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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 11, 2016

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OCT 23 2016

Mr. Scott Glenn, Director
Office of Environmental Quality Control
Department of Health, State of Hawaii
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

Dear Mr. Glenn:

With this letter, the Department of Land and Natural Resources hereby submits a draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for "Draft Environmental Assessment for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii," to be published in the next available edition of the *Environmental Notice*. The proposed project involves a portion of TMK (3) 7-4-008: 003 in Kealakehe on the island of Hawai'i.

Enclosed is a completed OEQC Publication Form, two copies of the DEA-AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have sent by electronic mail to your office a summary of the action in a text file.

If there are any questions, please contact Mr. Carty Chang, Chief Engineer, at 587-0230 or via email to Carty.S.Chang@hawaii.gov.

Sincerely,

SUZANNE D. CASE
Chairperson

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Enclosures: One (1) hard copy of the DEA-AFONSI
One (1) hard copy of the OEQC Publication Form
One (1) CD containing the DEA, OEQC Publication Form and summary

17-158

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OCT 23 2016

AGENCY PUBLICATION FORM

Project Name:	Draft Environmental Assessment for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawai'i
Project Short Name:	DEA for DLNR Facility in Kealakehe
HRS §343-5 Trigger(s):	Use of government lands and funds
Island(s):	Hawai'i
Judicial District(s):	North Kona
TMK(s):	(3) 7-4-008: 003 (por.)
Permit(s)/Approval(s):	State of Hawai'i National Pollutant Discharge Elimination System Permit, Community Noise Permit and Variance, Non-Covered and/or Covered Source Permit (Air Quality), Lane Use Permit for Construction Work, Oversized and Overweight Vehicles on State Highways Permit; County of Hawai'i Building Permits, Grubbing/Grading/Stockpiling Permits, Permit to Work Within County Right-of-Way, Special Management Area Use Permit (Major)
Proposing/Determining Agency:	Department of Land and Natural Resources, Engineering Division
Contact Name, Email, Telephone, Address	Brandon Kim, Project Engineer, Email: Brandon.J.Kim@hawaii.gov, Telephone: 587-0248; Address: 1151 Punchbowl Street, Room 221, Honolulu, HI 96813
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	The Limtiaco Consulting Group
Contact Name, Email, Telephone, Address	Claire Oshiro, Environmental Planner, Email: claire@tlcghawaii.com, Telephone: 596-7790, Address:, 1622 Kanakanui Street, Honolulu, HI 96817

Status (select one)	**Submittal Requirements**
___✓___ DEA-AFNSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
____ FEA-FONSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
FEIS Statutory Acceptance	Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.

____ Supplemental EIS Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary
Provide a description of the proposed action and purpose and need in 200 words or less.

The Department of Land and Natural Resources (DLNR) proposes to develop a new community conference center and administration facility in Kealakehe that will allow the department to consolidate services at a single central location in West Hawai'i. The project is the development of a modern, energy efficient facility that accommodates present and future operational needs such as secure base yards, storage facilities, and spaces where division personnel can interact with the public it serves. The proposed facility includes a community conference center, a shared base yard and a separate climate-controlled collections warehouse.

The community conference center will be contained within the new administration building and DLNR's divisions will share the proposed base yard.The project may be developed in phases due to funding options and constraints. DLNR's new facility will require the installation of infrastructure during the earliest phase of development. Base yards and storage areas will have access controls to protect government-owned vessels, vehicles, equipment, and tools; records; artifacts and disinterred remains (or *iwi*); and impounded vehicles. Parking areas and pedestrian circulation routes will be developed within the project site. A free-standing building to house the community center is proposed for a later phase of development.

Draft Environmental Assessment for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawai‘i

Prepared For:

State of Hawai‘i
Department of Land and Natural Resources, Engineering Division

Prepared By:

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

October 2016

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Draft Environmental Assessment

for the

DEPARTMENT OF LAND AND NATURAL RESOURCES COMMUNITY CONFERENCE CENTER AND ADMINISTRATION BUILDING IN KEALAKEHE, NORTH KONA, HAWAI‘I

Tax Map Key (3) 7-4-008: 003 (por.)

This environmental document has been prepared pursuant to
Chapter 343, Hawai‘i Revised Statutes

Prepared For:

State of Hawai‘i
Department of Land and Natural Resources
Engineering Division

Prepared By:

The Limtiaco Consulting Group
Civil Engineering and Environmental Consultants
1622 Kanakanui Street
Honolulu, Hawai‘i 96817

October 2016

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LIST OF ABBREVIATIONS

Abbreviation	Definition
AFONSI	Anticipated Finding of No Significant Impact
ASA	Aquifer Sector Area
ASYA	Aquifer System Area
BMPs	Best Management Practices
CATV	Cable television service
CWRM	Department of Land and Natural Resources, Commission on Water Resource Management
CZM	Coastal Zone Management
DAGS	State of Hawaiʻi, Department of Accounting and General Services
DAR	Department of Land and Natural Resources, Division of Aquatic Resources
DEM	Hawaiʻi County Department of Environmental Management
DOBOR	Department of Land and Natural Resources, Division of Boating and Ocean Recreation
DOCARE	Department of Land and Natural Resources, Division of Conservation and Resources Enforcement
DOFAW	Department of Land and Natural Resources, Division of Forestry and Wildlife
DHHL	State of Hawaiʻi, Department of Hawaiian Homelands
DLNR	State of Hawaiʻi, Department of Land and Natural Resources
DOH	State of Hawaiʻi, Department of Health
DOT	State of Hawaiʻi, Department of Transportation
DPW	Hawaiʻi County Department of Public Works
DWS	Hawaiʻi County Department of Water Supply
EA	Environmental Assessment
EAI	Erskine Architects, Inc.
ENG	Department of Land and Natural Resources, Engineering Division
EO	Executive Order
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
FWS	U.S. Fish and Wildlife Service
gdp	gallons per day

LIST OF ABBREVIATIONS (Continued)

Abbreviation	Definition
HAR	Hawai‘i Administrative Rules
HELCO	Hawaiian Electric Light Company, Inc.
HRS	Hawai‘i Revised Statutes
IBC	International Building Code
IWS	Individual Wastewater System
LSB	Land Study Bureau (of the University of Hawai‘i)
LUC	State of Hawai‘i, Land Use Commission
LUO	Hawai‘i County Land Use Ordinance
LUPAG	Land Use Pattern Allocation Guide
MGD	Million gallons per day
NAAQS	National Ambient Air Quality Standards
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. Department of the Interior, National Park Service
OEQC	State of Hawai‘i, Office of Environmental Quality Control
OP	State of Hawai‘i, Office of Planning
OTWC	Oceanic Time Warner Cable
QLT	Queen Lili‘uokalani Trust
rLW	Lava Flow - Pāhoehoe
SAAQS	State (of Hawai‘i) Ambient Air Quality Standards
SCS	Scientific Consultant Services, Inc.
SHPD	Department of Land and Natural Resources, Historic Preservation Division
SP	Department of Land and Natural Resources, Division of State Parks
SMA	Special Management Area
TIAR	Traffic impact assessment report
TMDL	Total Maximum Daily Load
TMK	Tax Map Key
TOD	Transit Oriented Development
UIC	Underground Injection Control
WWTP	Wastewater Treatment Plant

PROJECT SUMMARY

Proposing/Determination Agency:	Department of Land and Natural Resources (DLNR), Engineering Division
Contact:	Mr. Brandon Kim, Project Engineer
Location:	Kealakehe, North Kona, Hawai‘i
Tax Map Key:	(3) 7-4-008: 003 (por.)
Land Area:	roughly 4 acres (whereas parcel is 128.766 acres)
Recorded Fee Owner:	State of Hawai‘i
Existing Use:	Open (undeveloped)
Proposed Use:	DLNR community conference center and administration facility with a shared base yard
Community Plan Region:	**North Kona District**
Land Use Designations:	
State Land Use	Urban
Development Plan	Residential
County Zoning	O - Open District (No Setbacks or Height Restrictions)
Action Requested:	DLNR proposes to develop a new community conference center and administration facility in Kealakehe that will allow the department to consolidate services at a single central location in West Hawai‘i. The project is the development of a modern, energy efficient facility that accommodates present and future operational needs such as secure base yards, storage facilities, and spaces where division personnel can interact with the public it serves. The community conference center will be contained within the new administration building and DLNR’s divisions will share the proposed base yard. The project may be developed in phases due to funding options and constraints. DLNR’s new facility will require the installation of infrastructure during the earliest phase of development. A free-standing building to house the community center is proposed for a later phase of development.
Agency Determination:	Anticipated Finding of No Significant Impact (AFONSI)

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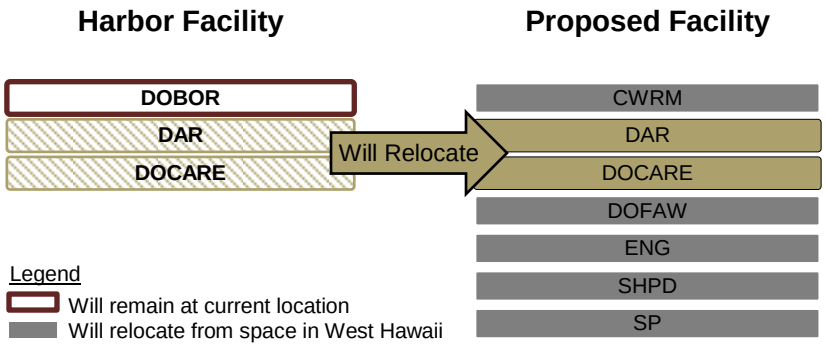
1. SETTING AND PROJECT DESCRIPTION

1.1. Introduction and Background

The State of Hawaiʻi, Department of Land and Natural Resources (DLNR) proposes to develop a new community conference center and administration facility (hereafter, "proposed facility") in Kealakehe, North Kona. The project site is an undeveloped portion of the state-owned parcel identified as Tax Map Key (TMK) 7-4-008: 003, which encompasses the area from Queen Kaʻahumanu Highway to the coast. DLNR's proposed facility will allow the agency to consolidate services at a single central location in West Hawaiʻi as office leases for several divisions end. The community conference center would accommodate public meetings and special events of various sizes up to a maximum of 200 people. Smaller meeting areas adjacent to administrative spaces would accommodate a maximum of 20 people each and allow for regularly-scheduled agency meetings and special events. The proposed facility includes a shared base yard and a separate climate-controlled collections warehouse. DLNR anticipates that the consolidation of services at the proposed facility in West Hawaiʻi will improve operational efficiencies.

DLNR's Division of Boating and Ocean Recreation (DOBOR), Division of Conservation and Resources Enforcement (DOCARE), and Division of Aquatic Resources (DAR) are currently located at the Honokōhau Small Boat Harbor Facility. Both DOCARE and DAR would relocate to the proposed facility, which will also house the Commission on Water Resource Management (CWRM), Division of Forestry and Wildlife (DOFAW), Division of State Parks (SP), Engineering Division (ENG) and State Historic Preservation Division (SHPD). Figure 1 depicts the described relocations to the proposed facility.

Figure 1 Planned Locations for DLNR's Divisions

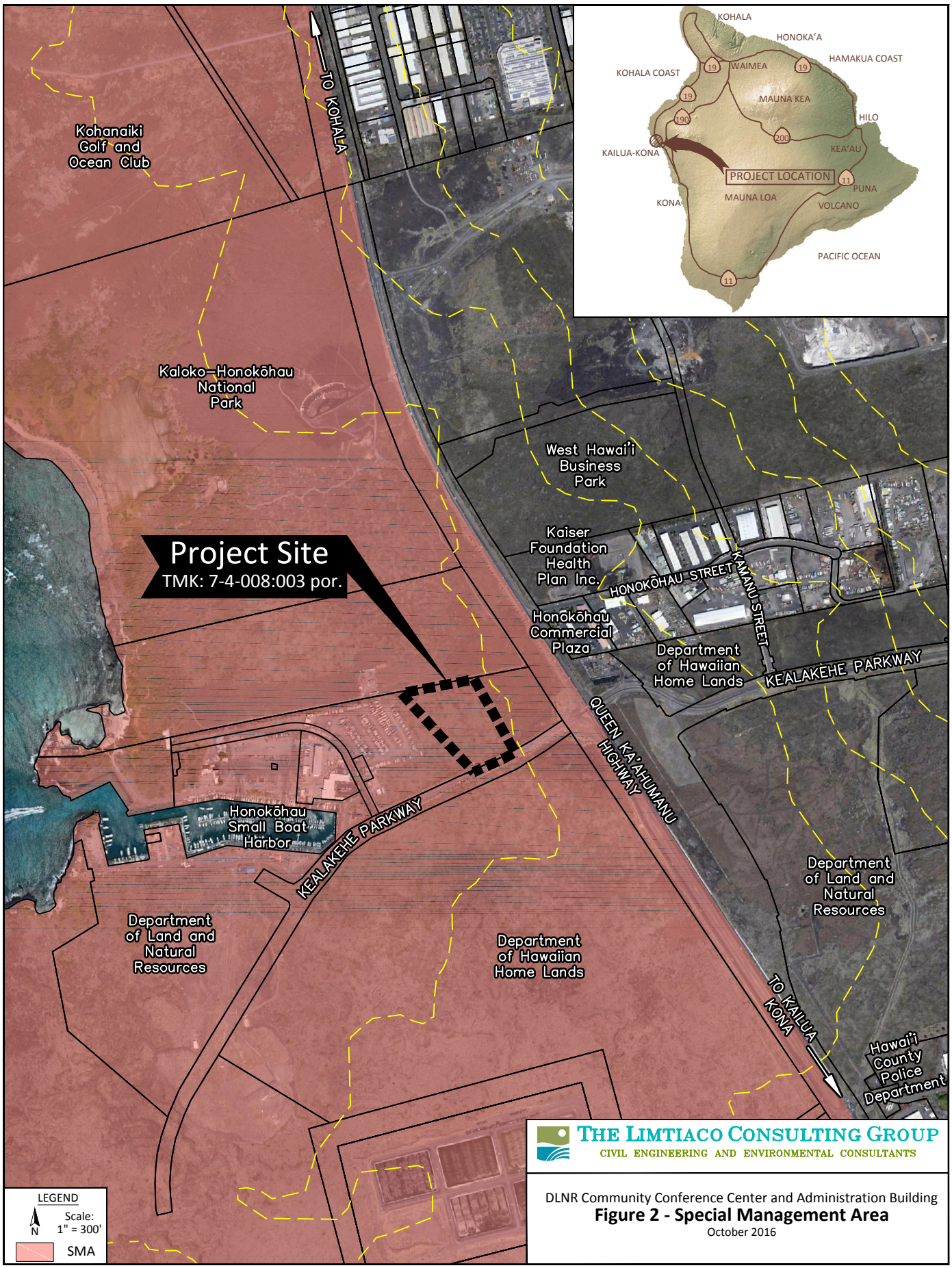


The proposed facility will be *mauka* (or landward) of the existing Honokōhau Small Boat Harbor Facility and *makai* (or seaward) of the Queen Kaʻahumanu Highway (see Appendix A for site photographs and conceptual renderings). The project site is immediately adjacent to undeveloped land that is part of the Kaloko-Honokōhau

National Park (see Figure 2). DLNR is proposing the development of a modern, energy efficient facility that accommodates present and future operational needs such as secure base yards, storage areas, and spaces where division personnel can interact with the public it serves. The project may be developed in phases due to funding options and constraints. DLNR's proposed facility will require the installation of site infrastructure (e.g., water, wastewater, electrical/communication systems, and internal roadways with access and egress from Kealakehe Parkway) during the earliest phase of development. Base yards and storage areas will have access controls to protect government-owned vessels, vehicles, equipment, and tools; records; artifacts and disinterred remains (or *iwi*); and impounded vehicles. Parking areas and pedestrian circulation routes will be developed within the project site. The proposed facility will be accessible in accordance with the Americans with Disabilities Act guidelines. At some point in the future, the community conference center may be relocated to a separate free-standing building.

The proposed project represents the continued presence of DLNR in West Hawai‘i. DLNR’s proposed facility will be designed to house the following divisions:

- CRWM. This division administers the State Water Code. Its service aspects include planning, surveying, regulating, monitoring, and conserving the State’s water resources in accordance with adopted plans.
- DAR. The mission of DAR is to manage, conserve and restore the State’s unique aquatic resources and ecosystems. DAR administers programs in commercial fisheries and resource enhancement; aquatic resources protection, habitat enhancement, and education; and recreational fisheries.
- DOCARE. This division is tasked with enforcing state laws that serve to protect, conserve and manage Hawai‘i’s unique and limited natural, cultural and historic resources held in public trust. DOCARE’s patrol responsibilities include small boat harbors, parks and public lands. It is tasked with collecting and securing evidence such as impounded vehicles.
- DOFAW. Its mission is to responsibly manage and protect watersheds, native ecosystems, and cultural resources. DOFAW provides outdoor recreation and sustainable forest products opportunities while facilitating partnerships, community involvement and education. Its purview includes State-owned forests, natural areas, public hunting areas, and plant and wildlife sanctuaries.
- SP. This division manages and administers public lands and interest areas that are part of the Hawai‘i Park System.
- ENG. Its mission is to provide engineering services and technical assistance to other departmental divisions and other State agencies to implement capital improvement or repair and maintenance projects.
- SHPD. This division maintains the Inventory of Historic Properties and reviews planning and construction documents. SHPD is also responsible for ensuring the proper handling of disinterred remains or *iwi*.



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DLNR Community Conference Center and Administration Building

Figure 2 - Special Management Area

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DLNR's project would use State of Hawai'i lands and funds and, therefore, requires the preparation of an Environmental Assessment (EA) pursuant to Chapter 343, HRS and associated Title 11, Chapter 200, Hawai'i Administrative Rules (HAR). This EA was prepared to examine potential project impacts and to provide for public participation as required and defined in the statutes.

The proposed project will require approval of a Special Management Area (SMA) Use Permit by the Leeward Planning Commission of the County of Hawai'i. The project site is located within the SMA (refer to Figure 2) but it is not located in a "shoreline area" as defined by Hawai'i Revised Statutes (HRS) §205-A-41. The EA will accompany the SMA Use Permit Assessment Application in accordance with Section 9-11 of the Planning Commission Rules. It is anticipated that the SMA Use Permit (Major), which applies to development with a valuation equal to or exceeding $500,000, will be obtained during the design phase of the project.

1.2. Project Need and Objectives

DLNR's proposed project would facilitate the consolidation of several divisions at a single central facility in West Hawai'i. The proposed facility would provide adequate space and site security for DLNR's current and future operations that pertain to its administration, management, protection and conservation efforts. The siting of the proposed facility addresses functional and spatial challenges created by divisions (e.g., DOBOR, DOCARE and DAR) that utilize and are currently located at the Honokōhau Small Boat Harbor Facility. The project site is part of a state-owned parcel that is encumbered under Governor's Executive Order No. 4334 to DOBOR for small boat harbor and related purposes. DLNR's project accommodates CRWM, DAR, DOCARE, DOFAW, SP, ENG and SHPD since all of these divisions provide programs and services in West Hawai'i from locations throughout Hawai'i County.

DLNR is proposing the development of a modern, energy efficient facility that accommodates present and future operational needs such as secure base yards, storage areas, and spaces where division personnel can interact with the public it serves. A community conference center that can be utilized for events and meetings for up to 200 people will initially be housed within the proposed administration building. DLNR's proposed facility will have secured access areas to protect government-owned property (e.g., equipment, tools, vehicles and vessels) and collected evidence including impounded vehicles. There will also be secured storage for records, artifacts and ancestral resources (e.g., *iwi*). Site security with respect to theft and vandalism is a high priority due to the enforcement functions and missions of DLNR's divisions. The community conference center may be relocated to a separate building within the project site that is constructed in the future.

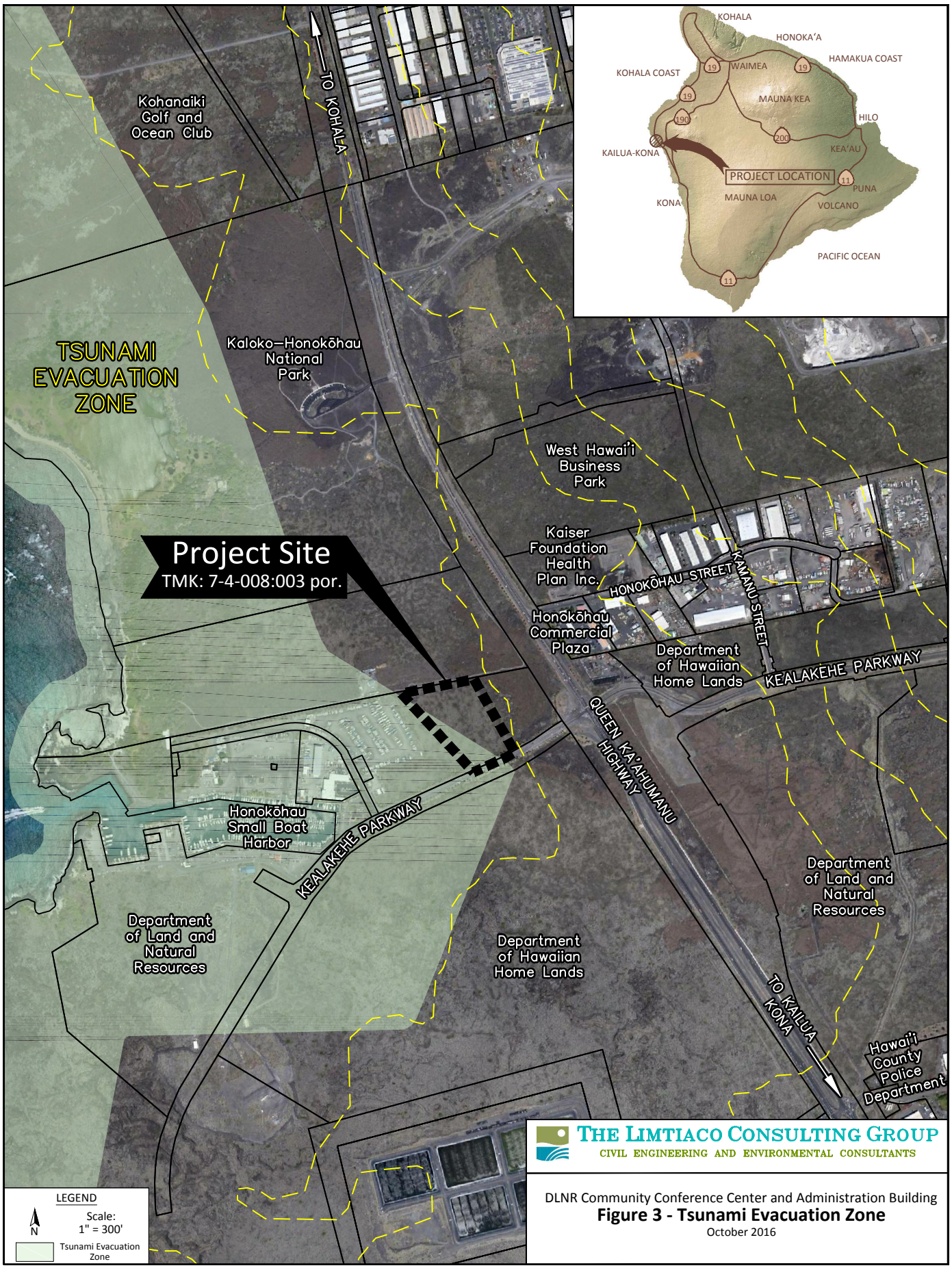
Completion of the proposed project would allow DLNR to achieve several objectives:

- Increase opportunities for personnel to interact with the public it serves;
- Accommodate present and future operational needs in a modern, energy efficient facility with secure storage areas and base yards;
- Deliver DLNR programs and services more efficiently from a central location in West Hawaiʻi that is within close proximity to harbor facilities;
- Utilize state-owned land encumbered for public uses; and
- Continue agency efforts pertaining to state parks; historical sites; forests and forest reserves; aquatic sanctuaries; public fishing areas; boating, ocean recreation, and coastal programs; wildlife sanctuaries; game management areas; public hunting areas; and natural area reserves.

1.3. Site Location and Description

The project site comprises state-owned land on the leeward coast of the Island of Hawaiʻi in Kealakehe, North Kona. The state-owned parcel TMK 7-4-008: 003 is 128.766 acres and contains the Honokōhau Small Boat Harbor Facility; this parcel is roughly 3.5 miles south of the Kona International Airport and 0.5 miles north of the Kealakehe Wastewater Treatment Plant (WWTP). The northern site boundary for the entire parcel is defined by the Kaloko-Honokōhau National Historical Park. Queen Kaʻahumanu Highway, Kealakehe Parkway and the Pacific Ocean define the respective eastern, southern, and western boundaries of the state-owned parcel.

The proposed facility would be sited within a trapezoidal area of about 4 acres upon land that slopes gently west towards the Pacific Ocean. New buildings are proposed to be sited within a relatively flat area that is outside of the Tsunami Evacuation Zone (see Figure 3). The project site is within the SMA but away from shoreline development associated with the Honokōhau Small Boat Harbor Facility that was initially developed in 1970 as part of the Rivers and Harbors Act of 1965. The physical landscape at the project site is generally characterized as dry, barren, exposed lava flows from the Hualālai volcano. The project site contains relatively flat land that has experienced at least two distinct lava flow events. The eastern portion of the trapezoidal site, which contains the most recent lava flow, is more rocky and rugged than the western portion, which has some areas of accumulated soils that sustain grassland and scrub vegetation. The biological field survey conducted by AECOS, Inc. (see Appendix B) noted the presence of endemic (or native to Hawaiʻi) *maiapilo* within the project site. The archaeological inventory survey conducted by Scientific Consultant Services, Inc. (see Appendix C) resulted in the documentation of sixteen (16) historic features of which three (3) sites are recommended for preservation; several individuals consulted for the cultural impact assessment (see Appendix D) requested *in situ* preservation for said historic resources.



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DLNR Community Conference Center and Administration Building

Figure 3 - Tsunami Evacuation Zone

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Kealakehe Parkway is a two-lane collector roadway that provides vehicular access from Queen Ka‘ahumanu Highway to mixed use recreational, commercial, charter, and boating facilities located at the small boat harbor. There is mixed-use commercial development in the general vicinity of the project site on parcels along the *mauka* side of the highway. The federally funded Phase 2 of the Queen Ka‘ahumanu Highway widening project may be completed by 2018.

The Kaloko-Honokōhau National Historical Park that is north of and adjacent to the project site contains the Honokōhau Settlement National Historic Landmark (1962), known archaeological and cultural sites, anchialine ponds, two ancient Hawaiian fishponds with associated wetlands, and a fishtrap. Park lands and waters provide habitat for waterbirds and waterfowl, and for federally listed and candidate species for listing under the Endangered Species Act. Other undeveloped parcels near the project site are retained by DLNR and the Department of Hawaiian Homelands (DHHL); undeveloped land south of the Kealakehe WWTP is owned by the Queen Lili‘uokalani Trust (QLT).

Although DLNR’s parcel is designated Urban and Conservation by the State Land Use Commission (LUC), the project site is in the Urban area (see Figure 4). The Land Use Pattern Allocation Guide (LUPAG) Map designates DLNR’s parcel as Open and Urban Expansion. The County of Hawai‘i Planning Department indicated in its letter dated April 15, 2015 that the project site is designated Open; however, the site appears to be within the Urban Expansion area as shown on the LUPAG Map (see Figure 5).

The County of Hawai‘i zoning designation for the project site is Open (see Figure 6). Permitted uses pursuant to Chapter 25-5-162(a)(3) of the Hawai‘i County Code include Community buildings, as permitted under §25-4-11. The County’s letter referenced §25-4-11(c):

> *Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use*.

DLNR’s project represents a public use that is permitted in Hawai‘i County’s Open District. There are no setbacks or height restrictions per the Hawai‘i County’s Land Use Ordinance.

1.4. Historical Setting

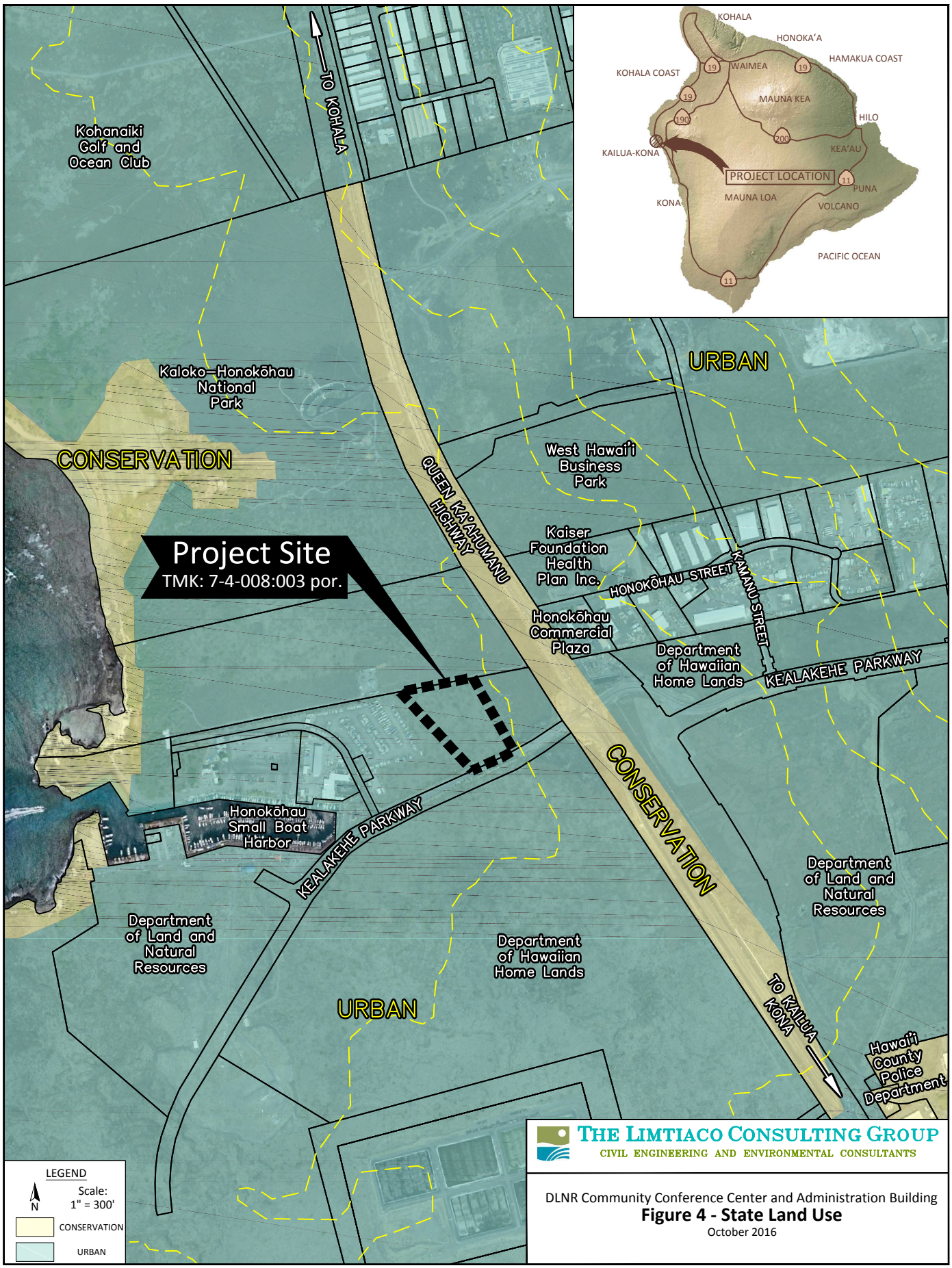
The information for this section is summarized from the cultural impact assessment report (November 2014) prepared by Scientific Consultant Services, Inc. (SCS) unless otherwise noted. The report is included in Appendix D.

The earliest voyagers from the Marquesas and Central Polynesia established settlements on the fertile windward and eastern shores of the Island of Hawai‘i, which are characterized by abundant rainfall, numerous streams and vast marine resources. The settlers established food production systems including fishpond development that allowed coastal populations to expand inland. The earliest known settlements along the dry, rocky, leeward shores in West Hawai‘i include temporary habitation caves used when fishing and permanent habitation sites associated with fishpond production. The settlement pattern on the drier, barren, leeward side of the island may have started from inland areas that could support the cultivation of taro, banana, breadfruit, sugarcane, and gourds. The settlers may have utilized an exchange system to distribute agricultural and marine resources among extended family members inhabiting the inland and shoreline communities. The improvement of dry-land cultivation methods and the introduction of sweet potato may have allowed permanent settlements in West Hawai‘i to expand and thrive. The emerging Hawaiian culture was self-sufficient and organized as a fairly rigid caste structure that incorporated communal subsistence.

By the 1700s, the communities of Kailua-Kona, North Kohala, Waimea, and Lalamilo had permanent, large-scale agricultural field systems in contrast to lands in the project area, which contain little to no soils. Small fishing communities and villages between larger population areas and political centers were connected via a foot trail system over the barren *pāhoehoe* and *‘a‘ā* lava flows. The Hawaiians utilized canoes for shoreline travel whereas trail systems connected Kailua-Kona with North and South Kohala. Other *mauka-makai* trail systems connected upland agricultural areas with coastal villages. There is scant information pertaining to prehistoric events associated with lands in the project area; available information pertains to the activities of ruling chiefs (or *ali‘i*).

The first documented account of western contact with the Hawaiian people occurred in 1778 when British Captain James Cook traded with island inhabitants and went ashore at Waimea Bay on the Island of Kauai. In 1779, Captain Cook arrived in Kealakekua Bay on the Island of Hawai‘i and observed that the surrounding area was flourishing. The subsequent influx of European and American traders, whalers and missionaries dispersed western influences throughout the Hawaiian Islands. The first cattle and sheep were brought to Hawai‘i in 1793 and 1794 by Captain George Vancouver as gifts for King Kamehameha I and his chiefs; Kamehameha established a ten-year *kapu* on the killing of cattle and constructed a 486-acre stone corral in the uplands of Lehu‘ula-Honua‘ino for the herd.

By 1812, Kamehameha I had unified the Hawaiian Islands and established an absolute monarchy with its capital in West Hawai‘i at Kailua-Kona. By 1813 to 1815, populations of cows, sheep, goats and cattle had grown to such an extent that numerous walls were constructed to protect agricultural areas from being overrun.



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DLNR Community Conference Center and Administration Building

Figure 4 - State Land Use

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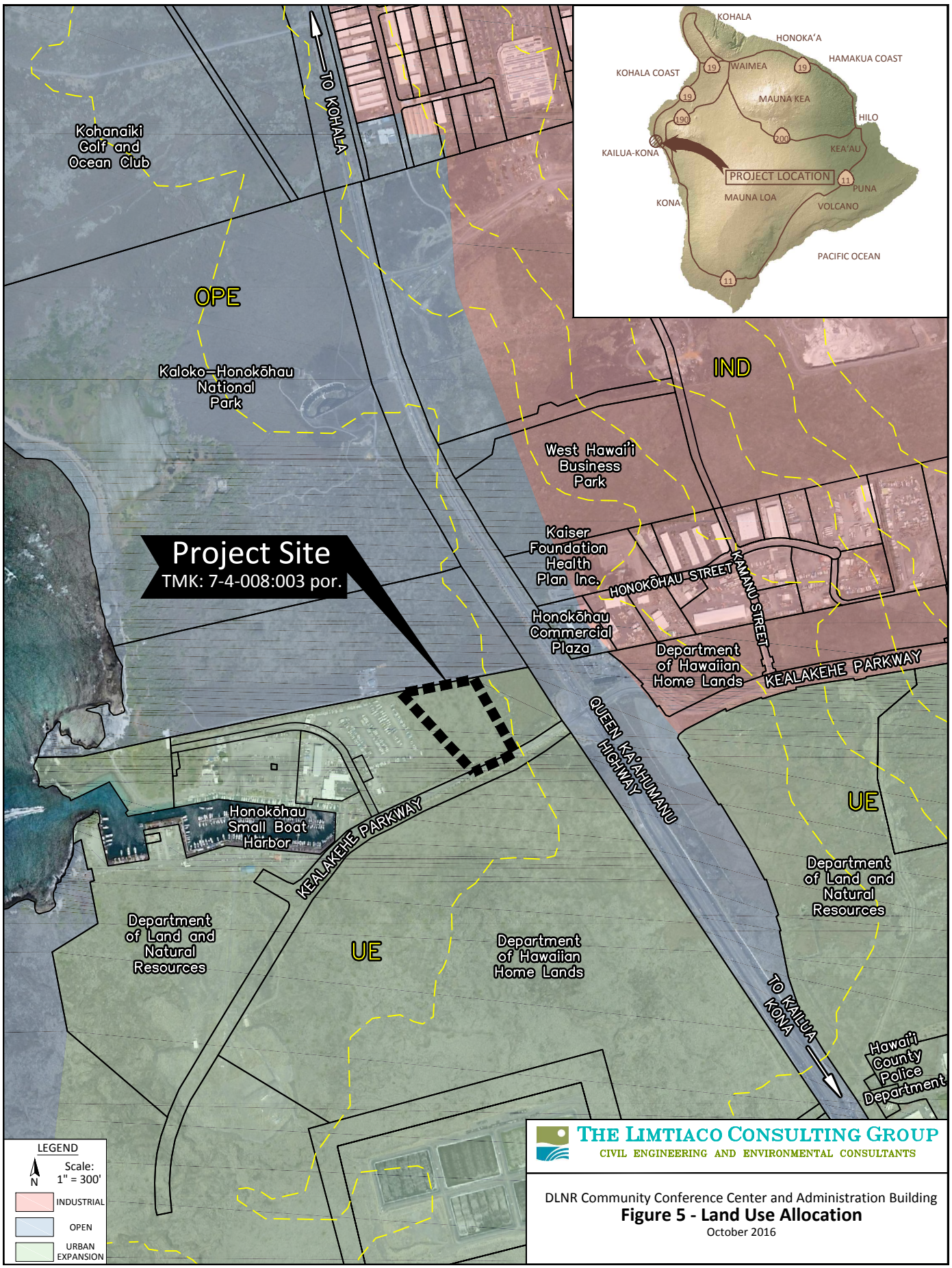

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Figure 5 - Land Use Allocation

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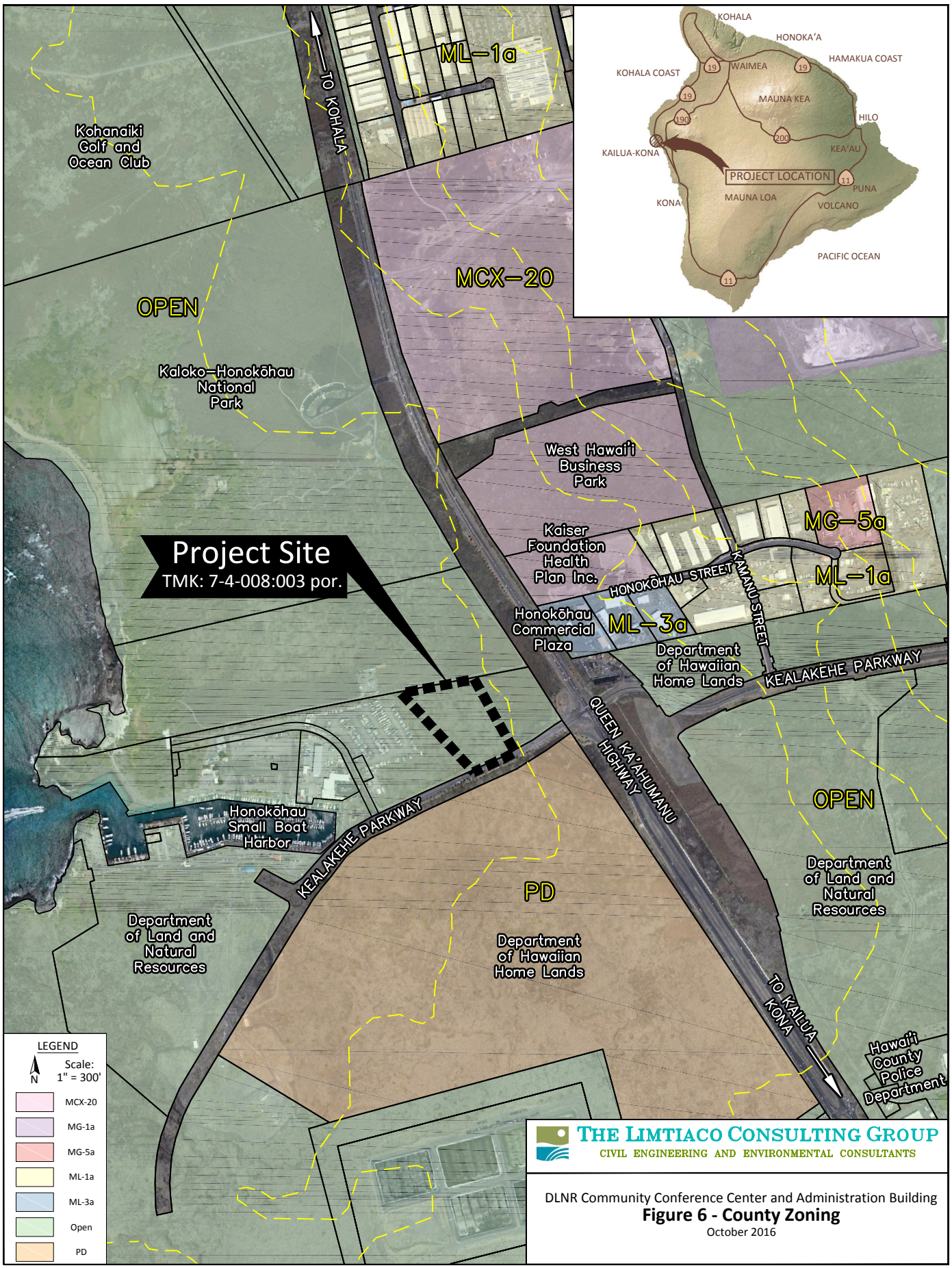

DLNR Community Conference Center and Administration Building

Figure 6 - County Zoning

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The efforts to capture and hunt wild cattle that began in the 1820s ultimately contributed to the cattle ranching industry in Hawaiʻi. Efforts to control grazing sheep and cattle led to the construction of ranch walls and the branding of cattle, which furthered the consolidation of large ranches in the Kona area. In addition to large ranches, large parcels of land in Kona were utilized for plantation enterprises.

The era from 1845 to 1900 is characterized by the introduction of private land ownership and commercial ventures (e.g., cattle ranching, sandalwood collection, supplying whaling vessels, and the cultivation of coffee, sugarcane, and other food crops). The effects of the Great Māhele enacted in 1848, which abolished the previous semi-feudal land tenure system and attempted to redistribute Hawaiian land, led to vast changes in land-use patterns, settlement patterns, cultural practices and traditions throughout Hawaiʻi. The sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants were authorized by the Alien Land Ownership Act and the Kuleana Act of 1850. Hawaiian lands were ultimately divided between the king, the chiefs, and the government. Most of the vast land in Kealakehe was awarded to Ane Keohokalole, the mother of King Kalākaua and Queen Liliuʻokalani. The large Greenwell Ranch in the North and South Kona districts was established by Nicholas Greenwell in 1850. By 1885, Greenwell owned seven *ahupuaʻ*a including Honokōhau. The Crown Lands of Kealakehe were leased to the Interior Department by King Kalākaua for a period of 20 years beginning in 1886 for homesteading purposes under the Homestead Act of 1884. Many homestead lots were purchased and have Land Grant numbers.

The modern history of the Kealakehe region from 1900 to today includes changing land ownership practices, land-use patterns and cultural practices. Honokōhau Harbor was developed along the coast of Kealakehe as part of the Rivers and Harbors Act of 1965, which authorized the U.S. Army Corps of Engineers to design and construct numerous navigation and beach erosion projects. The initial harbor project was completed in 1970. Urban uses within the coastal lands of Kealakehe include harbor facilities (e.g., offices, a small shop, a restaurant, a fueling station, and a boat yard), the Kealakehe WWTP (which opened in 1993), Kealakehe Parkway (which provides vehicular access to the harbor) and several unpaved roads across barren lava flows. Most of the coastal lands of Kealakehe remain unaltered.

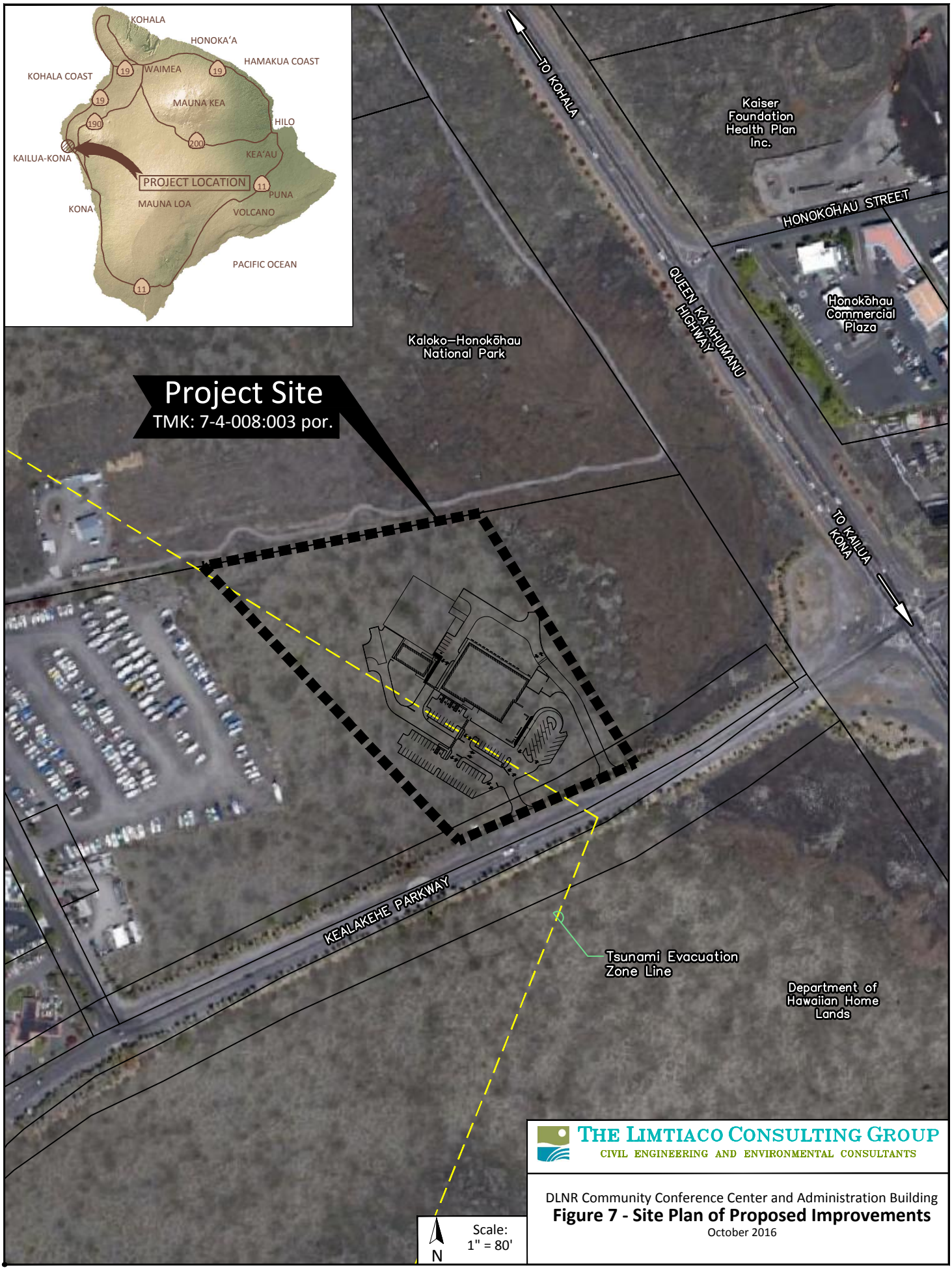
1.5. Technical Considerations

DLNR's proposed project provides the opportunity to house consolidated public services in a modern, energy efficient facility that conforms to the International Building Code (IBC), the applicable sections of the National Fire Protection Association (NFPA), the 2010 Americans with Disabilities Standards for Accessible Design, and related standards pertaining to life and safety.

The undeveloped portions of the state-owned parcel require on-site infrastructure and connections to existing municipal systems within the project area. DLNR's project includes the development of internal roadways and parking lots for the proposed facility. Two driveways will provide vehicular access from Kealakehe Parkway; a gated entry will limit public access to one driveway. Proposed structures and associated infrastructure will be sited outside of the Tsunami Evacuation Zone whereas public parking areas will be sited within the Tsunami Evacuation Zone.

The proposed facility is expected to house approximately 40 to 50 personnel; however, field duties and different kinds of interactions with constituents, contractors and the public implies that staff and visitor numbers will vary on a daily basis. Public areas within the proposed facility will be designed for staff interactions with visitors for purposes such as acquiring licenses and permits, consultations, bid openings, meetings and general inquiries. Figure 7 presents a conceptual site layout of DLNR's proposed project, which includes the following elements and features:

- Community Conference Center. The proposed administration building of approximately 19,000 square feet (sf) will initially house the community conference center. The auditorium-style public meeting room will be a flexible space that can accommodate a maximum of 200 people. Storage and support spaces (e.g., public restrooms) will be provided to support conference center uses such as public hearings, informational workshops, activities associated with resource programs, and community outreach. Video and teleconferencing capability will be available. The community conference center may relocate to a separate building of about 4,800 sf at a future phase of development. This free-standing building will contain additional smaller conference rooms, as well as storage and support spaces.
- Administration Building. The office and administrative functions of CWRM, DAR, DOCARE, DOFAW, ENG, SHPD, and SP will be consolidated within a one-story, custom, steel-framed building. As previously mentioned, this main building will consist of approximately 19,000 sf and contain offices, workstations, secure file storage areas, support spaces, dedicated staff areas, shared conference room spaces to accommodate 20 people each, and areas for receiving and meeting with the visiting public. Several smaller conference rooms that are equipped with video conferencing amenities may be utilized for agency functions such as regularly-scheduled board meetings, bid openings, consultations and staff training. DAR will have a wet lab for testing and analysis; DOCARE will have an evidence room and library. SHPD's library is expected to be utilized by the public for research purposes and consultations with the agency. There will be parking areas in front of the building along Kealakehe Parkway and along the *makai* length of the building on both sides of the internal roadway. A trash enclosure area will house the trash bins, transformer and emergency generator.



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DLNR Community Conference Center and Administration Building

Figure 7 - Site Plan of Proposed Improvements

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- Collections Warehouse. A secure, climate controlled warehouse of approximately 3,200 sf will be provided for the storage of artifacts and ancestral resources (e.g., *iwi*). This warehouse will provide an archival environment for storing, cleaning, and sorting artifacts. An open air space for cultural ceremonies will be nearby.
- Open Base Yards. DLNR's divisions will utilize secured, open base yards for government-owned property (e.g., equipment, tools, vehicles and vessels) and collected evidence including impounded vehicles. Personnel will access the base yards via a gated access road. The base yards will include wash down stations equipped with hose bib, drainage systems and oil-water separators. The public will not have access to the base yards for security and safety reasons. Site security will be achieved with chain-link fencing, gated access points and other features (e.g., surveillance cameras).
- Public Plaza. The proposed facility includes a public plaza on the southern portion of the site, which is aligned with Kealakehe Parkway. It is anticipated that the public plaza may be utilized as an outdoor extension of the community conference center.
- Parking Areas. DLNR personnel are expected to utilize the parking areas located within secured access areas and outside of the Tsunami Evacuation Zone. Public parking areas will be aligned along the southern and western sides of the proposed facility. Preliminary discussions with DLNR suggest that the public parking areas along the western side of the proposed facility may be sited within the Tsunami Evacuation Zone.

The Department of Accounting and General Services (DAGS) manages leases and requested coordination in its letter to DLNR dated March 13, 2015 with respect to space assignments in facilities managed by DAGS: "Coordination on these issues is essential to ensuring sufficient time is given to execute any termination of leases and/or reassignment of State office spaces."

1.6. Environmental Considerations

DLNR's proposed facility will utilize undeveloped, relatively flat, state-owned land in Kealakehe in West Hawai'i. The known pre-contact history of the West Hawai'i area includes numerous historic events pertaining to ruling chiefs and their extended families, and the Hawaiian Monarchy under Kamehameha I. DLNR's commitment with regards to the project is to balance the development of adequate facilities that support its operations and missions with environmental considerations and community concerns pertaining to scenic views, soundscapes, access, and traffic.

The environmental conditions pertaining to three (3), large, state-owned parcels TMKs 7-4-008: 003, 071 and 072 were previously evaluated for the *Final Environmental Impact Statement for Kona Kai Ola, Kealakehe, North Kona District,*

Island of Hawai‘i (Oceanit, 2007), which is hereby incorporated by reference. The unrealized Kona Kai Ola project was a collaborative effort between DLNR and DHHL to establish marina, commercial, light industrial, and resort uses on 330 acres of DLNR’s land and 200 acres of DHHL’s land in Kealakehe between the shoreline and Queen Ka‘ahumanu Highway. The project site identified in this EA is within an area that was designated for community and commercial uses according to the conceptual plan for the Kona Kai Ola project.

Surveys of the project site were conducted in 2014 to identify biological resource considerations, historic properties, cultural features, traditional cultural practices and anticipated traffic impacts; these studies are appended to this EA. The project site does not contain proposed or final critical habitat and is devoid of federal or State of Hawai‘i listed species of plants and insects; however, the site does contain the endemic (or native to Hawai‘i) *maiapilo,* most of which will remain *in situ* as a landscaping element. One *maiapilo* plant may have to be relocated. Traditional and cultural practices are not known to have occurred within the project site in recent times. The conceptualized project is intentionally sited and designed to avoid important historic properties that exist upon the mostly barren lava flows; consultation with SHPD has occurred and will continue throughout the various phases of the project. The results of the traffic impact analysis suggest that project-related traffic would not generate a need for off-site improvements.

The proposed facility will connect to developed water, wastewater, and communications infrastructure in the project area. Construction activities associated with the proposed facility would generate short-term effects such as fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services that would cease upon project completion. Anticipated short-term impacts will be mitigated to the extent practical with the use of appropriate construction techniques and Best Management Practices (BMPs). DLNR has consulted with neighboring and surrounding landowners and has designed its facility to minimize project impacts. The new facility will be designed to reduce the visual impact of the facility and compliment the surrounding area. DLNR’s project represents a public use on government land that does not affect population levels or the housing supply.

1.7. Project Schedule and Cost

The environmental review process, which includes publication and public review of the EA, may be concluded by Spring 2017. The final design phase and acquisition of necessary permits and approvals may be completed by Fall 2017, whereby construction may be authorized to begin by the end of calendar year 2017. Funding opportunities and constraints may result in project completion through a phased multi-year approach for design and construction.

The estimated project cost is over $17 million; the timing and phasing of design and construction is expected to influence total costs. The construction of a separate building for the community conference center during a future phase of work is estimated to cost over $4 million. Design fees and the costs for anticipated permits and approvals are included in the estimate.

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2. DESCRIPTION OF EXISTING ENVIRONMENT, PROJECT IMPACTS, AND MITIGATION

2.1. Climate, Air Quality and Airspace Considerations

The climate throughout the State of Hawaiʻi is generally characterized by mild temperatures with low daily and monthly variability, moderate humidity, persistent trade winds, and abundant sunshine. The Hawaiian climate is further characterized by a two-season year: the summer season from May through September is generally warmer and less wet than the cooler, winter season from October through April (Western Regional Climate Center, 2014). Rainfall distribution across the State of Hawaiʻi varies greatly according to geographic conditions, elevation and long-term climatic cycles.

The project site is on the leeward side of the Island of Hawaiʻi, which is sunnier and drier than the windward side. The annual rainfall at the project site is approximately 20 inches (Giambelluca, 2014). Average temperatures at the project site range from 71 degrees Fahrenheit in January to 78 degrees Fahrenheit in August (Ibid.). Strong winds are known to occur in connection with storm systems that disrupt climatic patterns.

Ambient air quality in the State of Hawaiʻi consistently meets National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency per requirements of the Clean Air Act and State Ambient Air Quality Standards (SAAQS) established by the State of Hawaiʻi Department of Health (DOH). The State standards for select parameters are more stringent than their Federal counterparts. Air pollutant sources in the project area include vehicular activity, industrial uses, natural areas and/or agricultural sites. The Keāhole Power Plant, which is four miles north of the project site, is a stationary source of industrial air pollutant emissions consisting primarily of sulfur dioxide and oxides of nitrogen. Southwesterly winds bring volcanic haze (or vog) from Kīlauea, which is 50 miles east of the project site, into the project area on a periodic basis.

Ambient air quality at the project site is influenced by non-stationary (or nonpoint) sources of airborne emissions including motor vehicle traffic along Queen Kaʻahumanu Highway and Kealakehe Parkway. Nighttime winds bring emissions to downslope areas whereas afternoon onshore winds carry emissions away from the project area and help to disperse airborne pollutants.

Form 7460 Notice of Proposed Construction or Alteration was filed in April 2015 with the Federal Aviation Administration (FAA) because the project site is roughly 20,000 linear feet from an airport runway greater than 3,200 feet in length. The FAA issued a Determination of No Hazard to Air Navigation, which expired on October 1, 2016.

Impacts and Mitigation Measures

The proposed facility includes landscaping that may help to reduce the heat-island effects from urban sites. DLNR's project also incorporates energy conservation and sustainable design strategies. No measurable adverse effect on climatic conditions is anticipated and no mitigation is proposed.

Ambient air quality at the project site will be temporarily affected by construction-related vehicles, equipment and activities that would generate fugitive dust and emissions. The construction contractor will be responsible for complying with HAR Title 11, Chapter 60, "Air Pollution Control." The contractor will be responsible for the implementation of erosion and dust control measures as necessary for compliance with the above-mentioned rules. The dust control plan may incorporate but is not limited to the following measures:

- Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
- Providing an adequate water source at the site prior to start-up of construction activities;
- Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Minimizing dust from shoulders and access roads;
- Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
- Controlling dust from debris being hauled away from the project site. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.

Construction equipment and vehicles shall be properly maintained in order to control vehicular emissions. Said exhaust emissions are anticipated to have negligible impacts on air quality in the project vicinity since the carbon monoxide and nitrogen oxide emissions would be intermittent and readily dissipated.

Long-term, nonpoint air quality impacts will occur from motor vehicles that travel to and from the proposed facility and between the project site and the nearby Honokōhau Small Boat Harbor Facility. DLNR personnel currently located at the small boat harbor and at various locations in West Hawaiʻi who would be relocated to the proposed facility are already traveling in the project area such that no significant impacts are anticipated from the project.

According to the determination from the FAA, DLNR's facility does not exceed the obstruction standards and does not pose a hazard to air navigation; thus, marking and lighting are not necessary for aviation safety. Since construction did not commence by October 2016, DLNR will need to file a request for extension of the effective period of the determination. A separate Form 7460 is required if the project requires erection equipment during construction or on a temporary basis, which extends higher than the permanent height of the structure.

2.2. Geology and Soils

The Island of Hawaiʻi is the largest and youngest island of the Hawaiian chain. The North Kona region encompasses basaltic lava flows from Hualālai, which is an active shield volcano that last erupted in 1801. The project site contains lava flows that emanated from the southwest rift zone of Hualālai. The lava surface at the project site is mostly bare; however, there are some small pockets of shallow soil that sustain vegetation including fountain grass, *koa haole* bushes and *maiapilo*.

From 1965 to 1972, the Land Study Bureau (LSB) of the University of Hawaiʻi developed a detailed classification system for the major Hawaiian Islands that was intended as a rating of agricultural productivity based on soil properties and productive capabilities. Lands in the highest productivity agricultural categories were classified with the "A" or "B" rating. The State of Hawaiʻi Office of Planning (OP) noted in its letter dated March 19, 2015 that the soil type for the project site is classified "E" by the LSB, which represents a lower-productivity category.

According to the *Web Soil Survey* (U.S. Department of Agriculture, Natural Resources Conservation Service, n.d.), the predominant soil type in the vicinity of the project site is classified as Lava Flow - Pāhoehoe (rLW), 0 to 40 percent slopes. The rLW soil type is characterized as excessively drained. The soil classifications are shown in Figure 8.

Impacts and Mitigation Measures

The proposed facility will be properly designed with respect to subsurface conditions and geotechnical concerns within the footprint of construction. The lava on the project site has practically no soil covering such that no impacts to soils are anticipated. Project actions would therefore have no adverse impacts on the underlying geology and soils at the project site such that no mitigation is proposed.

Earth disturbing activities may create exposed areas and surface-generated sediment that may enter the groundwater if significant rainfall occurs during grading. Mitigation that addresses sediment-laden runoff is discussed in

Section 2.4, Water Resources. Areas affected by project actions will be stabilized and either paved or landscaped, which reduces the long-term potential for erosion and sediment transport. No graded areas will remain uncovered.

2.3. Topography

The project site consists of relatively flat, undeveloped land located between approximately 45 to 55 feet above mean sea level (refer to Figure 8). DLNR's parcel slopes gently west towards the Honokōhau Small Boat Harbor and has reportedly experienced at least two distinct lava flow events from Hualalai, which have resulted in observable variations within the dry, desolate landscape. Most of the project site has a nearly level surface of exposed lava from an older *pāhoehoe* flow. The remainder of the project site contains two distinct levels that may represent two periods of *ʻaʻā* flow over the underlying *pāhoehoe* flow. Small pockets of soil material are present among the prehistoric lava flows, which allows for the growth of grassland and scrub vegetation within the project site; however, the most recent *ʻaʻā* flow on the eastern portion of the project site contributes to a rocky, rugged landscape that is mostly barren of vegetation.

Impacts and Mitigation Measures

DLNR's proposed project will transform the open area into a developed landscape of buildings, roads, utilities and other facilities that serve a public purpose. Project actions would generally retain the overall topographic profile for most of the site since the proposed facility would be situated within the flatter, open areas of DLNR's parcel. There are no obvious topographical features that would obstruct site preparation activities. Areas that will be affected by project actions will be stabilized and either paved or landscaped. No graded areas will remain uncovered. Mitigation that addresses drainage and surface runoff is discussed in Section 2.4, Water Resources.

2.4. Water Resources

The project site is within the Keauhou Aquifer System Area (ASYA) that is part of the Hualālai Aquifer Sector Area (ASA). As indicated in the study by Waimea Water Services for the unrealized Kona Kai Ola project, "groundwater elevations fluctuate with the tide" and "Honokōhau Harbor acts as a drainage point for local groundwater" (Oceanit, 2007). Current ground water withdrawals as calculated from actual pumpage data are below the *sustainable yield* for the Keauhou ASYA, which is 38 million gallons per day (MGD). *Sustainable yield* refers to "the quantity of water that can be extracted from an aquifer indefinitely without diminishing the quantity or quality of the water withdrawn" (State of Hawaiʻi, Department of Land and Natural Resources, Commission on Water Resource Management, 2008).

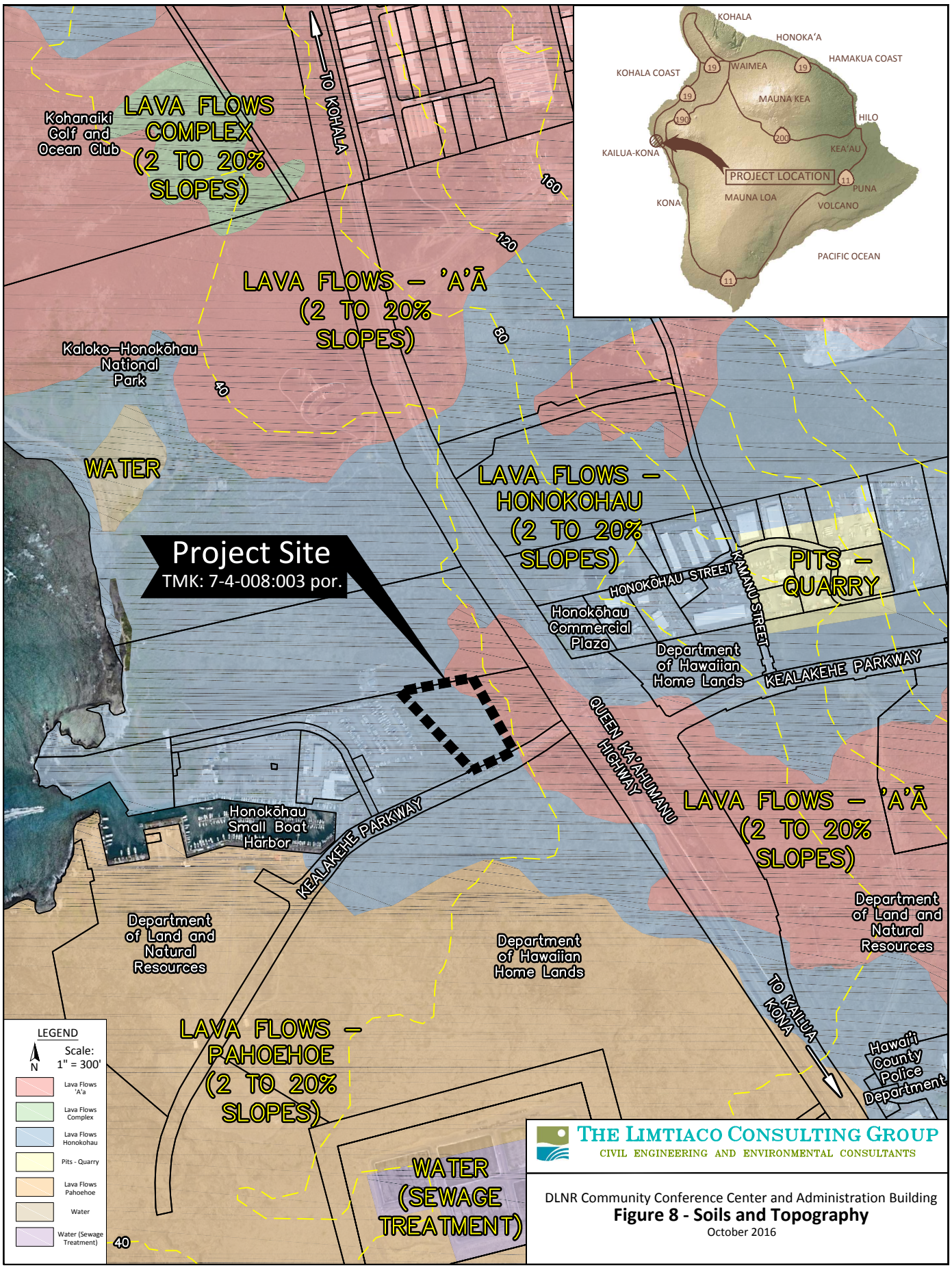

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Figure 8 - Soils and Topography

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The Hawai‘i County Department of Water Supply (DWS) is currently revising the Keauhou section of its Water Use and Development Plan to update the potential water demand from the Keauhou ASYA based on future land uses. The timeline for completion is not known; however, DLNR’s Commission on Water Resource Management is monitoring the revisions to the plan. DLNR is consulting with DWS about a determination that the water system can accommodate the proposed facility.

The Underground Injection Control (UIC) line as determined by the DOH Safe Drinking Water Branch demarcates the boundary and associated restrictions that apply to areas with non-drinking water aquifers or underground sources of drinking water. Injection well activity is more restricted in areas above the UIC line to protect underground sources of drinking water from injected fluids that may contain chemical, physical, radioactive, and biological contamination. The State Department of Health, Safe Drinking Water Branch noted the following conditions that pertain to the project site in its letter dated March 12, 2015:

> *The project site is located below the UIC line. There are no known drinking water wells located within ¼ mile of the project site.*
>
> *There may be ecologically sensitive environments, such as anchialine ponds, existing in the area. We recommend that injection wells not be considered as a primary disposal component for any of the project’s wastewaters, if possible.*

There are no freshwater streams, rivers, ponds or other open water bodies within the project site. Wetlands (or marshes, swamps, bogs, etc.) are also not present. Storm run-off from the project site flows in the direction of the existing grade and naturally percolates into ground water and the nearshore waters of Honokōhau Bay. The letter dated April 2, 2015 from the U.S. Department of the Interior, National Park Service (NPS) noted the following conditions and concerns since water-dependent park resources (e.g., fishponds, anchialine pools, marine waters and coral reefs) provide habitat for culturally important and rare native aquatic species:

> *The proposed site for the project is located in highly permeable lava with few accumulated soils and is generally less than 30 feet above the water table. Rain and runoff carry pollutants quickly to ground water, to coastal anchialine pools, and into the nearshore waters. Although average rainfall is ~20 inches per year, rainfall accumulation is typically concentrated in a few intense events that cause a pulse of pollution flushing to drainage systems, and, in places so close to the water table and coastal waters, into the groundwater and nearshore waters.*
>
> *Honokōhau Bay is directly makai of the project area and is designated by the Hawai‘i Department of Health as an impaired waterbody for elevated*

> *nutrients under section 303(d) of the Clean Water Act. For over a decade, Hawai'i County and the Land Use Commission have recognized the need to implement additional measures to control nonpoint source pollution flowing into groundwater in the Park and in the surrounding area.*
>
> *At a minimum, dry wells used for run-off from paved surfaces should be equipped with oil-water separators and water used to wash vehicles at the wash-down stations should be collected, filtered, and reused. In addition, other best management practices should be discussed.*
>
> *There may be ecologically sensitive environments, such as anchialine ponds, existing in the area. We recommend that injection wells not be considered as a primary disposal component for any of the project's wastewaters, if possible.*

The State of Hawai'i Office of Planning (OP) noted the following additional site conditions in its letter dated March 19, 2015:

> *According to data sources available to OP, this parcel lies within the Honokōhau watershed; the project site appears to be located approximately 1,500 feet from the protected waters of the small boat harbor and 3,000 feet from the nearshore waters of Honokōhau Bay; and the project site is largely undeveloped with limited drainage infrastructure. The area of North Kona is exposed to a range of human activities from agriculture, urban development, and activity along the shoreline.*

DAR noted the following water quality concerns in its letter dated March 16, 2015:

> *Although the Hawai'i Department of Health has insufficient water quality data to categorize the waters within Honokōhau harbor [sic], the adjacent marine waters (i.e., Honokōhau Beach) are categorized as impaired, with five of six measured parameters currently not meeting State water quality standards.*

Coastal waters along the Kona shoreline including Honokōhau Bay have a marine water quality classification of Class AA whereas the waters inside the Honokōhau Habor are Class A. The DOH objectives are as follows:

> Class AA. The DOH objective for Class AA waters is that these waters "remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from human-caused source or actions."
>
> Class A. The DOH objective for Class A waters is to protect "their use for recreational purposes and aesthetic enjoyment."

Nonpoint source pollution from agricultural and urban activities including runoff containing nitrogen, phosphorus, and/or sediments is considered to be a threat to coastal ecosystems. Discharges of sediments and pollutants from sewage injection wells and defunct septic tanks may further contribute to harmful impacts including the growth of macroalgal blooms.

Impacts and Mitigation Measures

DLNR is consulting with DWS about the availability of water and the determination that would allow construction of the proposed facility to proceed. At this time, DLNR does not propose to develop a new potable water source to support the proposed facility. No significant impacts to surface water quality would occur because the project site is devoid of such resources including wetlands, perennial streams, or other sensitive riparian habitats. The proposed facility will have drainage systems with oil-water separators to reduce nonpoint source pollution concerns. Therefore, the long-term use of the project site is not anticipated to result in contamination of the underlying aquifer and groundwater sources in the Keauhou ASYA.

A short-term and temporary impact of the project may occur from the generation of sediment-laden surface runoff during earth-disturbing activities, especially if heavy rains coincide with the activity. A National Pollutant Discharge Elimination System (NPDES) Permit for discharges of pollutants, including storm water runoff (e.g., construction dewatering effluent) is required for the disturbance of one acre or more of total land area pursuant to HAR Title 11, Chapter 55, “Water Pollution Control” effective December 6, 2013. The construction contractor will be responsible for implementing a storm water management plan that prevents a concentration of runoff from flowing into neighboring areas. The project will incorporate Low-Impact Development design practices and structural BMPs to control storm water that may further reduce nonpoint source pollution concerns. No adverse impact from the proposed facility is anticipated after the completion of construction.

2.5. Solid Waste and Hazardous Materials

The Puʻuanahulu West Hawaiʻi Landfill is approximately fifteen miles north of the project site at Waikōloa; recyclers divert recoverable material from the waste stream. Hawaiʻi County continues to explore waste reduction strategies including a waste-to-energy facility to avoid further landfill development.

Solid waste collected from the Honokōhau Small Boat Harbor Facility is transported off-site for disposal at the landfill. No solid waste is currently generated at the project site in its undeveloped state.

DOBOR currently offers oil disposal to public permit holders from its existing location at the Honokōhau Small Boat Harbor Facility. There are no known threats pertaining to hazardous materials at the small boat harbor or at the undeveloped project site.

Impacts and Mitigation Measures

Construction activities at the project site would temporarily increase the volume of solid waste including construction debris that must be transported off-site for proper disposal. DLNR is expected to ensure that appropriate waste management and disposal practices are implemented by the construction contractor.

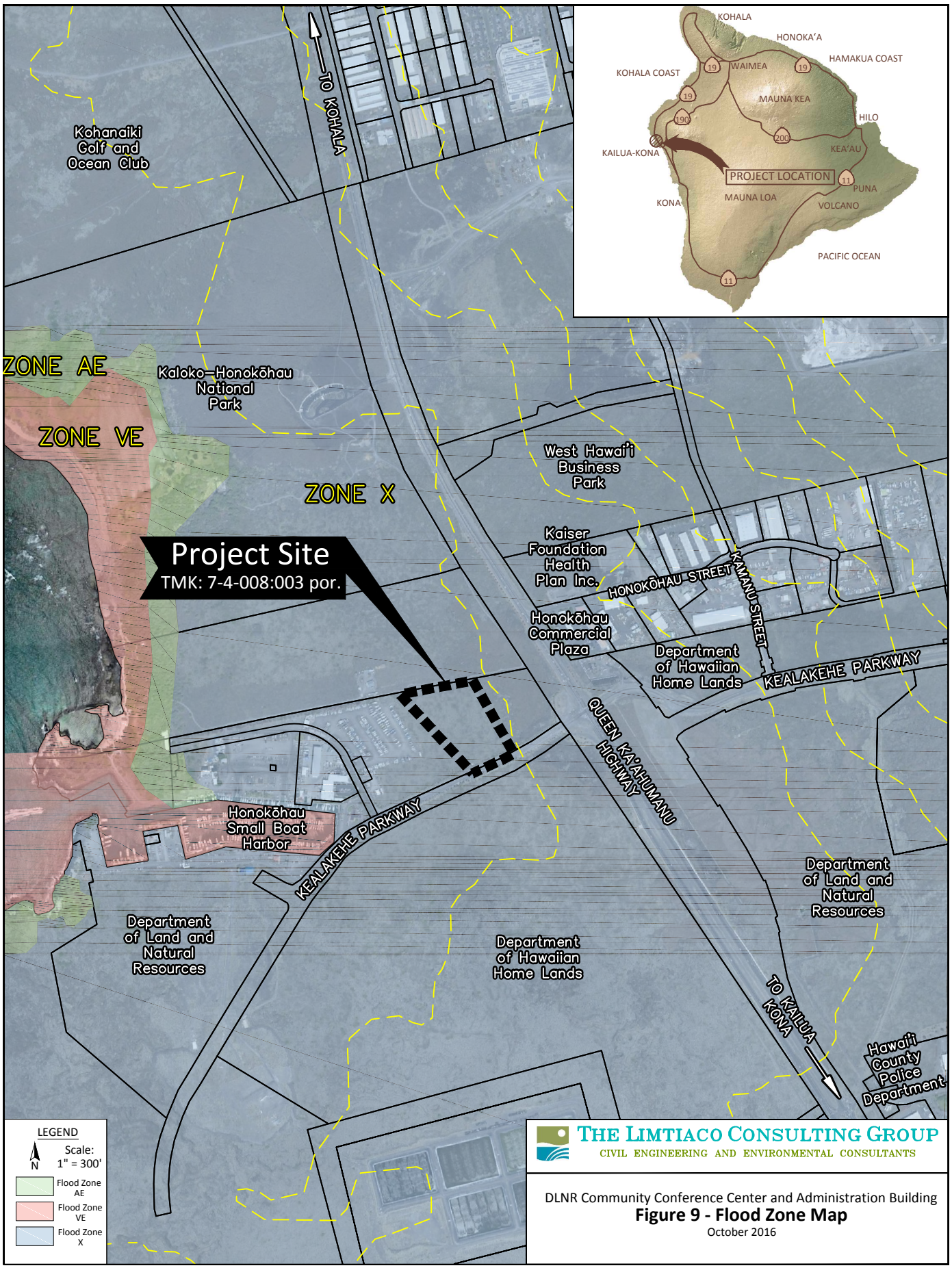
The proposed facility will require solid waste disposal service similar to what is available for the Honokōhau Small Boat Harbor Facility. The onsite trash collection dumpster will be located in an area that is accessible by the service vehicle. Waste material from normal operations will be collected and transported off-site by a service provider for proper disposal. DOBOR will remain at the small boat harbor and is expected to continue to offer oil disposal to public permit holders. No adverse impacts are anticipated.

2.6. Natural Hazards

Natural hazards that may threaten life and property on the Island of Hawaiʻi include tsunami inundation, tropical cyclones, earthquakes, volcanic activity, floods, drought, wildfires, sea level rise, high wind and landslides. Recent earthquakes and wind damage from storms have resulted in power outages for extended periods in localized areas on the Island of Hawaiʻi. Recent lava flows from the active Kīlauea volcano have destroyed built structures and covered roads, which jeopardized access for affected communities. The entire area of West Hawaiʻi is subject to varying degrees of natural hazards.

Tsunami Evacuation Zone maps for the State of Hawaiʻi identify low lying areas where excavation is recommended since extensive damage to life and property may occur from seismic sea waves. Most of the project site is outside the Tsunami Evacuation Zone as previously mentioned in Section 1.3 Site Location and Description and depicted in Figure 2.

The response from ENG dated March 23, 2015 notes that the project site is within Zone X according to the Flood Insurance Rate Map Panel No. 1551660692C for Hawaiʻi (effective date September 16, 1988) prepared by the Federal Emergency Management Agency. The Zone X designation refers to inundation areas of low-to-moderate risk that are outside the 0.2 percent annual chance (or 500-year) floods. Flood zone designations are shown in Figure 9.



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DLNR Community Conference Center and Administration Building

Figure 9 - Flood Zone Map

October 2016

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The project site consists of relatively flat land and there are no apparent rockfall hazards in the project vicinity. Threats from wildfires are unlikely but possible since the project site and nearby areas contain grassland and scrub vegetation. Drought conditions and high winds could exacerbate the fire hazard. Many wildfires are caused by human actions of an intentional nature or as a result of negligence.

Impacts and Mitigation Measures

The threats to humans and property from unpredictable natural events will always be present. Proposed activities at the project site would not affect the occurrence of naturally occurring hazards.

DLNR's project is not expected to significantly increase the risks to human health or property. The proposed facility is intentionally sited outside of the tsunami zone and would not require evacuation during a tsunami warning. DLNR's personnel are expected to respond to man-made and natural disasters in accordance with the agency's disaster preparedness strategies, which include but are not limited to evacuation plans that consider the safety of staff and visitors in its facilities.

2.7. Floral and Faunal Resources

The undeveloped project site is within a developing urban expansion area that also contains vast natural resources including habitat for federal or State of Hawai'i listed species. The U.S. Fish and Wildlife Service (FWS) reviewed pertinent information in its files and indicated in its letter dated April 2, 2015 that the project vicinity contains two listed seabirds, one listed insect and seven listed plants, as summarized below. The letter from FWS also stated that there is no proposed or final critical habitat within the project site, whereas the adjacent Kaloko-Honokōhau National Historic Park does contain proposed critical habitat. The summary below contains excerpts from the FWS letter.

Seabirds. The endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*) are seabirds that "may transit over the proposed project area when flying between the ocean and nesting sites in the mountains during their breeding season (March through November)."

Insects. The Blackburn's sphinx moth (*Manduca blackburni*) feeds "on nectar from native plants, including beach morning glory (*Ipomoea pes-caprae*), iliee (*Plumbago zeylanica*), and *maiapilo* (*Capparis sandwichiana*); larvae feed upon non-native tree tobacco (*Nicotiana glauca*) and native [Broadleaf] *'aiea* (*Nothocestrium latifolium*). Tree tobacco is a weed species that grows rapidly and inhabits disturbed places, roadsides, urban waste areas, gravel quarries, landscaped sites, and natural communities,

including riparian areas, grassland, and woodland. Due to the invasive nature and rapid growth of tree tobacco, it is possible that it may be at the site."

Plants. The seven listed plants within a two mile radius of the project site include the *koʻokoʻolau* (*Bidens micrantha* ssp. *Ctenophylla*), *uhiuhi* (*Mezoneuron kavaiense*), *hala pepe* (*Chrysodracon hawaiiensis*), *wahine noho kula* (*Isodendrion pyrifolium*), (*Naraudia ovata*), and [smallflower] *ʻaiea* (*Nothocestrium breviflorum*).

AECOS, Inc. conducted a biological field survey of the project site and detected no federal or State of Hawaiʻi listed species during the course of its survey, which extended beyond the project site boundaries. The report by AECOS, Inc. is included in Appendix B. The survey area extended east to the edge of Queen Kaʻahumanu Highway, south to the pavement edge of Kealakehe Parkway, west to the boat yard lot at Honokōhau Small Boat Harbor, and north to the perimeter of Kaloko-Honokōhau National Historical Park.

Eight (8) instances of endemic *maiapilo* were recorded by AECOS, Inc. on the older *ʻaʻā* lava flow within the project site. The older *ʻaʻā* lava flow is being invaded by non-native species including fountain grass (*Cenchrus setaceus*, Forssk. or *Pennisetum setaceum*, Poaceae.), Christmas berry (*Schinus terebinthefolius*), and *koa haole* (*Leucaena leucocephala*). Fountain grass has been designated as one of Hawaii's most invasive horticultural plants by DOFAW; it outcompetes other plant species for water and space, grows quickly, and serves as fuel for brush fires.

Impacts and Mitigation Measures

DLNR's project is not expected to displace any federal or State of Hawaiʻi listed species of plants or insects since the project site is devoid of these protected resources. Site preparation work such as clearing and grubbing is expected to involve the necessary removal of onsite vegetation. The conceptual site configuration of the proposed facility incorporates existing *maiapilo* as a landscaping element; plants within the footprint of land alteration activities will be moved to other areas of the site to the extent possible. The landscaping plan will include drought-tolerant plants with no turf grass and other native plants found in the project area. The conceptual design of the proposed facility also includes interpretive gardens that demonstrate how native plants can be utilized in the landscape.

The project includes suggested recommendations that would avoid or minimize adverse impacts to seabirds and Hawaiian hoary bats, which were not detected during the biological field survey but are known to frequent the Kaloko-Honokōhau National Historic Park and surrounding project area.

Night work. The project does not involve night work that would require artificial illumination.

Site lighting. Permanent exterior lighting for the proposed facility will utilize shielded bulbs and warmer color lamps that satisfy dark sky requirements. The NPS recommends the implementation of the following *Best Practices* for managing outdoor lighting in parks and protected areas:

- *Light only WHERE you need it*
- *Light only WHEN you need it*
- *SHIELD lights and direct them downward*
- *Select lamps with WARMER COLORS*
- *Use the MINIMUM AMOUNT of light necessary*
- *Select the most ENERGY EFFICIENT lamp and fixture*

Tree Removal. Woody vegetation that is taller than 15 feet would not be removed between June 1 and September 15 since this is a roosting period in which bats are potentially at risk from vegetation clearing.

Feral Predators. DLNR will consider the use of a trapping program prior to the start of construction to prevent the migration of feral predators such as cats (*Felis cattus*) and small Indian mongoose (*Herpestres auropunctatus*) to the neighboring Kaloko-Honokōhau National Historic Park. The NPS indicated that these predator species pose a threat to the endangered Hawaiian stilt and the Hawaiian coot breeding populations within the Park.

2.8. Archaeological Resources

An archaeological inventory survey conducted by SCS extended beyond the boundaries of the project site as requested by DLNR; fieldwork included a pedestrian survey of approximately 32.5 acres of undeveloped land according to the methodology described in the report by SCS (see Appendix C). The summarized information from SCS's report (2016) pertains to the project area.

The pre-contact history of West Hawai‘i as determined from archaeological evidence suggests that the project area once contained clusters of coastal settlements. Archaeological features recorded during the early archaeological studies in the *ahupua‘a* of Kealakehe included *heiau*, habitation features, burial features, and trails. Numerous traditional Hawaiian habitation features, agricultural features, burials, trail segments, and ceremonial features were recorded in later studies along with a smaller number of Historic era features, such as ranch walls.

Previous investigations that included radiocarbon dating for collected samples indicate initial use of the Kealakehe sites "in the thirteenth to fourteenth centuries, growth during the fifteenth and sixteenth centuries, and

> maximal use of the area in the seventeenth and eighteenth centuries."
>
> "The overall picture presented by archaeological data is clustered habitation, agricultural, ceremonial, and burial sites connected by a shoreline trail system located in the Coastal Zone. Subsistence in this zone centered on ocean resources and fishpond aquaculture." Other trails that connect to the upland zones traverse an area with a sparse concentration of temporary habitation features and *pāhoehoe* excavations.

SCS recorded eight (8) previously identified and (8) newly identified historic properties, whereby a total of sixteen (16) features were documented as part of its survey. All of the properties are considered to be significant based on Hawaiʻi Register Criterion D (have yielded, or likely to yield, information important for research on history). The archaeological features were assigned State Inventory of Historic Property numbers. Data collected by SCS for its survey effort resulted in the documentation of the known archaeological features and determinations pertaining to the function and age of the sites. No further work is recommended for thirteen (13) historic properties: an oval enclosure (Site 50-10-27-23007), three cairns (Sites 25550, 25553, and 30206), five rock concentrations (Sites 25551 and 30202 through 30205), a rock alignment (Site 25552), a C-shaped enclosure (Site 30199), a wall segment (Site 30200), and a modified outcrop (Site 30201). Two enclosures (Sites 25554 and 25555) are considered significant under Hawaiʻi Register Criteria C and D, and recommended for preservation. Site 25554 embodies the distinctive building style of pre-contact era to early post-contact era temporary habitation enclosures whereas Site 25555 embodies the distinctive building style of post-contact era agriculture or ranching enclosures. A pre-contact era trail (Site 25549) is considered significant under Hawaiʻi Register Criteria A, C, D, and E and is also recommended for preservation. The assessed significance attributed to Site 25549 is described below:

> The trail feature may be considered a traditional cultural property (A);
>
> It embodies distinctive characteristics of pre-contact era trails (C);
>
> It is likely to yield information important to prehistory (D); and
>
> Trails have an important value to native Hawaiian people (E).

<u>Impacts and Mitigation Measures</u>

DLNR's proposed facility, which will serve a public purpose, is expected to result in direct and indirect impacts to known archaeological features within the project site. Consultation with SHPD has occurred and will continue as the project proceeds through the various stages of design and construction. SHPD reviewed SCS's draft report and acknowledged in its letter dated March 9, 2016 (reference Log No. 2015.03770, Doc. No. 1603JA11) that the

determination for DLNR's project is "effect, with proposed mitigation commitments" pursuant to HAR §13-275-7.

One historic property (Site 23007) that is outside the conceptual footprint for the proposed facility and along the *mauka*-bound lane of Kealakehe Parkway will not be directly impacted by construction-related activities; however, twelve properties (Sites 25550 through 25553 and 30199 through 30206) that are within the design footprint are expected be directly impacted by DLNR's project. SCS's report mentions several indirect impacts that may occur due to the development of the proposed facility: alteration of the surrounding environment, visual, spatial, and noise impacts, and increased access to historic properties. Proposed mitigation includes the preservation of three historic properties (Sites 25554, 25555 and 255549) in accordance with a SHPD-approved preservation plan. The mitigation commitment reflects recommendations from archaeologists with SHPD and SP and the requests from several consulted individuals to preserve the three sites in place. In the event that any historic remains or other potentially significant subsurface resources are encountered during the various phases of construction (e.g., excavation and trenching), the contractor will be required to halt construction activities and to immediately notify SHPD of the discovery.

The proposed facility includes a secure, climate controlled space for storing, cleaning, and sorting artifacts. SHPD will have office space in the administration building and the public will have access to its library and other improved spaces intended for meetings and consultations, which will be physically separate from controlled access areas utilized to safeguard ancestral resources (e.g., *iwi*).

2.9. Cultural Practices and Resources

The cultural impact assessment conducted by SCS for the proposed project is included in Appendix D. Summarized information from SCS's report (2014b) was previously discussed in Section 1.4 Historical Setting. The consultation effort by SCS resulted in responses from eleven (11) individuals including several people who have past or present affiliations with SHPD's Hawai'i Island Burial Council and the Office of Hawaiian Affairs; the list of respondents also includes Kealakehe and Hawai'i Island *'ohana* members and the NPS archaeologist for the Ala Kahakai National Historic Trail. The following characterization of the project area is derived from SCS's report.

The coastal areas in Kealakehe contain a large number of archaeological sites that contribute to a historical and cultural landscape. Hawaiians are known to have utilized the coastal zone in the project area for resource

> extraction. Trails throughout the region facilitated travel between coastal and uplands areas and also provided access to many coastal fishing areas. The trails, *ahu*, and temporary habitation structures in the project area were constructed and used by Hawaiians. "The archaeological sites in the coastal region, some of which are listed on the National Register of Historic Places and the Hawai'i Register of Historic Places, are a reminder of Hawaiian cultural adaptations to the dry leeward environment. Many of the adaptations are related to and were directed by Hawaiian cultural beliefs."

SCS noted in its report that respondents expressed concern for "the wider cultural landscape and specific cultural resources important to Native Hawaiian cultural practitioners." Respondents shared accounts of fishing and fishpond practices within the project area but identified no specific past or ongoing cultural practices. Their collective knowledge suggests that the project site, which is not within the coastal zone, has not been utilized for traditional and cultural practices within recent times.

Erskine Architects, Inc. (EAI) consulted with the Department of Hawaiian Home Lands, the Queen Lili'uokalani Trust and the NPS during the various phases of project development since vast acreage in the vicinity of the project site is under the purview of these agencies and organizations. The NPS provided written comments via its letter dated April 2, 2015 [Reference L7621 (2015-6)] and expressed concerns with regards to development within the project site that may impact the Kaloko-Honokōhau National Historical Park including the Honokōhau Settlement National Historic Landmark. The use statistics maintained by the NPS indicate that a majority of visitors (about 88,000 of approximately 150,000 visitors per year) access the Park through the Honokōhau Harbor area, which contains parking areas, restrooms, and connecting foot trails to shoreline features (e.g., anchialine ponds, *heiau*, the Ai'opio Fishtrap, Honokōhau Beach, and the 'Aimakapā Fishpond and wetland). The concerns expressed by the NPS pertain to the protection of the fragile natural and cultural resources that are important to visitors including local residents who seek to experience cultural and natural history, and to cultural practitioners who strive to understand and perpetuate Hawaiian traditions.

<u>Impacts and Mitigation Measures</u>

The project site does not contain any of the known burials documented in previous investigations. Development within the project site will not restrict access to coastal areas that contain important natural and cultural resources.

The conceptual design of the proposed facility intentionally incorporates the preservation of historic sites and features that were identified in the archaeological inventory survey. The following excerpt is from SCS's cultural impact assessment report (2014b):

> *Recommendations proposed by cultural informants to mitigate the potential project impacts to the project area lands and traditional cultural beliefs and practices include preserving the trail and ahu (Site 25549 and 30206), displaying photographs of archaeological features that might be removed for new construction, and using stones from those sites in walls and buildings to constructed on the project area.*
>
> *Based upon an evaluation of responses to inquiries, individual cultural informant interviews, cultural informant recommendations, and archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. The proposed undertaking will not produce adverse effects to any specific Native Hawaiian cultural practices in the area.*

DLNR's project represents a commitment to permanently house the divisions tasked with protecting natural and cultural resources at Kealakehe in West Hawaiʻi. The proposed facility includes a designated open air space for cultural ceremonies near the collections warehouse. The long-term presence of DLNR in the project area may ultimately enhance resource protection activities since the proposed facility allows personnel to be near the coastal zone, which contains numerous important resources, and adjacent to the Kaloko-Honokōhau National Historical Park, which includes the Honokōhau Settlement National Historic Landmark. The proposed facility includes a community conference center that has the potential to foster educational opportunities for understanding the importance and significance of the natural and cultural environment at Kealakehe.

2.10. Visual Resources

The region from Honokōhau to Kealakehe (and specifically, TMKs 7-4-08: 3 and 4) is identified as an example of natural beauty in the County of Hawaiʻi General Plan, Table 7-11, Natural Beauty Sites, District of North Kona. The vast expanse of barren lava flows and long natural grade contributes to a characteristic sense of openness and space. Public views of the coastline from the Queen Kaʻahumanu Highway are mostly unobstructed. The letter dated April 2, 2015 from the U.S. Department of the Interior, National Park Service emphasizes the "critical importance" of visual resources within the Kaloko-Honokōhau National Historic Park that continue to be protected and preserved. Landform alterations in the project area are in concentrated locations such as in the area surrounding the Honokōhau Small Boat Harbor. A concentration of existing commercial development is located along Honookahu Street, which is across from the project site and on the *mauka* side of Queen Kaʻahumanu Highway (refer to site photographs in Appendix A).

Impacts and Mitigation Measures

DLNR's proposed project will contribute building elements and landforms along Kealakehe Parkway that are generally in keeping with existing development patterns, harbor-related facilities, and commercial building elements in the surrounding area. Landscaping within the project site will buffer or soften the visual impact of the single-story facility, which is designed to have a reduced development footprint. Views of the completed project from the Queen Kaʻahumanu Highway will consist primarily of the low-sloped roof. Visual impacts will be further mitigated by design choices such as the use of earth tone finishes and the siting of the project on the lower *pāhoehoe* lava flow, below the *ʻaʻā* bench. Conceptual renderings of the proposed facility are found in Appendix A.

2.11. Noise

The project site is located within a developing urban area that also contains important natural and cultural resources such as the Kaloko-Honokōhau National Historic Park. The NPS provided its perspective regarding soundscapes in its letter dated April 2, 2015: "Natural soundscapes are an essential facet of any National Park experience, and, given the reasons that Congress created the Kaloko-Honokōhau National Historic Park, are especially important here, even as development near the Park continues." The primary noise sources that characterize the soundscape at the project site include vehicular traffic along Queen Kaʻahumanu Highway and Kealakehe Parkway. Existing development surrounding the Honokōhau Small Boat Harbor also contributes to ambient noise levels. Low background noise in the vicinity of the project site is generally influenced by natural sounds from undeveloped areas and the sounds associated with human activities that emanate from established developed areas and modern travel routes. The activities of DLNR's divisions currently contribute to the soundscape at the Honokōhau Small Boat Harbor Facility; traveling personnel also contribute human activity along established vehicular routes as part of normal operations.

Impacts and Mitigation Measures

Audible noise from demolition and construction activity is expected to be intermittent and unavoidable since construction vehicles, heavy equipment and impact tools generate noise as part of normal operations. The mitigation of noisy activities to inaudible levels will not be practical in all cases due to the intensity and exterior nature of the work. Ambient noise levels in the vicinity of the project site will therefore increase during construction periods. Quieter construction activities, such as building erection and equipment installation, may not be audible. Construction noise is temporary in nature and will cease upon completion of the project.

Project activities shall comply with the provisions of HAR Title 11, Chapter 46, "Community Noise Control." The noise regulations require a noise permit if the noise level from construction activity is expected to exceed allowable levels stated in the Chapter 11-46 rules. It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment and to maintain noise levels within regulatory limits. If construction activities occur outside of the allowable timeframes designated for the noise permit (i.e., nighttime, Sunday, holiday) and exceed allowable noise levels, a noise variance must be obtained prior to commencement of construction activities, as required. The construction contractor will obtain the appropriate permit or approvals (e.g., Notice of Intent to Construct, Community Noise Permit, or Noise Variance). DLNR will ensure that the contractor complies with all permit conditions. Potential noise impacts will also be mitigated by performing the majority of construction work during daytime hours (as opposed to night work), thereby avoiding the creation of construction noise impacts during the quieter nighttime hours.

The activities of DLNR's divisions will continue to contribute to the soundscape of the project area. The proposed facility is not expected to be a significant source of new background noise since normal operational activities are generally associated with low volumes of local vehicle movement at various times. Large group events that utilize the community conference center are expected to occur on an infrequent basis and will be contained in the facilities closest to Kealakehe Parkway. Additional travel and resulting noise would be a temporary and intermittent impact. Landscaping within the project site may help to reduce or buffer the sounds from human activities.

2.12. Site Access, Circulation and Traffic

Queen Ka'ahumanu Highway (State Highway Route 19) is a primary arterial route in the project area that is currently being expanded to four lanes; the federally funded, highway widening project (Phase 2) may be completed by 2018. The posted speed limit in the project vicinity is 45 miles per hour (mph). There are unsignalized and signalized intersections for turning movement from Queen Ka'ahumanu Highway to the land uses that are *makai* of the highway including the Kaloko-Honokōhau National Historic Park, Honokōhau Small Boat Harbor and Kealakehe WWTP.

The project site is located along Kealakehe Parkway, which is a two-lane collector roadway with a posted speed limit of 35 mph. Kealakehe Parkway connects to Queen Ka'ahumanu Highway at a signalized intersection and is the sole vehicular access route to the Honokōhau Small Boat Harbor. There are no planned improvements or realignments of Kealakehe Parkway at this time.

The County of Hawaiʻi provides bus services along Queen Kaʻahumanu Highway including routes identified as “North Kohala/Waimea/Kailua-Kona,” “Intra-Kona” and “Pahala/Kona/South Kohala.” There is bicycle traffic along the wide shoulders of the highway, which serves as a training route and race route for the annual Iron Man Triathalon; there are no designated pedestrian facilities along the highway.

Appendix E contains the traffic impact assessment report (TIAR) that was prepared by SSFM International to evaluate existing (2014) and future (2025) conditions. The level-of-service for the eastbound approach at the unsignalized intersection of Queen Kaʻahumanu Highway and the Kaloko-Honokōhau National Historic Park driveway was considered to be poor. The level-of-service for signalized intersections that provide access to the Honokōhau Small Boat Harbor and the Kealakehe WWTP were deemed to be appropriate, although some turning movements operated poorly. The Hawaii Fishing and Boating Association expressed its concerns with regards to traffic and site access in a letter dated May 12, 2015 that identified Kealakehe Parkway as a “heavily used” roadway and the intersection of Queen Kaʻahumanu Highway with Kealakehe Parkway as “dangerous” since traffic in the area includes vehicles with large trailers. DLNR personnel traverse roadways in the project area as part of normal operations since DOBOR, DAR and DOCARE are currently housed at the Honokōhau Small Boat Harbor Facility.

The Queen Kaʻahumanu Highway widening project includes signalization at the intersection of Queen Kaʻahumanu Highway and the Kaloko-Honokōhau National Historic Park driveway. Future lane configurations and intersection controls are projected to result in appropriate intersection LOS, although some turning movements are anticipated to continue to operate poorly.

Impacts and Mitigation Measures

DLNR’s proposed project includes the construction of secured base yards, parking lots and internal roadways for site circulation. DOT stated in its letter dated April 24, 2015 that “the entrance to the DLNR base yard should be located as far from the Queen Kaʻahumanu Highway Kealakehe Parkway intersection as is possible.” Vehicular access to the project site will be from two driveway locations along Kealakehe Parkway located roughly 485 feet and 735 feet, respectively, from the existing pavement edge of Queen Kaʻahumanu Highway. A gated driveway that provides direct access and egress to the base yard via a service road will be secured to prevent unauthorized entry. Internal circulation routes and base yard areas will be designed to incorporate gates and fencing for site security.

Queen Kaʻahumanu Highway and Kealakehe Parkway will be utilized for the transportation of equipment and material to the project site. Disruptions to vehicular, bicycle and pedestrian traffic during the various phases of

construction will be intermittent and temporary in nature. Bus routes and bus stops along Queen Ka‘ahumanu Highway are not expected to be impacted by project actions. The transport of oversized and/or overweight materials and equipment on State highway facilities requires a permit from the State of Hawai‘i Department of Transportation (DOT). It will be determined during the design phase whether the operation or transportation of any oversized and/or overweight vehicles and loads will be required during construction.

Traffic control along Kealakehe Parkway in the vicinity of the project site will be directed by construction personnel or by law enforcement personnel, when necessary. The majority of construction work and the moving of heavy equipment or construction-related supplies will be scheduled during daytime hours (as opposed to night work). At night and when work is not occurring, all associated construction equipment will be secured and appropriately sited to prevent obstructions to traffic. The temporary increase in traffic due to construction vehicles and equipment accessing the project site will cease upon project completion.

The two new driveways for the project site must be approved by DOT. Coordination and consultation with DOT is expected to be conducted by the project representative and/or the construction contractor as a requirement for acquiring the necessary project approvals and permits. DLNR personnel will continue to traverse roadways in the project area in the foreseeable future as part of normal operations at the project site and at the Honokōhau Small Boat Harbor Facility. Vehicular travel by DLNR personnel will occur at various times due to the nature of operational activities, which includes responding to unplanned situations involving protected resources. Events, meetings and workshops for 20 to 200 people are expected to be held at the community conference center at frequencies which are not yet known.

The findings in the TIAR indicate that there would be a minimal change to the LOS at nearby intersections as a result of project-related traffic. The TIAR evaluated future (2025) conditions with DLNR’s proposed facility and determined that all intersections would operate at acceptable LOS; therefore, no mitigation is recommended for the studied intersections in the project area. Signal timing adjustments can be made to address poor operations at specific turning movements. Events that maximize the occupancy of the community conference center and create additional traffic can be scheduled to avoid periods of peak travel. Advance notification of anticipated traffic-related issues in the vicinity of the project site and the use of traffic control personnel (e.g., police officers) may also mitigate impacts attributed to events held at the proposed facility.

2.13. Utilities (Water, Wastewater, Drainage)

The undeveloped project site receives no utility service at this time but is located within an area served by existing municipal systems for potable water and wastewater disposal. Municipal water service may be available to the project site from an existing 20-inch water main near the Queen Kaahumanu Highway that connects to an 8-inch main extension along the alignment of Kealakehe Parkway. Utility lines and connecting infrastructure will require further evaluation upon completion of the federally funded Queen Kaahumanu Highway widening project, which includes the installation of new municipal water, sewer and drainage infrastructure. DLNR's water allocation requires an approval from the Hawai'i County Department of Water Supply (DWS) since it administers and operates the potable water system. The letter from DWS dated April 10, 2015 indicates that "the average daily water usage through the existing services, over the past year, is approximately 65,300 gallons per day (gpd), which is equivalent to approximately 164 units of water."

The DOH Wastewater Branch stated in its letter dated March 17, 2015 that the project site is located in the critical wastewater disposal area as determined by the Hawai'i County Wastewater Advisory Committee. DOH indicated that it has information in its files pertaining to individual wastewater systems on DLNR's parcel for the Honokōhau Small Boat Harbor Facility, Hawaii Big Game Fishing Club, DOCARE Office, and DOBOR. The Hawaii Fishing and Boating Association stated in its letter dated May 12, 2015 that DOH "recently sent a memo to DLNR alerting them that the injection wells currently used for sewage disposal at the Honokōhau SBH are inadequate, inappropriate and must be replaced with proper sewage treatment and disposal processes." Hawai'i County's domestic wastewater collection and treatment facilities are administered by the Department of Environmental Management (DEM). Expansion of the Kealakehe WWTP, which has been in operation since 1993, is needed to allow the facility to accept new wastewater flows; however, it is unknown when the WWTP will be upgraded.

Impacts and Mitigation Measures

Project actions require the installation of on-site utility distribution systems, fire protection infrastructure (e.g., hydrants, fire sprinkler laterals) and irrigation systems for on-site landscaping. Utility services to the Honokōhau Small Boat Harbor Facility may be disrupted during periods of work; however, this impact is expected to be short-term and temporary. There are no long-term impacts associated with establishing new utility connections to the proposed facility that may house 40 to 50 personnel. Some of DLNR's operational uses and personnel are already receiving utility service at the small boat harbor or elsewhere in West Hawai'i and would relocate to the proposed facility. Various field duties are anticipated to cause some of

DLNR's staff to be away from the project site at undetermined intervals. There will be various kinds of interactions with constituents, contractors and the public whereby staff and visitor numbers at the proposed facility are expected to vary on a daily basis.

The projected water demand for the proposed facility with an assumption of once-per-day or twice-per-day irrigation of landscape plants is between 4,170 to 4,720 gpd, respectively. DLNR will explore options to reduce the demand for potable water such as utilizing trucks to transport non-potable water from underutilized state-owned wells to supply on-site water reservoirs for landscape irrigation and fire protection purposes. On-site water catchment and the use of water efficient features may further help to reduce the potable water demand for the proposed facility. New municipal infrastructure is currently being installed along Queen Kaahumanu Highway and connecting water system infrastructure along Kealakehe Parkway may require further improvement to ensure adequate service delivery and fire protection to the project site. All necessary improvements for potable water service will be coordinated with DWS. The final decision by DWS with regards to the availability of water will be confirmed when the building permit application is submitted for approval. The civil drawings will be reviewed by the Hawai'i County Fire Department when the building permit application is submitted for approval to ensure that fire department access, water supply for on-site fire protection, and life safety requirements are met. The project site is not connected to recycled water infrastructure and there are no plans to transport recycled water to the project site for non-potable uses at this time. Various stakeholders including DOH and DWS will be consulted if recycled water infrastructure becomes available in the future for non-potable uses at the project site.

All necessary improvements for municipal wastewater service will be coordinated with DEM prior to the building permit application process. The average day sewer demand is estimated at 5,280 gpd. DLNR will confirm with DEM that there is adequate wastewater system capacity to convey flows to the Kealakehe WWTP since it is currently unknown when the WWTP will be upgraded.

DLNR's project is expected to increase drainage flows due to the addition of impervious surfaces such as paved roadways, parking lots, and other built areas at the project site. The proposed facility will include passive landscaping, and drain inlets with drywells to enhance stormwater retention and minimize runoff. Runoff from paved vehicular areas will be directed toward drain inlets with filter media and other vegetated areas. The site drainage plan will comply with applicable Hawai'i County Department of

Public Works (DPW) drainage standards. The resulting drainage flows leaving the site must not exceed pre-development drainage flows per DPW's requirements.

A short-term and temporary impact of the project would occur from the generation of sediment-laden surface runoff during construction work. BMPs will be incorporated into a storm water management plan. Appropriate erosion control BMPs will be used to minimize the amount of sediment transported in stormwater runoff during construction activities. All construction activities will comply with applicable Federal, State and County regulations and rules for erosion control as previously discussed in Section 2.4, Water Resources. DLNR's completed facility will increase impervious surfaces associated with paved roadways, parking lots and buildings within the project site; however, this anticipated impact will be offset by incorporating design methods that reduce storm water runoff from the site. Passive landscaping, drain inlets and drywells for roof runoff and AC condensation will be utilized to keep drainage flows that leave the site at pre-development volumes. All drainage features will comply with applicable DPW drainage standards.

2.14. Power and Communications

The project area receives electrical power service provided by Hawaiian Electric Light Company, Inc. (HELCO). Underground duct lines and overhead lines along Kealakehe Parkway convey electrical power from Queen Kaʻahumanu Highway to the Honokōhau Small Boat Harbor Facility. The letter dated March 26, 2015 from Hawaiʻi Gas includes the company's determination that the area is clear of utility gas facilities (e.g., gas lines). The undeveloped project site does not require or receive power or communications service.

Telecommunications service in the project area is provided by Hawaiian Telcom and Oceanic Time Warner Cable (OTWC). OTWC does not currently provide internet and cable television service (CATV) in the project area because a project to install underground CATV infrastructure from Queen Kaʻahumanu Highway towards Honokōhau Harbor has been on hold for several years; the time frame for project completion is unknown.

Impacts and Mitigation Measures

Proposed construction activity has the potential to disrupt power and communication systems to the site but these effects are expected to be short-term and temporary. DLNR's project will be coordinated with HELCO, Hawaiian Telcom and other service providers as needed. The proposed facility does not represent a substantial increase in energy consumption since some of DLNR's operational uses and personnel are already receiving power

and communications service at the Honokōhau Small Boat Harbor Facility. There are no long-term impacts associated with establishing new service connections. The project will incorporate sustainable building design concepts and energy efficient features.

2.15. Socio-Economic Characteristics

The County of Hawaiʻi has identified the West Hawaiʻi planning region as an area for directed urban growth. The project site is located within the North Kona area of West Hawaiʻi, which is expected to continue to grow because there is ample potential for expansion of the housing stock and commercial centers in this area.

In 2010, the North Kona region had a resident population of 37,875 inhabitants, which represented approximately 20 percent of the Hawaiʻi Island population of 185,079 inhabitants (State of Hawaiʻi Department of Business, Economic Development and Tourism, 2015). The 2015 estimate suggests the resident population of Hawaiʻi County was 196,428 and the annual growth rate is 1.2 percent; the growth of the resident population is due to natural increase (birth less death) and net in-migration from the mainland and from foreign countries (State of Hawaiʻi, Department of Business, Economic Development and Tourism, 2016).

Kealakehe Elementary School, Kealakehe Intermediate School, and Kealakehe High School are located within the Kealakehe project area and *mauka* of Queen Kaʻahumanu Highway. Kealakehe High School, which is closest to the project site, is located approximately 1.5 miles from the project site and along Ane Keohokalole Highway.

Impacts and Mitigation Measures

The proposed project is intended to enhance the service capabilities of DLNR and is not expected to affect population levels, housing or schools. The various phases of construction will create short-term jobs for people in design and construction. The proposed facility will be staffed by approximately 40 to 50 personnel who will relocate from spaces at the Honokōhau Small Boat Harbor Facility or from other spaces in West Hawaiʻi. DLNR's project is expected to be a relatively insignificant source of new full-time employment opportunities in West Hawaiʻi for the foreseeable future.

2.16. Emergency Service Facilities and Shelters

Law enforcement is provided by the County of Hawaiʻi Police Department. The Kealakehe Police Substation, which is closest to the project site, is located along Queen Kaʻahumanu Highway.

Fire protection services are provided by the County of Hawaiʻi Fire Department. The Kailua-Kona Fire Station is located approximately 2.6 miles from the project site near the intersection of Palani Road and Queen Kaʻahumanu Highway. There are two fire hydrants on Kealakehe Parkway in the vicinity of the project site.

Emergency service providers include critical care providers such as hospitals and clinics. The Kona Community Hospital in Kealakekua is a full service hospital facility; it is approximately 12.9 miles south of the project site. The privately owned and operated Urgent Care of Kona facility provides limited emergency care services; it is approximately 6.5 miles south of the project site.

The Kealakehe High School is a designated hurricane evacuation shelter that is located about 1.5 miles east of the project site. This shelter can accommodate and provide limited support to persons with special health needs.

Impacts and Mitigation Measures

No significant adverse impacts to police, fire, medical or emergency shelter services will occur from the completion of the proposed facility. The installation of four new fire hydrants will be coordinated with DWS. The civil drawings will be reviewed when the building permit application is submitted for approval to ensure that fire department access, water supply for on-site fire protection, and life safety requirements are met. As indicated in its letter dated July 22, 2014, the County of Hawaiʻi Fire Department "determined that there will be no significant impact to fire department services" from the project. The proposed buildings are intentionally sited outside of the tsunami zone. Since the facility would not need to be evacuated during tsunami warnings, DLNR can continue operations and could potentially render disaster related services in the event of an emergency.

2.17. Recreational Resources

DLNR has jurisdiction over state parks; historical sites; forests and forest reserves; aquatic sanctuaries; public fishing areas; boating, ocean recreation, and coastal programs; wildlife sanctuaries; game management areas; public hunting areas; and natural area reserves. The County of Hawaiʻi Department of Parks and Recreation operates and maintains County park facilities. Notable recreational resources near the project site include the Kaloko-Honokōhau National Historic Park, Honokōhau Bay and Honokōhau Harbor. The project site abuts the 1,200-acre Kaloko-Honokōhau National Historic Park, which contains unique cultural and natural resources such as archeological sites, anchialine ponds, ancient Hawaiian fishponds, and a fishtrap.

Other public parks in the project area include the Old Kona Airport State Recreation Area. The County of Hawai‘i manages the facilities at this park including the baseball and soccer fields, the Kona Community Aquatic Center, and Kekuaokalani Gym.

Impacts and Mitigation Measures

The proposed project creates no additional demand for recreational facilities such that no mitigation is warranted. Project actions are expected to have no adverse impact on recreational resources. The proposed project represents the continued presence of DLNR in the West Hawai‘i region.

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3. RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

3.1. State Land Use District

The State Land Use Law (Chapter 205, HRS) is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare for Hawaii's people. All lands in the State are classified into four land use districts by the State of Hawaiʻi, Land Use Commission: Urban, Agricultural, Conservation, and Rural. Urban areas are characterized by residential neighborhoods, commercial enterprises, industrial development, and community facilities including public buildings. DLNR's parcel contains land that is within the Urban and Conservation Districts; however, the project site is entirely located within the Urban District. The proposed facility is a permitted use within the Urban District.

3.2. Hawaiʻi State Plan

The Hawaiʻi State Plan (Chapter 226, HRS) outlines broad goals, policies and objectives to serve as guidelines for the future growth and development of the State. The excerpts below are pertinent Hawaiʻi State Plan objectives, policies, and priority guidelines that pertain to the proposed project at Kealakehe in West Hawaiʻi. The proposed facility is functionally related to other existing public use structures and facilities located at the Honokōhau Small Boat Harbor Facility. The various divisions of DLNR provide government services such as resource management, protection and conservation that are not provided by the private sector.

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

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

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

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

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

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

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

§226-13 Objectives and policies for the physical environment--land, air, and water quality.

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

following objectives:

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

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

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

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

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

§226-14 Objective and policies for facility systems--in general.

(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

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

(1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.

(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.

(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.

§226-25 Objectives and policies for socio cultural advancement--culture.

(a) Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.

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

(1) Foster increased knowledge and understanding of Hawaii's ethnic and cultural heritages and the history of Hawaii.

§226-27 Objectives and policies for socio cultural advancement – government.

(a) Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following

objectives:

(1) Efficient, effective, and responsive government services at all levels in the State.

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

(1) Provide for necessary public goods and services not assumed by the private sector.

(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.

3.3. County of Hawai‘i General Plan

The *County of Hawai‘i General Plan* (2005 edition, amended in 2014) is the policy document that encompasses the long-range goals, policies, standards, and courses of action for comprehensive physical development on the island of Hawai‘i. DLNR's project is the construction of a community conference center and administration facility for its divisions that have responsibilities pertaining to the protection of natural or cultural resources. The proposed facility would enhance DLNR's efforts to inform and engage the general community with regards to its resource protection programs and services. New buildings that house DLNR's divisions will be sited outside of the Tsunami Evacuation Zone. DLNR is proposing a project that supports the goals and policies listed below.

General Plan - Historic Sites

Goals:

Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawaii.

Policies:

Agencies and organizations, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.

Require both public and private developers of land to provide historical and archaeological surveys and cultural assessments, where appropriate, prior to the clearing or development of land when there are indications that the land under consideration has historical significance.

General Plan - Natural Beauty

Goals:

Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.

Protect scenic vistas and view planes from becoming obstructed.

Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

Policies:

Protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.

General Plan - Natural Resources and Shoreline

Goals:

Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.

Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.

Ensure that alterations to existing land forms, vegetation, and construction of structures cause minimum adverse effect to water resources, and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.

Policies:

Coordinate programs to protect natural resources with other government agencies.

Encourage the use of native plants for screening and landscaping.

General Plan - Public Facilities

Goals:

Encourage the provision of public facilities that effectively service community and visitor needs and seek ways of improving public service through better and more functional facilities in keeping with the environmental and aesthetic concerns of the community.

Policies:

Continue to seek ways of improving public service through the coordination of service and maximizing the use of personnel and facilities.

Coordinate with appropriate State agencies for the provision of public facilities to serve the needs of the community.

General Plan - Recreation

Goals:

Maintain the natural beauty of recreation areas.

Policies:

The use of land adjoining recreation areas shall be compatible with community values, physical resources, and recreation potential.

The letter dated April 15, 2015 from the Hawaiʻi County Planning Department cited Table 7-11 Natural Beauty Sites, District of Kona which lists the Honokōhau coastline, TMK 7-4-08: 003 and 004 as an example of natural beauty. The 7.5-acre project site is within TMK 7-4-008: 003 but not situated within the 17-mile protected coastline area, which has mostly been set aside for park purposes.

The LUPAG map serves as a guide for the direction of future developments and indicates the general location of various land uses in relation to each other. DLNR's parcel contains land that is within the Open and Urban Expansion designations on the LUPAG map; however, the project site appears to be entirely within the area designated as Urban Expansion.

3.4. Kona Community Development Plan

The *Kona Community Development Plan* that was adopted by ordinance and became effective on September 25, 2008 encompasses the districts of North and South Kona. DLNR's project is the construction of a community conference center and administration facility for its divisions that have responsibilities pertaining to the protection of natural or cultural resources. The proposed facility is consistent with the guiding principle of providing infrastructure and essential facilities concurrent with growth.

The letter from the Hawaiʻi County Planning Department dated April 15, 2015 cited the following policies and figures from the *Kona Community Development Plan*:

Policy TRAN-1.5 Frontage Road

Figure 4-2a, Official Transportation Network Map - Proposed Roads and Transit

Policy LU-1.6: 17-Mile Protected Coastline

Figure 4-7, Official Kona Land Use Map

DLNR's project maintains a buffer area along Queen Kaʻahumanu Highway; it is noted that the *makai* side of the highway may serve as a Secondary Transit Route in the future. The proposed facility requires no new access points from the highway because vehicular access and egress will be from Kealakehe Parkway. As previously mentioned, the 7.5-acre project site is outside the 17-mile protected coastline.

3.5. County of Hawaiʻi Land Use Ordinance

Hawaiʻi County's Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the County's General Plan and Community Development Plans. The zoning for the project site is O - Open District. There are no setbacks or height restrictions per the Hawaiʻi County's LUO. DLNR's project is a public use on state-owned property in accordance with the following description from the LUO:

> *Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use.*

3.6. State Coastal Zone Management Program

Hawaii's Coastal Zone Management (CZM) program, established pursuant to the Hawaiʻi Coastal Zone Management Act (Chapter 205A, HRS, as amended), is administered by the State of Hawaiʻi, Office of Planning and provides for the beneficial use, protection, and development of the State's coastal zone. The CZM area consists of the entire State of Hawaiʻi. The objective of the Act is to protect, preserve, and restore recreational, historic, and scenic resources as well as implementing the state's ocean resources management plan and protecting coastal ecosystems. The Act involves a system of permits to manage development within the coastal areas and encourages public participation.

All counties in Hawaiʻi have enacted ordinances establishing SMAs. Any significant development within the SMA requires permit approval from the appropriate County. On the Island of Hawaiʻi, the SMA permit process is administered by the Department of Planning. The SMA Use Permit (Major), which applies to development with a valuation equal to or exceeding $500,000, requires action by the Leeward Planning Commission of the County of Hawaiʻi.

The project site is located within the SMA. The proposed project establishes a new facility on State-owned land that is away from the shoreline but in the vicinity of the Honokōhau Small Boat Harbor and the Kaloko-Honokōhau National Historical Park. The project does not affect the use of or access to coastal or public recreational opportunities. The various DLNR divisions provide important services and programs

that pertain to state parks; historical sites; forests and forest reserves; aquatic sanctuaries; public fishing areas; boating, ocean recreation, and coastal programs; wildlife sanctuaries; game management areas; public hunting areas; and natural area reserves. Hence, the proposed facility is consistent with the CZM objectives and policies pursuant to Section 205A-2, HRS.

> *(1) Recreational Resources;*
> *(A) Provide coastal recreational opportunities accessible to the public.*
>
> *(2) Historic resources;*
> *(A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.*
>
> *(4) Coastal ecosystems;*
> *(A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*
>
> *(5) Economic uses;*
> *(A) Provide public or private facilities and improvements important to the State's economy in suitable locations.*

The development footprint of DLNR's facility was reduced and is designed to minimize the visual impact of new building elements and landforms along Kealakehe Parkway that are generally in keeping with built elements in the surrounding area. Landscaping within the project site and design choices such as the use of earth tone finishes will further buffer or soften the visual impact of the single-story facility that is sited on the lower *pāhoehoe* lava flow below the *ʻaʻā* bench. DLNR's project is consistent with the CZM policies pursuant to §205A-2(c)(3)(B) that pertain to scenic and open space resources.

> *(3) Scenic and open space resources;*
> *(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.*

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4. POSSIBLE ALTERNATIVES

Project alternatives are hereby discussed in a tiered analysis format. The West Hawai‘i region is expected to be more disturbed by the footprint of human activities as new development transforms vacant land designated for future growth. Urban expansion along with associated infrastructure effectively reduces the resource areas that contribute to the natural, open setting of the North Kona district in West Hawai‘i. DLNR is aware that facility development upon vacant land will generate direct and indirect impacts; it is the responsibility of the land management agency to decide what level of impact is acceptable and what actions are needed to maintain resource conditions. DLNR is committed to a continued presence in West Hawai‘i as it strives to effectively respond to the effects of urban growth and increased use of natural resources for recreational and cultural purposes.

4.1. Tier One Analysis: Available Site Locations

There are state-owned lands in Kealakehe on the *mauka* and *makai* sides of Queen Ka‘ahumanu Highway that are dedicated for specific purposes; the state-owned parcel (TMK 7-4-008: 003) that contains the Honokōhau Small Boat Harbor Facility is encumbered under Governor’s Executive Order (EO) No. 4334 to DOBOR for small boat harbor and related purposes. Most of the undeveloped area immediately surrounding the harbor facility is reserved for future harbor expansion that has not yet progressed beyond the design concepts described in the *Final Environmental Impact Statement for Kona Kai Ola, Kealakehe, North Kona District, Island of Hawai‘i* (Oceanit, 2007). The tier one analysis must therefore include considerations about future dedicated uses of state land along with the expectation that DOBOR will remain at the harbor facility for the foreseeable future. No action is also discussed.

Locations *Mauka* of Queen Ka‘ahumanu Highway

The Hawai‘i County Planning Department in its letter dated April 15, 2015 suggested the consideration of site alternatives that are not located within the 17-mile protected coastline area from Honokōhau to Kealakehe, in keeping with applicable land use policies identified in the Kona Community Development Plan. The agency included the following statements in its letter:

> *Consider the proximity to the Honokōhau Village Transit Oriented Development (TOD) which is also identified as a Regional Center. It is recommended that the project site be located closer to the existing government center mauka of the Queen Ka‘ahumanu Highway and adjacent to existing and future areas of development planned for Honokōhau Village TOD.*

The Hawaii Fishing and Boating Association in its letter dated May 12, 2015 similarly suggested that state-owned land “on the mauka side of Queen

Ka‘ahumanu Highway, out of the tsunami inundation zone, away from the area most appropriate for harbor facilities expansion, closer to the growing government core (County building, judiciary, etc.), with a far less significant traffic issue” would be more favorable for DLNR’s facility. The letter also recognized that a location farther from the ocean would be less practical and more inconvenient for DLNR divisions that have ocean-related missions; a location away from the harbor may also reduce interactions with constituents.

Several state-owned parcels were identified in the *Final Environmental Impact Statement for the Kona Judiciary Complex Site Selection, Kona District, Island of Hawai‘i, Hawai‘i* (Group 70 International, 2011), which is hereby incorporated by reference. Several candidate sites for the Kona Judiciary Complex contain developable state-owned and private land along Kealakehe Parkway and are close to the West Hawai‘i Civic Center; any land not owned by DLNR would require negotiations to establish a long-term lease if said land could not be acquired in fee or through a land swap. The known conditions including environmental challenges and future use dedications that pertain to the sites identified in Figure 10 are summarized below.

DHHL Site. DHHL is the recorded owner of TMK 7-4-020:003, which contains a 7.6-acre site abutting the West Hawai‘i Civic Center. The developable area is constrained by a designated future road right-of-way. The 7.6-acre site was previously disturbed such that there are no known archaeological resource constraints. The site is known to contain common native plants. Reportedly, the water unit allocations to the DHHL Site are “not sufficient” (Group 70 International, 2011).

Lanihau/DHHL Site .Land use considerations for the 12.5-acre site are more complicated because two contiguous parcels with different land tenure are involved; DHHL is the recorded owner of TMK 7-4-021:008 and Lanihau Properties LLC is the recorded owner of TMK 7-4-008:005. The Lanihau/DHHL Site, which is on the *mauka* side of Ane Keohokalole Highway, consists of 5.8 acres from Lanihau’s parcel and 6.7 acres from DHHL’s parcel. The developable area may contain multiple historic properties and is known to contain common native plants.

Kealakehe 1 Site. The 10-acre site is entirely within TMK 7-4-020: 007, which is recorded to DLNR. The Kealakehe 1 Site was rededicated to Hawai‘i County for wastewater reclamation, golf course and/or public park purposes by EO 4355 signed on January 28, 2011. Joint approval from the County, Governor and DLNR Land Board is needed to withdraw the land from the EO. The Kealakehe 1 Site is located at the intersection of Queen Ka‘ahumanu Highway and Kealakehe Parkway; the 10-acre site is known to contain various trail segments and rare or native plants.

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DLNR Community Conference Center and Administration Building

Figure 10 - Alternative Sites

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Kealakehe 2 Site. The 10-acre site spans two contiguous parcels recorded to DLNR; the site involves 1.8 acres from TMK 7-4-020: 007 and 8.2 acres from TMK 7-4-020: 004. The Kealakehe 2 Site is located directly across from the West Hawai‘i Civic Center at the intersection of Kealakehe Parkway with Ane Keohokalole Highway. Historical/archaeological resources and rare or native plants are present within the site. In 2012, the Kealakehe 2 Site was selected as the preferred location for the Kona Judiciary Complex. In 2013, “environmental complications” including the discovery of an endangered *uhiuhi* tree and the timing of a decision by the USFWS to designate a portion of the site as critical habitat for threatened plant species apparently contributed to the Judiciary’s decision to site its complex near the Makalapua Center upon land recorded to the Queen Lili‘uokalani Trust (*Pacific Business News*, 2013). The Kona Judiciary Complex will now be further away from the West Hawai‘i Civic Center but less than one mile from the urban core of Kailua-Kona.

No other alternative sites where land disturbance has occurred and/or site infrastructure is already in place are known to be available for consideration. A multitude of factors beyond the purview of DLNR would need to occur for successful land transfers or lease negotiations between the state and other government entities or private landowners.

The siting of DLNR’s proposed facility close to the West Hawai‘i Civic Center would help to strengthen the government cluster the County is striving to establish; however, a site location near the government cluster implies a need for coordination and collaboration between various agencies for timing and to ensure compatibility among the public functions that would be situated near each other. There appears to be no compelling environmental benefits associated with the described locations in Kealakehe on the *mauka* side of Queen Ka‘ahumanu Highway since landform alterations may result in disturbances to biological resources and/or their habitat or site development may be constrained by discoveries of historical/archaeological resources. Several projects on the *mauka* side of Queen Ka‘ahumanu Highway including Village 4 of La‘i ‘Ōpua and the Kealakehe Regional Park have experienced delay pertaining to the establishment of agreements with the FWS for critical habitat set asides and habitat management (Yager, 2016).

A site location on the *mauka* side of Queen Ka‘ahumanu Highway is further away from the Honokōhau Small Boat Harbor Facility and considered to be less practical for DLNR’s divisions that have ocean-related missions or marine and shoreline resource protection responsibilities. The transportation of state-owned or impounded watercraft, equipment, vehicles and vessels between the harbor facility and a site across the highway involves a longer

travel route as compared to a site location that is *makai* of the highway. The option to site DLNR's proposed facility *mauka* of the highway is therefore possible but not favorable from the perspective of DLNR whereby other options that fulfill the objectives previously stated in Section 1.2 of this EA must be pursued.

Locations *Makai* of Queen Ka'ahumanu Highway

DHHL and DLNR are the recorded owners of large parcels in Kealakehe on the *makai* side of Queen Ka'ahumanu Highway. In 2006, the environmental conditions pertaining to three state-owned parcels (TMKs 7-4-008: 003, 071 and 072) located along Kealakehe Parkway were assessed for the unrealized Kona Kai Ola project; this collaborative effort between DLNR and DHHL sought to establish an 800-slip marina along with commercial, light industrial, and resort uses on 330 acres of DLNR's land and 200 acres of DHHL's land. A marine science center, a Hawaiian cultural center, open space, public access, and recreational water features (e.g., lagoons and ponds) were part of this planned project. The conceptual plan introduced no new development within vacant areas contiguous to the Honokōhau Small Boat Harbor Facility since said areas are reserved by DLNR for future harbor-related uses.

DHHL is the recorded owner of TMKs 7-4-008: 071 and 072 (hereafter parcels 71 and 72), which remain undeveloped. Parcel 71 encompasses the shoreline area whereas parcel 72 abuts Queen Ka'ahumanu Highway and is immediately south of Kealakehe Parkway. Reportedly, DHHL has no plans to develop its parcels, which currently do not warrant or receive utility services. DHHL's parcels are known to contain historical/archaeological resources recommended for preservation and native plants. A successful land transfer or lease would need to be executed for DLNR's use of DHHL's land, which is not favorable from the perspective of DLNR because there is developable area within its own nearby parcel.

DLNR is the recorded owner of TMK 7-4-008: 003 (hereafter parcel 3), which contains the Honokōhau Small Boat Harbor Facility; parcel 3 is between Kealakehe Parkway and the Kaloko-Honokōhau National Park. Vacant areas contiguous to the small boat harbor are reserved for future harbor-related uses. Three (3) vacant sites beyond this reserved area were identified and considered for the proposed facility (refer to Figure 10).

Site A. The remote, 4.56-acre site is located outside of the tsunami evacuation zone and in an isolated location beyond existing roadways. Site A is aligned with the extension of Kealakehe Parkway but there is no vehicular access to the undeveloped site at this time. The development of Site A would therefore necessitate extensive off-site land disturbance for

the extension of Kealakehe Parkway and utility infrastructure. Site A is characterized by rugged terrain, and steep elevations and drop offs. The most direct route from Site A to DOBOR's office is about 0.3 miles long and traverses lava, unpaved roads and a paved portion of Kealakehe Parkway. The edge of Site A is roughly 1,300 feet from the closest connection to existing utility lines.

Site B. The flatter, 7.54-acre site is located between Site A and the small boat harbor. Site B has the following characteristics: the topography is relatively flat, it is entirely within the tsunami evacuation zone, and development would necessitate off-site land disturbance to improve an existing unpaved road and to extend Kealakehe Parkway and utility infrastructure. The undeveloped site is currently aligned with the unpaved dirt road that provides a connection between the small boat harbor and the Kealakehe WWTP; the planned extension of Kealakehe Parkway would provide vehicular access at the southern corner of Site B. The edge of Site B is approximately 350 feet from the closest connection to existing utility lines. A direct route from Site B to DOBOR's office utilizing unpaved roads and a paved portion of Kealakehe Parkway is about 0.3 miles long. The use of Site B is impractical for DLNR given that personnel and stored vehicles would have to be evacuated from the facility whenever there is a tsunami warning.

Site C. The relatively flat, undeveloped, 9.02-acre site is upland from the Honokōhau Small Boat Harbor Facility and spans the area between Kealakehe Parkway and the Kaloko-Honokōhau National Park. A wide buffer area established along the Queen Ka'ahumanu Highway further restricts Site C to a trapezoidal area of about 4 acres; roughly 70 percent of this trapezoidal area is outside of the Tsunami Evacuation Zone (refer to Figures 3 and 7). The development of the 4-acre site involves the least amount of off-site land disturbance because Site C is aligned along Kealakehe Parkway and its southern edge is adjacent to existing utility line connections. A direct travel route from Site C to DOBOR's office utilizes approximately 0.3 miles of the paved portion of Kealakehe Parkway.

The siting of the proposed facility at Sites A, B or C would allow DLNR to remain close to its constituents and harbor berth. Sites A, B and C are undeveloped such that any urban usage would involve localized grading and excavation to create level terrain. Landform alterations may result in the disturbance of previously unknown historic features or biological resources. No other alternative sites within parcel 3 where land disturbance has occurred and/or site infrastructure is already in place were available for DLNR's consideration.

Site C was ultimately selected by DLNR as the proposed site because it contains ample developable area that is outside the Tsunami Evacuation Zone and is not further challenged by the characteristics associated with Sites A and B such as the lack of nearby utility connections and the need for roadway improvements. Any additional off-site improvements have the potential to result in a longer and more costly design and construction time frame and/or the delayed completion of DLNR's facility due to funding and timing challenges. Unanticipated circumstances that cause delays in phasing and timing may increase capital improvement costs since building materials and labor costs tend to increase with time. It is also noted that the conceptual plan for the Kona Kai Ola project identified the general location of Site C for community and commercial uses.

No Action (DLNR Divisions Remain in Current Locations)

The no action alternative implies that DOBOR, DAR and DOCARE would remain in their current spaces at the Honokōhau Small Boat Harbor Facility whereas CWRM, DOFAW, ENG, SHPD and SP would continue to operate from leased spaces in West Hawaiʻi pursuant to negotiated terms and conditions. No construction-related activities would occur as a result of maintaining status quo. No action implies that there would be no commitment of funding or capital improvement costs and no effort to construct the proposed facility for DLNR's operational needs in the West Hawaiʻi area. There would be no installation of site infrastructure and the undeveloped state-owned land would continue to remain vacant for the foreseeable future. The harbor facility is within the Tsunami Evacuation Zone and must be evacuated whenever there is a tsunami warning.

In the long term, the no action alternative will still result in the need for funding and financial expenditures related to DLNR's operations, especially if several divisions continue to lease space in West Hawaiʻi. DLNR's existing harbor facility will age and require improvements in the future, which may necessitate full or partial renovation of the spaces currently occupied by DOBOR, DAR and DOCARE. The resulting effect of said improvements is likely to reduce the availability of DLNR's existing harbor space such that additional divisions may need to seek leased space in West Hawaiʻi.

The long-term funding considerations for future lease agreements are unknown because there are uncertainties associated with inflation and the latent demand for available space in West Hawaiʻi. DLNR's programs and services may become vulnerable if spaces for lease in West Hawaiʻi become scarce or difficult to obtain as the region experiences anticipated future growth. An increase in the commitment of state funds for rent implies that less

funding would be available for programs and services, which may ultimately hamper DLNR's efforts to improve and provide its services and programs while the natural and cultural setting of West Hawai'i becomes more heavily disturbed by the footprint of human activities. No action is therefore an unacceptable alternative from the perspective of DLNR.

4.2. Tier Two Analysis: Sizing Considerations at Proposed Site

In light of the results from the tier one analysis, DLNR intends to utilize the proposed site consisting of about 4 acres within its parcel for a modern, energy efficient facility. Use of the trapezoidal area that is mostly outside of the Tsunami Evacuation Zone avoids the need to evacuate personnel and government vehicles/equipment each time there is a tsunami warning. DOBOR will remain in its space at the Honokōhau Small Boat Harbor Facility for the foreseeable future and DLNR will house several of its divisions within new, one-story buildings that are relatively close to the harbor facility. The present and future operational needs of CWRM, DAR, DOCARE, DOFAW, ENG, SHPD and SP include secure base yards, storage areas, and spaces where 40 to 50 personnel can regularly interact with constituents, contractors, and the public they serve.

DLNR's project is the construction of a community conference center and administration facility with the following functional areas: office and administrative spaces, support and public meeting areas, secure base yards, secure storage areas, and parking. The proposed facility must include staff areas with restricted access and security features. DLNR's community conference center is envisioned as a flexible venue that may be utilized by government entities and non-profit groups for outreach and educational opportunities, public informational meetings, and workshops and conferences servicing up to 200 people. The Hawaii Fishing and Boating Association indicated in its letter dated May 12, 2015 that the need for meeting facilities "has been largely fulfilled by the new County Building facilities, and the Hawaii Big Game Fishing Club." DLNR has determined that the community conference center is appropriate based on the responsibilities of its divisions. During the outreach effort for the EA, the National Park Service and Gentry's Kona Marina Honokōhau Harbor expressed support for the community conference center.

The conceptual design for DLNR's facility must address the environmental considerations described in this EA including but not limited to known historic features and biological resources within the proposed site. The natural slope towards the ocean, and landscaping within developed areas and around buildings will minimize the visual impact of the proposed facility from the Queen Ka'ahumanu Highway and the Kaloko-Honokōhau National Historical Park; landscaping may also help to reduce or buffer the sounds of human activities at the project site. The landscaping plan will incorporate native plants including *maiapilo*, which is present

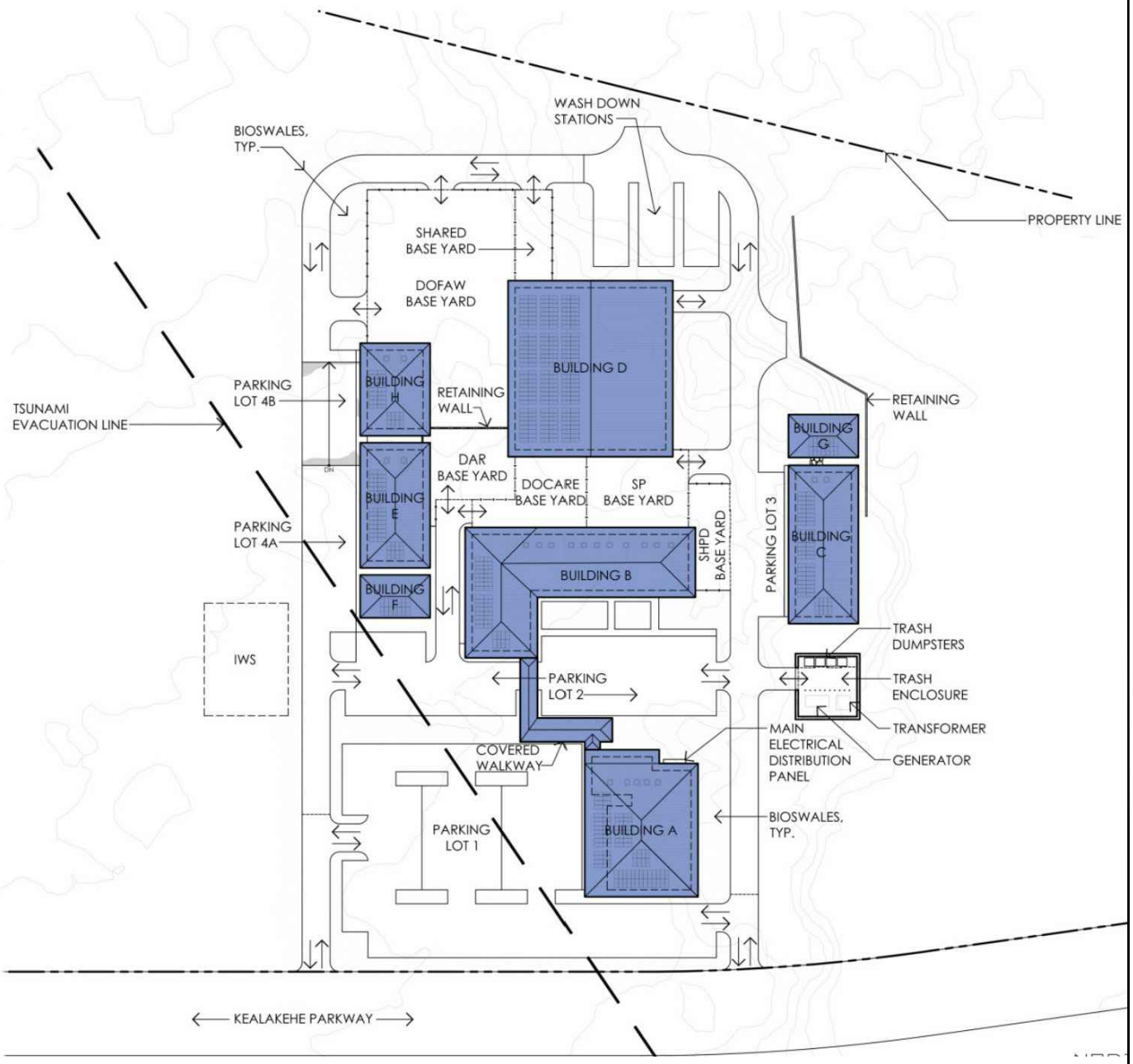
within the site. Landform alterations that would occur regardless of facility size may result in the disturbance of previously unknown historic features or biological resources. The traffic impacts, which are associated with the number of personnel at the proposed site, are expected to be similar regardless of facility size. Three sizing scenarios are discussed below and evaluated according to considerations about desired space allocations, functional requirements, development footprints and visual impacts. Utility system alternatives are also discussed.

Campus Layout with Multiple Buildings

DNLR's anticipated needs are adequately accommodated in the conceptual site plan developed in June 2013 (see Figure 11), which consisted of numerous separate buildings connected by functional areas (e.g., multiple base yards). The campus layout is characterized by distinct physical separations between various DLNR divisions. The challenge of siting all of the buildings and base yards outside of the Tsunami Evacuation Zone results in less open space or buffer areas around historic features and/or less flexibility in avoiding *maiapilo*. An on-site individual wastewater system (IWS) is shown in Figure 11 because the campus layout was developed prior to the September 1, 2015 construction Notice-to-Proceed for Phase 2 of the Queen Ka'ahumanu Highway widening project, which includes the installation of utilities and drain inlet structures. Completion of the widening project by 2018 will result in improved utility infrastructure along the highway.

The campus scenario would add numerous new urban features to the existing landscape. The visual impact of numerous new buildings is expected to be consistent with urban development *makai* of the project site at the Honokōhau Small Boat Harbor Facility and *mauka* of the Queen Ka'ahumanu Highway. All of the buildings and connecting base yards would require site lighting. A variety of human activities by DLNR staff are likely to occur in many portions of the proposed site, which may deter theft and enhance overall site security; however, the campus scenario would still include fencing and other security measures (e.g., surveillance cameras) to protect secure access areas.

Land disturbing activities relative to size of the development footprint would occur at the proposed site. Construction of a facility with many separate buildings would generate short-term environmental impacts such as fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services that would cease upon project completion. Mitigation that addresses anticipated project impacts would be provided. DLNR ultimately determined that it can achieve its desired goals and objectives with a facility that has fewer buildings and a smaller development footprint. The added benefits of a smaller facility include lower construction and maintenance costs. The campus scenario was therefore dismissed from further consideration.



Plan prepared for general planning purposes only by Erskine Architects, Inc.

THE LIMTIACO CONSULTING GROUP
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DLNR Community Conference Center and Administration Building

Figure 11 - Conceptual Site Plan June 2013

October 2016

Scale: 3/4" = 1'

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Consolidated Facility (One Single-Story Building)

The option to consolidate all of DLNR's divisions in one single-story building of less than 26,000 sf implies greater flexibility in siting the building within the trapezoidal area and outside of the Tsunami Evacuation Zone in consideration of disaster preparation realities. The areas around the building would be available for secure base yards, storage and parking. The consolidated facility scenario implies that the community conference center could remain close to administrative spaces for the foreseeable future or relocate to a second building constructed at a later date.

A consolidated facility on the proposed site would add new urban features to the existing landscape and would also necessitate site improvements for utility systems and supporting infrastructure. A site layout with one building allows for more open space and the creation of wide buffer zones around known locations of historic features and *maiapilo*. Site lighting around the building and in open areas would be included for safety and security. It is also possible that the fenced open areas furthest from the building would require additional security features (e.g., security cameras) if most of the human activities from DLNR's personnel are concentrated at, near, or around the consolidated facility.

The construction of one single-story facility at the proposed site would generate short-term environmental impacts such as fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services that would cease upon project completion. Landform alterations may be minimized if construction activities and site work are constrained to a small development footprint. Mitigation that addresses anticipated project impacts would be provided.

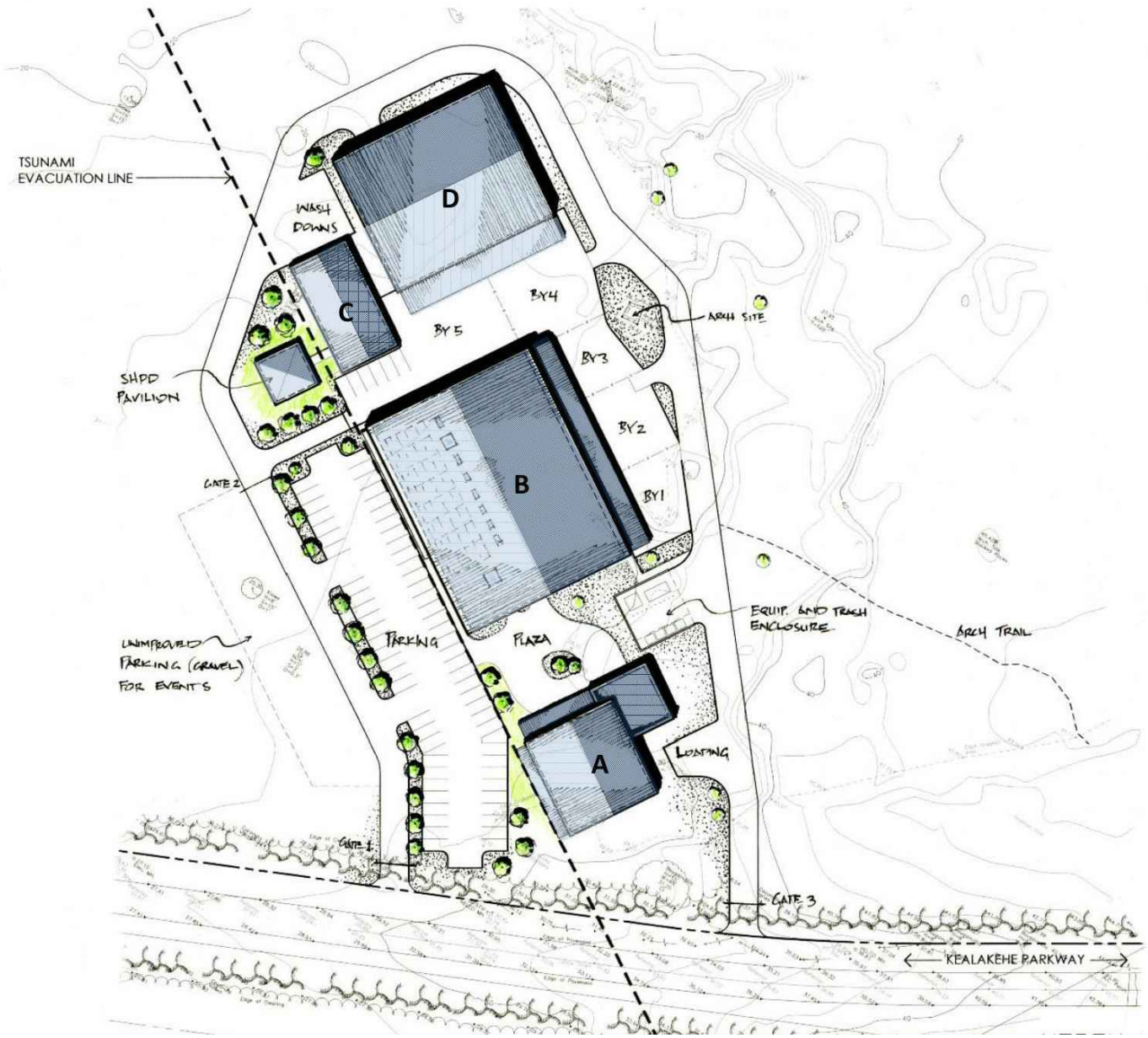
Both SHPD and SP have responsibilities pertaining to archaeological/historic resources and functional storage requirements. It is technically possible to enlarge and design a building to include secure storage and a climate-controlled space that is suitable for an archival environment. DLNR prefers to utilize a dedicated, separate area in a separate building for artifacts and ancestral resources (e.g., stored *iwi*) for security reasons and in recognition of the cultural sensitivity pertaining to stored items. Consequently, the alternative to construct one single-story building of less than 26,000 sf is not favorable from the perspective of DLNR. No conceptual site plan for a consolidated facility was developed and DLNR considered other options that fulfill the objectives previously stated in Section 1.2 of this EA.

Modest Facility with Several Buildings (the Proposed Facility)

The conceptual layout developed in November 2014 depicts four (4) buildings of less than 41,000 sf (see Figure 12) and shared base yards. The main building of approximately 19,000 sf (Building B) would house administrative functions and the community conference center; the next largest building of approximately 12,000 sf (Building D) would house SP and DOCARE; a third building of about 3,200 sf (Building C) would be designed as a collections warehouse with a nearby open air space for cultural ceremonies. The community conference center would relocate to a fourth building of about 6,275 sf (Building A) and the vacated space in the main building would be available for DOFAW and other DLNR divisions. Funding and phasing considerations suggested that DLNR's facility could be completed in two phases: Buildings B and C would be constructed in phase 1 whereas Buildings A and D for the community conference center would be constructed in phase 2. The buildings that house DLNR's divisions would be sited outside of the tsunami zone whereas public parking areas and a designated open air space for cultural ceremonies would be sited within the tsunami zone.

Figure 13 reflects a concerted effort to further minimize the development footprint through facility consolidation and conscientious design decisions. DLNR determined that a modest facility consisting of three (3) one-story buildings can adequately address the present and future operational needs of CWRM, DAR, DOCARE, DOFAW, ENG, SHPD and SP. The proposed facility would have the following elements as previously described in Section 1.5 Technical Considerations: a main administration building of approximately 19,000 sf (Building B); open base yards; a collections warehouse of approximately 3,200 sf (Building C); a public plaza; and parking areas. Building B would be designed to initially contain the community conference center. The area between Building B and Kealakehe Parkway would be utilized for a free-standing community conference center of approximately 4,800 sf (Building A, not shown in Figure 13) that is constructed in phase 2 as funding allows. DOFAW and other DLNR divisions are expected to utilize the vacated space in the main administration building upon relocation of the community conference center to its own building. All buildings will be sited outside of the tsunami zone whereas public parking areas aligned along the western edge of the facility would be sited within the tsunami zone.

The conceptual layout for the proposed facility considers site security for State-owned assets, impounded property, government records, artifacts and ancestral resources (e.g., stored *iwi*). There will be approved dark sky site lighting around the buildings and connecting base yards along with enhanced security features such as surveillance cameras.



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DLNR Community Conference Center and Administration Building

Figure 12 - Conceptual Site Plan November 2014

October 2016

Scale:
3/4" = 1'

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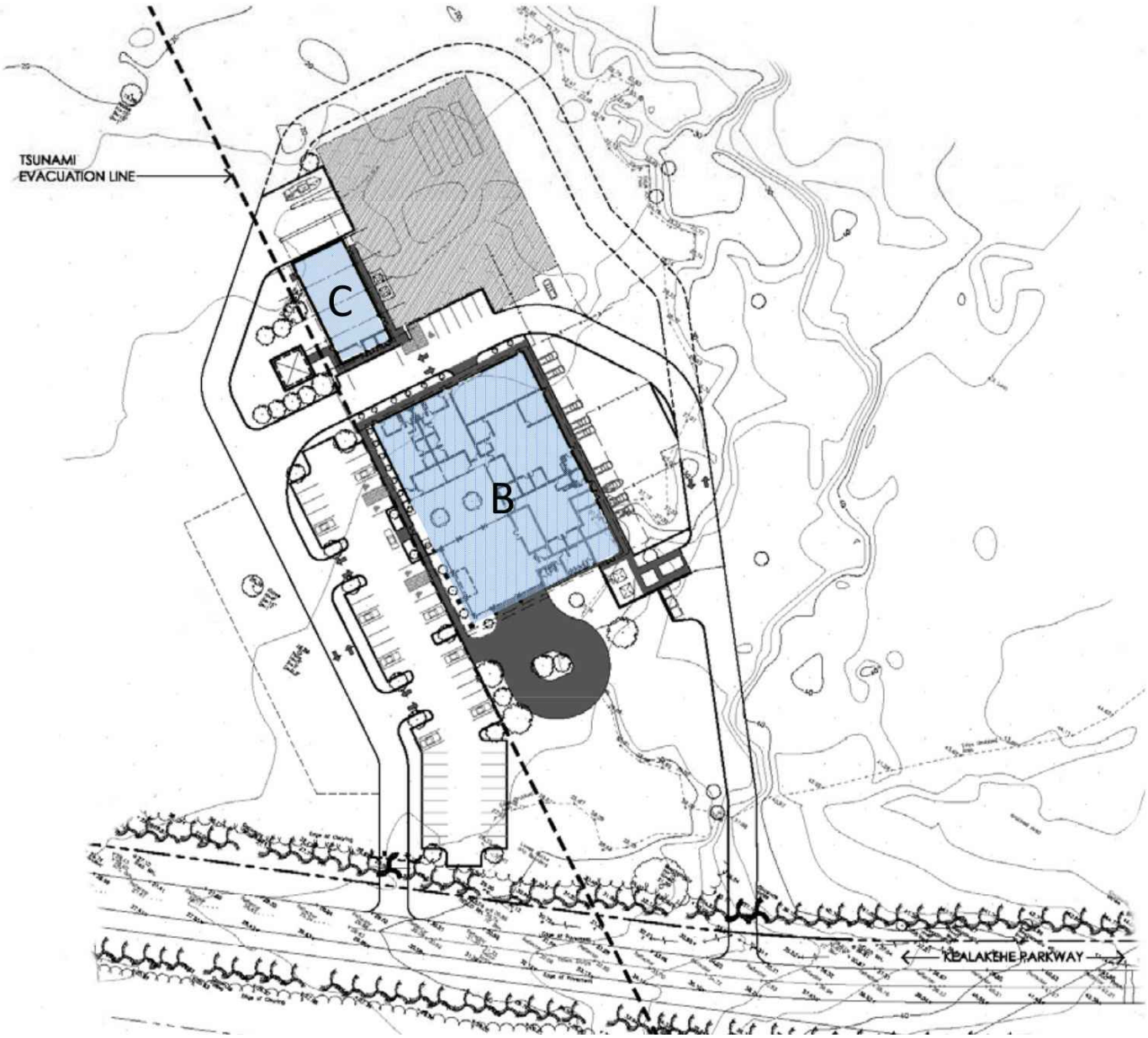

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DLNR Community Conference Center and Administration Building

Figure 13 - Schematic Site Plan March 2015

October 2016

Scale:
3/4" = 1'

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Modest Facility (continued)

The construction of the proposed facility would involve landform alterations and site work relative to the development footprint. DLNR's proposed project incorporates buffer zones around significant historic features and the landscaping plan retains existing *maiapilo* to the extent possible. The anticipated visual impact of the proposed facility is expected to be consistent with other urban development at the Honokōhau Small Boat Harbor Facility and in the surrounding Kealakehe project area. Construction activities are expected to generate short-term environmental impacts such as fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services that would cease upon project completion. Proposed mitigation that addresses anticipated project impacts is identified in this EA. The proposed facility consisting of three (3) one-story buildings is considered by DLNR to be the preferred alternative that addresses project objectives with minimal effect on historic and biological resources.

4.3. Additional Considerations Pertaining to the Preferred Alternative

Based on the tier two analysis, DLNR intends to construct a modest facility of several buildings at the proposed site. The additional considerations pertaining to municipal water resources and wastewater systems are generally beyond the purview of DLNR to resolve. It is generally presumed that DLNR's project would not proceed in the absence of sufficient potable water service and wastewater conveyance infrastructure to the project site. DLNR will continue to consult with various stakeholders including DOH and DWS to address concerns associated with required approvals.

Water Allotment Considerations

There are no known drinking water wells near the proposed site and DLNR has not included the development of new ground water wells as part of its project at this time. As previously indicated in Section 2.4 Water Resources, the DWS is updating the Keauhou section of its Water Use and Development Plan. DLNR will continue to consult with DWS about the availability of water for the proposed facility and has considered several options (such as transporting water from elsewhere, utilizing on-site water catchment and water efficient features) to reduce the projected demand for potable water.

New municipal water system infrastructure is currently being installed as part of the Phase 2 of the Queen Kaʻahumanu Highway widening project. Completion of the federally funded project may affect the available options and improvements that are required by DWS to make water available to the

proposed site. As previously indicated in Section 2.13 Utilities (Water, Wastewater, Drainage), various stakeholders including DOH and DWS will be consulted if recycled water infrastructure becomes available in the future for non-potable uses at the project site.

CRWM is expected to render a decision pertaining to the designation of Keauhou ASYA as a water use management area before the proposed project proceeds. If designated, new groundwater withdrawals from the Keauhou ASYA would require a Water Use Permit from CWRM.

Wastewater System Considerations

DLNR initially considered wastewater system alternatives in response to indications that municipal infrastructure and conveyance facilities in the vicinity of the project site would remain limited for the foreseeable future. Timing considerations and delay of Phase 2 of the Queen Ka‘ahumanu Highway widening project contributed to the perceived need for an on-site IWS until such time that wastewater flows from the proposed facility could be conveyed to the Kealakehe WWTP. The following wastewater system alternatives were initially considered by DLNR.

Septic Systems with Leach Fields. An on-site IWS consisting of a septic tank system with aerobic treatment is a decentralized wastewater system that provides treatment close to the generating source. The effluent from the septic system is conveyed to a leach field, which is a large area where treated wastewater is dispersed into the subsurface soils below the root zone. Adequately managed on-site wastewater treatment systems can be designed to achieve public health and safety objectives for small volumes of domestic wastewater. Effluent that receives additional treatment may be suitable for re-use. The NPS, DOH, DAR, and the Hawaii Fishing and Boating Association expressed concerns about the installation of a new IWS and potential effects to nearby aquatic environments, nearshore water quality, natural resources, and Native Hawaiian resources or the exercise of traditional cultural practices.

“Green” Wastewater Treatment. An IWS that consists of a bioremediation system with constructed wetlands can be designed to achieve desired objectives (e.g., reducing pollution, conserving water, land resources or energy, and utilizing natural treatment processes). Plants selected for the constructed wetlands must be robust and acclimated to site conditions to ensure successful treatment. A bioremediation system with constructed wetlands appears to be inappropriate for the project site based on site conditions including but not limited to the highly permeable soil and dry climate. The creation of wetland habitat that may be attractive to Hawaiian

waterbird species is expected to necessitate coordination with federal and state agencies to identify permit requirements, avoidance measures and recommendations for mitigation in the event of incidental takings of listed species. The design, construction and installation of a bioremediation system with constructed wetlands may therefore span several years and be subject to uncertainties associated with delay and increasing costs for labor and materials. This IWS alternative also involves long-term capital expenditures for water quality monitoring and specialized expertise to ensure that the system provides the desired treatment capability.

The announcement in April 2015 that Phase 2 of the Queen Kaʻahumanu Highway widening project will be able to proceed (Yager, 2015) contributed to DLNR's decision to omit the on-site IWS from the proposed project. A construction Notice-to-Proceed was issued for the highway widening project on September 1, 2015. Improvements to utility systems along the highway are included as part of the federally funded, $80 million highway improvements project that is currently underway and expected to be completed by 2018. DLNR's proposed project is expected to convey wastewater to the Kealakehe WWTP via a connection to improved wastewater conveyance facilities along the widened highway, which must be available to complete DLNR's project. As previously indicated in Section 2.13 Utilities (Water, Wastewater, Drainage), DLNR will consult with DEM regarding sewer service to the proposed facility since capacity improvements to the Kealakehe WWTP are not underway at this time.

Completion of the proposed facility, which DLNR has selected as its preferred alternative, would allow DLNR to utilize its parcel and retain a strategic location close to the small boat harbor. The proposed facility represents the commitment by DLNR to maintain its operations while considering coordination efforts and disaster preparation. The preferred alternative helps to ensure that DLNR's divisions continue to provide services and programs in West Hawaiʻi as the region experiences the effects of urban growth.

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5. PERMITS AND APPROVALS

Although exact permitting and approval requirements will be determined during the design phase, the following list contains permits and approvals that may be required for the proposed project:

State of Hawaii

- National Pollutant Discharge Elimination System Permit
- Community Noise Permit
- Community Noise Variance
- Non-Covered and/or Covered Source Permit (Air Quality)
- Lane Use Permit for Construction Work
- Oversized and Overweight Vehicles on State Highways Permit

County of Hawaii

- Building Permit
- Grubbing, Grading, and Stockpiling Permit
- Erosion Control Plan/Best Management Practices
- Permit to Work Within County Right-of-Way
- Special Management Area Use Permit (Major)

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6. DETERMINATION

A Finding of No Significant Impact (FONSI) determination is anticipated for the proposed project, which is not expected to have a significant impact on the physical or human environment. The supporting rationale for this finding as set forth in HAR Title 11, Chapter 200, Section 12 is discussed below.

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

The construction of the proposed facility is not expected to endanger any natural or cultural resources. Completion of the new facility would allow the various divisions of DLNR to fulfill their respective resource protection missions. The conceptual site plan incorporates buffer zones around biological resources and historic features. The construction contractor shall stop work and contact SHPD immediately in the event any unanticipated buried archaeological or cultural resources are encountered.

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

No beneficial uses of the environment will be curtailed as a result of the proposed project, which represents the continued presence of DLNR in the West Hawai‘i region. Completion of the proposed facility ensures the beneficial use of the state-owned land for a public purpose.

(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 would be in conformance with State Environmental Policy, inclusive of its individual policies, goals, and guidelines for population growth; natural resources; biological resources; transportation; energy; and culture, as discussed in the individual resource categories throughout this EA.

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

The proposed project does not substantially or negatively affect the economic or social welfare and cultural practices of the community or State. The project creates short-term jobs for people in design and construction. Completion of the new facility would allow the various divisions of DLNR to fulfill their respective missions. The proposed project will provide an archival environment for artifacts and spaces intended for meetings, consultations and viewing of *iwi*.

(5) Substantially affects public health;

Public health will not be adversely affected during the construction phases of the proposed project. Short-term and temporary effects such as surface runoff, fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services are expected to cease upon project completion. The implementation of construction BMPs will minimize temporary impacts. Completion of the project would improve onsite infrastructure and provide the various divisions of DLNR with functional office spaces and support areas in a modern, energy efficient facility.

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

No secondary impacts such as population shifts are anticipated from the proposed project, which represents a continuation of DLNR's current functions in West Hawai‘i. Utility demands for potable water, wastewater disposal, solid waste disposal and power are expected to be insignificant since personnel at the proposed facility currently receive utility services at other locations in West Hawai‘i.

(7) Involves a substantial degradation of environmental quality;

The proposed project is not expected to degrade environmental quality. Environmental impacts that may occur during the various phases of construction will be mitigated through the implementation of construction BMPs, as appropriate. Appropriate mitigation measures have been identified throughout this EA.

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

The proposed facility represents a long-term commitment by DLNR to provide its programs and services in West Hawai‘i. The proposed project is not part of or associated with a supplemental future action.

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

No species listed by the U.S. Fish and Wildlife Service or in the Endangered Species Act are expected to be significantly impacted by the proposed project. The project site does not contain habitat for proposed, candidate, or listed threatened or endangered species.

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

Short-term impacts to air quality, water quality or ambient noise levels may occur during construction. No State or Federal air quality or water quality standards should be violated during or after construction. Environmental impacts will be mitigated through proper construction techniques and compliance with applicable DOH rules and regulations. The proposed facility is not expected to negatively impact ambient air quality and background noise levels.

(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 site is not situated within an environmentally sensitive area and is not anticipated to affect such areas. DLNR's project reflects an intentional effort to site new buildings outside of the tsunami zone.

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

New one-story buildings will not obstruct or affect scenic vistas and view planes. Landscaping may further reduce the visual impact of the proposed facility.

(13) Requires substantial energy consumption.

The proposed project is the construction of modern, energy efficient buildings and is not anticipated to cause a substantial increase in energy consumption. The proposed facility represents a continuation of current operations in West Hawai‘i that already receive power and communications service.

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7. PUBLIC AGENCY REVIEW AND CONSULTATION

7.1. Pre-Assessment Consultation

The consulted agencies, organizations, and individuals are listed below. There were twenty-seven (27) formal responses to the pre-assessment consultation letter, as indicated by the ✓ below. Comments and responses are included in Appendix F.

Federal Agencies

✓ U.S. Fish and Wildlife Service
✓ U.S. Department of the Interior, National Park Service, Kaloko-Honokōhau National Historical Park

State of Hawai‘i

Department of Accounting and General Services
✓ Public Works Division
Planning Branch
Hawai‘i District Office
Department of Land and Natural Resources
Commission on Water Resource Management
State Historic Preservation Division
Hawai‘i Island Burial Council
✓ Division of Aquatic Resources
✓ Division of Boating and Ocean Recreation
Division of Conservation and Resource Enforcement
✓ Division of Forestry and Wildlife
Division of Forestry and Wildlife - Hawai‘i Branch
✓ Land Division
✓ Land Division - Hawai‘i District
✓ Engineering Division
✓ State Parks
✓ Department of Transportation
✓ Highways Division - Hawai‘i District
Harbors Division
Department of Health
Office of Environmental Quality Control
Indoor and Radiological Health Branch
✓ Clean Air Branch
✓ Clean Water Branch
Clean Water Branch - Kona
✓ Safe Drinking Water Branch
Solid and Hazardous Waste Branch

State of Hawai‘i (continued)

- ✓ Wastewater Branch
  - Environmental Health Administration
  - Environmental Health Services Division
  - Environmental Management Division
  - Environmental Planning Office
- ✓ Hawai‘i District Health Office
- ✓ Department of Business, Economic Development and Tourism - Office of Planning
- Office of Hawaiian Affairs
  - West Hawai‘i (Kona)
- Department of Hawaiian Home Lands
  - Planning Office
  - Homestead Services Division West - Hawai‘i District
- Department of Education
  - Hawai‘i District Office
- Hawai‘i State Public Library System
  - Hawai‘i and Pacific Section, Documents Center
  - Kealakekua Public Library
  - Kailua-Kona Public Library
- Senator Josh Green (District 3)
- Representative Nicole Lowen (District 6)

County of Hawai‘i

- Office of the Mayor
- Civil Defense Agency
- Department of Environmental Management
  - Wastewater Division
  - ✓ Solid Waste Division
- ✓ Fire Department
  - Fire Prevention Bureau
- ✓ Planning Department
- Department of Parks and Recreation
- ✓ Department of Public Works
- Department of Transportation
- ✓ Department of Water Supply
- ✓ Police Department
- Councilmember Karen Eoff (District 8)

Organizations, Associations and Interested Parties

- Ala Kahakai Trail Association
- Hawai‘i Electric Light Company, Inc.
- ✓ Hawaii Fishing and Boating Association
- Hawai‘i Island Humane Society
- Hawai‘i Tribune Herald
- Isemoto Contracting Co.
- Kailua Village Business Improvement District
- Kaiser Foundation Health Plan Inc
- Kona Kohala Chamber of Commerce
- Oceanic Time Warner Cable
- S J A Partnership
- Sierra Club
- Taylor Family Ltd Ptnrship
- ✓ The Gas Company, LLC (dba Hawai‘i Gas)
- West Hawai‘i Business Park LLC
- West Hawai‘i Today

Neighboring or Nearby Property Owners and Recorded Lessees

- Queen Lili‘uokalani Trust
- ✓ Gentry's Kona Marina Honokōhau Harbor

7.2. Draft EA Consultation

DLNR and The Limtiaco Consulting Group will continue to coordinate and consult with governmental agencies that will review the Draft EA. Agency review comments and responses will be published in the Final EA. Public comments received from organizations and interested parties during the 30-day statutorily-mandated comment period will also be responded to and published in the Final EA.

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8. REFERENCES

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APPENDIX A

Site Photographs and Conceptual Renderings by Erskine Architects, Inc.

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Photo #1
View of the project site, which slopes gently west towards the Pacific Ocean. Honokohau Small Boat Harbor is in the distance.

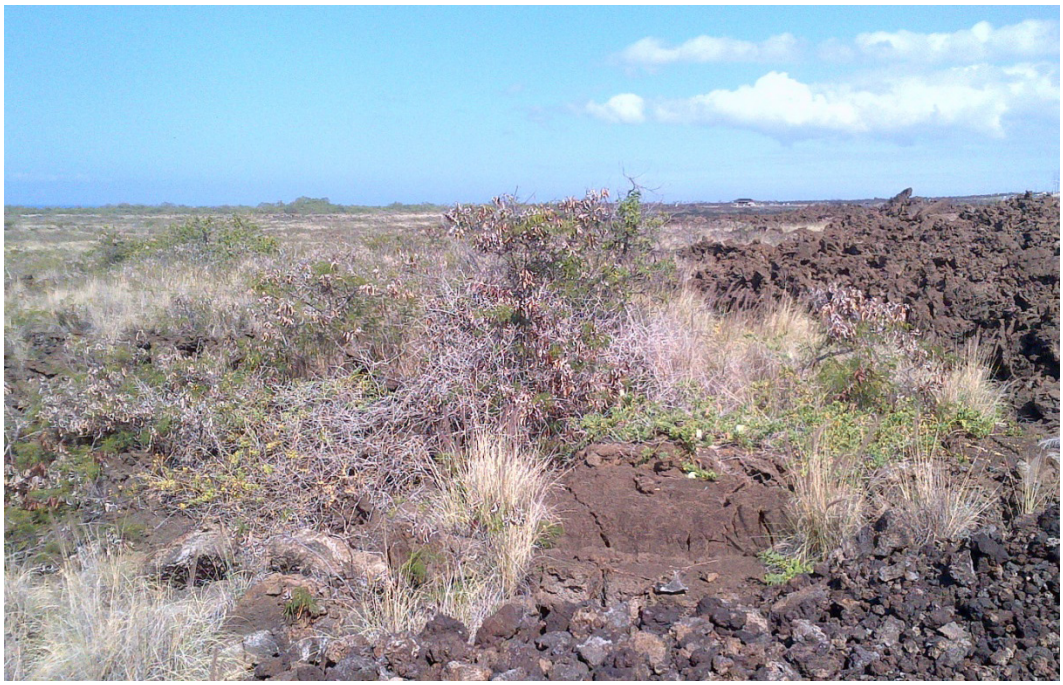

Photo #2
View of the adjacent Kaloko - Honokohau National Park. The project site has some areas of accumulated soils that sustain grassland and scrub vegetation.

Photo #3
The coconut palms in Photo #3 and #4 are along Kealakehe Parkway, which defines the southern boundary of the project site.

Photo #4
View of Kealakehe Parkway towards the harbor. The project site is to the right of utility poles and the line of coconut palms.

Photo #5
View from Kealakehe Parkway towards Queen Kaahumanu Highway. Urban development along the highway is visible through the line of coconut palms.

Photo #6
View of the project site and urban development from Kealakehe Parkway. The project site is behind the utility pole and line of coconut palms.

Overall View of the Facility with Building B in the foreground and Building C beyond. Note the PV arrays on the Building B roof.

View of the front entry to Building B with wood gate. Note the various shading devices to protect this exposure from the hot afternoon sun.

View of the Building B open air Entry Lobby. Note the landscape planter with roof opening above and the DLNR display walls.

End view of Building B with the SP warehouse overhead door and SP and SHPD suites, showing the clerestory and view windows. Note that the view window configuration will be changing from individual windows to a storefront window system.

View of the Building B Plaza space just outside of the CCC. Note the operable wall system at the CCC and the shading devices including tensile structures.

Image of the DOCARE Suite (as an example) in Building B, showing the modular work stations as well as the modular wall system beyond.

APPENDIX B

Natural Resources Survey by AECOS, Inc.

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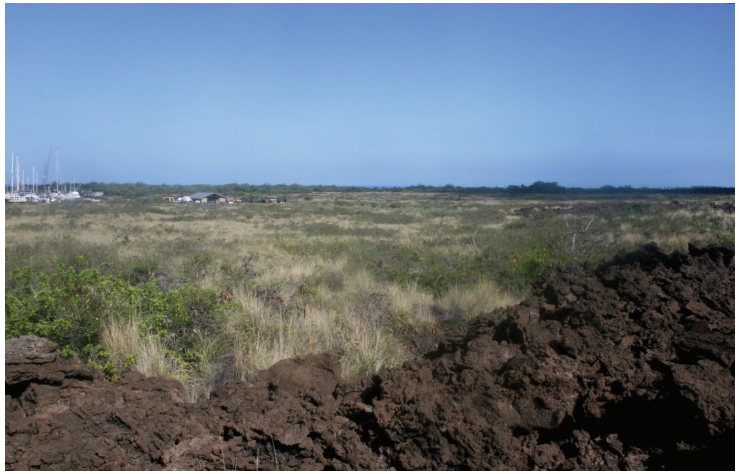
AECOS No. 1400

Natural resources survey for a DLNR Administration Building in West Hawai'i — Site 2: corner of Queen Ka'ahumanu Highway and Kealakehe Parkway, Hawai'i Island



Prepared by:

AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāne'ohe, Hawai'i 96744-3221

September 5, 2014

Natural resources survey for a DLNR Administration Building in West Hawai'i — Site 2: corner of Queen Ka'ahumanu Highway and Kealakehe Parkway, Hawai'i Island

September 5, 2014 *AECOS* No. 1400

Eric Guinther and Reginald David[1]
AECOS, Inc.
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Introduction

This report presents the results of a field survey for an approximately 9-ac (3.6-ha) parcel located at the corner of Queen Ka'ahumanu Highway and Kealakehe Parkway directly east of the Honokohau Small Boat Harbor (SBH) in North Kona District, Island of Hawai'i (Figure 1). The State of Hawai'i, Department of Land and Natural Resources (DLNR) is intending to develop a portion of state property here as a DLNR Administration Center ("Project") for the Kona districts.

Site description

The survey area comprises at least two exposed lava flow events from Hualalai volcano: The most recent dated in the range of 3,000 to 5,000 years ago (Qh1y) and the older in the range of 5,000 to 11,000 years ago (Qh1o; Sherrod et al., 2007; Wolf and Morris, 1996). These areas differ considerably in the nature of the surface of the flows. The eastern approximately 1/3 of the survey area (and most of the proposed Project area) is an *'a'ā* flow overlying the older *pāhoehoe* flow. The *'a'ā* flow may actually be two flows as there are two distinct levels: the older or lower a relatively narrow shelf fronting the higher *'a'ā* flow (Figure 2). The uppermost *'a'ā* flow is distinguished by the ruggedness of the surface and a complete absence of vegetation (where not disturbed). The *pāhoehoe* flow

[1] Rana Biological Consulting, Inc., Kailua-Kona, Hawai'i.

constitutes a nearly level surface here, sloping down only very slightly west to the boat harbor and, unlike many *pāhoehoe* flows, minimally humped or cracked.

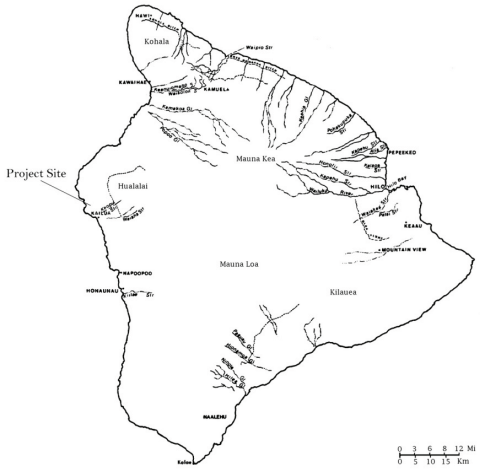

Figure 1. Project location on Moku o Keawe (Big Island of Hawaiʻi).

Methods

Our biological survey was conducted during the period from early morning to mid-day on August 15, 2014. For completeness and to accommodate any future changes in project layout, our survey area was expanded beyond the currently proposed Project boundaries to encompass all of the area between the highway verge on the east, the pavement of Kealakehe Parkway on the south, the boat yard lot at Honokohau SBH on the west, and the federal property boundary for Kaloko-Honokōhau National Historical Park on the north (see Figure 2).

Plant names follow *Manual of the Flowering Plants of Hawaiʻi* (1999) for native and naturalized flowering plants, *A Tropical Garden Flora* (2005) for crop and

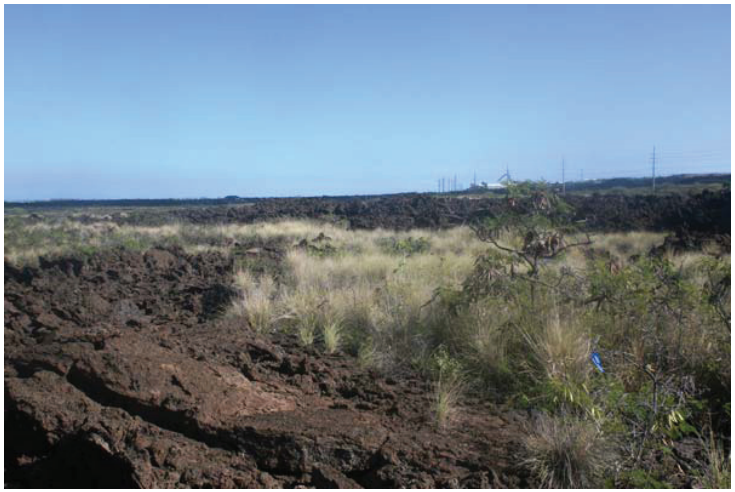

Figure 2. View to north from the lower *ʻaʻā* flow showing steep face of the barren *ʻaʻā* flow in background.

ornamental plants, and *Hawaii's Ferns and Fern Allies* (2003) for ferns and fern allies. More recent name changes for naturalized plants follow Imada (2012). Avian phylogenetic order and nomenclature used in this report follows the *AOU Check-List of North American Birds* (American Ornithologists' Union, 1998), and the 42nd through the 55th supplements to the Check-List (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser et al., 2009, 2010, 2011, 2012, 2013, 2014). Mammal scientific names follow *Mammal Species of the World: a Taxonomic and Geographic Reference* (Wilson and Reeder, 2005).

The federal and State of Hawaiʻi listed species status follows species identified in Department of Natural Resources (DLNR, 1998) and U. S. Fish & Wildlife Service (USFWS, 2005, 2013).

Botanical Survey

The plant survey was conducted on August 15 by walking back and forth across the survey area (that is, laid out in real time utilizing a hand-held GNSS [GPS] device, a Trimble 6000 Series GeoXH) for a complete visual coverage of the area (Figure 3). This standard survey approach offers the best method for discovering rare plants in a survey area. The upper *'a'ā* was minimally traversed (where accessible at the edges and along a road cut through it) because inspection showed no plants were growing on this most recent lava flow.

Figure 3. Map of survey area with survey tracks of the botanist recorded by a handheld GNSS unit and recorded locations of *maiapilo* plants.

The position locations of selected native species were recorded on the GNSS units as plants were encountered. Plants selected for recording location with GNSS would be any plant species listed as threatened or endangered under the Endangered Species Act and any species regarded as rare or vulnerable (IUCN Plant Red Data Book as used in Wagner, Herbst, and Sohmer, 1990; IUCN, 2014).

For all other plants encountered, both native and non-native, identification was made and relative abundance (e.g., abundant, common, rare, etc.) within the overall survey area estimated as the survey progressed.

Fauna Survey

Avian Survey - Four avian count stations were sited roughly equidistant from each other within the survey site. A single eight-minute, avian point count was made at each count stations. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. Avian counts were conducted in the early morning hours. Time not spent counting at point count stations was used to search the site for species and habitats not detected during the point counts. Weather conditions were ideal, with no rain, unlimited visibility, and winds between 2 and 5 kilometers per hour.

Mammalian Survey - With the exception of the endangered Hawaiian hoary bat or *'ōpe'ape'a* (*Lasiurus cinereus semotus*), all terrestrial mammals currently found on the Island of Hawai'i are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area.

Results

Vegetation

The vegetation over the survey area can be divided into two types: 1) a grassland/scrub vegetation dominated by fountain grass (*Cenchrus setaceus*) and *koa haole* (*Leucaena leucocephala*); and 2) a weedy/ornamental vegetation associated with disturbed and planted areas mostly along the roadways in the eastern and southern boundary areas. As noted above, most of the verey rugged *'a'ā* lava flow in the eastern third of the survey area is barren of vegetation, except where disturbed by grading. In contrast, the lower shelf of the *'a'ā* flow supports the same vegetation as seen across the *pāhoehoe* flow that constitutes most of the survey area. Trees on the site are limited to a few *kiawe* (*Prosopis pallida*) in the southwest corner and coconut palms or *niu* (*Cocos nucifera*) planted along Kealakehe Parkway and at the corner of the Parkway and Queen Ka'ahumanu Highway.

Flora

A listing (flora) of all the vascular plants observed in the survey area is presented as Table 1. In total, 29 flowering plants and one fern were recorded. Of these 30 species, five (17 %) are considered to be species native to the Hawaiian Islands. An additional two are early Polynesian introductions (so-called "canoe plants"): niu (*Cocos nucifera*) and *noni* (*Morinda citrifolia*). Indigenous native species (species native to Hawai'i and elsewhere in the Pacific) are: *naupaka kahakai* (*Scaevola taccada*), *'ilima* (*Sida fallax*), *'uhaloa* (*Waltheria indica*) , and *alahe'e* (*Psydrax odorata*). These are generally common species in the Islands. The single endemic is the *maiapilo* (*Capparis sandwichiana*) plant, recorded in eight instances[2] across the property.

Table 1. Flora listing for a proposed DLNR administration facility site in North Kona.

Family / *Species*	Common name	Status	Abund.	Notes
FERNS AND FERN ALLIES				
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F. M. Jarrett ex C.V. Morton	---	Nat	R	
FLOWERING PLANTS				
DICOTYLEDONES				
ANACARDIACEAE				
Schinus terebinthifolius L.	Christmas berry	Nat	C	
ASTERACEAE (COMPOSITAE)				
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	O	
Pluchea carolinensis (Jacq.) G. Don	sourbush	Nat	R	
Tridax procumbens L.	coat buttons	Nat	O3	
CAPPARACEAE				
Capparis sandwichiana DC.	*maiapilo*	**End**	U	<1>
CARICACEAE				
Carica papaya L.	papaya	Nat	R	
CUCURBITACEAE				
Momordica charantia L.	wild bitter melon	Nat	R	

[2] This represents at least eight separate plants, although the rambling nature of the *maiapilo* shrub can obscure the fact that more than one plant is present at a specific location.

Table 1 (continued).

Family / *Species*	Common name	Status	Abund.	Notes
EUPHORBIACEAE				
Euphorbia hirta L.	garden spurge	Nat	U	
Euphorbia hypericifoilia L.	graceful spurge	Nat	O1	
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat	O	
Chamaecrista nictitans (L.) Moench	*lauki*, partridge pea	Nat	O2	
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	Nat	O	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	AA	
Macroptilium lathyroides (L.) Urb.	---	Nat	C	
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat	R	
GOODINIACEAE				
Scaevola taccada (J. Gaertn.) Roxb.	*naupaka kahakai*	**Ind**	R	
MALVACEAE				
Sida fallax Walp.	*'ilima*	**Ind**	R	
Waltheria indica L.	*'uhaloa*	**Ind**	A	
MORACEAE				
Ficius microcarpa L.	Chinese banyan	Nat	R	
NYCTAGINACEAE				
Bougainvillea spp.	bougainvillea	Orn	U1	
PORTULACACEAE				
Portulaca pilosa L.	---	Nat	O3	
Talinum fruticosum (L.) Juss.	---	Nat	O2	
RUBIACEAE				
Morinda citrifolia L.	*noni*	**Pol**	R	
Psydrax odorata (G. Forst.) A.C. Sm. & S. Darwin	*alahe'e*	**Ind**	R	
VERBINACEAE				
Lantana camara L.	lantana	Nat	R	
MONOCOTYLEDONES				
ARACEAE				
Cocos nucifera L.	*niu*, coconut	**Pol**	C1	
POACEAE (GRAMINEAE)				
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	C	
Melinus repens (Willd.) Zizka	Natal redtop		C	
Cenchrus setaceus (Forssk.) Morrone	fountain grass	Nat	AA	

Table 1 (continued).

Legend to Table 1:

Status = distributional status
End. = endemic; native to Hawaii and found naturally nowhere else.
Ind. = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
Nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
Orn. = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).
Pol. = Polynesian introduction before 1778.
Abundance = occurrence ratings for plants by area A, B, C, D, E, F, and G on June 16, 2011.
R – Rare - only one or two plants seen.
U - Uncommon - several to a dozen plants observed.
O - Occasional - found regularly, but not abundant anywhere.
C - Common - considered an important part of the vegetation and observed numerous times.
A - Abundant - found in large numbers; may be locally dominant.
AA - Abundant - abundant and dominant; defining species in the vegetation.
Notes: <1> A listed or sensitive species (federally listed as endangered or threatened, or a USFWS "Species of Concern") or by IUCN (2010).

Fauna – Birds

A total of 57 individual birds of 13 species, representing nine separate families, were recorded during station counts (Table 2). All 13 avian species recorded during the course of this survey are alien to the Hawaiian Islands (Table 2).

Avian diversity and densities were low, but in keeping with the vegetation present on the study site, and its location on the Kona Coast. Three species—Zebra Dove (*Geopilia striata*), Common Myna (*Acridotheres tristis*), and Yellow-fronted Canary (*Serinus mozambicus*)—accounted for slightly less than 48.5% of all birds recorded during station counts. The most frequently recorded species was Zebra Dove, which accounted for 20% of the total number of individual birds recorded during station point counts.

Fauna – Mammals

Three terrestrial mammalian species were detected on the site during our survey. Two small Indian mongoose (*Herpestes auropunctatus*) were seen within the study site. One cat (*Felis catus*) was seen close to the harbor entrance road, and scat and tracks of dogs (*Canis familiaris*) were encountered in several locations within the site. All of the mammalian species recorded are alien to the Hawaiian Islands and are regarded as deleterious to native species.

Table 2. Avian species recorded for a proposed DLNR administration facility site in North Kona

Common Name	Scientific Name	***ST***	***RA***
	PELECANIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Cattle Egret	*Bubulcus ibis*	A	1.50
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	1.50
Zebra Dove	*Geopelia striata*	A	7.50
	PASSERIFORMES		
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	4.00
	TIMALIIDAE - Babblers		
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	4.00
	THRAUPIDAE - Tanagers		
Yellow-billed Cardinal	*Paroaria capitata*	A	1.50
	EMBERIZIDAE - Emberizids		
Saffron Finch	*Sicalis flaveola*	A	1.00
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	1.00
	FRINGILLIDAE - Fringilline and Carduline Finches & Allies Carduelinae - Carduline Finches & Hawaiian Honeycreepers		
House Finch	*Haemorhous mexicanus*	A	1.00
Yellow-fronted Canary	*Serinus mozambicus*		
	ESTRILDIDAE - Estrildid Finches		
Common Waxbill	*Estrilda astrild*	A	1.50
African Silverbill	*Euodice cantans*	A	1.00
Java Sparrow	*Lonchura oryzivora*	A	0.50

Legend to Table 2:
ST Status
A Alien – Introduced to the Hawaiian Islands by humans
RA Relative Abundance – Number of birds detected divided by the number of count stations (4)

Discussion

Flora resources

With the exception of the approximately 8 *maiapilo* plants, none of the species recorded in the plant survey are of interest or concern from a conservation perspective. The coconut trees are part of the landscaping along the road and not likely to be removed for the Project, although individuals could be moved as needed to construct a site access road.

Figure 4. A *maiapilo* in flower, here growing on the grassland upslope from the Kona International Airport.

Maiapilo (Figure 4, above) is a relatively rare native capper, described as a "species of concern" by USFWS (2010)[3]. This term ("species of concern") is not

[3] A species of concern has no legal status under ESA; the term essentially replaces the former category 2 candidates listing (USFWS, 1996). Conservation efforts are strongly encouraged for species of concern.

defined in the federal Endangered Species Act (ESA), but commonly refers to species that are declining and appear to be in need of conservation. The species profile on USFWS (2014) for the "pus pilo" [sic] now simply states "not listed." The IUCN Red List of Threatened Species (IUCN, 2014) lists the status of this plant as "Vulnerable" (C1 = population declining; also, Bruegmann and Caraway, 2012).

The distribution of *maiapilo* plants (Fig. 3 above) in relation to the *'a'ā* and *pāhoehoe* flows on this site is interesting (see also, Guinther & Miranda, 2013). All instances of the plant on the DLNR property surveyed here occur on the lower or older *'a'ā* flow (see Fig. 3, above). A reasonable conclusion is that conditions on the lowland *pāhoehoe* may not be unsuitable for *maiapilo* or other rare native plants, but are more conducive to the growth of non-native species that out-compete the natives or create circumstances which give disadvantage to the natives. On the other hand, conditions on the more rugged and presumably much younger *'a'ā* on the eastern part of the site are too severe to support any vascular plant life. This flow lacks soil development, and unless disturbed by grading, rainfall drains away rapidly compared with adjacent areas. The older and lower *'a'ā* shelf, where all of the *maiapilo* plants occur, is invaded slowly by fountain grass, Christmas berry (*Schinus terebinthefolius*), and *koa haole*. The *'a'ā* is less susceptible to fires and less desirable ground to grazing ungulates.

Avian Resources

The findings of the avian survey are consistent with the location of the property, and the habitats present on the site. The results are also in keeping with the results of at least two other faunal surveys conducted on lands immediately adjacent to the site and lands within close proximity to the property (David, 2006; David and Guinther, 2011).

All of the 13 avian species recorded during the course of this survey are alien to the Hawaiian Islands. Although not detected during this survey, the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened endemic sub-species of Newell's Shearwater (*Puffinus auricularis newelli*) likely over-fly the site between April and the middle of December each year in very small numbers.

The primary cause of mortality in Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of this seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings

on their way to sea in the summer and fall, can become disoriented by exterior lighting and collide with man-made structures. If not killed outright, dazed or injured birds become easy targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al, 2003).

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and the habitats currently present on the site. Although no rodents were recorded, it is likely that some of the four established alien Muridae found on Hawaiʻi—roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus musculus domesticus*)—use resources found within the general Project area on a seasonal basis. All of these introduced rodents are deleterious to native flora and fauna.

No Hawaiian hoary bats were detected during the course of this survey. Given the lack of suitable roosting trees, any usage of the area by this species would be of incidental foraging. This species is regularly seen within the Kaloko-Honokōhau National Historical Park located immediately adjacent to the north. The bats are usually observed foraging over nearshore areas and ʻAimakapā Pond.

Potential Impacts to Protected Species

No plant, avian, or mammalian species currently protected or proposed for protection under either the federal or State of Hawaiʻi endangered species programs were detected during the course of this survey (DLNR, 1998; USFWS; 2005a, 2014).

Seabirds - The principal potential impact that construction and operation of the proposed DLNR administrative center poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the Project during the nesting season. The two main situations by which outdoor lighting could pose a threat to nocturnally flying seabirds are: 1) during construction it is deemed expedient or necessary to conduct night-time activities, and 2) following build-out, the use of security or other outdoor lighting during the seabird nesting season.

Hoary Bat - The principal potential impact that the construction and operation of the proposed base-yard poses to Hawaiian hoary bats is associated with

clearing and grubbing phases of construction as vegetation is removed, roosting bats can be disturbed. The trimming or removal of foliage and/or trees may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season female carrying their pups may be less able to rapidly vacate a roost site as the vegetation is cleared, additionally adult female bats sometimes leave their pups in the roost tree while they themselves forage, very small pups may be unable to flee a tree that is being felled. The only trees on or immediately adjacent to the site that potentially could be used by bats to roost in are the palm trees lining the entrance road to the harbor road.

Critical Habitat

Currently there is no federally delineated Critical Habitat present on the property. However, the adjacent federal property of the Park is included in Lowland Dry-Unit 36 proposed for Critical Habitat for *koʻokoʻolau* (*Bidens micrantha ctenophylla*) and *aupaka* or *wahine noho kula* (*Isodendron pyrifolium*) (USFWS, 2012). Neither species has been recorded from the Project parcel. There is no equivalent statute for "habitat" protection under state law.

Recommendations

- We would recommend laying out the Project on this site to avoid the *ʻaʻā* flows, developing only the *pāhoehoe* land for the reason that the *ʻaʻā* substratum here has greater potential for supporting lowland native species and is therefore more compatible with the adjacent proposed critical habitat at Kaloko-Honokōhau National Historical Park. Indeed, compatibility would be enhanced to the degree that the DLNR project removes non-natives from the state-owned parcel.

- In the event that destruction of existing *maiapilo* growing on the site cannot be avoided, no violation of conservation statutes would occur. The *maiapilo* is an exceptional plant that would be ideal for landscaping in selected parts of the proposed facility, requiring minimal watering. It will grow into a shrub perhaps no more than 1 m (3 ft) tall (and 2 or 3 m across, up to 5 m), bearing bright green leaves, large, unusual white flowers, and fruits that resemble small cucumbers. The plant is generally easy to grow from seed, but has narrow habitat requirements: *maiapilo* grows well only in dry, low elevation leeward (or coastal windward) areas, requiring well-drained lava or limestone substrata, and only minimal shading. Any part of the DLNR site would be conducive to propagation of this species as a landscaping element.

- If night-time construction activity or equipment maintenance is proposed during the construction phases of the Project, all associated lights should be shielded, and when large flood/work lights are used, they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

- If streetlights or exterior facility lighting is installed in conjunction with the Project, it is recommended that the lights be shielded to reduce the potential for interactions of nocturnally flying seabirds with man-made structures (Reed et al., 1985; Telfer et al., 1987).

- If any of the palm trees lining the harbor entrance road will be removed as part of this project it is recommended that no woody vegetation taller than 4.6 m (15 ft), between June 1 and September 15, the period in which roosting bats are potentially at risk from vegetation clearing.

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APPENDIX C

Archaeological Inventory Survey by Scientific Consultant Services, Inc.

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SCS Project Number 1467-3

ARCHAEOLOGICAL INVENTORY SURVEY OF 32.5 ACRES IN KEALAKEHE AHUPUA'A, KAILUA-KONA NORTH KONA DISTRICT, HAWAI'I ISLAND, HAWAI'I

[PORTIONS OF TMK: (3) 7-4-008:003; (3) 7-4-008:025, 072, 999; AND (3) 7-4-020:999]

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March 2016

REVISED DRAFT

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ABSTRACT

At the request of Limtiaco Consulting Group, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey (AIS) for the proposed Department of Land and Natural Resources (DLNR) offices project in Kealakehe Ahupua'a, Kailua-Kona, North Kona District, Island of Hawai'i [TMK: (3) 7-4-008:003 (por.)]. The DLNR project area is a 9.0-acre portion of Parcel 003 situated northwest of Queen Ka'ahumanu Highway and Kealakehe Parkway intersection. It is surrounded by undeveloped land.

At the request of the client, SCS surveyed beyond the boundary of the 9.0-acre project area, including portions of TMK: (3) 7-4-008: 025, 072, 999; and 7-4-020:999. Parcels 003 and 999 are owned by the State of Hawai'i, Parcel 025 is owned by the U.S. federal government (Kaloko-Honokōhau National Historic Park), and Parcel 072 is owned by the Department of Hawaiian Homelands (DHHL). The pedestrian survey portion of the archaeological inventory survey was conducted on approximately 32.5 acres of undeveloped land.

Sixteen archaeological features were documented in the project survey area. Eight of the sites were previously recorded (Sites 50-10-27-23007, and 25549 through 25555) and eight new sites (Sites 50-10-27-30199 through 30206) were documented in the AIS. Each of the sites contained a single feature, with the exception of Site 25552, which appears to have been a homeless camp consisting of a rock alignment and a rock shelter overhang constructed on a rough 'a'ā lava flow. The remaining sites consisted of rock concentrations (n=5), enclosures (n=4), cairns (n=3), a short wall segment, and a modified outcrop. There were no other archaeological sites or historic properties encountered within the project area.

All of the sites, with the exception of Site 25552, appear to have been the results of late pre-Contact Era to Early post-Contact Era resource extraction, travel, and shelter while traveling and resting within the area.

Trail Site 25549 is significant under criteria a, c, d, and e, as trails sites can be considered traditional cultural properties (a), the trail embodies distinctive characteristics of pre-Contact era trails (c), the trail contains information important to prehistory (d), and trails have an important value to native Hawaiian people (e). Trail site 25549 is recommended for preservation. The trail will be preserved in accordance with a SHPD-approved preservation plan.

Enclosure Site 25554 and enclosure Site 25555 are significant under criteria c and d as the sites embody distinctive characteristics of pre-Contact era and post-Contact era building styles. Site 25554 and site 25555 are recommended for preservation. The sites will be preserved in accordance with an SHPD-approved preservation plan.

No further work is recommended at the remaining 13 archaeological sites. Data collected during the AIS study and documented in this report has adequately determined the function and age of the sites. Location information for the sites has been recorded with GPS and is clearly presented in the map figures included in the AIS report.

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INTRODUCTION

PROJECT AREA DESCRIPTION

At the request of Limtiaco Consulting Group, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey (AIS) for the proposed Department of Land and Natural Resources (DLNR) offices project in Kealakehe Ahupuaʻa, Kailua-Kona, North Kona District, Island of Hawaiʻi [TMK: (3) 7-4-008:003 (por.)] (Figures 1 through 4). The DLNR project area is a 9.0-acre portion of Parcel 003 situated northwest of Queen Kaʻahumanu Highway and Kealakehe Parkway intersection. It is surrounded by undeveloped land. At the request of the client, SCS surveyed beyond the boundary of the 9.0-acre project area, including portions of TMK: (3) 7-4-008: 025, 072, 999; and 7-4-020:999 (see Figure 3). Parcels 003 and 999 are owned by the State of Hawaiʻi, Parcel 025 is owned by the U.S. federal government (Kaloko-Honokōhau National Historic Park), and Parcel 072 is owned by the Department of Hawaiian Homelands (DHHL). The pedestrian survey portion of the archaeological inventory survey was conducted on approximately 32.5 acres of undeveloped land.

SCOPE OF WORK

The archaeological inventory survey was undertaken in accordance with Hawaiʻi Administrative Rules 13§13-284 and 13§13-275, and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports contained in Hawaiʻi Administrative Rules 13§13-276.

METHODOLOGY

ARCHIVAL METHODS

Prior to commencing field work, archival research was conducted in the State Historic Preservation Division (SHPD) report database and library facility (Hilo, HI), the Hawaii County land records office, the *Waihona ʻĀina Māhele* database website, the Hawaiian collections holdings at the University of Hawaiʻi-Hilo Library, and the Hawaiʻi State Library system. Archival work consisted of general research on the history and cultural practices specific to the project area, as well as research of previous archaeological studies in and around the subject parcels. Historic land use data, land ownership, maps, and narrative information were obtained from the Hawaiʻi County land records office, the *Waihona ʻĀina Māhele* database website, and the University of Hawaiʻi, Hilo, Special Collections.

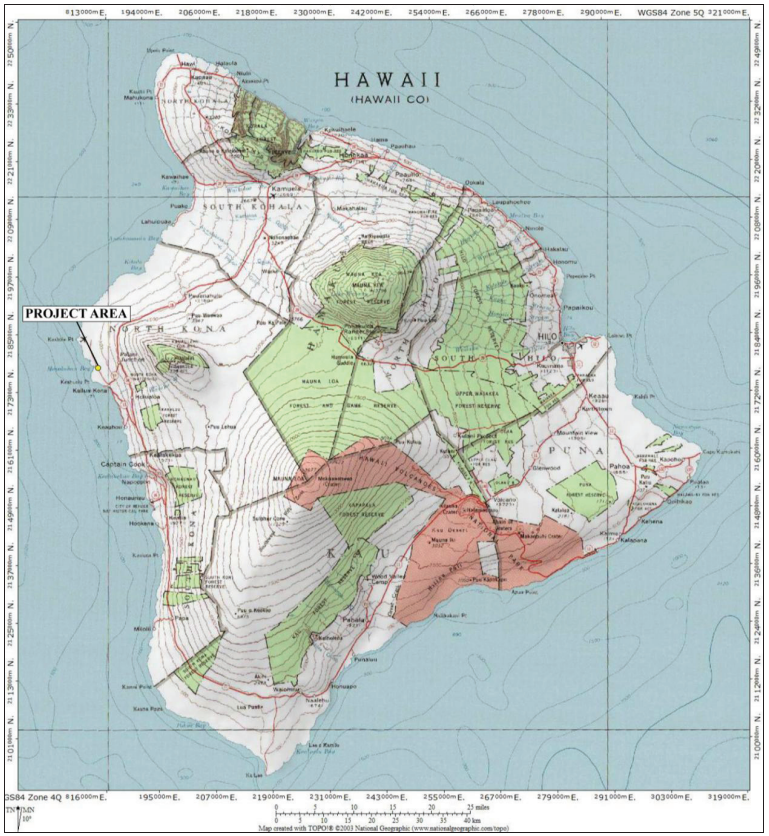

Figure 1: 5,500 K-Series Map of Hawaiʻi Showing Location of Project Area (National Geographic Topo!, 2003. Sources: National Geographic Society, USGS).

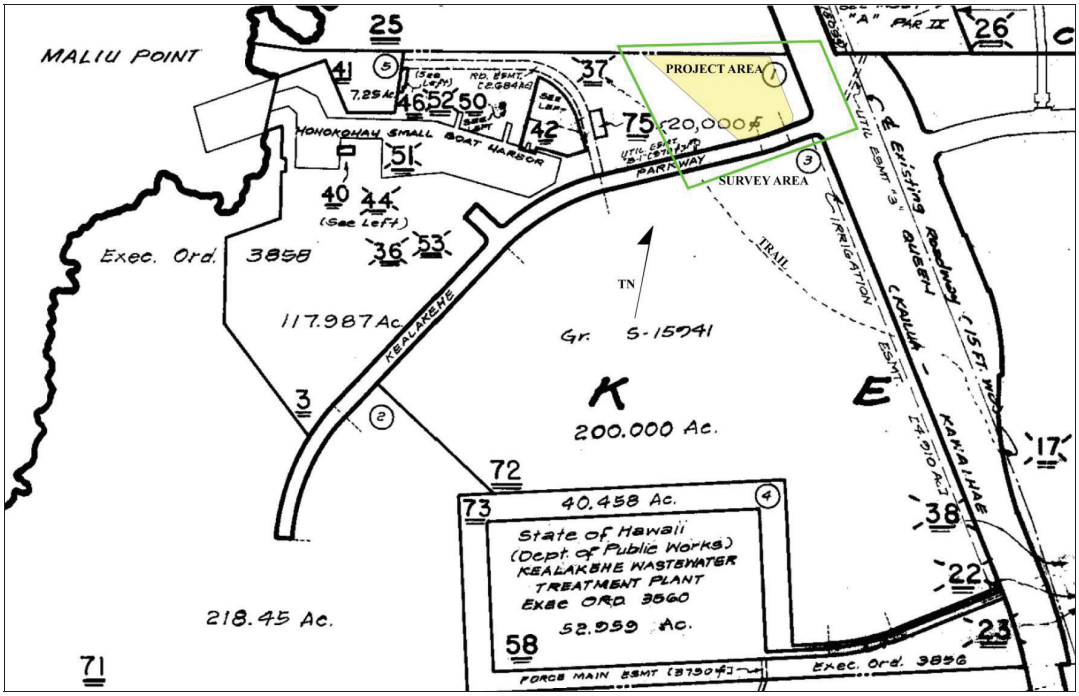

Figure 3: Portion of TMK (3) 7-4-008 Map Showing Project Area and Survey Area (Hawai'i County Planning Department, 2014).

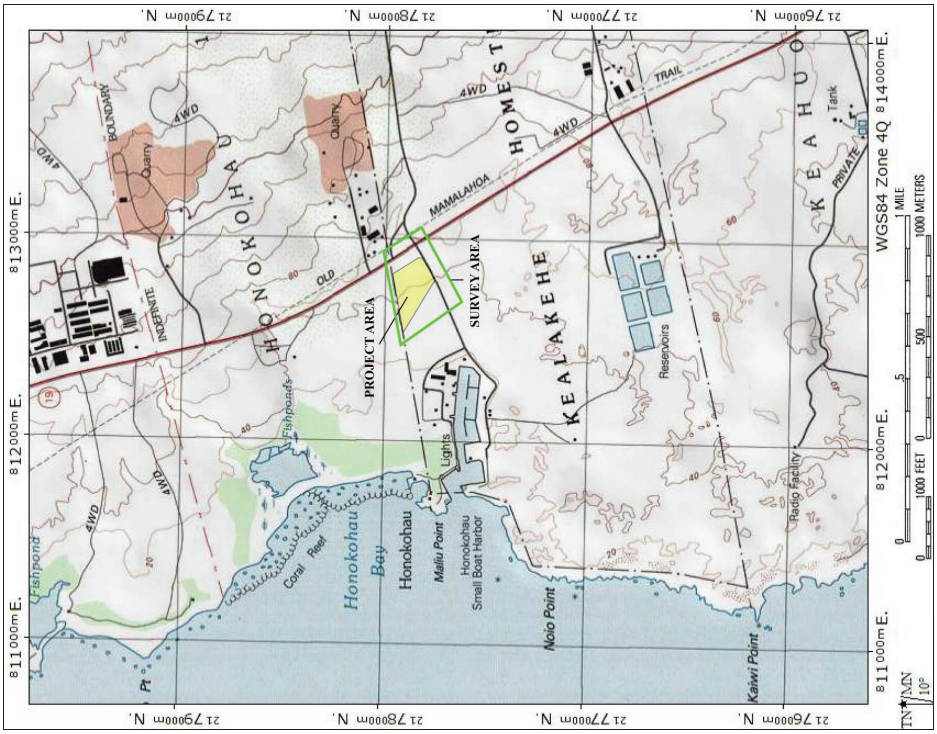

Figure 2: 7.5-Minute Series USGS Topographic Map Showing Project Area and Survey Area (Keāhole Point Quad, National Geographic Topo!, 2003. Source: National Geographic Society).

Figure 4: : Aerial Photograph Showing Project Area and Survey Area Location (Google Earth, 2013 Image. Kealakehe, HI, 4Q 812690m E 2177890 m N).

FIELD METHODS

There were four main field components of the archaeological inventory survey process: pedestrian survey of the entire project area; plotting located sites on a project area map with Global Position System (GPS) Universal Transverse Mercator (UTM) units (Zone 4 North) using WSGS84 datum for all three sites; individual site mapping and recording; and hand excavations.

One hundred and seventy-five hours of AIS fieldwork was conducted in July and August, 2014 by Glenn Escott, M.A., Suzan Keris, B.A., and Chris Arruda, B.A.. Glenn Escott was the Principal Investigator for the project. Survey was conducted along north/south transect lines at five to ten meter intervals, depending on ground cover. Observed surface midden, features, or anomalies were assigned temporary feature numbers. The site UTM was recorded at the site datum, which is marked with a metal tag.

Site boundaries were determined by the aerial extent of features and by feature function and temporal association. Features that were in close proximity to one another and that appeared to have functional and temporal associations suggesting they were constructed and used as a functional set of features, were included together as a single site. Features that were beyond twenty to thirty meters away from each other, or that were constructed at very different times, or for different purposes, were separated into individual sites.

Site type, function, age, condition, integrity, significance, and recommendations were determined for each site. Age determinations used in this report are expressed in terms of recognized formal eras including pre-Contact era (before 1778), post-Contact era (1778-1850) Historic era (1851-1965), and Modern era (post-1965).

The previously recorded sites documented in Haun And Henry (2001 and 2006) were relocated and recorded. Copies of the previously recorded site descriptions with maps, photograph and map figures were used in the field to ensure that the previous documentation matched the current condition of the sites and features. They did. This report contains previous documentation for sites and new documentation for sites, where warranted. New maps were not drawn when the previous site plan view drawings accurately depicted the current site characteristics. Site summaries for previously recorded sites are also located in Appendix A.

Only one site (Site 50-10-27-25555) had surface deposits that could be excavated. Two test-units were excavated at Site 25555. A surface midden scatter was mapped and analyzed at Site 30199. The midden was not collected and was left at the site. No artifacts were removed from the project area. None of the other sites recorded within the project area had surface artifacts or soil deposits that could be collected or excavated.

Test-units were excavated as 0.5 x 0.5 meter (m), or 1.0 x 1.0 m units, dug in both natural and arbitrary 10 centimeter (cm) levels. These were excavated at features that contained soil deposits. Test-unit excavations were screened for cultural material through 1/8th inch mesh.

Cultural material was recorded by type on standard SCS excavation forms. Soil colors were recorded using Munsell color charts, soil composition was recorded with the aid of the U.S. Department of Agriculture Soil Survey Manual on standard soil stratigraphy forms, and stratigraphic profiles were drawn. Color photographs were taken of individual site features, sites, excavations, and the project area using a 25 cm long north arrow scale divided into 10 cm black and white increments.

LABORATORY METHODS

Midden at Site 30199 was analyzed and weighed in the field. No artifacts were recovered from the test excavations at Site 25555. No excavations were conducted at other sites. This report contains a table of midden analyzed at Site 30199. Field notes, maps, cultural material, and photographs pertaining to this project are currently being curated at the SCS facilities on the Island of Hawai‘i.

CONSULTATION AND ORAL INTERVIEWS

Public notices for the proposed DLNR project were published in the Ka Wai Ola, the West Hawai‘i Today, and the Honolulu Star-Advertiser. Consultation letters briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation to consult. The consultation letters requested information of both historic properties and cultural properties or practices associated with the project area lands.

Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs (OHA) on O‘ahu; Shane Palacat Nelson, Coordinator of the Hawai‘i Branch of the Office of Hawaiian Affairs; Kauanoe

Ho‘omanawanui, SHPD Hawai‘i Island Burial sites Specialist; Rick Gmirkin, Ala Kahakai National Historic Trail, NPS Archaeologist; James "Kimo" Lee, Jr., HIBC former Chairman; Fred Cachola, HIBC Kohala Representative; Edwin Miranda, HIBC Chairman; and Kealakehe and Hawai‘i Island *‘ohana* members Raymond Lui, Agnes Lui, Nicole Lui, and Isaac Harp (Table 1).

Table 1: List of Persons Consulted for the Proposed Project.

Name	Affiliation (Family/Agency)	Response (Written/Oral)	Knowledge (Yes/No)	Provided Input (Yes/No)
Kai Markell	Office of Hawaiian Affairs	-	-	-
Shane Palacat Nelson	Office of Hawaiian Affairs	Oral	Yes	Yes
Kauanoe Ho‘omanawanui	State Historic Preservation Division Cultural Historian	Oral	Yes	No
Rick Gmirkin	Ala Kahakai National Historic Trail, NPS Archaeologist	Oral	Yes	No
James "Kimo" Lee, Jr.	Former Chair, Hawai‘i Island Burial Council	Oral	Yes	No
Edwin Miranda	New Chair, Hawai‘i Island Burial Council	Written & Oral	Yes	Yes
Fred Cachola	Kohala Representative, Hawai‘i Island Burial Council	Oral	Yes	Yes
Raymond Lui	Kona ‘Ohana	Oral	Yes	Yes
Agnes Lui	Kona ‘Ohana	Oral	Yes	Yes
Nicole Lui	Kona ‘Ohana	Oral	Yes	Yes
Isaac Harp	Kona ‘Ohana	Oral	Yes	Yes

SCS archaeologists also attended an anniversary celebration at Kaloko-Honokōhau National Park on August 23, 2014 where many family members recounted their experiences living at ‘Āi‘ōpio fishpond. The Palacat family, the Lui family, and others spoke of life and the lands of Honokōhau and Kealakehe.

The proposed project and results of the pedestrian survey were discussed in detail in meetings with Shane Palacat Nelson, OHA West Hawai‘i Representative and members of the Lui *‘ohana*. Raymond and Nicole Lui provided an in-depth account of their knowledge of Kealakehe and of the recent history of the area. The draft AIS was provided to Uncle Fred Cachola, Isaac Harp, and Nicole Lui. Isaac and Nicole provided comments that were incorporated into the revised draft report. Several informants requested that Sites 25554 and 25555, both temporary habitation enclosures, and trail Site 25549 be preserved in place if possible. DLNR has agreed to preserve all three sites in place.

ENVIRONMENTAL SETTING

The current project area consists of a portion of a parcel situated on level land between 45 and 55 feet (14-17 m) above mean sea level (amsl). The western portion of the project area is on a Hualālai pāhoehoe flow dated between 5,000 and 10,000 years before present (ybp) (Wolfe and Morris 1996). The eastern portion is on a Hualālai ʻaʻā flow dated between 3,000 and 5,000 ybp. The ground surface is bare lava with a few small pockets of very thin soil. Annual rainfall in the project area is 20 to 30 inches. Vegetation in the project area is fountain grass (*Cenchrus setaceus*), *koa haole* (*Leucaena diversifolia*) bushes, and *maiapilo* (*Capparis sandwichiana*) (Starr Environmental, 2013).

HISTORICAL AND CULTURAL CONTEXTS

EARLY SETTLEMENT AND EXPANSION

Many archaeologists believe that Hawaiʻi Island was first settled after A.D 1,000 by people sailing from the Marquesas (Athens et al. 2014; Dye 2011; Kahn et al. 2014; Kirch 2011; Kirch and McCoy 2007; McCoy 2005 and 2007; Mulrooney et al. 2011; Reith et al. 2011; Wilmhurst et al. 2011a and 2011b). An article published in the Journal of Archaeological Science reviewing radiocarbon dates recovered at archaeological sites on the Island of Hawaiʻi suggests that, by relying on only carbon samples from short-lived plant remains, the most reliable dates point to initial Polynesian colonization of Hawaiʻi Island occurring between AD 1220 and 1261 (Rieth et al. 2011:2747).

Early settlers established settlements on the windward shores in places such as Waipiʻo, Waimanu, and Hilo Bay. The windward, or *koʻolau* shores receive abundant rainfall and have numerous streams such as the Wailuku, Waiolama, ʻAlenaio, and Wailoa that facilitated agricultural and fishpond production (Maly 1996:3). The windward shores also provide rich benthic and pelagic marine resources.

The dry leeward shores of Hawaiʻi Island presented a very different environment requiring a modified set of subsistence strategies. Archaeologists and historians are uncertain about the exact motives that lead to the establishment and spread of settlements on the leeward side of Hawaiʻi, but radiocarbon dates from early studies that did not select for short-lived plant remains suggest the process was underway around A.D. 1000 (Cordy 2000:130). There have been no studies conducted in the broader region of the current project area using short-lived plant remains.

Coastal sites in South Kohala District, *makai* of Waikōloa, at Kalāhuipuaʻa and ʻAnaehoʻomalu, and inland sites in the *ahupuaʻa* of Waimea (Figure 5) have been dated to the A.D. 800s to 900s (Cordy 2000:130, Kirch 1979: 198). It may well be that these dates are from long-lived tree species and reflect the age of the trees rather than the time they were used by early Polynesians. Other early radiocarbon dates might reflect the fact they were obtained from marine shell samples, which do not reflect accurate dates of occupation or use.

The early coastal settlements are located on, or adjacent to, the dry rocky shoreline and consist of temporary habitation caves containing midden, fishing tools, and fish remains; and possibly surface permanent habitation sites (Barrera 1971, Jensen 1989a, 1989b, 1990a, and 1990b). The earlier phases of occupation were, most likely, temporary habitations used when fishing, and later permanent habitations associated with fishpond production. Cordy suggests people who lived inland occasionally frequented the Kīholo, Kalāhuipuaʻa, ʻAnaehoʻomalu, Kaloko, and Honokōhau areas for their anchialine ponds and marine resources (Cordy 2000:131) (see Figure 5). There were walled fishponds at Kaloko and Honokōhau as early as the early 1600s (Kamakau 1961:56).

The implication is that, along the barren leeward coast, inland settlements and agriculture may have developed first, perhaps spreading from nearby Waimanu and Waipiʻo. Maly suggests that people living permanently along the dry shoreline shared extended family relations with people inland, allowing for an exchange system where inland taro, banana, breadfruit, sugarcane, gourds, and sweet potato were exchanged for marine resources (Maly and Maly 2002).

The fertile plain of Waimea and the area of Kailua-Kona receive roughly 40 to 80 inches of rainfall annually while Waimea is watered by streams from the Kohala Mountains (the Waikōloa, Waiʻaka, and Keanuʻiʻomanō streams). Sweet potato was the dominant crop at elevations that received from 30 to 60 inches (Cordy 2000:135). Leeward expansion away from the coastline, at least on a more permanent basis, is believed to have occurred only with the development or improvement of dry-land cultivation methods, possibly spurred by the introduction of the sweet potato.

Figure 5: Portion of Hawai'i Territory Survey Map Showing Coastal Place Names From Puakō Bay to Kailua Bay (Donn 1901).

Current evidence suggests that significant inland leeward settlement did not occur until 100 to 400 years after initial settlement, *i.e.*, between AD 1100 and 1400 (Cordy 2000; Green 1980; Hommon 1976). At lower elevations in North Kona and South Kohala Districts, especially along the coast, rainfall is less than thirty inches and soils are shallow or nonexistent. It is possible that mulching with rocks or cut plant materials allowed for a limited amount of root crop and arboreal agriculture in pockets of sandy soil.

In Kailua-Kona, Waimea, and Kohala, new settlements and agricultural field systems continued to spread and intensify during the A.D. 1200s to 1400s. Permanent communities were developing at Kailua-Kona, Lapakahi, and along the coastal region from 'Upolu Point to Kawaihae (Cordy 2000: 140). Residences and an agricultural field system were also established in the mid-elevations of Kailua-Kona and the uplands of the Waimea area (Maly and Maly 2002: 4; Moffat and Fitzpatrick 1995).

As communities grew and agriculture intensified during this period, polities began to form, along with competition between polities. Large polities influencing communities within modern district-sized boundaries emerged in the 1300s (Cordy 2000:142). Cordy notes that just north of the project area "two different settlement and political zones seem to have developed prior to the 1200s and to have lasted until late in prehistory—one focused on Waimea and Kawaihae in the south, and the other in north Kohala up to 'Upolu Point" (Cordy 2000:385, footnote 15). Kailua-Kona also developed as an important political center south of the current project area during this period.

By the late 1700s extensive permanent field systems were well established in the Kailua-Kona, North Kohala, Waimea, and Lālāmilo regions (Clark 1981, Clark and Kirch 1983, Cordy 2000). Lands of the current project area contained little or no soil and were not suited to the development of large-scale field systems. The project area lands remained the location for small fishing villages, near fishponds maintained along the coast.

The villages that lay between the major polities to the north and to the south were connected by a trail system that allowed for travel over the barren pāhoehoe and 'a'ā lava flows in the region (Figure 6). Alternatively, north-south travel could be made along the shoreline by canoe. The coastal trails connected the political centers of Kailua-Kona with

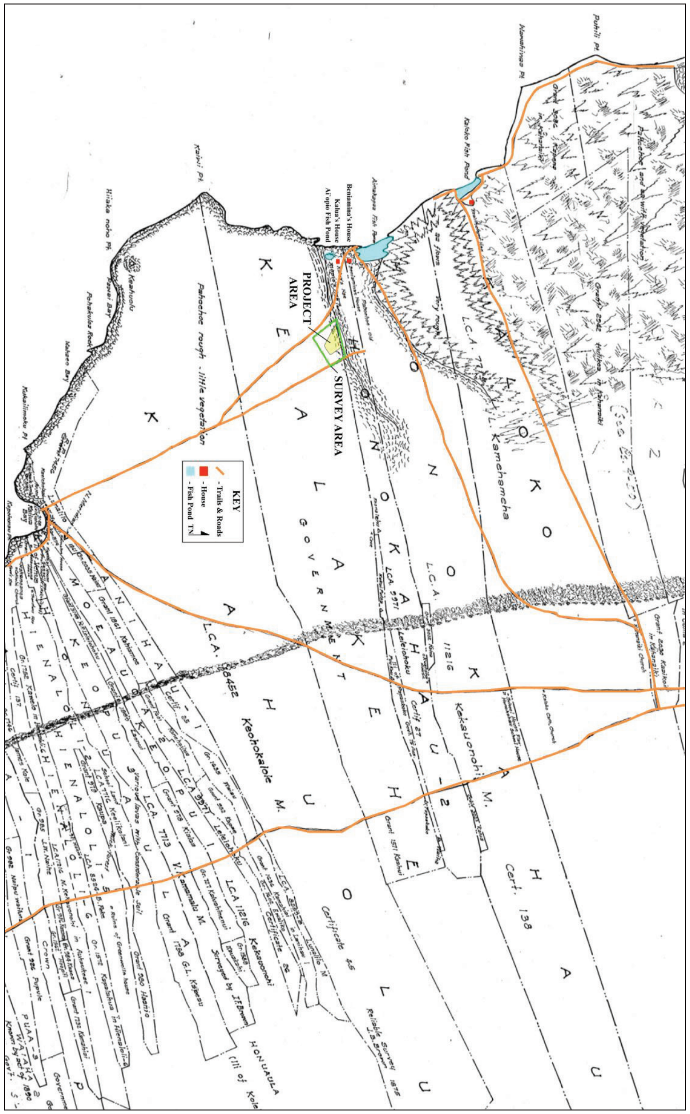

Figure 6: Portion of Kailua Title Map Showing Trails, Fishponds, and Homes Near the Project Area (Adapted From Emerson 1880s).

those of South Kohala and North Kohala. Other trails ran *mauka-makai*, allowing easy travel between the coastal villages and the upland agricultural settlements.

TRADITIONAL ACCOUNTS OF THE LANDS OF KEALAKEHE

Kealakehe translates literally as "the bend of a road" (Andrews and Parker 1922). Traditional accounts (*mo'olelo 'āina*) of legendary places (*wahi pana*) in Kealakehe and neighboring Keahuolu include legends and historical narratives documented in historic times by native Hawaiians and 19th century authors. The accounts refer to events that took place from the 13th century to the arrival of European explorers. Accounts include legends of supernatural entities, descriptions of places they traveled within this region, and also legends that tell the stories of deities and persons whose actions and namesakes are the origins of prominent natural features and places on the landscape.

The Heart Stirring Legend of Ka-Miki, published in the Hawaiian language newspaper *Ka Hoku o Hawai'i* and translated by Maly contains an extensive description of customs, lands, and places near the project area, as well as many places on the Island of Hawai'i. The story was published serially between 1914 and 1917 under the title "Kaao Hooniua Puuwai No Ka-Miki" (no diacriticals in original title). The legend is set in the 13th century but also reflects more recent influences (Maly 1996). According the legend,

> ... Within the lands of Keahuolu you saw Hale-pa'u (Interpretive translation: Sooty [soot covered] house) which is also near Ka-pā-wai (The water enclosure). Kapāwai is also known as Makā'eo (Look with anger), and a coconut grove encircled those places. Further on, between the lands of Keahulou and Kealakehe was the ā*hua* (hillock-plantation mound) of Lae-oniau ... (April2 and 9,1914)

> ... The priest who officiated over rituals of Keahuolu and Kealakehe was named Kalua'olapauila, He was the priest of the temple Kalihi, which is also called Kalua'ōlapauila. This temple is in the coastal area along the border of Keahuolu and Kealakehe, near the old road into Kailua ... (April30, 1914)

> ... The district of Keahuolu and divisions of Lanihau (1 and 2) were under the rule of Kapohuku'imaile (kane) and Papalūlā (wahine), and Papaumauma was their warrior champion. When Papaumauma competed

with Ka-Miki at the contest site ʻIwaʻawaʻa (at Kohana-iki), he was defeated. Papaumauma was honorable, and he greatly admired the superior skills of Ka-Miki and asked to turn his status and land rights over to Ka-Miki, but Ka-Miki declined ... (May 21,1914)

Ka-noenoe (The mist, fogginess) - The mound-hill called Puʻu-o-Kaloa sits upon the plain of Kanoenoe which is associated with both Keahuolu and Kealakehe, The settling of mists upon Puʻ-u-o-Kaloa was a sign of pending rains; thus the traditional farmers of this area would prepare their fields. This plain was referenced by Pili when he described to Ka-Miki the extent of the lands which Ka-Miki would oversee upon marrying the sacred chiefess Paehala of Honokōhau. The inheritance lands included everything from the uplands of Hikuhia above Napu'u and the lands of the waterless Kekaha, which spanned from the rocky plain of Kanikū (Keahualono) to the plain of Kanoenoe at Puʻuokaloa... (October 25, 1917)

Puʻu-okaloa (Mound, or hill of Kaloa) - The narratives in Ka-Miki identify Puʻuokaloa as *"Puʻuokaloa i ka malo O Kaʻeha e waiho ala ... "* Puʻuokaloa where Kaʻeha's loin cloth (symbolic of the mists) was spread out (October 25, 1917; Maly 1996:12-13).

Ka-iwi (The bone) is also called Ka-lae-o-Ka-iwi (The point of Ka-iwi) and is the name of a shark shaped stone near heiau of Kalua'olapauila. The priest Kaluaʻolapauila had two body forms, one human, as the priest, and the other body form as a shark in which he swam along the shore of Kealakehe and Keahuolu, attacking people. The shark form was named Kaiwi, and the point Ka-lae-o-Kaiwi is named for him (Maly 1996:14).

In the legend "Nā Ho'onanea O lea Manawa, Kekāhi mau Wahi Pana o Kekaha ma Kona" written by J.W.I. Kihe in the newspaper *Ka Hoku o Hawaiʻi* there is a description of agricultural practices at Keahuolu and Kealakehe.

Puʻu-o-kaloa is a mound-hill site in the lands of Keahuolu - Kealakehe, not far from the shore of Kaiwi and Hiʻiakanoholae. During periods of dry weather

(Ka Iā maloʻo) when planted crops, from the grassy plains to the ʻamaʻumaʻu (fern forest zone) zone, and even the ponds (kiʻo waī) were dry, people would watch this hill for signs of coming rains. When the lihau (light dew mists) sat atop the hill of Puʻu-o-kaloa, rains were on the way. Planters of the districts agricultural fields watched for omens at Pu'uokaloa, and it was from keen observation and diligent work that people prospered on the land (Maly 1996:13).

EARLY ACCOUNTS OF NORTH KONA

There is a paucity of prehistoric information pertaining to Kealakehe and the lands of the project area. Cordy notes that the "oral traditions are silent" for the years of early settlement of and expansion along the leeward shores of Hawaiʻi (Cordy 2000: 130). There are no historical accounts of Kealakehe Ahupuaʻa. The little information that does exist concerns the activities of *aliʻi* and was collected and published by Fornander, ʻĪʻī, and Kamakau.

William Ellis recorded two trips he made between Kawaihae and Kailua in 1823. He traveled by boat during the first trip and only remarked on the coast to say it was "a rugged and barren shore of lava" (Ellis 2004:83). During his second trip, Ellis traveled by canoe from Kawaihae to Kailua. He left the former at six in the morning, stopped at Kapalaoa around 9:00am, and arrived in Kīholo around 4:00pm. He described Kīholo as "a straggling village, inhabited principally by fishermen" (Ellis 2004:418). He also described the large fishpond created by order of Kamehameha I at that village. He left Kīholo just before sunset and arrived at Kaʻūpūlehu between 7:00 and 8:00pm. Ellis recorded little about the village except that everyone was asleep. When the moon had risen, by 11:00pm, he continued his journey by moonlight, arriving in Kailua an hour before sunrise. In all Ellis makes little description of the coastal area of North Kona District, perhaps because he was traveling at night.

Isabella Bird, who traveled from Kailua to Kawaihae some fifty years later described the coastal region by writing, "We sailed for some hours along a lava coast, streamless, rainless, verdureless, blazing under the fierce light of a tropical sun and sometime after noon anchored in the scorching bay of Kawaihae" (Bird 2007:144).

THE MĀHELE (1845-1850)

With the Māhele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). Article IV of the Board

of Commissioners to Quiet Land Titles was passed in December 1845 and began the legal process of private land ownership. Through the Māhele of 1847-48 and the Kuleana Act of 1850, land was made available for private ownership.

The Māhele established a board of five commissioners to oversee land claims and to issue patents and leases for valid claims. Many scholars believe that Kauikeaouli (Kamehameha III) was forced to establish laws in order to protect Hawaiian sovereignty and crown lands from foreigners who had already begun claiming ownership of land they were granted permission to use for homes and business interests (Daws 1968:111; Kameʻeleihiwa 1992: 169-70, 176; Kelly 1983: 45; Kuykendall 1938(1): 145 footnote 47, 152, 165-6, 170;). Among other things, the foreigners were demanding private ownership of land to secure their island investments (Kameʻeleihiwa 1992: 178; Kuykendall 1938(1): 138, 145, 178, 184, 202, 206, 271).

As legal statutes defining the Māhele continued to evolve (up to 1850), the lands of the kingdom of Hawaiʻi were divided among the king (crown lands), the *aliʻi* and *konohiki*, and the government. Once lands were thus divided and private ownership was instituted, the *makaʻāinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living as stipulated in the Kuleana Act (1850). These claims, however, could not include any previously cultivated or presently fallow land, *okipuʻu*, stream fisheries, or many other resources traditionally necessary for survival (Kameʻeleihiwa 1992:295; Kelly 1983:45-76; Kirch and Sahlins 1992 vol.1:3, 135-137, and vol.2:2).

The right of claimants to land was based on the written testimony of at least two witnesses who could corroborate the claimant's long-standing occupation and use of the parcel(s) in question. The claimant might have been awarded a patent for the property, subsequently called Land Commission Awards (LCAs) (Chinen 1961:16).

The majority of Kealakehe Ahupuaʻa and all of Keahuolū Ahupuaʻa were awarded to Ane Keohokalole, the mother of King Kalākaua and Queen Liliuʻokalani (LCA 8452). The crown lands of Kealakehe (LCA 8452, ʻĀpana 12) later became government lands. Eleven smaller LCAs were also awarded within Kealakehe Ahupuaʻa (Figure 7 and Table 2).

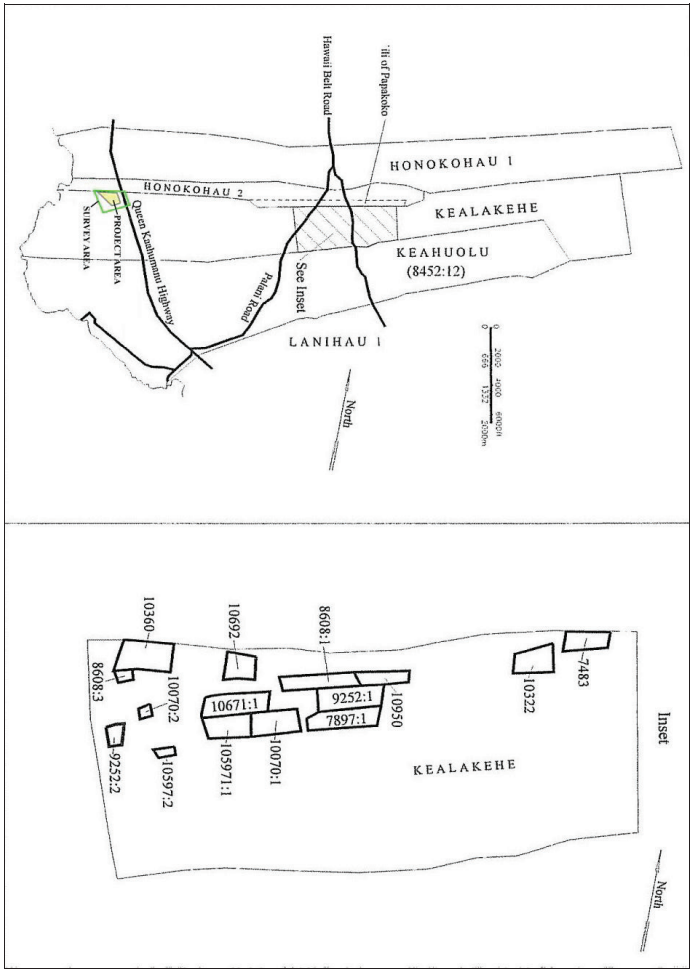

Figure 7: Map of Kealakehe Ahupuaʻa Showing Location of Land Commission Award (Adapted From Haun and Henry 2006: 6).

Table 2: Land Commission Awards in Kealakehe Ahupuaʻa.

LCA #	Awarded To	Number of ʻĀpana	Acreage	Royal Patent #
7483	Kulua	1	2.60	4040
7897	Kahuanui	2	4.90	4002
8608	Kaahui	2	3.90	5228
8252	Kauhai	2	5.78	4005
10070	Mioi	2	4.40	4003
10306	Nuole	1	5.25	4406
10322	Nuhi	1	4.75	8054
10597	Puou	2	4.12	6235
10671	Pepe	2	4.95	4007
10692	Paai	1	2.80	4004
10950	Waiwaiole	1	2.00	5123

All of the smaller LCAs awarded in Kealakehe were in the uplands at elevations between 900 to 1,900 feet amsl. The awards ranged in size from 2.0 to 5.78 acres and contained between one and two *ʻāpana* each. Several of the awards had house lots and gardens used to cultivate bananas, taro, and sweet potato. The Boundary Commission data also recorded that LCA 10671contained a house lot enclosed by a wall and the boundaries of LCA 7483 were marked by *kuaʻiwi* walls.

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1900)

The introduction of fee simple land ownership and commercial ventures in cattle ranching, sandalwood collection, supplying whaling vessels, and the cultivation of coffee, sugarcane, and other food crops greatly changed land-use patterns, settlement patterns, and cultural practices. The introduction of commercial economic practices further spurred on these rapid changes. Cattle ranching in particular either restricted or limited the use of entire *ahupuaʻa* from the traditional land tenure and horticultural regimes.

Ranching has its roots in the first cattle and sheep brought to the island in 1793 and 1794 by Vancouver. Two cows, three bulls, five ewes, and five rams were released to prosper in the region of Kealakekua in 1794 (Vancouver 1967:(3)11). Kamehameha placed a ten-year *kapu* on the killing of cattle so that they would have the opportunity to multiply. A 486-acre stone corral was built in the uplands of Lehuʻula-Honuaʻino, above Kāināliu where they were raised (Bowser 1880, cited in Maly and Maly 2001:285).

Two American captains, William Shaler and Richard Cleveland presented two horses to John Young in 1803. Cleveland later returned with more than 200 horses brought from California. Donkeys, mules and oxen were also imported for transportation and hauling. Goats were also brought to the island and left to multiply in the wild.

By 1813 to 1815 cows began overrunning agricultural fields and became a danger to travelers and residents alike (Ellis 1963: 291, Wilkes 1970: 204). A number of walls were commissioned to keep feral sheep, goats, and cattle out of agricultural areas and away from homes. A wall, called *Kauliokamoa* for the King's k*onohiki*, was constructed between 1813 and 1819 (Barrère 1983) to keep cattle in Waikōloa and off of agricultural land to the east (Lālāmilo and Waimea). The wall was located from roughly the northern border of Waikōloa to near Puʻu Huluhulu and separated the less fertile annual grasslands from the perennial grasslands (Boundary Commission Book for Hawaiʻi Vol. A, 6,10). By 1848, in Kona District a Great Wall (the Kuakini Wall) was constructed from Lanihau to ʻŌnouli (Maly and Maly 2001:286).

John Parker was granted permission to hunt wild bullock for the crown in 1822. Wild cattle were captured in bullock pits seven to eight feet long by four feet wide covered with braches and a thin layer of dirt (Wilkes 1970: 204). They were also hunted with guns and were lassoed in later years, after the arrival of *vaqueros*, "Spaniards [Central and South Americans] with horses from California" (Wilkes 1970: 203).

In 1830 Governor Kuakini moved to oversee and improve government cattle by constructing corrals. Liholiho visited the same year to witness strides made in the nascent cattle ranching industry. It was hoped that the exportation of tallow, hides, and salted beef would supplant the defunct Sandalwood trade as a major source of income. Several ventures related to ranching, including tallow making, tanning, saddle making, and blacksmithing were initiated (Bergin 2004: 156). Cowhide was tanned using the astringent bark of local trees (Wilkes 1970: 218). The lion's share of commercial enterprises on the island involved supplying whaling ships and the local market with beef.

By 1840 bullock hunting had drastically reduced the numbers of wild cattle, driving them to higher and higher elevations of Mauna Loa and Mauna Kea (Wellmon 1969). A five-year *kapu* was placed on cattle hunting and lead to further efforts to tame,

brand, and fence in herds on privately owned land (Wilkes 1970: 200). The decline of whaling and the *kapu* placed on killing cattle created economic hardship.

Grazing, the opening of new pastureland, and fires was denuding the forested plains of the island, and pushing the tree line to higher and higher elevations (Doyle 1953: 47-48). The impacts were the direct result of grazing sheep and cattle on the Island of Hawai‘i in the 80-year period after Vancouver landed the first of their kind. The Hawaiian Government move to require the branding of cattle and the construction of ranch walls to contain livestock began a trend toward the consolidation of large ranches.

Ranches in the Kona area are generally located between 1, 500 to 4,500 amsl (Maly and Maly 2001: 288), with lower elevations containing house lots and routes to landings at the coast. One such ranch was the Greenwell Ranch established Henry Nicholas Greenwell in 1850. The Greenwells began by planting oranges and coffee, and added sheep in the 1870s and cattle in the 1880s. By 1885, Greenwell owned seven ahupua‘a including Honokōhau.

Maly described the major ranch interests near the current project area in some detail. His account is reproduced below:

> The Greenwell Ranch is located in the Districts of North and South Kona, Island of Hawaii. Among those early interested in the cattle business in Kona, were the Reverend John Paris. William H. Johnson. A. A. Todd and later Dr. Trousseau. The Johnson and Trousseau herds were of Shorthorn strain, the Todd herd was Devon. H. N. Greenwell became interested in the cattle industry about the year 1875 and shortly thereafter purchased the Trousseau herd and bought cattle from Todd and others. With these as a nucleus Greenwell embarked in the dairy business and imported pure bred Jersey bulls from time to time until his death in 1891. These activities were in the main carried on under partnership agreements with others and were profitable. Little was done in the sale of beef, as production far exceeded demand, but business in the sale of hides and tallow was good. In 1889, Greenwell added a Holstein bull (dairy strain) to his herd; this was probably the first Holstein brought to Kona; the purchase was made of Judge McCully, who conducted a dairy near Honolulu. Shortly after Greenwell's death the entire ranch came under the management of his

> eldest son, William H. Greenwell. No Jersey stock was added to the herd after 1891; two years later Hereford and Shorthorn bulls were added to the herd and later a Devon. In 1898 came annexation, the price of beef rose; the price of butter declined. In 1910 butter making on the ranch was stopped and the raising of beef cattle was taken up in earnest. The types selected were Shorthorns and Herefords, purchases of purebred bulls being made at frequent intervals, largely from the Parker ranch and abroad. All cattle are range fed (Maly and Maly 2001:290).

Along with large ranches, large parcels of land in the area were given over to plantation enterprises. Plantations for the growing of coffee and oranges were located above ranch lands, generally above 4,500 amsl. Sugar cane plantations occupied similar elevations but often were situated at lower elevations, as well. These large plantations and cattle ranches were responsible for the changing pattern of land holdings and subsistence farming in the area.

In 1886, King Kalākaua leased the Crown Lands of Kealakehe to the Interior Department for a period of 20 years. The Interior Department was to make the land available to subjects under the Homestead Act of 1884. The homestead lots were 20 acres in area, and titled to the new occupants pending improvements to the land and payment of fees within five years of taking possession of the lot.

The Kealakehe lots included a block of lots (First Series) in the upland area near LCA parcels and a block of lots (Second Series) in the lower coastal region (Figure 8). The First Series lots were homestead lots subject to title while the Second Series lots were larger and were available to lease. Many of the homestead lots were purchased and have Land Grant numbers. Offers were made to purchase land within the Second Series block but were not accepted. Portions of the Second Series lots were leased.

MODERN HISTORY OF KEALAKEHE REGION (1900 TO PRESENT)

Despite changing land ownership practices, land-use patterns, and newly developing commercial enterprises, coastal fishing practices and fishpond management, practices continued to endure into the 1900s. Families that lived at their upland homesteads in North Kona still traveled to the coast to collect coastal resources (Kuulei Keakealani, personal correspondence). Women often traveled from their upland homes to the coast to give birth.

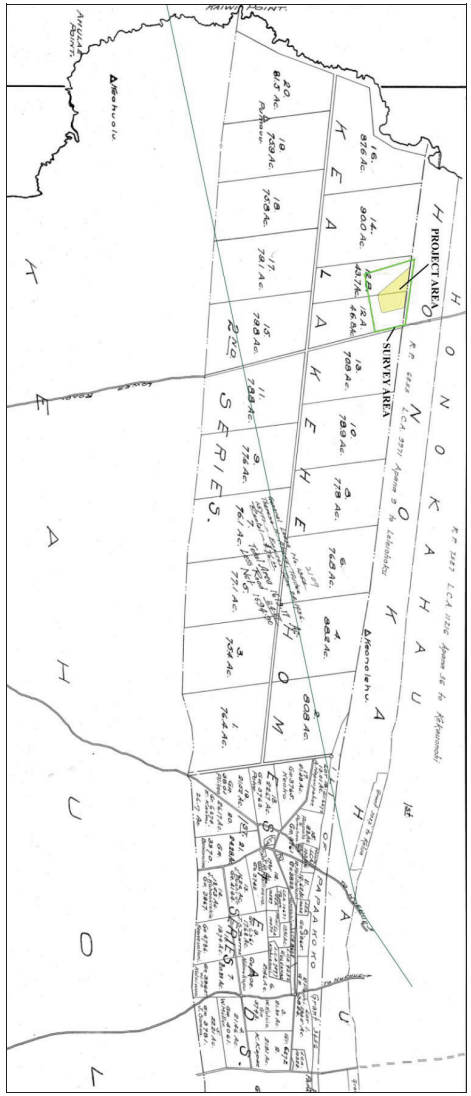

Figure 8: Portion of a 1914 Kealakehe Homesteads Map Showing Location of Project Area (Wall 1914).

SCS archaeologists interviewed Josephine Palacat Barney in 2009 concerning her family's residence at several locations along the coast from Kohanaiki to Kailua Town. SCS archaeologists also attended an anniversary celebration at Kaloko-Honokōhau National Park on August 23, 2014 where many family members recounted their experiences living at ʻĀiʻōpio fishpond. The Palacat family, the Lui family, and others spoke of life and the lands of Honokōhau and Kealakehe.

The following CIA interview conducted February 12, 2009 with Aunty Josephine Palacat Barney of Kailua-Kona documents her knowledge of the coastal area from Kohanaiki to Kailua-Kona during the period from 1925 to 1935. Josephine is the daughter of Palacat Catalino (father) and Pararat Philipa (mother) of the Philippines. Palacat Catalino arrived in Hawaii in 1912 at the age of 15. Pararat Philipa was brought to Hawaii by her adoptive father. Palacat Catalino and Pararat Philipa met in Onomea when she was 14. He was a field supervisor for the Hāmākua Sugar Company. They later married and moved to Kona.

Josephine is one of fifteen children. She is fifth born and the oldest girl. They lived in Kaloko, Honokōhau, and Kohanaiki between 1925 and 1935 during which time her father was the supervisor of the *ʻōpai* ponds. He was hired to care for and maintain the ponds and was responsible for keeping them in pristine condition, for all people had the privilege of using the shrimp without permission. The fish in those ponds such as *ʻawa* (milk fish, *Chanos chanos*) and *ʻamaʻama* (mullet, *Mugil cephalus*) were the property of the person leasing the ponds, and only they had access to them. Most land in the area belonged to Huʻehuʻe Ranch, so the ponds were probably leased through them. Other individuals would help clean the ponds, removing algae and debris. The algae was burned so it didn't make its way back into the pond.

The Palacats first beach house was just south of the Kaloko fish pond (Figure 9). They also lived in homes along the beach in Honokōhau (Figure 10) and Kohanaiki (Figure 11). They used the tax trail (Māmālahoa Trail) and traveled by donkey up and down the coast. By that time, the trail was no longer used for collecting taxes. That ended after Kamehameha's death. They traveled north on the trail to Kalaoa to gather taro (*Colocasia esculenta*) and breadfruit (*Artocarpus altilis*), and south to Kailua.

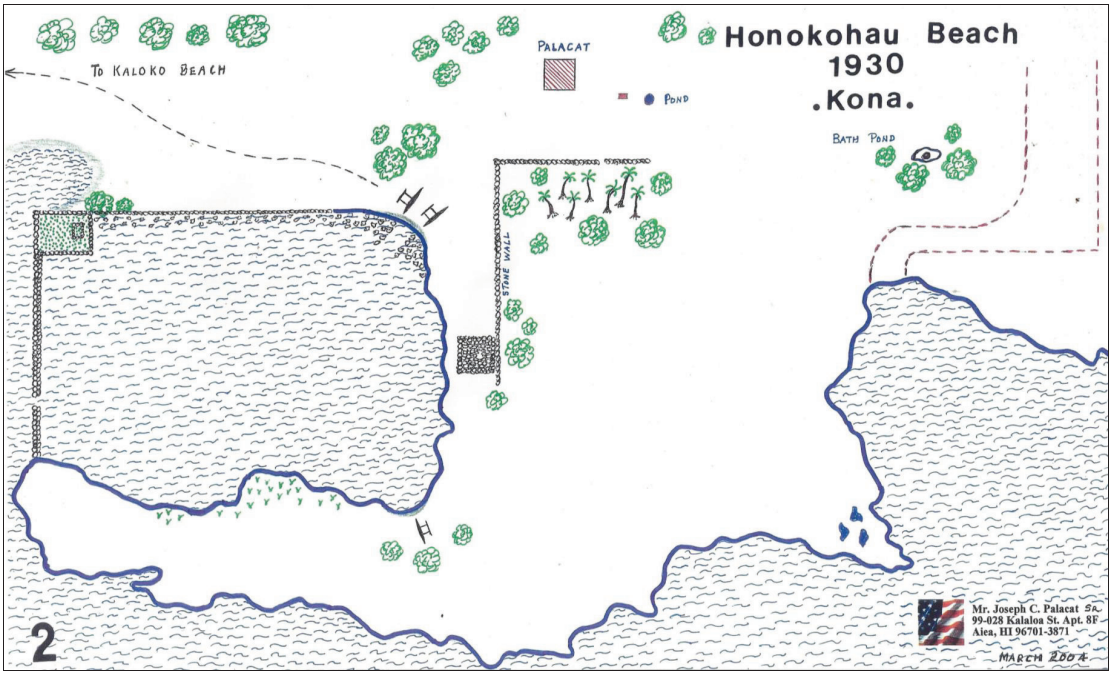

Figure 10: Palacat House at Honokōhau Fishpond (Drawn by Mr. Joseph Palacat 2004).

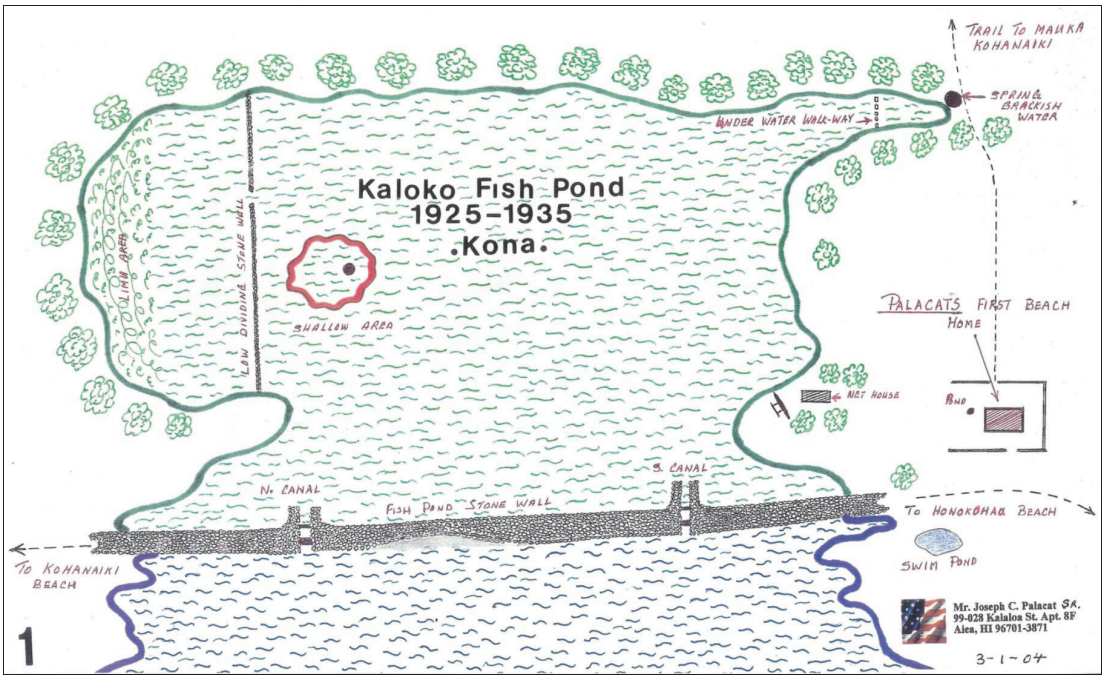

Figure 9: Palacat House at Kaloko Fishpond (Drawn by Mr. Joseph Palacat 2004).

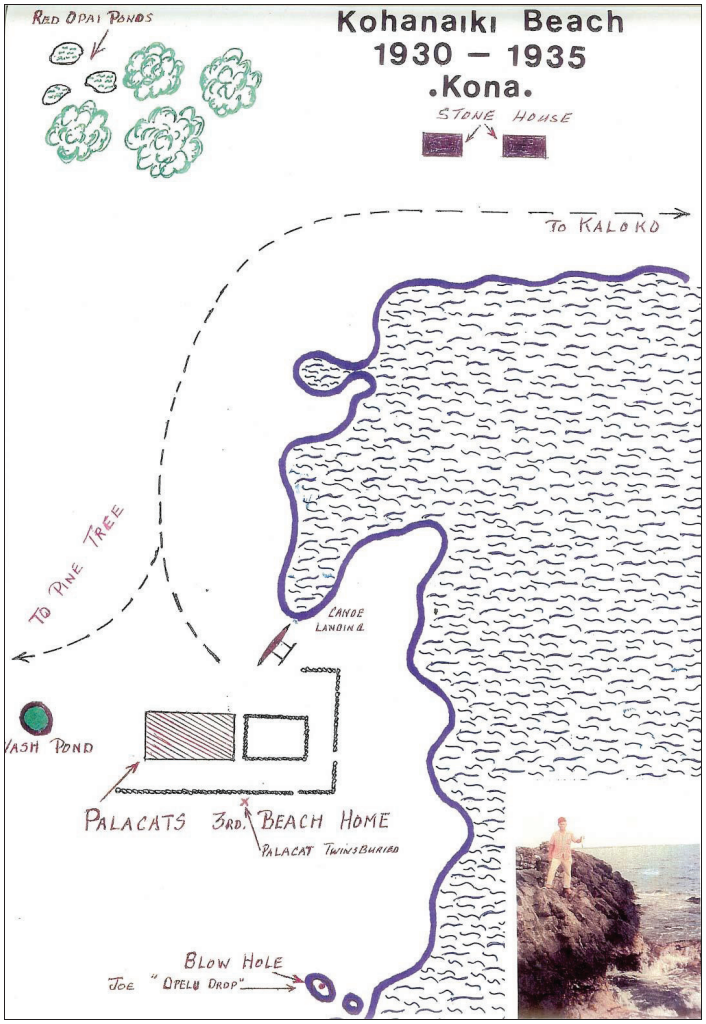

Figure 11: Palacat House at Kohanaiki Drawn by Mr. Joseph Palacat (in photo).

The house they lived in at Kohana-iki was already standing when they arrived. It was a ranch house that Josephine's father proceeded to repair and enlarge. They began their stay there in 1930 and continued on there until 1935. The house belonged to the Greenwell's, and was probably obtained through payment of unpaid taxes. The Keanaaina family claimed that land. At one time they lived there because they have two family members buried there. This occurred prior to the Palacats residency there.

There was once a village near there prior to the 1801 lava flow. The flow stopped before it got to the ocean. The legend is that Kamehameha I was concerned about the village taken by Pele, and feared that she was headed for Kailua. Kamehameha went to Hualālai but forgot *ho'okupu* (gifts). All the *kahuna* were with him, and he asked them to make peace with Pele. As he had forgotten the gifts, he grasped his hair and cut it off as he was chanting and the lava stopped flowing.

During the Palacat's stay at Kohana-iki, only one other family lived in the area. Pedro Espigata was from the same province in the Philippines as Josephine's father, so they were good friends, and he and his family moved wherever the Palacats happened to be.

When the Palacats moved to Kaloko, the Espigatas moved to Kaloko. When the Palacats moved to Kohana-iki, the Espigatas moved to Kohana-iki. And when the Palacats moved to Kailua, the Espigatas moved there, too. He was married to Sarah Pai. She was very dedicated to her name because she was a descendent of an old Hawaiian Chief named Pai from ancient times. She was part Hawaiian, but also had ancestors from the Philippines, China and Portugal. She and Pedro had several children. There were no other individuals living near there during that time.

People at that time had respect for one another and for the *'āina*, and fishermen had respect for the ocean, as well. If a person used something, they were compelled to give something back in return. There were fishing traditions like the *'ōpelu koa* [shrine and marker for fishing *'ōpelu* (*Decapterus macarellus*)]. There were several *koa* on the west side of the island. The tradition was to fish one, then skip one. Then fish the next, and skip the one after that. Later, on their way back down the coast, they would feed the ones that they skipped. The next time they went fishing they would fish the ones that were skipped the last time.

There was a tradition that was practiced so that the *ʻōpai* (shrimp, various sp.) were not depleted. *Kaunaoa* flower (*Cuscuta sandwichiana*), which is also called the flower of Lānaʻi is orange in color. It used to be plentiful along the coast, but the only place that it still exists is Makalawena. To chum the fish, it was customary to use a piece of cloth the size of a men's handkerchief. Josephine used soil from the base of the *keawe* tree made into mud, a pinch of shrimp and the orange *kaunaoa* flower. The handkerchief was closed up and thrown out into the water. The handkerchief opens, the dirt forms a cloud, then the fish feed on the *kaunaoa* because it's the same color as the shrimp. There was no need to deplete the shrimp population. This is not practiced by fishermen today, because there's not a fisherman alive today that has learned or even knows about this technique. Josephine and her brother remember this. Her sister doesn't because she wasn't involved.

Depending on the currents, Josephine's brother would go out and make fish *imu* at Honokōhau. He would take rocks and depending on the way the waves were breaking, he would construct a mound, setting the rocks in such a way so that the waves wouldn't disturb them. Once the fish made a home there, inhabiting the rocks, a net could be thrown over it to catch the fish. In those days, those who fished using this method were free to use any *imu*, but were obligated to rebuild it for the next person to use. People at that time were respectful of others and of their efforts. There were strong notions concerning keeping things the way they were and putting things back, and not being disruptive.

Members of the Palacat family, including Joseph Palacat, and the Lui family also said that fishing was the primary means of subsistence while living on the beach at Honokōhau. Dried fish was often traded for upland food items. Travel was along the mule trail, often by foot, but later by jeep or four-wheel drive. Travel to Kailua town was often made by canoe as well.

On October 30, 2014 an interview with Kupuna Raymond Kealohaokalani Lui and his *keiki* Nicole "Keaka" Lui held at the West Hawaii Civic Center gazebo. The interview was to discuss the historical and cultural significance of Kealakehe Ahupuaʻa as they knew it in their time and what was shared with them from *kupuna* still alive from the earlier part of the twentieth century.

The Lui ʻOhana lived along the coast at ʻAiʻōpio fishpond from 1967 to 1969. ʻAiʻōpio translates literally as "youth eating" (Pukui et al 1976:8). Kupuna Raymond spoke about fishing at ʻAiʻōpio. Raymond said they would set the cross net across the ʻAiʻōpio fish trap and leave for a couple of hours, the net was never left in the water for a long time.

Pa'ipa'i style fishing was also done by the Lui ʻohana alongside with Tutukane Solomon Kaelemakule and Tutu Samson Pelekane and other family members when they came to stay for the day. The ʻohana did it by torch light in the evening. The fish was guided into the net by the slapping of the water and with coconut fronds or *milo* (*Thespesia populnea*) leaves from area trees. They only took enough to eat and would release fish that were not needed.

Kupuna Raymond had his own boat from the mid 1970's to the early 1980's and would fish for ʻōpelu and feed the various *koa*. He had been shown the *koa* along the coast by his father-in-law Solomon Kaelemakule who passed away in 1977.

Nicole, aka Keaka, shared that in 1969 she, along with other students of various ages from the old Kailua School, were the first to attend the newly established Kealakehe School. Keaka shared how Uncle Joe Kahananui, the last great Kahuna Pule of Kona, came to the school and stood alongside Mrs. Chee by the flagpole on the stairs and blessed the school because of the meaning associated with the name "Kealakehe". Uncle Joe explained that Kealakehe means "the trail to the graves" because of a *mauka/makai* trail that crossed through Kealakehe Ahupua'a to the numerous burials in Keahuolu, aka Ke 'ohu'olu Ahupua'a, to the south.

Another time, Uncle Joe Kahananui shared that a cave at ʻAlula Bay in Kealakehe was the burial place of Kamehameha I. Nicole also mentioned that at ʻAlula her grandfather Solomon Kaelemakule shared with her and her siblings that the *heiau* there with the two stones standing upright was a temple to the moon, and that Hina was the god. Kupuna Solomon said that at a certain time of the year the moon would rise right between the two stones and signified the change of season. Nicole does not know which season specifically because grandfather did not mention more.

Kupuna Raymond and Nicole also shared about a coastal inland trail that Solomon Kaelemakule showed them back in the 1970's. This trail started from the

boundary fence line of Keahuolu near Pawai at the end of the Old Airport and meandered through Kealakehe, continuing to an area near ‘Alula bay. Portions of the trail were constructed by filling in low spots and holes in the ground surface. The trail was marked by coral fragments placed along the trail corridor. The coral glows in the moon light so that the trail can be followed at night.

Mauka of the trail in Keahuolu Ahupua‘a there is a large rectangular area of sand and sparse grass in the middle of the surrounding lava. The area is geometrically perfect with straight lines and appears to have been man-made. The place gives an uneasy feeling to people who spend any amount of time there. Both Kupuna Raymond and Nicole expressed a desire to GPS and record the trail and rectangular feature.

Raymond also recalls that during the family’s summer’s at ‘Ai‘ōpio fishpond, cattle still wandered in the area of the proposed DLNR Kealakehe offices project. He thought Hu‘ehu‘e Ranch was likely leasing the land from the Greenwells and that they were Hu‘ehu‘e Ranch cattle. Access to the beach where they lived was along a *mauka-makai* four-wheel drive road through Honokōhau-iki Ahupua‘a. The road was maintained by Hu‘ehu‘e Ranch.

Raymond also recalls that the road they used to get to ‘Ai‘ōpio started near where the Kona Coast Shopping Center is, somewhere near where Pier Imports is now located, and would go through Keahuolu and into Kealakehe, then traverse through Honokōhau pāhoehoe passed where the petroglyphs are, continuing on to the sand. From there they would go up the incline where the Kaloko-Honokōhau National Park’s greeting shack is now located, where the old Kanakamakai house once was. Raymond said that in the late 1960’s, no one used the old trail that passes the project area between the Government Road and ‘Ai‘ōpio fishpond. The trail is illustrated in Emerson's 1880’s map (see Figure 6) and is labeled as a "Pack Trail" on the 1953 USGS Keāhole Quadrangle map (see Figure 18 below). It is likely that the trail was no longer used once the Government Road was available for use. The trail is no longer visible on the ground surface where it crosses Kealakehe Ahupua’a.

The majority of the coastal lands of Kealakehe remain undeveloped. Honokōhau Harbor was constructed along the coast of Kealakehe in the late 1960s and was completed in 1970. The harbor facilities include offices, a small shop, a restaurant, a fueling station, and a boat yard. The Kealakehe Wastewater Treatment Plant was also

constructed in coastal Kealakehe. There are several bulldozed roads that cross the barren pāhoehoe coastal flats of Kealakehe, however, the majority of the area is unaltered.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Roughly thirty-five archaeological studies have been conducted in Kealakehe Ahupua‘a (Figure 12). The early studies, conducted by Bonk (1987), Emory and Soehren (1971), Reinecke (1930), Sinoto (1975, 1977), and Soehren (1980, 1981) were pedestrian surveys concentrating on locating major archaeological features in shoreline areas and near coastal regions of Kealakehe and adjacent *ahupua‘a*. These studies and the later studies in Kealakehe Ahupua‘a are concentrated in two environmental zones: the Coastal Zone (0-15 feet amsl) and the Middle Zone (15-900 feet amsl). Archaeological features recorded during these early studies included heiau, habitation features, burial features, and trails.

Later studies conducted by Donham (1990b) and Haun and Henry (2001, 2006) within the same area, recorded over 600 archaeological sites containing more than 3,700 features. More than 200 traditional Hawaiian habitation features, approximately 3,000 agricultural features, 56 burials, 56 trail segments, and 13 ceremonial features were documented throughout the course of these later archaeological studies. In addition, a smaller number of Historic era features, primarily ranch walls, were recorded during the later studies.

Radiocarbon analysis results indicated ranges of use of the Kealakehe sites beginning in the thirteenth to fourteenth centuries, with growth during the fifteenth and sixteenth centuries, and maximal use of the area in the seventeenth and eighteenth centuries.

The overall picture presented by archaeological data is clustered habitation, agricultural, ceremonial, and burial sites connected by a shoreline trail system located in the Coastal Zone (Figure 13, Figure 14, and Figure 15). Subsistence in this area is centered on ocean resources and fishpond aquaculture. Additionally, there are trails lead into the Middle Zone and further *mauka* passing through an area with a less dense concentration of temporary habitation features and pāhoehoe excavations.

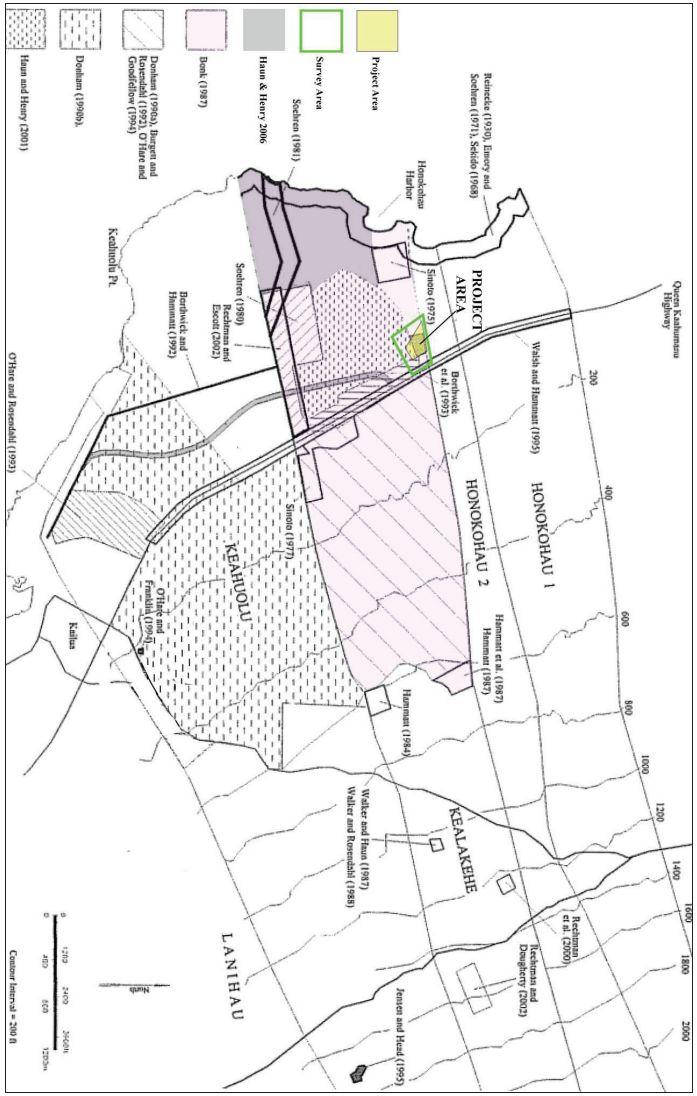

Figure 12: Map Showing Location of Previous Archaeological Studies (Adapted from Haun and Henry 2006:17).

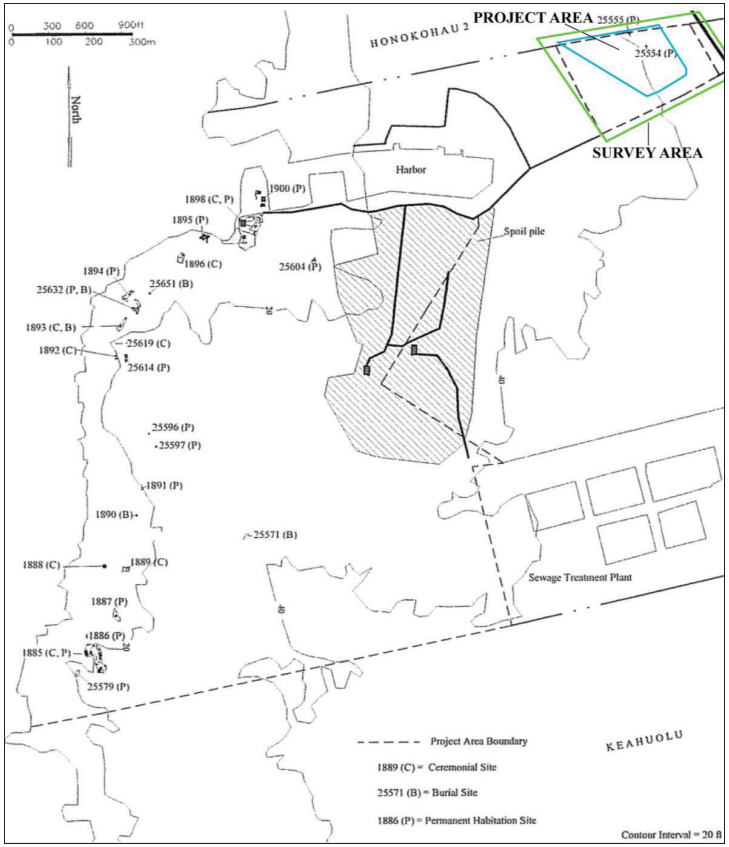

Figure 13: Permanent Habitation, Ceremonial, and Burial Sites Recorded in the Coastal Zone (Haun & Henry 2006:26).

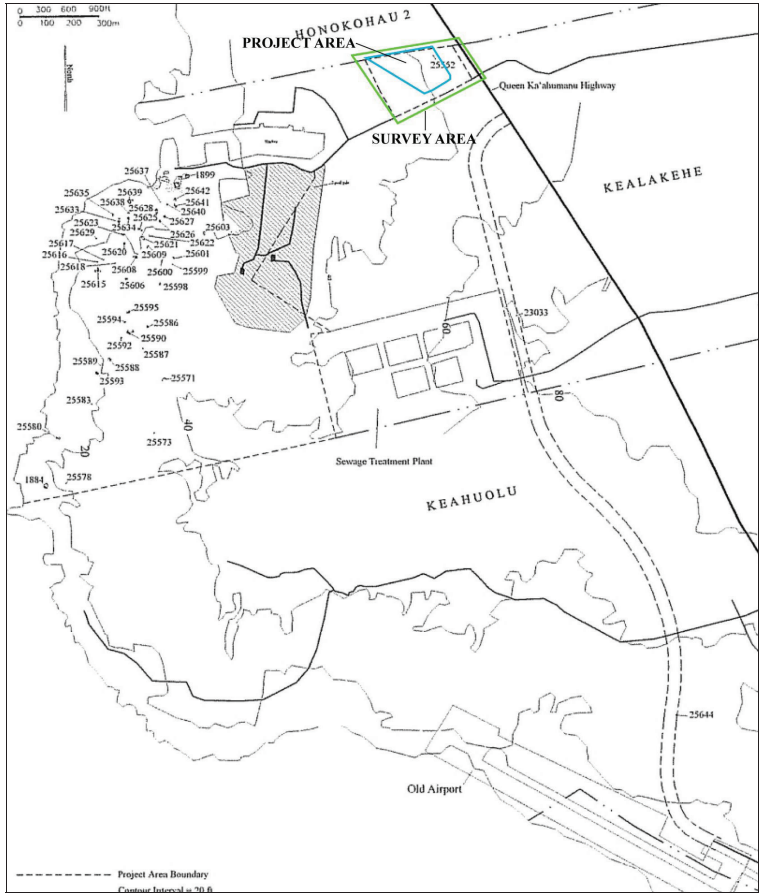

Figure 14: Temporary Habitation Sites Recorded in the Coastal Zone (Haun & Henry 2006:28).

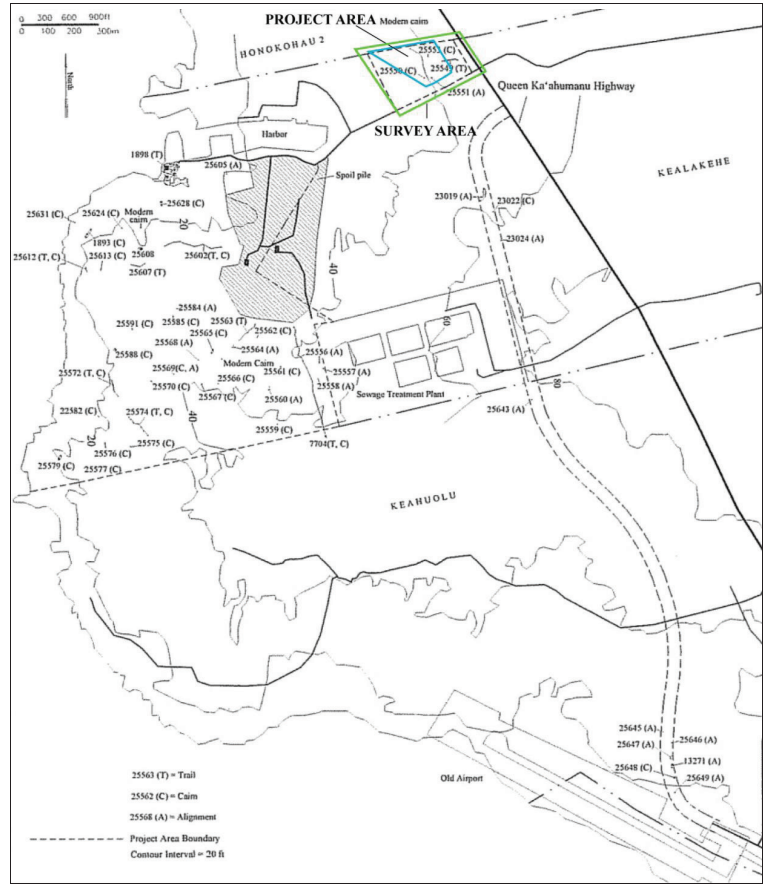

Figure 15: Trail, Cairn, and Rock Alignment Sites Recorded in the Coastal Zone (Haun & Henry 2006:35).

Haun and Henry (2001) conducted an archaeological inventory survey in the Middle Zone, just south of the current project area (see Figure 12). The AIS study identified 56 sites with 121 features including 41 single feature sites and 15 complexes (Haun and Henry 2001:16) (Figure 16). Recorded features included 55 pāhoehoe excavations, 31 stone alignments, 16 cairns, 8 rock mounds, 5 petroglyphs, 2 enclosures, a cave overhang, a platform, and a trail. Feature functions included quarry sites (n=55), agriculture (n=16), rock art (n=5), temporary habitation (n=4), ceremonial (n=1), transportation (n=1), and undetermined function (n=37).

The rock alignments recorded in Haun and Henry 2001 are not features typically recorded as rock alignments. Typically, rock alignments are linear where as the features they recorded are collections of rock, sometimes in no specific configuration, and in other instances, oval in shape or in the shape of a typical C-shaped or U-shaped enclosure. These features were not constructed like enclosures and are for the most part only a single course high, with two courses in a few places.

The features appear to be areas where rock which has been taken from nearby areas, is being collected and placed on bare pāhoehoe. It is likely these features are the result of collecting slab pāhoehoe for later use. It may be useful to refer to these features as rock concentrations for clarity.

The majority of archaeological features at the center of the Middle Zone are associated with resource extraction and collection, as well as with travel through the area (Figure 17). The greatest percentage of features are pāhoehoe excavations and rock concentrations. This area, inland from the Coastal Zone, appears to have been used primarily for resource extraction where raw materials were collected. The remaining features in this zone are rock mounds, cairns, enclosures associated with temporary habitation, as well as trail segments, petroglyphs and a ceremonial platform. There are far fewer habitation and burial sites than are located in the Coastal Zone.

Many of the significant Coastal Zone archaeological sites are listed on the Hawai‘i Register of Historic Places (Figure 18). The western half of the current project area is within the southeast corner of the Kaloko-Honokōhau Historic District.

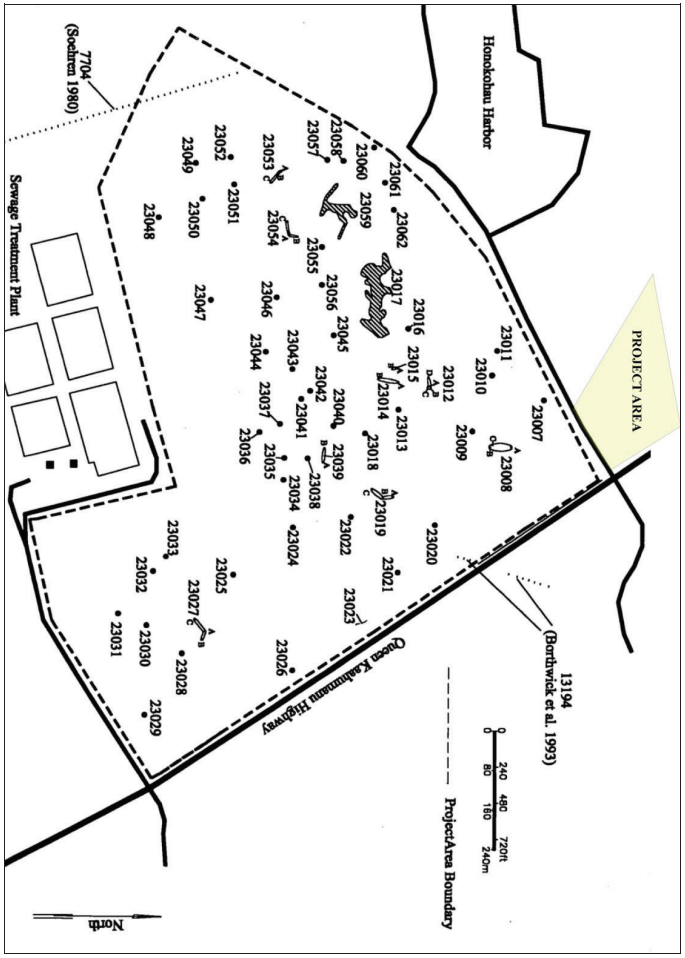

Figure 16: Plan View Map of Archaeological Sites Recorded in Haun and Henry (2001:17).

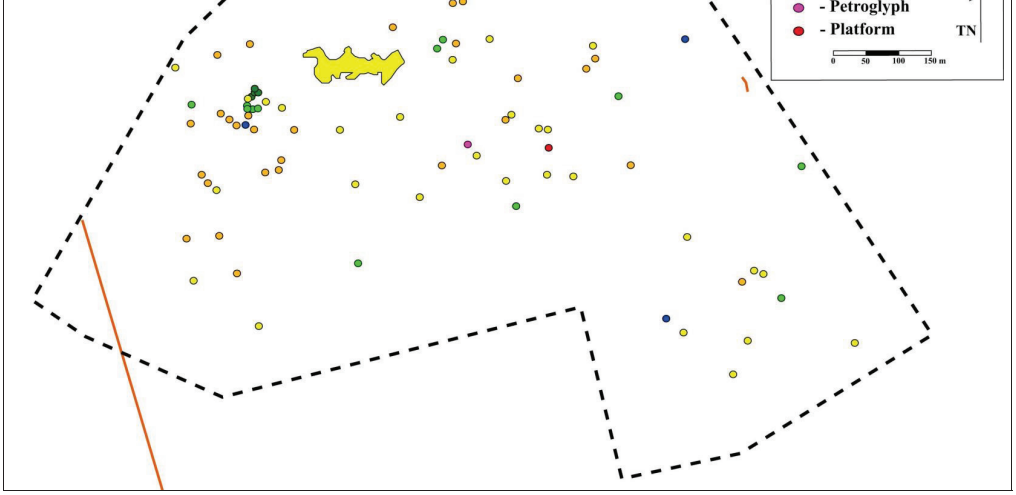

Figure 17: Plan View Map of Archaeological Feature Types Recorded in Haun and Henry (2001).

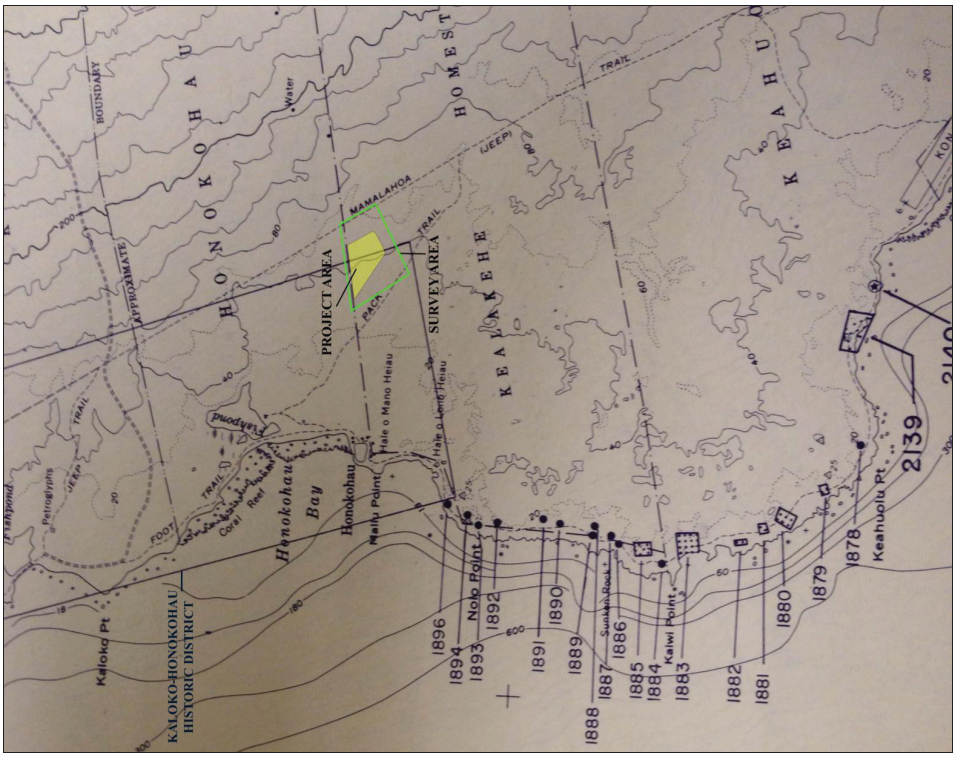

Figure 18: Portion of 7.5-Minute Series USGS Topographic Map Showing the Locations of Hawai'i Register of Historic Places Sites (Keahole Quad, 1959).

EXPECTED ARCHAEOLOGICAL PATTERNS

The current project area lands are at the center of the Middle Zone. Based on previous archaeological studies, land-use in the area appears to have been focused on resource extraction (pāhoehoe excavations and rock concentrations) and travel along the trail system situated between the coastal villages and upland locations. The Māmālahoa trail, smaller trails, associated trail features (*ahu* and two habitation sites), *heiau*, habitation sites, and resource extraction activity areas constitute the major cultural activity located in the general vicinity of the current project area.

Based on historical research, cultural practices and archival study, and previous archaeological studies, it is likely that archaeological remains associated with traditional Hawaiian travel and resources gathering might remain on the project area. Archaeological features will most likely include pāhoehoe excavations, rock concentrations, cairns, rock mound, wall segments, rock alignments, temporary habitation features, and remnant trail segments.

RESULTS OF FIELDWORK

Sixteen archaeological sites were documented during the current study (Table 3 and Figure 19). Eight of the sites were previously recorded (see Appendix A for Haun and Henry 2006 site plan view figures). The vast majority of sites contain a single feature including rock concentrations, rock mound markers, rock enclosures, a wall segment, and a modified outcrop. The State Inventory of Historic Property (SIHP) numbers for the sites recorded in the AIS begin with the prefix 50-10-27-. The Old Government Road Alignment that once existed east of the project area, just northeast of Queen Ka‘ahumanu Highway, has been bulldozed and is no longer evident in the AIS survey area (see Figure 19). It is not in the DLNR offices project area. There were no other archaeological sites or historic properties identified within the project area.

Table 3: Inventory of Archaeological Sites Identified in the Survey Area.

Site #*	Type	Function	Age
23007	Oval Enclosure	Temporary Habitation	Pre-Contact Era
25549	Trail	Travel	Pre-Contact to Early Post-Contact Era
25550	Cairn	Marker	Undetermined
25551	Rock Concentration	Resource Extraction	Undetermined
25552	Rock Alignment	Shelter	Historic Era to Modern
25553	Cairn	Marks Shelter	Modern
25554	Rectangular Enclosure	Temporary Habitation	Pre-Contact to Early Post-Contact Era
25555	Enclosure	Agriculture or Ranching	Post-Contact Era
30199	C-Shaped Enclosure	Temporary Habitation	Pre-Contact Era
30200	Wall Segment	Shelter	Pre-Contact to Early Post-Contact Era
30201	Modified Outcrop	Shelter	Pre-Contact Era
30202	Rock Concentration	Resource Extraction	Undetermined
30203	Rock Concentration	Resource Extraction	Undetermined
30204	Rock Concentration	Resource Extraction	Undetermined
30205	Rock Concentration	Resource Extraction	Undetermined
30206	Cairn	Marker	Pre-Contact to Early Post-Contact Era

*SIHP No. Prefix 50-10-27-.

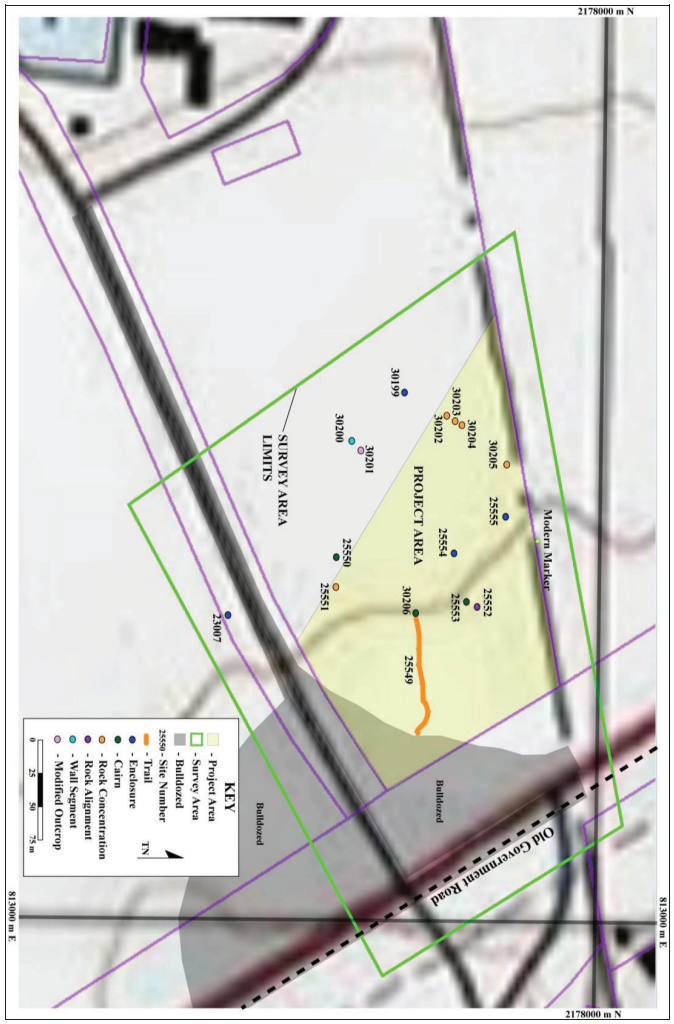

Figure 19: 7.5-Minute Series USGS Topographic Map Showing Location of Project Survey Area Archaeological Sites (Keahole Point Quad, ESRI 2011. Sources: National Geographic, USGS, Hawai'i County Planning Department).

SITE 23007	**Oval Enclosure**
FUNCTION:	Temporary Habitation
AGE:	Pre-Contact Era
DIMENSIONS:	10.2 m (N/S) by 5.25 m by 0.38 m in max. height
CONDITION:	Fair, Slightly Altered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	Haun and Henry 2001, TU-1

DESCRIPTION: Site 23007 is a crudely constructed oval enclosure located along the southern boundary of the survey area (see Figure 19). Site 23007 is on the south Side of Kealakehe Parkway, outside of the proposed DLNR offices project area. Site 23007 was previously recorded by Haun and Henry (2001:20-21). The enclosure is situated on level to slightly undulating pāhoehoe cobble ground surface. The enclosure is 10.2 m in length (N/S) and 3.7 to 5.25 m wide, by 0.25 to 0.38 m in height (Figure 20). The enclosure walls are constructed of piled subangular basalt cobbles and small boulders (Figure 21, Figure 22, Figure 23, and Figure 24). No stacking or facing is evident in the feature construction. The interior of the enclosure measures 3.9 m in length (N/S) and 2.45 m wide, and consists of scattered rock and a thin soil deposit. There was no cultural material observed on the ground surface at the site.

A 0.5 by 0.5 m test unit (TU-1) was excavated inside the south end of the enclosure during the Haun and Henry (2006) AIS (see Figure 20). The excavation consisted of a single stratigraphic layer overlying bedrock. Layer I consisted of 0.14 to 0.18 m of a dark brown (10YR 3/3) sandy silt, with no cultural remains.

Site 23007 is interpreted as a temporary habitation structure. Although larger in area than the typical size range for temporary habitation structures (Cordy 1981), the lack of substantial construction (un-faced walls, lack of paving, etc.) and the lack of other habitation features, suggests it is a temporary habitation. The site is unaltered and in fair condition. Site 23007 is significant under criterion "d" and no further work is recommended.

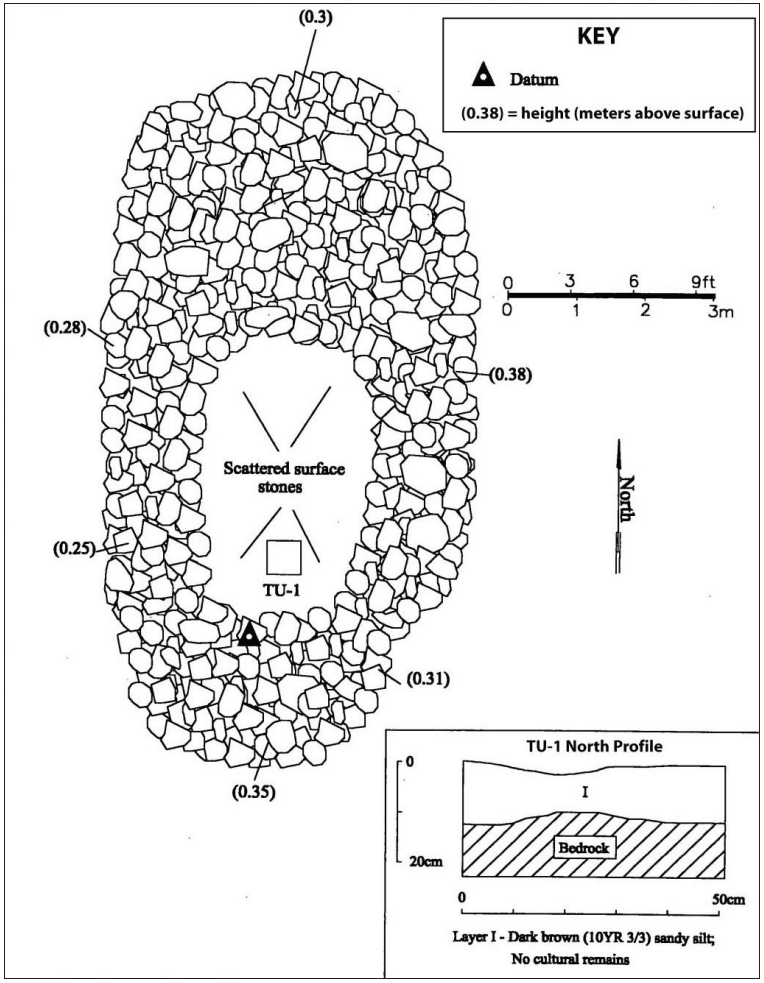

Figure 20: Site 23007 Plan View and TU-1 Profile Facing North (Adapted from Haun and Henry 2001:21).

Figure 21: Photograph of Site 23007 Facing South (1 Meter Scale).

Figure 23: Photograph of Site 23007 East Side Facing North (1 Meter Scale).

Figure 22: Photograph of Site 23007 West Side Facing South (1 Meter Scale).

Figure 24: Photograph of Site 23007 North End Facing North (1 Meter Scale).

SITE 25549	**Trail**
FUNCTION:	Travel
AGE:	Pre-Contact to Early Post-Contact Era
DIMENSIONS:	80.0 meters (E/W) by 0.80 meters
CONDITION:	Good, Slightly Altered by Bulldozing
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	Individual Basalt Cobbles Placed Along Trail
EXCAVATION:	None

DESCRIPTION: Site 25549 is a trail located at the center of the survey area (see Figure 19). It is within the proposed DLNR offices project area. Site 25549 was previously recorded by Haun and Henry (2006:100 & 102). The trail is situated on an undulating ‘a‘ā lava flow. The trail is approximately 80.0 m in length (E/W) and 0.8 m wide (Figure 25 through Figure 32).

The trail was constructed by removing some of the larger cobbles from the center of the trail and by filling low spots with rock. There are no curbstones. The trail surface has a slightly foot worn appearance. Photographic documentation was made of the trail alignment surface at locations where the trail was easier to see, primarily where people walking on the soft, friable cinder ‘a‘ā lava field had crushed and worn a narrow path into the lava surface. The photographs were taken from the east end to the west end of the trail at intervals of four to thirteen meters apart (see Figure 26 through Figure 32).

There are dense basalt cobbles, dissimilar to the lava flow, placed two to three meters apart along the surface of the trail (Figure 33 through Figure 36). No other cultural remains were observed on the ground surface at the site. The west end of the trail is not visible on the pāhoehoe flow along the western edge of the ‘a‘ā flow. The eastern end of the site has been altered by bulldozing. The trail may have connected with the Old Government Road alignment to the east. The eastern end of the trail has been altered by bulldozing and the remaining trail segment is in good condition. Site 25549 is significant under criteria "a," "c," "d" and "e" and is recommended for preservation.

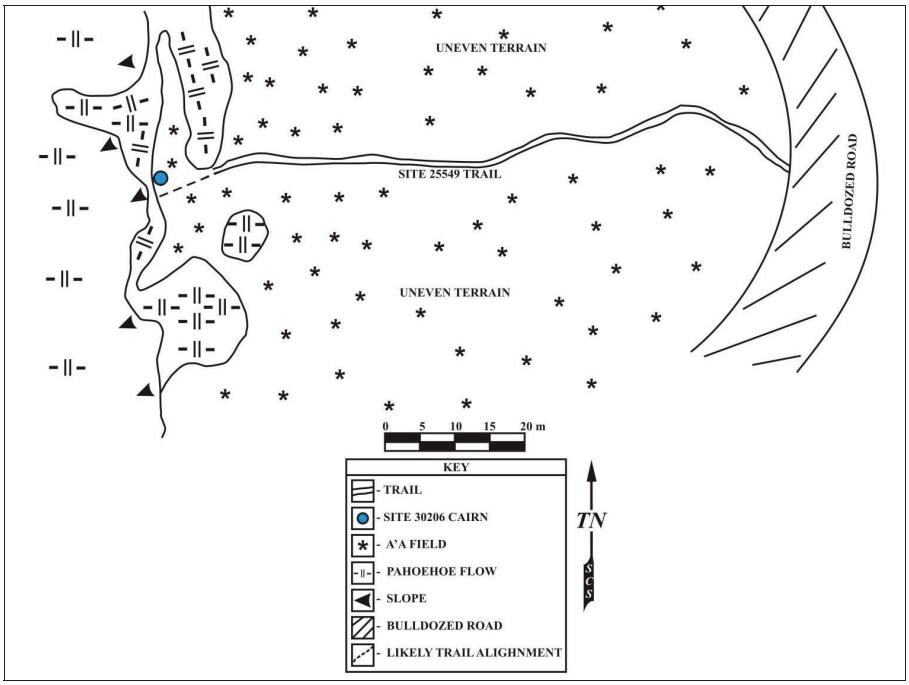

Figure 25: Site 25549 Plan View Map.

Figure 26: Photograph of Eastern Most Portion of Site 25549 Showing Trail Surface, Facing East.

Figure 27: Photograph of Eastern Portion of Site 25549 Showing Trail Surface, Facing East (5 meters west of Figure 26).

Figure 28: Photograph of Eastern Portion of Site 25549 Showing Trail Surface, Facing East (4 meters west of Figure 27).

Figure 29: Photograph of Eastern Portion of Site 25549 Showing Trail Surface, Facing East (10 meters west of Figure 28).

Figure 30: Photograph of Central Portion of Site 25549 Showing Trail Surface, Facing East (4 meters west of Figure 29).

Figure 31: Photograph of Western Portion of Site 25549 Showing Trail Surface, Facing East (13 meters west of Figure 30).

Figure 32: Close Up Photograph of Western Portion of Site 25549 Showing Trail Surface, Facing West (same location as Figure 31).

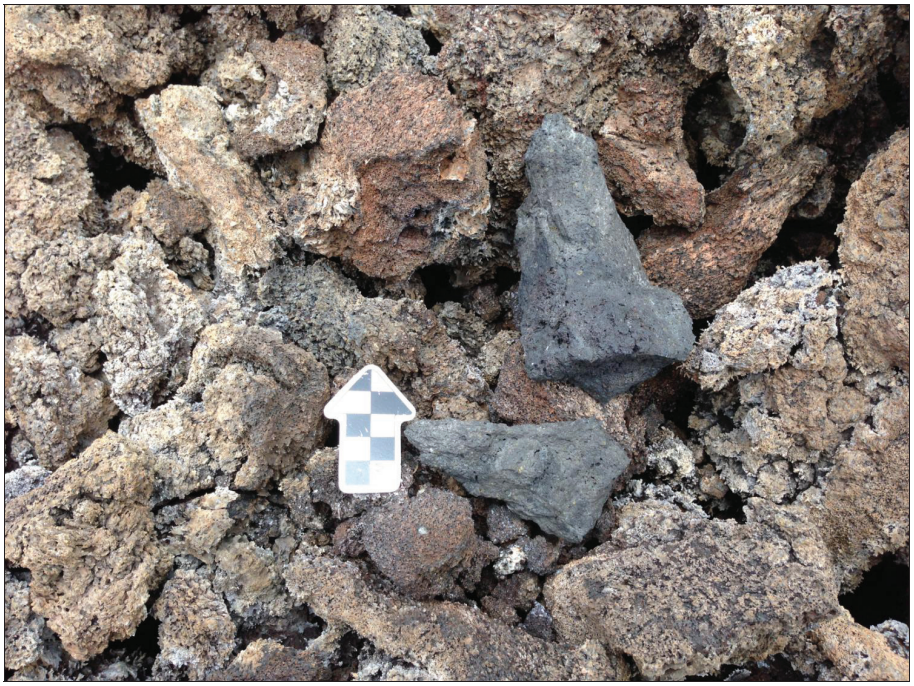

Figure 33: Photograph of Basalt Cobbles on Site 25549 Trail Surface (5 cm North Arrow Scale).

Figure 34: Photograph of Basalt Cobble on Site 25549 Trail Surface (5 cm North Arrow Scale).

Figure 36: Photograph of Basalt Cobble on Site 25549 Trail Surface (5 cm North Arrow Scale).

Figure 35: Photograph of Basalt Cobble on Site 25549 Trail Surface (5 cm North Arrow Scale).

SITE 25550 **Rock Mound**

FUNCTION: Location Marker

AGE: Undetermined

DIMENSIONS: 0.4 m (NE/SW) by 0.28 m by 0.23 m in max. height

CONDITION: Good, Unaltered

INTEGRITY: Possesses integrity of location, design, setting, material, workmanship, feeling, and association

SURFACE ARTIFACTS: None

EXCAVATION: None

DESCRIPTION: Site 25550 is a rock mound located approximately 60 m southwest of Site 25549 (see Figure 19). It is to the west of the proposed DLNR offices project area. Site 25550 was previously recorded by Haun and Henry (2006:102-103). The rock mound is situated on a level pāhoehoe flow. The mound is approximately 0.4 m in length (NE/SW) and 0.28 m wide, with a maximum height of 0.23 m (Figure 37 and Figure 38). The rock mound is constructed of five slabby pāhoehoe cobbles. There were no cultural remains located on the ground surface at the site. The site is unaltered and is in good condition. Site 25549 is significant under criterion "d" and no further work is recommended.

SITE 25551 **Rock Concentration**

FUNCTION: Resource Collection

AGE: Undetermined

DIMENSIONS: 3.56 m (NE/SW) by 2.87 m by 0.21 m in max. height

CONDITION: Good, Unaltered

INTEGRITY: Possesses integrity of location, design, setting, material, workmanship, feeling, and association

SURFACE ARTIFACTS: None

EXCAVATION: None

DESCRIPTION: Site 25551 is a rock concentration located approximately 20 m southeast of Site 25550 (see Figure 19). It is within the proposed DLNR offices project area. Site 25551 was previously recorded by Haun and Henry (2006:3-4).

The rock concentration is situated on a level pāhoehoe flow. The rock concentration is approximately 3.56 m long (NE/SW) by 2.87 m wide by 0.21 m in maximum height (Figure 39). The rock concentration is constructed of slabby pāhoehoe cobbles laid out on the bare pāhoehoe (Figure 40).

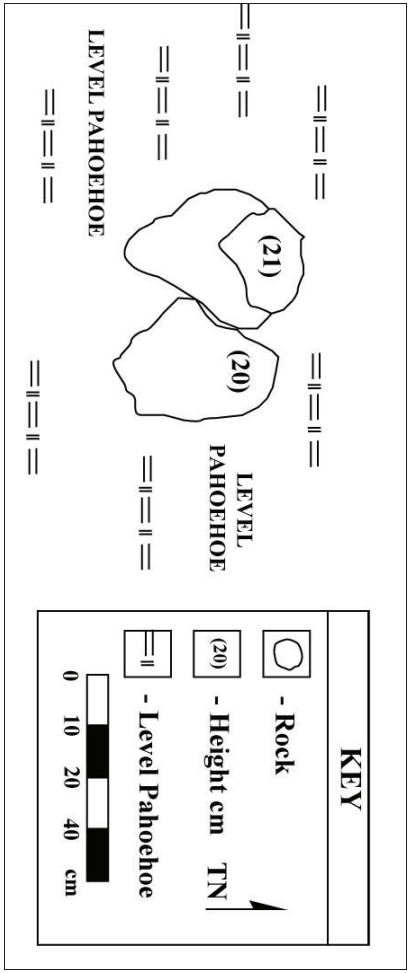

Figure 37: Site 25550 Plan View Map.

Figure 38: Photograph of Site 25550 Rock Mound Looking North.

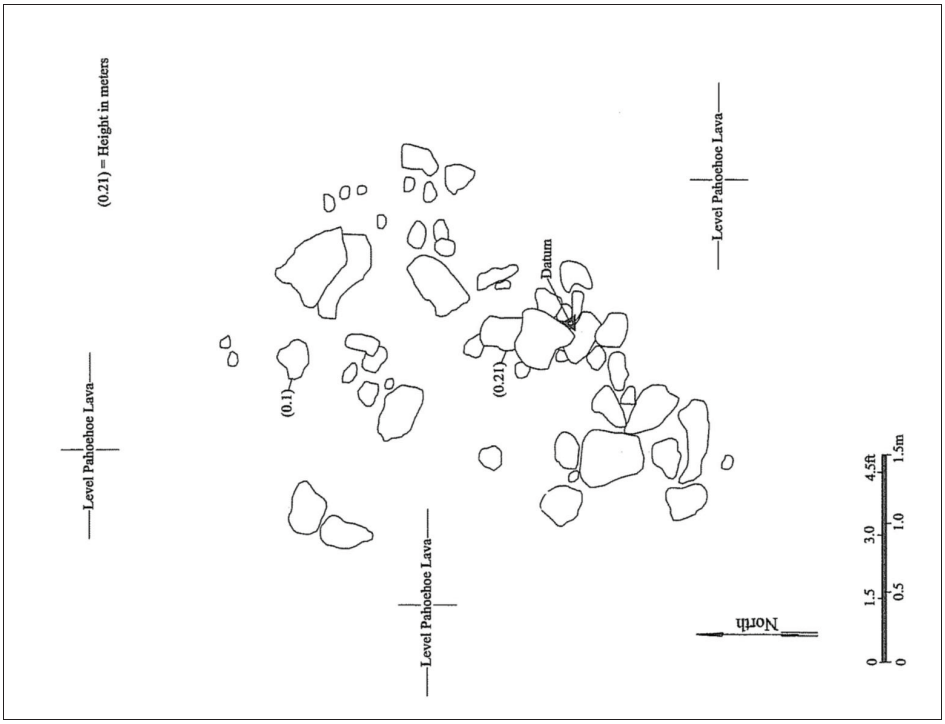

Figure 39: Site 25551 Plan View Map (Haun and Henry 2006:104).

Figure 40: Photograph of Site 25551 Rock Concentration Facing Northeast (10 cm North Arrow Scale).

There were no cultural remains located on the ground surface at the site. The rock concentration is unaltered and is in good condition. Site 25551 is significant under criterion "d" and no further work is recommended.

SITE 25552	**Rock Alignment and Shelter**
FUNCTION:	Temporary Habitation/ Camp
AGE:	Historic Era to Modern Era
DIMENSIONS:	3.27 m (N/S) by 2.0 m by 0.45 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 25552 is a rock alignment (Feature 1) and rock shelter (Feature 2) located approximately 45 m north of Site 25549 (see Figure 19). It is within the proposed DLNR offices project area. Site 25552 was previously recorded by Haun and Henry (2006:103 & 105). Site 25552 is situated on an undulating ‘a‘ā lava flow. The site is approximately 3.27 m in length (N/S) and 2.0 m wide, with a maximum height of 0.45 m (Figure 41).

Feature 1 is a rock alignment located at the north end of the site. The rock alignment is 0.8 m in length (N/S) and 0.58 m wide, with a maximum height of 0.45 m. It is constructed of pāhoehoe cobbles and small boulders placed along the top of natural boulders to form a small windbreak east of the natural boulders and feature (Figure 42). The height of the top of the feature and boulders ranges from 0.85 m to 1.4 m. There is no footwear or modification of the surface behind the windbreak. A single, unmodified cowrie shell (*Cyprea sp.*) was located at the top of the east end of Feature 1. The cowrie was not weathered.

Feature 2 is at the south end of Site 25552, consisting of rock piling along the eastern edge of a natural pāhoehoe overhang (Figure 43). The slab pāhoehoe is naturally perched on surrounding rock to form a small overhang. Feature 2 is a small shelter 1.00 m in length (E/W) by 0.72 m wide, with a maximum height of 0.95 m. There is very little wear on the ground surface below the overhang, and no evidence that the overhang shelter was used repeatedly. There were no artifacts encountered at Feature 2.

Figure 42: Photograph of site 25552 Feature 1, Facing West (10 cm North Arrow Scale).

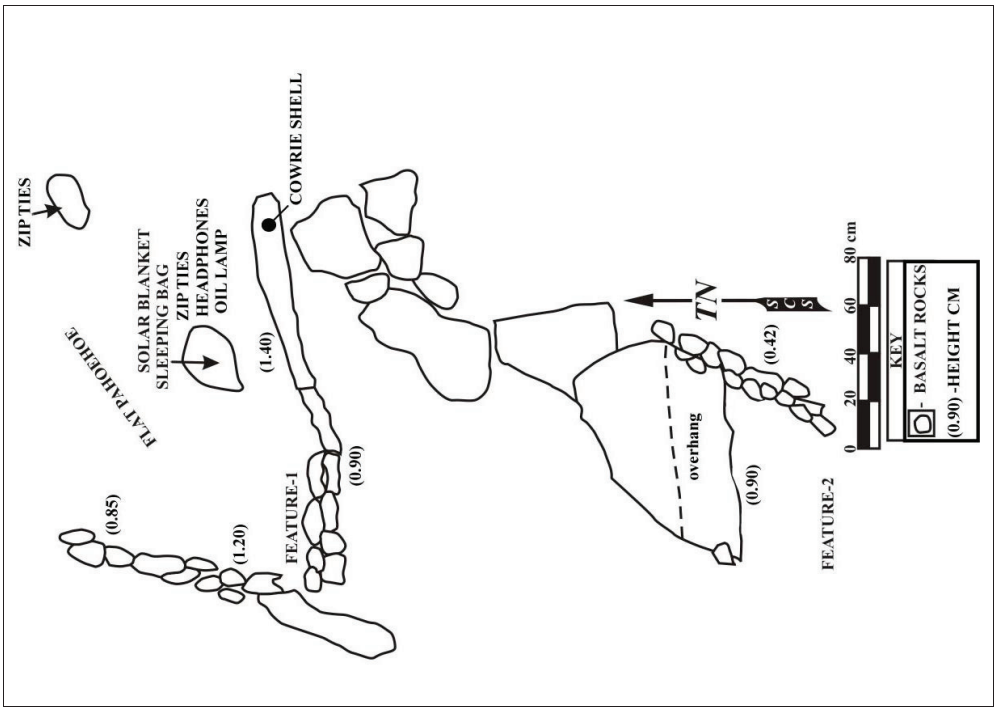

Figure 41: Site 25552 Plan View Map.

Figure 43: Photograph of site 25552 Feature 2, Facing North (10 cm North Arrow Scale).

A solar blanket, a sleeping bag, a small oil lamp, headphones, and several zip ties were found immediately east of Feature 1, hidden under pāhoehoe slabs. The items were weathered and had the appearance of being a decade or so old. Based on the presence of the modern camping items and the loose construction of the features, it is possible that Site 25552 was first constructed as a temporary habitation shelter, and was modified during the modern era. Site 25552 is unaltered and is in good condition. Site 25552 is significant under criterion "d" and no further work is recommended.

SITE 25553	**Cairn**
FUNCTION:	Marker
AGE:	Likely Modern
DIMENSIONS:	0.5 m (N/S) by 0.48 m by 0.80 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 25553 is a rock mound marker located approximately 9.0 m southwest of Site 25552 (see Figure 19). It is within the proposed DLNR offices project area. Site 25553 was previously recorded by Haun and Henry (2006:103 & 106). The cairn is approximately 0.50 m in length (N/S) and 0.48 m wide, with a maximum height of 0.80 m (Figure 44). The rock mound is constructed of three large ʻaʻā cobbles stacked two courses high on a larger ʻaʻā boulder (Figure 45). The marker is along the western edge of an ʻaʻā lava flow where it meets a pāhoehoe flow. The closest site to the cairn is Site 25552 which is a possible homeless camp. It seems likely that the cairn marks the easiest access route across the ʻaʻā flow to the camp. There were no cultural remains located on the ground surface at Site 25553. The site is unaltered and is in good condition. Site 25553 is significant under criterion "d" and no further work is recommended..

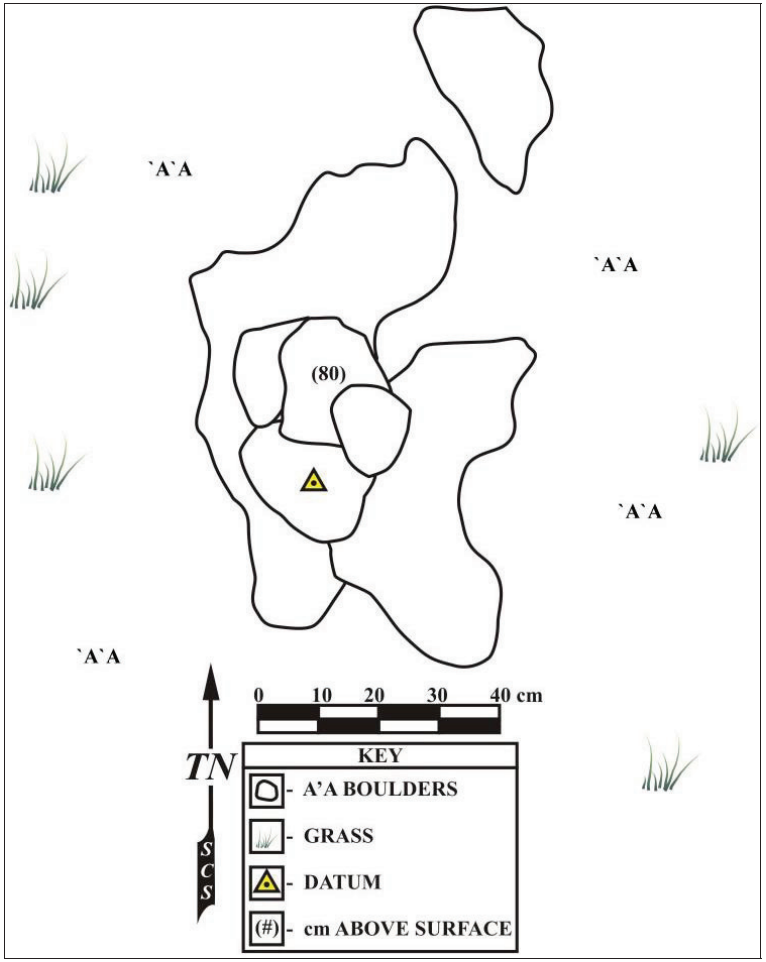

Figure 44: Site 25553 Plan View Map.

Figure 45: Photograph of site 25553 Cairn Facing West (10 cm North Arrow Scale).

SITE 25554	**Rectangular Enclosure**
FUNCTION:	Temporary Habitation
AGE:	Pre-Contact to Early Post-Contact Era
DIMENSIONS:	4.1 m (160°/340°) by 3.65 m by 0.48 m in max. height
CONDITION:	Fair, Partially Collapsed
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 25554 is a crudely constructed rectangular enclosure located approximately 37.0 meters west of Site 25553 (see Figure 19). It is within the proposed DLNR offices project area. Site 22554 was previously recorded by Haun and Henry (2006:103 & 106).

The enclosure is situated on level to slightly undulating pāhoehoe flow. The enclosure is 4.1m in length (160°/340°) by 3.65 m wide (Figure 46, 47, and 48). The enclosure walls range in width from 0.55 to 0.77 m and range in height from 0.21 to 0.48 m. The walls are constructed of piled subangular and slabby basalt large cobbles and small boulders. No stacking or facing is evident.

The entrance to the enclosure is in the southern portion of the west wall (see figure 47). The interior of the enclosure measures 2.6 m in length (160°/340°) and 2.30 m wide. It consists of bare pāhoehoe with sparse grass. There were no discernible soil deposits and no cultural remains observed on the ground surface at the site.

The enclosure was interpreted as a "the foundation for a permanent habitation roofed structure" (Haun and Henry 2006:103). However, there would be cultural remains, including midden, on the ground surface evident at a permanent habitation site. This is especially true at the Site 25554 where the ground surface is bare pāhoehoe and there are no soil deposits to cover remains discarded at a habitation site.

Site 25554 is interpreted as a temporary habitation structure. Although larger in area than the typical size range for temporary habitation structures (Cordy 1981), the lack of substantial construction (un-faced walls, lack of paving, etc.) and the lack of habitation artifacts, suggest it is a temporary habitation site. Additionally, the site is roughly a kilometer from the coast where the majority of permanent habitation sites were known to

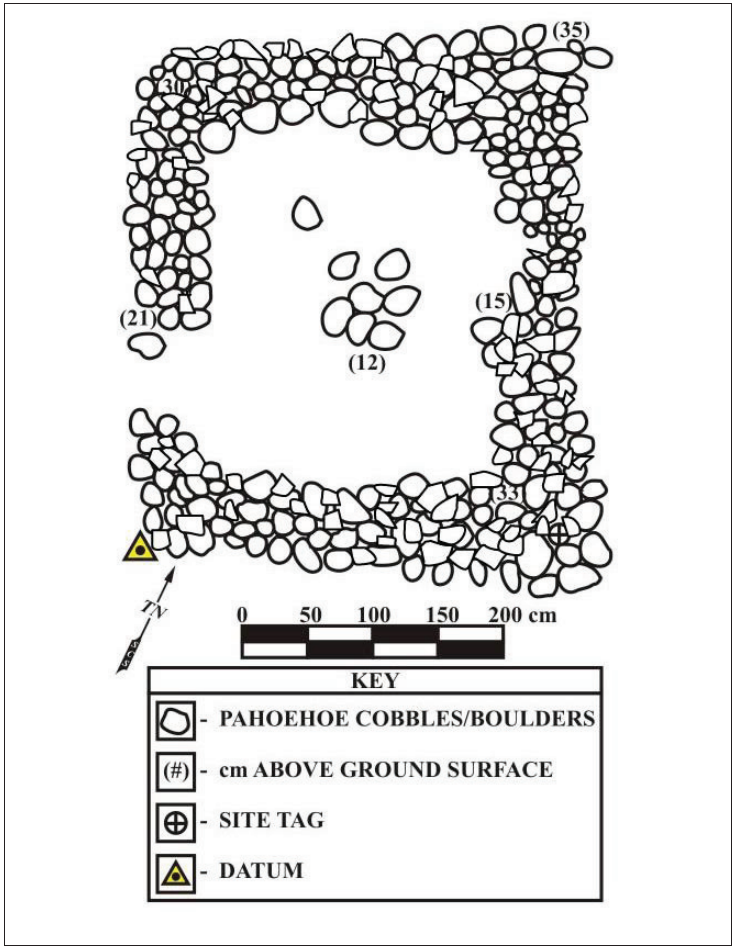

Figure 46: Site 25554 Plan View Map.

Figure 48: Photograph of site 25554 Enclosure Entrance in Foreground, Facing Northwest (10 cm North Arrow Scale).

Figure 47: Photograph of site 25554 Enclosure Facing North (10 cm North Arrow Scale).

exist. The site is partially collapsed and is in fair condition. Site 25554 is significant under criteria "c" and "d" and is recommended for preservation.

SITE 25555	**Enclosure**
FUNCTION:	Agriculture or Ranching
AGE:	Pre-Contact to Early Post-Contact Era
DIMENSIONS:	5.80 m (NE/SW) by 5.60 m by 1.24 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	TU-1 and TU-2

DESCRIPTION: Site 25555 is an enclosure located approximately 47.0 meters northwest of Site 25554 (see Figure 19). It is within the proposed DLNR offices project area. Site 22555 was previously recorded by Haun and Henry (2006:107-108).

The enclosure is situated on level to slightly undulating pāhoehoe flow. The enclosure is 5.80 m in length (NE/SW) by 5.60 m wide, and is 1.24 m in maximum height (Figure 49, 50, and 51).

The enclosure was constructed by building a 5.40 m long wall across the western opening of an alcove of pāhoehoe where it is surrounded by the a ʻaʻā flow to the east.

The natural geological formation forms an alcove of pāhoehoe within the flow, and the rock wall blocks the entrance to the natural alcove. The walls and the surrounding ʻaʻā flow create an enclosure that would be impassable to most animals, with the exception of goats and sheep.

The wall of the enclosure is 5.40 m in length (130′/310′), and 0.60 m wide, ranging in height from 0.85 to 1.00 m (see Figure 51). It is a bi-faced, cobble core filled wall constructed of stacked (four courses high) angular and subangular basalt large cobbles and small boulders (Figure 52 and Figure 53). Many of the angular rocks in the exterior surfaces of the wall are placed with their longest edge parallel to the wall surface, and with their largest flattest surface facing the exterior of the wall. The rocks are fairly tightly fitted and the exterior wall surfaces slope slightly inward toward the top of the

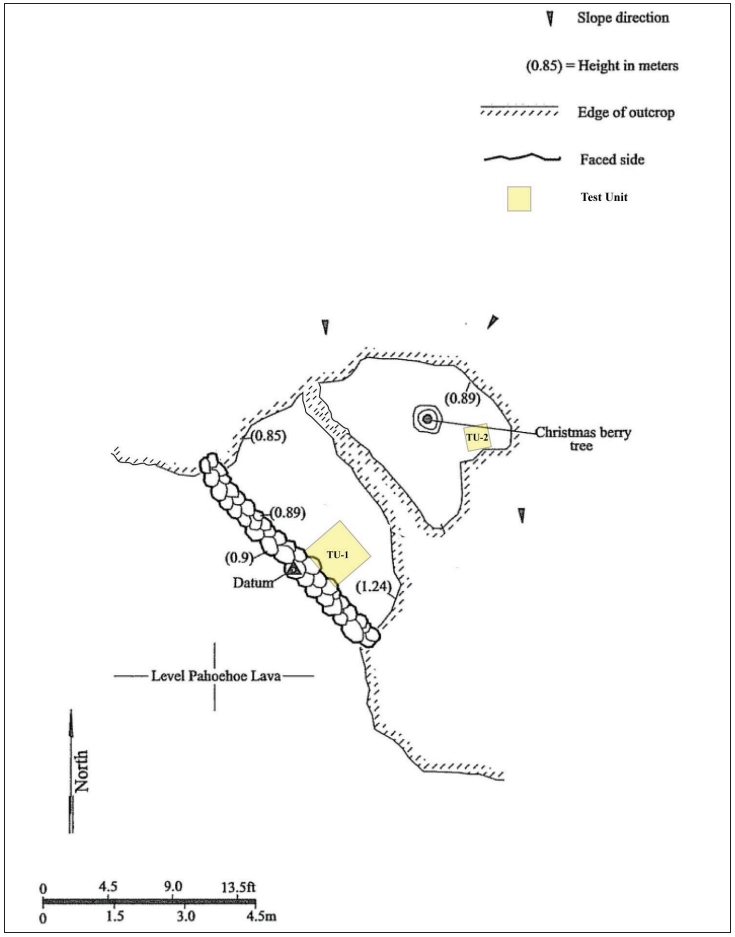

Figure 49: Site 25555 Plan View (Adapted from Haun and Henry 2001:108).

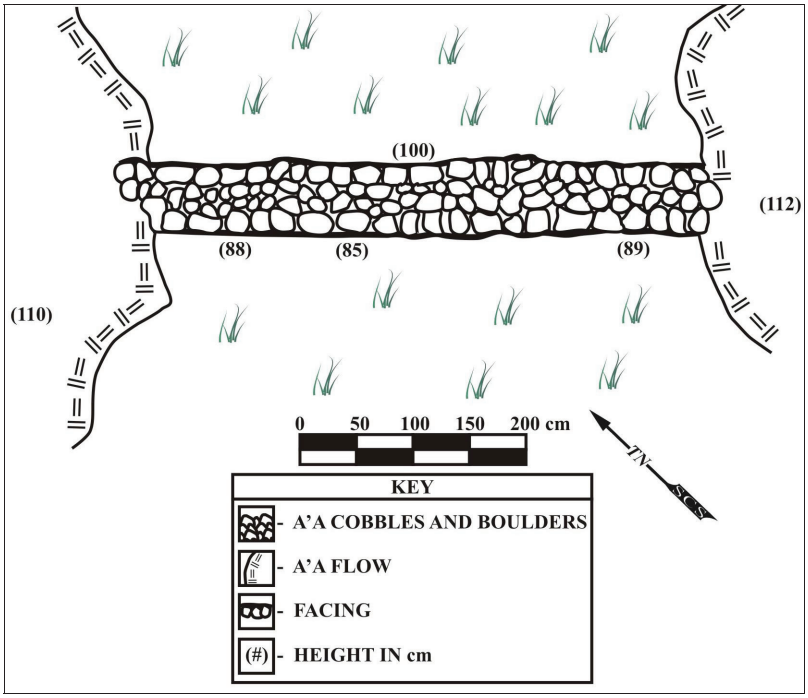

Figure 51: Site 25555 Wall Plan View.

Figure 50: Photograph of site 25555 Enclosure Interior Facing North (25 cm North Arrow Scale).

Figure 52: Photograph of Site 25555 Wall Facing Southwest (10cm North Arrow Scale).

Figure 53: Photograph of Site 25555 Top of Wall Facing Southwest (10cm North Arrow Scale).

wall, resulting in the base being wider than the top. The features of the rock wall construction described above are characteristic of post-Contact Era ranch wall construction.

The interior of the enclosure measures roughly 5.00 m in length (NE/SW) by 4.60 m wide, and consists of bare pāhoehoe with a few small deposits of soil. There were no cultural remains identified on the ground surface. Two test units (TU-1 and TU-2) were excavated within the enclosure, in an effort to recover cultural material to aid in the determination of the function and age of the site (see figure 49).

TU-1 was a 1.0 m long (NE/SW) by 1.0 m wide unit excavated along the inside (NE) edge of the wall at Site 25555. TU-1 contained a single natural stratigraphic layer, and was excavated to bedrock at a maximum depth of 5.0 cm below the modern ground surface (cmbs) (Figure 54 and Figure 55). Layer I was loose, very dark brown (7.5YR2.5/2) sandy loam with some blocky peds. Layer I contained 5% small roots and 10% pebbles and small cobbles and terminated on pāhoehoe bedrock. The base of the rock wall was located directly on bedrock in the base of TU-1. There were no artifacts or cultural deposits identified within the test unit.

TU-2 was a 0.5 m long (NNW/SSE) by 0.5 m wide unit excavated in a soil deposit at the back (northeastern edge) of the enclosure where it is bounded by the natural pāhoehoe. The location for TU-2 was chosen because it was the only place in the enclosure that contained a sizable soil deposit.

TU-2 contained two natural stratigraphic layers, was excavated as three 10 cm levels, and terminated on bedrock at a maximum depth of 24.0 cmbs (Figure 56, Figure 57, and Figure 58). Layer I was loose very dark brown (7.5YR2.5/2) sandy loam with some blocky peds. Layer I contained 5% small roots and 10% pebbles and small cobbles. The base of Layer I was clear and level and terminated on Layer II along the edges of the unit and on bedrock in the center of the unit. There were no artifacts or cultural deposits identified within Layer I.

Layer II was soft brown (7.5YR2.4/2) fine silt, with less than 1% small roots and less than 1% pebbles. Layer II terminated on bedrock. There were no artifacts or cultural deposits identified within Layer I.

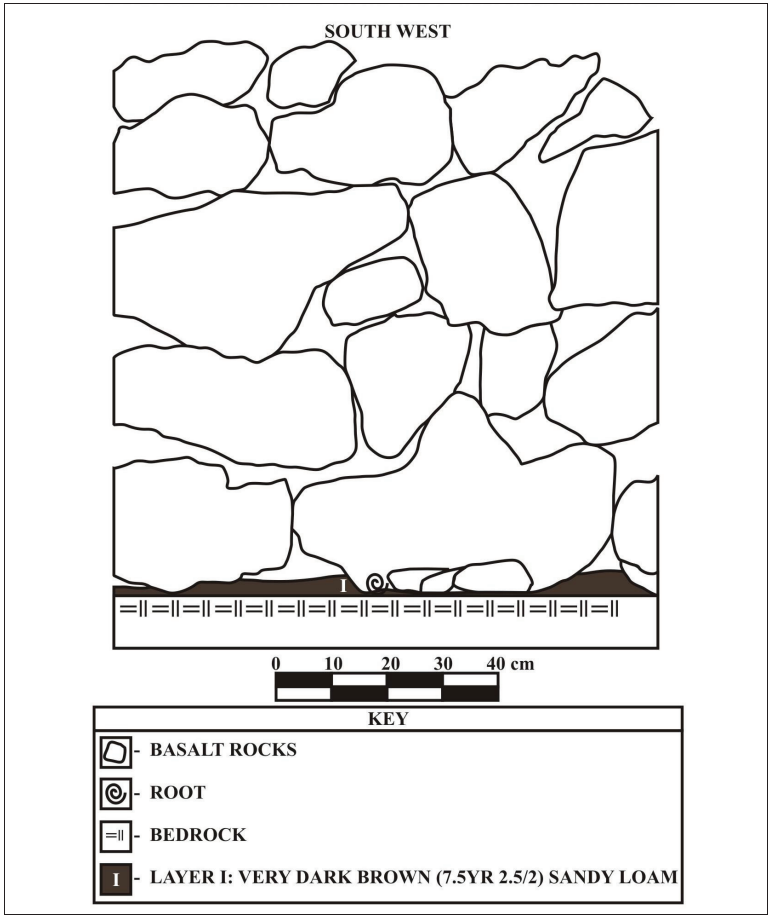

Figure 54: Site 25555 Test Unit 1 Southwest Profile.

Figure 55: Photograph of Site 25555 Test Unit 1Base of Excavation Facing Southwest.

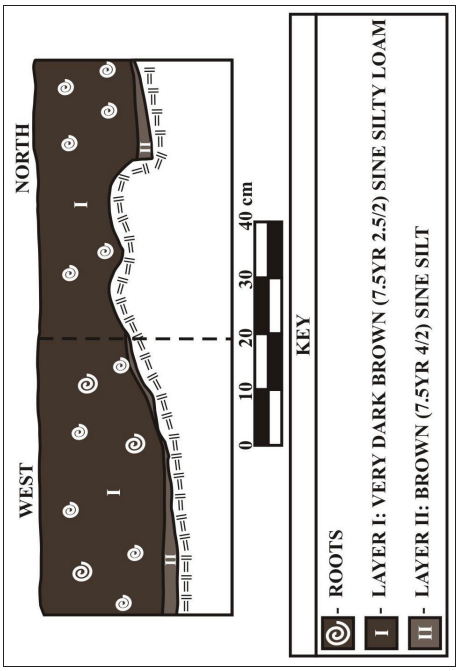

Figure 56: Site 25555 Test Unit 2 West and North Profiles.

Figure 57: Photograph of Site 25555 Test Unit 2 West Profile.

Figure 58: Photograph of Site 25555 Test Unit 2 Base of Excavation Facing Northwest.

The enclosure was interpreted as a permanent habitation enclosure by Haun and Henry (2006:107). However, the lack of artifacts or cultural material on the ground surface and in subsurface test excavations at Site 25555, suggest that the enclosure was not used for habitation. Additionally, the site is roughly a kilometer from the coast where the majority of permanent habitation sites were known to exist.

It is much more likely that the enclosure was constructed to keep cattle out of the ‘a‘ā surrounded alcove, or to keep small animals in. If it was constructed to keep animals out, the enclosure might have functioned to keep cattle from wandering into the ‘a‘ā alcove for their own safety, or to protect cultigens grown in the few soil deposits within the enclosure. The site is unaltered and is in good condition. Site 25555 is significant under criteria "c" and "d" and is recommended for preservation.

SITE 30199	**C-Shaped Enclosure**
FUNCTION:	Temporary Habitation
AGE:	Pre-Contact Era
DIMENSIONS:	3.85 m (N/S) by 2.65 m by 0.30 m in max. height
CONDITION:	Fair, Slightly Altered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	Marine Shell, Coral, Volcanic-Glass, & Waterworn Pebbles
EXCAVATION:	None

DESCRIPTION: Site 30199 is a crudely constructed C-shaped enclosure located at the center of the project area (see Figure 19). Site 30199 is west of the proposed DLNR offices project area was not previously recorded. The enclosure is situated on level to slightly undulating pāhoehoe lava with sparse grass. The enclosure is 3.85 m in length (N/S) and 2.65 m wide, with a maximum height of 0.30 m (Figure 59). The enclosure walls are constructed of loosely piled (one to two courses high) subangular and slabby basalt cobbles and small boulders (Figure 60). There is no stacking or facing evident in the feature construction. The interior of the enclosure measures 2.65 m in length (N/S) and 1.75 m wide, consisting of scattered rock on bare pāhoehoe with sparse grass. There were no soil deposits observed on the ground surface at the site.

Figure 60: Photograph of Site 30199 Enclosure Facing Northeast.

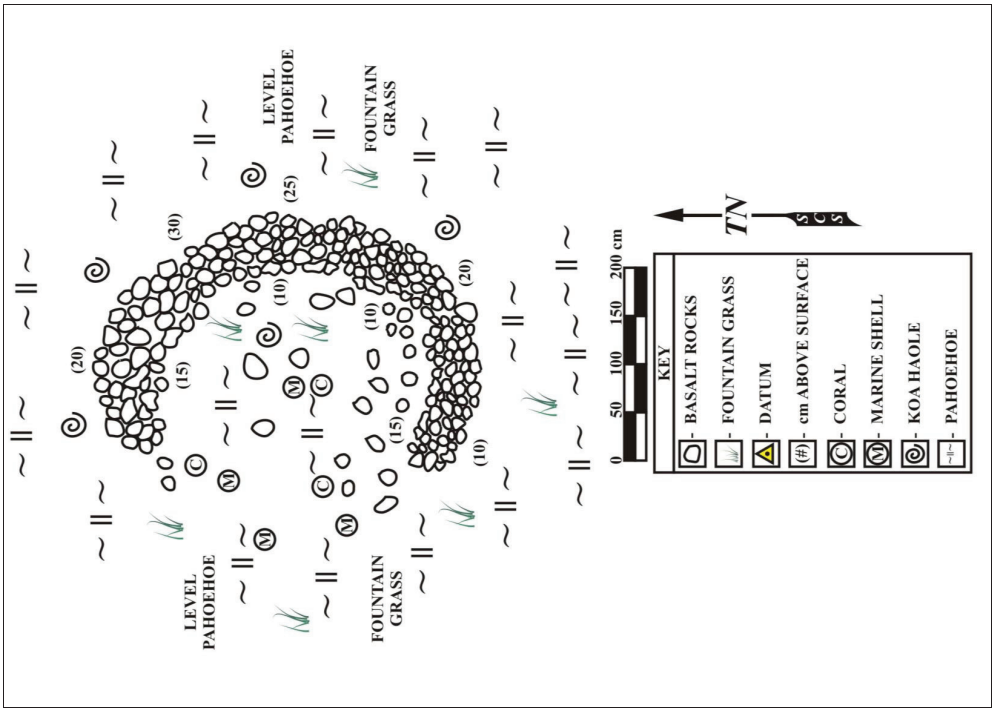

Figure 59: Site 30199 plan View Map.

A scatter of marine shell fragments (primarily *Cypraeidae* and a few *Conidae* and *Echinoid* species), coral fragments, one volcanic-glass flakes, two waterworn pebbles, and two fish scales was encountered on the surface and plotted on the plan view map of Site 30199. The artifacts were collected for quantitative analysis and tabulation (Table 3).

Table 4: Site 30199 Surface Artifact Inventory.

Artifact	Number	Weight (grams)	Comment
Marine Shell	50+	111.86	Small Fragments
Coral	20	98.32	Small Fragments
‘Ili‘ili	2	16.25	Pebbles
Volcanic-glass	1	0.66	Flake

Site 30199 is interpreted as a temporary habitation structure based on its size, method of construction, and the artifacts collected from the ground surface at the site. The lack of substantial construction (un-faced walls, lack of paving, etc.) and the features isolation from other habitation features, suggests it is a temporary habitation. The site is slightly altered and is in fair condition. Site 30199 is significant under criterion "d" and no further work is recommended.

SITE 30200 **Wall Segment**

FUNCTION: Windbreak, Shelter

AGE: Pre-Contact Era to Early Post-contact Era

DIMENSIONS: 3.75 m (NE/SW) by 1.00 m by 0.60 m in max. height

CONDITION: Good, Unaltered

INTEGRITY: Possesses integrity of location, design, setting, material, workmanship, feeling, and association

SURFACE ARTIFACTS: None

EXCAVATION: None

DESCRIPTION: Site 30200 is short wall segment located 54.0 m southeast of Site 30199 (see Figure 19). Site 30200 is to the west of the proposed DLNR offices project area and was not previously recorded. The enclosure is situated on level to slightly undulating pāhoehoe lava with sparse grass. The enclosure is 3.75 m in length (NE/SW) by 1.00 m wide, with a maximum height of 0.60 m (Figure 61). The wall is constructed of slabby basalt cobbles and small boulders stacked four courses high (Figure 62 and Figure 63). The wall is not core filled and is faced along its northwest side.

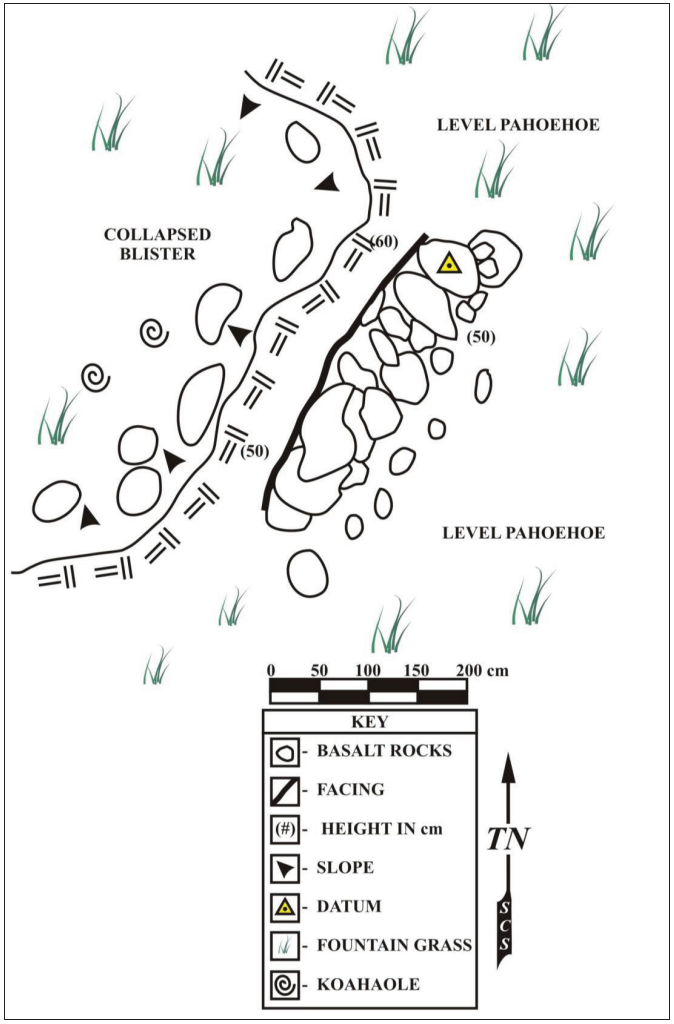

Figure 61: Site 30200 plan View Map.

Figure 63: Photograph of Site 30200 Wall Segment Facing West (10 cm North arrow Scale).

Figure 62: Photograph of Site 30200 Wall Facing East (10 cm North arrow Scale).

There were no soil deposits, artifacts, or cultural material observed on the ground surface at the site.

Site 30200 is interpreted as a windbreak or shelter based on its size, method of construction, and the lack of artifacts at the site. The site is unaltered and is in good condition. Site 30200 is significant under criterion "d" and no further work is recommended.

SITE 30201	**Modified Outcrop**
FUNCTION:	Shelter
AGE:	Pre-Contact Era to Early Post-contact Era
DIMENSIONS:	3.13 m (N/S) by 0.92 m by 0.35 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 30201 is a modified outcrop located 10.0 m northeast of Site 30200 (see Figure 19). It is west of the proposed DLNR offices project area and was not previously recorded. The enclosure is situated on level to slightly undulating pāhoehoe lava with sparse grass. The enclosure is 3.13 m in length (N/S) and 0.92 m wide, with a maximum height of 0.35 m (Figure 64). The modified outcrop is constructed of angular slabby basalt cobbles and small boulders stacked and piled two to three courses high along the western edge of a bedrock outcrop (Figure 65). The feature is not faced. There were no discernible soil deposits, artifacts, or cultural material observed on the ground surface at the site.

Site 30201 is interpreted as a modified outcrop that functioned as a windbreak or shelter based on its size, method of construction, and lack of artifacts at the site. The site is unaltered and is in good condition. Site 30201 is significant under criterion "d" and no further work is recommended.

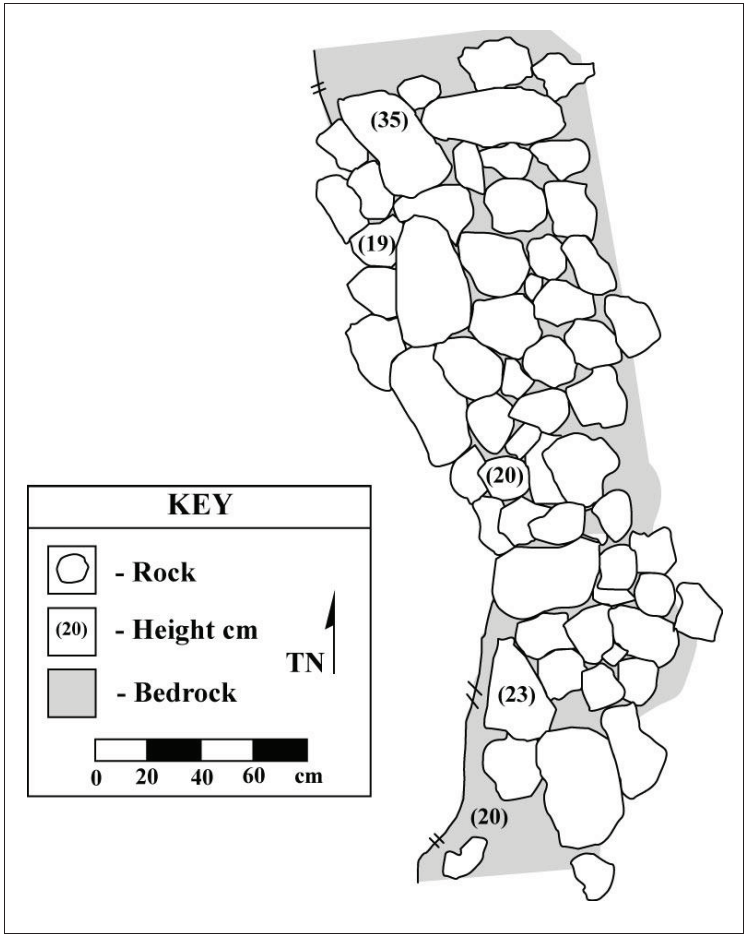

Figure 64: Site 20301 Plan View Map.

Figure 65: Photograph of Site 30201 Modified Outcrop Facing East (10 cm North arrow Scale).

SITE 30202	**Rock Concentration**
FUNCTION:	Resource Collection
AGE:	Undetermined
DIMENSIONS:	1.15 m (E/W) by 0.88 m by 0.18 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 30202 is a rock concentration located approximately 36.0 m northeast of Site 30199 (see Figure 19). It is within the proposed DLNR offices project area and was not previously recorded. The rock concentration is situated on level pāhoehoe surrounded by grass. The rock concentration is approximately 1.15 m in length (E/W) by 0.88 m wide, with a maximum height of 0.18 m (Figure 66). The rock concentration is constructed of angular and slabby pāhoehoe cobbles and small boulders one to two courses high (Figure 67). There were no cultural remains located on the ground surface at the site. The feature was likely constructed as a temporary shelter while traveling through the area. The site is unaltered and is in good condition. Site 30202 is significant under criterion "d" and no further work is recommended.

SITE 30203	**Rock Concentration**
FUNCTION:	Resource Collection
AGE:	Undetermined
DIMENSIONS:	3.00 m (E/W) by 3.00 m by 0.28 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 30203 is a rock concentration located approximately 7.0 m northeast of Site 30202 (see Figure 19). It is within the proposed DLNR offices project area and was not previously recorded. The rock concentration is situated on level pāhoehoe surrounded by grass, and is approximately 3.00 m in length (E/W) by 3.00 m wide, with a maximum height of 0.28 m (Figure 68). The rock concentration is constructed of angular and slabby pāhoehoe cobbles and small boulders one to two courses high on the ground surface (Figure 69).

Figure 67: Photograph of Site 30202 Rock Concentration Facing East (10 cm North Arrow Scale).

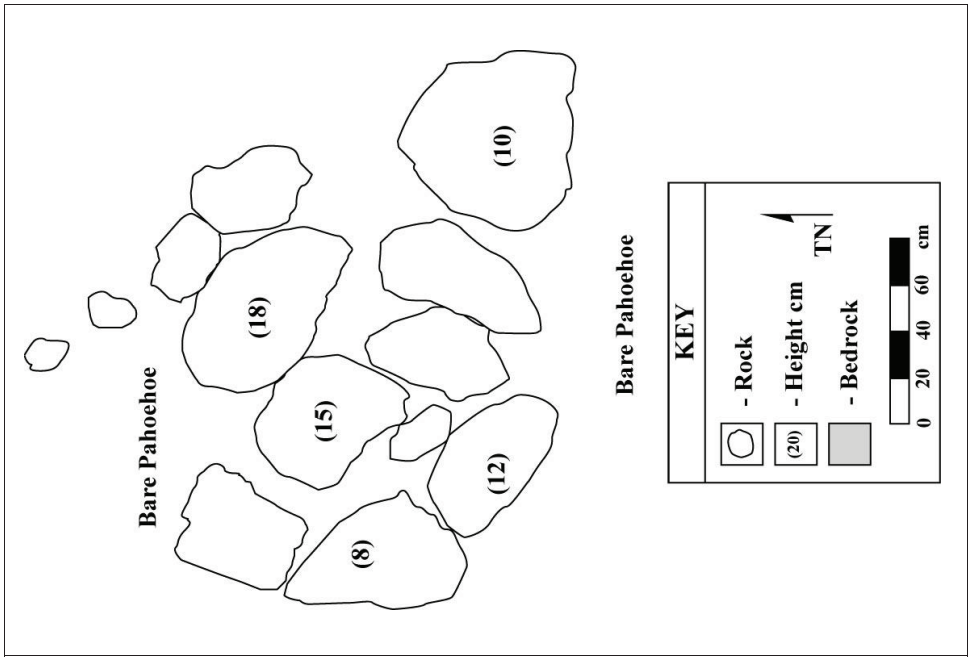

Figure 66: Site 30202 Plan View Map.

Figure 69: Photograph of Site 30203 Rock Concentration Facing North (10 cm North arrow Scale).

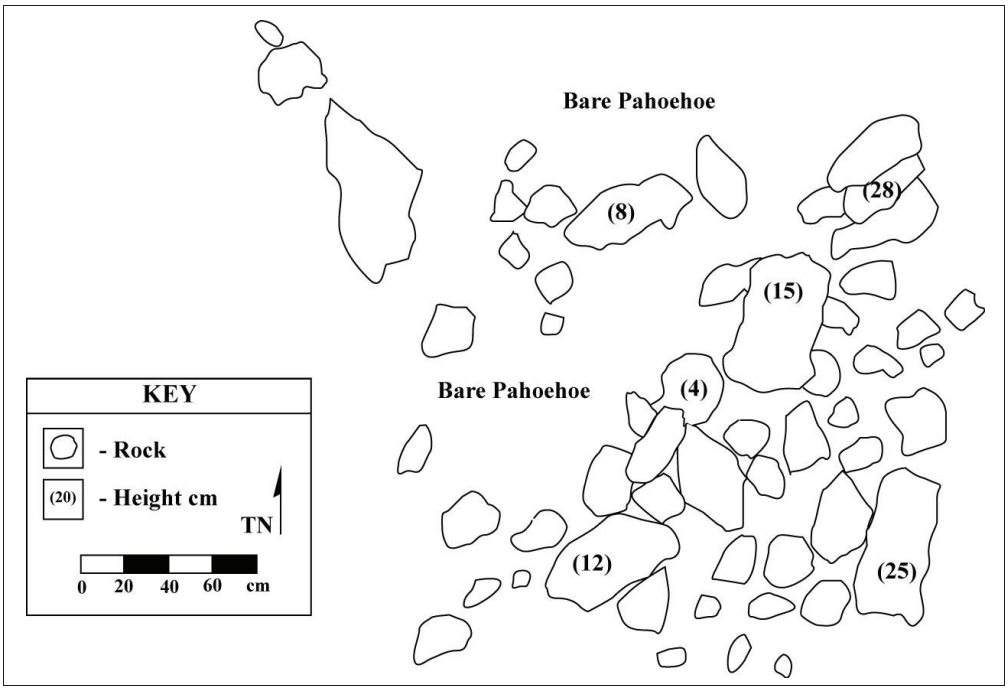

Figure 68: Site 30203 Plan View Map.

There were no cultural remains located on the ground surface at the site. The site is unaltered and is in good condition. Site 30203 is significant under criterion "d" and no further work is recommended.

SITE 30204 **Rock Concentration**
FUNCTION: Resource Collection
AGE: Undetermined
DIMENSIONS: 3.00 m (NW/SE) by 2.25 m by 0.08 m in max. height
CONDITION: Good, Unaltered
INTEGRITY: Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 30204 is a rock concentration located approximately 6.5 m northeast of Site 30203 (see Figure 19). It is within the proposed DLNR offices project area and was not previously recorded. The rock concentration is situated on level pāhoehoe surrounded by grass. The rock concentration is approximately 3.00 m in length (NW/SE) and 2.25 m wide, with a maximum height of 0.08 m (Figure 70). The rock concentration is constructed of angular and slabby pāhoehoe cobbles and small boulders one course high on the ground surface (Figure 71). There were no cultural remains located on the ground surface at the site. The site is unaltered and is in good condition. Site 30204 is significant under criterion "d" and no further work is recommended.

SITE 30205 **Rock Concentration**
FUNCTION: Resource Collection
AGE: Undetermined
DIMENSIONS: 3.00 m (E/W) by 2.50 m by 0.18 m in max. height
CONDITION: Good, Unaltered
INTEGRITY: Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 30205 is a rock concentration located approximately 44.5 m northeast of Site 30204 (see Figure 19). It is within the proposed DLNR offices project area and was not previously recorded. The rock concentration is situated on level

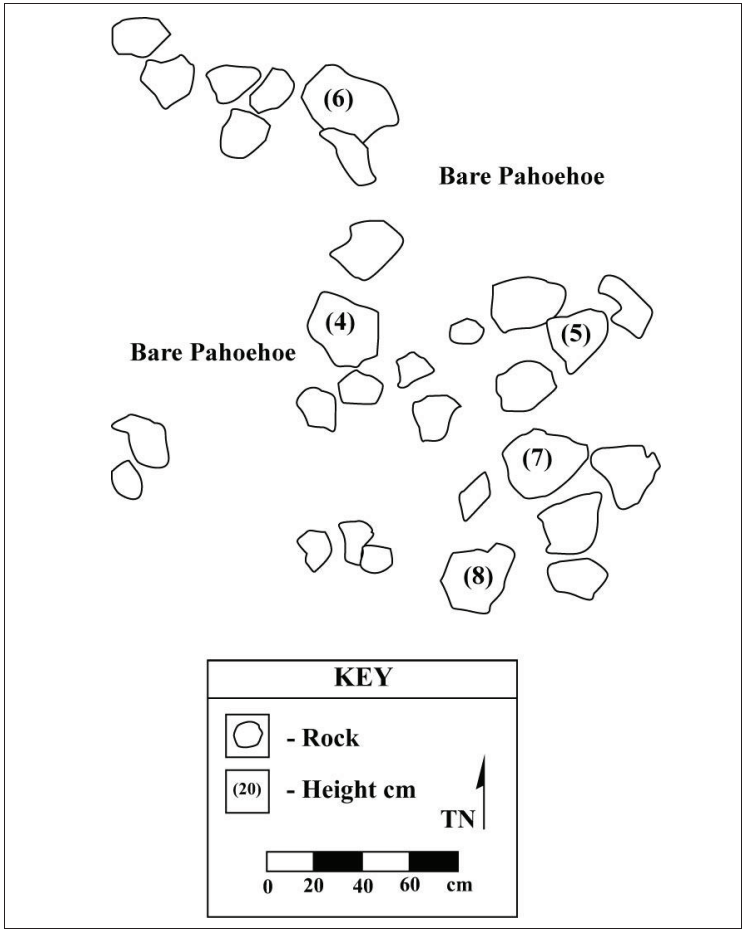

Figure 70: Site 20304 Plan View Map.

Figure 71: Photograph of site 30204 Rock Concentration Facing Northeast (10 cm North Arrow Scale).

pāhoehoe surrounded by grass. The rock concentration is approximately 3.00 m in length (E/W) and 2.50 m wide, with a maximum height of 0.18 m (Figure 72).

The rock concentration is constructed of angular and slabby pāhoehoe cobbles and small boulders one to two courses high on the ground surface (Figure 73). There were no cultural remains located on the ground surface at the site. The site is unaltered and is in good condition. Site 30205 is significant under criterion "d" and no further work is recommended.

SITE 30206	**Cairn**
FUNCTION:	Marker
AGE:	Pre-Contact Era to Early Post-Contact Era
DIMENSIONS:	0.5 m (N/S) by 0.48 m by 0.38 m in max. height
CONDITION:	Good, Unaltered
INTEGRITY:	Possesses integrity of location, design, setting, material, workmanship, feeling, and association
SURFACE ARTIFACTS:	None
EXCAVATION:	None

DESCRIPTION: Site 30206 is a rock mound marker located at the west end of trail Site 25549 (see Figure 19). It is within the proposed DLNR offices project area. Site 30206 was not previously recorded. The rock concentration is approximately 0.5 m in length (N/S) and 0.48 m wide, with a maximum height of 0.38 m (Figure 74). The rock mound is constructed of two slabby pāhoehoe cobbles stacked two courses high on the lava flow surface. A third pāhoehoe slab was identified lying on the ground surface 12.0 cm southeast of the feature, may have been removed from the mound.

The marker is along the western edge of an ‘a‘ā lava flow where it meets a pāhoehoe flow. The cairn marks the western end of trail site 25549 where it meets the level pāhoehoe flow. There were no cultural remains located on the ground surface at Site 30206. The site is unaltered and is in good condition. Site 30206 is significant under criterion "d" and no further work is recommended.

Figure 73: Photograph of site 30205 Rock Concentration Facing East (10 cm North Arrow Scale).

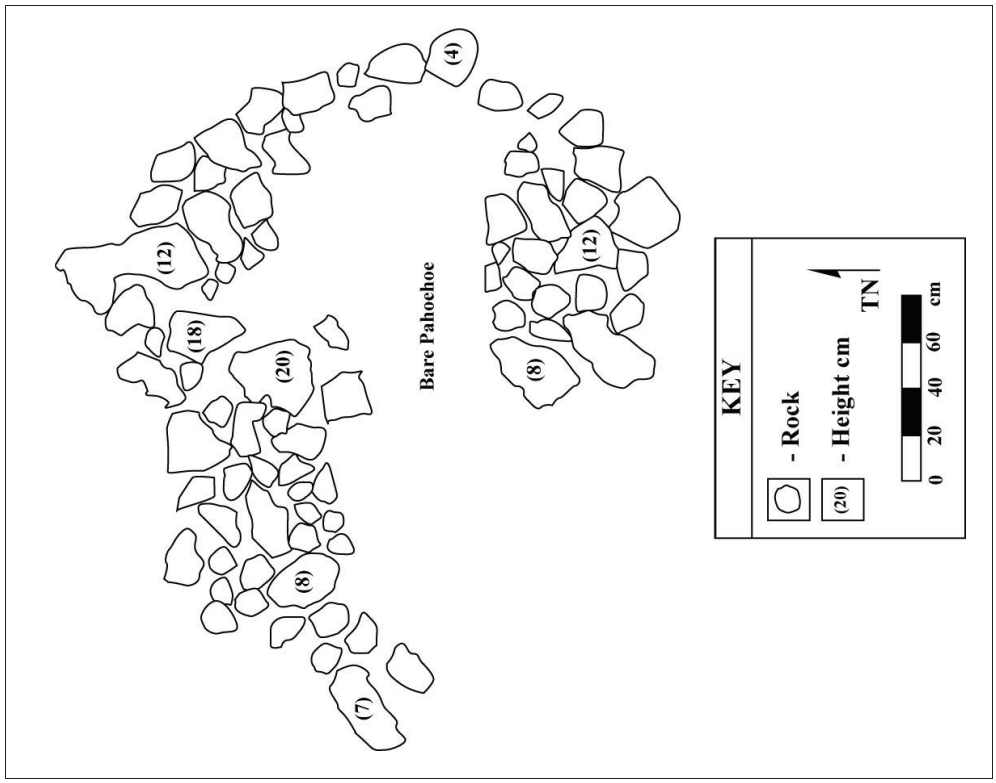

Figure 72: Site 30205 Plan view Map.

Figure 74: Photograph of site 30206 Cairn Facing East (10 cm North Arrow Scale).

CONCLUSION

Sixteen archaeological sites were documented in the project survey area (Table 5 and Figure 70). Eight of the sites were previously recorded and eight new sites were documented in the AIS. All but on site (Site 25552) contained a single feature. Site 25552 appears to have been a homeless camp consisting of a rock alignment and a rock shelter overhang constructed on a rough ‘a‘ā lava flow. The site may have been constructed as an Historic era temporary rest area, associated with travel along the nearby trail, and later modified as a modern camp. The remaining sites consisted of rock concentrations (n=5), enclosures (n=4), cairns (n=3), a trail segment, a short wall segment, and a modified outcrop. There were no other archaeological sites or historic properties identified within the project area.

Table 5: Inventory of Archaeological Sites Identified in the Survey Area.

Site #*	Type	Function	Age
23007	Oval Enclosure	Temporary Habitation	Pre-Contact Era
25549	Trail	Travel	Pre-Contact to Early Post-Contact Era
25550	Cairn	Marker	Undetermined
25551	Rock Concentration	Resource Extraction	Undetermined
25552	Rock Alignment	Shelter	Historic Era to Modern
25553	Cairn	Marks Shelter	Modern
25554	Rectangular Enclosure	Temporary Habitation	Pre-Contact to Early Post-Contact Era
25555	Enclosure	Agriculture or Ranching	Post-Contact Era
30199	C-Shapd Enclosure	Temporary Habitation	Pre-Contact Era
30200	Wall Segment	Shelter	Pre-Contact to Early Post-Contact Era
30201	Modified Outcrop	Shelter	Pre-Contact Era
30202	Rock Concentration	Resource Extraction	Undetermined
30203	Rock Concentration	Resource Extraction	Undetermined
30204	Rock Concentration	Resource Extraction	Undetermined
30205	Rock Concentration	Resource Extraction	Undetermined
30206	Cairn	Marker	Pre-Contact to Early Post-Contact Era

*SIHP No. Prefix 50-10-27-.

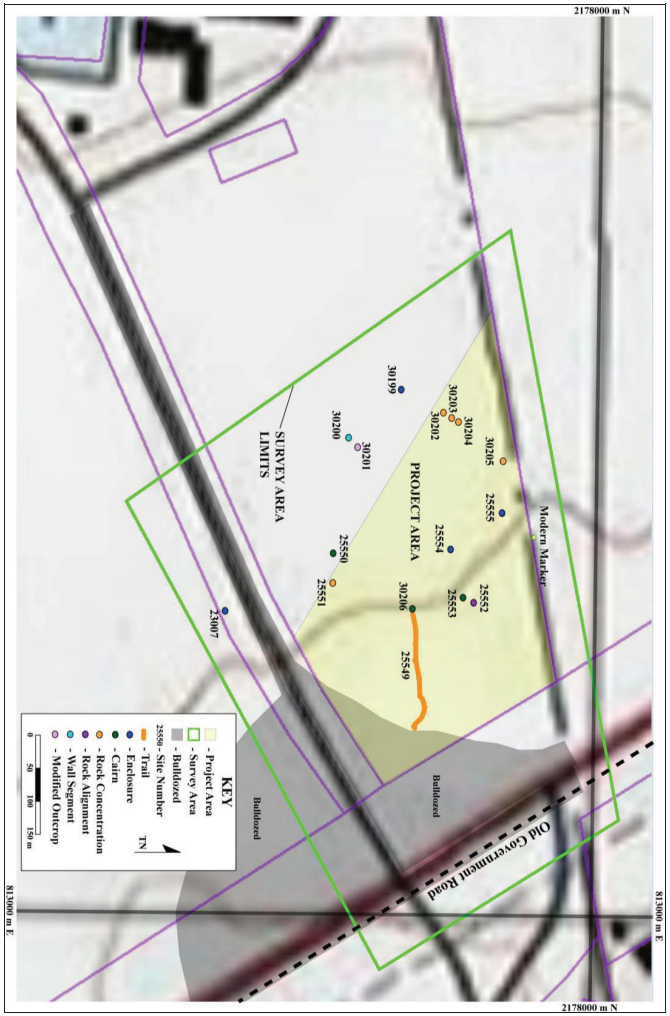

Figure 75: 7.5-Minute Series USGS Topographic Map Showing Location of Project Survey Area Archaeological Sites (Keahole Point Quad, ESRI 2011. Sources: National Geographic, USGS, Hawai'i County Planning Department).

All of the sites, except Site 25552, appear to have been the results of late pre-Contact Era to Early post-Contact Era resource extraction, travel, and shelter while traveling and resting in the area.

The majority of sites in this portion of the Middle Zone are pāhoehoe excavations and rock concentrations (Figure 76). Rock concentration features are characterized as slabby and angular pāhoehoe large cobbles and small boulders placed on the bare pāhoehoe. The rocks are usually one course high, though less often, they are placed one on top of another two courses high. Some of the rocks were placed laying upside down on the pāhoehoe, though this might be random. The features do not appear to have been placed in any particular configuration though they sometimes appear in the shape of an oval. They infrequently appear in the shape of an oval or c-shape enclosure. However, they do not serve the same purpose as an enclosure since there is no protection from the wind.

It is most likely that rock concentration features are the result of collecting the pāhoehoe rocks for transport and later use to construct features. That the features might be the result of modern collecting of rocks for rock wall building is a remote possibility. However, the rock concentrations are not located near modern dirt roads or existing paved roads as would be expected. Instead, they are concentrated near pāhoehoe excavations and areas of broken pāhoehoe (see Figure 76).

There are far more pāhoehoe excavations per acre in the area south of the current project area because the lava substrate is qualitatively different. The pāhoehoe flow in the current project area is not as broken up and friable as that in the area to the south. There are also slightly more rock concentrations in the Haun and Henry (2001) project area than in the current project area.

The cairns and rock mounds documented during both studies appear to be located primarily near other sites in loose or tight clusters. The four enclosures documented during both studies appear to be primarily associated with pre-contact era temporary habitation.

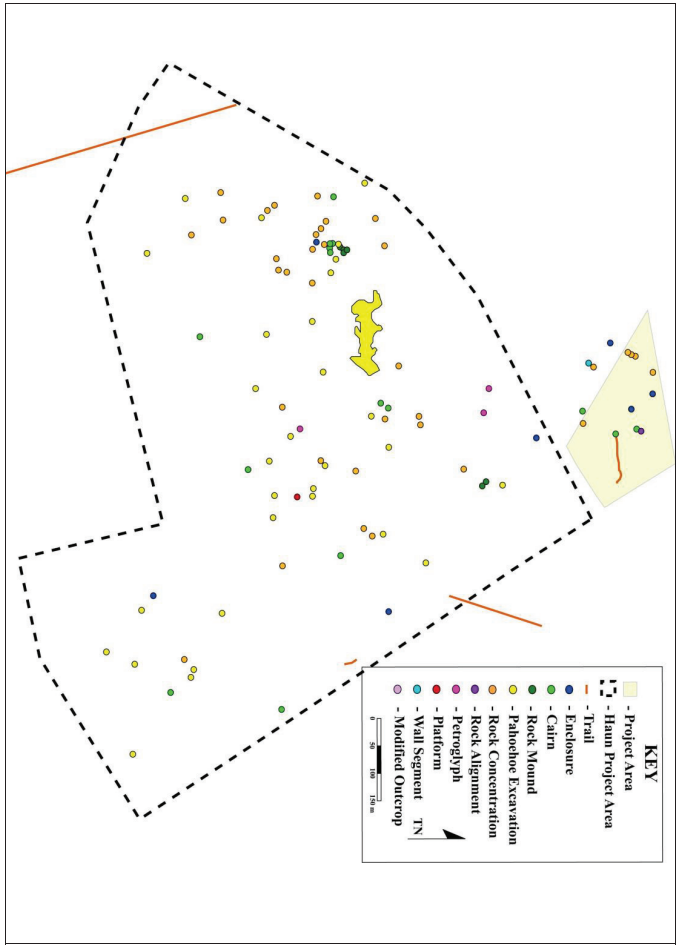

Figure 76: Map Showing Distribution of Site Types documented in Haun and Henry 2001 and the Current Project Area.

Site 23007 is a large oval enclosure, Site 30199 is a smaller oval enclosure, Site 25554 is roughly square, and Site 25555 was constructed by building a wall across an opening of a 1.0 meter high lava flow. The interior of Site 25555 is bounded by the one meter high lava flow surrounding it on three sides and is irregular in shape. Artifacts were not evident at any of the enclosures, except Site 30199, which contained a small quantity of marine shell midden.

The Site 23007, 25554, and 30199 enclosures were not very substantially constructed and do not appear to have been used over a long period of time or even on multiple occasions. The walls at all three sites are low, 35.0 centimeters or less in height and are constructed of loosely piled rock. There was no formal stacking or facing evident in the feature construction. The Site 23007 enclosure interior is 9.55 square meters, the Site 25554 enclosure interior is 6.0 square meters, and the interior of Site 30199 is 4.5 square meters. The interior ground surface of the Site 30199 enclosure did contain a small amount of marine shell midden, suggesting limited repeated use.

The enclosure wall at Site 25555 was much more substantially constructed. The wall was constructed of tightly fitted and well faced large cobbles and small boulders. The wall was bi-faced, core-filled, and sloped inward toward the top of the wall. Larger rocks were placed with their longest sides facing parallel to the length of the wall. Some larger footing stones were visible at the base of the wall.

All of the enclosures documented during the study appear to have been limited use features. They were likely used as temporary rest areas while traveling between the coast and the uplands, or while collecting resources in the area.

The lower Middle Zone site distribution is similar to the central portion of the Middle Zone documented in the Haun and Henry (2001) study and the current AIS. There is a large number of resource extraction sites (Figure 77), and a smaller number of cairns and trails (see Figure 15). Most of the permanent habitation and temporary habitation sites are located in the Coastal Zone (see Figure 13 and Figure 14).

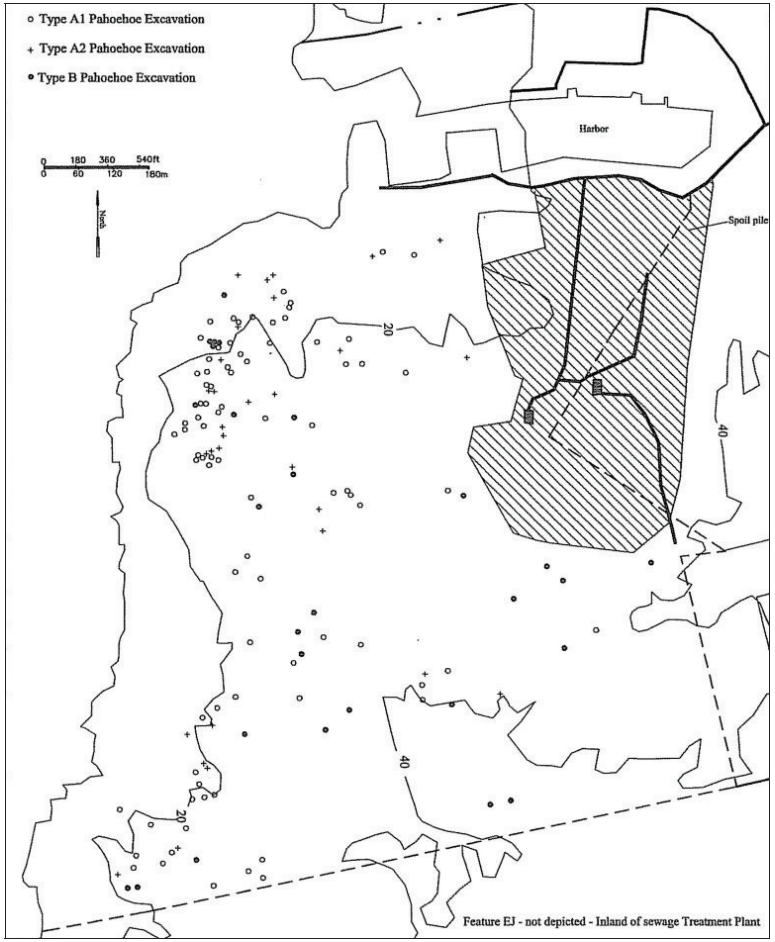

Figure 77: Map Showing Distribution of Pāhoehoe Excavation Features in the Lower Middle Zone (Haun and Henry 2006:222) (Project area Outside of Figure Margins).

SIGNIFICANCE ASSESSMENT & RECOMMENDATIONS

Archaeological sites identified during this project were assessed for significance as outlined in Hawai‘i Administrative Rules §13-275-6. To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criteria [§13-275-6(b)]:

(a) It must be associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property [§13-275-6(b)(1)].

(b) It must be associated with the lives of persons significant in the past property [§13-275-6(b)(2)].

(c) It must embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction property [§13-275-6(b)(3)].

(d) It must have yielded or may be likely to yield, information important in prehistory or history property [§13-275-6(b)(4)].

(e) Have an important value to native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events, oral accounts--these associations being important to the group's history and cultural identity property [§13-275-6(b)(5)].

All sixteen archaeological sites documented in this report are significant under criterion "d" as they have yielded, or are likely to yield, information important to history (Table 6). Information recorded at all of the archaeological sites during the current study and documentation contained in this report is sufficient to warrant no further data collection.

Table 6: Site Significance Assessments and Recommended Treatments.

Site #	Type	Function	Significance Criteria	Recommended Treatment
23007	Oval Enclosure	Temporary Habitation	d	No Further Work
25549	Trail	Travel	a, c, d, e	Preservation
25550	Cairn	Marker	d	No Further Work
25551	Rock Concentration	Resource Extraction	d	No Further Work
25552	Rock Alignment	Shelter	d	No Further Work
25553	Cairn	Marks Shelter	d	No Further Work
25554	Rectangular Enclosure	Temporary Habitation	c, d	Preservation
25555	Enclosure	Agriculture or Ranching	c, d	Preservation
30199	C-Shapd Enclosure	Temporary Habitation	d	No Further Work
30200	Wall Segment	Shelter	d	No Further Work
30201	Modified Outcrop	Shelter	d	No Further Work
30202	Rock Concentration	Resource Extraction	d	No Further Work
30203	Rock Concentration	Resource Extraction	d	No Further Work
30204	Rock Concentration	Resource Extraction	d	No Further Work
30205	Rock Concentration	Resource Extraction	d	No Further Work
30206	Cairn	Marker	d	No Further Work

Trail Site 25549 is significant under criteria a, c, d, e as trails sites can be considered traditional cultural properties (a), the trail embodies distinctive characteristics of pre-Contact era trails (c), the trail contains information important to prehistory (d), and trails have an important value to native Hawaiian people (e). Trail site 25549 is recommended for preservation. The trail will be preserved in accordance with a SHPD-approved preservation plan.

Enclosure Site 25554 and enclosure Site 25555 are significant under criteria c and d as the sites embody distinctive characteristics of pre-Contact era and post-Contact era building styles. Site 25554 and site 25555 are recommended for preservation. The sites will be preserved in accordance with a SHPD-approved preservation plan.

No further work is recommended at the remaining 13 archaeological sites. Data collected during the AIS study and documented in this report has adequately determined the function and age of the sites. Location information for the sites has been recorded with GPS and is clearly presented in the map figures included in the AIS report.

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APPENDIX A: HAUN AND HENRY 2006 SITE PLAN FIGURES

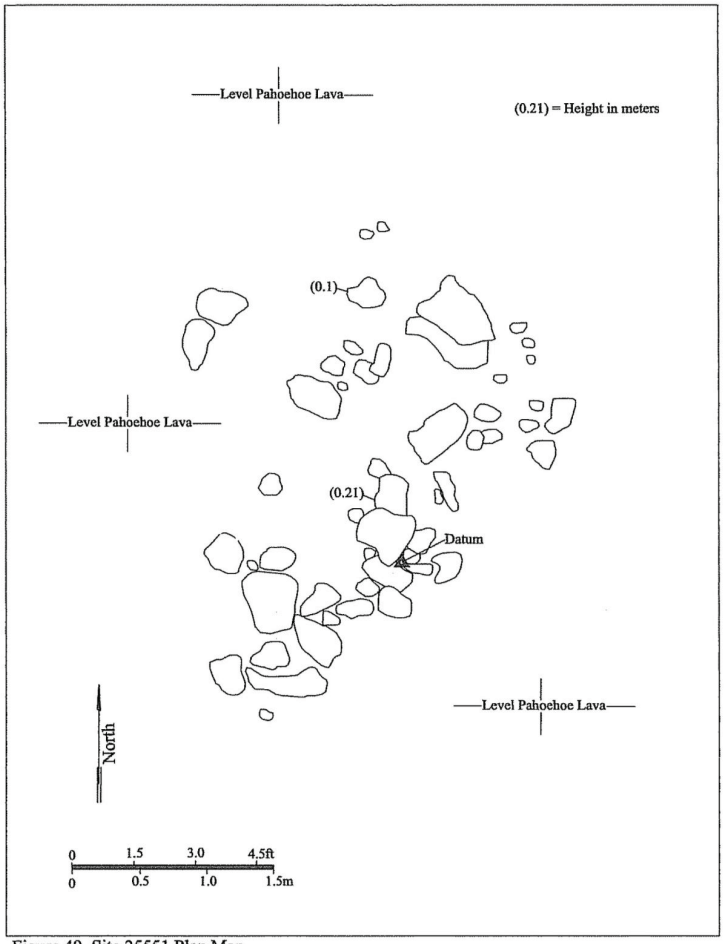
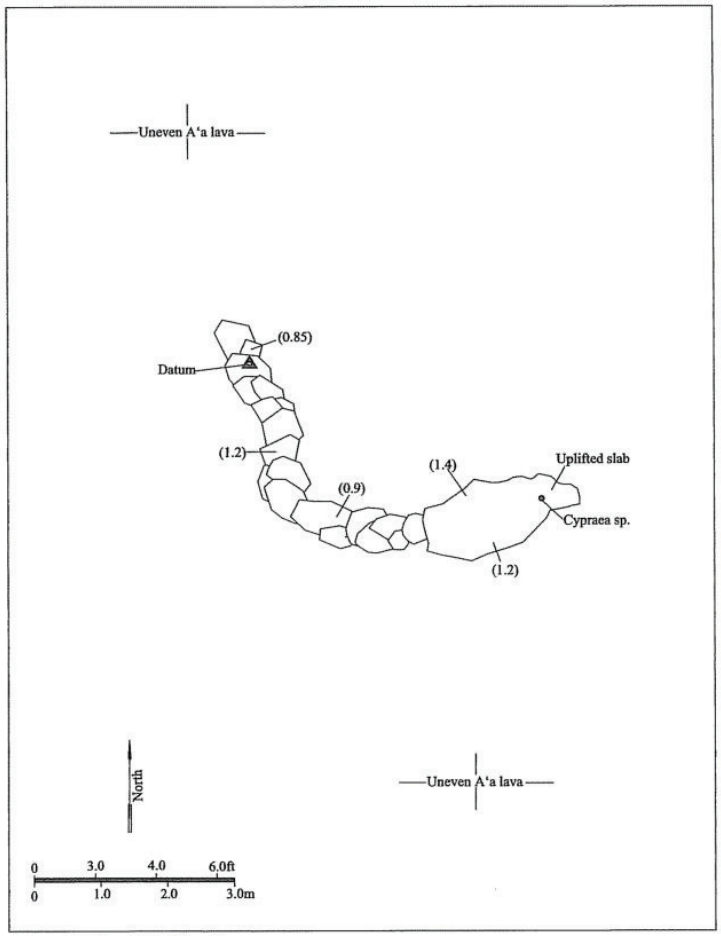


Figure 49. Site 25551 Plan Map



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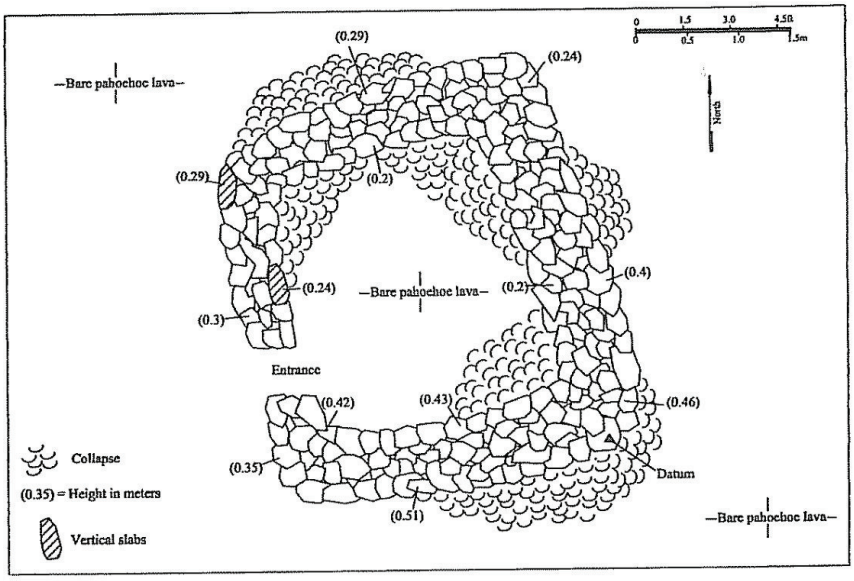

Figure 52. Site 25554 Plan Map

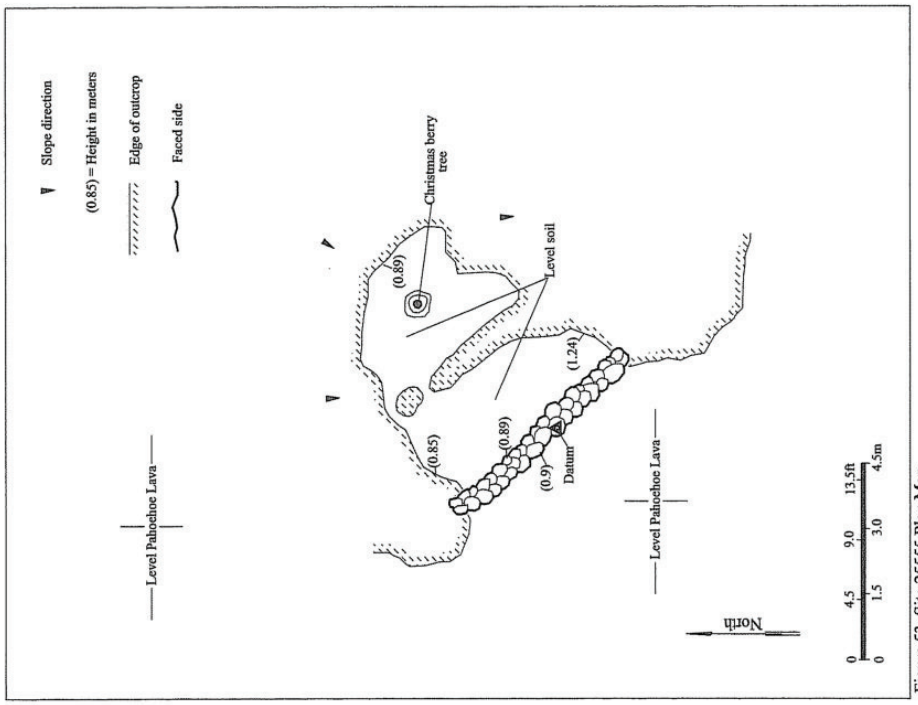

Figure 53. Site 25555 Plan Map

APPENDIX D

Cultural Impact Assessment by Scientific Consultant Services, Inc.

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SCS Project Number 1468-CIA-1

A CULTURAL IMPACT ASSESSMENT FOR LANDS OF KEALAKEHE AHUPUA‘A, NORTH KONA DISTRICT, HAWAI‘I ISLAND, HAWAI‘I [TMK: (3) 7-4-008:003 (POR.)]

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November 2014
DRAFT

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INTRODUCTION

At the request of Limtiaco Consulting Group, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment for the proposed Department of Land and Natural Resources (DLNR) offices project in Kealakehe Ahupuaʻa, North Kona District, Island of Hawaiʻi (Figures 1 through 4). The DLNR project area is a 7.5-acre portion of TMK: (3) 7-4-008:003 situated northwest of Queen Kaʻahumanu Highway and Kealakehe Parkway intersection. It is surrounded by undeveloped land.

The Constitution of the State of Hawaiʻi clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupuaʻa* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the people's traditional right to subsistence. In 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupuaʻa* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways, codified now under the Hawaiʻi Revised Statutes (HRS) 7-1. In 1992, the State of Hawaiʻi Supreme Court reaffirmed HRS 7-1 and expanded it by stating "native Hawaiian rights…may extend beyond the *ahupuaʻa* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaiʻi (2000) with House Bill 2895, relating to Environmental Impact Statements, stated that:

> …there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights… [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed developments subject to the HRS Chapter 343 environmental review process on the "cultural practices of the community and State" (2001).

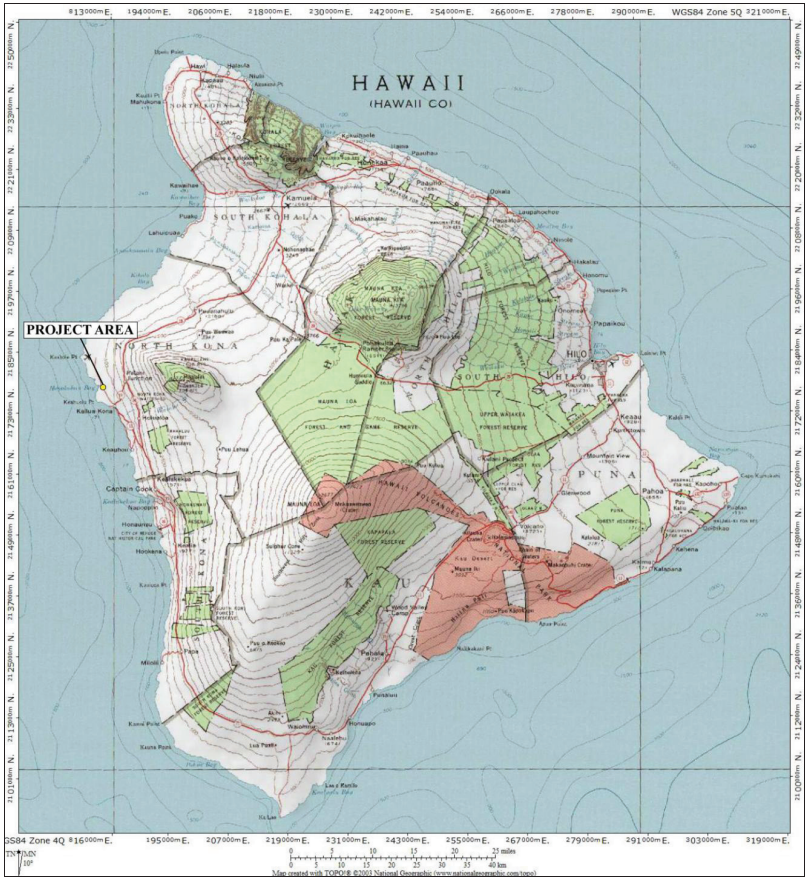

Figure 1: 5,500 K-Series Map of Hawaiʻi Showing Location of Hāmākua District and Project Area (National Geographic Topo!, 2003. Sources: National Geographic Society, USGS).

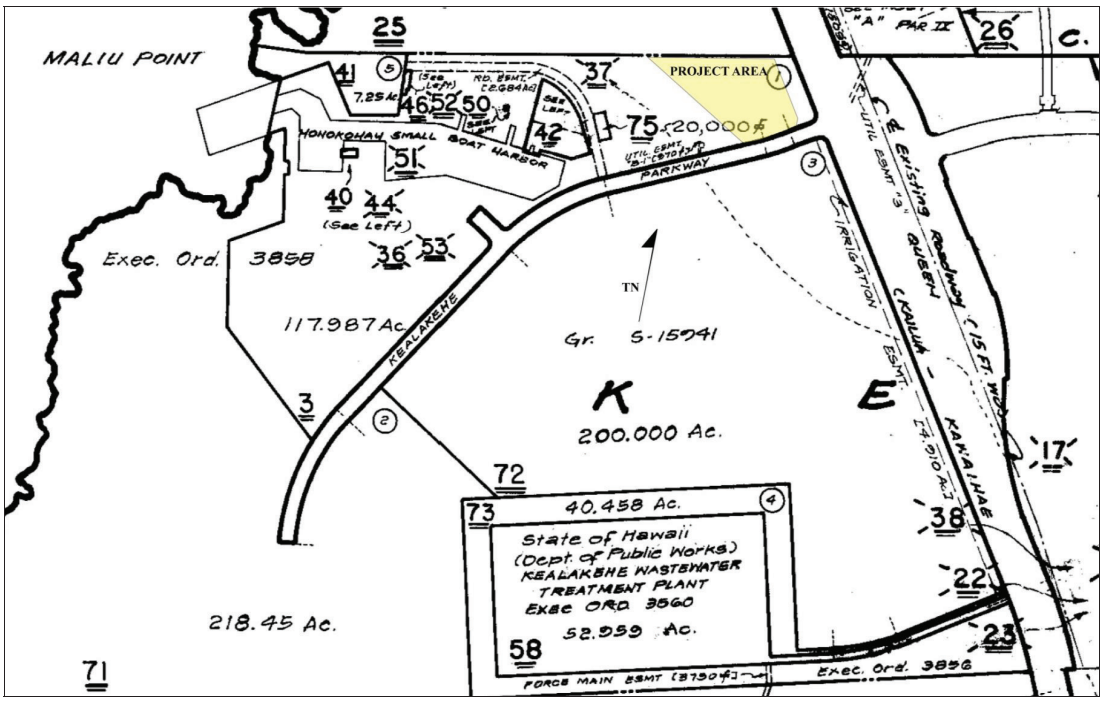

Figure 3: Portion of TMK (3) 7-4-008 Map Showing Project Area and Survey Area (Hawai'i County Planning Department, 2014).

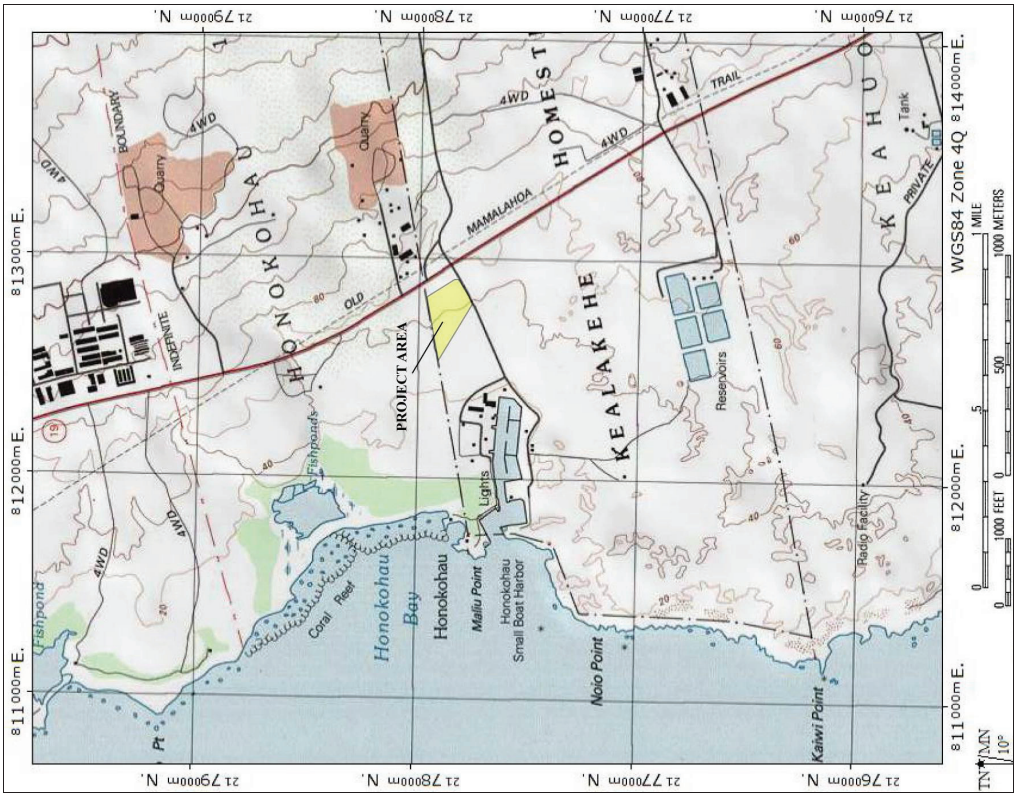

Figure 2: 7.5-Minute Series USGS Topographic Map Showing Project Area and Survey Area (Keāhole Point Quad, National Geographic Topo!, 2003. Source: National Geographic Society).

Figure 4: Aerial Photograph Showing Project Area and Survey Area Location (Google Earth, 2013 Image. Kealakehe, HI, 4Q 812690m E 2177890 m N).

The purpose of HRS 343 has broadened, "to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of 'significant effect' to be re-defined as "the sum of effects on the quality of the environment including actions that are…contrary to the State's environmental policies…or adversely affect the economic welfare, social welfare, or cultural practices of the community and State" (H.B. 2895, Act 50, 2000). The *ahupua'a* or district is recognized as a culturally appropriate geographic unit of study, depending on the scale of the project.

The process distinguishes 'anthropological' cultural practices from 'social' cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

> According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997): The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity (H.B. 2895, Act 50, 2000). The vicinity can be defined as "the broad geographical area, e.g. district or *ahupua'a*" (QEQC 1997).

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC state: …information may be obtained through scoping, community meetings, ethnographic interviews and oral histories… (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). According to these Guidelines, the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

(1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints of limitations with might have affected the quality of the information obtained;

(2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;

(3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;

(4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;

(5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;

(6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.

(7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;

(8) an explanation of confidential information that has been withheld from public disclosure in the assessment;

(9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;

(10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;

(11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research involved study of both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports. Such scholars as I‘i, Kamakau, Chinen, Kame‘eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku‘i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai‘i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona ‘Āina 2014 Data Base. Historical and cultural source materials were extensively used and can be found listed in the *References Cited* portion of the report.

INTERVIEW METHODOLOGY

Interviews were conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with the project area or who know of historical properties within the project area were sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with

the project area were invited to share their relevant information. Organizations including the Hawai‘i Island Burial Council (HIBC), the State Historic Preservation Division (SHPD) Burial Sites Specialist, the Kona Hawaiian Civic Club, and the Office of Hawaiian Affairs were asked for their recommendations of suitable informants. These groups were invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

The “level of effort undertaken” to identify a proposed project's potential effect to cultural resources, traditional cultural places, or traditional cultural beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be, in itself, a “good faith effort”. However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the current project, letters of inquiry briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. In the case of the proposed DLNR offices project, consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Shane Palacat Nelson, Coordinator of the Hawai‘i Branch of the Office of Hawaiian Affairs; Kauanoe Ho‘omanawanui, SHPD Hawai‘i Island Burial sites Specialist; Rick Gmirkin, Ala Kahakai National Historic Trail, NPS Archaeologist; James "Kimo" Lee, Jr., HIBC former Chairman; Fred Cachola, HIBC Kohala Representative; Edwin Miranda, HIBC new Chairman; and Kealakehe and Hawai‘i Island *‘ohana* members Josephine Palacat Barney, Raymond Lui, Agnes Lui, Nicole Lui, and Isaac Harp.

Public notices were published in the Office of Hawaiian Affairs Ka Wai Ola Newspaper, the Honolulu Star-Advertiser and the West Hawai‘i Today (see Appendix A).

Personal interviews with knowledgeable individuals were written out in summary form and were returned to each of the participants for their review and comments. Key topics discussed with the interviewees included personal association to the *ahupua‘a*; land use in the project’s vicinity; knowledge of traditional trails, gathering areas, fishing practices, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; and evidence of previous activities identified while in the project vicinity.

ENVIRONMENTAL SETTING

The proposed DLNR Kealakehe offices project area is situated on level land between 45 and 55 feet (14-17 m) above mean sea level (amsl) 0.75 km east of the coastline. The western portion of the project area is on a Hualalai pāhoehoe flow dated between 5,000 and 10,000 years before present (ybp) (Wolfe and Morris 1996). The eastern portion is on a Hualalai ‘ā‘a flow dated between 3,000 and 5,000 ybp. The ground surface is bare lava with a few small pockets of very thin soil. Annual rainfall in the project area is 20 to 30 inches. Vegetation in the project area is fountain grass (*Cenchrus setaceus*), *koa haole* (*Leucaena diversifolia*) bushes, and *maiapilo* (*Capparis sandwichiana*) (Starr Environmental, 2013).

CULTURAL AND HISTORIC BACKGROUND

EARLY SETTLEMENT AND EXPANSION

Archaeologists have long thought Hawai‘i Island was first settled around A.D. 700 by people sailing from the Marquesas (Cordy 2000:104-109). Recently, there has been debate surrounding the archaeological dating of the initial settlement of Hawai‘i. An article published in the Journal of Archaeological Science reviewing radiocarbon dates recovered at archaeological sites on the Island of Hawai‘i suggests that, by relying on only carbon samples from short-lived plant remains, the most reliable dates point to initial Polynesian colonization of Hawai‘i Island occurring between AD 1220 and 1261 (Rieth et al. 2011:2747).

Early settlers established settlements on the windward shores in likely places such as Waipiʻo, Waimanu, and Hilo Bay. The windward, or *koʻolau* shores receive abundant rainfall and have numerous streams such as the Wailuku, Waiolama, ʻAlenaio, and Wailoa that facilitated agricultural and fishpond production (Maly 1996:3). The windward shores also provide rich benthic and pelagic marine resources.

The dry leeward shores of Hawaiʻi Island presented a very different environment requiring a modified set of subsistence strategies. Archaeologists and historians are uncertain about the motives that lead to the establishment and spread of settlements on the leeward side of Hawaiʻi, but conventional archaeological evidence suggests the process was underway between the A.D. 900s and 1100s (Cordy 2000). Coastal sites in Kailua-Kona, South Kohala District, *makai* of Waikōloa, at Kalāhuipuaʻa and ʻAnaehoʻomalu and inland sites in the *ahupuaʻa* of Waimea have been dated to the A.D. 800s to 900s (Kirch 1979: 198, Cordy 2000: 130).

The early coastal settlements are located on, or adjacent to, the dry rocky shoreline and consist of temporary habitation caves containing midden, fishing tools, and fish remains; and possibly surface permanent habitation sites (Barrera 1971, Jenson 1989a, 1989b, 1990a, and 1990b). The earlier phases of occupation were likely temporary habitations used when fishing, and later permanent habitations associated with fishpond production. Cordy suggests people who lived inland occasionally frequented the Kīholo, Kalāhuipuaʻa, ʻAnaehoʻomalu, Kaloko, and Honokōhau areas for their anchialine ponds and marine resources (Cordy 2000:131) (Figure 5). There were walled fishponds at Kaloko and Honokōhau as early as the early 1600s (Kamakau 1961:56).

The implication is that, along the barren leeward coast, inland settlements and agriculture may have developed first, perhaps spreading from nearby Waimanu and Waipiʻo. Maly suggests that people living permanently along the dry shoreline shared extended family relations with people inland, allowing for an exchange system that distributed marine resources to inland agriculturalists and brought inland agricultural products to people at the coastal settlements (Maly and Maly 2002).

Figure 5: Portion of Hawaiʻi Territory Survey Map Showing Coastal Place Names From Puakō Bay to Kailua Bay (Donn 1901).

The fertile plain of Waimea and the area of Kailua-Kona receive roughly 40 to 80 inches of rainfall annually while Waimea is watered by streams from the Kohala Mountains (the Waikōloa, Wai‘aka, and Keanu‘i‘omanō streams). Inhabitants of these areas planted taro, banana, breadfruit, sugarcane, gourds, and sweet potato for subsistence. Sweet potato was the dominant crop at elevations that received from 30 to 60 inches (Cordy 2000: 135). Leeward expansion away from the coastline, at least on a permanent basis, is believed to have occurred only with the development or improvement of dry-land cultivation methods, possibly spurred by the introduction of sweet potato.

Current evidence suggests that significant inland leeward settlement did not occur until 600 to 900 years after initial settlement, *i.e.*, between AD 1100 and 1400 (Green 1980; Hommon 1976; Cordy 2000). At lower elevations in North Kona and South Kohala Districts, especially along the coast, rainfall is less than thirty inches and soils are shallow or nonexistent. It is possible that mulching with rocks or cut plant materials allowed for a limited amount of root crop and arboreal agriculture in pockets of sandy soil.

In Kailua-Kona, Waimea, and Kohala, new settlements and agricultural field systems continued to spread and intensify during the A.D. 1200s to 1400s. Permanent communities were developing at Kailua-Kona, Lapakahi, and along the coastal region from ‘Upolu Point to Kawaihae (Cordy 2000: 140). Residences and an agricultural field system were also established in the mid-elevations of Kailua-Kona and the uplands of the Waimea area (Moffat and Fitzpatrick 1995, Maly and Maly 2002: 4).

As communities grew and agriculture intensified during this period, polities began to form, along with competition between polities. Large polities influencing communities within modern district-size boundaries emerged in the 1300s (Cordy 2000: 142). Cordy notes that just north of the project area “two different settlement and political zones seem to have developed prior to the 1200s and to have lasted until late in prehistory—one focused on Waimea and Kawaihae in the south, and the other in north Kohala up to ‘Upolu Point” (Cordy 2000:385, footnote 15). Kailua-Kona also developed as an important political center south of the current project area during this period.

By the late 1700s extensive permanent field systems were well established in the Kailua-Kona, North Kohala, Waimea, and Lālāmilo regions (Clark 1981, Clark and Kirch 1983, Cordy 2000). Lands of the current project area contained little to no soil and were

not suited to the development of large-scale field systems. The project area lands remained the location for small fishing villages near fishponds maintained along the coast.

The villages that lay between the major polities to the north and to the south were connected by a trail system that allowed for travel over the barren pāhoehoe and ‘ā‘a lava flows in the region (Figure 6). Alternatively, north-south travel could be made along the shoreline by canoe. The coastal trails connected the political centers of Kailua-Kona with those of South Kohala and North Kohala. Other trails ran *mauka-makai*, allowing easy travel between the coastal villages and the upland agricultural settlements.

EARLY ACCOUNTS OF PREHISTORIC EVENTS IN NORTH KONA

There is a paucity of prehistoric information pertaining to the lands of the project area and surrounding lands. Cordy notes that the “oral traditions are silent” for the years of early settlement of and expansion along the leeward shores of Hawai‘i (Cordy 2000: 130). The little information that does exist concerns the activities of *ali‘i* and was collected and published by Fornander, I‘i, and Kamakau.

There are no historical accounts of Kealakehe Ahupua‘a. Kealakehe translates literally as "the bend of a road" (Andrews and Parker 1922).

William Ellis recorded two trips he made between Kawaihae and Kailua in 1823. He traveled by boat during the first trip and only remarked on the coast to say it was “a rugged and barren shore of lava” (Ellis 2004:83). During his second trip, Ellis traveled by canoe from Kawaihae to Kailua. He left the former at six in the morning, stopped at Kapalaoa around 9:00am, and arrived in Kīholo around 4:00pm. He described Kīholo as “a straggling village, inhabited principally by fishermen” (Ellis 2004:418). He also described the large fishpond created by order of Kamehameha I at that village. He left Kīholo just before sunset and arrived at Ka‘ūpūlehu between 7:00 and 8:00pm. Ellis recorded little about the village except that everyone was asleep. When the moon had risen, by 11:00pm, he continued his journey by moonlight, arriving in Kailua an hour before sunrise. In all Ellis makes little description of the coastal area of North Kona District, perhaps because he was traveling at night.

Isabella Bird, who traveled from Kailua to Kawaihae some fifty years later described the coastal region by writing, “We sailed for some hours along a lava coast,

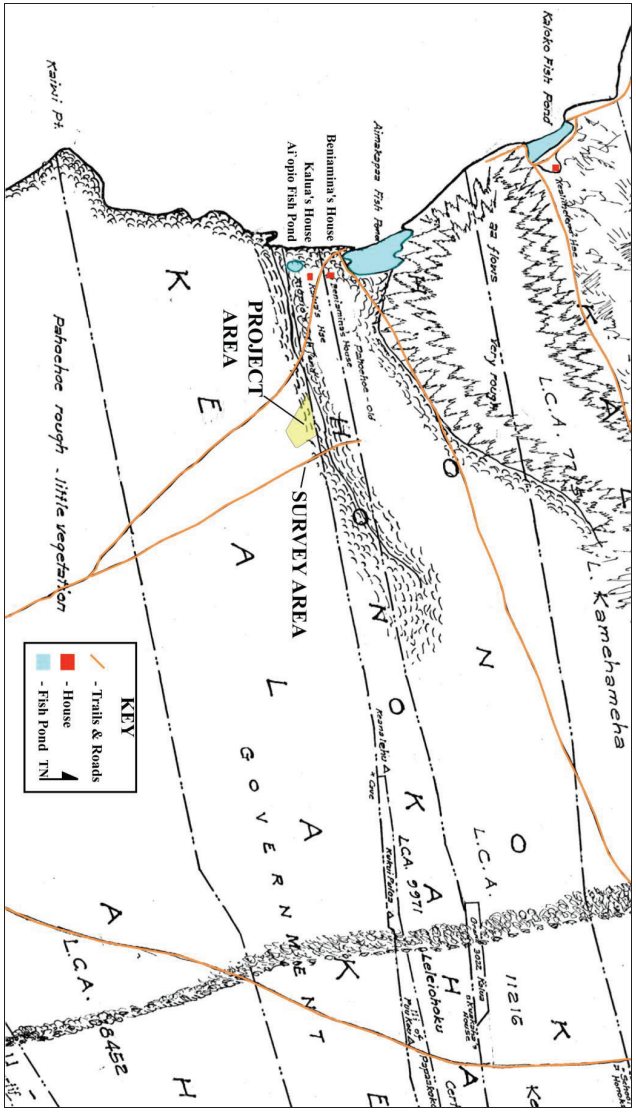

Figure 6: Portion of Kailua Title Map Showing Trails, Fishponds, and Homes Near the Project Area (Adapted From Emerson 1880s).

streamless, rainless, verdureless, blazing under the fierce light of a tropical sun and some time after noon anchored in the scorching bay of Kawaihae" (Bird 2007:144).

THE MĀHELE

With the Māhele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). The majority of Kealakehe Ahupuaʻa and all of Keahuolū Ahupuaʻa were awarded to Ane Keohokalole, the mother of King Kalākaua and Queen Liliuʻokalani (LCA 8452). The crown lands of Kealakehe (LCA 8452, ʻĀpana 12) later became government lands. Eleven smaller LCAs were also awarded within Kealakehe Ahupuaʻa (Table 1 and Figure 7).

All of the smaller LCAs awarded in Kealakehe were in the uplands at elevations between 900 to 1,900 feet amsl. The awards ranged in size from 2.0 to 5.78 acres and contained between one and two *ʻāpana* each. Several of the awards had house lots and gardens used to cultivate bananas, taro, and sweet potato. The Boundary Commission data also recorded that LCA 10671contained a house lot enclosed by a wall and the boundaries of LCA 7483 were marked by *kuaiwi* walls.

Table 1: Land Commission Awards in Kealakehe Ahupuaʻa.

LCA #	Awarded To	Number of ʻĀpana	Acreage	Royal Patent #
7483	Kulua	1	2.60	4040
7897	Kahuanui	2	4.90	4002
8608	Kaahui	2	3.90	5228
8252	Kauhai	2	5.78	4005
10070	Mioi	2	4.40	4003
10306	Nuole	1	5.25	4406
10322	Nuhi	1	4.75	8054
10597	Puou	2	4.12	6235
10671	Pepe	2	4.95	4007
10692	Paai	1	2.80	4004
10950	Waiwaiole	1	2.00	5123

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1900)

The introduction of fee simple land ownership and commercial ventures in cattle ranching, sandalwood collection, supplying whaling vessels, and the cultivation of coffee, sugarcane, and other food crops greatly changed land-use patterns, settlement patterns, and cultural practices. The introduction of commercial economic practices further

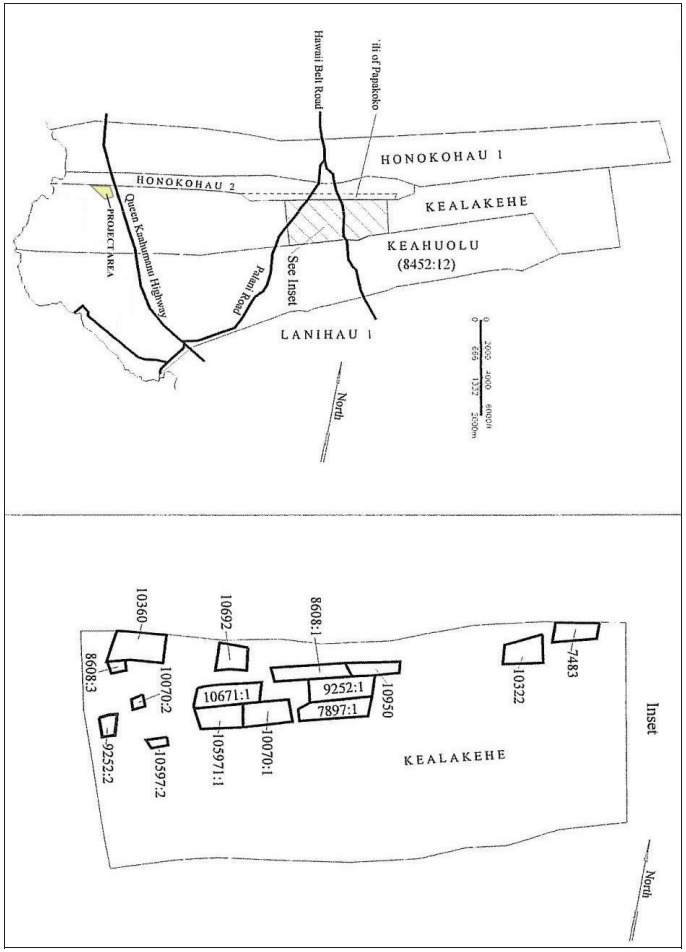

Figure 7: Map of Kealakehe Ahupua'a Showing Location of Land Commission Award (Adapted From Haun and Henry 2006: 6).

spurred on these rapid changes. Cattle ranching in particular either restricted or limited the use of entire ahupua'a from the traditional land tenure and horticultural regimes.

Ranching has its roots in the first cattle and sheep brought to the island in 1793 and 1794 by Vancouver. Two cows, three bulls, five ewes, and five rams were released to prosper in the region of Kealakekua in 1794 (Vancouver 1967:(3)11). Kamehameha placed a ten-year *kapu* on the killing of cattle so that they would have time to multiply. A 486-acre stone corral was built in the uplands of Lehu'ula-Honua'ino, above Kāināliu where they were raised (Bowser 1880, cited in Maly and Maly 2001:285).

Two American captains, William Shaler and Richard Cleveland presented two horses to John Young in 1803. Cleveland later returned with more than 200 horses brought from California. Donkeys, mules and oxen were also imported for transportation and hauling. Goats were also brought to the island and left to multiply in the wild.

By 1813 to 1815 cows began overrunning agricultural fields and became a danger to travelers and residents alike (Ellis 1963: 291, Wilkes 1970: 204). A number of walls were commissioned to keep feral sheep, goats, and cattle out of agricultural areas and away from homes. A wall, called *Kauliokamoa* for the King's k*onohiki*, was constructed between 1813 and 1819 (Barrère 1983) to keep cattle in Waikōloa and off of agricultural land to the east (Lālāmilo and Waimea). The wall was located from roughly the northern border of Waikōloa to near Pu'u Huluhulu and separated the less fertile annual grasslands from the perennial grasslands (Boundary Commission Book for Hawai'i Vol. A, 6,10). By 1848, in Kona District a Great Wall (the Kuakini Wall) was constructed from Lanihau to Onouli (Maly and Maly 2001:286).

John Parker was granted permission to hunt wild bullock for the crown in 1822. Wild cattle were captured in bullock pits seven to eight feet long by four feet wide covered with braches and a thin layer of dirt (Wilkes 1970: 204). They were also hunted with guns and were lassoed in later years, after the arrival of *vaqueros*, "Spaniards [Central and South Americans] with horses from California" (Wilkes 1970: 203).

In 1830 Governor Kuakini moved to oversee and improve government cattle by constructing corrals. Liholiho visited the same year to witness strides made in the nascent cattle ranching industry. It was hoped that the exportation of tallow, hides, and salted beef would supplant the defunct Sandalwood trade as a major source of income.

Several ventures related to ranching, including tallow making, tanning, saddle making, and blacksmithing were begun (Bergin 2004: 156). Cowhide was tanned using the astringent bark of local trees (Wilkes 1970: 218). The lion's share of commercial enterprises on the island involved supplying whaling ships and the local market with beef.

By 1840 bullock hunting had drastically reduced the numbers of wild cattle, driving them to higher and higher elevations of Mauna Loa and Mauna Kea (Wellmon 1969). A five-year *kapu* was placed on cattle hunting and lead to further efforts to tame, brand, and fence in herds on privately owned land (Wilkes 1970: 200). The decline of whaling and the *kapu* placed on killing cattle created economic hardship.

Grazing, the opening of new pastureland, and fires was denuding the forested plains of the island, and pushing the tree line to higher and higher elevations (Doyle 1953: 47-48). The impacts were the direct result of grazing sheep and cattle on the Island of Hawai'i in the 80-year period after Vancouver landed the first of their kind. The Hawaiian Government moved to require the branding of cattle and the construction of ranch walls to contain livestock began a trend toward the consolidation of large ranches.

Ranches in the Kona area are generally located between 1, 500 to 4,500 amsl (Maly and Maly 2001: 288), with lower elevations containing house lots and routes to landings at the coast. One such ranch was the Greenwell Ranch established Henry Nicholas Greenwell in 1850. The Greenwells began by planting oranges and coffee, and added sheep in the 1870s and cattle in the 1880s. By 1885, Greenwell owned seven ahupua'a including Honokōhau.

Maly described the major ranch interests near the current project area in some detail. His account is reproduced below:

> The Greenwell Ranch is located in the Districts of North and South Kona, Island of Hawaii. Among those early interested in the cattle business in Kona, were the Reverend John Paris. William H. Johnson. A. A. Todd and later Dr. Trousseau. The Johnson and Trousseau herds were of Shorthorn strain, the Todd herd was Devon. H. N. Greenwell became interested in the cattle industry about the year 1875 and shortly after purchased the Trousseau herd and bought cattle from Todd and others. With these as a

> nucleus Greenwell embarked in the dairy business and imported pure bred Jersey bulls from time to time until his death in 1891. These activities were in the main carried on under partnership agreements with others and were profitable. Little was done in the sale of beef, as production far exceeded demand, but business in the sale of hides and tallow was good. In 1889, Greenwell added a Holstein bull (dairy strain) to his herd; this was probably the first Holstein brought to Kona; the purchase was made of Judge McCully, who conducted a dairy near Honolulu. Shortly after Greenwell's death the entire ranch came under the management of his oldest son, William H. No Jersey stock was added to the herd after 1891; two years later Hereford and Shorthorn bulls were added to the herd and later a Devon. In 1898 came annexation, the price of beef rose; the price of butter declined. In 1910 butter making on the ranch was stopped and the raising of beef cattle was taken up in earnest. The types selected were Shorthorns and Herefords, purchases of purebred bulls being made at frequent intervals, largely from the Parker ranch and abroad. All cattle are range fed (Maly and Maly 2001:290).

Along with large ranches, large parcels of land in the area were given over to plantation enterprises. Plantations for the growing of coffee and oranges were located above ranch lands, generally above 4,500 amsl. Sugar cane plantations occupied similar elevations but often were situated at lower elevations as well. These large plantations and cattle ranches were responsible for the changing pattern of land holdings and subsistence farming in the area.

In 1886, King Kalākaua leased the Crown Lands of Kealakehe to the Interior Department for a period of 20 years. The Interior Department was to make the land available to subjects under the Homestead Act of 1884. The homestead lots were to be 20 acres in area and title to the land would be made available if the new occupants built improvements to the land and paid a fee within five years of taking possession of the lot.

The Kealakehe lots included a block of lots (First Series) in the upland area near LCA parcels and a block of lots (Second Series) in the lower coastal region (Figure 8). The First Series lots were homestead lots subject to title while the Second Series lots were larger and were available to lease. Many of the homestead lots were purchased and

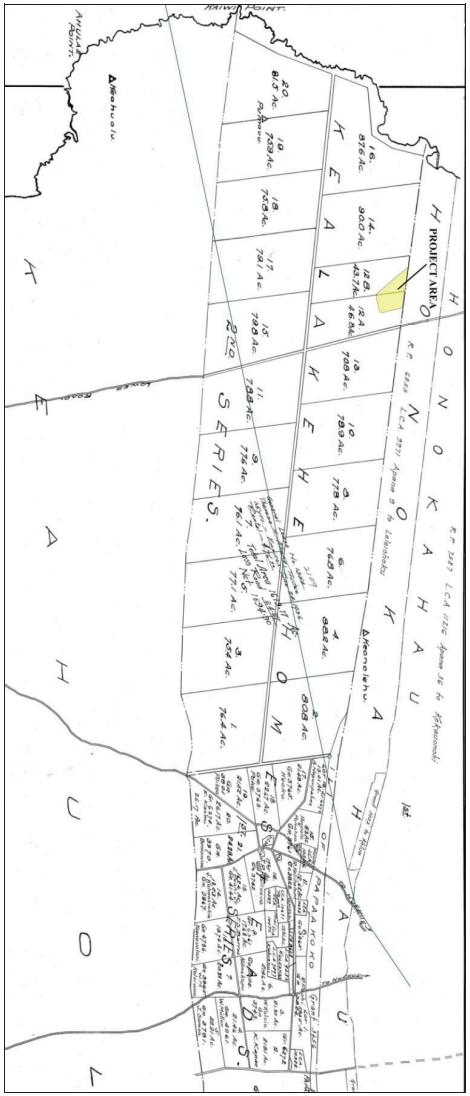

Figure 8: Portion of a 1914 Kealakehe Homesteads Map Showing Location of Project Area (Wall 1914).

have Land Grant numbers. Offers were made to purchase land within the Second Series block but were not accepted. Portions of the Second Series lots were leased.

MODERN HISTORY OF KEALAKEHE REGION (1900 TO PRESENT)

Despite changing land ownership practices, land-use patterns, and newly developing commercial enterprises, coastal fishing practices and fishpond management practices continued to endure into the 1900s. Families that lived at their upland homesteads in North Kona still traveled to the coast to collect coastal resources. Women often traveled from their upland homes to the coast to give birth (Kuulei Keakealani, personal correspondence).

The majority of the coastal lands of Kealakehe remain undeveloped. Honokōhau Harbor was constructed along the coast of Kealakehe in the late 1960s and was completed in 1970. The harbor facilities include offices, a small shop, a restaurant, a fueling station, and a boat yard. The Kealakehe Wastewater Treatment Plant was also constructed in coastal Kealakehe. There are several bulldozed roads that cross the barren pāhoehoe coastal flats of Kealakehe but most of the general area is unaltered.

A number of people who lived at the Honokōhau-Kealakehe coast as late as the 1960s and who were interviewed for this CIA remembered that cattle still grazed the dry lowlands of both *ahupua'a*, almost down to the coast. The cattle belonged to Huehue Ranch and the Greenwell ranch. The main access route to the cast at that time was a four wheel drive road that ran mauka-makai through Honokōhau Ahupua'a.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Roughly thirty-six archaeological studies have been conducted in Kealakehe Ahupua'a (Figure 9). The early studies, conducted by Reinecke (1930), Emory and Soehren (1971), Sinoto (1975), Soehren (1980, 1981), and Bonk (1987) were pedestrian surveys concentrating on locating major archaeological features in the shoreline and near coastal regions of Kealakehe and nearby *ahupua'a*. These studies and the later studies in Kealakehe Ahupua'a are concentrated in two environmental zones: the Coastal Zone (0-15 feet amsl) and the Middle Zone (15-900 feet amsl). Archaeological features recorded during these early studies included heiau, habitation features, burial features, and trails.

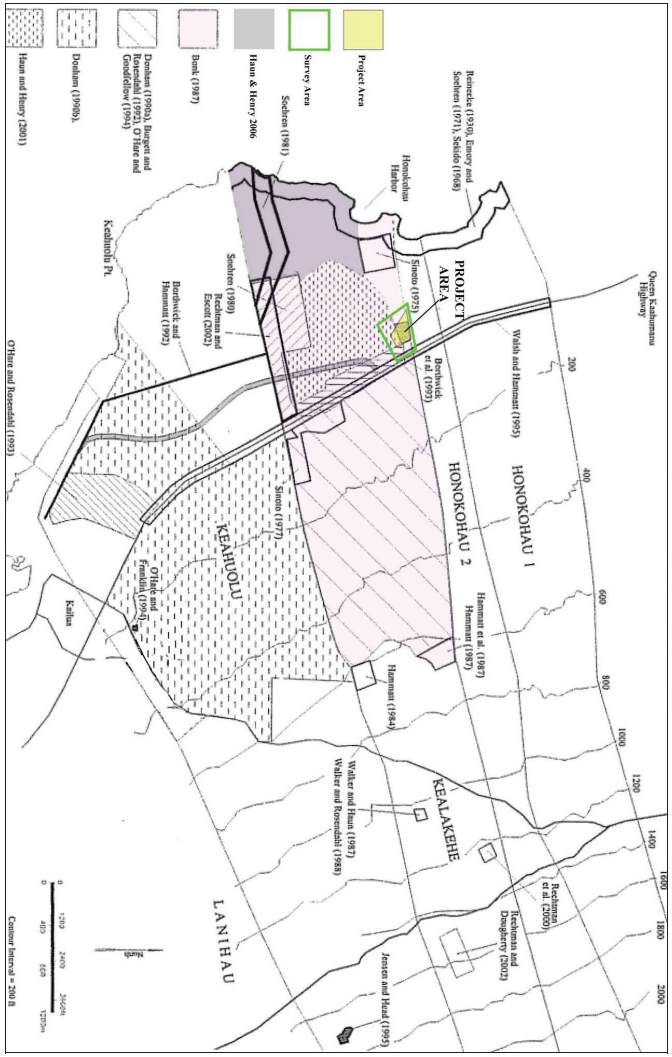

Figure 9: Map Showing Location of Previous Archaeological Studies (Adapted from Haun and Henry 2006:17).

Later studies conducted by Donham (1990b) and Haun and Henry (2001, 2005) in the same area recorded over 600 archaeological sites containing more than 3,700 features. More than 200 traditional Hawaiian habitation features, roughly 3,000 agricultural features, 56 burials, 56 trail segments, and 13 ceremonial features were documented during the course of these later archaeological studies. In addition, a smaller number of Historic era features, mostly ranch walls, were recorded during the later studies.

Radiocarbon dates from collected at sites returned date ranges indicating initial use of the Kealakehe sites in the thirteenth to fourteenth centuries, growth during the fifteenth and sixteenth centuries, and maximal use of the area in the seventeenth and eighteenth centuries.

The overall picture presented by archaeological data is clustered habitation, agricultural, ceremonial, and burial sites connected by a shoreline trail system located in the Coastal Zone (Figure 10, Figure 11, and Figure 12). Subsistence in this area is centered on ocean resources and fishpond aquaculture. Additionally, there are trails lead into the Middle Zone and further *mauka* passing through an area with a less dense concentration of temporary habitation features and pāhoehoe excavations.

Haun and Henry (2001) conducted an archaeological inventory survey in the Middle Zone just south of the current project area (see Figure 9). The AIS study identified 56 sites with 121 features including 41 single feature sites and 15 complexes (Haun and Henry 2001:16) (Figure 13). Recorded features included 55 pāhoehoe excavations, 31 stone alignments, 16 cairns, 8 rock mounds, 5 petroglyphs, 2 enclosures, a cave overhang, a platform, and a trail. Feature functions included quarry sites (n=55), agriculture (n=16), rock art (n=5), temporary habitation (n=4), ceremonial (n=1), transportation (n=1), and undetermined function (n=37).

The rock alignments recorded in Haun and Henry 2001 are not features typically recorded as rock alignments. Typically, rock alignments are linear where as the features they recorded are collections of rock, sometimes in no specific configuration, and in other instances, oval in shape or in the shape of a typical c-shape or u-shape enclosure. These features were not constructed like enclosures and are only a single course high with two courses in a few places. The features look more like the result of collecting rocks from nearby areas and placing them on a bare pāhoehoe area. It is likely these features are the

result of collecting slabby pāhoehoe for later use. It might be preferable to call these feature rock concentrations for clarity.

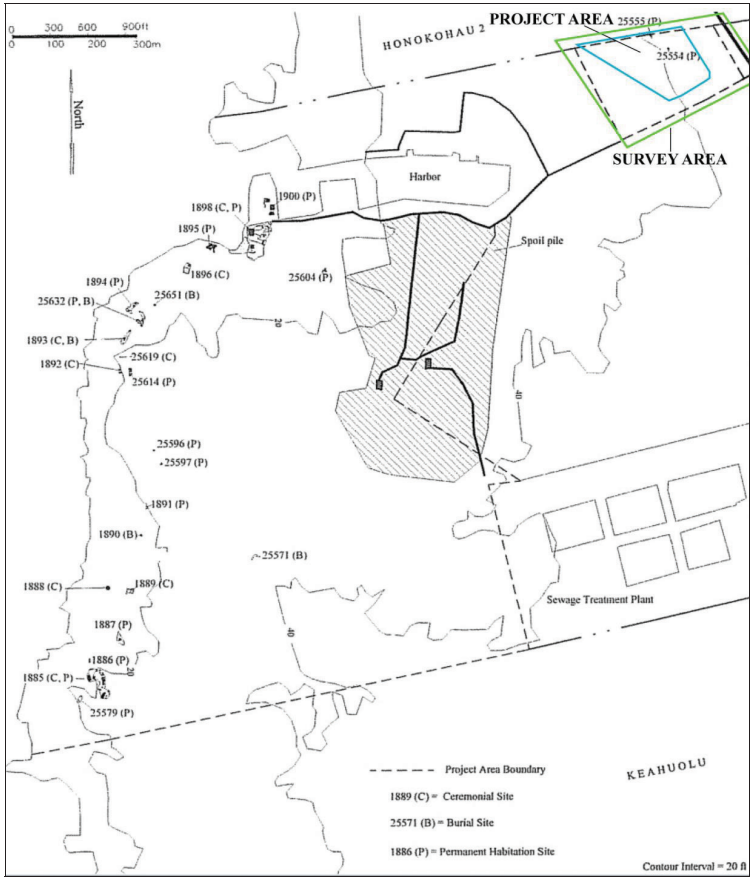

Figure 10: Permanent Habitation, Ceremonial, and Burial Sites Recorded in the Coastal Zone (Haun & Henry 2006:26).

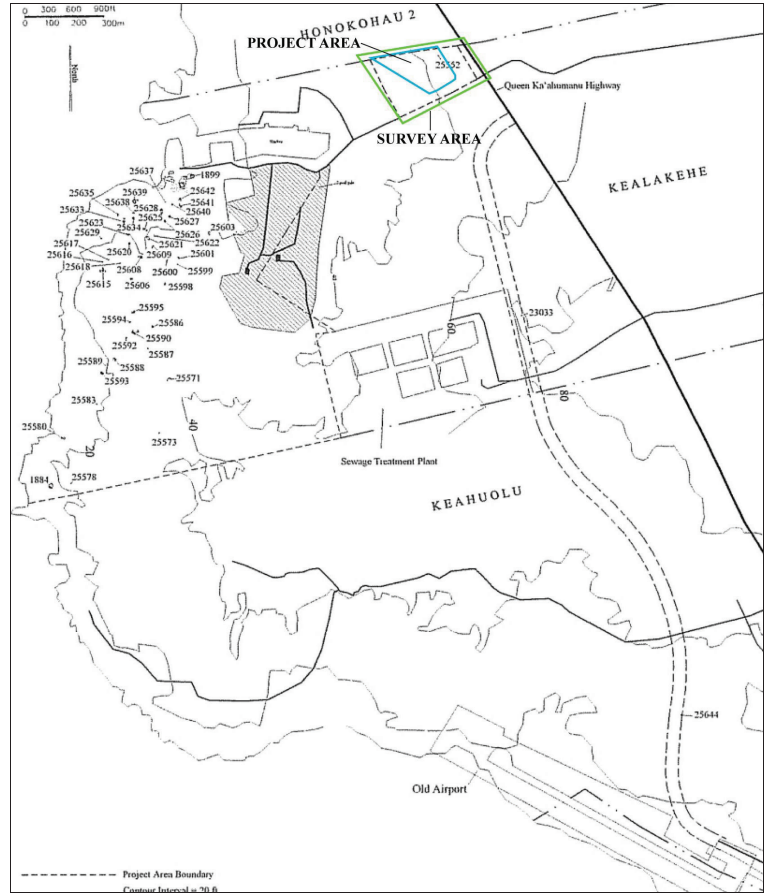

Figure 11: Temporary Habitation Sites Recorded in the Coastal Zone (Haun & Henry 2006:28).

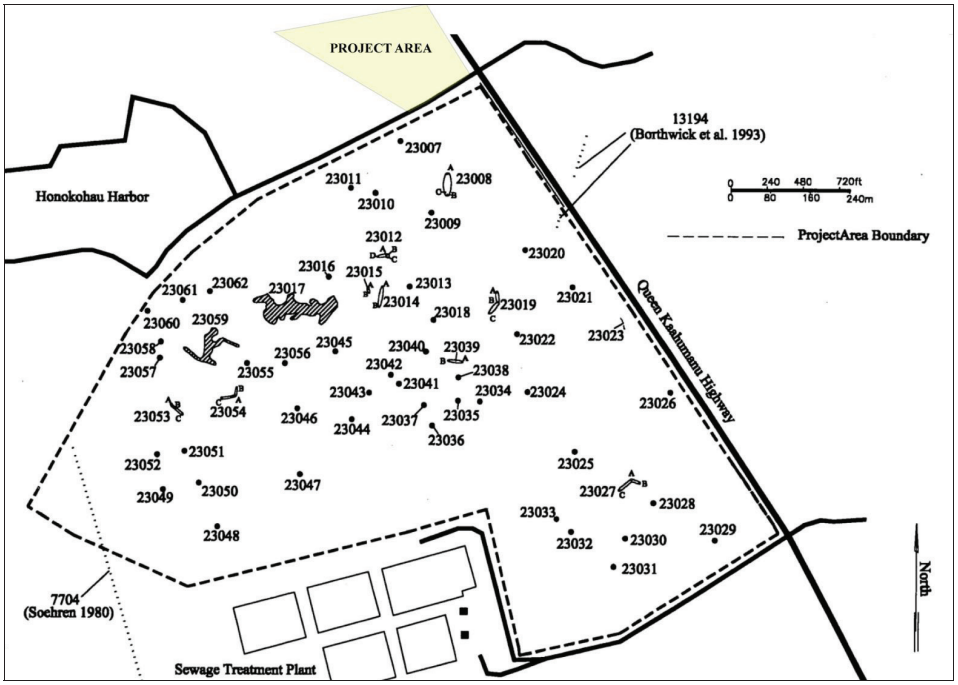

Figure 13: Plan View Map of Archaeological Sites Recorded in Haun and Henry (2000:17).

Figure 12: Trail, Cairn, and Rock Alignment Sites Recorded in the Coastal Zone (Haun & Henry 2006:35).

The majority of archaeological features at the center of the Middle Zone are associated with resource extraction and collection, as well as with travel through the area (Figure 14). The largest percentage of features are pāhoehoe excavations and rock concentrations.

This area, inland from the Coastal Zone, appears to have been used primarily as a resource extraction area where raw materials were collected. The remaining features in this zone are rock mounds, cairns, enclosures associated with temporary habitation, as well as trail segments, petroglyphs and a ceremonial platform. There are far fewer habitation and burial sites than are located in the Coastal Zone.

Many of the significant Coastal Zone archaeological sites are listed on the Hawai‘i Register of Historic Places and National Register of Historic Places (Figure 15). Significant Sites include the Kaloko-Honokōhau Historic District, Hale ‘O Kane Heiau, as well as other heiau, burials, and habitation sites. The western half of the current project area is within the southeast corner of the Kaloko-Honokōhau Historic District. There are no sites listed on either historic register within the proposed DLNR Kealakehe offices project area.

PROJECT AREA ARCHAEOLOGICAL INVENTORY SURVEY RESULTS

Sixteen archaeological features were documented in the project survey area (Figure 16 and Table 2) during an archaeological inventory survey study conducted by SCS (Escott 2014). Eight of the sites were previously recorded and eight new sites were documented in the AIS. All but on site (Site 25552) contained a single feature. Site 25552 appears to have been a homeless camp consisting of a rock alignment and a rock shelter overhang constructed on a rough ‘ā‘a lava flow. The remaining sites consisted of rock concentrations (n=5), enclosures (n=4), cairns (n=3), a short wall segment, and a modified outcrop. No other archaeological sites or historic properties exist on the project area.

All of the sites, except Site 25552, appear to have been the results of late pre-Contact Era to Early post-Contact Era resource extraction, travel, and shelter while traveling and resting in the area.

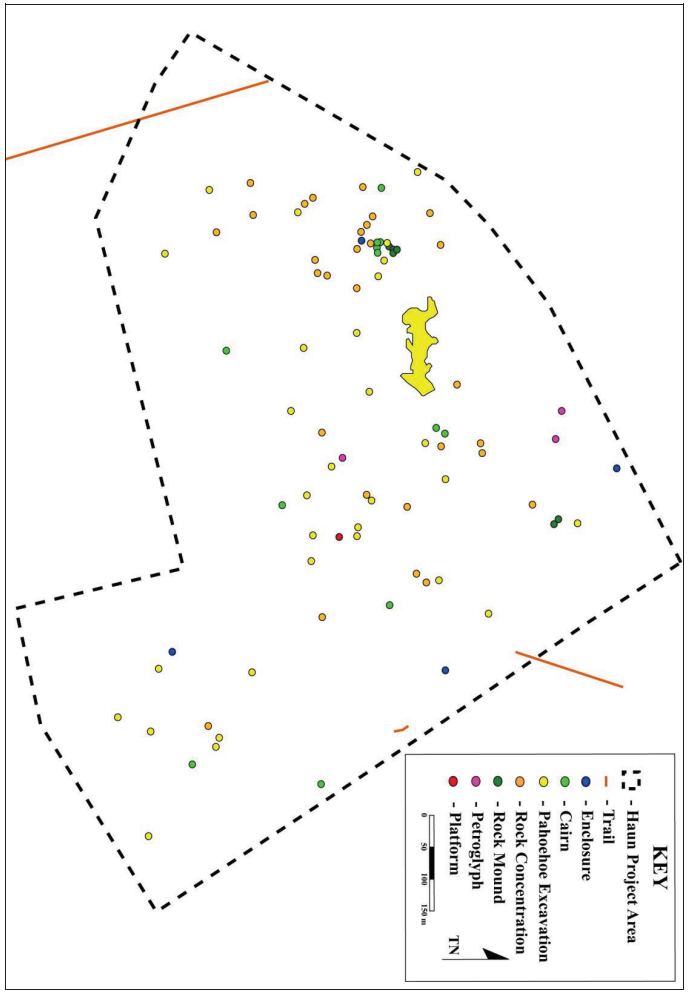

Figure 14: Plan View Map of Archaeological Feature Types Recorded in Haun and Henry (2000).

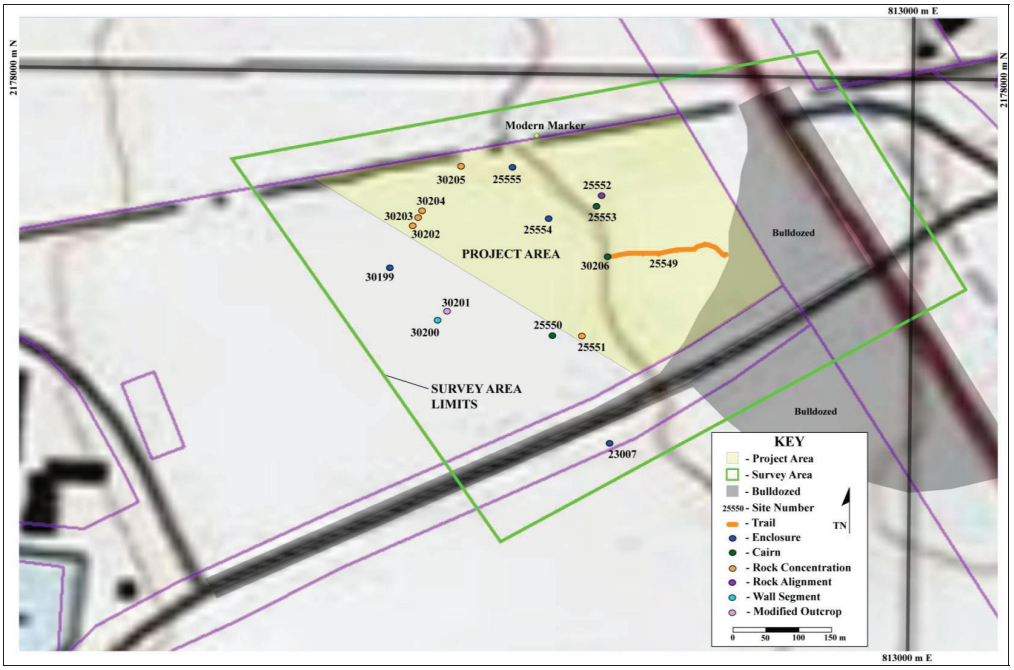

Figure 16: 7.5-Minute Series USGS Topographic Map Showing Location of Project Survey Area Archaeological Sites (Keāhole Point Quad, ESRI 2003. Sources: National Geographic, USGS, Hawai'i County Planning Department).

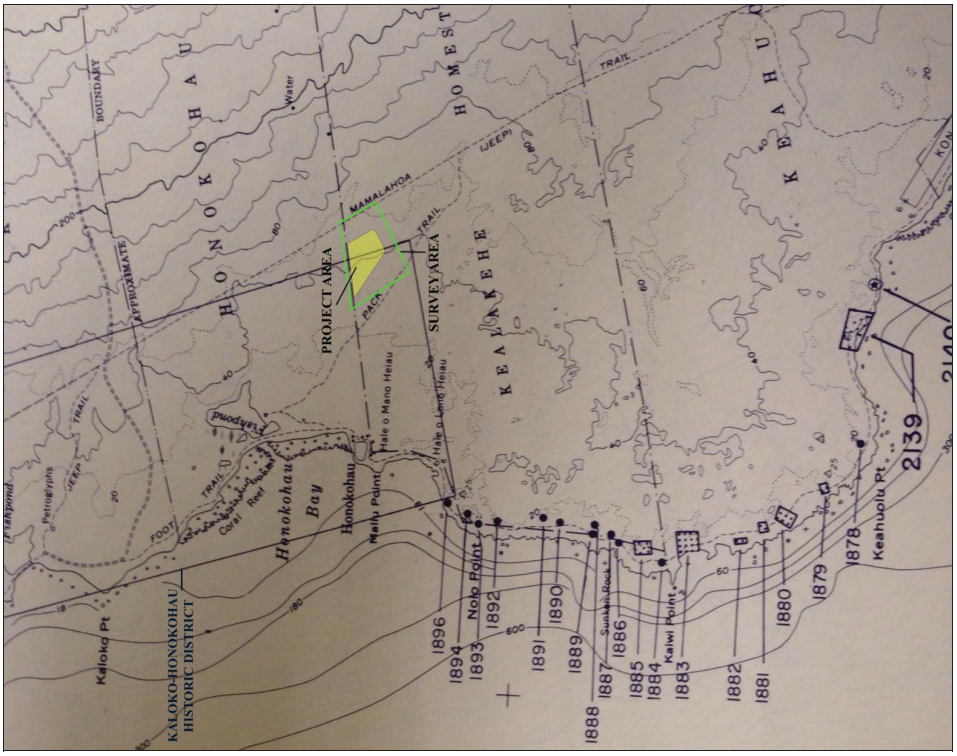

Figure 15: Portion of 7.5-Minute Series USGS Keāhole Point Quadrangle Map Showing the Locations of Hawai'i Register of Historic Places Sites (Keāhole Quad, 1959).

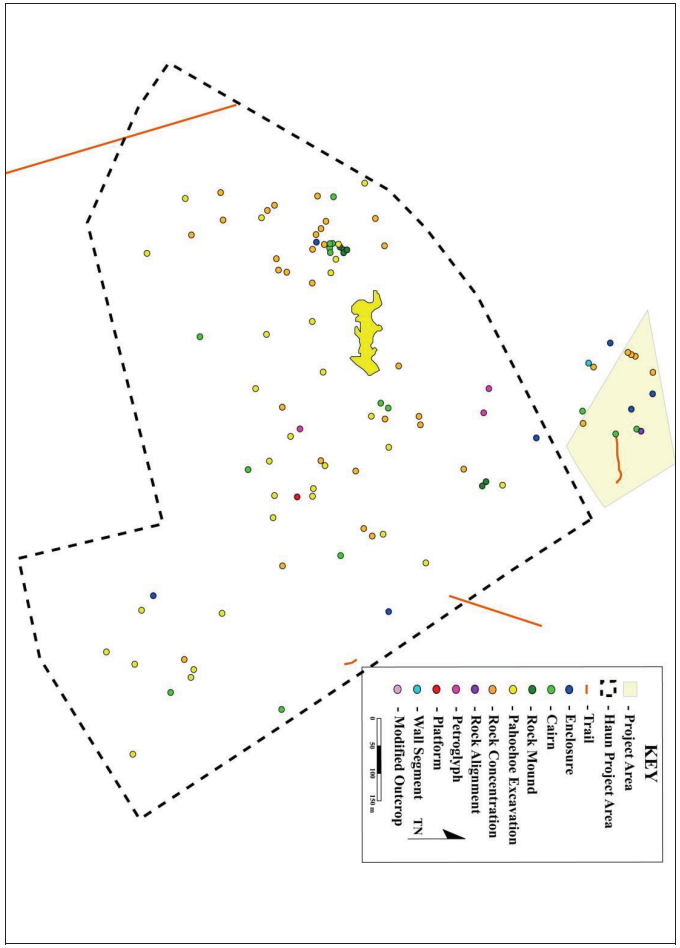

Figure 17: Map Showing Distribution of Site Types documented in Haun and Henry (2001) and Escott (2014).

Table 2: Inventory of Archaeological Sites Identified in the Survey Area.

Site #	Type	Function	Age
23007	Oval Enclosure	Temporary Habitation	Pre-Contact Era
25549	Trail	Travel	Pre-Contact to Early Post-Contact Era
25550	Cairn	Marker	Undetermined
25551	Rock Concentration	Resource Extraction	Undetermined
25552	Rock Alignment	Homeless Camp	Modern
25553	Cairn	Marks Homeless Camp	Modern
25554	Rectangular Enclosure	Temporary Habitation	Pre-Contact to Early Post-Contact Era
25555	Enclosure	Agriculture or Ranching	Post-Contact Era
30199	C-Shape Enclosure	Temporary Habitation	Pre-Contact Era
30200	Wall Segment	Shelter	Pre-Contact to Early Post-Contact Era
30201	Modified Outcrop	Shelter	Pre-Contact Era
30202	Rock Concentration	Resource Extraction	Undetermined
30203	Rock Concentration	Resource Extraction	Undetermined
30204	Rock Concentration	Resource Extraction	Undetermined
30205	Rock Concentration	Resource Extraction	Undetermined
30206	Cairn	Marker	Pre-Contact to Early Post-Contact Era

The majority of sites in this portion of the Middle Zone are pāhoehoe excavations and rock concentrations (Figure 17). Rock concentration features are characterized as slabby and angular pāhoehoe large cobbles and small boulders placed on the bare pāhoehoe. The rocks are usually one course high, though less often, they are placed one on top of another two courses high. Some of the rocks were placed laying upside down on the pāhoehoe, though likely this is random. The features do not appear to have been placed in any particular configuration though they sometimes appear in the shape of an oval. They infrequently appear in the shape of an oval or c-shape enclosure. However, they do not serve the same purpose as an enclosure since there is no protection from the wind.

It is most likely that rock concentration features are the result of collecting the pāhoehoe rocks for transport and later use to construct features. That the features might be the result of modern collecting of rocks for rock wall building is a remote possibility. However, the rock concentrations are not located near modern dirt roads or existing paved roads as would be expected. Instead, they are concentrated near pāhoehoe excavations and areas of broken pāhoehoe (see Figure 17).

There far more pahoehoe excavations per acre in the area south of the current project area because the lava substrate is qualitatively different. The pahoehoe flow in the current project area is not as broken up and friable as that in the area to the south. There are also slightly more rock concentrations in the Haun and Henry (2001) project area than in the current project area.

The cairns and rock mounds documented during both studies appear to be located primarily near other sites in loose or tight clusters. The enclosures documented during both studies appear to be primarily associated with pre-contact era temporary habitation. They are not very substantially constructed and do not appear to have been used for a long duration or many times.

The lower Middle Zone site distribution is similar to the central portion of the Middle Zone documented in the Haun and Henry (2001) study and the current AIS. There is a large number of resource extraction sites (Figure 18), and a smaller number of cairns and trails (see Figure 12). Most of the permanent habitation and temporary habitation sites are located in the Coastal Zone (see Figure 10 and Figure 11).

AIS SIGNIFICANCE ASSESSMENT & RECOMMENDATIONS

All sixteen archaeological sites documented in the AIS report were assessed as significant under criterion "D" as they have yielded, or are likely to yield, information important to history (Table 3). Trail Site 25549 is significant under criteria A, C, D, E as trails sites can be considered traditional cultural properties (A), the trail embodies distinctive characteristics of pre-Contact era trails (C), the trail contains information important to prehistory (D), and trails have an important value to native Hawaiian people (E). Trail site 25549 is recommended for preservation. The trail will be preserved in accordance with a SHPD-approved preservation plan.

Enclosure Site 25554 and enclosure Site 25555 are significant under criteria C and D as the sites embody distinctive characteristics of pre-Contact era and post-Contact era building styles. Site 25554 and site 25555 are recommended for preservation. The sites will be preserved in accordance with a SHPD-approved preservation plan. No further work is recommended at the remaining 13 archaeological sites.

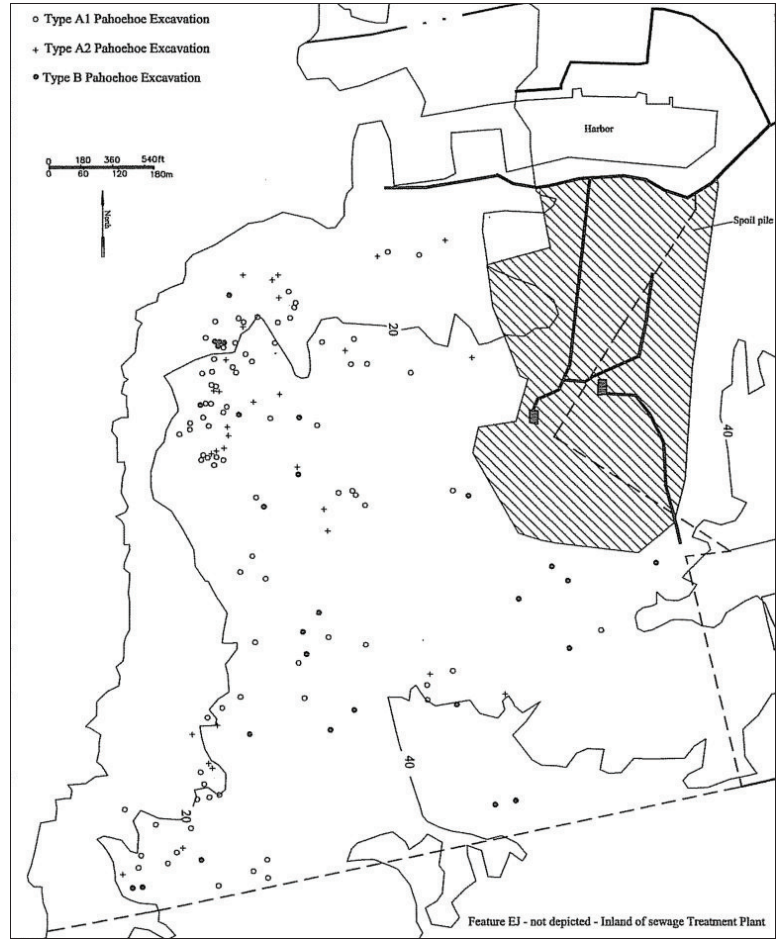

Figure 18: Map Showing Distribution of Pahoehoe Excavation Features in the Lower Middle Zone (Haun and Henry 2006:222) (Project area Outside of Figure Margins).

Table 3: Site Significance Assessments and Recommended Treatments.

Site #	Type	Function	Significance Criteria	Recommended Treatment
23007	Oval Enclosure	Temporary Habitation	D	No Further Work
25549	Trail	Travel	A, C, D, E	Preservation
25550	Cairn	Marker	D	No Further Work
25551	Rock Concentration	Resource Extraction	D	No Further Work
25552	Rock Alignment	Homeless Camp	D	No Further Work
25553	Cairn	Marks Homeless Camp	D	No Further Work
25554	Rectangular Enclosure	Temporary Habitation	C, D	Preservation
25555	Enclosure	Agriculture or Ranching	C, D	Preservation
30199	C-Shape Enclosure	Temporary Habitation	D	No Further Work
30200	Wall Segment	Shelter	D	No Further Work
30201	Modified Outcrop	Shelter	D	No Further Work
30202	Rock Concentration	Resource Extraction	D	No Further Work
30203	Rock Concentration	Resource Extraction	D	No Further Work
30204	Rock Concentration	Resource Extraction	D	No Further Work
30205	Rock Concentration	Resource Extraction	D	No Further Work
30206	Cairn	Marker	D	No Further Work

TRADITIONAL HAWAIIAN CULTURAL PERSPECTIVES ON NATURAL RESOURCES AND THE AHUPUA‘A

From a traditional Hawaiian cultural point of view, the *ahupua‘a* can be understood as a most basic land-use unit. Families and individuals felt they were deeply connected to the *ahupua‘a* that they lived in (Handy *et al*. 1972:42). There was not so much a sense that people owned the land, but that people belonged to the land in which they lived and had a responsibility to nurture it. It was this deep connection to the land that informed each individual’s right to collect the produce of their *ahupua‘a*.

Each *ahupua‘a* was administered by a *konohiki*, or lesser chief-landlord who was subject to an *ali‘i ‘ai ahupua‘a*, or the chief who controlled the resources of an *ahupua‘a* (Maly and Maly 2001:7). The *maka‘āinana* tended the fields and collected the abundance of their *ahupua‘a* for their own needs, as well as those of the *konohiki*

and the *ali‘i*. Those who lived in each *ahupua‘a* had claim to the differing resources from all elevations of their *ahupua‘a*. The timing of planting and harvesting, the timing and quotas for fishing, the religious rituals and ceremonies that promoted the abundance of natural resources, and the cultural mores that laid out how food was distributed to all members of Hawaiian society were regulated by traditional cultural and religious practices so that all members of each *ahupua‘a* shared in the bounty of the *ahupua‘a*.

The natural environment and resources within the *ahupua‘a* were imbued with sacredness and were the focus of the traditional Hawaiian religious and social practices (Maly and Maly 2001:5). Many of the religious rituals, practices, and ceremonies centered on maintaining the fertility and abundance of the natural resources. Maly and Maly, pointing to the work of Handy, Handy, and Pukui (1972), write,

> the worship of Lono was centered in Kona. Indeed, it was while Lono was dwelling at Keauhou, that he is said to have introduced taro, sweet potatoes, yams, sugar cane, bananas, and ‘awa to Hawaiian farmers (Handy et al. 1972:14). The rituals of Lono “The father of waters” and the annual Makahiki festival, which honored Lono and which began before the coming of the kona (southerly) storms and lasted through the rainy season (the summer months), were of great importance to the native residents of this region (Handy et al. 1972: 523). The significance of rituals and ceremonial observances in cultivation and indeed in all aspects of life was of great importance to the well-being of the ancient Hawaiians, and cannot be over-emphasized, or overlooked when viewing traditional sites of the cultural landscape [Maly and Maly 2001:6].

With the coming of the Great Māhele (1848), the Alien Land Ownership Act and the Kuleana Act of 1850, the traditional Hawaiian archetype of land-use was essentially deconstructed and replaced with the European concept of fee-simple land ownership. Traditional Hawaiian subsistence practices, including the rights to collect resources from all ecological zones of one's *ahupua‘a*, were challenged, restricted, or prevented. As private land owners considered their property off limits to others, cultivation and collection of resources on private land diminished. Individual Hawaiian

cultural beliefs, specialized knowledge, and practices associated with the use of the different ecological resource zones also diminished. The development of cattle ranching and commercial crops, such as sugar cane and coffee, removed traditional cultigens and resources from large swaths of the lands of Kona.

The traditional Hawaiian cultural beliefs of nurturing the land are still held by many Hawaiians and are protected by the Hawai‘i State Constitution. Cultural practices, including the gathering of plant resources from a variety of ecological regions, is still continued today. Kamehameha Schools, the Hawaiian Studies Program at the University of Hawai‘i, as well as other private groups and cultural practitioners, are teaching cultural beliefs and practices informed by the natural landscape and resources of Hawai‘i. The natural landscape, plants, and animals are important educational resources to teach traditional Hawaiian cultural values.

CULTURAL INFORMANT INTERVIEWS

As part of the consultation methodology discussed above, SCS, Inc. consulted with Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Shane Palacat Nelson, Coordinator of the Hawai‘i Branch of the Office of Hawaiian Affairs; Kauanoe Ho‘omanawanui, SHPD Hawai‘i Island Burial sites Specialist; Rick Gmirkin, Ala Kahakai National Historic Trail, NPS Archaeologist; James "Kimo" Lee, Jr., HIBC former Chairman; Edwin Miranda, HIBC new Chairman; Fred Cachola, HIBC Kohala Representative; and Kealakehe and Hawai‘i Island *‘ohana* members Josephine Palacat Barney, Raymond Lui, Agnes Lui, Nicole Lui, and Isaac Harp (Table 4).

Table 4: Results of CIA Consultation.

Name	Affiliation (Family/Agency)	Response (Written/Oral)	Knowledge (Yes/No)	Practices & Beliefs (Yes/No)
Kai Markell	Office of Hawaiian Affairs	No	-	-
Shane Palacat Nelson	Office of Hawaiian Affairs	Oral	Yes	Yes
Kauanoe Ho‘omanawanui	State Historic Preservation Division Cultural Historian	Oral	Yes	No
Rick Gmirkin	Ala Kahakai National Historic Trail, NPS Archaeologist	Oral	Yes	No
James "Kimo" Lee, Jr.	Former Chair, Hawai‘i Island Burial Council	Oral	Yes	No

Name	Affiliation (Family/Agency)	Response (Written/Oral)	Knowledge (Yes/No)	Practices & Beliefs (Yes/No)
Edwin Miranda	New Chair, Hawai‘i Island Burial Council	Written & Oral	Yes	Yes
Fred Cachola	Kohala Representative, Hawai‘i Island Burial Council	Oral	Yes	Yes
Josephine Palacat Barney	Kona ‘Ohana	Written & Oral Oral	Yes	Yes
Raymond Lui	Kona ‘Ohana	Oral	Yes	Yes
Agnes Lui	Kona ‘Ohana	Oral	Yes	Yes
Nicole Lui	Kona ‘Ohana	Oral	Yes	Yes
Isaac Harp	Kona ‘Ohana	Oral	Yes	Yes

SCS archaeologists also attended an anniversary celebration at Kaloko-Honokōhau National Park on August 23, 2014 where many family members recounted their experiences living at ‘Āi‘ōpio fishpond. The Palacat family, the Lui family, and others spoke of life and the lands of Honokōhau and Kealakehe.

The following CIA interview conducted February 12, 2009 with Aunty Josephine Palacat Barney of Kailua-Kona documents her knowledge of the coastal area from Kohanaiki to Kailua-Kona during the period from 1925 to 1935. Josephine is the daughter of Palacat Catalino (father) and Pararat Philipa (mother) of the Philippines. Palacat Catalino arrived in Hawaii in 1912 at the age of 15. Pararat Philipa was brought to Hawaii by her adoptive father. Palacat Catalino and Pararat Philipa met in Onomea when she was 14. He was a field supervisor for the Hamakua Sugar Company. They later married and moved to Kona.

Josephine is one of fifteen children. She is fifth born and the oldest girl. They lived in Kaloko, Honokōhau, and Kohanaiki between 1925 and 1935 during which time her father was the supervisor of the *‘ōpai* ponds. He was hired to care for and maintain the ponds and was responsible for keeping them in pristine condition, for all people had the privilege of using the shrimp without permission. The fish in those ponds such as *‘awa* (milk fish, *Chanos chanos*) and *‘ama‘ama* (mullet, *Mugil cephalus*) were the property of the person leasing the ponds, and only they had access to them. Most land in the area belonged to Hu‘ehu‘e Ranch, so the ponds were probably leased through them. Other individuals would help clean the ponds, removing algae and debris. The algae was burned so it didn’t make its way back into the pond.

The Palacats first beach house was just south of the Kaloko fish pond (Figure 19). They also lived in homes along the beach in Honokōhau (Figure 20) and Kohanaiki (Figure 21). They used the tax trail (Māmālahoa Trail) and traveled by donkey up and down the coast. By that time, the trail was no longer used for collecting taxes. That ended after Kamehameha's death. They traveled north on the trail to Kalaoa to gather taro (*Colocasia esculenta*) and breadfruit (*Artocarpus altilis*), and south to Kailua.

The house they lived in at Kohanaiki was already standing when they arrived. It was a ranch house that Josephine's father proceeded to repair and enlarge. They began their stay there in 1930 and continued on there until 1935. The house belonged to the Greenwell's, and was probably obtained through payment of unpaid taxes. The Keanaaina family claimed that land. At one time they lived there because they have two family members buried there. This was before the Palacats lived there.

There was once a village near there prior to the 1801 lava flow. The flow stopped before it got to the ocean. The legend is that Kamehameha I was concerned about the village taken by Pele, and feared that she was headed for Kailua. Kamehameha went to Hualalai but forgot *ho'okupu* (gifts). All the *kahuna* were with him, and he asked them to make peace with Pele. As he had forgotten the gifts, he grasped his hair and cut it off as he was chanting and the lava stopped flowing.

During the Palacat's stay at Kohanaiki, only one other family lived in the area. Pedro Espigata was from the same province in the Philippines as Josephine's father, so they were good friends, and he and his family moved wherever the Palacats happened to be.

When the Palacats moved to Kaloko, the Espigatas moved to Kaloko. When the Palacats moved to Kohanaiki, the Espigatas moved to Kohanaiki. And when the Palacats moved to Kailua, the Espigatas moved there, too. He was married to Sarah Pai. She was very dedicated to her name because she was a descendent of an old Hawaiian Chief named Pai from ancient times. She was part Hawaiian, but also had ancestors from the Philippines, China and Portugal. She and Pedro had several children. There were no other individuals living near there during that time.

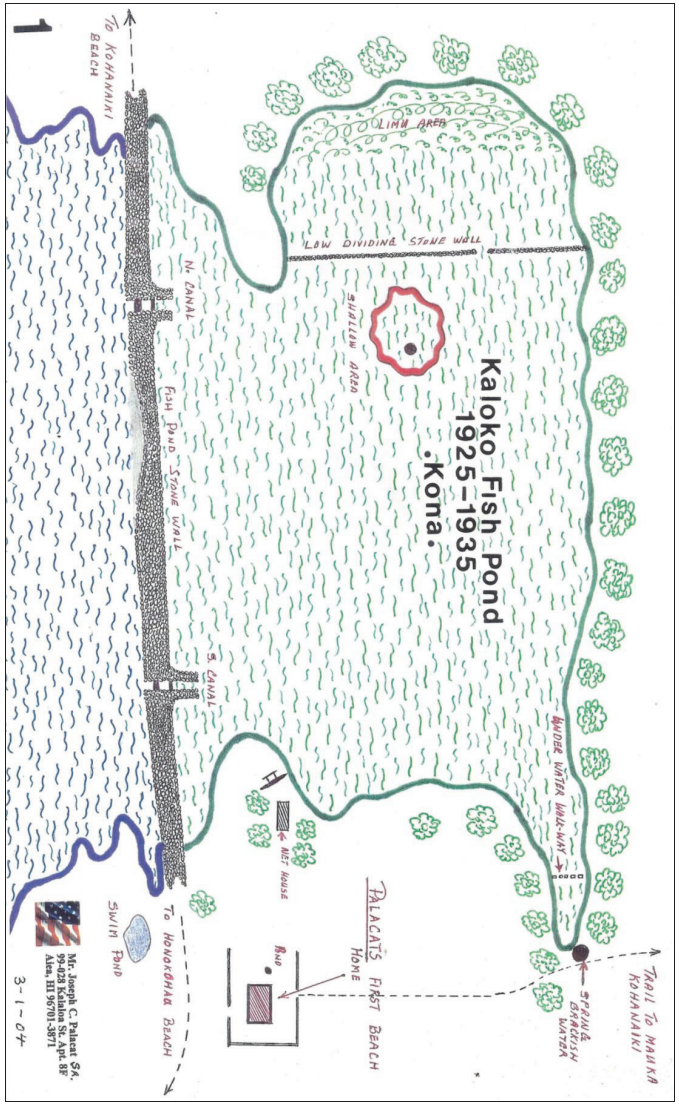

Figure 19: Palacat House at Kaloko Fishpond (Drawn by Mr. Joseph Palacat 2004).

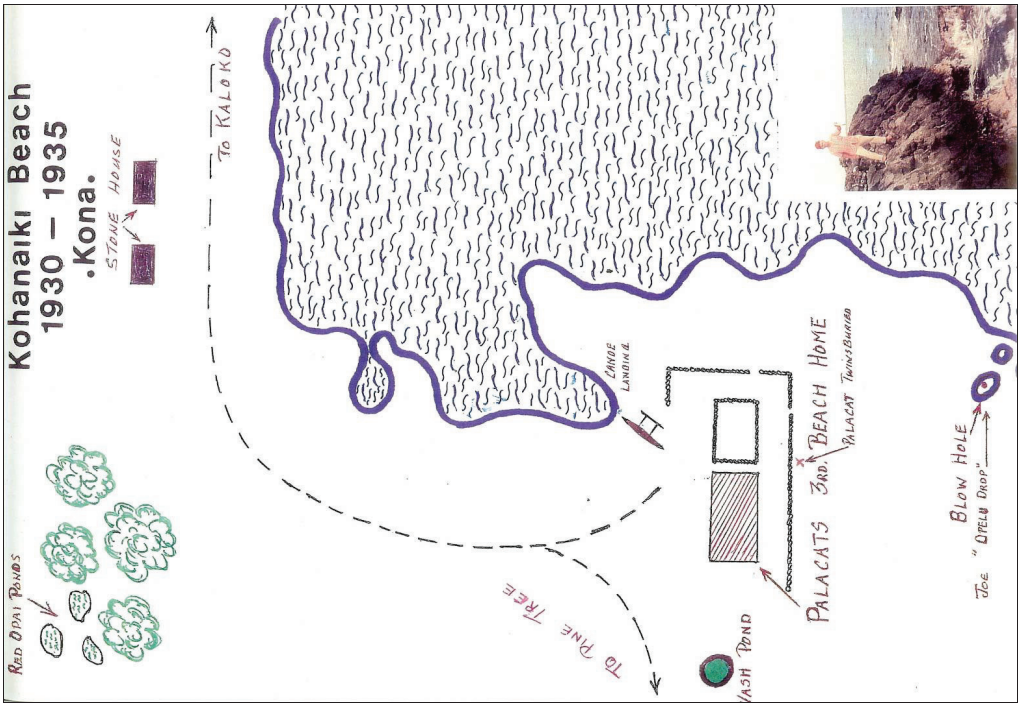

Figure 21: Palacat House at Kohanaiki Drawn by Mr. Joseph Palacat (in photo).

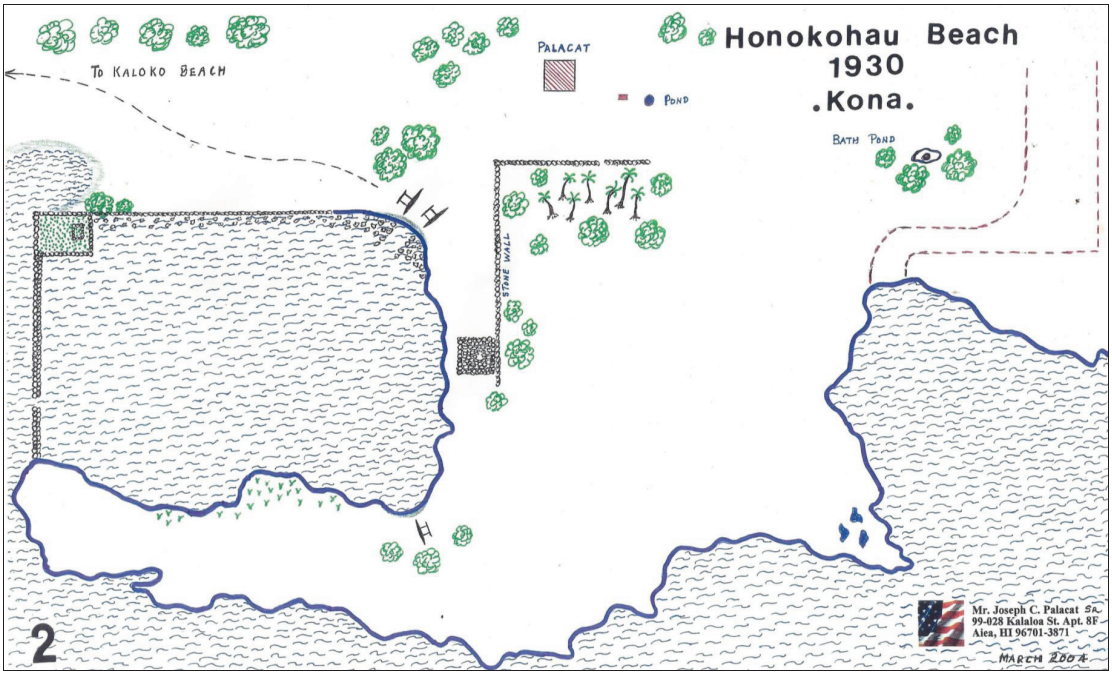

Figure 20: Palacat House at Honokōhau Fishpond (Drawn by Mr. Joseph Palacat 2004).

People at that time had respect for one another and for the *ʻāina*, and fishermen had respect for the ocean, as well. If a person used something, they were compelled to give something back in return. There were fishing traditions like the *ʻōpelu koa* [shrine and marker for fishing *ʻōpelu* (*Decapterus macarellus*)]. There were several *koa* on the west side of the island. The tradition was to fish one, then skip one. Then fish the next, and skip the one after that. Later, on their way back down the coast, they would feed the ones that they skipped. The next time they went fishing they would fish the ones that were skipped the last time.

There was a tradition that was practiced so that the *ʻōpai* (shrimp, various sp.) were not depleted. *Kaunaoa* flower (*Cuscuta sandwichiana*), which is also called the flower of Lānaʻi is orange in color. It used to be plentiful along the coast, but the only place that it still exists is Makalawena. To chum the fish, it was customary to use a piece of cloth the size of a men's handkerchief. Josephine used soil from the base of the *keawe* tree made into mud, a pinch of shrimp and the orange *kaunaoa* flower. The handkerchief was closed up and thrown out into the water. The handkerchief opens, the dirt forms a cloud, then the fish feed on the *kaunaoa* because it's the same color as the shrimp. There was no need to deplete the shrimp population. This is not practiced by fishermen today, because there's not a fisherman alive today that has learned or even knows about this technique. Josephine and her brother remember this. Her sister doesn't because she wasn't involved.

Depending on the currents, Josephine's brother would go out and make fish *imu* at Honokōhau. He would take rocks and depending on the way the waves were breaking, he would construct a mound, setting the rocks in such a way so that the waves wouldn't disturb them. Once the fish made a home there, inhabiting the rocks, a net could be thrown over it to catch the fish. In those days, those who fished using this method were free to use any *imu*, but were obligated to rebuild it for the next person to use. People at that time were respectful of others and of their efforts. There were strong notions concerning keeping things the way they were and putting things back, and not being disruptive.

Members of the Palacat family, including Joseph Palacat, and the Lui family also said that fishing was the primary means of subsistence while living on the beach at Honokōhau. Dried fish was often traded for upland food items. Travel was along the mule trail, often by foot, but later by jeep or four-wheel drive. Travel to Kailua town was often made by canoe as well.

Shane Palacat Nelson, Office of Hawaiian Affairs West Hawaiʻi Branch Coordinator and grandson of Joseph Palacat was interviewed on October 3, 2014 at his office in Kailua-Kona.

Shane agreed that the trail (Site 25549) should be preserved. He also expressed that *ahu* markers are also important to his and many other Native Hawaiian cultural practitioners. This is especially true of markers that mark traditional geographic bounders and trails.

HIBC members Edwin Miranda and Fred Cachola have expressed many times in personal communication that burials, trails, and traditional geographic boundary markers are important to them and to Native Hawaiian cultural practitioners in general. They have often expressed that these features should be preserved.

On October 30, 2014 an interview with Kupuna Raymond Kealohaokalani Lui and his *keiki* Nicole "Keaka" Lui held at the West Hawaii Civic Center gazebo. The interview was to discuss the historical and cultural significance of Kealakehe Ahupuaʻa as they knew it in their time and what was shared with them from *kupuna* still alive from the earlier part of the twentieth century.

The Lui ʻOhana lived along the coast at ʻAiʻōpio fishpond from 1967 to 1969. ʻAiʻōpio translates literally as "youth eating" (Pukui et al 1976:8). Kupuna Raymond spoke about fishing at ʻAiʻōpio. Raymond said they would set the cross net across the ʻAiʻōpio fish trap and leave for a couple of hours, the net was never left in the water for a long time.

Pa'ipa'i style fishing was also done by the Lui ʻohana alongside with Tutukane Solomon Kaelemakule and Tutu Samson Pelekane and other family members when they came to stay for the day. The ʻohana did it by torch light in the evening. The fish was guided into the net by the slapping of the water and with coconut fronds or *milo* (*Thespesia populnea*) leaves from area trees. They only took enough to eat and would release whatever fish they could not eat.

Kupuna Raymond also had his own boat from the mid 1970's to the early 1980's and he would fish for ʻōpelu and continued to feed the various *koa* and fish at these *koa*. Raymond's father-in-law Solomon Kaelemakule had shown him the *koa* along the coast before his death in 1977.

Nicole, aka Keaka, shared that in 1969 she, along with other students of various ages from the old Kailua School, were the first to attend the newly established Kealakehe School. Keaka shared how Uncle Joe Kahananui, the last great Kahuna Pule of Kona, came to the school and stood alongside Mrs. Chee by the flagpole on the stairs and blessed the school because of the meaning associated with the name "Kealakehe". Uncle Joe explained that Kealakehe means "the

trail to the graves" because of a *mauka/makai* trail that crossed through Kealakehe Ahupua'a to the numerous burials in Keahuolu, aka Ke 'ohu'olu Ahupua'a, to the south.

Uncle Joe Kahananui also shared at another time that 'Alula Bay in Kealakehe was the burial place of Kemehameha I in a cave of the area. Nicole also shared that at Alula her grandfather Solomon Kaelemakule told her and her siblings that the *heiau* there with the two stones standing upright was a temple to the moon and Hina was the god. Kupuna Solomon said that at a certain time of the year the moon would rise right between the two stones and signified the change of season. Nicole does not know what change because grandfather did not mention more.

Kupuna Raymond and Nicole also shared about a coastal inland trail that Solomon Kaelemakule showed them back in the 1970's. This trail started from the boundary fence line of Keahuolu near Pawai at the end of the Old Airport and meandered through Kealakehe and came out near 'Alula bay. Portions of the trail were constructed by filling in low spots and holes in the ground surface. The trail was marked by corral fragments placed along the trail corridor. The corral glows in the moon light so the trail can be followed at night.

Mauka of the trail in Keahuolu Ahupuaʻa there is a large rectangular area of sand and sparse grass in the middle of the surrounding lava. The area is geometrically perfect with straight lines and appears to have been man-made. The place gives an uneasy feeling to people who would spend any amount of time there. Both Kupuna Raymond and Nicole expressed a desire to GPS and record the trail and rectangular feature.

Raymond also recalls that during the family's summer's at 'Aiʻōpio fishpond, cattle still wandered in the area of the proposed DLNR Kealakehe offices project. He thought Huʻehuʻe Ranch was likely leasing the land from the Greenwells and that they were Huʻehuʻe e Ranch cattle he saw out there. Access to the beach where they lived was along a *mauka-makai* four-wheel drive road through Honokōhau-iki Ahupuaʻa. The road was maintained by Huʻehuʻe Ranch.

Raymond also recalls that the road they used to get to 'Aiʻōpio started near where the Kona Coast Shopping Center is, somewhere near Pier Imports is, and would go through Keahuolu and into Kealakehe and would traverse through Honokōhau pahoehoe pass where the petroglyphs are and end up on the sand. From there they would go up the incline where the

Kaloko-Honokōhau National Park's greeting shack is, where the old Kanakamakai house used to be.

Kupuna Raymond said that, in the late 1960s, no one used the old trail that passes near the project area between the Government Road and 'Āiʻōpio fishpond. The trail is illustrated in Emerson's 1880s map (see Figure 6) and is labeled as a "Pack Trail" on the 1953 USGS Keāhole Quadrangle map (see Figure 15). It is likely that it was no longer used once the Government Road was in use. The trail is no longer visible on the ground surface where it crosses Kealakehe Ahupuaʻa.

Kupuna Raymond and Nicole discussed the archaeological sites identified in the project area. They felt that the trail (Site 25549) should be preserved in place. They understood that some of the other features might be removed for the proposed offices construction. They asked if the sites were to be removed, would be possible to professionally photograph and frame the features at Site 25554, 2555, 30199, and 30201 and hang them in the new DLNR offices to remind people of the history of the area. They also asked if it would be possible to use the rock from these sites to construct walls and other structures at the planned offices. In this way, it would be possible to include the past structures in the new.

CULTURAL ASSESSMEMNT

While no specific past or ongoing cultural practices, aside from fishing and fishpond practices, were identified by respondents within the project area, the wider cultural landscape and specific cultural resources important to Native Hawaiian cultural practitioners were concerns expressed by respondents. The coastal Kealakehe region contains a large number of archaeological sites that constitute an historical and cultural landscape. The archaeological sites in the coastal region, some of which are listed on the National Register of Historic Places and the Hawaiʻi Register of Historic Places, are a reminder of Hawaiian cultural adaptations to the dry leeward environment. Many of the adaptations are related to and were directed by Hawaiian cultural beliefs.

While the proposed DLNR Kelalakehe offices project area is not in the coastal zone, it near to it, and was used by Hawaiians for resource extraction and while traveling from the coast to the uplands. There are trails, *ahu*, and temporary habitation structures in the project area that were constructed and used by Hawaiians. Trails through the region allowed access to coastal fishing as

well. The proposed project will not restrict access to coastal areas and is not near previously identified burials.

Recommendations proposed by cultural informants to mitigate the potential project impacts to the project area lands and traditional cultural beliefs and practices include preserving the trail and *ahu* (Site 25549 and 30206), displaying photographs of archaeological features that might be removed for new construction, and using stones from those sites in walls and buildings to constructed on the project area.

Based upon an evaluation of responses to inquiries, individual cultural informant interviews, cultural informant recommendations, and archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. The proposed undertaking will not produce adverse effects to any specific Native Hawaiian cultural practices in the area.

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APPENDIX A: PUBLIC NOTICES

AFFIDAVIT OF PUBLICATION

State of Hawaii)
) SS:
County of Hawaii)

M. R. Chavez, being first duly sworn, deposes and says:

1. That she is the Classified Accountant of WEST HAWAII TODAY, a newspaper published in the City of Kailua-Kona, State of Hawaii.

2. That "**CULTURAL IMPACT ASSESSMENT NOTICE** Information requested by Scientific Consultant Services, Inc. of cultural resources or ongoing cultural practices…" of which a clipping from the newspaper is attached hereto, was published in said newspaper on the following date(s) August 10, 13 and 14, 2014 (etc.)

M. R. Chavez

Subscribed and sworn to before me
This 14th day of August, 2014

Henriann P. Kahananui

Notary Public, Third Circuit,
State of Hawaii

HENRIANN P. KAHANANUI NOTARY PUBLIC Comm. No. 11-188 STATE OF HAWAII

Henriann P. Kahananui

My Commission expires: June 6, 2015
Page(s): 1

West Hawai'i Today Public Notice Affidavit.

AFFIDAVIT OF PUBLICATION

IN THE MATTER OF
SCS1468 CIA Public Notice

STATE OF HAWAII }
} SS.
City and County of Honolulu }

Doc. Date: 8/14/14 **# Pages:** 1
Notary Name: COLLEEN E. SORANAKA First Judicial Circuit
Doc. Description: Affidavit of Publication
Notary Signature 8/14/14 Date

COLLEEN E. SORANAKA NOTARY PUBLIC No. 90-263 STATE OF HAWAII

Lisa Kaukani being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of Oahu Publications, Inc. publisher of The Honolulu Star-Advertiser and MidWeek, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the aforementioned newspapers as follows:

Honolulu Star-Advertiser 3 times on:
08/10, 08/13, 08/14/2014

Midweek Wed. 0 times on:

_____ times on:

And that affiant is not a party to or in any way interested in the above entitled matter.

Lisa Kaukani

Subscribed to and sworn before me this 14th day
of July A.D. 2014

Colleen E. Soranaka, Notary Public of the First Judicial Circuit,
State of Hawaii

My commission expires: Jan 06 2016

Ad # 0000656991

COLLEEN E. SORANAKA NOTARY PUBLIC No. 90-263 STATE OF HAWAII

SP.NO.: _____ L.N.

CULTURAL IMPACT ASSESSMENT NOTICE

Information requested by Scientific Consultant Services, Inc. of cultural resources or ongoing cultural practices on lands north of Kealakehe Parkway, in Kealakehe Ahupua'a, Kailua-Kona, North Kona District, Island of Hawai'i, TMK: (3) 7-4-008: 003. Please respond within 30 days to Glenn Escott at (808) 938-0988.
(SA656991 8/10, 8/13, 8/14/14)

Honolulu Star-Advertiser Public Notice Affidavit.

CULTURAL IMPACT ASSESSMENT NOTICE

Information requested by Scientific Consultant Services, Inc. of cultural resources or ongoing cultural practices on lands north of Kealakehe Parkway, in Kealakehe Ahupua'a, Kailua-Kona, North Kona District, Island of Hawai'i, TMK: (3) 7-4-008: 003. Please respond within 30 days to Glenn Escott at (808) 938-0968. ■

Ka Wai Ola Public Notice (September 2014 Issue).

APPENDIX E

Traffic Impact Assessment Report by SSFM International

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FINAL

New Administration and Base Yard in West Hawai'i for the State of Hawai'i, Department of Land & Natural Resources

Traffic Impact Analysis Report

Kealakehe, North Kona, Island of Hawai'i

February 20, 2015

Prepared for
Erskine Architects

Prepared by
SSFM INTERNATIONAL

MICHAEL Y. PACKARD
LICENSED PROFESSIONAL ENGINEER
NO. 13441-C
HAWAII USA

This work was prepared by me or under my supervision:

Michael Y. Packard
Date: 2/20/2015
Licensed Professional Engineer
License Number 13441
Expires: 4/30/2016

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I. PROJECT DESCRIPTION

The State of Hawai'i, Department of Land and Natural Resources (DLNR) is proposing to develop a new facility which will combine DLNR staff administrative offices and base yard services into a single location. The property, owned by the State of Hawai'i, is located on the west coast of the island of Hawai'i in Kealakehe, North Kona, at tax map key (TMK) (3) 7-4-008:003 (see Figure 1). Access to this new facility is being proposed through two driveway locations off of the makai (ocean-side) leg of Kealakehe Parkway (see Figure 2). The first and second driveways are located approximately 485 feet and 735 feet, respectively, from the existing Queen Ka'ahumanu Highway (measured from edge-of-pavement to edge-of-pavement).

The DLNR is proposing to consolidate the following division services, which are currently spread out in various locations throughout the island of Hawai'i: Division of Aquatic Resources (DAR), Division of Conservation and Resource Enforcement (DOCARE), Division of Forestry and Wildlife (DOFAW), Engineering Division (ENG), State Historic Preservation Division (SHPD), Division of State Parks (SP), as well as the Commission on Water Resource Management (CWRM) who will have a storage space within the covered base yard. The DAR, the DOCARE and the Division of Boating and Ocean Recreation (DOBOR) are currently located at the Honokōhau Harbor. The DOBOR was originally intended to be relocated to the new facility. However, DOBOR requested to remain at their existing location, immediately adjacent to the Honokōhau Small Boat Harbor.

In addition to the consolidation of DLNR divisions, the new facility will provide a Community Conference Center (CCC). With the limited amount of conference facilities in West Hawai'i, the need for a CCC was identified. The CCC would be used to host large and small meetings and as well as public informational meetings, workshops and conferences. The conference rooms will accommodate up to 20 people. The auditorium-style public meeting rooms will accommodate up to 200 people.

The new DLNR Administration and Base Yard Facility is being proposed for development in two phases. Phase 1 of construction (see Figure 2) will include Building B, Building C and Building D. The administrative functions and limited storage space for DAR, DOCARE, ENG, SHPD, and SP will be housed in Building B. In addition, the CCC will be temporarily located in Building B during Phase 1. Building C will serve as the SHPD Collections Warehouse. Building D will be a large Warehouse Building shared by SP and DOCARE. There is the possibility that Building D will be constructed in Phase 2 if funding cannot be secured for its construction during Phase 1.

Phase 2 of construction (see Figure 3) will include Building A, a free-standing facility to house the CCC. The CCC will be relocated from Building B to Building A. As part of Phase 2, the vacated space in Building B will be repurposed to accommodate additional DLNR administrative functions, likely for DOFAW.

The intent of this traffic impact analysis report (TIAR) is to evaluate existing conditions and assess impacts in the surrounding area as a result of the proposed development of all phases of the DLNR New Administration and Base Yard Facility. The TIAR will be prepared in support of the proposed environmental permitting.

Project related trip generation and analysis was conducted for the 62,000 square-foot facility proposed in the *Preliminary Planning and Site Assessment Report* (EAI, 2013). In October 2014 the site plan was modified, resulting in a 41,000 square-foot facility. Analysis for the 62,000 square-foot facility was retained due to it considering a greater impact to traffic, thereby assuring the updated facility would have negligible impact.

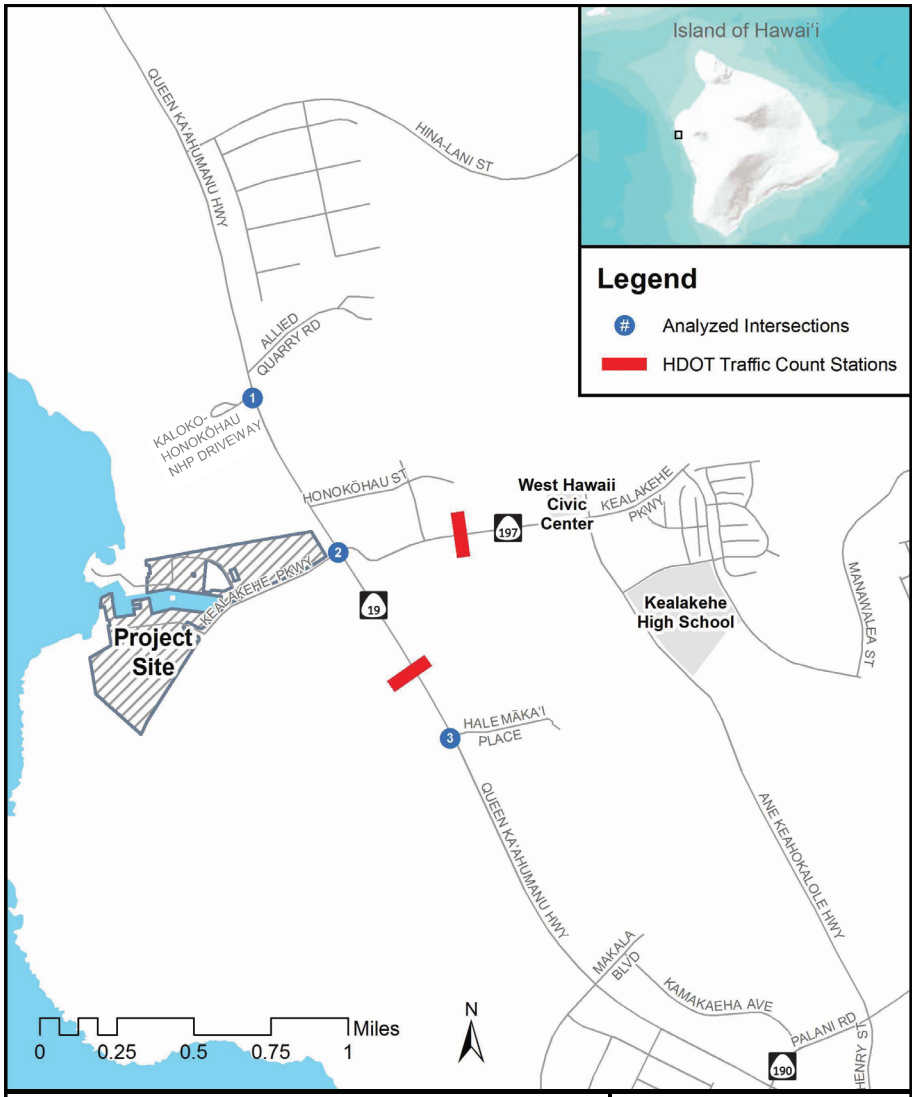

Figure 1: Project Location Map

DLNR New Administration and Base Yard Facility - Kealakehe, North Kona, Island of Hawai'i

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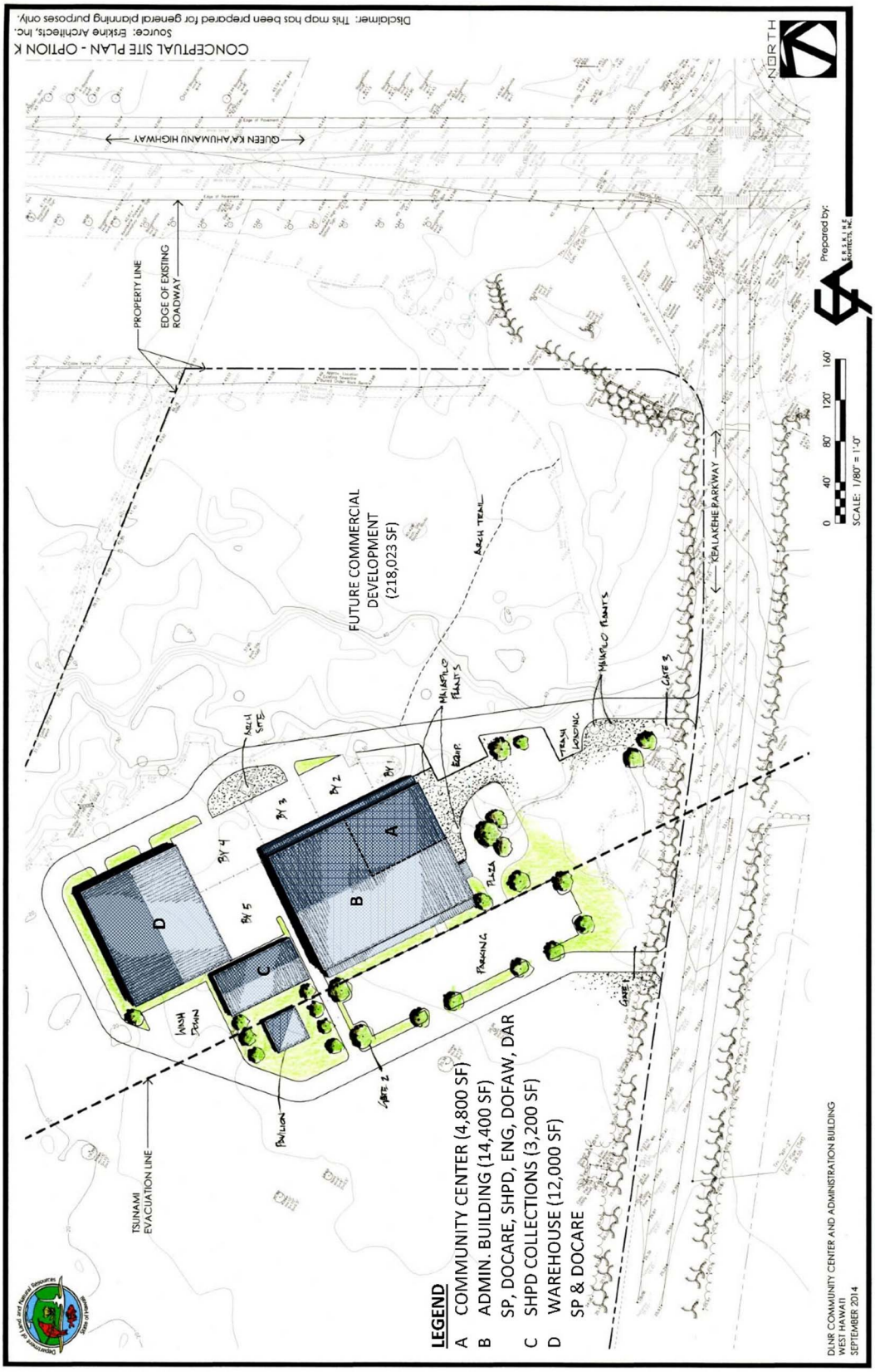

Figure 2: Conceptual Site Plan – Phase 1

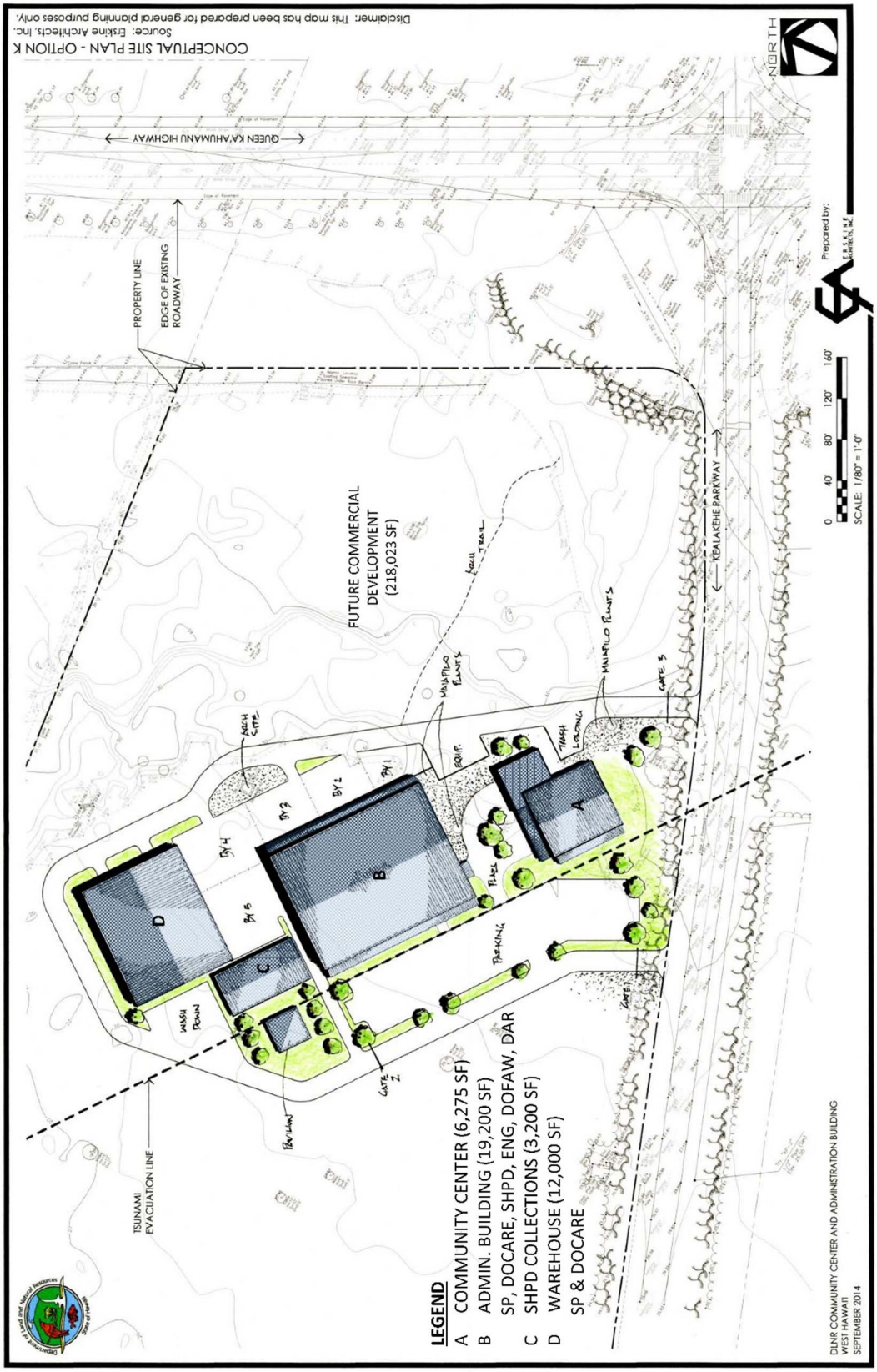

Figure 3: Conceptual Site Plan – Phase 2

II. EXISTING (2014) CONDITIONS

A. Geometric Configuration

Queen Ka'ahumanu Highway (State Highway Route 19) is a State owned, two-lane undivided primary arterial, oriented in the north-south direction with posted speeds of 45 mph. Kealakehe Parkway is a State owned, primarily two-lane divided collector, running mauka-makai (mountain side-ocean side) with a posted speed of 35 mph. The intersection of Queen Ka'ahumanu Highway and Kealakehe Parkway is signalized with dedicated left and right turn lanes along Queen Ka'ahumanu Highway and a single lane approaches along Kealakehe Parkway. The existing intersection lane configuration at study intersections are shown in Figure 4.

B. Volumes

1. 24-Hour Volumes

Average daily traffic (ADT) along Queen Kaahumanu Highway in the project area, based on Hawaii Department of Transportation (HDOT) *Historical Traffic Station Maps*, is 28,900 vehicles/day. ADT along Kealakehe Parkway, mauka of Queen Ka'ahumanu Highway, is 5,900 vehicles/day. Table 1 provides the roadway ADT.

Table 1: Roadway Average Daily Traffic

Roadway	Station	Location	Year	ADT
Queen Ka'ahumanu Highway	B71001909732	Between Kealakehe Parkway and Palani Road	2012	28,900
Kealakehe Parkway	B71019700000	Between Queen Ka'ahumanu Highway and Ane Keohokalole Highway	2012	5,900

Source: *Historical Traffic Station Maps* (HDOT)

The AM peak hour along Queen Ka'ahumanu Highway is about 7:30-8:30 AM with approximately 1,800 vehicles per hour (vph). The volumes increase over the day and remain consistently above 2,000 vph from 10:00 AM to 4:00 PM with 200 to 300 more vehicles travelling southbound. There is no distinct PM peak hour. The highest peak occurs around 1:00-2:00 PM which has about 2,200 vph. Figure 5 includes a graph showing directional hourly distribution along the roadway segment at the HDOT counting station location.

Traffic along Kealakehe Parkway are much less as it is a roadway which access residences and schools. The AM peak hour is 8:00-9:00 AM with about 550 vph and the PM peak hour is 3:00-4:00 PM with 500 vph. The directional distribution is balanced throughout the day. Figure 5 includes a graph showing directional hourly distribution along the roadway segment at the HDOT counting station. Appendix A includes the detailed 24-hour traffic count data.

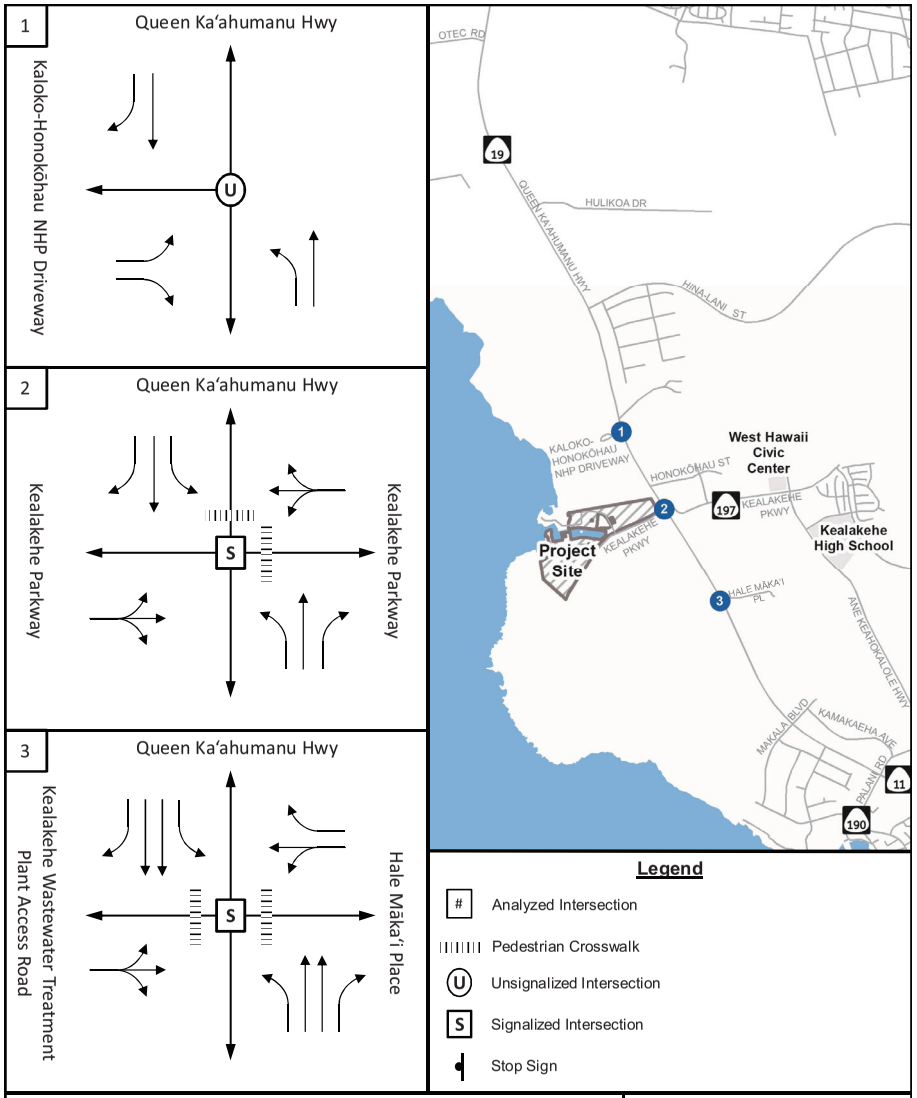

Figure 4: Existing (2014) Lane Configurations

DLNR New Administration and Base Yard Facility - Kealakehe, North Kona, Island of Hawai'i

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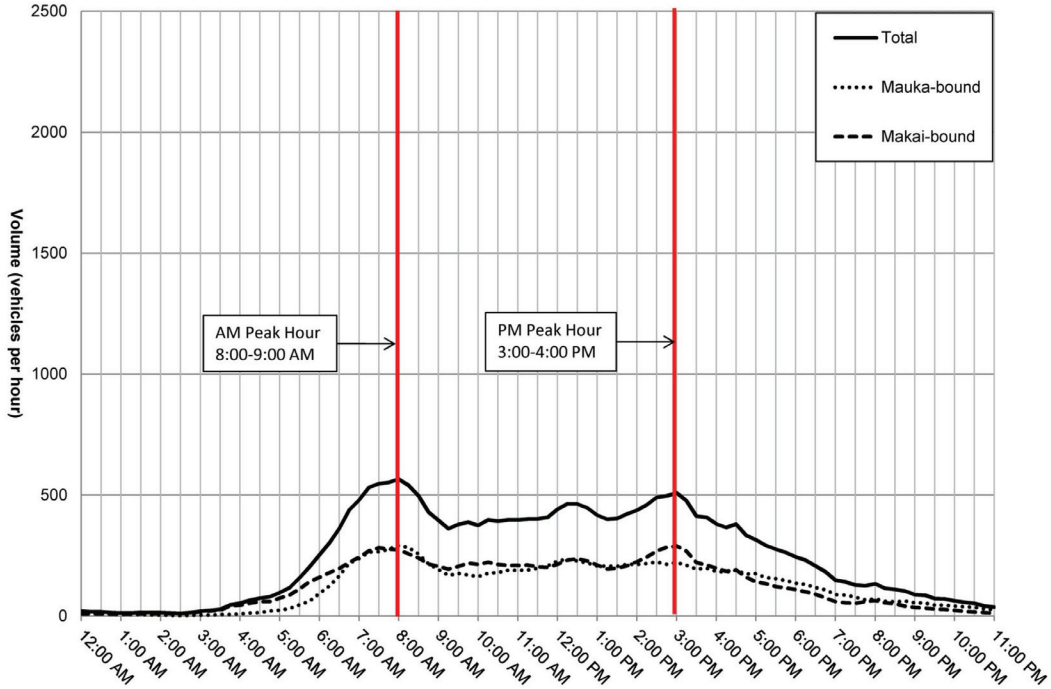

Figure 6: 24-Hour Volume Distribution - Kealakehe Parkway between Queen Ka'ahumanu Highway and Keanalehu Drive

DLNR New Administration and Base Yard Facility – Kealakehe, North Kona, Island of Hawai'i

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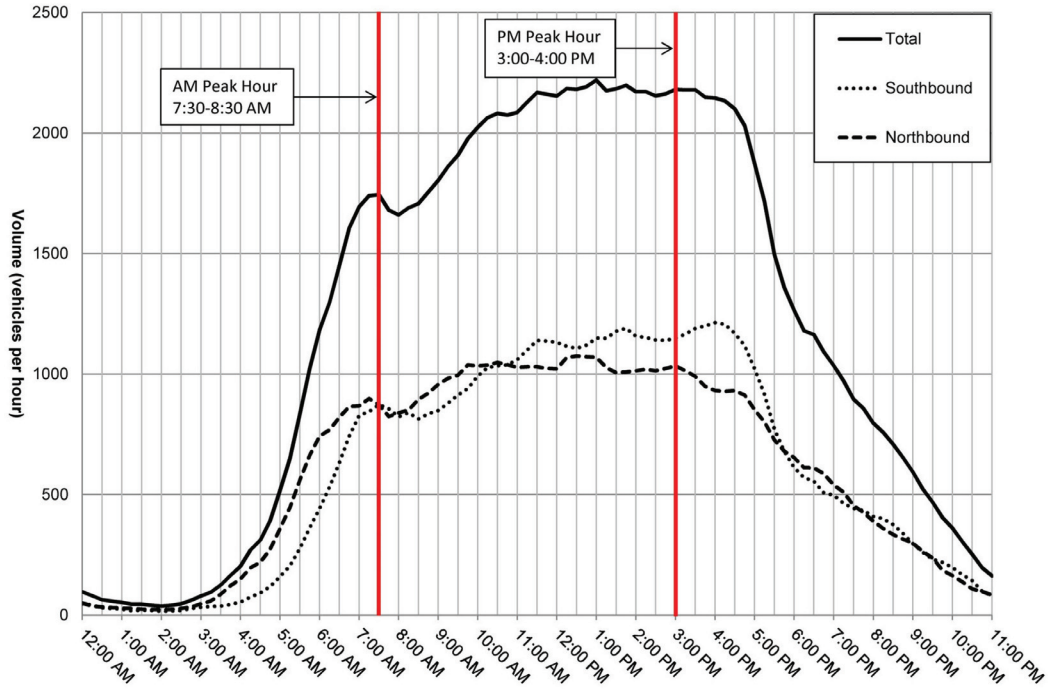

Figure 5: 24-Hour Volume Distribution - Queen Ka'ahumanu Highway between Kealakehe Parkway and Hale Māka'i Place

DLNR New Administration and Base Yard Facility – Kealakehe, North Kona, Island of Hawai'i

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2. Peak Hour Volumes

Peak period turning movement classification counts were taken at the study intersections on Thursday, August 21, 2014 during the AM and PM peak periods from 7:00-9:00 AM and 3:00-5:00 PM. The counts included classification of passenger vehicles, heavy vehicles (buses, trucks, vehicles with trailers), bicycles, and pedestrians. Peak hours generally occurred from 7:30-8:30 AM and 3:30-4:30 PM. Peak hour volumes are presented in Figure 6. Adjacent to the project site, heavy vehicle percent along Queen Ka'ahumanu Highway was 3.7% and 2.1% during the AM and PM peak hours. Appendix A includes the detailed count data.

3. Multi Modal System

a) Transit Bus

The County of Hawai'i transit system has multiple routes that pass the project area in Kona. Bus routes that run along Queen Ka'ahumanu Highway, adjacent to the project area, include "North Kohala/Waimea/Kailua-Kona", "Intra-Kona" and "Pahala/Kona/South Kohala".

The "North Kohala/Waimea/Kailua-Kona" bus route has one morning and one afternoon run. The morning run departs North Kohala at 6:45 AM en route to Kailua-Kona; the afternoon run departs Kailua-Kona at 1:35 PM and travels to North Kohala. The commute between North Kohala and Kailua-Kona takes about three hours.

The "Intra-Kona" transit bus has varied frequency, departing southern Kona every 45-120 minutes (depending on the time of day and bus stop location), between 5:00 AM and 6:30 PM. The bus departs from northern Kona between 6:25 AM and 4:50 PM over the same frequency. There are ten departures from southern Kona and from northern Kona.

The "Pahala/Kona/South Kohala" transit bus has varied frequency, departing approximately every 135 minutes, from Pahala between 3:30 AM and 8:00 AM. It also departs South Kohala resorts at 7:15 AM and 2:30 PM. For departures from South Kohala resorts to Pahala, there is one morning departure, one afternoon departure, and one evening departure. The commute between Pahala and South Kohala resorts takes about three and a half hours. During the AM and PM peak hours, there are two to three buses travelling along Queen Ka'ahumanu Highway past the project site. Appendix B includes bus route maps and timetables.

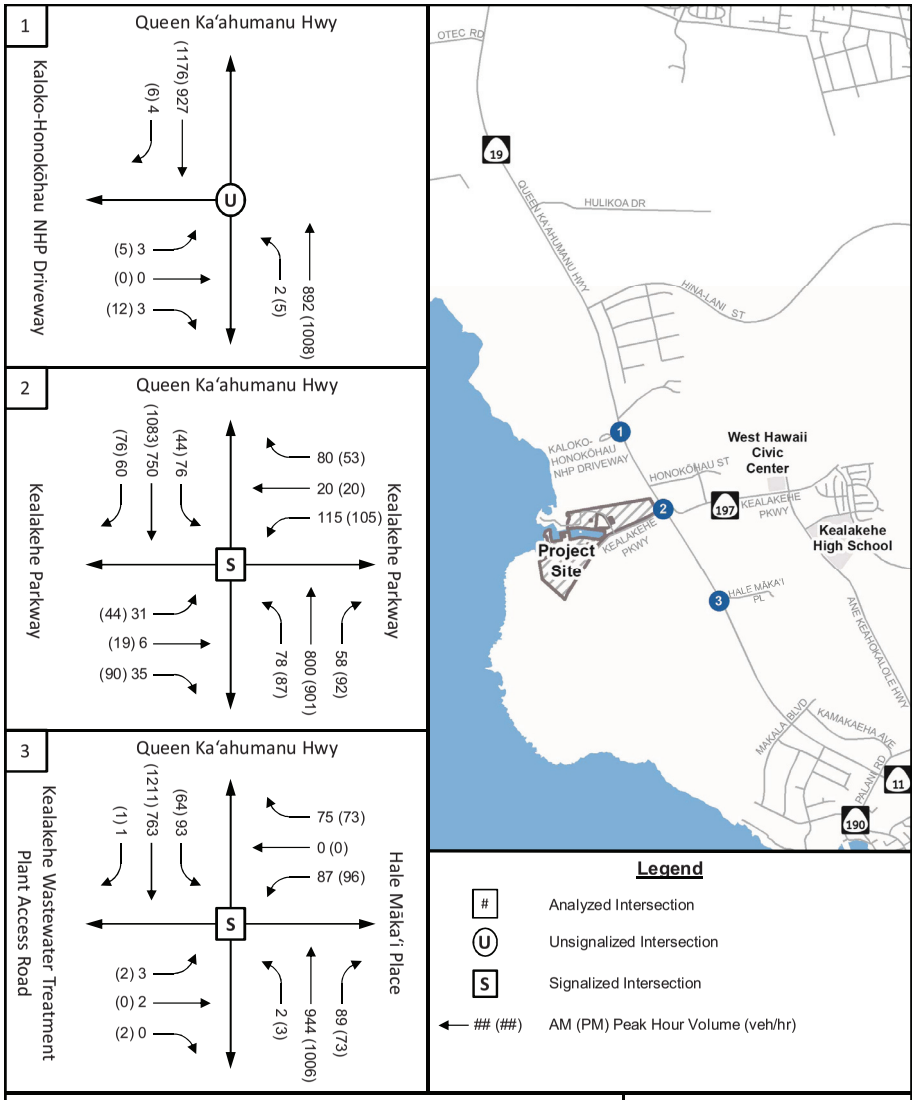

Figure 7: Existing (2014) Peak Hour Volume

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b) Bicycle

Queen Ka'ahumanu Highway is both the training route and race route for the Iron Man Triathlon, which occurs annually in October. For approximately a two month period prior to the race, there is a large volume of bike users along the highway. At other times of the year the volume of bikes along Queen Ka'ahumanu Highway it is more moderate, used by experienced and recreational cyclists. Travel by the bikes primarily occurs in the wide shoulders with marked designated bike lanes between the through-traveling and right turn lanes at intersections. During the four-hour peak hour counts, 25 to 51 bicycles were counted at intersections along Queen Ka'ahumanu. Peak hour bicycle volumes are shown in Figure 7.

c) Pedestrian

Pedestrian volumes in the area are minimal likely due to the high vehicular travel speeds and lack of designated pedestrian facilities along the highway. Peak hour pedestrian volumes are shown in Figure 7.

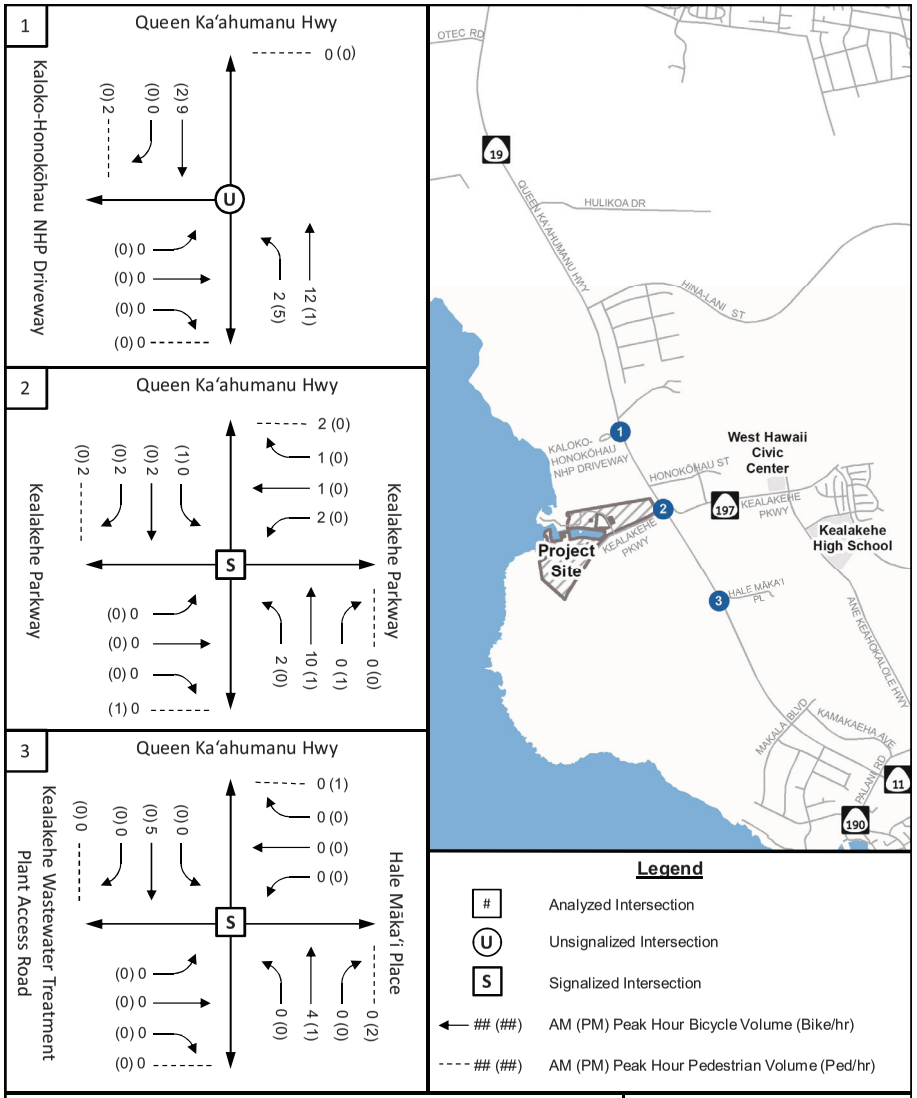

Figure 8: Existing (2014) Pedestrian-Bicycle Peak Hour Volumes

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C. Level of Service

1. Methodology

Level of service (LOS) is a rating system used in traffic engineering to measure the effectiveness of roadway operating conditions. There are six LOS ranging from A to F. LOS A is defined as being the least interrupted flow conditions with little or no delays, whereas LOS F is defined as conditions where extreme delays exist. *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011) states that an "appropriate" LOS for an urban arterial, which is the classification of Queen Ka'ahumanu Highway through the study area, is LOS C or D. Therefore, it is assumed that appropriate LOS for study intersections and turning movements should be LOS D or better. Intersection LOS and delay was determined for the AM and PM peak hours using *Synchro Version 8.0* traffic analysis software.

As stated in the *Highway Capacity Manual (HCM)* (TRB, 2010), LOS for a two-way stop controlled (TWSC) intersection is determined by the measured control delay (see Table 2) and is defined for each minor movement, not for the intersection as a whole. Vehicles traveling along the major, free-flow road, of a TWSC intersection, proceed through with minimal delay. Those vehicles approaching the intersection along the minor movement are controlled by a stop sign and thus experience delay attributable to the volume of vehicles passing along the free-flow road and the gaps available.

Table 2: LOS Criteria for Unsignalized Intersections

Average Control Delay (s/veh)	LOS by v/c Ratio	
	<=1.0	>1.0
≤ 10.0	A	F
>10 and ≤15	B	F
>15 and ≤25	C	F
>25 and ≤35	D	F
>35 and ≤50	E	F
>50	F	F

Source: *Highway Capacity Manual* (TRB, 2010)

The LOS analysis for signalized intersections is based on average total vehicle delay based on the methodologies of the *HCM* (TRB, 2010) shown in Table 3. High numbers of vehicles passing the intersection, long cycle lengths, inappropriate signal phasing, or a poor signal progression can result in long delays, and consequently poor LOS.

Table 3: LOS Criteria for Signalized Intersections

Average Control Delay (s/veh)	LOS by v/c Ratio	
	<=1.0	>1.0
≤ 10.0	A	F
>10 and ≤20	B	F
>20 and ≤35	C	F
>35 and ≤55	D	F
>55 and ≤80	E	F
>80	F	F

Source: *HCM* (TRB, 2010)

Another measure of intersection operation is the volume to capacity (v/c) ratio. This is the ratio of the volume of traffic utilizing the intersection compared to the maximum volume of vehicles that can be accommodated by the intersection during a specific period of time. A v/c ratio under 0.85 means the intersection is operating under capacity and excessive delays are not experienced. An intersection is operating near its capacity when v/c ratios range from 0.85 to 0.95. Unstable flows are expected when the v/c ratio is between 0.95 and 1.0. Any v/c ratio greater than or equal to 1.0 indicates that the intersection is operating at or above capacity which results in a LOS F per the *HCM* (TRB, 2010). A traffic movement can have a poor LOS but low v/c which suggests that the traffic volumes along that movement are low but have to wait a long time to make the movement. This is common for low volume protected turn movements or side streets that have to wait through a long cycle length for their split to come up.

2. Existing (2014) Intersection Conditions

Existing (2014) intersection conditions were analyzed using current traffic signal timing splits. Existing (2014) LOS for the signalized intersections of Queen Ka'ahumanu Highway at Kealakehe Parkway and Queen Ka'ahumanu Highway at Hale Māka'i Place operated at an appropriate LOS C or better during the AM and PM peak hours (see Table 4). The eastbound minor approach at the unsignalized intersection of Queen Ka'ahumanu Highway and Kaloko-Honokōhau National Historic Park (NHP) driveway operated at LOS E during the AM and PM peak hours although had a low v/c ratio which suggested that additional capacity existed. Appendix C provides the detailed analysis reports for the Existing (2014) conditions.

Table 4: Existing (2014) Intersection Level of Service

Unsignalized Intersection	App	Mvmt	AM			PM		
			Delay	v/c	LOS	Delay	v/c	LOS
Queen Ka'ahumanu Highway and Kaloko-Honokōhau NHP driveway	NB	L	10.6	0.01	B	11.4	0.01	B
	EB	LR	**37.0**	0.12	**E**	**35.4**	0.19	**E**

Signalized Intersection	App	Mvmt	AM			PM		
			Delay	v/c	LOS	Delay	v/c	LOS
Queen Ka'ahumanu Highway and Kealakehe Parkway	Intersection		33.0	-	C	34.0	-	C
	EB	LTR	**70.6**	0.19	**E**	**79.8**	0.29	**E**
	WB	LTR	**84.1**	0.76	**F**	**91.2**	0.74	**F**
	NB	L	**109.7**	0.83	**F**	**204.5**	**1.05**	**F**
		T	16.7	0.66	B	14.7	0.68	B
	SB	L	**149.7**	0.91	**F**	**107.3**	0.79	**F**
		T	16.7	0.65	B	22.4	0.82	C
Queen Ka'ahumanu Highway and Hale Māka'i Place	Intersection		20.4	-	C	18.0	-	B
	EB	LTR	39.2	0.45	D	53.2	0.43	D
	WB	LTR	33.5	0.74	C	36.6	0.74	D
	NB	L	**78.5**	0.42	**E**	**68.3**	0.42	**E**
		T	23.0	0.83	C	16.8	0.67	B
	SB	L	35.2	0.76	D	41.7	0.72	D
		T	13.3	0.53	B	15.6	0.71	B

III. FUTURE CONDITIONS

All phases of the DLNR New Administration and Base Yard Facility are anticipated to be developed by 2025. Therefore, for an understanding and comparison of build-out conditions in the area, study intersections are being analyzed for the future year 2025.

A. Surrounding Area Conditions

1. Roadway Construction

The **Queen Ka'ahumanu Highway** Widening, Phase 2, Kealakehe Parkway to Keāhole Airport Road, project will widen the existing highway to four lanes as well as complete intersection improvements. Initial design has been completed and despite delays, and potential need for redesign, start of construction is expected to occur in the next couple of years. As a part of the widening of Queen Ka'ahumanu Highway for Phase 2, access to Natural Energy Laboratory of Hawai'i Authority (NELHA) and Hawai'i Ocean Science and Technology Park will be restricted. The intersection of Queen Ka'ahumanu Highway and OTEC Road will become a right-in right-out intersection. To alleviate the limited access, NELHA and HDOT are proposing to open a makai leg at the signalized intersection of Queen Ka'ahumanu Highway and Kaiminani Drive.

The **Ane Keohokalole Highway**, also referred to as the Mid-Level Highway, was recently opened in June 2012 for the section between Palani Road (south of Kealakehe Parkway) and Hina Lani Street. Further construction of the road, from Hina Lani Street to Kaiminani Drive, by the COH is planned although nothing has been confirmed or is shown in the STIP. Future widening of the road is also planned although was not included in the STIP at the time of this report.

2. Surrounding Developments

Future developments in the vicinity of the project identified in the Kailua-Kona Regional Project Development Map (see Appendix D). These were researched for their latest status and all developments considered credible for construction. The following developments are considered credible for construction:

- Kona Judiciary Complex
- DHHL Villages of Laiopua
- Kaloko Industrial Park
- Kamakana Villages at Keauholu
- West Hawai'i Business Park
- West Hawai'i Civic Center
- Queen Liliuokalani Trust Lands
- Lanihau Shopping Center Phase II
- Mohala Kona Village
- Kaloko Heights
- Kona 327 (Kona View Estates)
- Kula Nei
- Honokohau Village

- Shores of Kohanaiki
- Lokahi Makai
- Makalei Estates
- Palamanui
- University of Hawai'i – West Hawai'i Center

B. Geometric Conditions

Resulting roadway construction and intersection lane configuration used for Future Without Project conditions includes the Phase 2 widening of Queen Ka'ahumanu Highway from Kealakehe Parkway to Keāhole Airport Road. The widening has been delayed due to the need to re-evaluate the culture impact of the widening. However, it is assumed the widening will be completed by the analysis year of 2025. Proposed changes to intersection configuration include the reconfiguration of the intersections of Queen Ka'ahumanu Highway at Kealakehe Parkway and at Kaloko-Honokōhau NHP driveway. The lane configurations for Future Without Project conditions are shown in Figure 8.

From research into the *Statewide Transportation Improvements Program* (STIP), there are no planned improvements or realignment of Kealakehe Parkway or additional roadway projects that are anticipated in the area that would affect the roadway geometrics in the study area by 2025.

C. Volumes

1. Background Growth

Traffic volumes along Queen Ka'ahumanu Highway, from HDOT *Historical Traffic Station Maps*, showed no change in ADT over the past six years (from 2006 to 2012). The *Hawai'i Long Range Land Transportation Plan* (HLRLTP) "2020 Baseline" TransCAD model (CH2M Hill, 2013) projects a cumulative increase of 3.0% along Queen Ka'ahumanu Highway near Kealakehe Parkway from the 2007 Existing model. This takes into account the future widening of Queen Ka'ahumanu Highway as well as anticipated surrounding development at time of the study. To reflect a smaller increase in volume than originally projected, although still accounting for the Queen Ka'ahumanu Highway widening, a compounded growth rate of 1.5% was applied to the through traffic along Queen Ka'ahumanu Highway to account for background growth.

Traffic volumes along Kealakehe Parkway, from HDOT *Historical Traffic Station Maps*, showed ADT to increase 9.3% annually from 2008 to 2012. This large growth is possibly due to the construction of the DHHL residences of Lai Opua, the opening of Ane Keohokalole Highway, as well as the opening of the West Hawai'i Civic Center. For the analysis of DLNR intersection impacts, no background growth in traffic volume was applied along Kealakehe Parkway, only considering the impact resulting from future surrounding area development trips.

2. Surrounding Area Development

An increase in traffic volumes resulting from regional surrounding area development was considered to be accounted for in the background growth. Project related trips for the developments that have primary

access at the study intersections were extracted from their respective traffic reports, where available, and applied to Future (2025) volume conditions. These developments include:

- Kona Judiciary Complex
- DHHL Villages of Laiopua
- West Hawai'i Civic Center
- West Hawai'i Business Park
- Honokōhau Village

3. Future (2025) Without Project Volumes

Future (2025) Without Project peak hour volumes at the study intersections are shown in Figure 9. It is not expected that there will be a significant change in pedestrian or bicycle traffic in the area. The increase to Future (2025) Without Project ADT along Queen Ka'ahumanu Highway is a result of the background growth and surrounding area development (see Table 5).

Table 5: Future (2025) Without Project Roadway ADT

Roadway	ADT
Queen Ka'ahumanu Highway	46,700

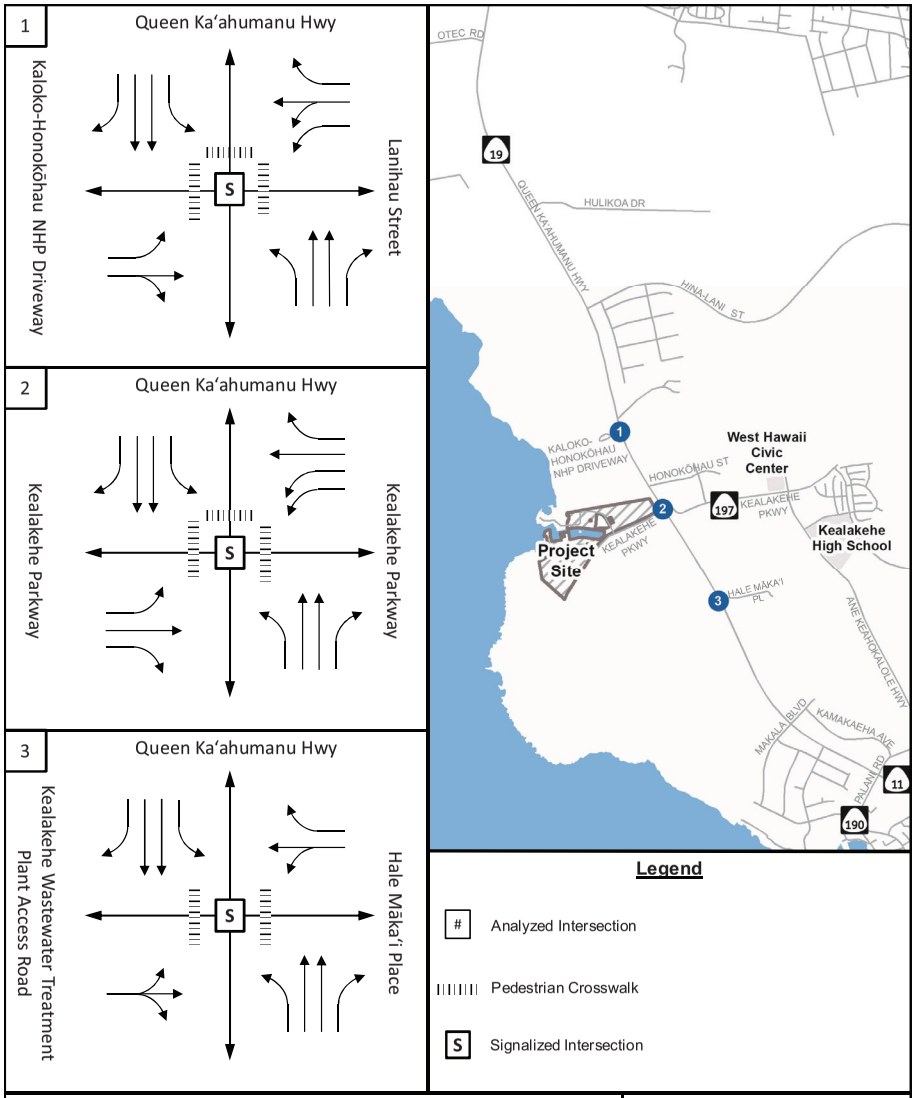

Figure 9: Future (2025) Without Project Lane Configuration

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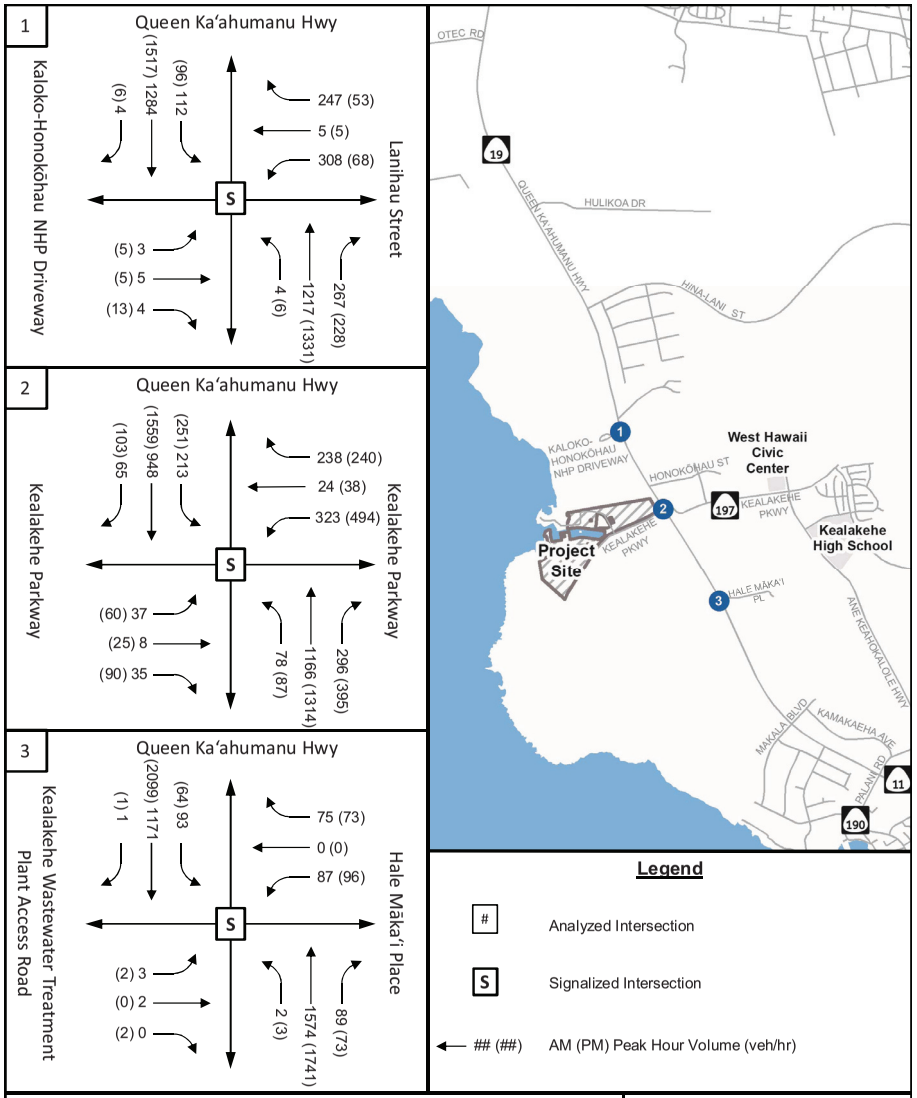

Figure 10: Future (2025) Without Project Peak Hour Volume

DLNR New Administration and Base Yard Facility - Kealakehe, North Kona, Island of Hawai'i

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4. Project Volumes

a) Trip Generation

Trips generated from the new DLNR facility were calculated using land use rates for a general office building in the *Trip Generation, 8th Edition* (ITE, 2008) which is shown in Table 6. These rates are based on comparable national facilities which may contain a mixture of tenants. This land use was considered applicable as there are seven divisions of DLNR that will be situated in the facility.

Analysis was conducted for the 62,000 square-foot facility proposed in the *Preliminary Planning and Site Assessment Report* (EAI, 2013). In October 2014 the site plan was modified in response to requests from DLNR. These changes resulted in a 41,000 square-foot facility being proposed for construction. Trip generation and analysis for the 62,000 square-foot facility was retained due to the resulting impact being negligible thereby leading to the conclusion that the 41,000 square-foot facility would also have negligible impact on traffic operations.

In addition to the administration buildings, there are Public Meeting rooms that can accommodate up to 200 people. It was noted in the proposed project's *Preliminary Planning and Site Assessment Report* (EAI, 2013) that the Public Meeting rooms would only be accessible after regular business hours. Therefore, it is assumed that public meetings will also occur outside of peak hours, lessening their impact on the study intersections, and will not be included in the analysis of the proposed project's peak hour impacts. The volumes calculated represent a worst case scenario with regards to impact resulting from vehicular traffic generated.

Table 6: Project Related Volumes Trip Generation

Land Use [ITE Code]	Qty	Units	Trip Generation							
			AM				PM			
			Rate	In	Out	Total	Rate	In	Out	Total
General Office Building [210]	62*	1,000 s.f.	1.55	84	12	96	1.49	16	76	92

Source: *Trip Generation, 8th Edition* (ITE, 2008)

* In October 2014, the proposed facility was reduced to 41,000 s.f.

b) Trip Distribution/Assignment

Following trip generation, trip distribution matches trip maker's origins and destinations to determine the number of trips from each development. Traffic assignment involves the selection of routes between the specified origins and destinations. Trips were assumed to follow existing intersection distribution calculated from the peak hour turning movement traffic counts. During the AM peak hour, about 40% travel to/from the north, 50% to/from the south and 10% to/from mauka. During the PM peak hour, vehicles entering are 40% from the north, 50% from the south and 10% from mauka while vehicles exiting are 30% travel north, 60% travel south and 10% travel mauka. Figure 10 includes project related trips.

HDOT standard practice is that intersections that result in a 3-5% increase in traffic volume resulting from project related trips should be considered in the study area. Project related trips along Queen Ka'ahumanu

Highway, north and south of the intersection with Kealakehe Parkway, represent less than 3% of peak hour volumes thereby suggesting that impacts at adjacent intersections are minimal.

c) Future (2025) With Project Peak Hour Volumes

Project related peak hour volumes were added to Future (2025) Without Project Peak Hour Volumes for the resulting Future (2025) With Project traffic volumes (see Figure 11). These volumes were used in the analysis for Future (2025) With Project conditions.

There will be a minimal increase to Future (2025) daily traffic volumes along Queen Ka'ahumanu Highway as a result of the project related traffic. Projected Future (2025) With Project roadway ADT is shown in Table 7.

Table 7: Future (2025) With Project Roadway ADT Comparison

Roadway	Year	ADT
Queen Ka'ahumanu Highway	Existing (2012)	28,900
	Future (2025) Without Project	46,700
	Future (2025) With Project	47,300

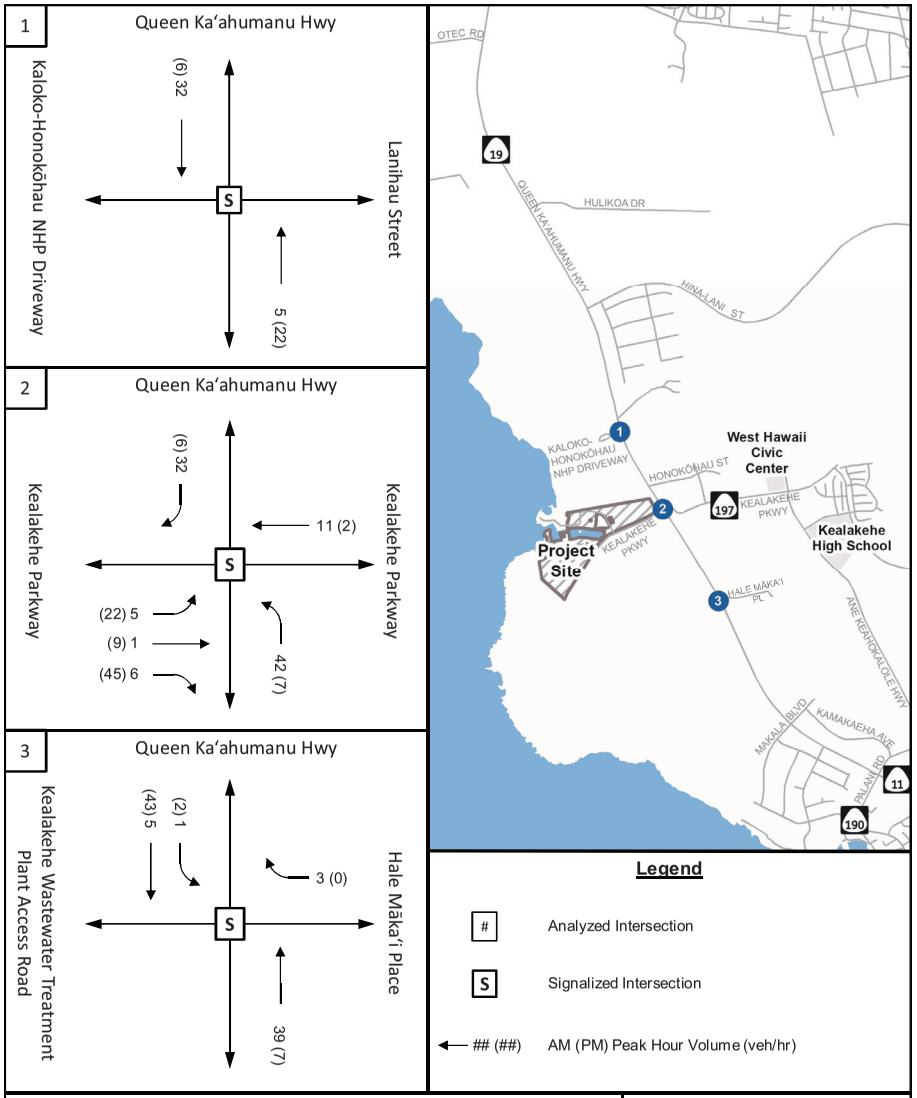

Figure 11: Project Related Peak Hour Volume

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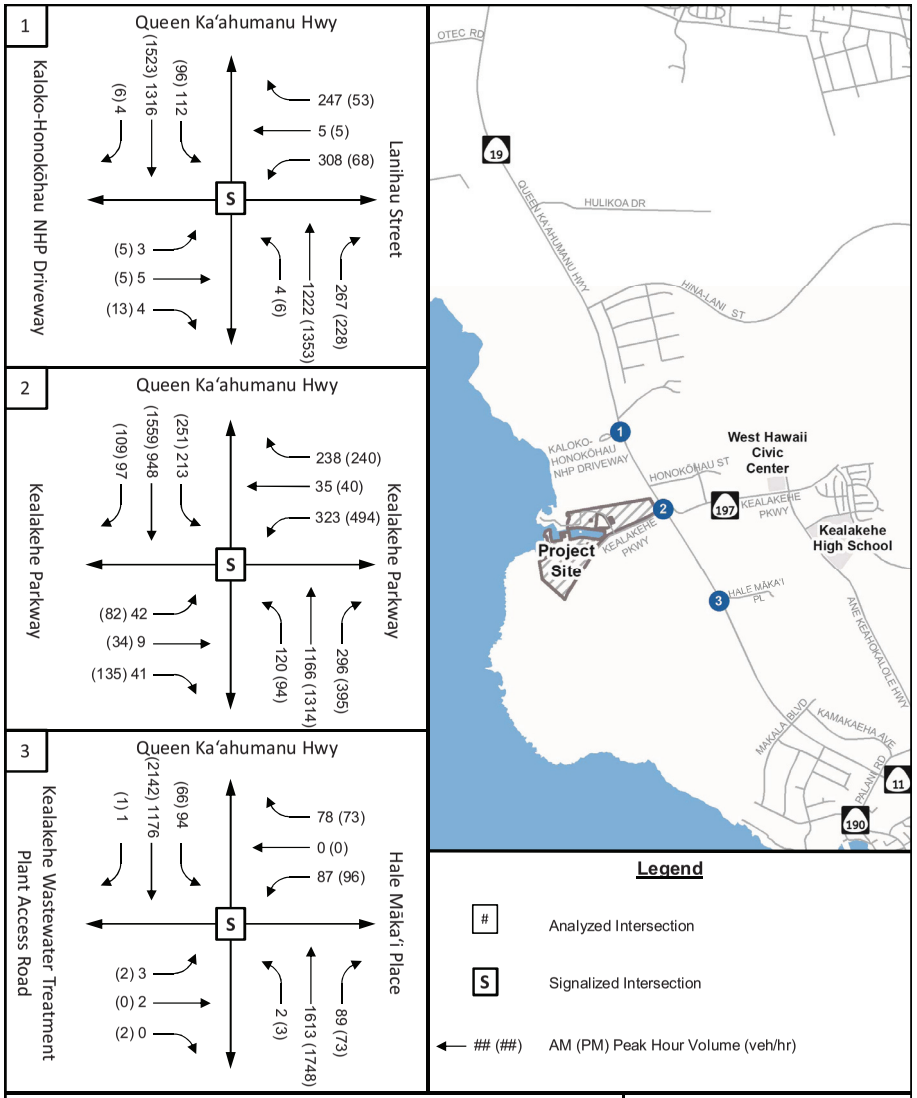

Figure 12: Future (2025) With Project Peak Hour Volume

DLNR New Administration and Base Yard Facility - Kealakehe, North Kona, Island of Hawai'i

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D. Level of Service

1. Future (2025) Without Project

Signalized intersection cycle lengths and splits were optimized for Future (2025) Without Project conditions. With the proposed widening of Queen Ka'ahumanu Highway, the study intersection LOS improved to LOS C or better during the AM and PM peak hours (see Table 8). Some intersection movements still resulted in poor LOS but most had v/c less than 1.0 which shows that additional capacity exists. The WBL and SBL movements during the PM at the intersection of Queen Ka'ahumanu were greater than 1.0. Appendix E provides the detailed analysis reports for the Future (2025) Without Project conditions.

Table 8: Future (2025) Without Project Intersection Level of Service

Signalized Intersection	App	Mvmt	AM			PM		
			Delay	v/c	LOS	Delay	v/c	LOS
Queen Ka'ahumanu Highway and Kaloko-Honokōhau NHP driveway/Lanihau Street	Intersection		14.9	-	B	9.8	-	A
	EB	L	40.9	0.36	D	37.2	0.35	D
		TR	35.7	0.21	D	32.5	0.21	C
	WB	LT	28.5	0.71	C	28.6	0.45	C
	NB	L	**81.7**	0.54	**F**	**63.4**	0.54	**E**
		T	13.5	0.73	B	9.2	0.69	A
	SB	L	43.9	0.79	D	40.0	0.78	D
		T	10.1	0.71	B	7.0	0.68	A
Queen Ka'ahumanu Highway and Kealakehe Parkway	Intersection		34.1	-	C	51.6	-	D
	EB	L	**64.9**	0.80	**E**	**61.5**	0.78	**E**
		T	36.2	0.11	D	42.4	0.27	D
	WB	L	**63.0**	0.95	**E**	**81.9**	**1.03**	**F**
		T	**28.8**	0.11	C	30.9	0.14	C
	NB	L	41.3	0.78	D	**113.2**	0.94	**F**
		T	31.3	0.90	C	47.4	0.99	D
	SB	L	**65.2**	0.91	**E**	**99.0**	**1.02**	**F**
		T	16.4	0.62	B	32.7	0.94	C
Queen Ka'ahumanu Highway and Hale Māka'i Place	Intersection		23.0	-	C	26.6	-	C
	EB	LTR	**60.1**	0.47	**E**	**72.8**	0.44	**E**
	WB	LT	**72.4**	0.80	**E**	**91.6**	0.88	**F**
	NB	L	**98.8**	0.42	**F**	**87.7**	0.42	**F**
		T	25.4	0.90	C	21.4	0.86	C
	SB	L	**72.1**	0.80	**E**	**76.6**	0.78	**E**
		T	11.2	0.56	B	25.8	0.94	C

2. Future (2025) With Project

Using Future (2025) Without Project lane configurations, the Future (2025) With Project conditions resulted in a slight increase in delay and a negligible reduction in LOS, as compared to Future (2025) Without Project conditions (see Table 9). The intersection of Queen Ka'ahumanu Highway and Kaloko-Honokōhau NHP driveway/Lanihau Street resulted in LOS B and A during the AM and PM peak hours respectively. The intersection of Queen Ka'ahumanu Highway and Kealakehe Parkway resulted in LOS D, which is still considered acceptable. The intersection of Queen Ka'ahumanu Highway and Hale Māka'i Place remained at LOS C during the peak hours. The same intersection movements resulted in v/c greater than 1.0 as did for Future (2025) Without Project conditions. Appendix F provides the detailed analysis reports for the Future (2025) With Project conditions.

Table 9: Future (2025) With Project Intersection Level of Service

Signalized Intersection	App	Mvmt	AM			PM		
			Delay	v/c	LOS	Delay	v/c	LOS
Queen Ka'ahumanu Highway and Kaloko-Honokōhau NHP driveway/Lanihau Street	Intersection		15.0	-	B	9.9	-	A
	EB	L	40.9	0.36	D	37.3	0.35	D
		TR	35.7	0.21	D	32.6	0.21	C
	WB	LT	28.5	0.71	C	28.6	0.45	C
	NB	L	**81.8**	0.54	**F**	**63.5**	0.54	**E**
		T	13.5	0.73	B	9.3	0.70	A
	SB	L	43.9	0.79	D	40.1	0.78	D
		T	10.5	0.73	B	7.1	0.68	A
Queen Ka'ahumanu Highway and Kealakehe Parkway	Intersection		35.8	-	D	52.7	-	D
	EB	L	**68.8**	0.79	**E**	**62.7**	0.78	**E**
		T	36.1	0.11	D	43.4	0.36	D
	WB	L	**63.9**	0.95	**E**	**82.3**	**1.03**	**F**
		T	29.5	0.17	C	32.3	0.16	C
	NB	L	49.6	0.80	D	**79.7**	0.84	**E**
		T	31.7	0.90	C	47.6	0.99	D
	SB	L	**66.1**	0.91	**E**	**99.4**	**1.02**	**F**
		T	18.9	0.67	B	36.8	0.96	D
Queen Ka'ahumanu Highway and Hale Māka'i Place	Intersection		27.0	-	C	27.7	-	C
	EB	LTR	**54.7**	0.47	**D**	**72.3**	0.44	**E**
	WB	LT	**124.0**	0.98	**F**	**129.7**	**1.00**	**F**
	NB	L	**93.6**	0.42	**F**	**87.2**	0.42	**F**
		T	26.8	0.93	C	20.7	0.85	C
	SB	L	**124.0**	0.98	**F**	**69.0**	0.78	**E**
		T	11.3	0.58	B	26.6	0.95	C

3. Mitigation

With all intersections operating at LOS D or better for the Future (2025) With Project conditions, no mitigation is recommended for the study intersections as a result of this project. For the analysis of Future Without Project and Future With Project conditions, traffic signal timings were optimized using *Synchro* software. Traffic signal timing cycle lengths were reduced in order to lower total intersection delay to acceptable LOS levels. The reduction of cycle lengths was achieved by minimizing the time given to minor movements in order to allow the phases with the largest volumes to get higher percentages of green time. This results in some of these minor movements operating with poor LOS. Therefore, where specific traffic movements are not operating acceptably, signal timing splits or cycle lengths can be adjusted to accommodate these movements.

IV. SUMMARY AND RECOMMENDATION

The State of Hawai‘i, DLNR is proposing to develop a new facility which will combine DLNR staff administrative offices and base yard services into a single location near Honokōhau harbor. Access to the facility is proposed to come through two driveway locations off of the makai leg of Kealakehe Parkway at the intersection with Queen Ka‘ahumanu Highway. Completion of all phases of the new DLNR facility is anticipated to occur by 2025. This TIAR was prepared in support of the proposed environmental permitting.

Existing (2014) LOS were appropriate at the signalized intersections of Queen Ka‘ahumanu Highway at Kealakehe Parkway and Queen Ka‘ahumanu Highway at Hale Māka‘i Place, although some turning movements operated poorly. The eastbound approach at the unsignalized intersection of Queen Ka‘ahumanu Highway and Kaloko-Honokōhau NHP driveway operated at poor LOS.

HDOT has plans to widen Queen Ka‘ahumanu Highway to four lanes, from Kealakehe Parkway to Keāhole Airport Road. With the widening, the unsignalized intersection of Queen Ka‘ahumanu Highway and NHP driveway will become signalized. Using the future lane configuration and intersection control, Future (2025) Without Project conditions resulted in appropriate intersection LOS. As with existing conditions some turning movements resulted in poor LOS.

Current plans propose the construction of a 41,000 square-foot DLNR facility. However, trip generation and analysis was conducted for a 62,000 square-foot facility as was proposed in the *Preliminary Planning and Site Assessment Report* (EAI, 2013). With the addition of DLNR project related trips, Future (2025) With Project resulted in similar study intersection operations as calculated for Future (2025) Without Project conditions which were acceptable LOS.

With all intersections operating at LOS D or better for the Future (2025) With Project conditions, no mitigation is recommended for the study intersections as a result of this project. Where specific traffic movements are not operating acceptably, signal timing splits or cycle lengths can be adjusted to accommodate these movements.

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APPENDIX A

24-Hour Data and Intersection Peak Period Traffic Counts

Run Date: 2013/03/15

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**

2012 Program Count - Summary

Site ID: B71001909732 **Town:** Hawaii **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 28300
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 19
Location: QUEEN K Hwy - KEALAKEHE PARKWAY TO P

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 06/20/2012															
12:00-12:15	17	19	36	06:00-06:15	71	161	232	12:00-12:15	301	239	540	06:00-06:15	165	192	357
12:15-12:30	19	12	31	06:15-06:30	106	162	268	12:15-12:30	267	263	530	06:15-06:30	143	153	296
12:30-12:45	6	12	18	06:30-06:45	130	202	332	12:30-12:45	244	262	506	06:30-06:45	169	154	323
12:45-01:00	13	10	23	06:45-07:00	155	209	364	12:45-01:00	273	243	516	06:45-07:00	139	137	276
01:00-01:15	9	5	14	07:00-07:15	161	171	332	01:00-01:15	287	273	560	07:00-07:15	151	137	288
01:15-01:30	3	10	13	07:15-07:30	197	247	444	01:15-01:30	268	265	533	07:15-07:30	128	148	276
01:30-01:45	5	13	18	07:30-07:45	243	252	495	01:30-01:45	299	271	570	07:30-07:45	128	130	258
01:45-02:00	8	8	16	07:45-08:00	223	230	453	01:45-02:00	314	246	560	07:45-08:00	118	102	220
02:00-02:15	0	4	4	08:00-08:15	179	210	389	02:00-02:15	268	259	527	08:00-08:15	99	121	220
02:15-02:30	9	9	18	08:15-08:30	229	204	433	02:15-02:30	312	274	586	08:15-08:30	91	102	193
02:30-02:45	2	5	7	08:30-08:45	213	193	406	02:30-02:45	290	256	546	08:30-08:45	122	111	233
02:45-03:00	3	8	11	08:45-09:00	179	223	402	02:45-03:00	272	235	507	08:45-09:00	99	67	166
03:00-03:15	5	5	10	09:00-09:15	195	222	417	03:00-03:15	301	248	549	09:00-09:15	88	64	152
03:15-03:30	8	11	19	09:15-09:30	188	243	431	03:15-03:30	307	254	561	09:15-09:30	74	71	145
03:30-03:45	11	13	24	09:30-09:45	242	219	461	03:30-03:45	306	253	559	09:30-09:45	80	69	149
03:45-04:00	8	17	25	09:45-10:00	190	254	444	03:45-04:00	286	205	491	09:45-10:00	48	55	103
04:00-04:15	9	16	25	10:00-10:15	219	264	483	04:00-04:15	299	245	544	10:00-10:15	55	55	110
04:15-04:30	9	40	49	10:15-10:30	241	248	489	04:15-04:30	324	218	542	10:15-10:30	47	44	91
04:30-04:45	17	45	62	10:30-10:45	282	259	541	04:30-04:45	310	217	527	10:30-10:45	54	36	90
04:45-05:00	16	51	67	10:45-11:00	247	256	503	04:45-05:00	303	246	549	10:45-11:00	27	35	62
05:00-05:15	24	64	88	11:00-11:15	254	202	456	05:00-05:15	278	221	499	11:00-11:15	22	27	49
05:15-05:30	32	60	92	11:15-11:30	236	275	511	05:15-05:30	274	219	493	11:15-11:30	23	21	44
05:30-05:45	41	98	139	11:30-11:45	280	274	554	05:30-05:45	231	193	424	11:30-11:45	13	16	29
05:45-06:00	68	139	207	11:45-12:00	272	241	513	05:45-06:00	176	177	353	11:45-12:00	11	19	30

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM		
AM - PEAK HR VOLUME	842	939	1781
AM - K FACTOR (%)			6.34
AM - D (%)	47.28	52.72	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM	07:15 AM to 08:15 AM	
AM - PEAK HR VOLUME	874	939	

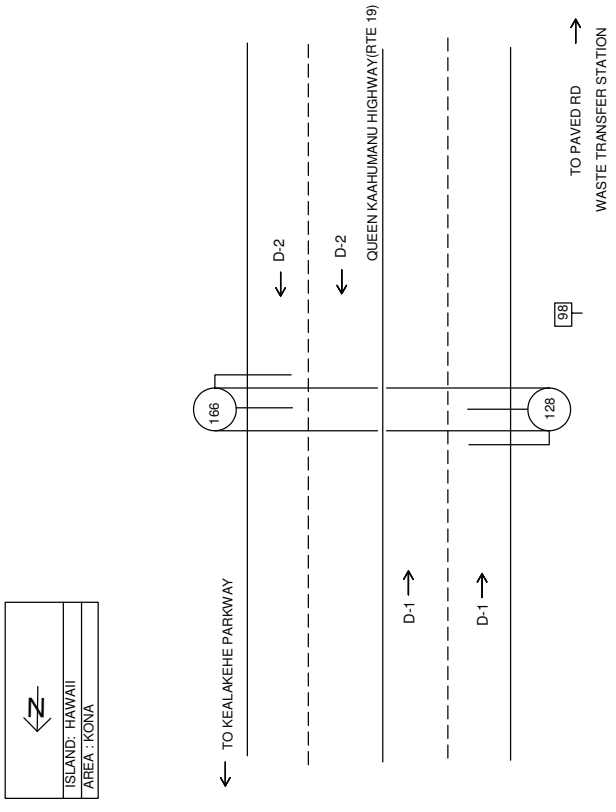
PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:00 PM to 05:00 PM		
PM - PEAK HR VOLUME	1236	926	2162
PM - K FACTOR (%)			7.69
PM - D (%)	57.17	42.83	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:00 PM to 05:00 PM	03:00 PM to 04:00 PM	
PM - PEAK HR VOLUME	1236	960	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	1042	992	2034
AM - K FACTOR (%)			7.24
AM - D (%)	51.23	48.77	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	01:30 PM to 02:30 PM		
PM - PEAK HR VOLUME	1193	1050	2243
PM - K FACTOR (%)			7.98
PM - D (%)	53.19	46.81	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	01:30 PM to 02:30 PM		
PEAK HR VOLUME	1193	1050	2243
DIRECTIONAL PEAK			
PEAK HR TIME	01:30 PM to 02:30 PM	01:00 PM to 02:00 PM	
PEAK HR VOLUME	1193	1055	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	4,932	5,421	10,353
AM 12-HR PERIOD (00:00-12:00)	5,274	6,095	11,369
PM 6-HR PERIOD (12:00-18:00)	6,790	5,782	12,572
PM 12-HR PERIOD (12:00-24:00)	8,884	7,848	16,732
24 HOUR PERIOD	14,158	13,943	28,101
D (%)	50.38	49.62	100.00



Station No: B71 0019 09732

Station Location: Queen Kaahumanu Highway @ the 98 milepost

Station Mileage:	97.80	GPS Coord (Latitude):	19.66572 N
		GPS Coord (Longitude):	156.01163 W
Begin Survey (Date/Time):	6/20/2012 0000	End Survey (Date/Time):	6/22/2012 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	CA,LT	Module No.:	

HPMS DATA

Segment Description: QUEEN KAAHUMANU HIGHWAY - KEALAKEHE PARKWAY TO PALANI ROAD (RTE. 190)

Segment Begin LRS	97.32	Segment End LRS	99.59	Length	2.27

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile	
QUEEN KAAHUMANU HIGHWAY	S	14	2	19	97.80	D-1 = Direction to End of Route D-2 = Direction to Beginning of Route D-1 TO PALANI ROAD D-2 TO KUHIO WHARF (HILO)

Sketch By: EPJ Date: 2/23/2012 SLD: 2009

Run Date: 2013/03/15

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section
Vehicle Classification Data Summary
2012

Site ID: B71001909732 — **Route No:** 19 — **Date From:** 2012/06/20 0:00
Town: Hawaii — **Direction:** +MP — **Date To:** 2012/06/21 23:45
Location: QUEEN K Hwy - KEALAKEHE PARKWAY TO P

Functional Classification: 14 URBAN:PRINCIPAL ARTERIAL - OTHER

REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	596	1.05%	1192
PC	51848	91.34%	103695
2A-4T	2826	4.98%	5653
LIGHT VEHICLE TOTALS	55270	97.36%	110540
HEAVY VEHICLES			
Bus	84	0.15%	211
SINGLE UNIT TRUCK			
2A-6T	411	0.72%	822
3A-SU	476	0.84%	1428
4A-SU	28	0.05%	112
SINGLE-TRAILER TRUCKS			
4A-ST	157	0.28%	628
5A-ST	270	0.48%	1350
6A-ST	28	0.05%	168
MULTI-TRAILER TRUCKS			
5A-MT	0	0.00%	0
6A-MT	1	0.00%	6
7A-MT	41	0.07%	287
HEAVY VEHICLE TOTALS	1497	2.64%	5012
CLASSIFIED VEHICLES TOTALS	56768 (A)	100.00%	115552 (B)
UNCLASSIFIED VEHICLES TOTALS	-2	-0.00%	

AXLE CORRECTION FACTOR (A/C) = 0.983

ROADTUBE EQUIVALENT(B/2) = 57776 (C)

PEAK HOUR VOLUME : 2223 2012/06/20 13:00	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
SINGLE UNIT TRUCKS (TYPE 4-7)	41	(65A-1) 1.88%	486	28300	(65A-2) 1.72%	7.86%
COMBINATION (TYPE 8-13)	23	(65B-1) 1.06%	242		(65B-2) 0.86%	7.86%

Run Date: 2013/03/15

Hawaii Department of Transportation
Highways Division — **Highways Planning Survey Section**
2012 Program Count - Summary

Site ID: B71001909732 — **Town:** Hawaii — **DIR 1:** +MP — **DIR 2:** -MP — **Final AADT:** 28300
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER — **Count Type:** CLASS — **Counter Type:** Tube — **Route No:** 19
Location: QUEEN K Hwy - KEALAKEHE PARKWAY TO P

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 06/21/2012															
12:00-12:15	9	16	25	06:00-06:15	75	143	218	12:00-12:15	299	265	564	06:00-06:15	192	182	374
12:15-12:30	15	15	30	06:15-06:30	93	191	284	12:15-12:30	300	283	583	06:15-06:30	128	162	290
12:30-12:45	10	7	17	06:30-06:45	127	201	328	12:30-12:45	300	240	540	06:30-06:45	161	154	315
12:45-01:00	5	6	11	06:45-07:00	127	214	341	12:45-01:00	278	249	527	06:45-07:00	126	172	298
01:00-01:15	9	6	15	07:00-07:15	162	184	346	01:00-01:15	281	324	605	07:00-07:15	122	152	274
01:15-01:30	4	10	14	07:15-07:30	202	210	412	01:15-01:30	282	292	574	07:15-07:30	113	165	278
01:30-01:45	4	1	5	07:30-07:45	237	241	478	01:30-01:45	273	224	497	07:30-07:45	106	130	236
01:45-02:00	5	3	8	07:45-08:00	230	198	428	01:45-02:00	295	242	537	07:45-08:00	127	114	241
02:00-02:15	4	5	9	08:00-08:15	174	205	379	02:00-02:15	298	253	551	08:00-08:15	106	108	214
02:15-02:30	5	5	10	08:15-08:30	228	204	432	02:15-02:30	296	242	538	08:15-08:30	108	101	209
02:30-02:45	4	4	8	08:30-08:45	232	205	437	02:30-02:45	306	246	552	08:30-08:45	95	90	185
02:45-03:00	3	4	7	08:45-09:00	209	232	441	02:45-03:00	273	263	536	08:45-09:00	95	76	171
03:00-03:15	3	7	10	09:00-09:15	192	217	409	03:00-03:15	253	275	528	09:00-09:15	100	105	205
03:15-03:30	9	11	20	09:15-09:30	218	253	471	03:15-03:30	280	249	529	09:15-09:30	77	82	159
03:30-03:45	11	8	19	09:30-09:45	247	232	479	03:30-03:45	286	268	554	09:30-09:45	64	92	156
03:45-04:00	10	20	30	09:45-10:00	224	271	495	03:45-04:00	277	313	590	09:45-10:00	62	55	117
04:00-04:15	4	20	24	10:00-10:15	231	227	458	04:00-04:15	288	239	527	10:00-10:15	59	47	106
04:15-04:30	12	38	50	10:15-10:30	233	274	507	04:15-04:30	309	240	549	10:15-10:30	48	55	103
04:30-04:45	16	48	64	10:30-10:45	259	276	535	04:30-04:45	303	221	524	10:30-10:45	63	26	89
04:45-05:00	21	41	62	10:45-11:00	271	262	533	04:45-05:00	289	237	526	10:45-11:00	41	29	70
05:00-05:15	32	64	96	11:00-11:15	268	295	563	05:00-05:15	294	254	548	11:00-11:15	31	23	54
05:15-05:30	23	66	89	11:15-11:30	251	270	521	05:15-05:30	286	246	532	11:15-11:30	25	20	45
05:30-05:45	46	101	147	11:30-11:45	267	241	508	05:30-05:45	280	206	486	11:30-11:45	15	24	39
05:45-06:00	51	125	176	11:45-12:00	291	254	545	05:45-06:00	225	187	412	11:45-12:00	18	16	34

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM		
AM - PEAK HR VOLUME	869	848	1717
AM - K FACTOR (%)			5.99
AM - D (%)	50.61	49.39	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM	07:15 AM to 08:15 AM	
AM - PEAK HR VOLUME	869	854	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM		
PM - PEAK HR VOLUME	1160	1060	2220
PM - K FACTOR (%)			7.74
PM - D (%)	52.25	47.75	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:15 PM to 05:15 PM	03:00 PM to 04:00 PM	
PM - PEAK HR VOLUME	1195	1105	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	10:30 AM to 11:30 AM		
AM - PEAK HR VOLUME	1049	1103	2152
AM - K FACTOR (%)			7.51
AM - D (%)	48.75	51.25	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	12:15 PM to 01:15 PM		
PM - PEAK HR VOLUME	1159	1096	2255
PM - K FACTOR (%)			7.87
PM - D (%)	51.40	48.60	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	12:15 PM to 01:15 PM		
PEAK HR VOLUME	1159	1096	2255
DIRECTIONAL PEAK			
PEAK HR TIME	01:45 PM to 02:45 PM	10:15 AM to 11:15 AM	
PEAK HR VOLUME	1195	1107	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	5,048	5,500	10,548
AM 12-HR PERIOD (00:00-12:00)	5,363	6,131	11,494
PM 6-HR PERIOD (12:00-18:00)	6,851	6,058	12,909
PM 12-HR PERIOD (12:00-24:00)	8,933	8,238	17,171
24 HOUR PERIOD	14,296	14,369	28,665
D (%)	49.87	50.13	100.00

Run Date: 2013/03/15

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**

2012 Program Count - Summary

Site ID: B71019700000 **Town:** Hawaii **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 5700
Functional Class: OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 197
Location: KEALAKEHE PKWY - QUEEN KAAHUMANU Hwy - E

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 05/23/2012															
12:00-12:15	4	2	6	06:00-06:15	9	27	36	12:00-12:15	38	52	90	06:00-06:15	31	34	65
12:15-12:30	2	3	5	06:15-06:30	19	44	63	12:15-12:30	52	46	98	06:15-06:30	42	30	72
12:30-12:45	5	2	7	06:30-06:45	23	56	79	12:30-12:45	52	34	86	06:30-06:45	27	24	51
12:45-01:00	2	2	4	06:45-07:00	38	40	78	12:45-01:00	85	66	151	06:45-07:00	27	32	59
01:00-01:15	0	1	1	07:00-07:15	39	46	85	01:00-01:15	69	95	164	07:00-07:15	32	19	51
01:15-01:30	3	0	3	07:15-07:30	65	57	122	01:15-01:30	53	53	106	07:15-07:30	30	19	49
01:30-01:45	0	1	1	07:30-07:45	78	87	165	01:30-01:45	47	47	94	07:30-07:45	22	10	32
01:45-02:00	0	1	1	07:45-08:00	72	62	134	01:45-02:00	56	40	96	07:45-08:00	12	7	19
02:00-02:15	2	2	4	08:00-08:15	65	74	139	02:00-02:15	50	54	104	08:00-08:15	20	19	39
02:15-02:30	2	3	5	08:15-08:30	62	78	140	02:15-02:30	57	59	116	08:15-08:30	22	14	36
02:30-02:45	0	2	2	08:30-08:45	91	75	166	02:30-02:45	65	48	113	08:30-08:45	8	13	21
02:45-03:00	0	2	2	08:45-09:00	75	77	152	02:45-03:00	57	59	116	08:45-09:00	22	15	37
03:00-03:15	0	3	3	09:00-09:15	65	64	129	03:00-03:15	63	80	143	09:00-09:15	8	13	21
03:15-03:30	1	3	4	09:15-09:30	34	54	88	03:15-03:30	52	93	145	09:15-09:30	15	10	25
03:30-03:45	1	3	4	09:30-09:45	33	35	68	03:30-03:45	48	65	113	09:30-09:45	14	4	18
03:45-04:00	1	7	8	09:45-10:00	51	38	89	03:45-04:00	62	61	123	09:45-10:00	8	6	14
04:00-04:15	0	5	5	10:00-10:15	31	41	72	04:00-04:15	44	49	93	10:00-10:15	11	9	20
04:15-04:30	1	4	5	10:15-10:30	39	43	82	04:15-04:30	41	34	75	10:15-10:30	10	9	19
04:30-04:45	2	24	26	10:30-10:45	33	38	71	04:30-04:45	56	53	109	10:30-10:45	10	5	15
04:45-05:00	5	11	16	10:45-11:00	32	40	72	04:45-05:00	60	53	113	10:45-11:00	10	5	15
05:00-05:15	4	13	17	11:00-11:15	43	48	91	05:00-05:15	48	38	86	11:00-11:15	10	5	15
05:15-05:30	5	18	23	11:15-11:30	45	48	93	05:15-05:30	48	40	88	11:15-11:30	8	5	13
05:30-05:45	8	18	26	11:30-11:45	36	52	88	05:30-05:45	40	31	71	11:30-11:45	3	0	3
05:45-06:00	8	29	37	11:45-12:00	42	42	84	05:45-06:00	48	31	79	11:45-12:00	5	2	7

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM		
AM - PEAK HR VOLUME	293	304	597
AM - K FACTOR (%)			10.14
AM - D (%)	49.08	50.92	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	08:00 AM to 09:00 AM	
AM - PEAK HR VOLUME	293	304	

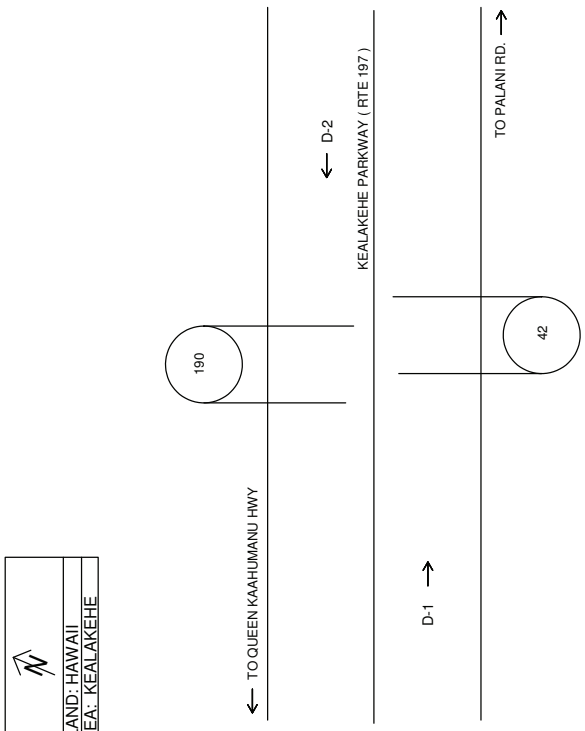
PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM		
PM - PEAK HR VOLUME	225	299	524
PM - K FACTOR (%)			8.90
PM - D (%)	42.94	57.06	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM	03:00 PM to 04:00 PM	
PM - PEAK HR VOLUME	225	299	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM		
AM - PEAK HR VOLUME	293	304	597
AM - K FACTOR (%)			10.14
AM - D (%)	49.08	50.92	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM		
PM - PEAK HR VOLUME	225	299	524
PM - K FACTOR (%)			8.90
PM - D (%)	42.94	57.06	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	12:45 PM to 01:45 PM		
PEAK HR VOLUME	254	261	515
DIRECTIONAL PEAK			
PEAK HR TIME	12:30 PM to 01:30 PM	12:45 PM to 01:45 PM	
PEAK HR VOLUME	259	261	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	1,120	1,266	2,386
AM 12-HR PERIOD (00:00-12:00)	1,176	1,425	2,601
PM 6-HR PERIOD (12:00-18:00)	1,291	1,281	2,572
PM 12-HR PERIOD (12:00-24:00)	1,698	1,590	3,288
24 HOUR PERIOD	2,874	3,015	5,889
D (%)	48.80	51.20	100.00



Station No: B71 0197 00000

Station Location:

Kealakehe Parkway between Queen Kaahumanu Highway and Extension

Station Mileage:	0.60	GPS Coord (Latitude):	19.67235 N
		GPS Coord (Longitude):	156.00924 W
Begin Survey (Date/Time):	5-23-12 0000	End Survey (Date/Time):	5-25-12 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	CA, LT	Module No.:	

HPMS DATA

Segment Description:

KEALAKEHE PARKWAY - QUEEN KAAHUMANU HIGHWAY (RTE. 19) TO ANE KEOHOKALOLE HIGHWAY

Segment Begin LRS	0.00	Segment End LRS	0.84	Length	0.84

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile		
KEALAKEHE PARKWAY	S	6	1	197	0.60	D-1 = Direction to End of Route	
						D-2 = Direction to Beginning of Route	
						D-1	TO PALANI RD.(EXT)
						D-2	TO QUEEN KAAHUMANU HWY.

Sketch By: EPJ Date: 2/23/2012 SLD: 2009

Run Date: 2013/03/15

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section
Vehicle Classification Data Summary
2012

Site ID: B71019700000 **Route No:** 197 **Date From:** 2012/05/23 0:00
Town: Hawaii **Direction:** +MP **Date To:** 2012/05/24 23:45
Location: KEALAKEHE PKWY - QUEEN KAAHUMANU Hwy - E

Functional Classification: 99 OTHER
REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	95	0.81%	190
PC	10198	86.82%	20395
2A-4T	1193	10.15%	2385
LIGHT VEHICLE TOTALS	11485	97.79%	22971
HEAVY VEHICLES			
Bus	48	0.40%	119
SINGLE UNIT TRUCK			
2A-6T	127	1.08%	254
3A-SU	34	0.29%	102
4A-SU	2	0.02%	8
SINGLE-TRAILER TRUCKS			
4A-ST	30	0.26%	120
5A-ST	17	0.15%	85
6A-ST	0	0.00%	0
MULTI-TRAILER TRUCKS			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	1	0.01%	7
HEAVY VEHICLE TOTALS	260	2.21%	695
CLASSIFIED VEHICLES TOTALS	11745 (A)	100.00%	23665 (B)
UNCLASSIFIED VEHICLES TOTALS	-0	-0.00%	

AXLE CORRECTION FACTOR (A/C) = 0.993

ROADTUBE EQUIVALENT(B/2) = 11833 (C)

	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
PEAK HOUR VOLUME : 597 2012/05/23 08:00	17	(65A-1) 2.90%	104	5700	(65A-2) 1.82%	10.47%
SINGLE UNIT TRUCKS (TYPE 4-7)	2	(65B-1) 0.34%	24		(65B-2) 0.42%	10.47%
COMBINATION (TYPE 8-13)						

Run Date: 2013/03/15

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**
2012 Program Count - Summary

Site ID: B71019700000 **Town:** Hawaii **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 5700
Functional Class: OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 197
Location: KEALAKEHE PKWY - QUEEN KAAHUMANU Hwy - E

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 05/24/2012															
12:00-12:15	5	0	5	06:00-06:15	13	25	38	12:00-12:15	60	56	116	06:00-06:15	26	32	58
12:15-12:30	1	1	2	06:15-06:30	21	33	54	12:15-12:30	60	48	108	06:15-06:30	42	25	67
12:30-12:45	3	4	7	06:30-06:45	23	46	69	12:30-12:45	61	71	132	06:30-06:45	32	22	54
12:45-01:00	2	1	3	06:45-07:00	41	47	88	12:45-01:00	47	53	100	06:45-07:00	42	18	60
01:00-01:15	2	3	5	07:00-07:15	42	44	86	01:00-01:15	40	47	87	07:00-07:15	16	29	45
01:15-01:30	3	1	4	07:15-07:30	59	55	114	01:15-01:30	46	52	98	07:15-07:30	27	17	44
01:30-01:45	2	2	4	07:30-07:45	71	65	136	01:30-01:45	51	41	92	07:30-07:45	17	6	23
01:45-02:00	2	2	4	07:45-08:00	47	69	116	01:45-02:00	49	46	95	07:45-08:00	19	13	32
02:00-02:15	0	1	1	08:00-08:15	69	68	137	02:00-02:15	58	55	113	08:00-08:15	23	18	41
02:15-02:30	3	3	6	08:15-08:30	66	59	125	02:15-02:30	41	53	94	08:15-08:30	17	15	32
02:30-02:45	0	1	1	08:30-08:45	79	67	146	02:30-02:45	51	59	110	08:30-08:45	10	19	29
02:45-03:00	0	3	3	08:45-09:00	77	48	125	02:45-03:00	46	60	106	08:45-09:00	18	12	30
03:00-03:15	0	1	1	09:00-09:15	50	44	94	03:00-03:15	53	67	120	09:00-09:15	16	6	22
03:15-03:30	0	4	4	09:15-09:30	39	50	89	03:15-03:30	57	69	126	09:15-09:30	21	12	33
03:30-03:45	3	3	6	09:30-09:45	54	56	110	03:30-03:45	49	72	121	09:30-09:45	10	8	18
03:45-04:00	0	10	10	09:45-10:00	55	67	122	03:45-04:00	46	69	115	09:45-10:00	17	9	26
04:00-04:15	0	5	5	10:00-10:15	37	45	82	04:00-04:15	50	56	106	10:00-10:15	10	7	17
04:15-04:30	4	9	13	10:15-10:30	50	82	132	04:15-04:30	36	33	69	10:15-10:30	8	5	13
04:30-04:45	2	17	19	10:30-10:45	43	82	125	04:30-04:45	49	65	114	10:30-10:45	13	3	16
04:45-05:00	3	13	16	10:45-11:00	60	54	114	04:45-05:00	30	50	80	10:45-11:00	7	2	9
05:00-05:15	4	12	16	11:00-11:15	52	56	108	05:00-05:15	41	42	83	11:00-11:15	8	3	11
05:15-05:30	3	9	12	11:15-11:30	51	60	111	05:15-05:30	45	39	84	11:15-11:30	4	5	9
05:30-05:45	9	23	32	11:30-11:45	57	60	117	05:30-05:45	34	27	61	11:30-11:45	8	1	9
05:45-06:00	6	22	28	11:45-12:00	50	51	101	05:45-06:00	43	33	76	11:45-12:00	4	2	6

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM		
AM - PEAK HR VOLUME	291	242	533
AM - K FACTOR (%)			9.10
AM - D (%)	54.60	45.40	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:45 AM to 08:45 AM	
AM - PEAK HR VOLUME	291	263	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM		
PM - PEAK HR VOLUME	205	277	482
PM - K FACTOR (%)			8.23
PM - D (%)	42.53	57.47	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM	03:00 PM to 04:00 PM	
PM - PEAK HR VOLUME	205	277	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM		
AM - PEAK HR VOLUME	291	242	533
AM - K FACTOR (%)			9.10
AM - D (%)	54.60	45.40	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM		
PM - PEAK HR VOLUME	205	277	482
PM - K FACTOR (%)			8.23
PM - D (%)	42.53	57.47	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	10:15 AM to 11:15 AM		
PEAK HR VOLUME	205	274	479
DIRECTIONAL PEAK			
PEAK HR TIME	11:45 AM to 12:45 PM	09:45 AM to 10:45 AM	
PEAK HR VOLUME	231	276	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	1,206	1,333	2,539
AM 12-HR PERIOD (00:00-12:00)	1,263	1,483	2,746
PM 6-HR PERIOD (12:00-18:00)	1,143	1,263	2,406
PM 12-HR PERIOD (12:00-24:00)	1,558	1,552	3,110
24 HOUR PERIOD	2,821	3,035	5,856
D (%)	48.17	51.83	100.00

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-003 **Day:** Thursday

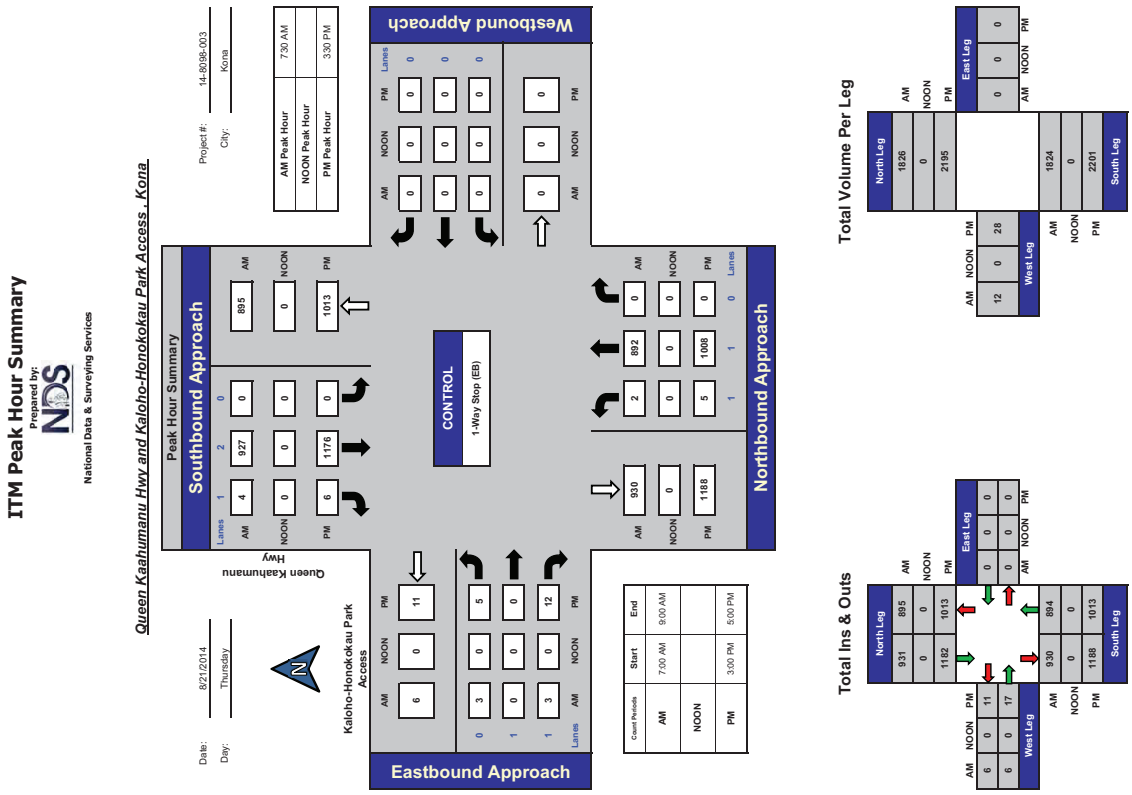
City: Kona **Date:** 8/21/2014

TOTALS

AM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kaloho-Honokokau Park Access			Kaloho-Honokokau Park Access				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
LANES:	NL 1	NT 1	NR 0	SL 0	ST 2	SR 1	EL 0	ET 1	ER 1	WL 0	WT 0	WR 0	TOTAL	NB	SB	EB	WB
7:00 AM	0	208	0	0	173	1	0	0	0	0	0	0	382				
7:15 AM	0	207	0	0	217	0	0	0	0	0	0	0	424				
7:30 AM	0	228	0	0	262	2	2	0	2	0	0	0	496				
7:45 AM	1	219	0	0	242	1	0	0	0	0	0	0	463				
8:00 AM	0	209	0	0	210	0	0	0	0	0	0	0	419				
8:15 AM	1	236	0	0	213	1	1	0	1	0	0	0	453				
8:30 AM	0	220	0	0	202	2	1	0	0	0	0	0	425				
8:45 AM	1	243	0	0	198	0	1	0	0	0	0	0	443				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	3	1770	0	0	1717	7	5	0	3	0	0	0	3505	0	0	0	0
APPROACH %'s :	0.17%	99.83%	0.00%	0.00%	99.59%	0.41%	62.50%	0.00%	37.50%	#DIV/0!	#DIV/0!	#DIV/0!					
PEAK HR START TIME :	730 AM												TOTAL				
PEAK HR VOL :	2	892	0	0	927	4	3	0	3	0	0	0	1831				
PEAK HR FACTOR :		0.943			0.882			0.375			0.000		0.923				

CONTROL : 1-Way Stop (EB)



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-003 | **Day:** Thursday

2 Axle+ Trucks

City: Kona | **Date:** 8/21/2014

AM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kaloho-Honokokau Park Access			Kaloho-Honokokau Park Access				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	0	0	2	1	0	1	1	0	0	0					
7:00 AM	0	14	0	0	6	1	0	0	0	0	0	0	21				
7:15 AM	0	12	0	0	11	0	0	0	0	0	0	0	23				
7:30 AM	0	12	0	0	11	0	1	0	0	0	0	0	24				
7:45 AM	1	10	0	0	14	2	0	0	0	0	0	0	27				
8:00 AM	0	10	0	0	7	0	0	0	0	0	0	0	17				
8:15 AM	0	13	0	0	14	0	1	0	0	0	0	0	28				
8:30 AM	0	13	0	0	12	1	0	0	0	0	0	0	26				
8:45 AM	0	11	0	0	13	0	1	0	0	0	0	0	25				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	1	95	0	0	88	4	3	0	0	0	0	0	191	0	0	0	0
APPROACH %'s :	1.04%	98.96%	0.00%	0.00%	95.65%	4.35%	100.00%	0.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!					

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	1	45	0	0	46	2	2	0	0	0	0	0	96
PEAK HR FACTOR :		0.885			0.750			0.500			0.000		0.919

CONTROL : 1-Way Stop (EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-003 | **Day:** Thursday

TOTALS

City: Kona | **Date:** 8/21/2014

PM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kaloho-Honokokau Park Access			Kaloho-Honokokau Park Access				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	0	0	2	1	0	1	1	0	0	0					
3:00 PM	1	270	0	0	264	1	2	0	0	0	0	0	538				
3:15 PM	2	256	0	0	259	0	1	0	3	0	0	0	521				
3:30 PM	1	268	0	0	304	2	0	0	3	0	0	0	578				
3:45 PM	0	247	0	0	295	2	3	0	4	0	0	0	551				
4:00 PM	1	251	0	0	294	1	1	0	4	0	0	0	552				
4:15 PM	3	242	0	0	283	1	1	0	1	0	0	0	531				
4:30 PM	2	257	0	0	267	1	1	0	1	0	0	0	529				
4:45 PM	1	238	0	0	291	1	0	0	2	0	0	0	533				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	11	2029	0	0	2257	9	9	0	18	0	0	0	4333	0	0	0	0
APPROACH %'s :	0.54%	99.46%	0.00%	0.00%	99.60%	0.40%	33.33%	0.00%	66.67%	#DIV/0!	#DIV/0!	#DIV/0!					

PEAK HR START TIME :	330 PM												TOTAL
PEAK HR VOL :	5	1008	0	0	1176	6	5	0	12	0	0	0	2212
PEAK HR FACTOR :		0.941			0.966			0.607			0.000		0.957

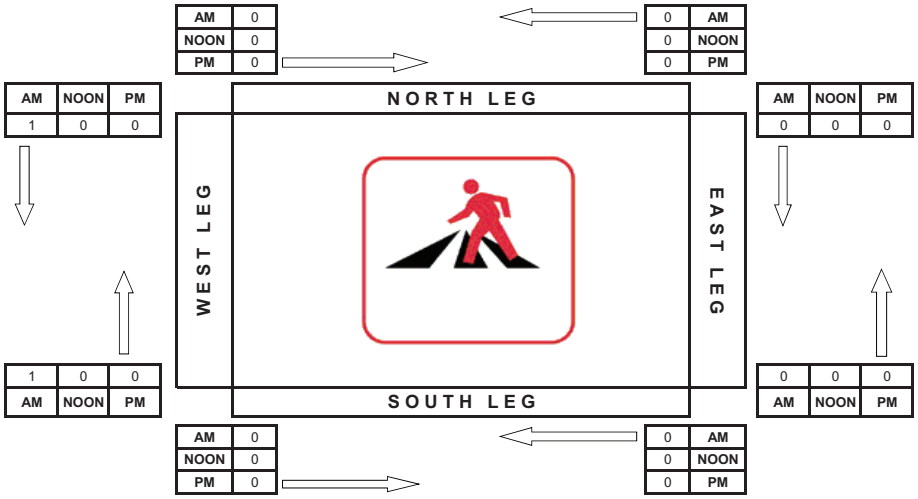
CONTROL : 1-Way Stop (EB)

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

PROJECT#: 14-8098-003
N/S Street: Queen Kaahumanu Hwy
E/W Street: Kaloho-Honokokau Park Access
DATE: 8/21/2014 DAY: Thursday
CITY: Kona

	Start:	End:
AM	7:00	9:00
NOON		
PM	15:00	17:00



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-003 **Day:** Thursday

City: Kona **Date:** 8/21/2014

2 Axle+ Trucks

PM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kaloho-Honokokau Park Access			Kaloho-Honokokau Park Access			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	0	2	1	0	1	1	0	0	0	
3:00 PM	0	7	0	0	10	0	0	0	0	0	0	0	17
3:15 PM	0	6	0	0	7	0	0	0	0	0	0	0	13
3:30 PM	0	8	0	0	6	0	0	0	0	0	0	0	14
3:45 PM	0	7	0	0	5	0	0	0	0	0	0	0	12
4:00 PM	0	7	0	0	10	0	0	0	0	0	0	0	17
4:15 PM	0	7	0	0	7	0	0	0	0	0	0	0	14
4:30 PM	0	3	0	0	4	0	0	0	0	0	0	0	7
4:45 PM	0	3	0	0	2	0	0	0	0	0	0	0	5
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	48	0	0	51	0	0	0	0	0	0	0	99
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	330 PM												TOTAL
PEAK HR VOL :	0	29	0	0	28	0	0	0	0	0	0	0	57
PEAK HR FACTOR :	0.906			0.700			0.000			0.000			0.955

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : 1-Way Stop (EB)

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-8098-003
N/S Street: Queen Kaahumanu Hwy
E/W Street: Kaloho-Honokokau Park Access
DATE: 8/21/2014 DAY: Thursday
CITY: Kona

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTALS	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	2	0	0	2	0	0	0	0	0	0	0
7:15 AM	0	2	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	4	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	6	0	0	5	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	2	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	2	0	0	0	0	0	0	0
8:30 AM	0	2	0	0	8	0	0	0	0	0	0	0
8:45 AM	0	2	0	0	3	0	0	0	0	0	0	0
TOTALS	**0**	**20**	**0**	**0**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
3:00 PM	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
TOTALS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
3:00 PM	0	0	0	0	1	0	0	0	0	0	0	0
3:15 PM	0	1	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	2	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	2	0	0	1	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0
TOTALS	**0**	**4**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	15:00	17:00

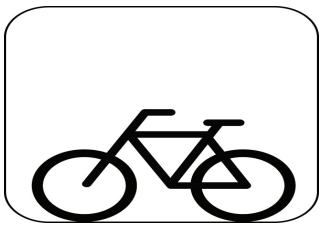
PROJECT#: 14-8098-003
N/S Street: Queen Kaahumanu Hwy
E/W Street: Kaloho-Honokokau Park Access
DATE: 8/21/2014 DAY: Thursday
CITY: Kona

AM	0	17	0
NOON	0	0	0
PM	0	4	0

NORTH LEG

AM	NOON	PM
0	0	0
0	0	0
0	0	0

WEST LEG



EAST LEG

AM	NOON	PM
0	0	0
0	0	0
0	0	0

SOUTH LEG

AM	0	10	0
NOON	0	0	0
PM	0	3	0

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-001 **Day:** Thursday

City: Kona **Date:** 8/21/2014

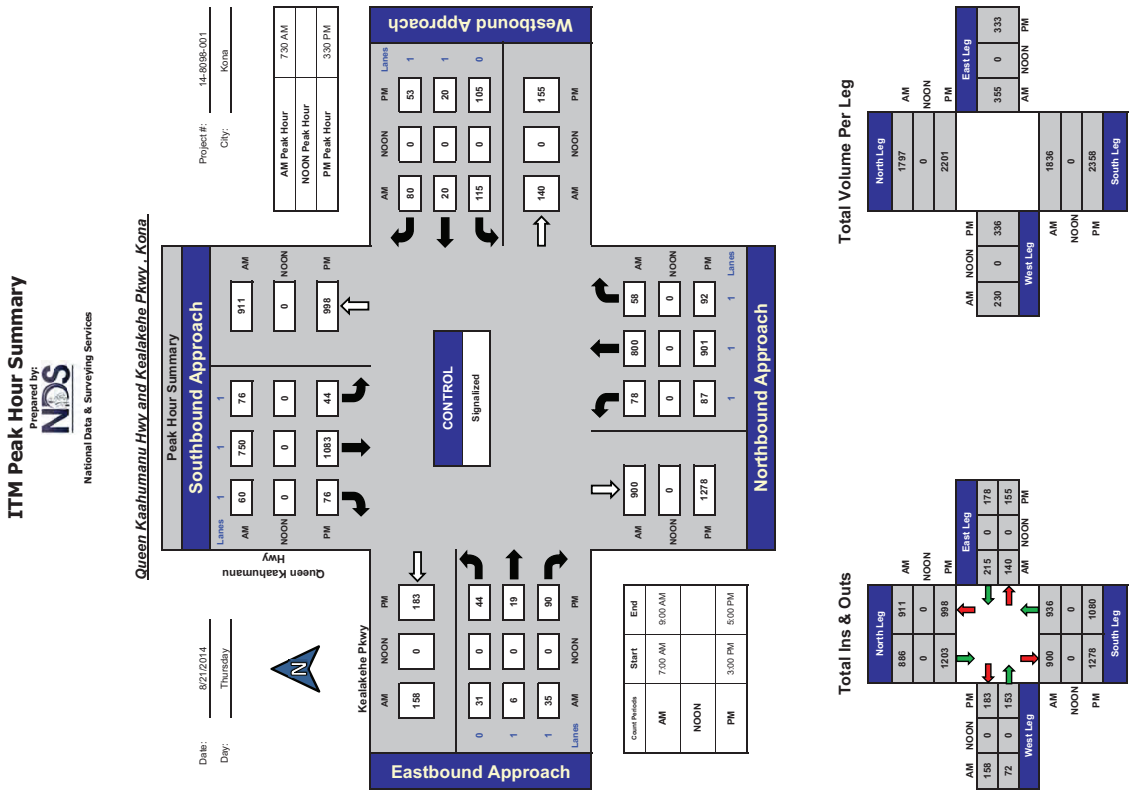
TOTALS

AM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kealakehe Pkwy			Kealakehe Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 0	ET 1	ER 1	WL 0	WT 1	WR 1	TOTAL
7:00 AM	12	177	14	12	144	11	14	2	10	8	5	17	426
7:15 AM	14	178	18	18	166	11	6	3	5	22	7	21	469
7:30 AM	25	215	15	23	195	18	8	0	6	16	4	16	541
7:45 AM	15	171	17	32	201	19	10	2	12	24	4	25	532
8:00 AM	20	197	15	15	174	12	8	4	8	49	8	18	528
8:15 AM	18	217	11	6	180	11	5	0	9	26	4	21	508
8:30 AM	18	217	24	8	188	15	3	3	9	13	0	11	509
8:45 AM	11	238	33	5	188	15	7	3	7	17	1	11	536
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	133	1610	147	119	1436	112	61	17	66	175	33	140	4049
APPROACH %'s :	7.04%	85.19%	7.78%	7.14%	86.14%	6.72%	42.36%	11.81%	45.83%	50.29%	9.48%	40.23%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	78	800	58	76	750	60	31	6	35	115	20	80	2109
PEAK HR FACTOR :	0.918			0.879			0.750			0.717			0.975

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-001 | **Day:** Thursday

2 Axle+ Trucks

City: Kona | **Date:** 8/21/2014

AM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kealakehe Pkwy			Kealakehe Pkwy				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	1	1	1	1	0	1	1	0	1	1					
7:00 AM	0	5	1	0	5	0	3	0	0	0	1	0	15				
7:15 AM	0	9	4	0	11	0	0	0	0	3	0	0	27				
7:30 AM	1	8	0	1	5	0	0	0	0	1	0	0	16				
7:45 AM	0	4	0	1	10	0	0	0	0	0	0	2	17				
8:00 AM	0	10	1	0	3	0	0	1	0	1	0	1	17				
8:15 AM	0	11	0	0	11	1	0	0	0	0	0	0	23				
8:30 AM	0	13	0	0	9	0	1	0	0	0	0	0	23				
8:45 AM	1	7	4	0	12	3	1	0	0	0	0	0	28				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	2	67	10	2	66	4	5	1	0	5	1	3	166	0	0	0	0
APPROACH %'s :	2.53%	84.81%	12.66%	2.78%	91.67%	5.56%	83.33%	16.67%	0.00%	55.56%	11.11%	33.33%					

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	1	33	1	2	29	1	0	1	0	2	0	3	73
PEAK HR FACTOR :		0.795			0.667			0.250			0.625		0.970

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-001 | **Day:** Thursday

TOTALS

City: Kona | **Date:** 8/21/2014

PM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kealakehe Pkwy			Kealakehe Pkwy				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	1	1	1	1	0	1	1	0	1	1					
3:00 PM	10	216	28	17	209	10	15	3	19	23	2	8	560				
3:15 PM	10	206	23	20	213	14	19	3	30	42	8	23	611				
3:30 PM	30	221	26	8	287	20	15	4	21	31	4	22	689				
3:45 PM	22	234	31	15	262	20	7	3	23	24	6	10	657				
4:00 PM	19	212	19	11	261	22	11	4	23	34	5	14	635				
4:15 PM	16	234	16	10	273	14	11	8	23	16	5	7	633				
4:30 PM	8	220	19	11	251	14	14	6	25	23	4	15	610				
4:45 PM	14	196	13	9	260	26	23	6	21	16	2	7	593				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	129	1739	175	101	2016	140	115	37	185	209	36	106	4988	0	0	0	0
APPROACH %'s :	6.31%	85.12%	8.57%	4.47%	89.32%	6.20%	34.12%	10.98%	54.90%	59.54%	10.26%	30.20%					

PEAK HR START TIME :	330 PM												TOTAL
PEAK HR VOL :	87	901	92	44	1083	76	44	19	90	105	20	53	2614
PEAK HR FACTOR :		0.941			0.955			0.911			0.781		0.948

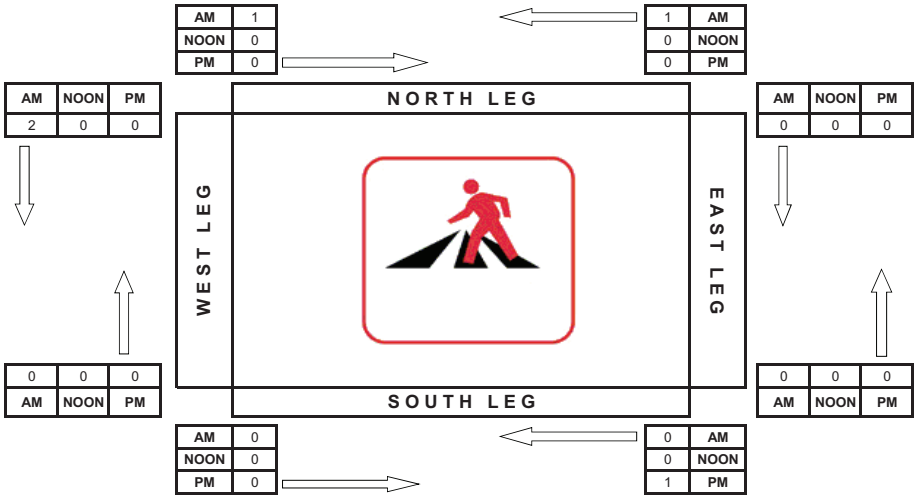
CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

PROJECT#: 14-8098-001
N/S Street: Queen Kaahumanu Hwy
E/W Street: Kealakehe Pkwy
DATE: 8/21/2014 DAY: Thursday
CITY: Kona

	Start:	End:
AM	7:00	9:00
NOON		
PM	15:00	17:00



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-001 **Day:** Thursday

City: Kona **Date:** 8/21/2014

2 Axle+ Trucks

PM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Kealakehe Pkwy			Kealakehe Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	0	1	1	0	1	1	
3:00 PM	0	5	2	0	6	0	0	0	0	0	0	0	13
3:15 PM	0	4	0	1	4	0	0	0	0	1	0	1	11
3:30 PM	0	7	1	0	5	0	0	0	0	0	0	0	13
3:45 PM	1	6	2	0	5	1	0	0	0	1	0	0	16
4:00 PM	0	5	0	0	7	0	1	0	0	1	0	0	14
4:15 PM	0	4	0	1	4	0	0	0	0	0	0	0	9
4:30 PM	0	4	1	0	5	0	0	0	0	0	0	0	10
4:45 PM	0	3	0	0	2	0	0	0	0	0	0	0	5
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	38	6	2	38	1	1	0	0	3	0	1	91
APPROACH %'s :	2.22%	84.44%	13.33%	4.88%	92.68%	2.44%	100.00%	0.00%	0.00%	75.00%	0.00%	25.00%	
PEAK HR START TIME :	330 PM												TOTAL
PEAK HR VOL :	1	22	3	1	21	1	1	0	0	2	0	0	52
PEAK HR FACTOR :	0.722			0.821			0.250			0.500			0.947

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-8098-001
N/S Street: Queen Kaahumanu Hwy
E/W Street: Kealakehe Pkwy
DATE: 8/21/2014
CITY: Kona

DAY: Thursday

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	1	1	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTALS	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**2**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	3	0	0	0	0	0	0	0	0	0	1
7:45 AM	1	3	0	0	1	0	0	0	0	0	0	1
8:00 AM	0	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	1	0	0	0	0	1	1	0
8:30 AM	0	1	0	0	1	0	2	0	0	0	0	0
8:45 AM	0	1	0	0	4	0	0	0	0	0	0	0
TOTALS	**2**	**12**	**0**	**0**	**7**	**0**	**2**	**0**	**0**	**1**	**1**	**2**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
3:00 PM	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	1	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
TOTALS	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
3:00 PM	0	1	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0
TOTALS	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

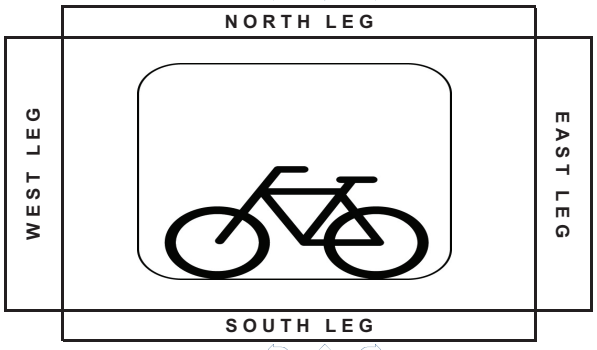
Bicycle Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	15:00	17:00

PROJECT#: 14-8098-001
N/S Street: Queen Kaahumanu Hwy
E/W Street: Kealakehe Pkwy
DATE: 8/21/2014
CITY: Kona

DAY: Thursday

AM	0	2	0
NOON	0	0	0
PM	0	0	0



AM	NOON	PM
0	0	0
0	0	0
0	0	0

AM	NOON	PM
2	0	0
1	0	0
1	0	0

AM	2	10	0
NOON	0	0	0
PM	0	2	1

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-002 | **Day:** Thursday

City: Kona | **Date:** 8/21/2014

TOTALS

AM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Hale Makai Place			Hale Makai Place			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 1	ST 3	SR 1	EL 0.5	ET 0.5	ER 1	WL 0.5	WT 0.5	WR 1	TOTAL
7:00 AM	0	202	18	10	148	0	0	0	0	14	0	15	407
7:15 AM	1	197	14	19	176	1	0	0	1	19	0	13	441
7:30 AM	0	221	30	15	186	0	0	0	0	17	0	20	489
7:45 AM	0	187	16	18	235	1	0	0	0	16	0	18	491
8:00 AM	1	217	18	33	186	0	0	1	0	18	0	16	490
8:15 AM	0	222	22	24	201	0	0	0	0	19	0	21	509
8:30 AM	1	241	25	17	175	0	3	0	0	23	0	19	504
8:45 AM	0	264	24	19	201	1	0	1	0	27	0	19	556
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	3	1751	167	155	1508	3	3	2	1	153	0	141	3887
APPROACH %'s :	0.16%	91.15%	8.69%	9.30%	90.52%	0.18%	50.00%	33.33%	16.67%	52.04%	0.00%	47.96%	
PEAK HR START TIME :	800 AM												TOTAL
PEAK HR VOL :	2	944	89	93	763	1	3	2	0	87	0	75	2059
PEAK HR FACTOR :		0.898			0.952			0.417			0.880		0.926

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

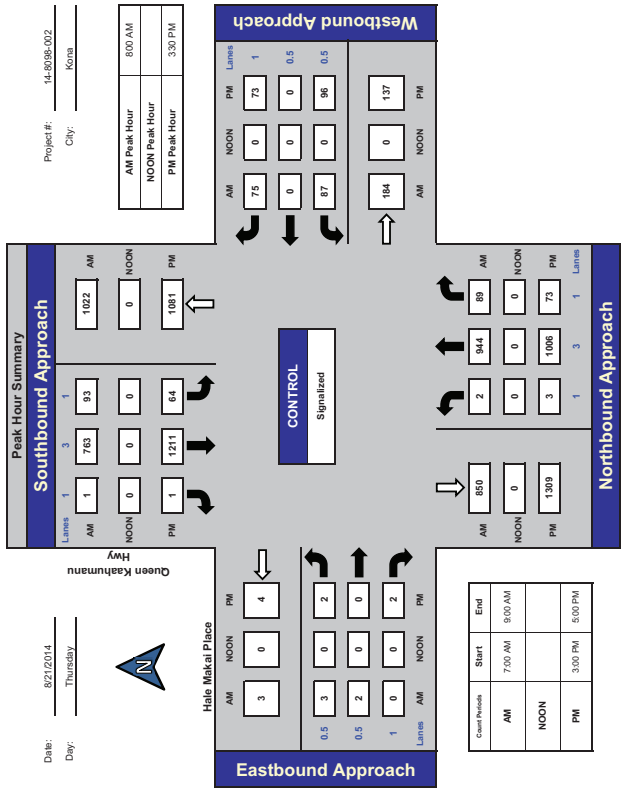
National Data & Surveying Services

Queen Kaahumanu Hwy and Hale Makai Place , Kona

Date: 8/21/2014 | Day: Thursday

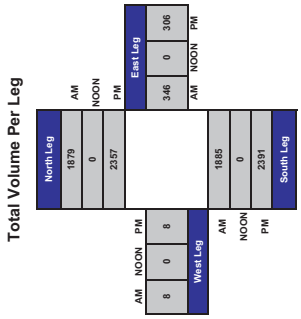
Project #: 14-8098-002 | City: Kona

AM Peak Hour	800 AM
NOON Peak Hour	
PM Peak Hour	330 PM

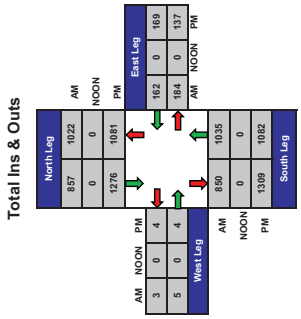


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	3:00 PM	5:00 PM

Total Volume Per Leg



Total Ins & Outs



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-002 | **Day:** Thursday

2 Axle+ Trucks

City: Kona | **Date:** 8/21/2014

AM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Hale Makai Place			Hale Makai Place				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	3	1	1	3	1	0.5	0.5	1	0.5	0.5	1					
7:00 AM	0	4	1	0	6	0	0	0	0	0	0	2	13				
7:15 AM	0	10	0	0	9	0	0	0	0	0	0	4	23				
7:30 AM	0	8	0	1	9	0	0	0	0	1	0	0	19				
7:45 AM	0	4	0	0	8	0	0	0	0	0	0	0	12				
8:00 AM	0	9	0	2	5	0	0	0	0	0	0	2	18				
8:15 AM	0	15	0	2	6	0	0	0	0	0	0	0	23				
8:30 AM	0	11	0	1	9	0	0	0	0	0	0	0	21				
8:45 AM	0	10	0	1	10	0	0	0	0	0	0	1	22				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	71	1	7	62	0	0	0	0	1	0	9	151	0	0	0	0
APPROACH %'s :	0.00%	98.61%	1.39%	10.14%	89.86%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	10.00%	0.00%	90.00%					
PEAK HR START TIME :	800 AM												TOTAL				
PEAK HR VOL :	0	45	0	6	30	0	0	0	0	0	0	3	84				
PEAK HR FACTOR :	0.750			0.818			0.000			0.375			0.925				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-002 | **Day:** Thursday

TOTALS

City: Kona | **Date:** 8/21/2014

PM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Hale Makai Place			Hale Makai Place				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	3	1	1	3	1	0.5	0.5	1	0.5	0.5	1					
3:00 PM	3	253	18	13	231	1	1	0	5	29	0	15	569				
3:15 PM	0	207	22	18	270	1	0	0	1	25	0	18	562				
3:30 PM	1	268	20	24	308	0	1	0	0	24	0	18	664				
3:45 PM	2	251	15	15	302	1	1	0	2	29	0	23	641				
4:00 PM	0	254	21	14	299	0	0	0	0	24	0	14	626				
4:15 PM	0	233	17	11	302	0	0	0	0	19	0	18	600				
4:30 PM	0	240	15	16	276	0	0	0	0	21	0	18	586				
4:45 PM	1	204	12	9	293	0	0	0	0	22	0	10	551				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	7	1910	140	120	2281	3	3	0	8	193	0	134	4799	0	0	0	0
APPROACH %'s :	0.34%	92.85%	6.81%	4.99%	94.88%	0.12%	27.27%	0.00%	72.73%	59.02%	0.00%	40.98%					
PEAK HR START TIME :	330 PM												TOTAL				
PEAK HR VOL :	3	1006	73	64	1211	1	2	0	2	96	0	73	2531				
PEAK HR FACTOR :	0.936			0.961			0.333			0.813			0.953				

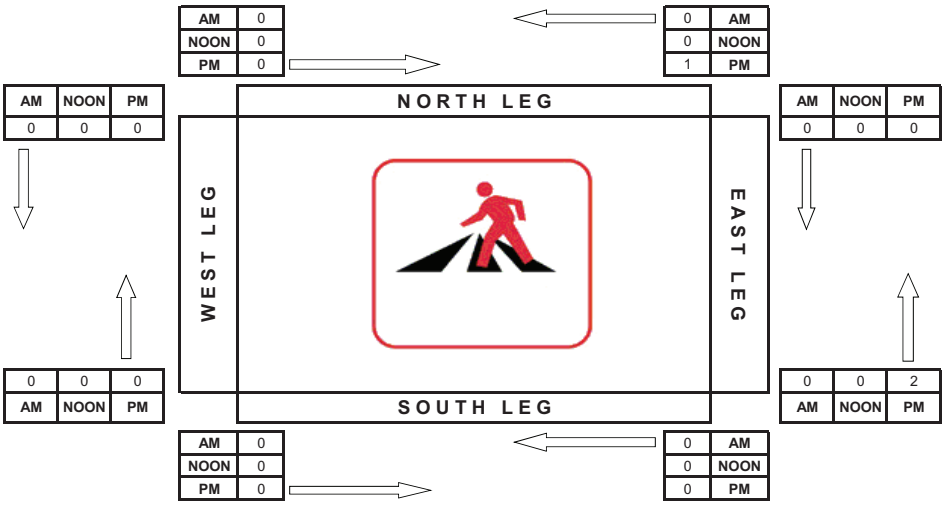
CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count Peak Hour

PROJECT#: 14-8098-002
N/S Street: Queen Kaahumanu Hwy
E/W Street: Hale Makai Place
DATE: 8/21/2014 DAY: Thursday
CITY: Kona

	Start:	End:
AM	7:00	9:00
NOON		
PM	15:00	17:00



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 14-8098-002 **Day:** Thursday

City: Kona **Date:** 8/21/2014

2 Axle+ Trucks

PM

NS/EW Streets:	Queen Kaahumanu Hwy			Queen Kaahumanu Hwy			Hale Makai Place			Hale Makai Place			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	1	1	3	1	0.5	0.5	1	0.5	0.5	1	
3:00 PM	0	7	0	0	3	0	0	0	0	0	0	0	10
3:15 PM	0	4	0	1	7	0	0	0	0	1	0	0	13
3:30 PM	0	8	0	2	2	0	0	0	0	0	0	1	13
3:45 PM	0	8	1	0	5	0	0	0	0	1	0	0	15
4:00 PM	0	6	0	2	8	0	0	0	0	0	0	1	17
4:15 PM	0	7	0	1	3	0	0	0	0	0	0	0	11
4:30 PM	0	3	0	2	2	0	0	0	0	1	0	0	8
4:45 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	45	1	8	31	0	0	0	0	3	0	2	90
APPROACH %'s :	0.00%	97.83%	2.17%	20.51%	79.49%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	60.00%	0.00%	40.00%	
PEAK HR START TIME :	330 PM												TOTAL
PEAK HR VOL :	0	29	1	5	18	0	0	0	0	1	0	2	56
PEAK HR FACTOR :	0.833			0.575			0.000			0.750			0.950

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-8098-002
N/S Street: Queen Kaahumanu Hwy
E/W Street: Hale Makai Place
DATE: 8/21/2014
CITY: Kona

DAY: Thursday

A M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTALS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	6	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	5	0	0	1	0	0	0	0	0	0	0
7:45 AM	0	6	0	0	2	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	2	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	0	2	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	3	0	0	0	0	0	0	0
TOTALS	**0**	**22**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
3:00 PM	0	0	0	0	0	1	0	0
3:15 PM	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	0	1	0	0	0
3:45 PM	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
TOTALS	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**0**

BIKES

TIME	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	1	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	2	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0
TOTALS	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

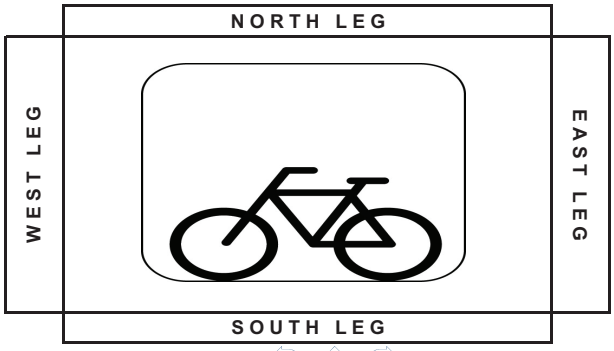
Bicycle Count Peak Hour

	Start:	End:
AM	7:00	9:00
NOON		
PM	15:00	17:00

PROJECT#: 14-8098-002
N/S Street: Queen Kaahumanu Hwy
E/W Street: Hale Makai Place
DATE: 8/21/2014
CITY: Kona

DAY: Thursday

AM	0	3	0
NOON	0	0	0
PM	0	0	0

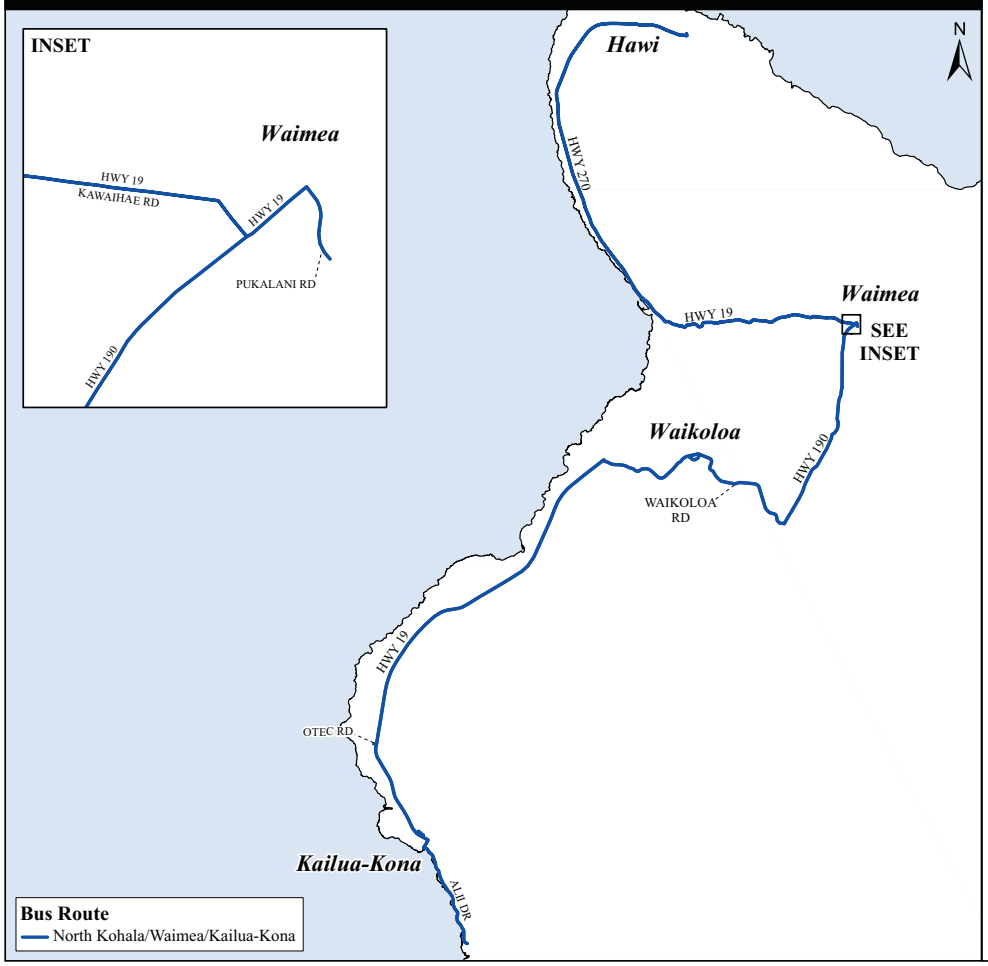


AM	NOON	PM
0	0	0
0	0	0
0	0	0

AM	NOON	PM
0	0	0
0	0	0
0	0	0

AM	0	18	0
NOON	0	0	0
PM	0	4	0

NORTH KOHALA/WAIMEA/KAILUA-KONA



COUNTY OF HAWAII
MASS TRANSIT AGENCY
961-8744

NORTH KOHALA/WAIMEA/ KAILUA-KONA BUS SCHEDULE

In consideration of others and for your safety:

1. Shirts and footwear are required.
2. Remain seated.

The following are prohibited on transit buses:

1. Obstructing or interfering with operator.
2. Smoking.
3. Refusing to vacate priority seating for the elderly and disabled passengers.
4. Consumption of food and beverage.
5. Talking on cell phones.
6. The playing of radios, tape players, dvd players, without headphones/earphones.
7. Horseplaying, yelling or talking loudly.
8. Surboards and bodyboards.
9. Flammable, explosive or toxic materials.
10. Expectorating or spitting.

The following will be charged $1.00:

1. Pets provided they are kept in an enclosed pet carrier or cage (except service animals).
2. Any item larger than 16″ x 10″ and/or more than one item ($1.00 per item).
3. Bicycle
4. Skateboard

How to board the bus:

1. Please utilize designated bus stops zones whenever possible.
2. Wait on the proper side of the roadway for the bus.
3. Flag the bus (please call for bus stop information).
4. Wait until the bus makes a complete stop.

How to exit the bus:

1. Before reaching your desired "get off" spot, pull cord located by the window of the bus.
2. Remain seated until the bus comes to a complete stop.
3. Exit from front of bus.

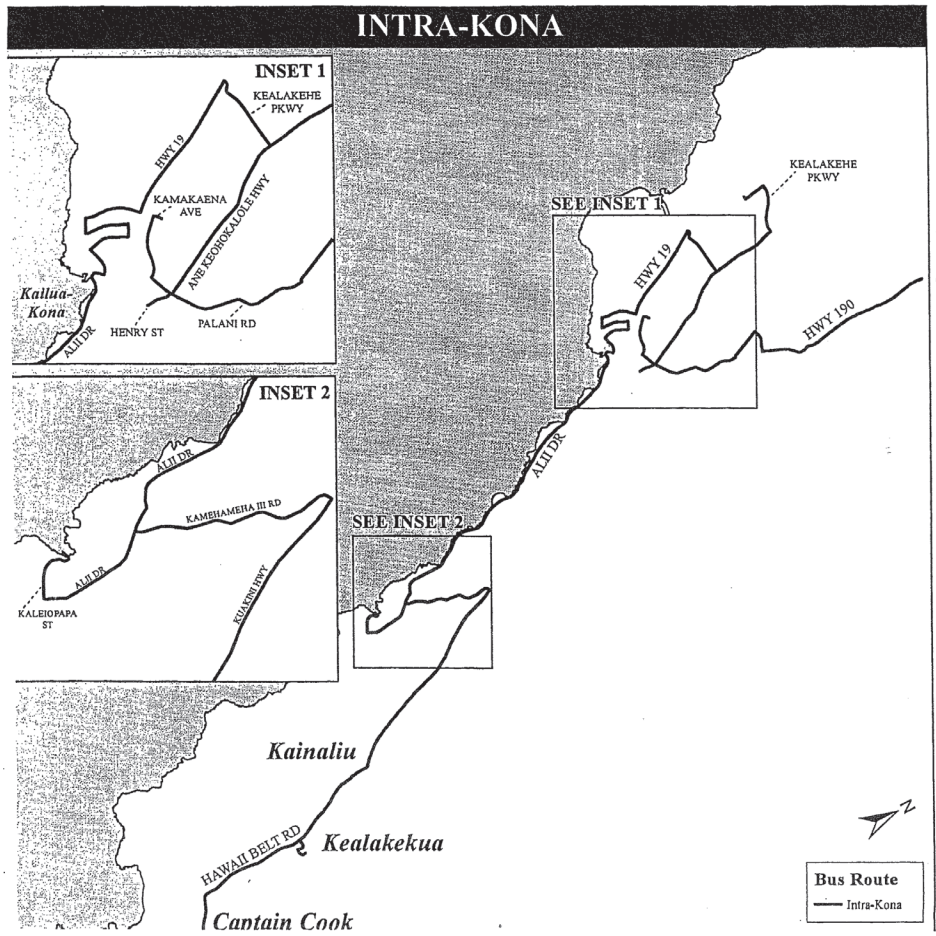
DISCLAIMER: The County of Hawaii will not be responsible for any inconvenience, expense, or damages resulting from the failure to depart or arrive at stated times or for any items brought on the bus.

For more information visit **www.co.hawaii.hi.us**

County of Hawaii is an Equal Opportunity Employer and Provider

7/6/10

APPENDIX B
County of Hawai'i Transit Bus Route Map and Timetables



COUNTY OF HAWAII
MASS TRANSIT AGENCY
961-8744

INTRA-KONA
BUS SCHEDULE

In consideration of others and for your safety:
1. Shirts and footwear are required.
2. Remain seated.

The following are prohibited on transit buses:
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2. Smoking.
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5. Talking on cell phones.
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For more information visit **www.heleonbus.org**

County of Hawai'i is an Equal Opportunity Employer and Provider

NORTH KOHALA/WAIMEA/KAILUA-KONA

Effective 5/25/2012

Operates Monday through Friday

North Kohala/Waimea/Keauhou

Kapaau Dispensary	Hawi Intersection	Kawaihae Road	Highway 19 & Highway 250 Intersection	Parker Square	Parker School (across by church)	Parker Ranch Shopping Center (back)	Waimea Park	Waikoloa Village Paniolo Avenue (South of Late Intersection)	Kmart	Alii Drive	Keauhou Shopping Center
6:45	**6:50**	**7:15**	**7:30**	**7:35**	**7:40**	**7:45**	**8:20**	**8:45**	**9:30**	**9:40**	**9:50**

Keauhou/Waimea/North Kohala

***BOLD = MORNINGS

Keauhou Shopping Center	Alii Drive	Kmart	Waikoloa Village Paniolo Avenue (South of Late Intersection)	Parker Ranch Shopping Center (back)	Parker School	Waimea Park	HPA Lower Campus	Highway 19 & Highway 250 Intersection	Kawaihae Road	Hawi Intersection	Kapaau Dispensary
1:35	1:50	2:00	2:45	3:25	3:30	3:35	3:40	3:45	4:00	4:50	4:55

******SCHEDULE BELOW OPERATES SATURDAY ONLY******

North Kohala to Keauhou shopping Center

Kapaau Dispensary	Hawi Intersection	Waikoloa Village	Kmart	Walmart	Alii Drive	Keauhou Shopping Center
9:15	**9:20**	**10:05**	**11:15**	**11:25**	**11:30**	**11:45**

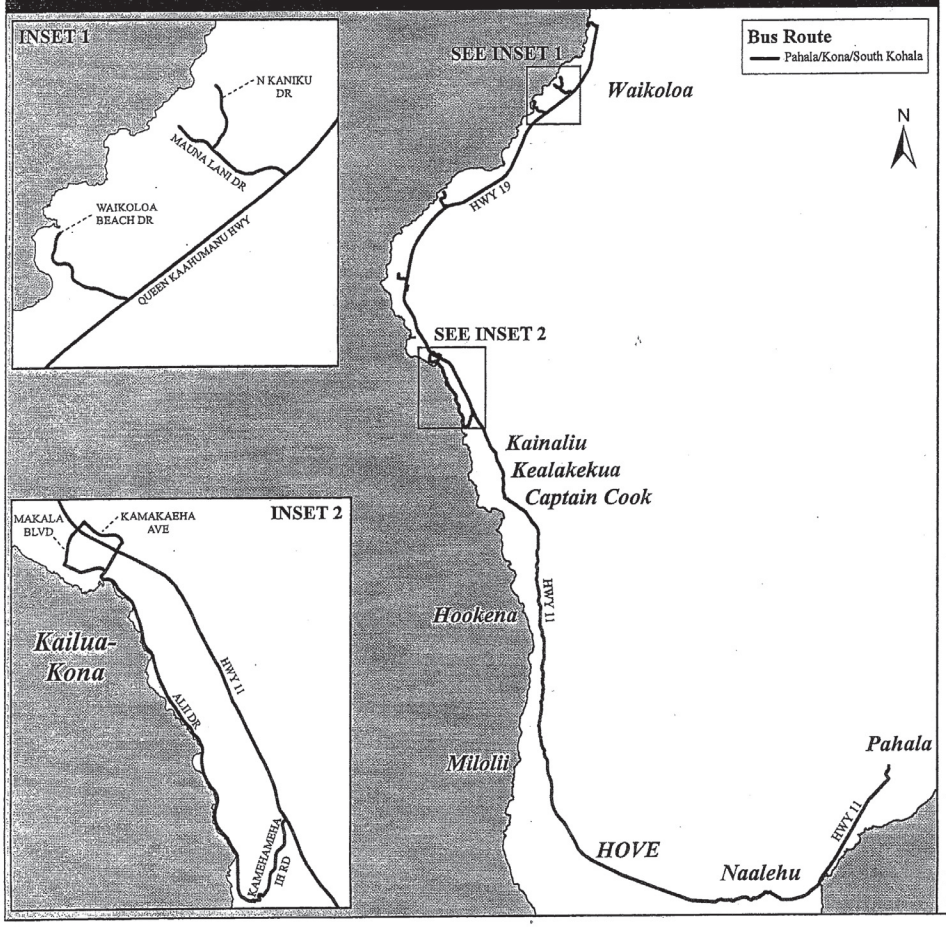
***BOLD = MORNINGS

Keauhou to North Kohala Shopping Center

Keauhou Shopping Center	Alii Drive	Walmart	Kmart	Waikoloa Village	Hawi Intersection	Kapaau Dispensary
2:30	2:40	3:00	3:10	3:55	4:30	4:35

For more information call Mass Transit @ 961-8744

PAHALA/KONA/SOUTH KOHALA



COUNTY OF HAWAII
MASS TRANSIT AGENCY
961-8744

PAHALA/KONA/SOUTH KOHALA BUS SCHEDULE

In consideration of others and for your safety:
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3. Refusing to vacate priority seating for the elderly and disabled passengers.
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7. Horseplaying, yelling or talking loudly.
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1. Pets provided they are kept in an enclosed pet carrier or cage (except service animals).
2. Any item larger than 16x10 and/or more than one item ($1.00 per item).
3. Bicycle
4. Skateboard

How to board the bus:
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County of Hawaii is an Equal Opportunity Employer and Provider

1/05/10

INTRA-KONA BUS SCHEDULE

Effective 7/01/2014

NORTHBOUND

Fujihara store	Honaunau	Capt. Cook Yano Hall	Kealakekua (Konawaena)	Kona Hospital	Kainaliu Honalo	Sheraton Keauhou Resort	Keauhou Shopping Center	Alii Drive	The Friendly Place Campus	Old Airport/ Kona Commons	Kaiser Permanente	Lokahi Apartments	Costco/Uluwini Housing	West Hawaii Civic Center	Kmart/ Macy's	Walmart	Kealakehe	Matsuyama Store	Airport	
5:00	**5:03**	**5:05**	**5:07**	---	**5:20**	---	---	---	---	---	---	---	---	---	**5:30**	---	---	---	---	Daily
5:45	**5:55**	**6:00**	**6:05**	---	**6:10**	**(6:20)**	----	**6:30**	---	---	---		---	---	***6:45***	---	---	**6:55**	---	Mon.- Sat.
7:10	**7:12**	**7:15**	**7:20**	---	**7:30**	---	**7:45**	**7:50**	---	---	**8:05**	---	---	---	**8:00**	---	---	---	**8:25**	Mon.- Sat.
---	---	**8:15**	**8:20**	**(8:25)**	**8:30**	**(8:40)**	**8:45**	**8:50**	**8:53**	**8:55**	**9:00**	**9:10**	**9:20**	**9:25**	**9:35**	**9:40**	**9:45**	**9:50**	---	Mon.- Sat.
9:20	**9:23**	**9:25**	**9:30**	---	**9:40**	---	**9:55**	**10:00**	---	**10:05**	---	---	---	---	**10:10**	---	---	---	---	Mon.- Sat.
---	---	**11:50**	**11:55**	(12:00)	12:05	(12:15)	12:20	12:25	12:27	12:30	12:35	---	12:40	12:45	12:55	1:00	1:05	1:10	---	Mon.- Sat.
---	---	1:20	1:25	(1:30)	1:35	(1:45)	1:50	1:55	1:57	2:00	2:05	2:15	2:25	2:30	2:40	2:45	2:50	2:55	---	Mon.- Sat.
---	---	3:05	3:10	(3:15)	3:25	(3:45)	3:50	3:55	3:57	4:00	4:05	4:15	4:25	4:30	4:40	4:45	4:50	4:55	---	Mon.- Fri.
---	---	4:55	5:00	(5:05)	5:10	(5:20)	5:25	5:30	5:32	5:35	5:40	5:50	6:00	---	6:10	6:15	6:20	6:25	---	Mon.- Sat.
---	---	6:25	(6:30)	(6:35)	6:40	---	6:50	6:55	7:05	7:07	---	---	7:15	---	7:25	7:30	7:35	7:40	---	Mon.- Fri.

SOUTHBOUND

Airport	Corner of Paliades (above Matsuyama)	Kealakehe	Walmart	Kmart Macy's	Kaiser Permanente	Lokahi Apartments	Costco Uluwini Housing	West Hawaii Civic Center	The Friendly Place Campus	Kona Commons	Alii Drive	Keauhou Shopping Center	Sheraton Keauhou Resort	Honalo	Kainaliu	Kona Hospital	Kealakekua (Konawaena)	Capt. Cook Yano Hall	Honaunau	Kealia	
---	**6:25**	**6:30**	**6:35**	***6:45***	---	---	**6:55**	**7:05**	**7:15**	**7:17**	**7:22**	**7:32**	**(7:37)**	**7:45**	**(7:55)**	**8:10**	**8:15**	---	---	Mon.- Sat.
8:30	---	---	---	**8:50**	---	---	---	---	---	**8:55**	**9:00**	**9:10**	---	**9:25**	---	**9:30**	**9:40**	**9:43**	**9:45**	Mon.- Sat.
---	**9:50**	**9:55**	**10:00**	**10:05**	**10:10**	**10:20**	**10:30**	**10:35**	**10:45**	**10:47**	**10:52**	**11:02**	**(11:07)**	**11:15**	**(11:25)**	**11:35**	**11:40**	---	---	Mon.- Sat.
	11:30	**11:35**	**11:40**	**11:45**	**11:50**	12:00	12:10	12:15	12:25	12:27	12:32	12:42	(12:47)	12:55	(1:05)	1:15	1:20	---	---	Mon.- Sat.
---	1:15	1:20	1:25	1:30	1:35	1:45	1:55	2:00	2:10	2:12	2:17	2:27	(2:32)	2:40	(2:50)	3:00	3:05	---	---	Mon.- Fri.
	3:00	3:05	3:10	3:15	3:20	3:30	3:40	3:45	3:55	3:57	4:02	4:12	(4:17)	4:25	(4:35)	4:45	4:55	---	---	Mon.- Sat.
---	---	---	---	3:55	---	---	---	---	---	---	---	---	---	4:05	---	4:10	4:20	4:23	4:25	Daily
---	4:15	4:20	---	4:25	---	---	---	---	---	---	4:35	---	---*	5:05	---	5:10	5:15	5:20	5:30	Mon.- Sat.
---	4:55	5:00	5:05	5:10	---	5:20	5:30	5:35	5:45	5:47	5:52	6:02	(6:07)	6:15	(6:20)	---	6:25	---	---	Mon.- Fri.
4:50	---	---	---	5:15	5:05	---	---	---	---	5:20	5:25	5:35	---	5:50	---	(5:55)	6:05	6:08	6:10	Mon.- Sat.

() = ENTER INTO
BOLD = MORNINGS
--- Service Not Available
*By Request Only

**6:45 a.m. riders requesting to go to the West Hawaii Civic Center must transfer at Kmart to the Intra-Kona bus*

APPENDIX C
Analysis Reports
Existing (2014) Conditions

PAHALA TO SOUTH KOHALA BUS SCHEDULE

Effective 7/01/14

PAHALA TO SOUTH KOHALA RESORTS

Pahala Shopping Center	Naalehu	Wong Yuen Store	Ocean View Park & Ride Lot	Fujihara Store	Yano Hall Capt. Cook	Kainaliu Honalo	Keauhou Shopping Center	Ali'i Drive	Old Airport Kona Commons	Kmart Macy's	Kaiser Permanente	Kona Palisades @ Queen K Hwy	Keahole Airport	Four Seasons @ Hualalai	Hilton Waikoloa	Fairmont Orchid	Mauna Lani Bay	Mauna Kea Beach Hotel	
3:30	***3:50***	***3:55***	***4:20***	***5:00***	***5:05***	***5:20***	---	---	---	***5:30***	---	***5:40***	---	***5:55***	***6:20***	***6:35***	***6:40***	***6:55***	Daily
5:40	**6:00**	**6:05**	**6:30**	**7:10**	**7:15**	**7:30**	**7:45**	**7:50**	---	**8:00**	**8:05**	**8:10**	**8:25**	---	---	---	---	---	M-Sat.
8:00	**8:20**	**8:25**	**8:50**	**9:20**	**9:25**	**9:40**	**9:55**	**10:00**	**10:05**	**10:10**	---	**10:20**	---	**10:35**	**11:00**	**11:15**	**11:20**	**11:30**	M-Sat.

SOUTH KOHALA RESORTS TO PAHALA

Mauna Kea Beach	Fairmont Orchid	Mauna Lani Bay	Hilton Waikoloa	Four Seasons Resort @ Hualalai	Keahole Airport	Kona Palisades @ Queen K Hwy	Kaiser Permanente	Kmart Macy's	Kona Commons	Ali'i Drive	Keauhou Shopping Center	Honalo Kainaliu	Yano Hall Capt. Cook	Fujihara Store Kealia	Ocean View Park & Ride Lot	Wong Yuen Store	Naalehu School	Pahala Shopping Center	
7:15	***7:30***	***7:35***	***7:50***	***8:15***	***8:30***	***8:40***	---	***8:50***	***8:55***	***9:00***	***9:10***	***9:25***	***9:40***	***9:45***	***10:25***	***10:50***	***10:55***	***11:15***	M-Sat
2:30	*2:45*	*2:50*	*3:05*	*3:30*	---	*3:45*	---	*3:55*	---	---	---	*4:05*	*4:20*	*4:25*	*5:05*	*5:30*	*5:35*	*5:55*	Daily
---	---	---	---	---	4:50	5:00	5:05	5:15	5:20	5:25	5:35	5:50	6:05	6:10	6:45	7:10	7:15	7:35	M-Sat.

BOLD = MORNINGS

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	3	3	2	892	927	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yeild	-	None	-	Yeild
Storage Length	0	-	525	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	94	94	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	8	8	2	949	1053	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2006	1053	1053	0	-	0
Stage 1	1053	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	64	271	650	-	-	-
Stage 1	331	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	64	271	650	-	-	-
Mov Cap-2 Maneuver	64	-	-	-	-	-
Stage 1	331	-	-	-	-	-
Stage 2	369	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	37	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	650	-	128	-	-
HCM Lane V/C Ratio	0.003	-	0.123	-	-
HCM Control Delay (s)	10.6	-	37	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	31	6	35	115	20	80	78	800	58	76	750	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	184.5	190.0	190.0	184.5	190.0	184.5	184.5	184.5	184.5	184.5	184.5
Adj Flow Rate, veh/h	41	8	0	160	28	0	85	870	0	86	852	0
Adj No. of Lanes	0	1	0	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.75	0.75	0.75	0.72	0.72	0.72	0.92	0.92	0.92	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	223	40	0	215	31	0	102	1322	1124	95	1315	1118
Arrive On Green	0.14	0.14	0.00	0.14	0.14	0.00	0.06	0.72	0.00	0.05	0.71	0.00
Sat Flow, veh/h	1307	282	0	1251	219	0	1757	1845	1568	1757	1845	1568
Grp Volume(v), veh/h	49	0	0	188	0	0	85	870	0	86	852	0
Grp Sat Flow(s),veh/h/ln	1589	0	0	1470	0	0	1757	1845	1568	1757	1845	1568
Q Serve(g_s), s	0.0	0.0	0.0	18.3	0.0	0.0	8.9	46.9	0.0	9.0	45.8	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0	23.2	0.0	0.0	8.9	46.9	0.0	9.0	45.8	0.0
Prop In Lane	0.84		0.00	0.85		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	0	0	246	0	0	102	1322	1124	95	1315	1118
V/C Ratio(X)	0.19	0.00	0.00	0.76	0.00	0.00	0.83	0.66	0.00	0.91	0.65	0.00
Avail Cap(c_a), veh/h	374	0	0	359	0	0	133	1322	1124	95	1315	1118
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.2	0.0	0.0	77.9	0.0	0.0	86.5	14.1	0.0	87.3	14.2	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	6.2	0.0	0.0	23.2	2.6	0.0	62.3	2.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	9.9	0.0	0.0	5.0	24.6	0.0	6.0	24.1	0.0
LnGrp Delay(d),s/veh	70.6	0.0	0.0	84.1	0.0	0.0	109.7	16.7	0.0	149.7	16.7	0.0
LnGrp LOS	E			F			F	B		F	B	
Approach Vol, veh/h		49			188			955			938	
Approach Delay, s/veh		70.6			84.1			24.9			28.9	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.0	153.4		32.6	14.8	152.7		32.6
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	133.0		41.0	14.0	129.0		41.0
Max Q Clear Time (g_c+I1), s	11.0	48.9		6.9	10.9	47.8		25.2
Green Ext Time (p_c), s	0.0	2.2		1.7	0.0	2.2		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	33.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	2	0	87	0	75	2	944	89	93	763	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	182.7	190.0	190.0	182.7	182.7	182.7	182.7	182.7	182.7	182.7	182.7
Adj Flow Rate, veh/h	7	5	0	99	0	0	2	1049	0	98	803	0
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	16	11	0	135	0	120	5	1266	566	128	1513	677
Arrive On Green	0.02	0.02	0.00	0.08	0.00	0.00	0.00	0.36	0.00	0.07	0.44	0.00
Sat Flow, veh/h	1035	740	0	1740	0	1553	1740	3471	1553	1740	3471	1553
Grp Volume(v), veh/h	12	0	0	99	0	0	2	1049	0	98	803	0
Grp Sat Flow(s),veh/h/ln	1775	0	0	1740	0	1553	1740	1736	1553	1740	1736	1553
Q Serve(g_s), s	0.4	0.0	0.0	3.2	0.0	0.0	0.1	15.8	0.0	3.2	9.8	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	3.2	0.0	0.0	0.1	15.8	0.0	3.2	9.8	0.0
Prop In Lane	0.58		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	27	0	0	135	0	120	5	1266	566	128	1513	677
V/C Ratio(X)	0.45	0.00	0.00	0.74	0.00	0.00	0.42	0.83	0.00	0.76	0.53	0.00
Avail Cap(c_a), veh/h	308	0	0	635	0	566	635	1266	566	635	1513	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.1	0.0	0.0	26.0	0.0	0.0	28.7	16.6	0.0	26.2	11.9	0.0
Incr Delay (d2), s/veh	11.1	0.0	0.0	7.6	0.0	0.0	49.8	6.3	0.0	9.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.8	0.0	0.0	0.1	8.7	0.0	1.8	4.9	0.0
LnGrp Delay(d),s/veh	39.2	0.0	0.0	33.5	0.0	0.0	78.5	23.0	0.0	35.2	13.3	0.0
LnGrp LOS	D			C			E	C		D	B	
Approach Vol, veh/h		12			99			1051			901	
Approach Delay, s/veh		39.2			33.5			23.1			15.7	
Approach LOS		D			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.2	28.0		8.9	4.2	32.1		12.5
Change Period (Y+Rc), s	4.0	7.0		8.0	4.0	7.0		8.0
Max Green Setting (Gmax), s	21.0	21.0		10.0	21.0	21.0		21.0
Max Q Clear Time (g_c+I1), s	5.2	17.8		2.4	2.1	11.8		5.2
Green Ext Time (p_c), s	0.2	2.6		0.0	0.0	6.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	20.4
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	5	12	5	1008	1176	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yeild	-	None	-	Yeild
Storage Length	0	-	525	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	61	61	94	94	97	97
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	8	20	5	1072	1212	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2295	1212	1212	0	-	0
Stage 1	1212	-	-	-	-	-
Stage 2	1083	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	43	221	572	-	-	-
Stage 1	280	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	43	221	572	-	-	-
Mov Cap-2 Maneuver	43	-	-	-	-	-
Stage 1	280	-	-	-	-	-
Stage 2	320	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35.4	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	572	-	146	-	-
HCM Lane V/C Ratio	0.009	-	0.191	-	-
HCM Control Delay (s)	11.4	-	35.4	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	19	90	105	20	53	87	901	92	44	1083	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	186.3	190.0	190.0	186.3	190.0	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	48	21	0	135	26	0	93	959	0	46	1128	0
Adj No. of Lanes	0	1	0	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.78	0.78	0.78	0.94	0.94	0.94	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	171	69	0	187	30	0	89	1413	1201	58	1381	1174
Arrive On Green	0.13	0.13	0.00	0.13	0.13	0.00	0.05	0.76	0.00	0.03	0.74	0.00
Sat Flow, veh/h	1090	540	0	1195	230	0	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	69	0	0	161	0	0	93	959	0	46	1128	0
Grp Sat Flow(s),veh/h/ln	1631	0	0	1425	0	0	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	0.0	14.7	0.0	0.0	10.0	51.2	0.0	5.1	79.3	0.0
Cycle Q Clear(g_c), s	7.5	0.0	0.0	22.2	0.0	0.0	10.0	51.2	0.0	5.1	79.3	0.0
Prop In Lane	0.70		0.00	0.84		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	0	0	216	0	0	89	1413	1201	58	1381	1174
V/C Ratio(X)	0.29	0.00	0.00	0.74	0.00	0.00	1.05	0.68	0.00	0.79	0.82	0.00
Avail Cap(c_a), veh/h	393	0	0	363	0	0	89	1413	1201	89	1381	1174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	79.0	0.0	0.0	85.6	0.0	0.0	94.8	12.0	0.0	95.8	16.9	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.0	5.6	0.0	0.0	108.8	2.6	0.0	11.4	5.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	9.1	0.0	0.0	7.6	27.1	0.0	2.7	42.5	0.0
LnGrp Delay(d),s/veh	79.8	0.0	0.0	91.2	0.0	0.0	204.5	14.7	0.0	107.3	22.4	0.0
LnGrp LOS	E			F			F	B		F	C	
Approach Vol, veh/h		69			161			1052			1174	
Approach Delay, s/veh		79.8			91.2			31.4			25.7	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.6	177.7		31.7	14.0	174.3		31.7
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	148.0		46.0	10.0	148.0		46.0
Max Q Clear Time (g_c+I1), s	7.1	53.2		9.5	12.0	81.3		24.2
Green Ext Time (p_c), s	0.0	3.0		1.7	0.0	3.0		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	2	96	0	73	3	1006	73	64	1211	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	186.3	190.0	190.0	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	6	0	0	119	0	0	3	1070	0	67	1261	0
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.33	0.33	0.33	0.81	0.81	0.81	0.94	0.94	0.94	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	0	0	162	0	144	7	1605	718	93	1777	795
Arrive On Green	0.01	0.00	0.00	0.09	0.00	0.00	0.00	0.45	0.00	0.05	0.50	0.00
Sat Flow, veh/h	1774	0	0	1774	0	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	6	0	0	119	0	0	3	1070	0	67	1261	0
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.2	0.0	0.0	4.5	0.0	0.0	0.1	16.2	0.0	2.5	18.8	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	4.5	0.0	0.0	0.1	16.2	0.0	2.5	18.8	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	14	0	0	162	0	144	7	1605	718	93	1777	795
V/C Ratio(X)	0.43	0.00	0.00	0.74	0.00	0.00	0.42	0.67	0.00	0.72	0.71	0.00
Avail Cap(c_a), veh/h	259	0	0	545	0	486	545	1605	718	545	1777	795
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.8	0.0	0.0	30.3	0.0	0.0	34.0	14.6	0.0	31.9	13.2	0.0
Incr Delay (d2), s/veh	19.5	0.0	0.0	6.4	0.0	0.0	34.3	2.2	0.0	9.8	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	2.5	0.0	0.0	0.1	8.4	0.0	1.5	9.7	0.0
LnGrp Delay(d),s/veh	53.2	0.0	0.0	36.6	0.0	0.0	68.3	16.8	0.0	41.7	15.6	0.0
LnGrp LOS	D			D			E	B		D	B	
Approach Vol, veh/h		6			119			1073			1328	
Approach Delay, s/veh		53.2			36.6			17.0			16.9	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	38.0		8.5	4.3	41.3		14.2
Change Period (Y+Rc), s	4.0	7.0		8.0	4.0	7.0		8.0
Max Green Setting (Gmax), s	21.0	31.0		10.0	21.0	31.0		21.0
Max Q Clear Time (g_c+I1), s	4.5	18.2		2.2	2.1	20.8		6.5
Green Ext Time (p_c), s	0.1	10.4		0.0	0.0	8.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	18.0
HCM 2010 LOS	B

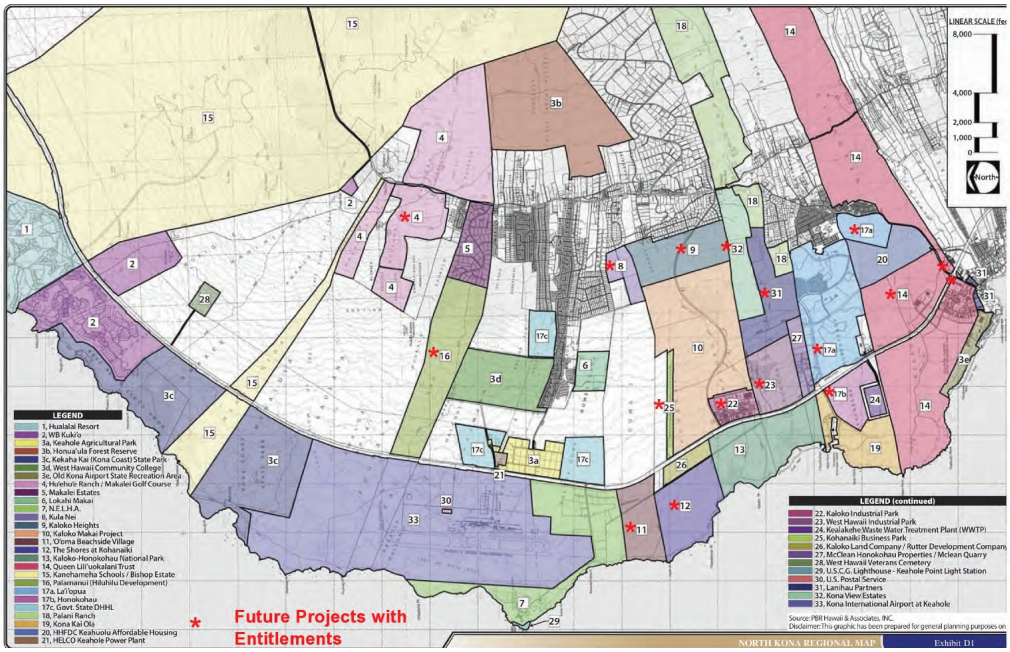

Figure 7. Future Residential, Commercial and LightIndustrial Projects With Entitlements

APPENDIX D
Kailua-Kona Regional Project Development Map and Chart of Surrounding Developments

DLNR – Surrounding Developments

#	Development	Project Description	Build Assumption	References
14	Queen Liliuokalani Trust Lands	• 1,135-acre property • 33,000 SFGFA commercial • 247,000 SFGFA light industrial	• For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
31	Lanihau Shopping Center Phase II	• 43,700 SFGFA commercial	• For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
NS	Mohala Kona Village	• 10,000 SFGFA commercial • Between Lowes and Walmart in Kailua Village	• For future conditions, development was considered to be constructed and fully operational.	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
9	Kaloko Heights	• 641 single family DU • 129 multi-family DU	• For future conditions, development was considered to be constructed and fully operational.	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
32	Kona 327 (Kona View Estates)	• 327-acre large lot subdivisions • 269 single family DU	• For future conditions, development was considered to be constructed and fully operational.	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
8	Kula Nei	• 270 single family DU	• For future conditions, development was considered to be constructed and fully operational.	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
NS	Honokohau Village	• 920 single family DU • Along Kealakehe Parkway, mauka of Queen Kaahumanu Highway	• COH discussed that land owner passed away and project is on hold. • Made determination that 50% of project would be developed by future 2032. • Used ITE trip generation rates using Single Family land use to determine project related trips for 50% of full build (460 DU)	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011) • Phone interview (COH Planning, December 2012) • *Trip Generation 8th Edition* (ITE, 2008)
12	Shores of Kohanaiki	• 450-acre property • 500 single family DU	• For future conditions, development was considered to be constructed and fully operational.	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)

SFGFA = square feet gross floor area, DU = dwelling units, NS = not shown

DLNR – Surrounding Developments

#	Development	Project Description	Build Assumption	References
NS	Kona Judiciary Complex	• 141,800 SFGFA facility with 500 parking spaces on 10-acres • Full occupancy of 220 employees • Visitors assumed not to exceed 280 daily	• In March 2012, Kealakehe Parkway near Ane-Keohokalole Highway location was selected as site of future complex • For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011) • "Kealakehe Selected as Site of Future Judiciary Complex in Kona" (Hawaii State Judiciary website, March 2012)
17a	DHHL Villages of Laiopua	• 500 single family DU • 62,500 SFGFA commercial	• For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
22	Kaloko Industrial Park	• 102-acres of mixed-use commercial and light industrial • 24,000 SFGFA commercial • 188,000 SFGFA light industrial	• For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
20	Kamakana Villages at Keahuolu	• 272-acre property • 2,330 single and multi-family DU • 197,000 SFGFA commercial • Elementary school, charter/private school	• For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
27	West Hawaii Business Park	• 280-acre property • 105,000 SFGFA commercial • 480,000 SFGFA light industrial • Previously named Kaloko-Honokohau Business Park	• For future conditions, development was considered to be constructed and fully operational	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
NS	West Hawaii Civic Center	• 85,000 SFGFA facility for 22 County/State agencies • Located at the intersection of Kealakehe Parkway and Ane- Keohokalole Highway	• Phase 1 of development has been constructed and fully occupied as confirmed by COH • Made determination that Phase 2 of project would be developed by future 2032	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011) • Phone interview (COH Planning, December 2012)

SFGFA = square feet gross floor area, DU = dwelling units, NS = not shown

APPENDIX E
Analysis Reports
Future (2025) Without Project Conditions

DLNR – Surrounding Developments

#	Development	Project Description	Build Assumption	References
6	Lokahi Makai	• 126 acre property • 191 single family DU	• Development is currently 90% complete. • For future conditions, development was considered to be constructed and fully operational.	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
5	Makalei Estates	• 77 single family DU	• Property managers confirmed there are units occupied, but could not specify volume • Made determination that development will have negligible impact to analysis along Queen Kaahumanu Hwy	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011) • Phone interview (Augustine Property Managers, December 2012)
10	Kaloko Makai	• Mixed use development	• Made determination that development will not be developed by future 2032	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011)
11	Ooma Beachside Village	• 420 single family DU • 530 multi-family DU	• LUC denied Ooma Beachside Village to reclassify from conservation to urban district • Made determination that development will not be developed by future 2032	• *Traffic Impact Report for the Proposed Kona Judiciary Complex* (TMC, July 2011) • "Ooma Beachside Villages appeal denied" (West Hawaii Today, August 2011)

SFGFA = square feet gross floor area, DU = dwelling units, NS = not shown

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	5	4	308	5	247	4	1217	267	112	1284	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	181.0	182.6	190.0	186.3	186.3	186.3	181.0	181.0	186.3	186.3	181.0	181.0
Adj Flow Rate, veh/h	8	5	0	339	0	0	4	1295	0	122	1459	0
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.38	0.92	0.38	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.88	0.88
Percent Heavy Veh, %	5	2	2	2	2	2	5	5	2	2	5	5
Cap, veh/h	22	24	0	478	0	213	7	1770	815	155	2057	920
Arrive On Green	0.01	0.01	0.00	0.13	0.00	0.00	0.00	0.51	0.00	0.09	0.60	0.00
Sat Flow, veh/h	1723	1826	0	3548	0	1583	1723	3438	1583	1774	3438	1538
Grp Volume(v), veh/h	8	5	0	339	0	0	4	1295	0	122	1459	0
Grp Sat Flow(s),veh/h/ln	1723	1826	0	1774	0	1583	1723	1719	1583	1774	1719	1538
Q Serve(g_s), s	0.3	0.2	0.0	5.9	0.0	0.0	0.1	18.8	0.0	4.3	19.0	0.0
Cycle Q Clear(g_c), s	0.3	0.2	0.0	5.9	0.0	0.0	0.1	18.8	0.0	4.3	19.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	22	24	0	478	0	213	7	1770	815	155	2057	920
V/C Ratio(X)	0.36	0.21	0.00	0.71	0.00	0.00	0.54	0.73	0.00	0.79	0.71	0.00
Avail Cap(c_a), veh/h	431	456	0	887	0	396	108	1880	866	194	2057	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.3	31.3	0.0	26.5	0.0	0.0	31.8	12.1	0.0	28.6	9.0	0.0
Incr Delay (d2), s/veh	9.5	4.4	0.0	2.0	0.0	0.0	49.9	1.4	0.0	15.3	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	3.0	0.0	0.0	0.2	9.2	0.0	2.8	9.2	0.0
LnGrp Delay(d),s/veh	40.9	35.7	0.0	28.5	0.0	0.0	81.7	13.5	0.0	43.9	10.1	0.0
LnGrp LOS	D	D		C			F	B		D	B	
Approach Vol, veh/h		13			339			1299			1581	
Approach Delay, s/veh		38.9			28.5			13.7			12.7	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	37.0		4.8	4.3	42.3		12.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	35.0		16.0	4.0	38.0		16.0
Max Q Clear Time (g_c+I1), s	1.3	20.8		2.3	2.1	21.0		7.9
Green Ext Time (p_c), s	0.0	12.2		0.0	0.0	14.7		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	8	35	323	24	238	78	1166	296	213	948	65
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5
Adj Flow Rate, veh/h	49	11	0	449	33	0	85	1267	0	242	1077	0
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.75	0.75	0.75	0.72	0.72	0.72	0.92	0.92	0.92	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	61	101	86	473	292	248	108	1414	632	266	1727	773
Arrive On Green	0.03	0.05	0.00	0.14	0.16	0.00	0.06	0.40	0.00	0.15	0.49	0.00
Sat Flow, veh/h	1757	1845	1568	3408	1845	1568	1757	3505	1568	1757	3505	1568
Grp Volume(v), veh/h	49	11	0	449	33	0	85	1267	0	242	1077	0
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1704	1845	1568	1757	1752	1568	1757	1752	1568
Q Serve(g_s), s	2.2	0.4	0.0	10.4	1.2	0.0	3.8	26.8	0.0	10.8	17.8	0.0
Cycle Q Clear(g_c), s	2.2	0.4	0.0	10.4	1.2	0.0	3.8	26.8	0.0	10.8	17.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	61	101	86	473	292	248	108	1414	632	266	1727	773
V/C Ratio(X)	0.80	0.11	0.00	0.95	0.11	0.00	0.78	0.90	0.00	0.91	0.62	0.00
Avail Cap(c_a), veh/h	89	116	99	473	292	248	199	1414	632	266	1727	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.0	35.7	0.0	33.9	28.6	0.0	36.7	22.1	0.0	33.1	14.7	0.0
Incr Delay (d2), s/veh	26.8	0.5	0.0	29.1	0.2	0.0	4.6	9.2	0.0	32.1	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.2	0.0	6.8	0.6	0.0	2.0	14.7	0.0	7.6	8.9	0.0
LnGrp Delay(d),s/veh	64.9	36.2	0.0	63.0	28.8	0.0	41.3	31.3	0.0	65.2	16.4	0.0
LnGrp LOS	E	D		E	C		D	C		E	B	
Approach Vol, veh/h		60			482			1352			1319	
Approach Delay, s/veh		59.6			60.7			31.9			25.4	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	38.7	15.0	10.3	8.9	45.8	6.8	18.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	12.0	32.0	11.0	5.0	9.0	35.0	4.0	12.0
Max Q Clear Time (g_c+I1), s	12.8	28.8	12.4	2.4	5.8	19.8	4.2	3.2
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	4.0	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	2	0	87	0	75	2	1574	89	93	1171	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	182.7	190.0	190.0	182.7	182.7	182.7	182.7	182.7	182.7	182.7	182.7
Adj Flow Rate, veh/h	7	5	0	99	0	0	2	1749	0	98	1233	0
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	15	11	0	124	0	111	5	1952	873	123	2188	979
Arrive On Green	0.01	0.01	0.00	0.07	0.00	0.00	0.00	0.56	0.00	0.07	0.63	0.00
Sat Flow, veh/h	1035	740	0	1740	0	1553	1740	3471	1553	1740	3471	1553
Grp Volume(v), veh/h	12	0	0	99	0	0	2	1749	0	98	1233	0
Grp Sat Flow(s),veh/h/ln	1775	0	0	1740	0	1553	1740	1736	1553	1740	1736	1553
Q Serve(g_s), s	0.6	0.0	0.0	5.4	0.0	0.0	0.1	42.7	0.0	5.3	19.5	0.0
Cycle Q Clear(g_c), s	0.6	0.0	0.0	5.4	0.0	0.0	0.1	42.7	0.0	5.3	19.5	0.0
Prop In Lane	0.58		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	25	0	0	124	0	111	5	1952	873	123	2188	979
V/C Ratio(X)	0.47	0.00	0.00	0.80	0.00	0.00	0.42	0.90	0.00	0.80	0.56	0.00
Avail Cap(c_a), veh/h	92	0	0	127	0	113	91	1952	873	127	2188	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.0	0.0	0.0	43.9	0.0	0.0	47.8	18.5	0.0	43.9	10.2	0.0
Incr Delay (d2), s/veh	13.1	0.0	0.0	28.5	0.0	0.0	51.0	6.9	0.0	28.2	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	3.6	0.0	0.0	0.1	22.0	0.0	3.5	9.6	0.0
LnGrp Delay(d),s/veh	60.1	0.0	0.0	72.4	0.0	0.0	98.8	25.4	0.0	72.1	11.2	0.0
LnGrp LOS	E			E			F	C		E	B	
Approach Vol, veh/h		12			99			1751			1331	
Approach Delay, s/veh		60.1			72.4			25.5			15.7	
Approach LOS		E			E			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	61.0		9.4	4.3	67.5		14.9
Change Period (Y+Rc), s	4.0	7.0		8.0	4.0	7.0		8.0
Max Green Setting (Gmax), s	7.0	54.0		5.0	5.0	56.0		7.0
Max Q Clear Time (g_c+I1), s	7.3	44.7		2.6	2.1	21.5		7.4
Green Ext Time (p_c), s	0.0	8.7		0.0	0.0	28.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	13	68	5	53	6	1331	228	96	1517	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	184.5	184.8	190.0	186.3	186.3	186.3	184.5	184.5	186.3	186.3	184.5	184.5
Adj Flow Rate, veh/h	8	5	0	78	0	0	6	1416	0	104	1564	0
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.61	0.92	0.61	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.97	0.97
Percent Heavy Veh, %	3	2	2	2	2	2	3	3	2	2	3	3
Cap, veh/h	23	24	0	175	0	78	11	2057	929	133	2298	1028
Arrive On Green	0.01	0.01	0.00	0.05	0.00	0.00	0.01	0.59	0.00	0.08	0.66	0.00
Sat Flow, veh/h	1757	1848	0	3548	0	1583	1757	3505	1583	1774	3505	1568
Grp Volume(v), veh/h	8	5	0	78	0	0	6	1416	0	104	1564	0
Grp Sat Flow(s),veh/h/ln	1757	1848	0	1774	0	1583	1757	1752	1583	1774	1752	1568
Q Serve(g_s), s	0.3	0.2	0.0	1.2	0.0	0.0	0.2	16.3	0.0	3.3	16.1	0.0
Cycle Q Clear(g_c), s	0.3	0.2	0.0	1.2	0.0	0.0	0.2	16.3	0.0	3.3	16.1	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	24	0	175	0	78	11	2057	929	133	2298	1028
V/C Ratio(X)	0.35	0.21	0.00	0.45	0.00	0.00	0.54	0.69	0.00	0.78	0.68	0.00
Avail Cap(c_a), veh/h	484	510	0	978	0	437	121	2174	982	183	2298	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	28.3	0.0	26.8	0.0	0.0	28.7	8.3	0.0	26.4	6.2	0.0
Incr Delay (d2), s/veh	8.9	4.2	0.0	1.8	0.0	0.0	34.7	0.9	0.0	13.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	0.6	0.0	0.0	0.2	7.9	0.0	2.1	7.9	0.0
LnGrp Delay(d),s/veh	37.2	32.5	0.0	28.6	0.0	0.0	63.4	9.2	0.0	40.0	7.0	0.0
LnGrp LOS	D	C		C			E	A		D	A	
Approach Vol, veh/h		13			78			1422			1668	
Approach Delay, s/veh		35.4			28.6			9.4			9.1	
Approach LOS		D			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	38.1		4.8	4.4	42.0		6.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	6.0	36.0		16.0	4.0	38.0		16.0
Max Q Clear Time (g_c+I1), s	5.3	18.3		2.3	2.2	18.1		3.2
Green Ext Time (p_c), s	0.0	15.8		0.0	0.0	17.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.8
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	25	90	494	38	240	87	1314	395	251	1559	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	66	27	0	633	49	0	93	1398	0	261	1624	0
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.78	0.78	0.78	0.94	0.94	0.94	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	100	85	613	343	292	99	1418	635	257	1734	776
Arrive On Green	0.05	0.05	0.00	0.18	0.18	0.00	0.06	0.40	0.00	0.14	0.49	0.00
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	66	27	0	633	49	0	93	1398	0	261	1624	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	3.3	1.3	0.0	16.0	2.0	0.0	4.7	35.1	0.0	13.0	38.9	0.0
Cycle Q Clear(g_c), s	3.3	1.3	0.0	16.0	2.0	0.0	4.7	35.1	0.0	13.0	38.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	100	85	613	343	292	99	1418	635	257	1734	776
V/C Ratio(X)	0.78	0.27	0.00	1.03	0.14	0.00	0.94	0.99	0.00	1.02	0.94	0.00
Avail Cap(c_a), veh/h	118	104	88	613	343	292	99	1418	635	257	1734	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	42.3	40.8	0.0	36.9	30.7	0.0	42.3	26.7	0.0	38.4	21.6	0.0
Incr Delay (d2), s/veh	19.2	1.6	0.0	45.0	0.2	0.0	71.0	20.7	0.0	60.5	11.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.7	0.0	11.3	1.0	0.0	4.2	21.2	0.0	10.6	21.4	0.0
LnGrp Delay(d),s/veh	61.5	42.4	0.0	81.9	30.9	0.0	113.2	47.4	0.0	99.0	32.7	0.0
LnGrp LOS	E	D		F	C		F	D		F	C	
Approach Vol, veh/h		93			682			1491			1885	
Approach Delay, s/veh		56.0			78.2			51.5			41.9	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.2	20.0	10.8	9.0	50.2	8.3	22.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	13.0	36.0	16.0	5.0	5.0	44.0	6.0	15.0
Max Q Clear Time (g_c+I1), s	15.0	37.1	18.0	3.3	6.7	40.9	5.3	4.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	51.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	2	96	0	73	3	1741	73	64	2099	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	186.3	190.0	190.0	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	6	0	0	119	0	0	3	1852	0	67	2186	0
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.33	0.33	0.33	0.81	0.81	0.81	0.94	0.94	0.94	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	0	0	135	0	121	7	2160	966	86	2317	1037
Arrive On Green	0.01	0.00	0.00	0.08	0.00	0.00	0.00	0.61	0.00	0.05	0.65	0.00
Sat Flow, veh/h	1774	0	0	1774	0	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	6	0	0	119	0	0	3	1852	0	67	2186	0
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.4	0.0	0.0	7.0	0.0	0.0	0.2	44.9	0.0	3.9	58.5	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	7.0	0.0	0.0	0.2	44.9	0.0	3.9	58.5	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	14	0	0	135	0	121	7	2160	966	86	2317	1037
V/C Ratio(X)	0.44	0.00	0.00	0.88	0.00	0.00	0.42	0.86	0.00	0.78	0.94	0.00
Avail Cap(c_a), veh/h	85	0	0	135	0	121	85	2160	966	101	2317	1037
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.8	0.0	0.0	48.0	0.0	0.0	52.1	16.7	0.0	49.3	16.4	0.0
Incr Delay (d2), s/veh	21.0	0.0	0.0	43.6	0.0	0.0	35.5	4.7	0.0	27.2	9.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	5.0	0.0	0.0	0.2	23.0	0.0	2.6	31.3	0.0
LnGrp Delay(d),s/veh	72.8	0.0	0.0	91.6	0.0	0.0	87.7	21.4	0.0	76.6	25.8	0.0
LnGrp LOS	E			F			F	C		E	C	
Approach Vol, veh/h		6			119			1855			2253	
Approach Delay, s/veh		72.8			91.6			21.5			27.3	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.1	71.0		8.8	4.4	75.7		16.0
Change Period (Y+Rc), s	4.0	7.0		8.0	4.0	7.0		8.0
Max Green Setting (Gmax), s	6.0	64.0		5.0	5.0	65.0		8.0
Max Q Clear Time (g_c+I1), s	5.9	46.9		2.4	2.2	60.5		9.0
Green Ext Time (p_c), s	0.0	16.8		0.0	0.0	4.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

APPENDIX F

Analysis Reports

Future (2025) With Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	5	4	308	5	247	4	1222	267	112	1316	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	181.0	182.6	190.0	186.3	186.3	186.3	181.0	181.0	186.3	186.3	181.0	181.0
Adj Flow Rate, veh/h	8	5	0	339	0	0	4	1300	0	122	1495	0
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.38	0.92	0.38	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.88	0.88
Percent Heavy Veh, %	5	2	2	2	2	2	5	5	2	2	5	5
Cap, veh/h	22	24	0	478	0	213	7	1771	816	155	2058	920
Arrive On Green	0.01	0.01	0.00	0.13	0.00	0.00	0.00	0.52	0.00	0.09	0.60	0.00
Sat Flow, veh/h	1723	1826	0	3548	0	1583	1723	3438	1583	1774	3438	1538
Grp Volume(v), veh/h	8	5	0	339	0	0	4	1300	0	122	1495	0
Grp Sat Flow(s),veh/h/ln	1723	1826	0	1774	0	1583	1723	1719	1583	1774	1719	1538
Q Serve(g_s), s	0.3	0.2	0.0	5.9	0.0	0.0	0.1	18.9	0.0	4.3	19.8	0.0
Cycle Q Clear(g_c), s	0.3	0.2	0.0	5.9	0.0	0.0	0.1	18.9	0.0	4.3	19.8	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	22	24	0	478	0	213	7	1771	816	155	2058	920
V/C Ratio(X)	0.36	0.21	0.00	0.71	0.00	0.00	0.54	0.73	0.00	0.79	0.73	0.00
Avail Cap(c_a), veh/h	430	456	0	886	0	395	108	1878	865	194	2058	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.4	31.3	0.0	26.5	0.0	0.0	31.8	12.1	0.0	28.6	9.1	0.0
Incr Delay (d2), s/veh	9.5	4.4	0.0	2.0	0.0	0.0	49.9	1.4	0.0	15.3	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	3.0	0.0	0.0	0.2	9.2	0.0	2.8	9.5	0.0
LnGrp Delay(d),s/veh	40.9	35.7	0.0	28.5	0.0	0.0	81.8	13.5	0.0	43.9	10.5	0.0
LnGrp LOS	D	D		C			F	B		D	B	
Approach Vol, veh/h		13			339			1304			1617	
Approach Delay, s/veh		38.9			28.5			13.8			13.0	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	37.0		4.8	4.3	42.3		12.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	35.0		16.0	4.0	38.0		16.0
Max Q Clear Time (g_c+I1), s	2.3	20.9		2.3	2.1	21.8		7.9
Green Ext Time (p_c), s	0.0	12.1		0.0	0.0	14.2		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	9	41	323	35	238	120	1166	296	213	948	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5	184.5
Adj Flow Rate, veh/h	56	12	0	449	49	0	130	1267	0	242	1077	0
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.75	0.75	0.75	0.72	0.72	0.72	0.92	0.92	0.92	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	71	106	90	471	287	244	162	1409	630	265	1615	722
Arrive On Green	0.04	0.06	0.00	0.14	0.16	0.00	0.09	0.40	0.00	0.15	0.46	0.00
Sat Flow, veh/h	1757	1845	1568	3408	1845	1568	1757	3505	1568	1757	3505	1568
Grp Volume(v), veh/h	56	12	0	449	49	0	130	1267	0	242	1077	0
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1704	1845	1568	1757	1752	1568	1757	1752	1568
Q Serve(g_s), s	2.5	0.5	0.0	10.4	1.8	0.0	5.8	26.9	0.0	10.8	19.0	0.0
Cycle Q Clear(g_c), s	2.5	0.5	0.0	10.4	1.8	0.0	5.8	26.9	0.0	10.8	19.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	106	90	471	287	244	162	1409	630	265	1615	722
V/C Ratio(X)	0.79	0.11	0.00	0.95	0.17	0.00	0.80	0.90	0.00	0.91	0.67	0.00
Avail Cap(c_a), veh/h	88	116	99	471	287	244	199	1409	630	265	1615	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.9	35.6	0.0	34.0	29.1	0.0	35.4	22.3	0.0	33.3	16.7	0.0
Incr Delay (d2), s/veh	30.9	0.5	0.0	29.8	0.3	0.0	14.2	9.4	0.0	32.8	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.3	0.0	6.8	1.0	0.0	3.4	14.7	0.0	7.7	9.6	0.0
LnGrp Delay(d),s/veh	68.8	36.1	0.0	63.9	29.5	0.0	49.6	31.7	0.0	66.1	18.9	0.0
LnGrp LOS	E	D		E	C		D	C		E	B	
Approach Vol, veh/h		68			498			1397			1319	
Approach Delay, s/veh		63.0			60.5			33.4			27.6	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	38.4	15.0	10.6	11.3	43.1	7.2	18.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	12.0	32.0	11.0	5.0	9.0	35.0	4.0	12.0
Max Q Clear Time (g_c+I1), s	12.8	28.9	12.4	2.5	7.8	21.0	4.5	3.8
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	3.9	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	35.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	2	0	87	0	78	2	1613	89	94	1176	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	182.7	190.0	190.0	182.7	182.7	182.7	182.7	182.7	182.7	182.7	182.7
Adj Flow Rate, veh/h	7	5	0	99	0	0	2	1792	0	99	1238	0
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	15	11	0	101	0	90	5	1932	864	101	2124	950
Arrive On Green	0.01	0.01	0.00	0.06	0.00	0.00	0.00	0.56	0.00	0.06	0.61	0.00
Sat Flow, veh/h	1035	740	0	1740	0	1553	1740	3471	1553	1740	3471	1553
Grp Volume(v), veh/h	12	0	0	99	0	0	2	1792	0	99	1238	0
Grp Sat Flow(s),veh/h/ln	1775	0	0	1740	0	1553	1740	1736	1553	1740	1736	1553
Q Serve(g_s), s	0.6	0.0	0.0	4.9	0.0	0.0	0.1	40.8	0.0	4.9	18.6	0.0
Cycle Q Clear(g_c), s	0.6	0.0	0.0	4.9	0.0	0.0	0.1	40.8	0.0	4.9	18.6	0.0
Prop In Lane	0.58		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	26	0	0	101	0	90	5	1932	864	101	2124	950
V/C Ratio(X)	0.47	0.00	0.00	0.98	0.00	0.00	0.42	0.93	0.00	0.98	0.58	0.00
Avail Cap(c_a), veh/h	103	0	0	101	0	90	101	1932	864	101	2124	950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	42.2	0.0	0.0	40.6	0.0	0.0	42.9	17.5	0.0	40.6	10.1	0.0
Incr Delay (d2), s/veh	12.6	0.0	0.0	83.4	0.0	0.0	50.7	9.3	0.0	83.4	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	4.7	0.0	0.0	0.1	21.9	0.0	4.7	9.1	0.0
LnGrp Delay(d),s/veh	54.7	0.0	0.0	124.0	0.0	0.0	93.6	26.8	0.0	124.0	11.3	0.0
LnGrp LOS	D			F			F	C		F	B	
Approach Vol, veh/h		12			99			1794			1337	
Approach Delay, s/veh		54.7			124.0			26.9			19.6	
Approach LOS		D			F			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	55.0		9.2	4.2	59.8		13.0
Change Period (Y+Rc), s	4.0	7.0		8.0	4.0	7.0		8.0
Max Green Setting (Gmax), s	5.0	48.0		5.0	5.0	48.0		5.0
Max Q Clear Time (g_c+I1), s	2.9	42.8		2.6	2.1	20.6		6.9
Green Ext Time (p_c), s	0.0	5.0		0.0	0.0	23.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	13	68	5	53	6	1353	228	96	1523	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	184.5	184.8	190.0	186.3	186.3	186.3	184.5	184.5	186.3	186.3	184.5	184.5
Adj Flow Rate, veh/h	8	5	0	78	0	0	6	1439	0	104	1570	0
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.61	0.92	0.61	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.97	0.97
Percent Heavy Veh, %	3	2	2	2	2	2	3	3	2	2	3	3
Cap, veh/h	23	24	0	175	0	78	11	2058	930	133	2299	1029
Arrive On Green	0.01	0.01	0.00	0.05	0.00	0.00	0.01	0.59	0.00	0.08	0.66	0.00
Sat Flow, veh/h	1757	1848	0	3548	0	1583	1757	3505	1583	1774	3505	1568
Grp Volume(v), veh/h	8	5	0	78	0	0	6	1439	0	104	1570	0
Grp Sat Flow(s),veh/h/ln	1757	1848	0	1774	0	1583	1757	1752	1583	1774	1752	1568
Q Serve(g_s), s	0.3	0.2	0.0	1.2	0.0	0.0	0.2	16.7	0.0	3.3	16.2	0.0
Cycle Q Clear(g_c), s	0.3	0.2	0.0	1.2	0.0	0.0	0.2	16.7	0.0	3.3	16.2	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	24	0	175	0	78	11	2058	930	133	2299	1029
V/C Ratio(X)	0.35	0.21	0.00	0.45	0.00	0.00	0.54	0.70	0.00	0.78	0.68	0.00
Avail Cap(c_a), veh/h	484	509	0	977	0	436	121	2171	981	183	2299	1029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	28.4	0.0	26.9	0.0	0.0	28.8	8.4	0.0	26.4	6.2	0.0
Incr Delay (d2), s/veh	8.9	4.2	0.0	1.8	0.0	0.0	34.7	1.0	0.0	13.7	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	0.6	0.0	0.0	0.2	8.3	0.0	2.2	7.9	0.0
LnGrp Delay(d),s/veh	37.3	32.6	0.0	28.6	0.0	0.0	63.5	9.3	0.0	40.1	7.1	0.0
LnGrp LOS	D	C		C			E	A		D	A	
Approach Vol, veh/h		13			78			1445			1674	
Approach Delay, s/veh		35.5			28.6			9.6			9.1	
Approach LOS		D			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	38.1		4.8	4.4	42.1		6.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	6.0	36.0		16.0	4.0	38.0		16.0
Max Q Clear Time (g_c+I1), s	5.3	18.7		2.3	2.2	18.2		3.2
Green Ext Time (p_c), s	0.0	15.4		0.0	0.0	17.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	82	34	135	494	40	240	94	1314	395	251	1559	109
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	90	37	0	633	51	0	100	1398	0	261	1624	0
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.78	0.78	0.78	0.94	0.94	0.94	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	102	87	612	313	266	118	1417	634	256	1693	757
Arrive On Green	0.06	0.05	0.00	0.18	0.17	0.00	0.07	0.40	0.00	0.14	0.48	0.00
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	90	37	0	633	51	0	100	1398	0	261	1624	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	4.5	1.7	0.0	16.0	2.1	0.0	5.0	35.2	0.0	13.0	39.8	0.0
Cycle Q Clear(g_c), s	4.5	1.7	0.0	16.0	2.1	0.0	5.0	35.2	0.0	13.0	39.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	102	87	612	313	266	118	1417	634	256	1693	757
V/C Ratio(X)	0.78	0.36	0.00	1.03	0.16	0.00	0.84	0.99	0.00	1.02	0.96	0.00
Avail Cap(c_a), veh/h	138	104	88	612	313	266	118	1417	634	256	1693	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.4	41.0	0.0	37.0	32.0	0.0	41.5	26.7	0.0	38.5	22.6	0.0
Incr Delay (d2), s/veh	21.2	2.4	0.0	45.3	0.3	0.0	38.2	20.9	0.0	60.8	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	1.0	0.0	11.4	1.1	0.0	3.7	21.2	0.0	10.7	22.7	0.0
LnGrp Delay(d),s/veh	62.7	43.4	0.0	82.3	32.3	0.0	79.7	47.6	0.0	99.4	36.8	0.0
LnGrp LOS	E	D		F	C		E	D		F	D	
Approach Vol, veh/h		127			684			1498			1885	
Approach Delay, s/veh		57.1			78.5			49.8			45.5	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.1	20.0	10.9	10.0	49.1	9.8	21.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	13.0	36.0	16.0	5.0	6.0	43.0	7.0	14.0
Max Q Clear Time (g_c+I1), s	15.0	37.2	18.0	3.7	7.0	41.8	6.5	4.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	52.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	2	96	0	73	3	1748	73	66	2142	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	190.0	186.3	190.0	190.0	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	6	0	0	119	0	0	3	1860	0	69	2231	0
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.33	0.33	0.33	0.81	0.81	0.81	0.94	0.94	0.94	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	0	0	119	0	107	7	2178	975	89	2341	1047
Arrive On Green	0.01	0.00	0.00	0.07	0.00	0.00	0.00	0.62	0.00	0.05	0.66	0.00
Sat Flow, veh/h	1774	0	0	1774	0	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	6	0	0	119	0	0	3	1860	0	69	2231	0
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.4	0.0	0.0	7.0	0.0	0.0	0.2	44.3	0.0	4.0	60.0	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	7.0	0.0	0.0	0.2	44.3	0.0	4.0	60.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	14	0	0	119	0	107	7	2178	975	89	2341	1047
V/C Ratio(X)	0.44	0.00	0.00	1.00	0.00	0.00	0.42	0.85	0.00	0.78	0.95	0.00
Avail Cap(c_a), veh/h	85	0	0	119	0	107	85	2178	975	119	2341	1047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.4	0.0	0.0	48.5	0.0	0.0	51.7	16.2	0.0	48.8	16.1	0.0
Incr Delay (d2), s/veh	21.0	0.0	0.0	81.2	0.0	0.0	35.5	4.5	0.0	20.2	10.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	6.1	0.0	0.0	0.2	22.8	0.0	2.5	32.2	0.0
LnGrp Delay(d),s/veh	72.3	0.0	0.0	129.7	0.0	0.0	87.2	20.7	0.0	69.0	26.6	0.0
LnGrp LOS	E			F			F	C		E	C	
Approach Vol, veh/h		6			119			1863			2300	
Approach Delay, s/veh		72.3			129.7			20.8			27.9	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.2	71.0		8.8	4.4	75.8		15.0
Change Period (Y+Rc), s	4.0	7.0		8.0	4.0	7.0		8.0
Max Green Setting (Gmax), s	7.0	64.0		5.0	5.0	66.0		7.0
Max Q Clear Time (g_c+I1), s	9.0	46.3		2.4	2.2	62.0		9.0
Green Ext Time (p_c), s	0.0	17.4		0.0	0.0	3.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C

APPENDIX F

Consultation and Comments

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THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

March 3, 2015

Subject: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center in Kealakehe, North Kona, Hawaii
Tax Map Key (3) 7-4-008: 003 (por.)

Dear Sir or Madam,

On behalf of the Department of Land and Natural Resources (DLNR), The Limtiaco Consulting Group is preparing a Draft Environmental Assessment (EA) for the proposed construction of a new DLNR Administration Building and Community Center in Kealakehe, North Kona, Hawaii. The project site is adjacent to the Kaloko-Honokohau National Park and consists of undeveloped land that is owned by DLNR between Queen Kaahumanu Highway and the existing Honokohau Small Boat Harbor Facility. The project site will be assessed for archaeological, cultural, biological and traffic considerations as part of the EA process. Pursuant to Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Hawaii Administrative Rules of the Department of Health, we are soliciting comments for the pre-assessment consultation phase of the Draft EA.

A new administration and shared base yard facility in Kealakehe will allow DLNR to consolidate services at a single central location in West Hawaii as office leases for several divisions end. DLNR's Division of Boating and Ocean Recreation (DOBOR), Division of Conservation and Resources Enforcement (DOCARE), and Division of Aquatic Resources (DAR) are currently located at the Honokohau Small Boat Harbor Facility. Both DOCARE and DAR would relocate to DLNR's new administration facility, which will also house the Commission on Water Resource Management (CWRM), Division of Forestry and Wildlife (DOFAW), Division of State Parks (SP), Engineering Division (ENG) and State Historic Preservation Division (SHPD). DLNR is proposing the development of a modern, energy efficient facility that accommodates present and future operational needs such as secure base yards, storage facilities, and spaces where division personnel can interact with the public it serves. A community conference center will be contained within the new administration building. The community conference center will accommodate public events and meetings that range from 20 to 200 people. The new facility in Kealakehe would allow DLNR to continue its administration, management, protection and conservation efforts while improving the delivery of its services and encouraging greater public interaction and outreach.

DLNR's proposed project would improve the undeveloped site, which consists of relatively flat land that has experienced at least two distinct lava flow events from the Hualalai volcano. It is anticipated that the project will be developed in phases due to funding options and constraints. DLNR's new facility will require the installation of infrastructure (e.g., water, wastewater, electrical/communication systems, and internal roadways with access and egress from Kealakehe Parkway) during the earliest phase of development. Base yards and storage areas will have access controls to protect government vessels, vehicles, equipment, tools, records,

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artifacts and disinterred remains (or *iwi*). Parking areas and pedestrian circulation routes will be developed within the project site. The public facility will be accessible in accordance with the Americans with Disabilities Act guidelines. A free-standing building to house the community center is proposed for development during a later phase of the project.

We would greatly appreciate information from you or your organization that considers how the construction of DLNR's administration facility could potentially impact important biological, archaeological and historic resources. The information will assist us and project stakeholders in determining appropriate mitigation measures. Additionally, we would appreciate any input and information about potential project impacts on traditional and cultural practices and beliefs of any cultural or ethnic group(s). The name(s) and contact information of knowledgeable individual(s) whom we could contact regarding any such beliefs, practices, or resources that may be affected would be very helpful to us.

The enclosed location map is provided for your reference. You are welcome to provide input on the project at this time or be a consulted party while the EA is being prepared. We would appreciate your response to this pre-assessment consultation letter by Friday, March 27, 2015.

Please send comments to:

Carty Chang, Chief Engineer
DLNR, Engineering Division
P.O. Box 373
Honolulu, HI 96809
Fax: (808) 587-0283

And please provide a copy to:

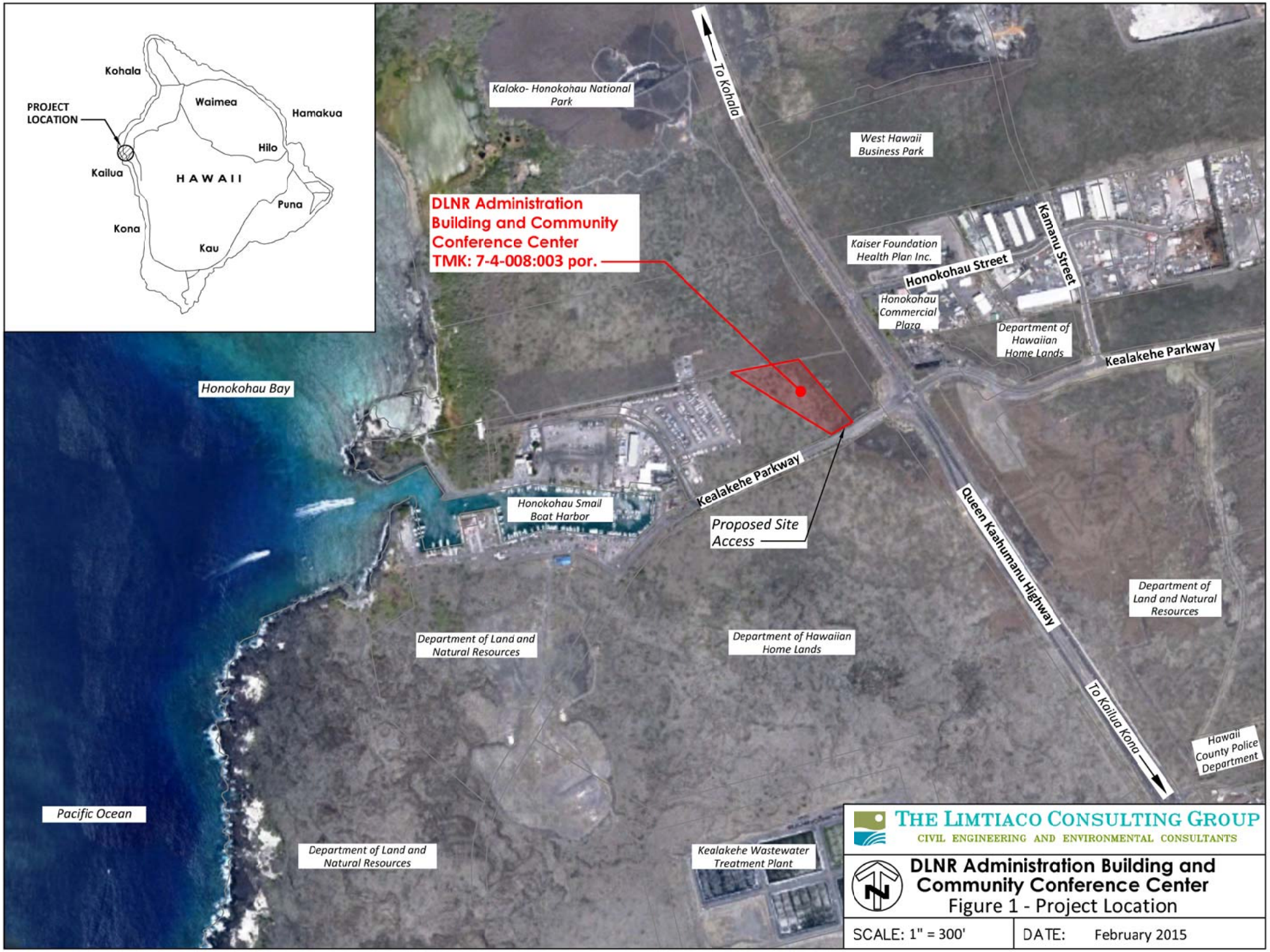
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner


Kohala
Waimea
Hamakua
PROJECT LOCATION
Hilo
Kailua
HAWAII
Puna
Kona
Kau
Kaloko- Honokohau National Park
To Kohala
West Hawaii Business Park
DLNR Administration Building and Community Conference Center
TMK: 7-4-008:003 por.
Kaiser Foundation Health Plan Inc.
Honokohau Street
Kamanu Street
Honokohau Commercial Plaza
Department of Hawaiian Home Lands
Kealakehe Parkway
Honokohau Bay
Kealakehe Parkway
Honokohau Small Boat Harbor
Proposed Site Access
Queen Kaahumanu Highway
Department of Land and Natural Resources
Department of Land and Natural Resources
Department of Hawaiian Home Lands
To Kailua Kona
Hawaii County Police Department
Pacific Ocean
Department of Land and Natural Resources
Kealakehe Wastewater Treatment Plant
THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS
DLNR Administration Building and Community Conference Center
Figure 1 - Project Location
SCALE: 1" = 300'
DATE: February 2015

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Ms. Tina Prettyman, General Manager
Gentry's Kona Marina Honokohau Harbor
74-425 Kealakehe Parkway
Kailua-Kona, HI 96740

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Ms. Prettyman:

Thank you for your letter dated 03/06/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe and for meeting with the project team on 04/30/15. We appreciate your statements of appreciation for the contemporary look of the buildings and the well-conceived design. The Environmental Assessment (EA) will mention your organization's support for DLNR's proposed community conference center, which is envisioned as a flexible venue that may be utilized by government entities and non-profit groups for outreach and educational opportunities, public informational meetings, and workshops and conferences servicing up to 200 people.

DLNR is aware that Phase 2 of the Queen Kaahumanu Highway widening project, which includes the installation of utilities and drain inlet structures, is currently underway. Completion of the federally funded project by 2018 will result in improved utility infrastructure along the highway; therefore, DLNR decided to omit the on-site individual wastewater system (IWS) from the proposed project and will instead convey wastewater to the Kealakehe WWTP via a connection to improved wastewater conveyance facilities along the widened highway.

The Draft EA is anticipated to be available for public review this summer 2016. We look forward to your continued interest and participation in the environmental review process. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

GENTRY'S KONA MARINA
HONOKOHAU HARBOR

03-07-15P02:54 RCVD

74-425 Kealakehe Parkway, Kailua-Kona, Hawaii 96740 • Phone 808.329.7896 Fax 808.329.7372 • Toll Free 888.458.7896

March 6, 2015

Carty Chang, Chief Engineer
DLNR, Engineer Division
P.O. Box 373
Honolulu, HI 96809

Via certified mail: 7014 0150 0000 4338 6518

Re: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources, Administration Building and Community Conference Center in Kealakehe TMK (3) 7-4-008: (por.)

Dear Mr. Chang:

Thank you for considering and allowing us an opportunity to comment on this project. We have read through the preliminary information about your project as provided by Claire Oshiro, Environmental Planner of The Limtiaco Consulting Group.

We will give it some thought and get back to you. Please continue to forward any and all other information as it becomes available on this project.

Sincerely,

Tina Prettyman
General Manager

cc: Claire Oshiro, Environmental Planner via Certified Mail 7014 0150 0000 4338 6389
The Limtiaco Consulting Group
Civil Engineering and Environmental Consultants
1622 Kanakanui St.
Honolulu, HI 96817

Machine Shop • Metal Fabrication • Propeller Repair • Boat Park
Tackle Shop • Surf/Dive • Tournaments • 50-Ton Travelift • Open Yard Storage • Shipwrights • Fiberglass Repair • Engine Repair • Electrical Repair
Marine Hardware • Dining Facilities • Fish & Ice House • Fish Scale • Fuel • Charter Activities • Yacht Brokerage • Deli & Convenience Store • Graphic Design • Marine Clothing & Accessories

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Warren H.W. Lee, P.E., Director
County of Hawaii
Department of Public Works
Aupuni Center
101 Pauahi Street, Suite 7
Hilo, HI 96720

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Lee:

Thank you for the email dated 03/16/15 from Mr. Kiran Emler regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge that your department provided no comments.

The Draft Environmental Assessment is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Claire Oshiro

From: Claire Oshiro
Sent: Monday, March 16, 2015 10:57 AM
To: Emler, Kiran
Cc: Mark, Bennett; Newlon, Rosalind
Subject: THANKS RE: DLNR Admin Facility in Kealakehe, West Hawaii

Hi Kiran: Thank you for your update that DPW will not be providing any comments at this time.

Please do not hesitate to contact me as needed with your department's comments or concerns with regards to the environmental assessment for DLNR's project.

Claire Oshiro
(808) 596-7790 x241

From: Emler, Kiran
Sent: Monday, March 16, 2015 9:44 AM
To: Claire Oshiro
Cc: Mark, Bennett; Newlon, Rosalind
Subject: RE: DLNR Admin Facility in Kealakehe, West Hawaii

Aloha Claire
Thanks for getting back to me. I needed to discuss with our Planning Department a future frontage road shown on the Kona Community Development Plan so was trying to verify the scale on the map attached to the announcement dated March 3. Having discussed with Planning, DPW will not be making any comments on the proposal.—Thanks--Ki

Kiran F. Emler
County of Hawaii
Department of Public Works
Engineering Division
West Hawaii Civic Center, Bldg. D
74-5044 Ane Keohokalole Hwy.
Kailua-Kona HI, 96740

[redacted]

From: Claire Oshiro
Sent: Monday, March 16, 2015 9:22 AM
To: Emler, Kiran
Subject: DLNR Admin Facility in Kealakehe, West Hawaii

Hi Kiran: Thank you for calling this morning (Wednesday 3/16) about the pre-assessment consultation for DLNR's Administration Building and Community Conference Center in Kealakehe.

Please confirm that I have your correct email address.

I will follow up with the additional project information once I have received your confirmation.

Thanks again.

Claire Oshiro
(808) 596-7790 x241

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Greg Goodale, Chief
County of Hawaii
Department of Environmental Management, Solid Waste Division
345 Kekuanaoa Street, Suite 41
Hilo, HI 96720

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Goodale:

Thank you for your letter dated 03/11/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge that your department had no comments or objections.

The Draft Environmental Assessment is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

SOLID WASTE DIVISION

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

COUNTY OF HAWAI'I- 345 KEKŪANĀO'A ST., STE 41- HILO, HI 96720
Tel: (808) 961-8270 Fax: (808) 961-8553
Website: www.hawaiizerowaste.org

03-13-15-92922-ARNV

March 11, 2015

DLNR, Engineering Division
Carty Chang, Chief Engineer
P.O. Box 373
Honolulu, HI 96809

Subject: Solid Waste Division response to Pre-Assessment Consultation, Draft Environmental Assessment for the DLNR Administration Building and Community Conference Center in Kealakehe, North Kona, Hawai'i
Tax Map Key (3) 7-4-008: 003 (por.)

Dear Carty Chang:

On behalf of the County of Hawai'i, Department of Environmental Management, we have no comments or objections to the Draft Environmental Assessment for the DLNR Administration Building and Community Conference Center in Kealakehe, North Kona, Hawai'i, TMK (3) 7-4-008: 003 (por.) dated March 3, 2015 received by our department from The Limtiaco Consultant Group.

Should you have any questions or require additional information, please contact me at (808) 961-8515.

Sincerely,

Greg Goodale
Chief, Solid Waste Division

cc: Bobby Jean Leithead-Todd, Director, Department of Environmental Management
Clair Oshiro, Environmental Planner, The Limtiaco Consulting Group

Hawai'i County is an equal opportunity provider and employer.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Ms. Joanna L. Seto, P.E., Chief
State of Hawaii
Department of Health, Safe Drinking Water Branch
919 Ala Moana Boulevard, Room 308
Honolulu, Hawaii 96814

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference SDWB Chang01.doc

Dear Ms. Seto:

Thank you for your letter dated 03/12/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge your department's Underground Injection Control (UIC) Program review of March 3, 2015. DLNR's project does not include the construction or operation of injection wells. The Environmental Assessment (EA) will include the following statements from your department's letter: *The project is located below the UIC line. There are no known drinking water wells within ¼ mile of the project site. There may be ecologically sensitive environments, such as anchialine ponds, existing in the area. We recommend that injection wells not be considered as a primary disposal component for any of the project's wastewaters, if possible.*

DLNR is aware that Phase 2 of the Queen Kaahumanu Highway widening project, which includes the installation of utilities and drain inlet structures, is currently underway. Completion of the federally funded project by 2018 will result in improved utility infrastructure along the highway; therefore, DLNR decided to omit the on-site individual wastewater system (IWS) from the proposed project and will instead convey wastewater to the Kealakehe WWTP via a connection to improved wastewater conveyance facilities along the widened highway.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
SAFE DRINKING WATER BRANCH
919 ALA MOANA BLVD., ROOM 308
HONOLULU, HI 96814-4920

In reply, please refer to:
File: SDWB
Chang01.doc

03-13-15P03:34 RCVD

March 12, 2015

To: Carty Chang, P.E., Chief Engineer
Engineering Division
Department of Land and Natural Resources

From: Joanna L. Seto, P.E., Chief
Safe Drinking Water Branch
Department of Health

Subject: UNDERGROUND INJECTION CONTROL (UIC) PROGRAM REVIEW OF MARCH 3, 2015, PRE-ASSESSMENT CONSULTATION FOR DLNR ADMINISTRATION BUILDING AND COMMUNITY CONFERENCE CENTER IN KEALAKEHE, NORTH KONA, HAWAII TMK NO. (3)7-4-008:003

The Safe Drinking Water Branch (SDWB) UIC program has reviewed your request and has the following comments:

1. The project is located below the UIC line. There are no known drinking water wells located within ¼ mile of the project site. Land areas above the UIC line are considered to overlie underground sources of drinking water;

2. The UIC program regulates the construction and operation of wastewater disposal injection wells to prevent the contamination of our drinking water aquifers. The use of injection wells may be proposed to be used for stormwater management or on-site sewage disposal. If the construction and operation of an injection well is proposed, the requirements of Hawaii Administrative Rules, Title 11, Chapter 23, Underground Injection Control will become applicable; and

3. The construction and use of injection wells has the potential of creating adverse environmental effects. Injection wells can introduce or spread contaminants into areas where contamination would not occur naturally. Injection may change the localized hydraulic gradient dependent on the discharge quantity, pressure, and duration which may affect the groundwater's natural flow pattern. Injection wells can discharge directly into the groundwater which bypasses the natural filtration effects of the surface soils and vegetation and shortens the travel time through the ground during which natural attenuation and breakdown of a contaminant can occur.

There may be ecologically sensitive environments, such as anchialine ponds, existing in the area. We recommend that injection wells not be considered as a primary disposal component for any of the project's wastewaters, if possible.

If you have any questions or comments on our review or the UIC program, please contact Mr. Norris Uehara, Supervisor of the SDWB UIC Program at 586-4258.

NU:nbp

c: Ms. Claire Oshiro
The Limitiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. James Kurata, Public Works Administrator
State of Hawaii
Department of Accounting and General Services
Public Works Division - Administration
P.O. Box 119
Honolulu, HI 96810

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Kurata:

Thank you for your letter dated 03/13/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge that your department had no comments to offer regarding impacts to biological, archaeological or historic resources. The Environmental Assessment (EA) will acknowledge your department's request for coordination with respect to managed office leases and impacts to space assignments in facilities managed by the Department of Accounting and General Services since coordination on these issues is essential to ensuring sufficient time is given to execute any termination of leases and/or reassignment of State office spaces.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR

DOUGLAS MURDOCK
Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

MAR 13 2015 03-13-15P03:00 RCVD

(P)1048.5

MEMORANDUM

TO: Mr. Carty Chang, Chief Engineer
Engineering Division
Department of Land and Natural Resources

FROM: James K. Kurata
Public Works Administrator

SUBJECT: Pre-Assessment Consultation
Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
Kealakehe, North Kona, Island of Hawaii, TMK (3) 7-4-008:003 (por.)

This is in response to your letter dated March 3, 2015 regarding the subject project. We have no comments to offer at this time with respect to the proposed project's impacts to important biological, archaeological, and historic resources.

We request to be kept informed of any impacts to the Department of Accounting and General Services (DAGS) managed office space leases as well as impacts to space assignments in facilities managed by DAGS. Coordination on these issues is essential to ensuring sufficient time is given to execute any termination of leases and/or reassignment of State office spaces.

If there are any questions, please call me at 586-0526, or your staff may call Mr. David DePonte of the Planning Branch at 586-0492.

DD:lnn
c: Ms. Claire Oshiro, Limtiaco Consulting Group
Mr. Jerry Watanabe, DAGS-Hawaii District Office
Mr. Ivan Nishiki, DAGS-Leasing

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Ford N. Fuchigami, Director
State of Hawaii
Department of Transportation
Aliiaimoku Building, 869 Punchbowl Street, Suite 509
Honolulu, HI 96713

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference DIR 0240 STP 8.1774, STP 8.1788

Dear Mr. Fuchigami:

Thank you for your letters dated 03/20/15 and 04/24/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe. We acknowledge your department's recommendation to discuss and evaluate the project's contribution to the cumulative traffic impacts on Queen Kaahumanu Highway. The Environmental Assessment (EA) will include the statement from your 03/20/15 letter that the transport of oversized and/or overweight materials and equipment on State highway facilities requires a permit from the State of Hawaii Department of Transportation, Highways Division.

We submitted the traffic impact assessment report for your agency's review and acceptance on 07/20/15. DLNR is aware that Phase 2 of the Queen Kaahumanu Highway widening project is currently underway and may be completed by 2018. The EA will include the statement from your 04/24/15 letter that the entrance to the DLNR base yard should be located as far from the intersection of Queen Kaahumanu Highway with Kealakehe Parkway as is possible. Vehicular access to the project site will be from two driveway locations along Kealakehe Parkway located roughly 485 feet and 735 feet, respectively, from the existing pavement edge of Queen Kaahumanu Highway.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
STP 8.1788

April 24, 2015

05-11-15A09:55 RCVD

TO: THE HONORABLE CARTY CHANG P. E., INTERIM CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR)

ATTN: CHRIS TAKASHIGE, ACTING CHIEF ENGINEER
ENGINEERING DIVISION

FROM: FORD N. FUCHIGAMI
DIRECTOR OF TRANSPORTATION

SUBJECT: DLNR ADMINSTRATION BUILDING AND COMMUNITY CONFERENCE CENTER IN KEALAKEHE
PRE-ASSESSMENT CONSULTATION, DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KEALAKEHE, NORTH KONA, HAWAII
TMK: (3) 7-4-008:003 (POR.)

Our State Department of Transportation (DOT) previously commented on the subject project during Pre-Consultation in our letter STP 8.1774 dated March 20, 2015 (copy attached) and now offer the following supplemental comments:

Highways Division (HWY)

1. A traffic assessment report shall be prepared and submitted to HWY for its review and acceptance.
2. The project should be aware that DOT has plans to widen Queen Kaahumanu Highway to four lanes and construct ancillary improvements.
3. The entrance to the DLNR base yard should be located as far from the Queen Kaahumanu Highway Kealakehe Parkway intersection as is possible.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

c: Claire Oshiro, The Limtiaco Consulting Group

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
DIR 0240
STP 8.1774

March 20, 2015

03-27-15P03:21 RCVD

TO: THE HONORABLE CARTY CHANG P. E., INTERIM CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR)

ATTN: CHRIS TAKASHIGE, ACTING CHIEF ENGINEER
ENGINEERING DIVISION

FROM: FORD N. FUCHIGAMI
DIRECTOR OF TRANSPORTATION

SUBJECT: DLNR ADMINSTRATION BUILDING AND COMMUNITY CONFERENCE CENTER IN KEALAKEHE
PRE-ASSESSMENT CONSULTATION, DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
KEALAKEHE, NORTH KONA, HAWAII
TMK: (3) 7-4-008:003 (POR.)

Our Department of Transportation's comments on the subject DLNR Administration Building and Community Conference Center are as follows:

The DEA should discuss and evaluate the project's contribution to the cumulative traffic impacts on the State highway facility in the area (Queen Kaahumanu Highway).

The DLNR is required to obtain a permit from DOT Highways Division, Hawaii District Office, for the transport of oversized and/or overweight materials and equipment on State highway facilities.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

c: Claire Oshiro, The Limtiaco Consulting Group

Claire Oshiro

From: Claire Oshiro
Sent: Thursday, March 19, 2015 2:06 PM
To: Sterling Chow
Cc: Robert Taira; Clinton Yamada; Sal Panem; Ken Tatsuguchi
Subject: RE: Pre-Assessment Consultation for the DLNR Administration Building Draft EA

Thank you, Sterling. We look forward to receiving a response from the Planning Branch.

Claire Oshiro
(808) 596-7790 x241
THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

From: Sterling Chow
Sent: Thursday, March 19, 2015 11:44 AM
To: Claire Oshiro
Cc: Robert Taira; Clinton Yamada; Sal Panem; Ken Tatsuguchi
Subject: Pre-Assessment Consultation for the DLNR Administration Building Draft EA

Hi Claire,

As discussed on the phone, our Division's response to your request for information dated March 3, 2105 regarding the proposed DLNR administrative building near Honokohau Harbor will be sent through our Planning Branch. I have forwarded your letter to their office for future action.

Sterling Chow
Assistant District Engineer
State Highways
Hawaii District
[redacted]

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Alec Wong, P.E., Chief
State of Hawaii
Department of Health, Clean Water Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference 03014PJF.15

Dear Mr. Wong:

Thank you for your letter dated 03/16/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe. We reviewed the standard comments posted on your department's website. We acknowledge that the project and its potential impacts to State waters must be in compliance with the antidegradation policy (Hawaii Administrative Rules [HAR] Section 11-54-1.1), designated uses pertaining to the classification of the receiving waters (HAR Section 11-54-3), and water quality criteria (HAR Sections 11-54-4 through 11-54-8).

DLNR's project does not involve work in, over, or under waters of the United States. The Environmental Assessment (EA) will include the following statements reflected in your letter: *A National Pollutant Discharge Elimination System Permit for pollutant discharges including storm water runoff (e.g., construction dewatering effluent) is required for the disturbance of one acre or more of total land area pursuant to HAR Title 11, Chapter 55, "Water Pollution Control." The construction contractor will be responsible for implementing a storm water management plan that prevents a concentration of runoff from flowing into neighboring areas. The project will incorporate Low-Impact Development design practices and structural BMPs to control storm water that may further reduce nonpoint source pollution concerns.*

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD/CWB

03014PJF.15

March 16, 2015

03-19-15P03:22 RCVD

Ms. Claire Oshiro
Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Ms. Oshiro:

SUBJECT: Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center in Kealakehe North Kona, Island of Hawaii, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated March 3, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

   d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

   e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb/, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:bk

c: The Honorable Carty S. Chang, DLNR

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Leo R. Asuncion, Jr., AICP, Director
State of Hawaii
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference P-14685

Dear Mr. Asuncion:

Thank you for your letter dated 03/19/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge that the project site is within the Urban district, the soil type is classified E by the Land Study Bureau and is designated Open by the County of Hawaii. The following studies were conducted and are appended to the Environmental Assessment (EA): natural resources survey, archaeological inventory survey, cultural impact assessment, and traffic impact assessment report.

We are aware that the Coastal Zone Management (CZM) program, established pursuant to Chapter 205A, HRS, as amended, provides for the beneficial use, protection, and development of the State's coastal zone. The EA will state that the CZM area consists of the entire state of Hawaii. The proposed project will meet the policies as listed in Chapter 205A-2, Hawaii Revised Statutes. The project does not affect the use of or access to coastal or other public recreational opportunities. The various DLNR divisions provide important services and programs that pertain to state parks; historical sites; forests and forest reserves; aquatic sanctuaries; public fishing areas; boating, ocean recreation, and coastal programs; wildlife sanctuaries; game management areas; public hunting areas; and natural area reserves. The EA acknowledges that the project site is located within the Special Management Area (SMA) and the proposed project will require approval of a SMA Use Permit (Major) by the Leeward Planning Commission of the County of Hawaii.

Thank you for the mention of the *Hawaii Watershed Guidance* that provides management measures for the minimization of coastal nonpoint pollution impacts and for the suggestion to utilize the techniques in the *Stormwater Impact Assessment*. Please note that project actions provide the opportunity to incorporate Low-Impact Development design practices (as described in *Low Impact Development, A Practitioners Guide*) and structural Best Management Practices to control storm water.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

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(808) 596-7790 • tlcghawaii.com

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

OFFICE OF PLANNING
STATE OF HAWAII

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

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

Ref. No. P-14685

03-23-15 A10:48 RCVD

March 19, 2015

To: Mr. Carty Chang, Interim Chairperson and
Chief Engineer, Engineering Division
Department of Land and Natural Resources

From: Leo R. Asuncion, Acting Director

Subject: Project: Pre-Assessment Consultation, Draft Environmental Assessment Administration Building and Community Center
Owner: State Department of Land and Natural Resources
Location: Honokohau, Kealakehe, North Kona, Hawaii
Tax Map Key No.: (3) 7-4-008: 003 (portion)

The Department of Land and Natural Resources (DLNR) is proposing to construct a new administration building and community center mauka of the existing Honokohau Harbor. The proposal includes a new baseyard and storage facility as well as office space in a new central location for many of DLNR divisions. The building will house the Division of Boating and Ocean Recreation (DOBOR), Division of Conservation and Resources Enforcement (DOCARE), Division of Aquatic Resources (DAR), Commission on Water Resource Management (CWRM), Division of Forestry and Wildlife (DOFAW), Division of State Parks (SP), Engineering Division (ENG), and the State Historic Preservation Division (SHPD).

The proposed separate community center will accommodate public events and meetings ranging from 20 to 200 people. Other accessory uses will also be constructed, such as parking and pedestrian walkways.

The Office of Planning (OP) has the following comments.

1. The proposed administration building is within the State Urban District. The soil type is classified as E by the Land Study Bureau, and is designated as Open by the County of Hawaii. Although the site is already within the Urban District, the Draft Environmental Assessment should include studies on flora and fauna of the site, including vertebrates and invertebrates, a traffic assessment study, including a parking study to determine the parking requirements for the community center. An engineering study should also be included to determine water and wastewater requirements for the entire project.

2. More details regarding the size and square footage of the Administration building and the accessory uses should also be included in the Draft Environmental Assessment. The scale of the proposed project may warrant a scenic impact study.

3. OP provides technical assistance to state and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of resources throughout the State. The Hawaii State Plan includes diverse policies and objectives of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.

   The Draft Environmental Assessment should include an analysis on the Hawaii State Plan, HRS Chapter 226, that addresses whether this project conforms or is in conflict with state and county plans, policies, and controls. The analysis should include a discussion on the project's ability to meet the objectives and policies, and priority guidelines listed in HRS Chapter 226.

4. The coastal zone management area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" see HRS § 205A-1 (definition of "coastal zone management area").

   HRS Chapter 205A requires all State and county agencies to enforce the coastal zone management (CZM) objectives and policies. The assessment on compliance with HRS Chapter 205A is an important component for satisfying the requirements of HRS Chapter 343. The Draft Environmental Assessment shall include an assessment as to how the proposed project conforms to the CZM objectives and its supporting policies set forth in HRS § 205A-2. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

5. This project appears to lie within the Special Management Area (SMA) delineated by the County of Hawaii Department of Planning. Please consult with said department on the procedures and requirements for addressing SMA regulations.

6. According to data sources available to OP, this parcel lies within the Honokohau watershed; the project site appears to be located approximately 1,500 feet from the protected waters of the small boat harbor and 3,000 feet from the nearshore waters of Honokohau Bay; and the project site is largely undeveloped with limited drainage infrastructure. The area of North Kona is exposed to a range of human activities from agriculture, urban development, and activity along the shoreline. The Draft EA should consider watershed protection and management.

   OP has created the Hawaii Watershed Guidance to provide direction on methods to safeguard Hawaii's watersheds and implement watershed plans. This guidance provides a number of management measures that address polluted runoff from urban activities, and a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. The water runoff generated by this location may flow directly into the waters of the small boat harbor, nearby urban areas in Kona, or ultimately into Honokohau Bay. Therefore, please consider best management practices (BMP's) and runoff management measures for urban areas listed in our watershed guidance. For more detail, please examine the management measures listed for Urban Runoff - Section B, pages 120-122. The document can be viewed or downloaded from the Office of Planning website at http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf.

7. Development and land use activities can create erosion, increased stormwater runoff, and pollution that cause direct, secondary, and cumulative impacts to Hawaii's natural resources. This area is of particular concern since it is adjacent to the existing Kaloko-Honokohau National Park. The wildlife inhabitants of the National Park may be more sensitive to adverse impacts of erosion and pollution. Therefore, a stormwater impact evaluation should be included in the Draft EA.

   Please consider OP's Stormwater Impact Assessment in your stormwater impact evaluation for this project. This document can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff occurrences. Mitigation measures and best management practices (BMP) listed in this guidance can be applied to water runoff strategies to prevent damage to coastal ecosystems. This guidance document will assist in integrating stormwater impact assessment within the planning and environmental review process of a project. The document can be found at

   http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf.

8. Because this proposal calls for new development on an undeveloped tract of land, please consider Low-Impact Development (LID) design practices in the planning process. The use of LID design and BMP's will be an effective means to expedite the permitting process, reduce construction costs, and reduce operation and maintenance overhead. LID techniques promote a range of structural BMP's for stormwater control management and urban layout that minimizes negative impacts to the environment. LID techniques can be classified as: the preservation of natural features and conservation design, the reduction of impervious cover, and utilizing natural features and source control for stormwater management. OP has created a guidance document where these design practices can be found: Low Impact Development, A Practitioners Guide. For a complete list of LID - Best Management Practices, please examine Section 1.7, pgs. 1-4 to 1-11. This guidance can be viewed or downloaded from the OP website at http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

Thank you for the opportunity to comment on the proposal. If you have any questions, please contact Josh Hekekia at 587-2845 or Lorene Maki at 587-2888.

c: Mr. Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Ms. Tammy Duchesne, Superintendant
U.S. Department of the Interior
National Park Service
Kaloko-Honokohau National Historical Park
73-4786 Kanalani Street, #14
Kailua-Kona, HI 96740

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference L7621 (2015-6)

Dear Ms. Duchesne:

Thank you for your letter dated 04/02/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe and for meeting with the project team on 04/30/15. We greatly appreciate your agency's statements that acknowledge the shared commitment and passion of both the National Park Service and DLNR for protecting Hawaii's unique and fragile natural and cultural resources. The Environmental Assessment (EA) will mention your agency's support for DLNR's proposed community conference center, which is envisioned as a flexible venue that may be utilized by government entities and non-profit groups for outreach and educational opportunities, public informational meetings, and workshops and conferences servicing up to 200 people.

The EA acknowledges your agency's concerns about non-point source pollution, surface water drainage and wastewater treatment, potable and non-potable water systems, cultural resources, wildlife, traffic and park visitor access, soundscape, visual resources and nighttime lighting, security and access, and cumulative impacts. The EA also acknowledges that Phase 2 of the Queen Kaahumanu Highway widening project, which includes the installation of utilities and drain inlet structures, is currently underway. Completion of the federally funded project by 2018 will result in improved utility infrastructure along the highway; therefore, DLNR decided to omit the on-site individual wastewater system from the proposed project and will instead convey wastewater to the Kealakehe Wastewater Treatment Plant (WWTP) via a connection to improved wastewater conveyance facilities along the widened highway. The planned expansion of the Kealakehe WWTP is expected to increase efficiencies and allow the County of Hawaii WWTP to accept new wastewater flows.

DLNR's proposed facility will have drainage systems with oil-water separators to reduce nonpoint source pollution concerns. Site lighting will satisfy dark sky requirements and incorporate Best Practices with regards to outdoor lighting. Landscaping within the project site will buffer or soften the visual impact of the single-story facility, which is designed to have a reduced development footprint. DLNR will consider the use of a trapping program prior to the

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start of construction to prevent the migration of feral predators such as cats and small Indian mongoose to the neighboring Kaloko-Honokohau National Historic Park since these predator species pose a threat to the endangered Hawaiian stilt and the Hawaiian coot breeding populations within the Park.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

National Park Service
U.S. Department of the Interior

Kaloko-Honokōhau
National Historical Park

73-4786 Kanalani Street # 14
Kailua-Kona, Hawai'i 96740

808 329-6881 Phone
808 329-2597 Fax

Kaloko-Honokōhau

IN REPLY REFER TO:
L7621 (2015-6)

April 2, 2015

Carty Chang, Chief Engineer
DLNR, Engineering Division
P.O. Box 373
Honolulu, HI 96809

Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

Subject: National Park Service Comments for Preparing a Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Center, Kealakehe, North Kona, Hawaii [Tax Map Key (3) 7-4-008: 003 (por.)]

Dear Mr. Chang and Ms. Oshiro:

Thank you for providing the National Park Service (NPS) with the opportunity to provide input on the development of a Draft Environmental Assessment (EA) for the Department of Land and Natural Resources (DLNR) Administration Building and Community Center, Kealakehe, North Kona, Hawaii. We would like to thank Ms. Oshiro for granting us a one-week time extension for sending in our comments. The proposed project is immediately adjacent to Kaloko-Honokōhau National Historical Park (Park). The Park boundaries also encompass the Honokōhau Settlement National Historic Landmark (1962).

Congress established Kaloko-Honokōhau National Historical Park in 1978 to preserve, interpret, and perpetuate traditional native Hawaiian activities and culture by protecting the cultural and natural resources within the Park (16 U.S.C. § 396d(a)). The Park contains more than 450 known archeological and cultural sites, among which are several heiau, networks of ancient and historic trails, seawalls, more than 180 known anchialine pools, two ancient Hawaiian fishponds with associated wetlands, and a fishtrap. The park lands and waters provide habitat for 17 federally listed, and candidate species for listing, under the Endangered Species Act. 'Aimakapā Fishpond and wetland is "core habitat" for the recovery of two endangered waterbird species, the Hawaiian stilt (*Himantopus mexicanus knudseni*) and the Hawaiian coot (*Fulica americana alai*),

and is an important habitat for migratory waterfowl.[1] In addition to the fishponds and pools, the park boundary encompasses 596 acres of marine waters and coral reef habitat. All of the Park's water resources are dependent upon groundwater inputs to maintain these ecosystems, especially as habitat for culturally important and rare native aquatic species.

Approximately 150,000 visitors per year visit the Park, and the majority (about 88,000) of these accesses the Park through the Honokōhau Harbor area.[2] Local residents, cultural practitioners, and visitors from around the world come to experience Kaloko-Honokōhau's unique sense of place, cultural and natural history, and to understand and carry on Hawaiian traditions.

To ensure that the outstanding, nationally significant cultural and natural resources within the Park and surrounding area are protected for the enjoyment of future generations, the NPS respectfully requests the following be addressed in the Draft EA:

<u>Non-point Source Pollution, Surface Water Drainage, and Wastewater Treatment</u>

The proposed site for the project is located in highly permeable lava with few accumulated soils and is generally less than 30 feet above the water table. Rain and runoff carry pollutants quickly to ground water, to coastal anchialine pools, and into the nearshore waters. Although average rainfall is ~20 inches per year, rainfall accumulation is typically concentrated in a few intense events that cause a pulse of pollution flushing to drainage systems, and, in places so close to the water table and coastal waters, into the groundwater and nearshore waters. Honokōhau Bay is directly makai of the project area and is designated by the Hawaii Department of Health as an impaired waterbody for elevated nutrients under section 303(d) of the Clean Water Act.[3] For over a decade, Hawaii County and the Hawaii Land Use Commission have recognized the need to implement additional measures to control nonpoint source pollution flowing into groundwater in the Park and in the surrounding area.[4] The Draft EA should address, in detail, how polluted runoff from the parking lots, driveways, and exposed base yards will be controlled and treated, as well as how base yard equipment wash-down water will be treated. Standard county, state and federal regulations for drainage wells (i.e. dry wells) are designed to address flood control but not to prevent polluted surface water flow from impacting the groundwater and coastal waters. At a minimum, dry wells used for run-off from paved surfaces should be equipped with oil-water separators and water used to wash vehicles at the wash-down stations should be collected, filtered, and reused. In addition, other best management practices should be discussed.

For wastewater generated by the facility, because of the proximity of the project to the Park and to the coastal waters, and the 303(d) designation, the best option seems to have the facility connected to the Kealakehe Wastewater Treatment Plant. The NPS understands that there may be issues of capacity at the existing treatment plant. However, we have serious concerns about any onsite treatment facility's ability to adequately remove nutrients and function as designed

[1] US Fish and Wildlife Service. 2011. Recovery Plan for Hawaiian Waterbirds, Second Revision.
[2] https://irma.nps.gov/Stats/
[3] "Impaired water bodies" are waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. 2014 State of Hawaii Water Quality Monitoring and Assessment Report. http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/integrated-report-and-total-maximum-daily-loads/
[4] LUC Docket A00-732; COH Ord 02 114 and 04 110

beyond the initial phase of operation. We also have significant concerns about how the effectiveness of onsite nutrient removal options can be monitored. The Draft EA must thoroughly analyze the direct, indirect, and cumulative impacts of the disposal of treated wastewater on aquatic and marine ecosystems in the Park and surrounding areas. The Draft EA should describe in detail the treatment process and what measures will ensure that the treatment process will function as described throughout the life of the facility.

Potable and Non-Potable Water Systems

The Draft EA should identify the sources of drinking and irrigation the water for the project. The NPS is concerned about the direct and cumulative impacts of groundwater withdrawals on the cultural and natural resources within the Park that are dependent upon groundwater flow. The NPS requests that the Draft EA include information as to the amount of water required for the project and how that amount adds cumulatively to the current usage of groundwater and the proposed needs of the surrounding developments. Although the water demand for this project may be small given this project's size, the NPS notes that this project is only one of many projects that are proposed in the vicinity, and that the projected cumulative impacts of these withdrawals will be significant.

Cultural Resources

The National Park Service is concerned with the potential impacts of the proposed project on historic properties located within the project footprint, the Park and the Honokōhau Settlement National Historic Landmark. The Draft EA should include a complete identification and inventory of historic properties within the project footprint, an evaluation of significance of historic properties, a determination of effects on significant historic properties and a description of any mitigation commitments if project will have an effect on significant historic properties. The Draft EA should also identify, address and mitigate the potential impacts the proposed project may have on the historic properties within the Park and the Honokōhau Settlement National Historic Landmark such as introduction of visual, atmospheric or audible elements that may diminish the integrity of the historic properties within the Park and the Honokōhau Settlement National Historic Landmark.

Wildlife

Although no threatened or endangered species may be present on the proposed project site, endangered species are adjacent to the site within the Park and may suffer secondary impacts from this proposed project. Because this project will be removing vegetation, invasive predator species (mongoose and feral cats) inhabiting the project area will be displaced and will likely relocate to the Park, posing a threat to the endangered Hawaiian stilt and the Hawaiian coot breeding population within the Park. Park staff have observed this migration associated with other adjacent projects (The Shores at Kohaniaiki) involving ground clearing along the Park boundary. Therefore, the Draft EA should analyze the impacts of displaced invasive predators on Park resources and describe what measures will be implemented to mitigate the impacts from invasive predators.

Traffic and Park Visitor Access

The proposed project will increase traffic – both on the Queen Ka'ahumanu highway and Kealakehe Parkway, including the harbor area. Many visitors to the Park use the parking lots at the harbor. Therefore, the Draft EA should address the impact from the proposed facility on Park visitors entering and exiting the Park from the area by the harbor.

Soundscape

Natural soundscapes are an essential facet of any National Park experience, and, given the reasons that Congress created Kaloko-Honokōhau National Historical Park, are especially important here, even as development near the Park continues. Thus, the Draft EA should analyze how traffic noise and construction noise will impact activities in the Park and what measures will be implemented to mitigate the noise impacts.

Visual Resources and Nighttime Lighting

Visual resources are of critical importance within the Park. Impacts to the natural night-sky from lighting, to scenic vistas and view planes, and to cultural landscapes should be addressed in the Draft EA. The Draft EA should give readers sufficient information to be able to visualize and analyze visual impacts from this project. The facades, height, and lighting of the proposed buildings are of particular concern. The Draft EA should have detailed artist's renderings of the proposed project and show the proposed facility's setback from the Park's boundary.

Security and Access

The site for this proposed project is currently undeveloped and abuts the Park's southern boundary. Developing this site may increase ease of access to areas that are off limits to the public via new unauthorized paths. The Draft EA should provide design alternatives or proposed mitigation measures that will prevent people from accessing areas that are not open to the public, including archeological sites and the Park's maintenance yard.

Cumulative Impacts

The proposed DLNR facility, whatever direct and indirect impacts it will have on the Park and surrounding area, will contribute to the growing cumulative impacts from the development adjacent to the Park and in the surrounding area. Therefore, the Draft EA must thoroughly analyze how the proposed facility will contribute to the cumulative impacts, especially for those topics listed above, from development near the Park and along the Kona coast.

We know the DLNR shares the NPS's commitment and passion for protecting Hawaii's unique and fragile natural and cultural resources. We look forward to working with you to analyze any potential impacts and to find ways to avoid or mitigate those impacts and hope we can meet with DLNR staff and the project's planners in the near future to discuss our concerns.

If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer of my staff (808-329-6881 ex 1500 or jeff_zimpfer@nps.gov).

Sincerely,

Tammy Ann Duchesne
Superintendent

cc: DAR Kona

Claire Oshiro

From: Claire Oshiro
Sent: Wednesday, March 25, 2015 3:37 PM
To: 'Zimpfer, Jeff'
Cc: Sallie Beavers; Tammy Duchesne
Subject: RE: Mahalo for the time extension

Hi Jeff: Thank you for informing us about the need for additional time to respond.

We look forward to receiving your agency's comments.

Claire Oshiro
(808) 596-7790 x241
THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

From: Zimpfer, Jeff
Sent: Wednesday, March 25, 2015 10:40 AM
To: Claire Oshiro
Cc: Sallie Beavers; Tammy Duchesne
Subject: Mahalo for the time extension

Aloha Claire,

Thanks for taking my call just now and thanks for giving us an extra week to send in our comments regarding the EA prep notice for the proposed DLNR building.

~Jeff
--
Jeff Zimpfer, Ph.D.
National Park Service
Environmental Protection Specialist
Kaloko-Honokohau National Historical Park
73-4786 Kanalani St., #14
Kailua Kona, HI 96740
[redacted]

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Chief Harry S. Kubojiri
County of Hawaii Police Department
349 Kapiolani Street
Hilo, Hawaii 96720

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Chief Kubojiri:

Thank you for your letter dated 03/19/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge that your department provided no comments or information.

The Draft Environmental Assessment is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

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(808) 596-7790 • tlcghawaii.com

William P. Kenoi
Mayor

03-23-15P02:13 RCVD

03-23-15P02:

March 19, 2015

County of Hawai'i
POLICE DEPARTMENT
349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

Mr. Carty Chang
Chief Engineer
DLNR, Engineering Division
P.O. Box 373
Honolulu, HI 96809

Dear Mr. Chang:

SUBJECT: PRE-ASSESSMENT CONSULTATION, DRAFT ENVIRONMENTAL ASSESSMENT FOR THE DEPARTMENT OF LAND AND NATURAL RESOURCES ADMINISTRATION BUILDING AND COMMUNITY CONFERENCE CENTER IN KEALAKEHE, NORTH KONA, HAWAI'I TAX MAP KEY (3) 7-4-008: 003 (POR.)

Dear Mr. Chang:

This is in reference to Environmental Planner Claire Oshiro's letter dated March 3, 2015, requesting comments regarding the above pre-assessment consultation in Kealakehe, North Kona, Hawai'i.

Thank you for allowing the Hawai'i Police Department to make comments regarding this pre-assessment consultation. At this time, the Hawai'i Police Department has no comments or information to provide.

Should you have any questions or concerns, please contact Captain Randal M. Ishii, Commander of our Kona Patrol Division, at 326-4646, extension 299.

Sincerely,

HARRY S. KUBOJIRI
POLICE CHIEF

PAUL H. KEALOHA, JR.
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

RMI/jaj

cc: Ms. Claire Oshiro
Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817

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CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Chief Darren J. Rosario
County of Hawaii Fire Department
25 Aupuni Street, Room 2501
Hilo, HI 96720

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Chief Rosario:

Thank you for your letter dated 03/19/15 from Deputy Chief Renwick J. Victorino regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. We acknowledge that your department provided no comments.

The Draft Environmental Assessment is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

William P. Kenoi
Mayor

Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

2015-25-15 P02:13

County of Hawai'i
HAWAI'I FIRE DEPARTMENT

25 Aupuni Street • Room 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

March 19, 2015

Ms. Claire Oshiro
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawai'i 96817

Dear Ms. Oshiro,

SUBJECT: Pre-Assessment Consultation Draft Environmental Assessment
Department of Land and Natural Resources Administration Building and
Community Conference Center in Kealakehe, North Kona, Hawaii
Parker Ranch, South Kohala, Island of Hawai'i
TMK (3) 7-4-008:003 (POR.)

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced project pre-assessment consultation.

Thank you for the opportunity to comment.

Sincerely,

RENWICK J. VICTORINO
Deputy Fire Chief

KT:lpc

Hawai'i County is an Equal Opportunity Provider and Employer.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Nolan S. Hirai, P.E., Manager
State of Hawaii
Department of Health, Clean Air Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference 15-172A CAB

Dear Mr. Hirai:

Thank you for your letter dated 03/19/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. The Environmental Assessment (EA) will include the following statements reflected in your letter:

> *There is a significant potential for fugitive dust emissions at all stages of construction. Proposed construction-related activities must comply with the provisions of Hawaii Administrative Rules, 11-60.1-33 on Fugitive Dust. The contractor will be responsible for the implementation of a dust control plan, which does not require approval by the Department of Health, for compliance with the above-mentioned rules. The dust control plan may incorporate but is not limited to the following measures:*

- *Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;*
- *Providing an adequate water source at the site prior to start-up of construction activities;*
- *Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;*
- *Minimizing dust from shoulders and access roads;*
- *Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and*
- *Controlling dust from debris being hauled away from the project site. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.*

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

COPY

DAVID Y. IGE
GOVERNOR OF HAWAII

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

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
File:

15-172A CAB

March 19, 2015

Mr. Carty Chang
Chief Engineer
Engineering Division
Department of Land and Natural Resources
P.O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Chang:

SUBJECT: **Pre-Assessment Consultation, Draft Environmental Assessment Department of Land and Natural Resources Administration Building and Community Conference Center in Kealakehe, North Kona, Hawaii Tax Map Key (3) 7-4-008: 003 (por.)**

A significant potential for fugitive dust emissions exists during all phases of construction. The activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. We encourage the contractor to implement a dust control plan, which does not require approval by the Department of Health, to comply with the fugitive dust regulations.

Dust control measures may include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing dust from shoulders and access roads;
e) Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling dust from debris being hauled away from the project site. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

NOLAN S. HIRAI, P.E.
Manager, Clean Air Branch

BC:rg

c: Claire Oshiro, The Limtiaco Consulting Group, Inc.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Sina Pruder, P.E., Acting Chief
State of Hawaii
Department of Health, Wastewater Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)
Reference LUD - 3 7 4 008 008 PreAsmnt DEA DLNR Admin Bldg-ID2115

Dear Ms. Pruder:

Thank you for your letter dated 03/17/15 regarding the pre-assessment consultation phase for the Department of Land and Natural (DLNR) Resources Community Conference Center and Administration Building in Kealakehe. The Environmental Assessment (EA) will state that the proposed project is in the critical wastewater disposal area as determined by the Hawaii County Wastewater Advisory Committee. Thank you for informing us that you have individual wastewater systems (IWSs) information on file for DLNR's parcel for the existing Honokohau Boat Harbor, Big Game Fishing Club, the Division of Conservation and Resources Enforcement Office - Honokohau Harbor and the Division of Boating and Ocean Recreation. We acknowledge your department's concerns about the effects of wastewater discharges to public trust resources, Native Hawaiian resources and traditional cultural practices.

DLNR is aware that Phase 2 of the Queen Kaahumanu Highway widening project, which includes the installation of utilities and drain inlet structures, is currently underway. Completion of the federally funded project by 2018 will result in improved utility infrastructure along the highway; therefore, DLNR decided to omit the on-site IWS from the proposed project and will instead convey wastewater to the Kealakehe WWTP via a connection to improved wastewater conveyance facilities along the widened highway.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

LUD - 3 7 4 008 003 PreAsmnt
DEA DLNR Admin Bldg-ID2115

March 17, 2015

03-27-15 A10:00 RCVD

Mr. Carty Chang, P.E., Chairperson
Department of Land & Natural Resources
Engineering Division
P.O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Chang:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center in Kealakehe, North Kona, Hawaii
74-429 Kealakehe Parkway, Kona, Hawaii 96745
TMK (3) 7-4-008: portion 003

Thank you for allowing us the opportunity to provide comments on the above subject project. We have the following information to offer.

The subject project is located in the critical wastewater disposal area as determined by the Hawaii County Wastewater Advisory Committee. We do have individual wastewater systems (IWSs) information on file for the same TMK for the existing Honokohau Boat Harbor, Big Game Fishing Club, DOCARE Office-Honokohau Harbor, and DLNR Boating Division.

We are unable to offer additional comments at this time as domestic wastewater treatment and disposal for the proposed facility have not been thoroughly addressed in the subject document. Information about the project will be required to be submitted to our office before we will be able to determine what type of wastewater treatment system will be required.

Please be informed that the proposed wastewater systems for the development may have to include design considerations to address any effects associated with the construction of and/or discharges from the wastewater systems to any public trust, Native Hawaiian resources or the exercise of traditional cultural practices. In addition, all wastewater plans must conform to applicable provisions of the Hawaii Administrative Rules, Chapter 11-62, "Wastewater Systems."

Should you have any questions, please contact Mr. Mark Tomomitsu of our office at 586-4294.

Sincerely,

SINA PRUDER, P.E., CHIEF
Wastewater Branch

LM/MST:lmj

cc:: Ms. Claire Oshiro, The Limtiaco Consulting Group
Mr. Dane Hiromasa, DOH-WWB's Kona Staff

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Russell Y. Tsuji, Land Administrator
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Tsuji:

Thank you for your letter dated 03/27/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe and for collecting the comments from DLNR's divisions. We acknowledge that the Division of Boating and Ocean Recreation (DOBOR) provided no comments; the Engineering Division provided flood zone information and a copy of the Flood Hazard Assessment Report; the Division of Forestry and Wildlife indicated it has no objections; the Division of State Parks provided no comments; and the Hawaii District Land Office stated that the affected property is encumbered under E.O. 4334 to DOBOR.

The Environmental Assessment (EA) acknowledges the concerns from DLNR's Division of Aquatic Resources about groundwater and water quality impacts, wastewater disposal, and the effects of nutrient inputs on sensitive coastal areas and nearshore waters. The EA also acknowledges that Phase 2 of the Queen Kaahumanu Highway widening project, which includes the installation of utilities and drain inlet structures, is currently underway. Completion of the federally funded project by 2018 will result in improved utility infrastructure along the highway; therefore, DLNR decided to omit the on-site individual wastewater system from the proposed project and will instead convey wastewater to the Kealakehe WWTP via a connection to improved wastewater conveyance facilities along the widened highway. The planned expansion of the Kealakehe WWTP is expected to increase efficiencies and allow the County of Hawaii WWTP to accept new wastewater flows.

The EA contains a discussion of wastewater system considerations including a bioremediation system with constructed wetlands; this onsite wastewater treatment alternative appears to be inappropriate for the project site based on site conditions including but not limited to the highly permeable soil and dry climate. Furthermore, the creation of wetland habitat that may be attractive to Hawaiian waterbird species is expected to necessitate coordination with federal and state agencies to identify permit requirements, avoidance measures and recommendations for mitigation in the event of incidental takings of listed species. We appreciate the statements from DAR that recognize the initial costliness and long-term monitoring efforts associated with alternative wastewater treatment systems.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 27, 2015

Carty S. Chang, Chief Engineer
DLNR, Engineering Division
P.O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Chang:

SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center, The Limtiaco Consulting Group for Department of Land and Natural Resources, Applicant, Kealakehe, North Kona, Hawaii, TMK: (3) 7-4-008:003 portion

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (i) Division of Aquatic Resources, (ii) Division of Boating and Ocean Recreation, (iii) Engineering Division, (iv) Division of Forestry and Wildlife, (v) Division of State Parks, and (vi) Hawaii District Land Office on the subject matter. Should you have any questions, please feel free to call Kevin Moore at (808) 587-0426. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

C: Clair Oshiro (via email: Claire@tlcghawaii.com)

RECEIVED
LAND DIVISION
2015 MAR 23 AM 10

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
MAR 09 2015
AQUATIC RESOURCES

DAR #5083

March 6, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
LOCATION: Kealakehe, North Kona, Hawaii
APPLICANT: The Limtiaco Consulting Group for Department of Land and Natural Resources

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by March 25, 2015.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

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

Signed:

Print name: Carty S. Chang
Date: 3/18/15

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813
Telephone: 587-0100

CARTY S. CHANG,
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

Date: (Mar 16, 2015)
DAR # (DAR 5083)

MEMORANDUM

TO: Carty S. Chang, DLNR Interim Chairperson (CS)
FROM: William j Walsh Ph.D, Aquatic Biologist (WJW) JKK
THRU: Jo-Anne N. Kushima, Aquatic Biologist
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center.

Comment	Date	Request	Receipt	Referral	Due Date
	(Mar 16, 2015)	(Mar 6, 2015)	(Mar 9, 2015)	(Mar 9, 2015)	(Mar 25, 2015)

Requested by: Russell Y. Tsuji, *Land Administrator*

Summary of Proposed Project

Title: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center.

Project by: The Limtiaco Consulting Group for Department of Land and Natural Resources.

Location: Kealakehe, North Kona, Hawaii.

Brief Description: The Limtiaco Consulting Group is preparing a Draft Environmental Assessment (EA) for the proposed construction of a new DLNR Administration Building and Community Center in Kealakehe, North Kona, Hawaii. The project site is adjacent to the Kaloko-Honokohau National Park and consists of undeveloped land that is owned by DLNR between Queen Kaahumanu Highway and the existing Honokohau Small Boat Harbor Facility. The project site will be assessed for archaeological, cultural, biological and traffic considerations as part of the EA process.

Comments: DAR has substantial concerns regarding the potential impacts of such large scale development occurring in close proximity to nearshore coastal waters and coral reefs. An increasing number of studies have documented the rapid movement of groundwater from land to nearby coastal regions, creating a tight connectivity between land use practices, water quality and coastal health. Scientific studies have also indicated that large scale disposal of wastewater can provide nutrients to nearshore waters that promote algal blooms which can permanently kill coral and negatively impact coral reef fishes and other reef inhabitants. The effect of such nutrient enrichment is likely cumulative and thus it is imperative to minimize additional inputs in these sensitive coastal areas.

Although DAR is aware that the project will incorporate an individual wastewater system (IWS), no details are available at present as to what type of IWS will be constructed nor is there any information as to whether this project will contribute additional nutrient inputs into sensitive coastal areas with the potential to negatively impact nearshore waters.

Although the Hawaii Department of Health has insufficient water quality data to categorize the waters within Honokohau harbor, the adjacent marine waters (i.e. Honokohau Beach) are categorized as impaired, with five of six measured parameters currently not meeting State water quality standards.

A comparison of historical and more recent data (Parsons et al. 2008) indicates that groundwater nutrients entering Honokohau Bay have increased dramatically - twice as much nitrate + nitrite and five times as much phosphate now enters these waters as compared to two decades earlier. The study noted that there are potential chronic stressors present in the forms of nutrient loading and algal abundance and several nutrient variables were significantly related to stressed and dead coral cover. If corals are being exposed to and affected by chronic stressors, recovery from future acute disturbances might be at risk. The study recommends that future management action should focus on alleviating the impacts of chronic stressors (e.g., reduce nutrient inputs) in order to lower the risk to the coral ecosystems.

Given the sensitivity and visibility of the area, the well documented ongoing and increasing threats and the project's very nature – it's a DLNR development, it is essential that the input to nearshore waters of waste water nutrients and associated pollutants is minimized if not wholly eliminated. This project needs to be an exemplar of informed concern and state-of-the art waste water handling.

A constructed wetland system could be one such option for an onsite wastewater treatment system. It could reuse water for irrigation, which would be beneficial for the site's landscape and also serve as a sustainability feature for DLNR. Having an onsite secondary treatment system such as a constructed wetland could also be designed to showcase native Hawaiian plant species. Several such wastewater systems have already been, or are, under construction in West Hawaii. Consideration should also be given to incorporating other existing waste water units within the harbor proper as well as planning for the ultimate construction of a vessel pump-out station which has been planned for the harbor. In-depth monitoring of the efficacy of any waste water treatment is also imperative for adaptive management and to inform future such efforts.

While such an alternative waste water system may be initially more expensive, it needs to be incorporated in the construction of the DLNR Administration Building because of the long-term impacts to the health of coastal regions. Protection of groundwater and coastal waters from pollution is essential if we are to maintain sustainable and resilient ecosystems and the health of our coasts and people, and our ocean food supply.

Thank you for providing DAR the opportunity to review and comment on the proposed project.

Reference cited above:

A multivariate assessment of the coral ecosystem health of two embayments on the lee of the island of Hawai'i. 2008. Michael L. Parsons, William J. Walsh, Chelsie J. Settlemier, Darla J. White, Josh M. Ballauer, Paula M. Ayotte, Kara M. Osada, Brent Carman. Marine Pollution Bulletin 56: 1138–1149.

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 6, 2015

2015 MAR 11 PM 2:57
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED LAND DIVISION

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
LOCATION: Kealakehe, North Kona, Hawaii
APPLICANT: The Limtiaco Consulting Group for Department of Land and Natural Resources

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by March 25, 2015.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

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

Signed: Edward R. Underwood
Print name: Edward R. Underwood
Date: 3/11/15

cc: Central Files

MAR10'15PM12:50BOR ADM

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 6, 2015

2015 MAR 23 PM 2:59
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

'15 MAR 9 AM 10:20 ENGINEERING
LAND DIVISION

MEMORANDUM

~~TO:~~ FR':

DLNR Agencies:
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

~~FROM:~~ TO:
Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
LOCATION: Kealakehe, North Kona, Hawaii
APPLICANT: The Limtiaco Consulting Group for Department of Land and Natural Resources

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by March 25, 2015.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

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

Signed: Chris Fahnestock for
Print name: Carty S. Chang, Chief Engineer
Date: 3/23/15

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji
Ref.: Pre-Assessment Consultation for DEA for DLNR Administration Building and Community Conference Center, Kealakehe
Hawaii.016

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X.

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

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

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

( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
( ) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

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

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

( ) Additional Comments: _____

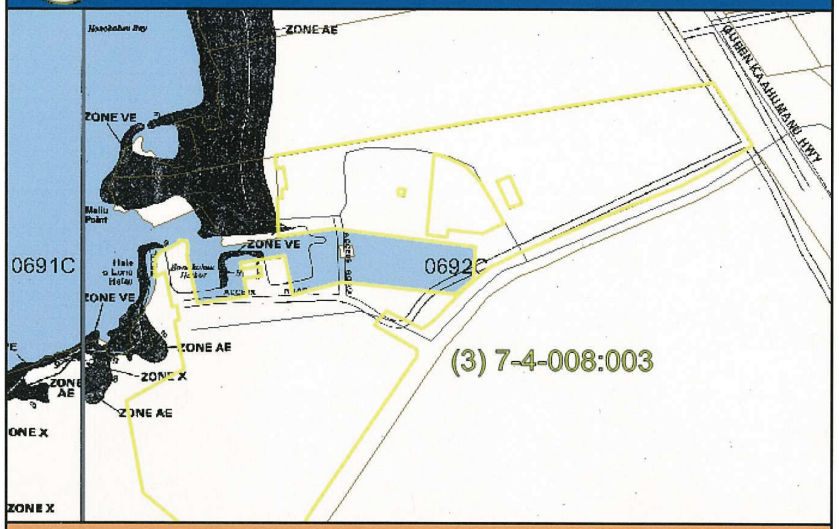
( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: Chris Takachige
for CARTY S. CHANG, CHIEF ENGINEER

Date: 3/23/15

State of Hawaii
FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY:	HAWAII
TMK NO:	(3) 7-4-008-003
PARCEL ADDRESS:	74-429 KEALAKEHE PARKWAY KAILUA KONA, HI 96740
FIRM INDEX DATE:	APRIL 02, 2004
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	1551660692C
PANEL EFFECTIVE DATE:	SEPTEMBER 16, 1988

PARCEL DATA FROM:	JUNE 2013
IMAGERY DATA FROM:	MAY 2005

IMPORTANT PHONE NUMBERS

County NFIP Coordinator
County of Hawaii
Frank DeMarco, CFM (808) 961-8042
State NFIP Coordinator
Carol Tyau-Beam, P.E., CFM (808) 587-0267

Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 6, 2015

MEMORANDUM

FROM ~~TO:~~ **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

2015 MAR 16 AM 11:06
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED LAND DIVISION

TO ~~FROM:~~ Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
LOCATION: Kealakehe, North Kona, Hawaii
APPLICANT: The Limtiaco Consulting Group for Department of Land and Natural Resources

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by March 25, 2015.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

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

Signed: [signature]

Print name: LISA HADWAY
Date: 3/13/15

cc: Central Files

56507

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
STATE PARKS DIV
15 MAR 10 A9:08
DEPT OF LAND & NATURAL RESOURCES

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 6, 2015

2015 MAR 18 AM 11:09
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED LAND DIVISION

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
LOCATION: Kealakehe, North Kona, Hawaii
APPLICANT: The Limtiaco Consulting Group for Department of Land and Natural Resources

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by March 25, 2015.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

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

Signed: [signature]

Print name: CURT COTRELL
Date: 3.13.15

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

2015 MAR 10 A 10:44
RECEIVED
LAND DIVISION
HILO, HAWAII

March 6, 2015

2015 MAR 16 AM 11:19
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED
LAND DIVISION

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center
LOCATION: Kealakehe, North Kona, Hawaii
APPLICANT: The Limtiaco Consulting Group for Department of Land and Natural Resources

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by March 25, 2015.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

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

Signed: _____

Print name: GORDON C. HEIT
Date: 3/11/15

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

75 Aupuni Street, Room 204
Hilo, Hawaii 96720
PHONE: (808) 961-9590
FAX: (808) 961-9599

March 12, 2015

MEMORANDUM

TO: Russell Y. Tsuji, Administrator

FROM: Gordon C. Heit, Hawaii District Land Agent

SUBJECT: Pre-Assessment Consultation for Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center

LOCATION: Kealakehe, North Kona, Island of Hawaii, TMK: (3) 7-4-008:003 portion

APPLICANT: The Limtiaco Consulting Group on behalf of the Department of Land and Natural Resources

Pursuant to your request for comments on the above matter, we offer the following:

The property identified above is encumbered under E.O. 4334 to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DOBOR). Any development of this land will require the concurrence of the DOBOR. The Land Division will provide further comments when the draft environmental assessment is available for review.

Please contact me should you have any questions.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Keith K. Yamamoto
The Gas Company, LLC (dba Hawaii Gas)
Engineering Department
945 Kalanianaole Street
Hilo, HI 96720

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Yamamoto:

Thank you for your letter dated 03/26/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. The Environmental Assessment (EA) will include the determination from your letter that the area is clear of utility gas facilities (e.g., gas lines).

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

HAWAII GAS
THE CLEAN ENERGY COMPANY

03-30-15P03:10 RCVD

March 26, 2015

Mr. Carty Chang
Chief Engineer
DLNR, Engineering Division
P. O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Chang:

Subject: Pre-Assessment Consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration Building and Community Conference Center in Kealakehe, North Kona, Hawaii
TMK: 7-4-008:003

In response to a letter received from The Limtiaco Consulting Group dated March 3, 2015, it has been determined that the area is currently clear of utility gas facilities.

Thank you for the opportunity to review the map. Should there be any questions, or if additional information is desired, please feel free to call Kris Tanner at 596-1425.

Sincerely,

Hawaii Gas

Keith K. Yamamoto
Manager, Engineering

KKY:krs
14-123

✓cc: Ms. Claire Oshiro, The Limtiaco Consulting Group

P.O. Box 3000 | Honolulu, Hawaii 96802-3000 | www.HawaiiGas.com

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Newton Inouye, District Environmental Health Program Chief
State of Hawaii
Department of Health, Hawaii District Health Office
P.O. Box 916
Hilo, HI 96721-0916

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.) Reference L7621 (2015-6)

Dear Mr. Inouye:

Thank you for your letter dated 03/30/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe. We reviewed the standard comments posted on your department's website. We acknowledge that the project and its potential impacts to State waters must be in compliance with the antidegradation policy (Hawaii Administrative Rules [HAR] Section 11-54-1.1), designated uses pertaining to the classification of the receiving waters (HAR Section 11-54-3), and water quality criteria (HAR Sections 11-54-4 through 11-54-8).

We acknowledge that a National Pollutant Discharge Elimination System Permit for discharges of storm water runoff is required for the disturbance of one acre or more of total land area pursuant to HAR Title 11, Chapter 55, "Water Pollution Control" effective December 6, 2013. DLNR's project does not involve work in, over, or under waters of the United States. We also acknowledge that a noise permit may be required and should be obtained before the commencement of work. The Environmental Assessment (EA) will state that project activities shall comply with the provisions of Hawaii Administrative Rule (HAR), Title 11, Chapter 46, "Community Noise Control."

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 916
HILO, HAWAII 96721-0916

COPY

04-03-15 P01:00 RCVD

MEMORANDUM

DATE: March 30, 2015

TO: Mr.Carty Chang, Chief Engineer
DLNR, Engineering Division

FROM: Newton Inouye
District Environmental Health Program Chief

SUBJECT: Pre-Assessment consultation, Draft Environmental Assessment for the Department of Land and Natural Resources Administration building and Community Conference Center in Kealakehe, North Kona, Hawaii
Tax Map Key: (3) 7-4-008:003 (por.)

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of the subject document on March 10, 2015. The CWB has reviewed the limited information contained in the subject document and offers the following comments:

Permit Issuance

* Any project and its potential impacts to State waters must meet the State's:
  1) Antidegradation policy, which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected;
  2) Designated uses, as determined by the classification of the receiving State waters; and
  3) Water quality criteria [Hawaii Administrative Rules (HAR), Chapter 11-54],

* A Section 401 Water quality Certification (WQC) is required if your project/activity:
  - Requires a federal permit, license, certificate, approval, registration, or Statutory exemption; and
  - May result in a discharge into State waters. The term "discharge" is defined in Clean Water Act, Subsections 502(16), 502(12), and 502(6). Examples of "discharge" include, but are not limited to, allowing the following pollutants to enter State waters from the surface or in-water: solid waste, rock/sand/dirt, heat, sewage, construction debris, any

underwater work, chemicals, fugitive dust/spray/paint, agricultural wastes, biological materials, industrial wastes, concrete/sealant/epoxy, and washing/cleaning effluent.

Determine if your project/activity requires a federal permit, license, certificate, approval, registration, or statutory exemption by contacting the appropriate federal agencies (e.g. Department of the Army (DA), U.S. Army Corps of Engineers (COE), Pacific Ocean Division Honolulu District Office (POH) Tel: 808-835-4303; U.S. Environmental Protection Agency Tel: 415-947-8021; Federal Energy Regulatory Commission Tel: 866-208-3372; U.S. Coast Guard Office of Bridge Programs Tel: 202-372-1511).

To request a Section 401 WQC, you must complete and submit the Section 401 WQC application. This application is available on the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/.

Please see HAR, chapter 11-54 for the State' Water Quality Standards and for more information on the Section 401 WQC. HAR, Chapter 11-54 is available on the CWB website at: http://health.hawaii.gov/cwb/.

- National Pollutant Discharge Elimination System (NPDES) permit coverage is required for:
  -Storm water associated with construction activities for land disturbances of one (1) acre or more. Land disturbance includes, but is not limited to, clearing, grading, grubbing, excavation, demolition, uprooting of vegetation, equipment staging, and storage areas.

  -Storm water associated with industrial activities for facilities with Standard Industrial Classification Codes regulated in 40 CFR 122.26(b)(14)(i) through (ix) and (xi).

  -Storm water and certain non-storm water from a small Municipal Separate Storm Sewer System.

  -Discharges of water pollutants into State surface waters. Examples of these discharges include, but are not limited to, cooling water, hydrotesting waters, dewatering effluent, and process wastewater.

  -Discharges from the application of pesticides (including pesticides, herbicides, fungicides, rodenticides, and various other substances to control pest) to State waters.

  An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge or start of construction activities. To request and NPDES individual permit, you must complete and submit the NPDES individual permit application. This application is available on the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/.

  A Notice of Intent (NOI) for coverage under a specific NPDES general permit must be submitted at least 30 calendar days before the commencement of the discharge or start of construction activities. To request NPDES general permit coverage, you must complete and submit the NOI. The NOI is available on the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/.

  Please see HAR, Chapter 11-55 for more information on the NPDES individual permit and NPDES general permits. The specific NPDES general permits located in HAR, Chapter 11-55, Appendices B through M. HAR, Chapter 11-55 and HAR, Chapter 11-55, Appendices B through M are available on the CWB website at: http://health.hawaii.gov/cwb/.

- According to State law, all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards.

Monitoring

- Effluent discharge and/or receiving water monitoring may be required as conditions of Section 401 Water Quality Certifications and NPDES General and Individual permits.

Enforcement

- Noncompliance with water quality requirements contained in HAR, Chapter 11-54 and/or permitting requirements specified in HAR, Chapter 11-55 may be subject to penalties of $25,000 per day per violation.

- Violations of Hawaii Revised Statutes 342D and 342E may elicit administrative, civil and criminal penalties for such violations.

Polluted Runoff Control

- Manage projects identified in watershed-based plans that reduce polluted runoff and educate the public about nonpoint source pollution. Projects are selected through an annual request for proposals. Funding is provided by the EPA through the Clean Water Act. For more information on projects and funding opportunities, please visit: www.hawaii.gov/doh/pollutedrunoffcontrol.

If you have any questions, please contact Mr. Alec Wong, Supervisor of the Engineering Section, CWB, at (808) 586-4309.

Construction activities must comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control."

1. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules.

2. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers.

3. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit.

Should there be any questions on this matter, please contact the Department of Health at 933-0917.

We recommend that you review all of the Standard Comments on our website: http://hawaii.gov/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this project should be adhered to.

The same website also features a Healthy Community Design Smart Growth Checklist (Checklist) created by Built Environment Working Group (BEWG) of the Hawaii State Department of Health. The BEWG recommends that state and county planning departments, developers, planners, engineers and other interested parties apply the healthy built environment principles in the Checklist whenever they plan or review new developments or redevelopments projects. We also ask you to share this list with others to increase community awareness on healthy community design.

c: Claire Oshiro, The Limtiaco Consulting group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Ms. Mary Abrams, Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.) Reference 01EPIF00-2015-TA-0192

Dear Ms. Abrams:

Thank you for your agency's letter dated 04/02/15 from Ms. Michelle Bogardus regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe. The Environmental Assessment (EA) includes the information provided in your agency's letter about two listed seabirds, one listed insect and seven listed plants within the project vicinity. The EA also states that there is no proposed or final critical habitat within the project site, whereas the adjacent Kaloko-Honokohau National Historic Park does contain proposed critical habitat.

A biological field survey that extended beyond the project site boundaries was conducted. No federal or State of Hawaii listed species were detected. DLNR's project includes the suggested recommendations that would avoid or minimize adverse impacts to seabirds and Hawaiian hoary bats, which were not detected during the biological field survey but are known to frequent the neighboring Kaloko-Honokohau National Historic Park and surrounding project area.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

04-05-15A10:25 RCVD

In Reply Refer To:
01EPIF00-2015-TA-0192

APR 0 2 2015

Ms. Claire Oshiro
The Limtiaco consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Subject: Technical Assistance for the Proposed Construction of a Department of Land and Natural Resources (DLNR) Administration Building and Community Conference Center, Kealakehe, North Kona, Hawaii

Dear Ms. Oshiro:

The U.S. Fish and Wildlife Service (Service) received your correspondence on March 3, 2015, requesting technical assistance regarding possible presence of endangered, threatened or protected flora and fauna within an area west of the Honokohau Small Boat Harbor that is bounded on the south and east by the Kealakehe Parkway and the Queen Kaahumanu Highway and the north by Kii Pohaku road, identified as TMK 7-4-008:003 (portion) in Kealakehe, North Kona, Hawaii. The Limtiaco Consulting Group is preparing a Draft Environmental Assessment (EA) for the proposed construction of a new Department of Land and Natural Resources (DLNR) Administration Building and Community Conference Center on this property.

Based on information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Project, there are two listed animals, the endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*), one listed insect, the Blackburn's sphinx moth (*Manduca blackburni*), and seven listed plants, kookoolau (*Bidens micrantha* ssp. *ctenophylla*), uhihui (*Mezoneuron kavaiense*), hala pepe (*Chrysodracon* (=*Pleomele*) *hawaiiensis*), wahine noho kula (*Isodendrion pyrifolium*), no common name (*Neraudia ovata*), and aiea (*Nothocestrum breviflorum*), in the vicinity of the project area. Our GIS files do not indicate there are listed plants within the project footprint of the TMK; however, listed plants are within a two mile radius of the project area and the project area is within the historical distributional range of the above listed endangered plants. There is no proposed or final critical habitat within the described project footprint, but adjacent to the TMK is Kaloko-Honokohau National Historical Park, which has proposed critical habitat. To help you minimize potential impacts to listed species, the Service is providing you the following avoidance and minimization measures. Please note that implementation of these measures does not ensure that impacts to listed species can be avoided, and further coordination with the Service on compliance with the ESA may be required.

Seabirds
Hawaiian petrels and Newell's shearwaters (collectively known as seabirds) may transit over the proposed project area when flying between the ocean and nesting sites in the mountains during their breeding season (March through November). Seabird fatalities resulting from collisions with artificial structures that extend above the surrounding vegetation have been documented in Hawaii where high densities of transiting seabirds occur. Additionally, artificial lighting, such as flood lighting for construction work and site security, can adversely impact seabirds by causing disorientation which may result in collision with utility lines, buildings, fences and vehicles. Fledgling seabirds are especially affected by artificial lighting and have a tendency to exhaust themselves while circling the light sources and become grounded. Too weak to fly these birds become vulnerable to depredation by feral predators such as cats (*Felis cattus*), dogs (*Canis familiaris*), and small Indian mongoose (*Herpestres auropunctatus*). Therefore the Service recommends that night work requiring artificial illumination be avoided during the seabird fledging season (approximately September 15 through December 15). All project-related installed lighting should be minimized and shielded so the bulb is not visible at or above bulb-height.

Blackburn's sphinx moth
Blackburn's sphinx moths feed on nectar from native plants, including beach morning glory (*Ipomoea pes-caprae*), iliee (*Plumbago zeylanica*), and maiapilo (*Capparis sandwichiana*); larvae feed upon non-native tree tobacco (*Nicotiana glauca*) and native aiea (*Nothocestrum latifolium*). Tree tobacco is a weed species that grows rapidly and inhabits disturbed places, roadsides, urban waste areas, gravel quarries, landscaped sites, and natural communities, including riparian areas, grassland, and woodland. Due to the invasive nature and rapid growth of tree tobacco, it is possible that it may be at the site. We recommend that a qualified biologist survey the project area for the presence of Blackburn's sphinx moth and its host plants prior to construction. We further recommend that these surveys be conducted during the wettest portion of the year (usually November-April) and approximately four to eight weeks following a significant rainfall event. Surveys should include looking for eggs, larvae, and signs of larval feeding (chewed stems, frass, or leaf damage).

Listed plants
We recommend you conduct plant surveys for the seven listed plants for which presence is documented within two miles of the proposed project area and historical distributional range includes the proposed project area.

Thank you for your efforts to conserve listed species and native habitats. Please contact Fish and Wildlife Biologist Jay Nelson (808-792-9441) if you have any questions or for further guidance.

Sincerely,

Michelle Bogardus
Island Team Leader
Maui Nui and Hawaii Island

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Quirino Antonio, Jr., P.E., Manager-Chief Engineer
County of Hawaii
Department of Water Supply
345 Kekuanaoa Street, Suite 20
Hilo, HI 96720

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Antonio:

Thank you for your letter dated 04/10/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe. The Environmental Assessment (EA) will indicate that the average daily water usage through the existing services, over the past year, is approximately 65,300 gallons per day, which is equivalent to approximately 164 units of water. The EA will indicate that the projected water demand for the proposed facility with an assumption of once-per-day or twice-per-day irrigation of landscape plants is between 4,170 to 4,720 gpd, respectively. On-site water catchment and the use of water efficient features may help to reduce the water demand.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

April 10, 2015

Mr. Carty Chang
State of Hawai'i
Department of Land and Natural Resources
Engineering Division
P.O. Box 373
Honolulu, HI 96809

PRE-ENVIRONMENTAL ASSESSMENT CONSULTATION
DLNR ADMINISTRATION BUILDING AND COMMUNITY CONFERENCE CENTER
TAX MAP KEY 7-4-008:003 (PORTION)

This is in response to your Pre-Environmental Assessment Consultation request dated March 3, 2015.

Please be informed that there are several existing water services to the subject property.

The Department will note that the average daily water usage through the existing services, over the past year, is approximately 65,300 gallons per day, which is equivalent to approximately 164 units of water.

Therefore, the Department requests that the applicant provide estimated maximum daily water usage calculations and address how the additional water will be provided.

Should there be any questions, please contact Ryan Quitoriano of our Water Resources and Planning Branch at 961-8070, extension 256.

Sincerely yours,

Quirino Antonio, Jr., P.E.
Manager-Chief Engineer

RQ:dfg

copy – The Limtiaco Consulting Group, Inc.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Duane Kanuha, Director
County of Hawaii
Planning Department, West Hawaii Office
West Hawaii Civic Center
74-5044 Ane Keohokalole Highway, Building E
Kailua-Kona, HI 96740

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Kanuha:

Thank you for your letter dated 04/15/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe. The Environmental Assessment (EA) will indicate that the parcel is designated Urban and Conservation by the State Land Use Commission and the site is in the Urban area; the Land Use Pattern Allocation Guide Map designates the parcel as Open and Urban Expansion and the project site appears to be within the Urban Expansion area; and County zoning for the parcel is Open. We appreciate your statements that permitted uses according to Chapter 25-5-162(a)(3) of the Hawaii County Code include "Community building, as permitted under section 25-4-11" and according to §25-4-11(c): "Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use." The EA will also state that the parcel is in the Special Management Area (SMA) but is not located in a "shoreline area" as defined by HRS §205A-41; SMA approval will be required for the project.

Thank you for the information pertaining to the Hawaii County General Plan, Table 7-11, Natural Beauty Sites, District of North Kona, which lists "Honokohau coastline, TMK: 7-4-08: 4, 3" as an example of natural beauty. The EA will state that the 7.5-acre project site is outside the 17-mile protected coastline, which has mostly been set aside for park purposes.

The EA includes DLNR's consideration of other site locations closer to the Honokohau Village Transit Oriented Development area, which is *mauka* of Queen Kaahumanu Highway. There appears to be no compelling environmental benefits associated with several described locations in Kealakehe on the *mauka* side of Queen Kaahumanu Highway since landform alterations may result in disturbances to biological resources and/or their habitat or site development may be constrained by discoveries of historical/archaeological resources.

The development footprint of DLNR's facility was reduced and is designed to minimize the visual impact of new building elements and landforms along Kealakehe Parkway that are generally in keeping with built elements in the surrounding area. Landscaping within the project site and design choices such as the use of earth tone finishes will further buffer or soften the

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visual impact of the single-story facility that is sited on the lower pahoehoe lava flow. DLNR's project is consistent with the Coastal Zone Management policies pursuant to §205A-2(c)(3)(B) that pertain to scenic and open space resources.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

William P. Kenoi
Mayor

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County of Hawai'i
PLANNING DEPARTMENT

Duane Kanuha
Director

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Deputy Director

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April 15, 2015

04-20-15 A08:23 RCVD

Mr. Carty Chang, Chief Engineer
DLNR, Engineering Division
P.O. Box 373
Honolulu, HI 96809

Dear Mr. Chang:

Subject: Pre-Consultation for an Environmental Assessment
Applicant: Department of Land and Natural Resources (DLNR)
Land Owner: State of Hawaii
Project: Administration Building and Community Conference Center
TMK: (3) 7-4-008:Por. of 003, Keahuolu, North Kona, Hawai'i

This is in response to your request for comments on the above-referenced project.

A new administration and shared base yard facility will allow DLNR to consolidate services at a single central location in West Hawai'i. It would also house the Commission on Water Resource Management (CWRM), Division of Forestry and Wildlife (DOFAW), Division of State Parks (SP), Engineering Division (ENG) and State Historic Preservation Division (SHPD). This project would accommodate the present and future operation needs such as secure base yards, storage facilities and spaces where division personnel can interact with the public. A community conference center will be contained within the new administration building. The early phase will include installation of infrastructure and internal roadways. The later phase will include a free-standing building to house the community center.

We have the following comments to offer for the proposed project on the subject 117.987 acre parcel:

1. Although it is designated Urban and Conservation by the State Land Use Commission, the project site is in the Urban area.

2. While the Land Use Pattern Allocation Guide (LUPAG) Map designates it Open and Urban Expansion, the project site is designated Open.

3. The parcel is zoned Open by the County. According to the Hawai'i County Code, Chapter 25-5-162(a)(3), permitted uses include *"Community building, as permitted under section 25-4-11."* §25-4-11(c) states that *"Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use."*

4. Although the parcel is in the Special Management Area (SMA), it is not located in a "shoreline area" as defined by Section 205-A-41, Hawai'i Revised Statutes (HRS). SMA approval will be required for the proposed project.

5. Describe how the proposed use is consistent with the policies, standards, and courses of action of the County of Hawai'i's General Plan. Please note that Table 7-11, Natural Beauty Sites, District of North Kona lists "Honokōhau coastline, TMK: 7-4-08:4,3" as an example of natural beauty.

6. The project site is located in the Kona Community Development Plan (KCDP) planning area. Please review and include discussion of the proposed project's consistency with the overall strategy, tools, goals, objectives, policies and actions identified in Chapter 4, Section 2, Land Use, found on pages 4-27 through 4-50. In particular, we note the following:

4.2 Land Use

4.2.2 Overall Strategy

The overall land use strategy is to proactively implement public policy through a regional framework for growth. While respecting landowner entitlements, this framework provides additional direction so that individual planning decisions are made as part of a larger, integrated program for achieving an efficient growth pattern, optimizing investment in services and infrastructure, protecting the natural environment and cultural resources, and creating opportunities to enhance the quality of life for Kona's residents."

4.2.3 Goals, Objectives, Policies, and Actions

Policy LU-1.6: 17-Mile Protected Coastline

Consider other site alternatives that are not located within the identified 17-mile coastline that is to be protected by this policy.

Figure 4-7, Official Kona Land Use Map

Consider the proximity to the Honokohau Village Transit Oriented Development (TOD) which is also identified as a Regional Center. It is recommended that the project site be located closer to the existing government center mauka of the Queen Kaahumanu Highway and adjacent to existing and future areas of development planned for Honokohau Village TOD.

Figure 4-2a, Official Transportation Network Map – Proposed Roads and Transit; and Policy TRAN-1.5:Frontage Road
The siting of the proposed project needs to consider the proposed location of the secondary transit road as shown in Figure 4-2a and described in Action TRAN-1.5a: Design and construct Frontage Road, Phase II – National Park Service (NPS) Section,(a) Determine alignment within 300 foot right-of-way or NPS property (PD, NPS, 3-5).

7. Finally, please describe the proposed project's consistency with Hawai'i Revised Statutes (HRS), Chapter 205A, Coastal Zone Management. More specifically, it should describe how the project is consistent with 205A-2(c)(3)(B) to *"Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline."*

We have no further comments to offer at this time. However, please provide our department with a copy of the Draft Environmental Assessment for our review and comment.

If you have questions or require further information, please feel free to contact Esther Imamura of this office at (808) 961-8139.

Sincerely,

for DUANE KANUHA
Planning Director

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cc: Planning Department – Kona

Ms. Claire Oshiro, Environmental Planner
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THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2016

Mr. Rick Gaffney, President
Hawaii Fishing and Boating Association
P.O. Box 1554
Kailua Kona, HI 96745

Subject: Response to Pre-Assessment Consultation for the Department of Land and Natural Resources Community Conference Center and Administration Building in Kealakehe, North Kona, Hawaii, Tax Map Key (3) 7-4-008: 003 (por.)

Dear Mr. Gaffney:

Thank you for your letter dated 05/12/15 regarding the pre-assessment consultation phase for the Department of Land and Natural Resources (DLNR) Community Conference Center and Administration Building in Kealakehe. Proposed structures and associated infrastructure for DLNR's project will be sited outside of the Tsunami Evacuation Zone whereas public parking areas will be sited within the Tsunami Evacuation Zone. We acknowledge your organization's concerns about the location *makai* of Queen Kaahumanu Highway with respect to future growth opportunities for the harbor community and your organization's preference for another location. We appreciate your statement that moving the offices of the Division of Aquatic Resources to a location farther away from the ocean, its constituents and its harbor berth is less practical and convenient.

The Environmental Assessment (EA) includes DLNR's consideration of other site locations *mauka* of Queen Kaahumanu Highway. There appears to be no compelling environmental benefits associated with several described locations in Kealakehe on the *mauka* side of Queen Kaahumanu Highway since landform alterations may result in disturbances to biological resources and/or their habitat or site development may be constrained by discoveries of historical/archaeological resources. The following studies were conducted and are appended to the EA: natural resources survey, archaeological inventory survey, cultural impact assessment, and traffic impact assessment report. The project site does not contain proposed or final critical habitat and is devoid of federal or State of Hawaii listed species of plants and insects. Traditional and cultural practices are not known to have occurred within the project site in recent times. DLNR's project is intentionally sited and designed to avoid important historic properties that exist upon the mostly barren lava flows. The results of the traffic impact analysis suggest that project-related traffic would not generate a need for off-site improvements.

Thank you for the information about the Department of Health memo to DLNR that injection wells currently used for sewage disposal at Honokohau Small Boat Harbor "are inadequate, inappropriate and must be replaced with proper sewage treatment and disposal processes." DLNR is aware that Phase 2 of the Queen Kaahumanu Highway widening project, which includes the installation of utilities and drain inlet structures, is currently underway. Completion of the federally funded project by 2018 will result in improved utility infrastructure along the highway; therefore, DLNR decided to omit the on-site individual wastewater system from the

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proposed project and will instead convey wastewater to the Kealakehe Wastewater Treatment Plant via a connection to improved wastewater conveyance facilities along the widened highway.

The EA also contains a discussion of wastewater system considerations including a bioremediation system with constructed wetlands; this onsite wastewater treatment alternative appears to be inappropriate for the project site based on site conditions including but not limited to the highly permeable soil and dry climate. Furthermore, the creation of wetland habitat that may be attractive to Hawaiian waterbird species is expected to necessitate coordination with federal and state agencies to identify permit requirements, avoidance measures and recommendations for mitigation in the event of incidental takings of listed species.

Thank you for your statement that the meeting room needs of the community are largely fulfilled by the new County Building facilities and Hawaii Big Game Fishing Club. DLNR has determined that the community conference center is appropriate based on the responsibilities of its divisions. During the outreach effort for the EA, the National Park Service and Gentry's Kona Marina Honokohau Harbor expressed support for the community conference center.

The Draft EA is anticipated to be available for public review this summer 2016. If you have any questions, please do not hesitate to contact me at 596-7790.

Sincerely,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

cc: Carty Chang, P.E., Chief Engineer, DLNR Engineering Division

May 12, 2015

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Mr. Carty Chang, Chief Engineer
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The DLNR is proposing to build a new administration building and equipment storage complex on DLNR land between the Queen Kaahumanu Highway and the Gentry's Kona Marina complex, adjacent to Honokohau Harbor. The Hawaii Fishing & Boating Association, and others in the community, feel this is a bad location for many reasons, not the least of which is that it will deprive the harbor community of future growth opportunities.

We are also concerned because:
1) the location of the proposed building appears to be in, or very nearly adjacent to, the tsunami evacuation zone;

2) it will be a large industrial site designed to accommodate all DLNR vehicles and equipment in West Hawaii, and a multi story office building, all of which is situated on the border of the Kaloko-Honokohau National Park:

3) the site will be accessed from the already heavily used Kealakehe Parkway, which is the sole entrance to Honokohau Small Boat Harbor raising traffic concerns, particularly at the dangerous Kealakehe Parkway/Queen Kaahumanu Highway intersection, in part because both the DLNR vehicle and community traffic will include many large trailers;

4) the plan proposes to move some DLNR offices (DAR) away from their current location into one that is far less practical and convenient for them as it is farther from the ocean, their constituents and their harbor berth:

5) This new facility proposes to include a new meeting room for the community, when that need has been largely fulfilled by the new County Building facilities, and the Hawaii Big Game Fishing Club. Moreover, the DLNR meeting room that was originally designed to be on the second floor of the current DOBOR building at Honokohau, was scrapped years ago after it was deemed to be unjustified.

The DLNR has land on the mauka side of the Queen Kaahumanu Highway, out of the tsunami inundation zone, away from the area most appropriate for harbor facilities expansion, closer to the growing government core (County building, judiciary, etc.), with a far less significant traffic issue. Why not build this new administrative center on that land?

Moreover, our initial perception is that an Environmental Assessment will not be adequate for the proposed location. There are known cultural sites and possibly threatened endemic plant species in that area, so a full EIS should be required.

Finally, the Department of Health recently sent a memo to DLNR alerting them that the injection wells currently used for sewage disposal at Honokohau SBH are inadequate, inappropriate and must be replaced with proper sewage treatment and disposal processes. The announcement for this project does not say anything about sewage disposal plans, but nothing less than a self-contained sewage treatment system, perhaps via a constructed wetlands, or connection to the adjacent County of Hawaii sewage treatment and reclamation plant, is appropriate.

In short, we believe that proposed new DLNR office building and facility should be relocated to a more appropriate place, and many of the issues presented herein, must factored into the planning and environmental management processes.

We look forward to meeting with you and your staff to discuss these issues in greater depth.

Mahalo,

Rick Gaffney,
President

Cc: Clare Oshiro, Environmental Planner
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