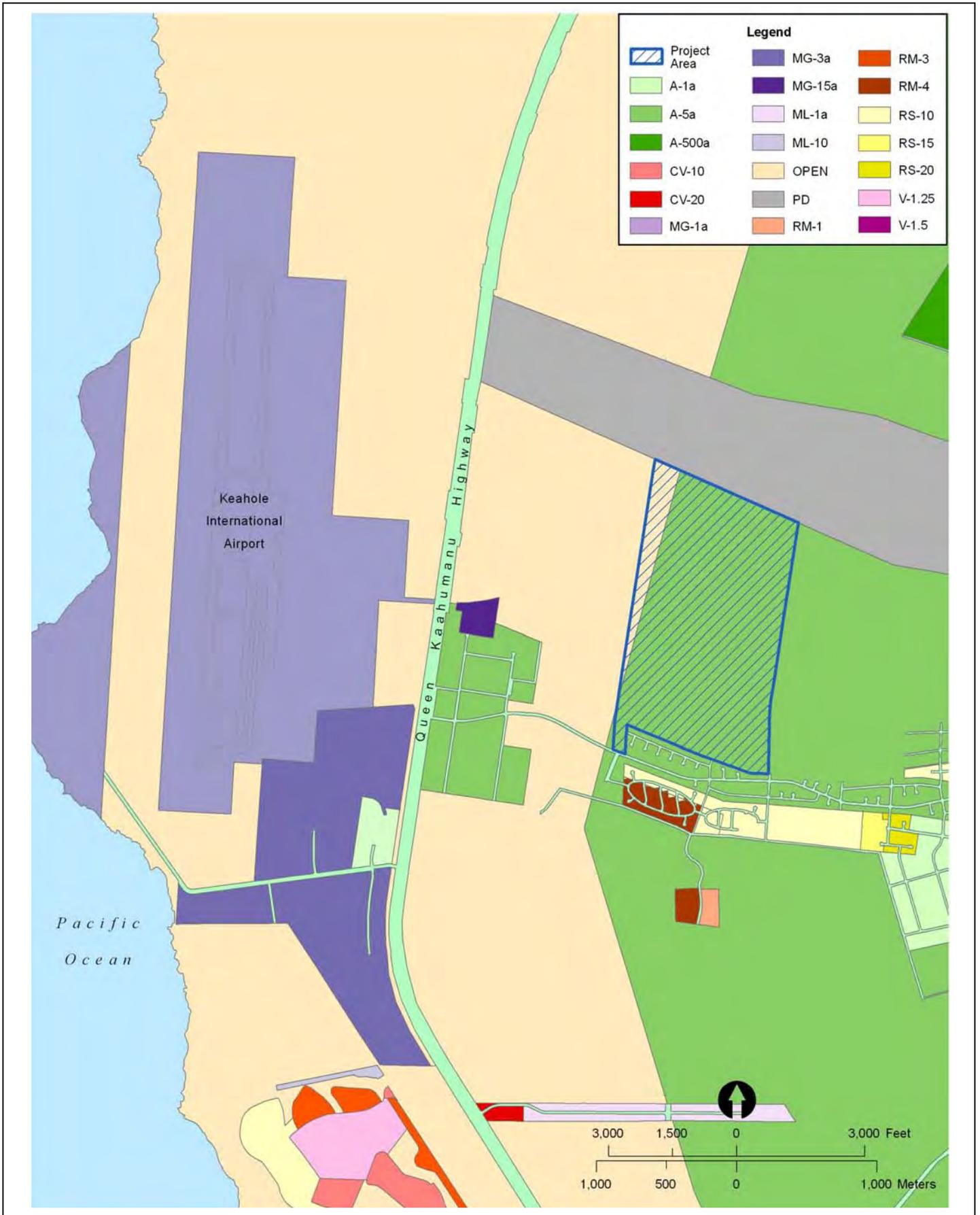
Figure 14



State Land Use Districts

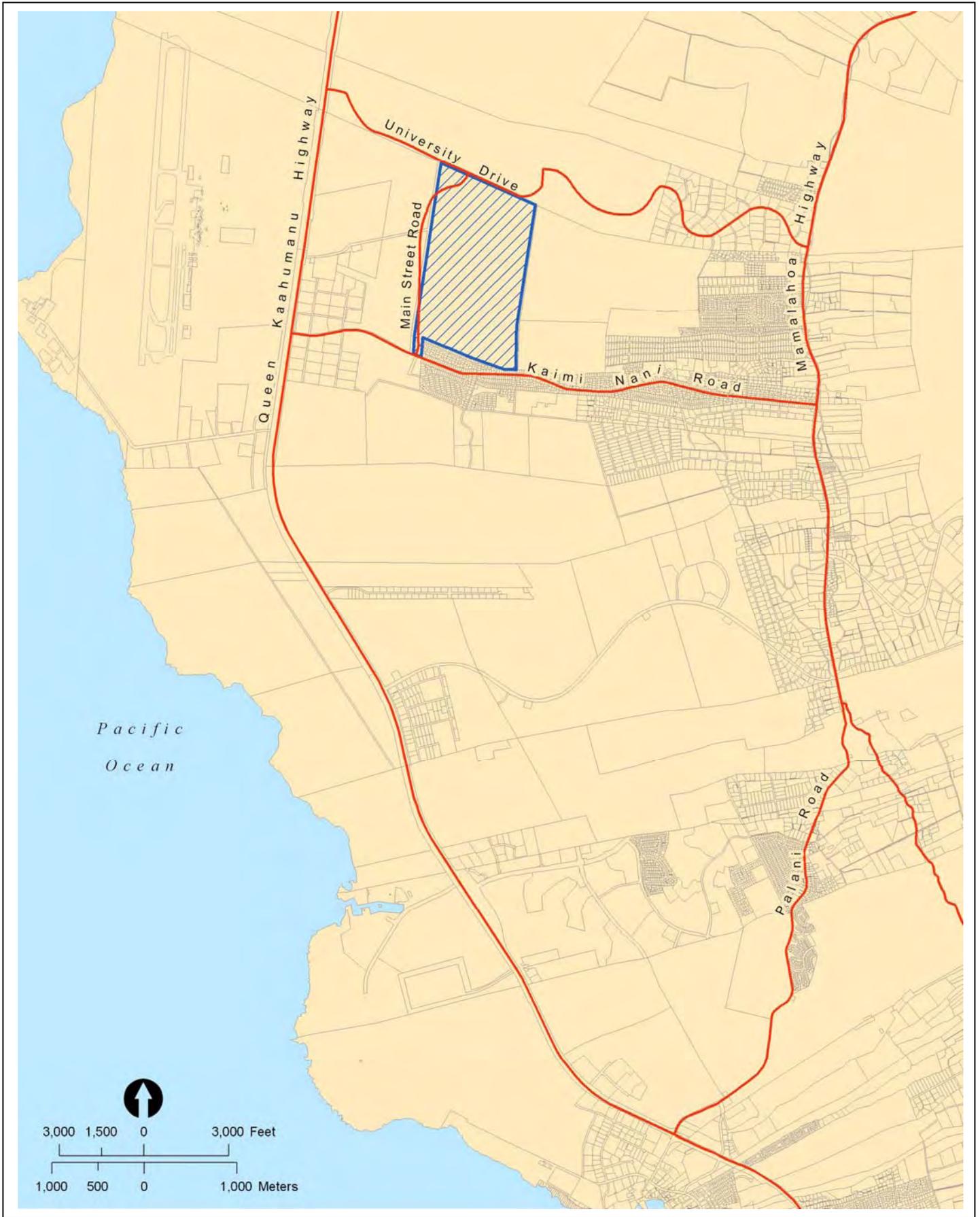
Figure 15





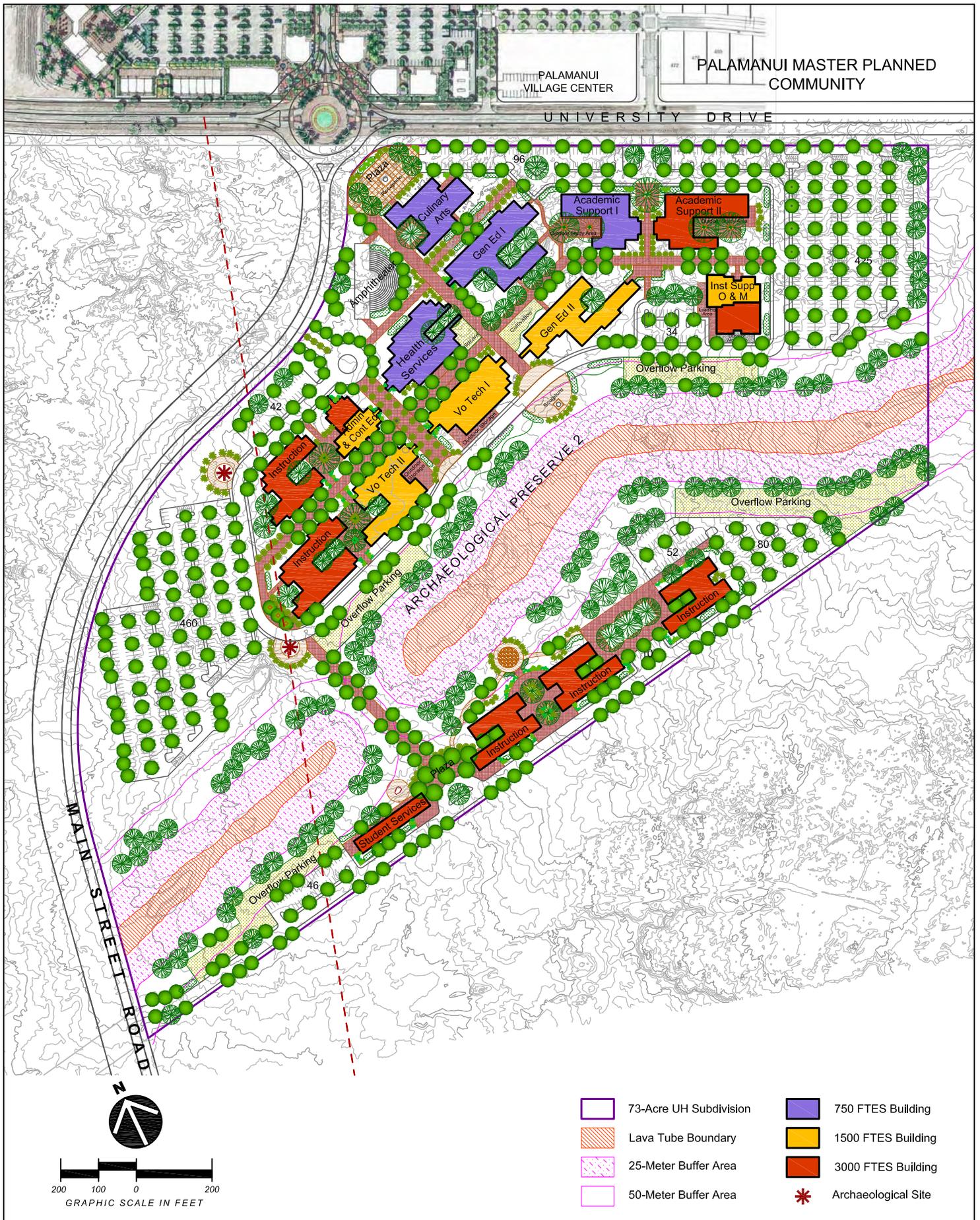
County Zoning Districts

Figure 17



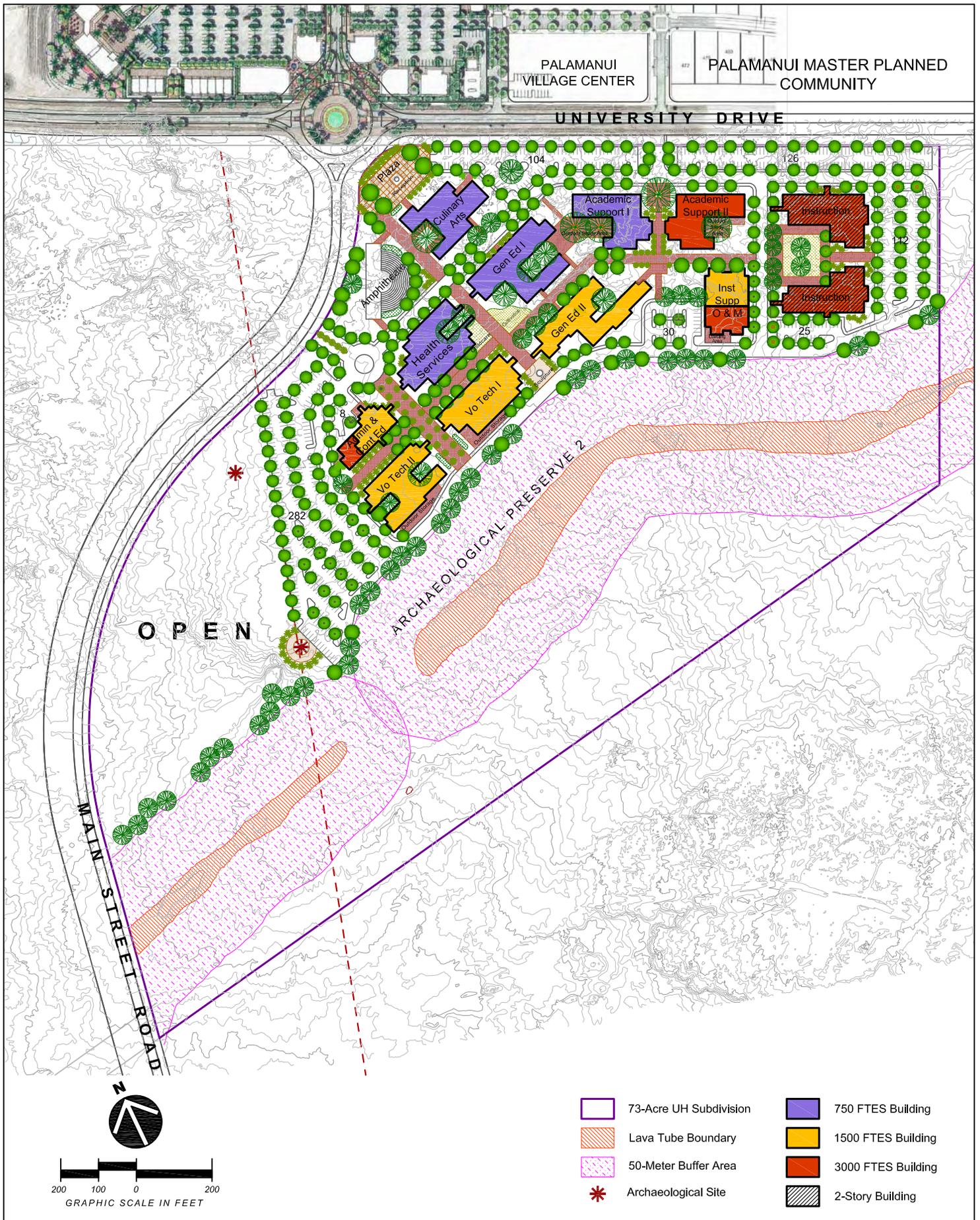
Major Regional Roadways

Figure 18



Alternative Campus Site Plan A

Figure 19



Alternative Campus Site Plan B

Figure 20