EIS Preparation Notice: Kahuku Villages

Kahuku, Ka‘ū, Island & County of Hawai‘i

Prepared for:
Nani Kahuku ‘Āina, LLC

Prepared by:
PBR Hawaii
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July 14, 2009

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SUMMARY

Project Name: Kahuku Villages

Project Location: Kahuku Ahupuaʻa, Kaʻū District, Island and County of Hawaiʻi, Hawaiʻi, TMK (3) 9-2-001: 072, approximately 16,456.547acres

Applicant/Landowner: Nani Kahuku ʻĀina, LLC, a Delaware Limited Liability Company

Accepting Authority: County of Hawaiʻi Planning Department

Project Description: The objectives of the proposed Kahuku Villages are:

- Confine development to clusters to economize infrastructure costs and maximize the amount of land to stay in open space.
- Create job opportunities, especially for Kaʻū residents who presently commute to Kona or Hilo.
- Protect and steward the precious natural and cultural resources, particularly the endangered hawksbill turtle nesting grounds, with input from the community, kūpuna, and scientists.
- Provide diverse housing opportunities to attract a workforce.
- Increase basic services in recognition of Kaʻū's remoteness and lack of basic services, by creating a concentrated population mass to support services such as medical, schools, retail, and emergency response.
- Incorporate sustainable principles and practices to power the Project with alternative energy, incorporate water conservation measures into the design, utilize the golf course as part of a green drainage system (sedimentation basin) and wastewater effluent reuse area, and encourage food/biofuel gardens for home use, farmer's markets, and/or sale to the mauka and makai villages.
- Leverage a low-key, high-quality resort to subsidize community benefits.

To meet these objectives the master plan proposes the following land uses:

- Mauka mixed-use village along Māmalahoa Highway, called Kahuku Village, envisioned to be a walkable, pedestrian-friendly village organized around a village green.
- Coastal low-profile resort consisting of sustainably designed hotels, eco-lodge and residential lots fronting a golf course.

- Hawaiian heritage center (encompassing the hawksbill turtle habitat at Pōhue Bay and Kanaone anchialine pond) to formalize, perpetuate, and expand the current scientific and cultural activities onsite. The concept is to learn and apply the pre-contact Hawaiian principles of ahupua‘a management by fostering an integration of cultural practiioners' knowledge with scientific knowledge.
- Agricultural and Renewable Energy Production lots consisting of large 20+-acre lots restricted in use to agricultural or renewable energy production.
- An extensive network of trails and open space to connect the mauka and makai areas, as well as provide lateral shoreline access through the Site.
- An airport and/or helipad to provide an alternative mode of access besides driving to this remote location.
- Infrastructure to support the proposed development including: intersection improvements along Māmalahoa to access the village, internal roadways, water system, drainage system, wastewater system with effluent reuse, trails/pathways, and possibly a private energy utility system using alternative energy sources.

Land Use Designations:

Designation	**Existing Classification**	**Proposed Reclassification**
State Land Use District	Agriculture and Conservation	Agriculture, Conservation, Urban, Rural
General Plan LUPAG	Extensive Agriculture, Conservation, Open Space	Extensive Agriculture, Open Space, Resort, Rural, Medium Density Urban, Urban Expansion, Industrial
County Zoning	Agriculture (A-20a), Open	Open, Project District

SMA: A small portion of the project area along the shoreline is situated in the Special Management Area

Permits/Approvals: Compliance with Chapter 343, HRS

Federal:

FAA (for proposed airport) and NEPA

State:

State Land Use District Boundary Amendment

Conservation District Use Permit

Air Permits: Energy farm (dependent on energy source), Waste Water Treatment Plant (WWTP)

National Pollutant Discharge Elimination System (NPDES) Individual Permit (point source): WWTP, Desalination Plant (if there is a discharge);

Approval for Waste Water Treatment Facility

Well Construction and Pump Installation PermitSafe Drinking Water approval for public water supply

Underground Injection Control Permit

Public Utilities Commission approval for sale of potable water, energy, and/or wastewater treatment services

Permit to Perform Work within a State Right-of-Way

County:

General Plan Amendment

Change of Zone

Special Management Area Permit

Grading /Building Permits

Subdivision Approval

LIST OF ACRONYMS AND ABBREVIATIONS

ALISH	Agricultural Lands of Importance to the State of Hawai‘i
CDP	Census Designated Place
CWDA	Critical Wastewater Disposal Area
CZM	Hawai‘i Coastal Zone Management
CZMA	Coastal Zone Management Act
DBA	District Boundary Amendment
DBEDT	State of Hawai‘i Department of Business Economic Development and Tourism
DHHL	State of Hawai‘i Department of Hawaiian Homelands
DLNR	State of Hawai‘i Department of Land and Natural Resources
DOH	State of Hawai‘i Department of Health
DWS	County Department of Water Supply
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HAR	Hawai‘i Administrative Rules
HCC	Hawai‘i County Code
HELCO	Hawai‘i Electric Light Company, Inc.
HOVE	Hawaiian Ocean View Estates
HRS	Hawai‘i Revised Statutes
Ka‘ū CDP	Ka‘ū Community Development Plan
kV	Kilovolt
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
LUC	State Land Use Commission
LUPAG	Land Use Pattern Allocation Guide Map
MG	General Industrial (zoning)
mgd	Million gallons per day
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGPC	Notice of General Permit Coverage
NKA	Nani Kahuku ‘Āina, LLC
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination Systems
NRCS	U.S. Department of Agriculture Natural Resources Conservation Services
NWS	National Weather Service
OEQC	Office of Environmental Quality Control
ppm	parts per million
PUD	Planned Unit Development
ROW	Right-of-Way
SHPD	State Historic Preservation Division
SMA	Special Management Area
SO_2	Sulfur dioxide
TIAR	Traffic Impact Analysis Report

TMK	Tax Map Keys
ug/m^3	micrograms per cubic meter
UHM	University of Hawaii at Manoa
USGS	United States Geological Survey
VA	U.S. Department of Veterans Affairs
WWTP	Wastewater Treatment Plant

CHAPTER

1

INTRODUCTION

1.1 IDENTIFICATION OF THE APPLICANT/LANDOWNER

The applicant is Nani Kahuku ʻĀina, LLC (hereinafter "Applicant"), a Delaware limited liability company. Applicant owns the subject property in fee simple. Applicant proposes to use the subject property for urban, agricultural/energy, and conservation/cultural uses as described in Chapter 2, "PROJECT DESCRIPTION" (hereinafter "Project").

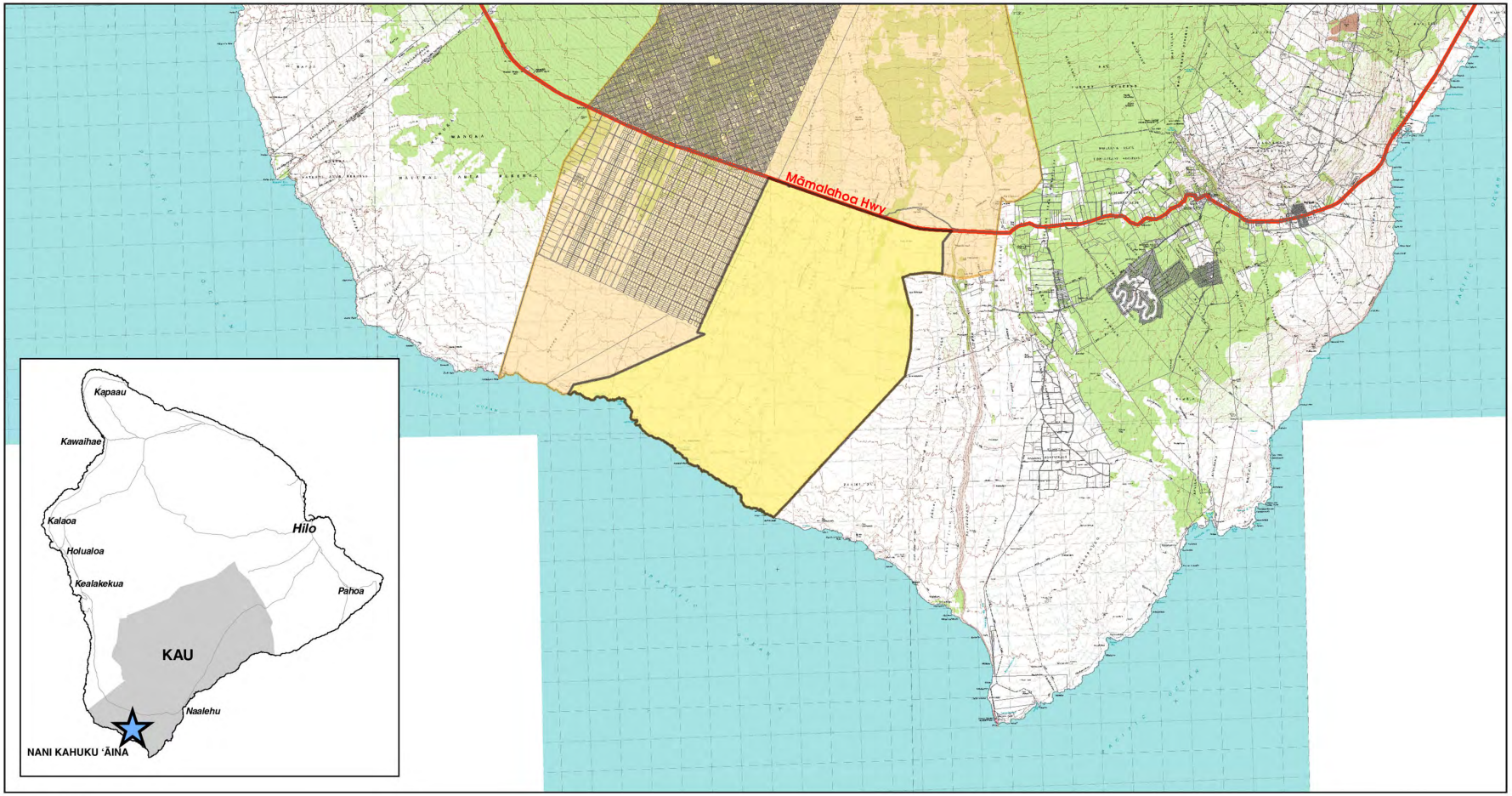
Contacts: Mr. Valentine Peroff, President
Ms. Katherine Peroff, Vice President
99-0880 Iwaena Street
Aiea, Hawaiʻi 96701
website: _____

1.2 LOCATION

The approximately 16,456.547 acre Project area is located in Kahuku, Kaʻū District, on the island and County of Hawaiʻi (see Figure 1, Location Map) (hereinafter "Site"). The Site consists of one parcel, identified as TMK 3rd/9-2-001: 072, that extends from Māmalahoa Highway makai to the coast, between Hawaiian Ocean View Ranchos to the northwest and a large parcel owned by Kamehameha Schools to the southeast (see Figure 2, Tax Map). The Site's 5-mile coastline includes Pōhue Bay, Hāliʻipalala, and Kākiʻo .

1.3 PURPOSE OF THIS DOCUMENT

This document, called an environmental impact statement preparation notice ("EISPN"), is being prepared pursuant to the requirements of Hawaiʻi Revised Statutes ("HRS") Chapter 343 and Hawaiʻi Administrative Rules Title 11, Department of Health, Chapter 200, Environmental Impact Rules. The EISPN is the first step in the process of preparing an Environmental Impact Statement ("EIS") (see sidebar).



LEGEND

- Project Boundary
- Major Road
- Kahuku Ahupuaa

Source: U.S. Geological Survey (GIS)
Disclaimer: This graphic has been prepared for general planning purposes only.

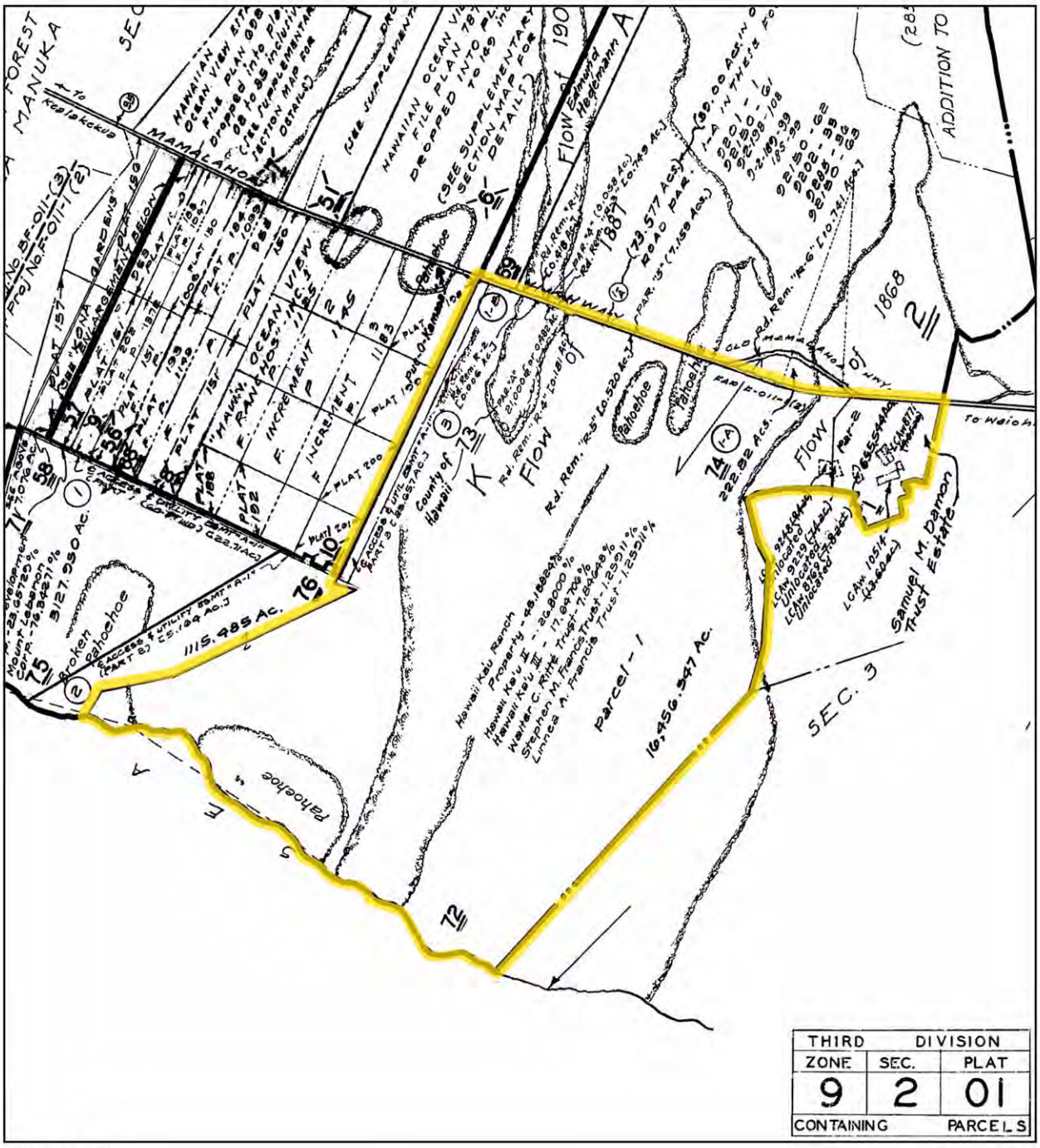
FIGURE
Regional Location Map
NANI KAHUKU 'ĀINA
Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 5,000 10,000 20,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 1. Location Map



LEGEND

Project Boundary

Tax Map Key: (3) 9-2-001:072

NANI KAHUKU 'ĀINA

Nani Kahuku 'Aina, LLC

KA'U, HAWAII

NORTH

NOT TO SCALE

PBR HAWAII & ASSOCIATES, INC.

Source: Tax Map Key: (3) 9-2-001:xxx
Disclaimer: This graphic has been prepared for general planning purposes only.

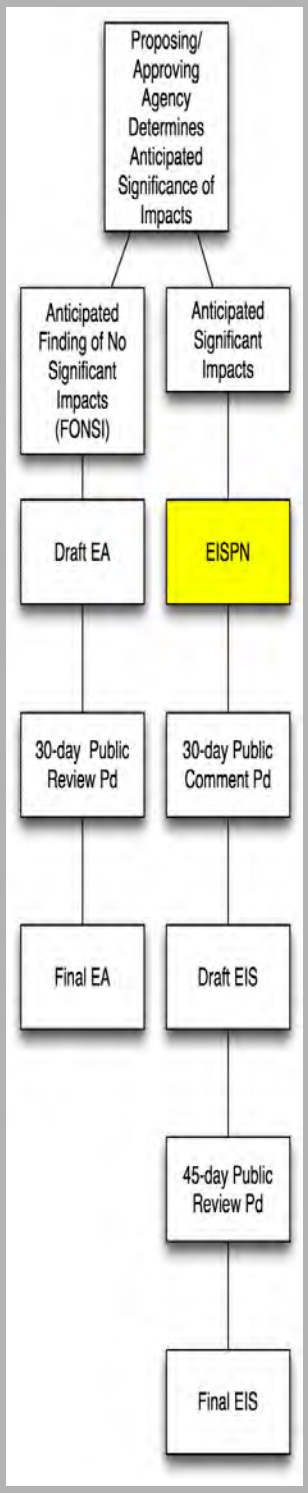
FIGURE 2. Tax Map

Section 343-5, HRS, sets forth nine criteria that trigger the need to comply with the environmental review requirements. The triggers for this Project include the following:

- Reclassification of State Conservation District land;
- Amendment to the existing Hawai‘i County General Plan;
- Possible use of State and/or County land (e.g., proposed highway intersection improvements on Māmalahoa Highway/Hawai‘i Belt Road);
- Possible construction of an alternative-energy power-generating facility;
- Possible construction of a new helicopter facility;
- Possible development of a wastewater treatment plant; and
- Possible work within the shoreline setback area.

This EISPN is a preliminary assessment of the environment, alternatives considered, potential impacts, and proposed mitigation measures. Publication of the EISPN in the Environmental Notice commences a 30-day public review period. Ideally, the comments should identify issues that should be addressed in the Draft EIS, identify relevant information resources, confirm the accuracy of information presented in the EISPN, suggest alternatives or mitigation measures, or suggest persons or organizations who should be contacted as potential stakeholders who may be affected by the Project. With this input, the Draft EIS can be a better decisionmaking tool that provides the necessary information to address pertinent issues.

EIS Process



1.4 IDENTIFICATION OF THE ACCEPTING AUTHORITY

The “accepting authority” is the government agency that determines the acceptability of the Final EIS. The accepting authority differs depending if the project is a government project or a private project. For a private project, such as this Project, the accepting authority is the agency receiving the first permit application. The first permit application for this Project is the petition for a General Plan Amendment, thereby establishing the County of Hawai‘i Planning Department as the accepting authority.

Contact: Ms. Bobby Jean Leithead-Todd, Planning Director
County of Hawai‘i
Planning Department
Aupuni Center
101 Pauahi Street, Suite 3
Hilo, Hawai‘i 96720
Phone: (808) 327-3510 (Kona office)
Fax: (808) 327-3563 (Kona office)

1.5 IDENTIFICATION OF THE ENVIRONMENTAL CONSULTANT

The environmental consultant is PBR HAWAII.

Contact: Mr. Vincent Shigekuni, Vice President
PBR HAWAII
1001 Bishop Street

ASB Tower, Suite 650
Honolulu, HI 96813
Telephone: (808) 521-5631
Fax: (808) 523-1402

1.6 STUDIES TO BE CONDUCTED AND INCLUDED IN THE EIS

The information contained in this EISPN has been developed from master planning efforts, site visits, consultation with parties listed in Section 8.1 and selected technical studies of the Site and surrounding area. Additional technical reports that will be incorporated and appended to the Draft EIS include:

- Botanical Survey;
- Fauna Survey;
- Terrestrial Invertebrate Survey;
- Cultural Impact Assessment;
- Archaeological Inventory Survey;
- Traffic Impact Assessment;
- Noise Assessment;
- Airport Site Assessment;
- Air Quality Study;
- Marine Water Quality Assessment;
- Ground Water Quality Assessment;
- Market and Economic Assessment;
- Agricultural Potential Assessment;
- Alternative Energy Assessment; and
- Preliminary Engineering Assessment.

CHAPTER

2

PROJECT DESCRIPTION

This section describes the existing and surrounding uses to provide a context for the proposed Project, followed by a description of the proposed master plan, development timeframe, and preliminary development costs.

2.1 EXISTING AND SURROUNDING USES

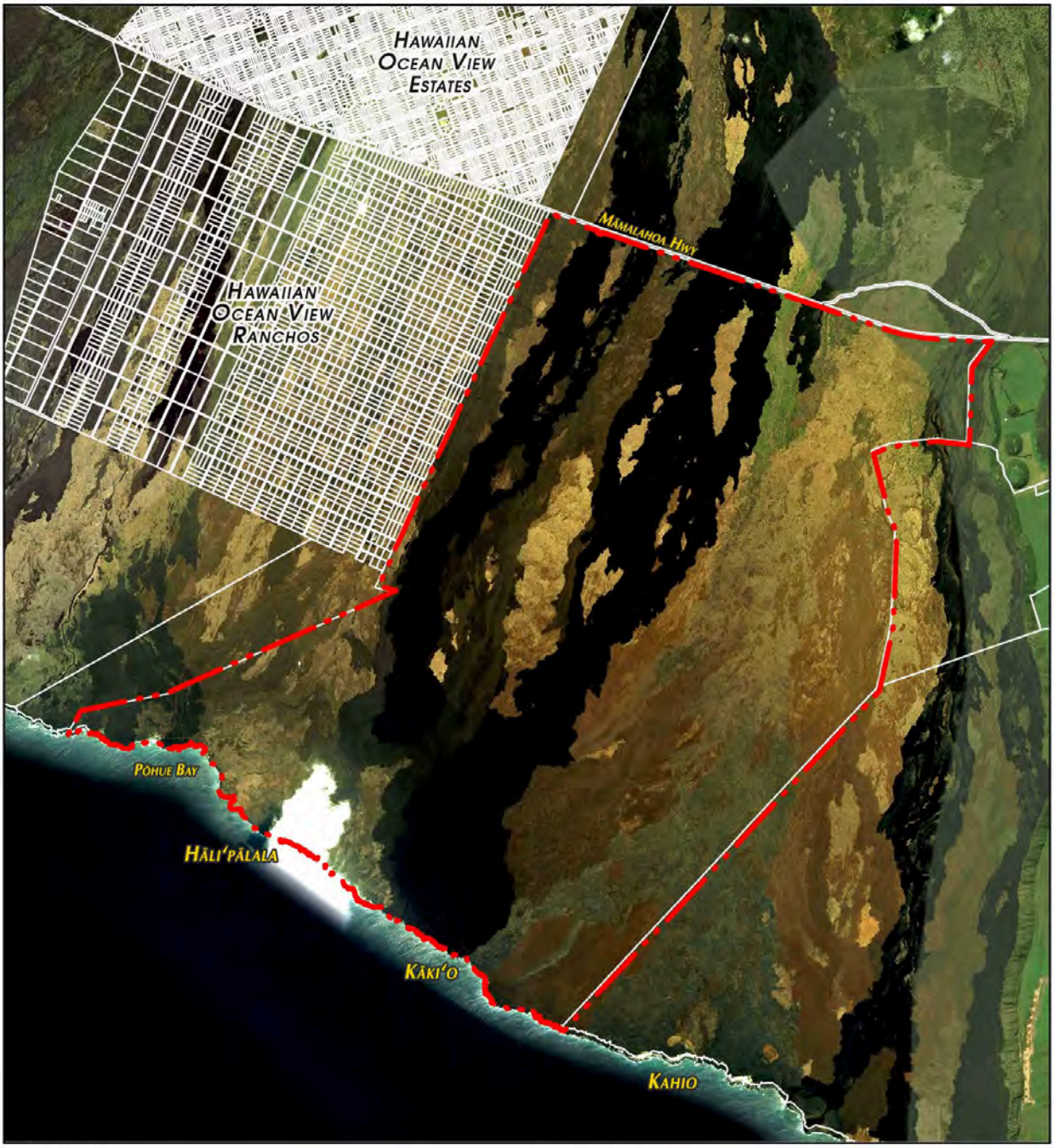
2.1.1 Existing Uses

The Site consists primarily of pāhoehoe and ʻaʻā lava with pockets of developed topsoil (see Figure 3, Aerial Photograph). Due to the lack of developed topsoil and fresh water, historically the area was used for ranching but not for crops. Ranching has been discontinued. Currently, there are no economic uses within the Site, and nearly the entire Site is vacant and undeveloped. While vegetation does exist, it is concentrated in small pockets surrounded by barren lava fields. Where vegetation is found, plant species include several members of the morning glory family, hala, and coconut in the coastal regions and an upland weedy scrub community including exotic Natal redtop and native hiʻaloa. A small mauka area includes an ʻōhiʻa forest community (see Section 3.5 for more detail on the vegetation).

Recreational and scientific uses are the only current existing uses. The Kahuku ahupuaʻa has been known for its fishing due to the location of pockets of very deep water that are accessible from the shore. This area has been known to local fishermen for catching ʻahi, aku, aʻu, ulua, mahimahi and ʻōpelu, and for limited overnight camping related to fishing.

Pōhue Bay is one of several coastal areas along the Site's shoreline that has been part of the Hawksbill turtle (honu ʻea) recovery project. Applicant has helped facilitate the international recovery project for this critically endangered sea turtle (Seitz and Kagimoto 2008). To better study both the Hawksbill and Green sea turtles, researchers from the University of Hawaiʻi at Hilo are allowed overnight camping privileges on the Site.

The Site has been utilized by a variety of research organizations since it was acquired by Applicant. Partnerships have been formed between Applicant and the U.S. Fish and Wildlife Service, the National Park Service, and NASA. These partnerships allow these organizations access to the Site to conduct a variety of research activities from flora/fauna inventory to lunar landing research. Applicant has also partnered with the Edith Kanakaʻole Foundation to provide cultural practitioners and educators with access to various locations on Site for the purpose of perpetuating the Hawaiian culture.



LEGEND

Project Boundary

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

FIGURE
Aerial Photograph
NANI KAHUKU 'ĀINA

Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 3,000 6,000 12,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 3. Aerial Photograph

2.1.2 Surrounding Uses

The Site is located along the southern coast of Hawai‘i Island. The surrounding owners and uses are as follows (see Figure 4, Surrounding Landowners):

North (Mauka). Māmalahoa Highway (also known as “Hawai‘i Belt Road”) defines the northern boundary of the Project Area. Mauka of the Highway, the Federal government purchased the Kahuku Ranch lands from the Damon Estates in 2004 to add to the Hawai‘i National Volcanoes Park.

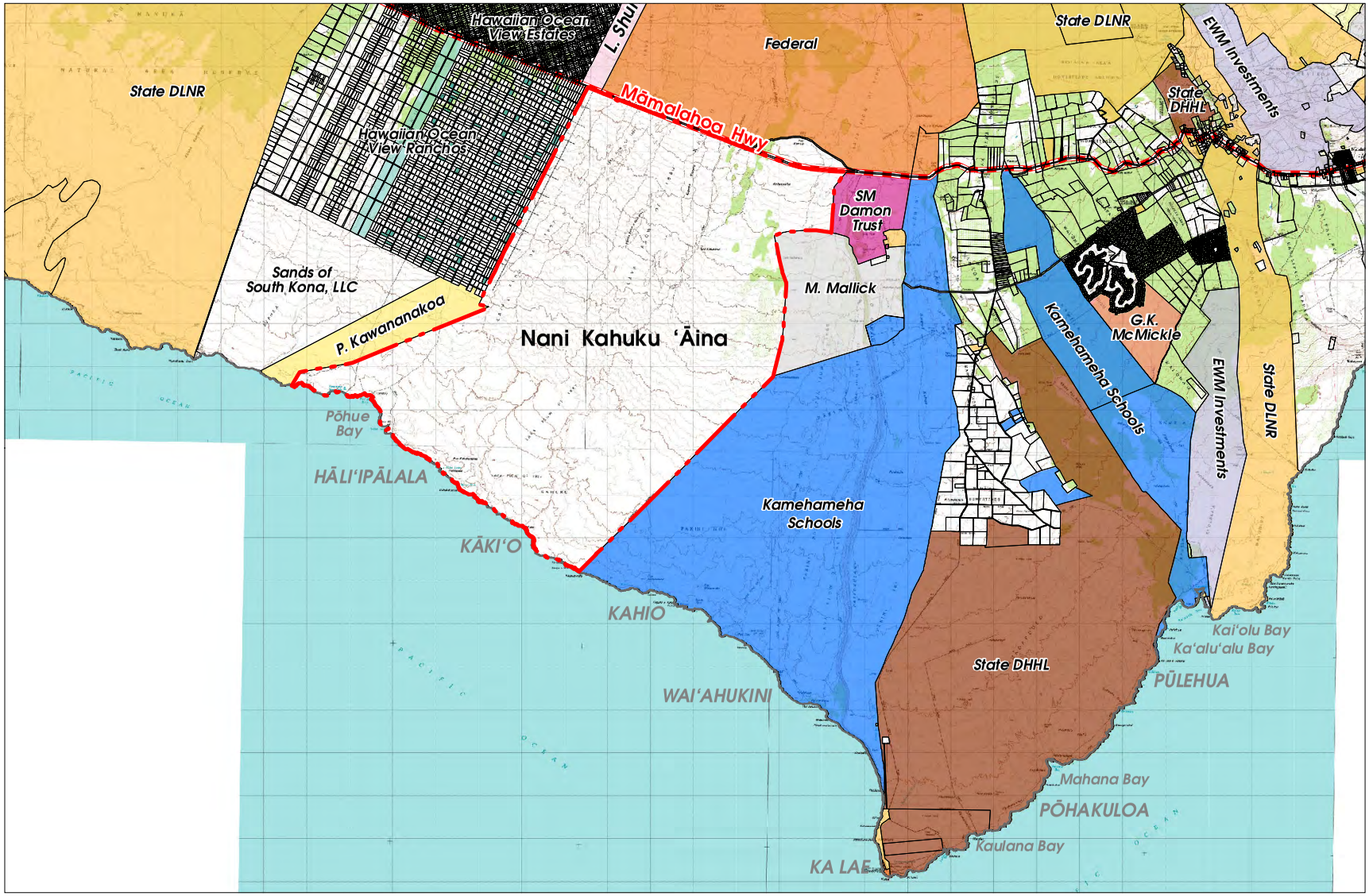
East (Towards South Point). To the east of the Site are vacant lands owned by S.M. Damon Trust, M. Mallick, and Kamehameha Schools. These lands are presently undeveloped.

West (Towards Kona). To the west of the Site are Hawaiian Ocean View Ranchos and an undeveloped parcel owned by P. Kawananakoa . Hawaiian Ocean View Ranchos, sometimes referred to as Hawaiian Ranchos, consists of 1,229 one- to three-acre lots makai of Māmalahoa Highway. Although subdivided in the 1950s, most of the lots have not been developed. The terrain varies from rugged lava fields to some lots containing ‘ōhi‘a trees and other vegetation. Water is by catchment only with power to some, but not all, of the lots. Elevation begins at the 500-foot level and rises up to the 1,500-foot level at Māmalahoa Highway. The subdivision is located between mile markers 76 and 78, and does not reach down to the ocean.

Directly mauka of Hawaiian Ranchos is Hawaiian Ocean View Estates. Hawaiian Ocean View Estates consists of 10,697 one-acre lots mauka of Māmalahoa Highway. Similar to Ranchos, the terrain varies from rugged lava fields to lots containing ‘ōhi‘a trees and other vegetation. Water is by catchment only with power to some, but not all, of the lots. Elevation begins at the 1,500 foot level, at Māmalahoa Highway, and rises up to the 5,000-foot level. Hawaiian Ocean View Estates was once part of Kahuku Ranch. Initial sales began in the late 1950s and early 60s. The original developer of Hawaiian Ocean View Estates was the Crawford Oil Company. In the early 1980s, a service station and a rental building, where the first hardware store began its business, were built. In 1989, the Ocean View Town Center was developed and the Ocean View Road Maintenance Corporation began an extensive rebuilding program of the roads in Hawaiian Ocean View Estates and the surrounding area. Shortly thereafter, the Ocean View Development Corporation started a new market, which included a laundromat and restaurant. Ocean View now has two shopping centers, a volunteer fire department, post office, and a park.

South (Makai). The five-mile coastline is generally rugged, consisting of lava rocks with only three sandy beach areas.

The nearest town is Nā‘ālehu located approximately 11 miles east of the Site. In 2000, approximately 1,000 people resided in Nā‘ālehu. Nā‘ālehu has shopping centers, farmer’s market, public library, public schools, a fire department, post office, several parks, medical facilities, and eldercare facilities.



LEGEND

- Project Boundary

Land Owner

- C.F. Oguss
- E.C. Olson
- EWM Investments
- G.K. McMickle
- County of Hawaii
- Federal
- State DLNR
- State DHHL
- Grayco Land
- Hawaii Conf. Foundation
- Hawaii Electric
- Kamehameha Schools
- L. Shum
- M. Mallick
- M.A. McGuire
- One Keahole
- P. Kawananakoa
- Roman Catholic Church
- SM Damon Trust
- The Nature Conservancy
- Title Guaranty Escrow
- Other

FIGURE

Regional Location Map with Surrounding Landowners

NANI KAHUKU ʻĀINA

Nani Kahuku ʻĀina, LLC — KAʻŪ, HAWAIʻI

NORTH

LINEAR SCALE (FEET) 0 5,000 10,000 20,000

Source: U.S. Geological Survey (GIS)
Disclaimer: This graphic has been prepared for general planning purposes only.

PBR HAWAII & ASSOCIATES, INC.

FIGURE 4. Surrounding Landowners

2.2 PROJECT OBJECTIVES

Taking into consideration the resources, constraints, community values, and regional needs, the Applicant's Project objectives are as follows:

- **Confine development to clusters.** In spite of the expansive project area, an objective of the Project is to confine development to clusters in order to economize infrastructure costs and maximize the amount of land to stay in open space.
- **Create job opportunities.** Since C. Brewer's closing of the Ka'ū Sugar Company, there has been no significant replacement of jobs. Many of Ka'ū's residents must commute to Hilo or the resorts of Kona or South Kohala. Unemployment in Ka'ū is high. In recognition of the need for jobs in Ka'ū, an objective of this Project is to provide job opportunities closer to home with a diversity of skill levels and a training program.
- **Protect and steward the precious natural and cultural resources.** With input from the community, kūpuna, and scientists, an objective of the Project is to develop a master plan that is sensitive to the natural and cultural resources, and establishes an ahupua'a stewardship program that integrates land and ocean management.
- **Provide diverse housing opportunities.** To attract a workforce, an objective of the Project is to provide a diverse range of housing opportunities in terms of income, special needs (e.g., elderly), tenure (for-sale and rental), and type (e.g., single-family, multi-family) within a mixed use compact town.
- **Increase basic services.** In recognition of Ka'ū's remoteness and lack of basic services, an objective of the Project is to create a critical concentrated population mass to support basic services such as medical, schools, retail, and emergency response.
- **Incorporate sustainable principles and practices.** To minimize environmental impacts, an objective of the Project is to power the Project with alternative energy, incorporate water conservation measures into the design, utilize the golf course as part of a green drainage system (sedimentation basin) and wastewater effluent reuse area, and encourage food and biofuel gardens for home use, farmer's markets, and/or sale to the mauka and makai villages.
- **Leverage a low-key, high-quality resort to subsidize community benefits.** To generate income that could subsidize community benefits, the objective is to develop a limited area of the Site into a high-quality resort. The resort would be designed to attract those who desire a remote, scenic, quiet get-away, and who may also appreciate learning about Hawaiian culture, rare natural phenomena such as the Hawksbill habitat, or subsistence activities such as fishing, gathering, or farming. Although there may be some transient accommodations of higher exclusivity, there will also be eco-lodges (e.g., tentalows or cabins) affordable to the general public.

The Draft EIS will include a market/economic assessment that will substantiate the economic feasibility of the master plan.

2.3 MASTER PLAN

The contemplated development will be primarily clustered in two Urban /Rural areas: a mauka mixed-use village, and a makai village. Of the 16,457 acres which comprise the Site, Petitioner only plans to develop about 26% of this area, which may be roughly allocated as follows: the residential resort areas (approximately 1,823 acres), the mauka mixed-use village – including the urban expansion area (approximately 1,090 acres), the resort areas – collectively comprised of three hotel sites, an eco-lodge and a resort village (approximately 607 acres), the airport (642 acres), and the eco-cabins at the Hawaiian Heritage Center (approximately 45 acres). The balance of the Site (12,250 acres) would be left in open space in the form of archaeological preserves, agricultural and/or energy generation areas, parks, trails, golf courses and other open space (see Figure 5, Overall Master Plan).

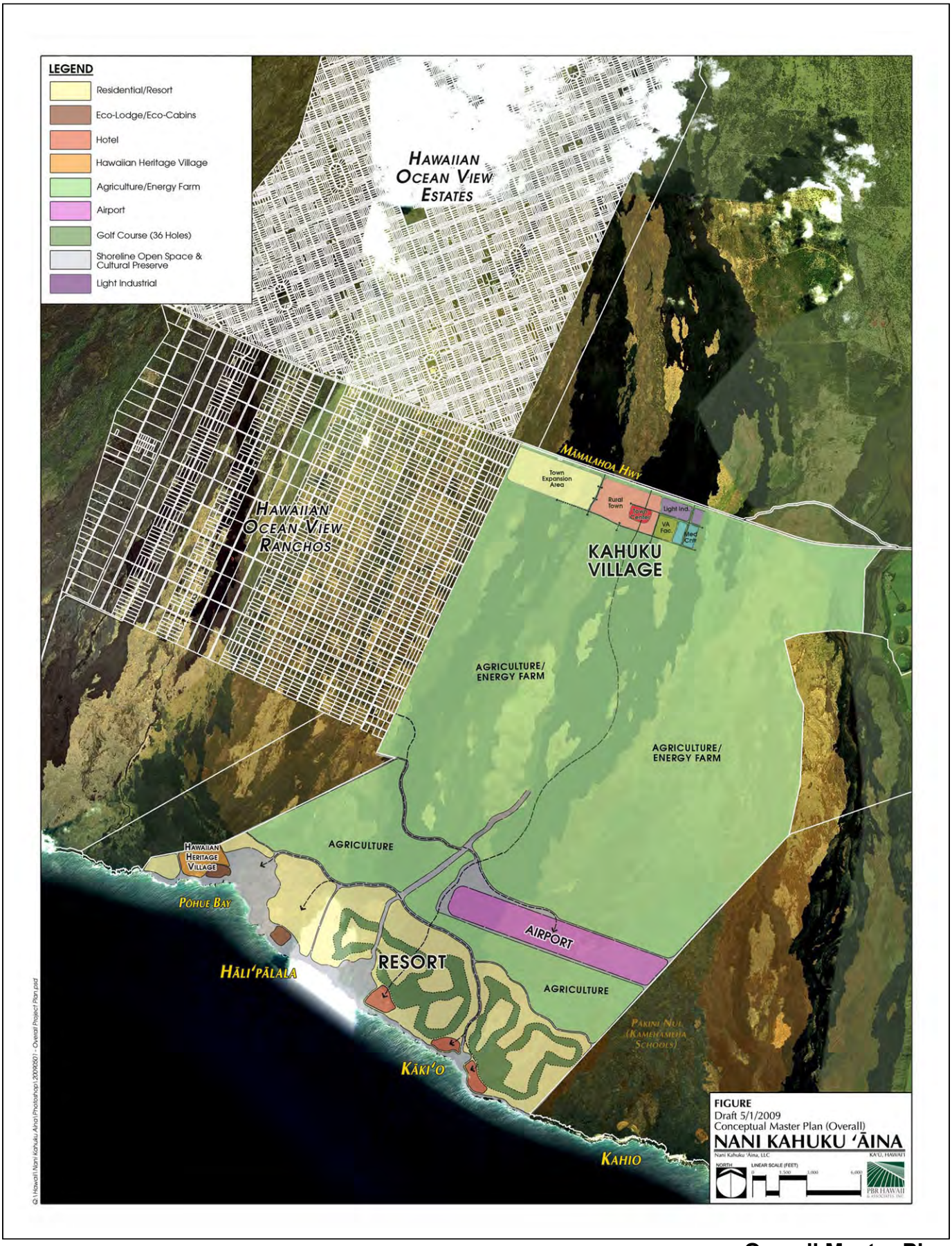


FIGURE 5. Overall Master Plan

Mauka Mixed-Use Village

The mauka mixed-use village along Māmalahoa Highway is envisioned to be a walkable, pedestrian-friendly village organized around a village green (see Figure 6, Mauka Village Master Plan). The village core area would consist of multi-family homes, "live-work" units, and affordable homes located over or adjoining retail or office spaces. There will be a full-range of community support services, including medical center, schools, VA facilities, fire, police, post office, bank, restaurants to serve residents and businesses. Light industrial areas will also be developed outside the village core to serve the residents and the communities immediately surrounding the Site. The mauka mixed-use village will also include single-family lots, ranging from 3,500 square feet to more than 10,000 square feet. A connector road between the village and the Ranchos subdivision will be discussed with the Ranchos subdivision; such a road should enable traffic to flow without entering Māmalahoa Highway.

Makai Village

The makai village area would consist of three hotel sites, an eco-lodge, a commercial area, and residential lots fronting one or two golf courses (see Figure 7, Makai Village Master Plan). The resort would be low-rise, designed to blend as much as possible into the landscape, and designed to meet sustainable building standards such as LEED. The golf course would be designed and operated to meet strict environmental standards to ensure minimal impact on the nearshore waters, such as the Audobon certification which require courses to comply with standards for operations including environmental planning, wildlife and habitat management, outreach and education, chemical use reduction and safety, water conservation, and water quality management.

Heritage Center and Research/Education

A proposed heritage center would formalize, perpetuate, and expand the current scientific and cultural activities onsite. The concept is to learn and apply the pre-contact Hawaiian principles of ahupuaʻa management by fostering an integration of cultural practiioners' knowledge with scientific knowledge. Kahuku ahupuaʻa is an area with a rich cultural history, and significant natural resources. The lands at Kahuku represent a unique opportunity to study, learn, and re-create pre-contact Hawaiʻi.

Foremost is protecting the integrity of the resource and the opportunity for research, but to the extent compatible, the economic motivation for this heritage center include: to train a knowledgeable and sensitive workforce to be stewards of the developed and natural landscape; to serve as an attraction for edu-tourism by attracting conference groups or adventurous independent travelers; to partner with academia and/or government to monitor the impacts of the Project; and to mitigate the impacts of suddenly opening this remote area to the public by experimenting with a konohiki-inspired management system to be evolved through the center's research. A possible marine laboratory would also function as a type of aquarium for visitors to observe various marine organisms from land. The residents of Kaʻū would also benefit from the educational opportunities.

Hawaiian Heritage Center

- **Ma Ka Hana ʻike** (hands on learning of traditional practices)
  - Weaving
  - Music
  - Building/repair of traditional sailing and fishing canoes
  - Fishing
  - Agriculture activities (ahupuaʻa demonstration site)

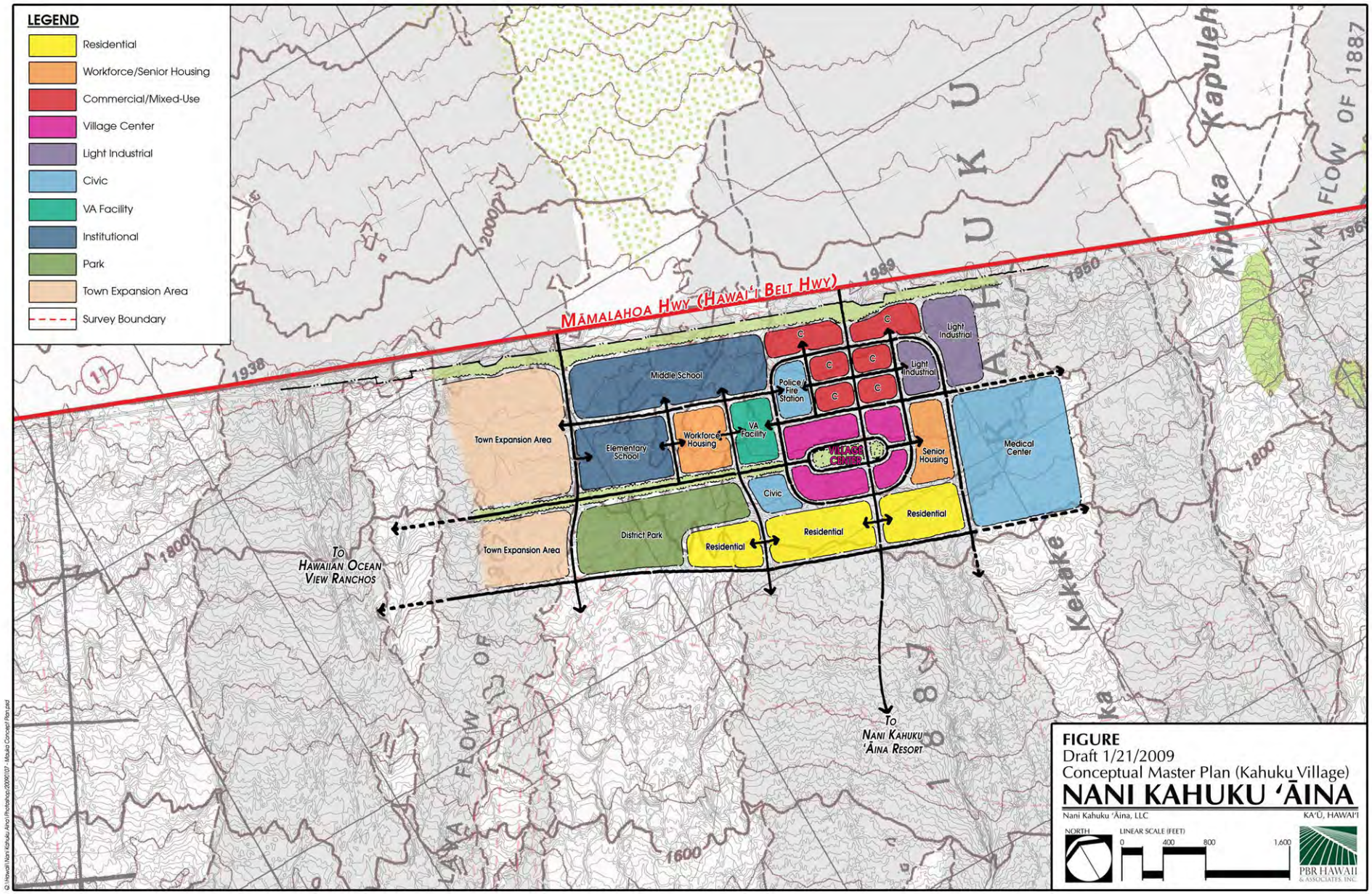


FIGURE 6. Mauka Village Master Plan

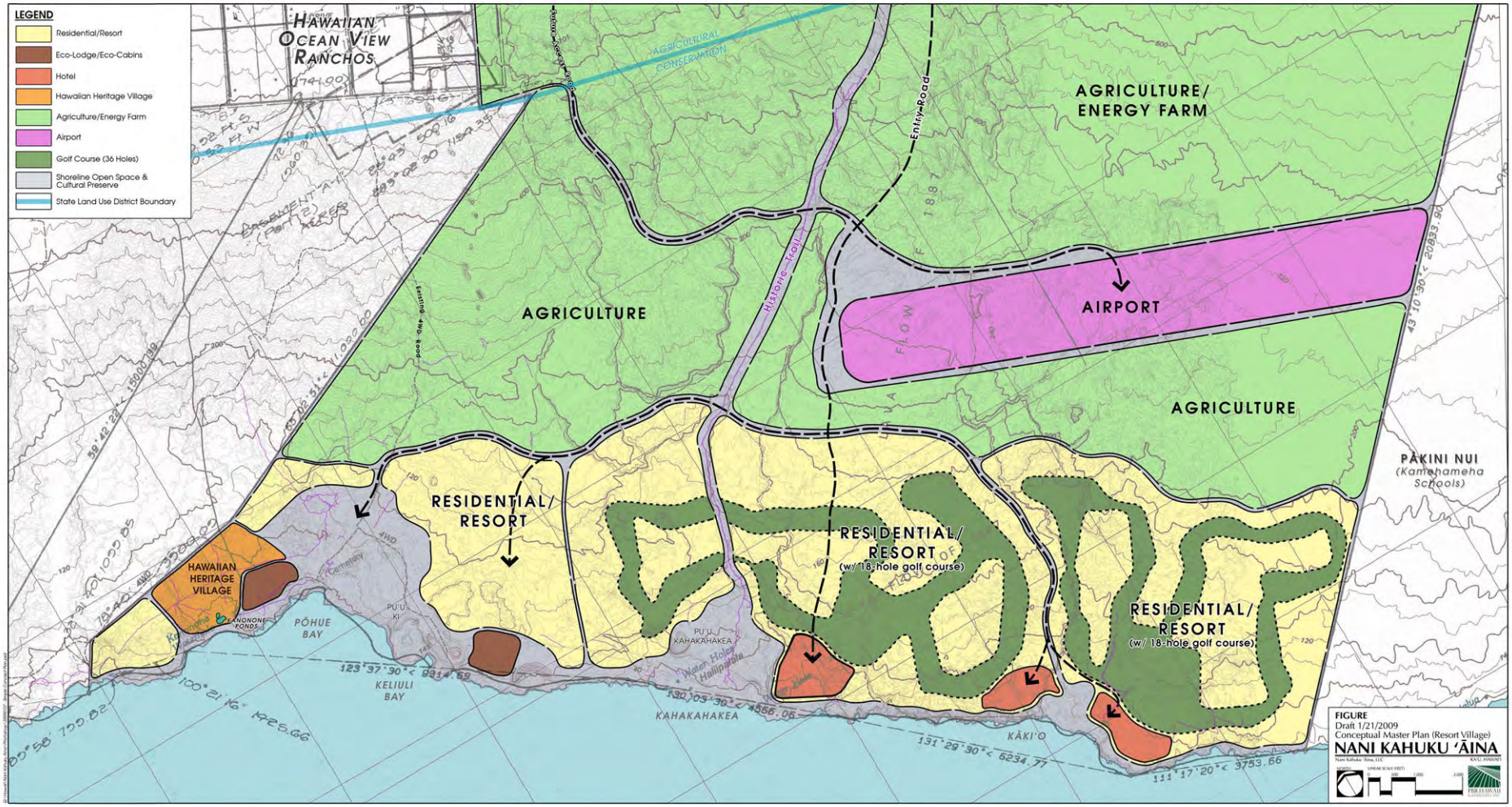


FIGURE 7. Makai Village Master Plan

- **Hale Papa‘a**
  - Museum/Cultural Repository
  - Interpretive Center
- **Hale Noi‘i** (Research Facilities)
  - Marine Science Lab
  - Cultural Practitioner Research
- **Hale Noho** (Eco-Cabins)

Trails, Parks, Preserves, and Open Space

An extensive network of trails and open space will connect the mauka and makai areas, as well as provide lateral shoreline access through the Site. The lateral shoreline access, which will be part of the Ala Kahakai National Historic trail, will traverse through the shoreline setback area that will range from a minimum of 100 feet to 3,000 feet preserving approximately 600 acres of coastal area. This conservation area encompasses significant geologic, cultural, and archaeological resources. The shoreline trail will connect with historic mauka-makai trails.

Agricultural Lots

Agricultural and renewable energy production lots consisting of large 20+-acre lots restricted in use to agricultural or renewable energy production would be located between the coastal makai village and Kahuku Village. The layout of the lots will minimize intrusion onto the 1907 and 1887 lava flows.

Airport and/or Helipad

An airport and/or helipad would provide an alternative mode of access to this remote location. Visitors could fly directly to the Site or into the Hilo or Kona airport, then transfer to a helicopter for a 20-minute flight to the Site compared with a drive of 1.5 to 2 hours. The helicopter(s) would be on-call for emergency response to supplement the County’s emergency response system to transport accident victims to the Ka‘ū, Kona, Hilo, or even Oahu hospitals. The facility would provide an alternate launching point closer to Volcano National park for sky tour operations.

Infrastructure Improvements

Infrastructure to support the proposed development include: intersection improvements along Māmalahoa to access the mauka mixed-use village, internal roadways, water system, drainage system, wastewater system with effluent reuse, and trails/pathways. A private energy utility system using altnerative energy sources will be considered that could deliver power to the mauka and makai villages at a cheaper cost, and tie into HELCO’s grid system to get credit for the excess production as well as to have the grid system serve as a backup.

Sustainable Building and Site Design[1]

To the extent feasible, sustainable site design standards such as Leadership in Energy and Environmental Design (LEED) Neighborhood principles will be applied to the village design. Site drainage

1. The Office of Environmental Quality Control (OEQC) issued “Guidelines for Sustainable Building Design in Hawai‘i: A Planner’s Checklist” (OEQC May 1999) and has requested that consideration be made in applying sustainable building techniques to projects. The OEQC Guidelines state, “[a] sustainable building is built to minimize energy use, expense, waste and impact on the environment. It seeks to improve the region’s sustainability by meeting the needs of Hawai‘i’s residents and visitors today without compromising the needs of future generations.”

systems and street design will employ green drainage principles. Building designs will employ sustainable building standards such as the LEED building principles. The golf course design and maintenance will strive to comply with environmental standards such as the Audobon certification standards.

Land Use Summary

Although the land use plan is still conceptual, an estimated breakdown of uses and an estimated range of homes are provided in the following table:

Table 2-1. Master Plan Land Use Summary

Master Plan	Potential Uses	Acreage (approx.)	Units
Mauka Village			
Village Core	Mixed residential, plaza, civic, police/fire, school, medical center, commercial	280	300-450 (residential)
Mixed Use Expansion Area	Single-family residential, district park, light industrial	810	350-600 (residential)
Makai Village			
Low-scale resort	Hotel(s), condominiums, eco-lodge, eco-cabins, oceanfront lots	600	400-650 (hotel, condo), 200-300 (eco-lodge, eco-cabins)
Golf course	36-hole	610	
Large lot residential	Golf estates and villas	1,820	850 lots
Hawaiian Heritage Center & other Open Space	Heritage Center, shoreline open space and trails	720	
Airport/Helipad			
Airport	Airport or helipad facilities	500	
Ancilliary lots	Residential or industrial lots	140	70 lots
Agricultural/Energy Lots	>5-acre lots limited to agricultural or energy production uses	1,820	170 lotss
Unplanned open area		9,150	
	TOTAL	16,450	

2.4 Development Timetable and Preliminary Costs

Proposed Phasing Plan

Development of the master-planned community will generally occur within three phases and is anticipated to begin as soon as all entitlement and permitting approvals have been received. Applicant is hoping to begin construction as early as 2012, with substantial completion anticipated within 10 years of the final discretionary land use or zoning approval. Phasing details will be discussed in the Draft EIS.

Cost Estimates

The estimated cost of subdivision and related improvements will be discussed in the Draft EIS.

CHAPTER

3

ENVIRONMENTAL SETTING AND IMPACT ASSESSMENT OF THE PHYSICAL ENVIRONMENT

This section describes the existing conditions of the physical or natural environment, potential impacts of the proposed Project on the environment, and mitigation measures to minimize any impacts.

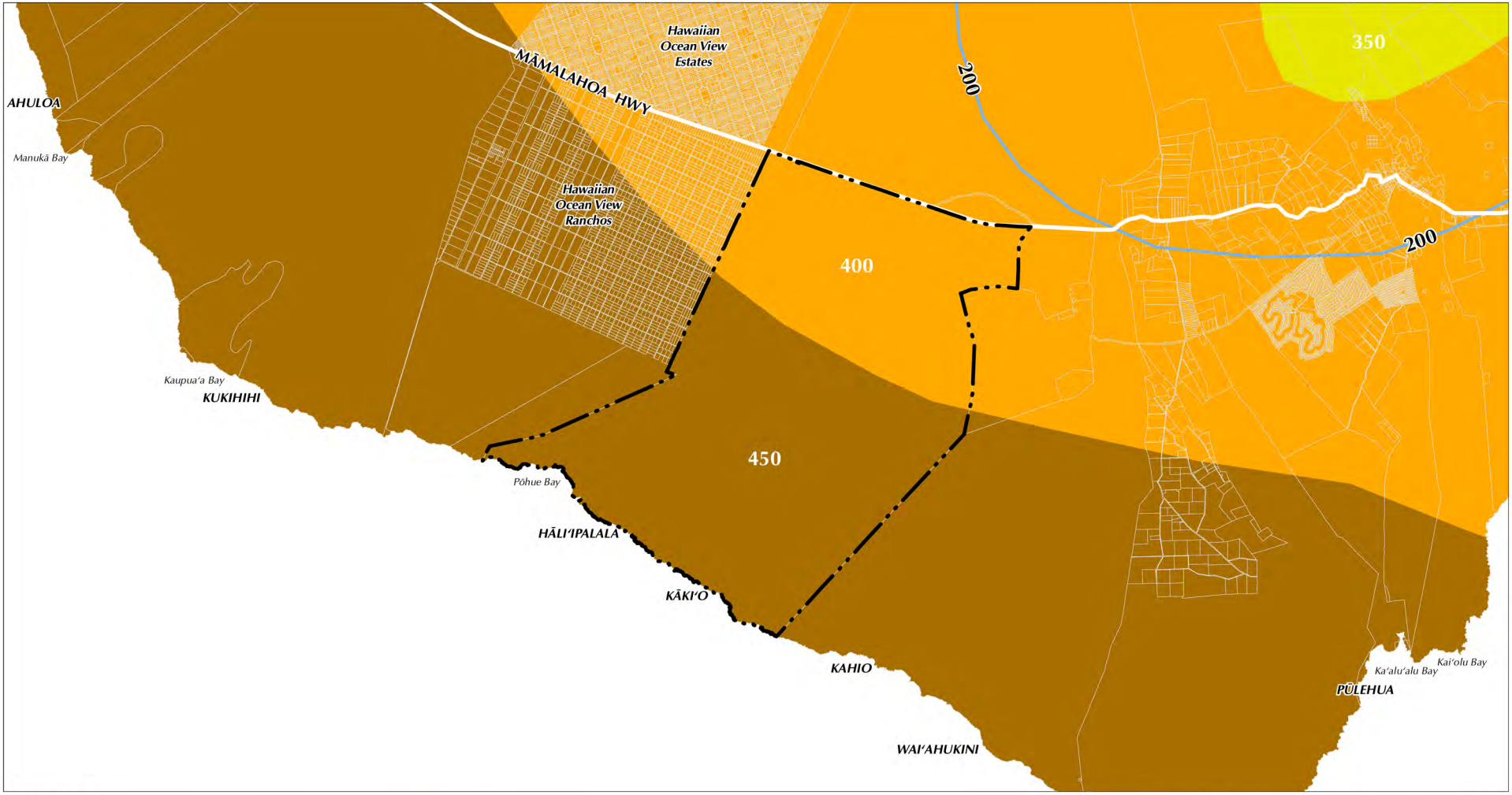
3.1 CLIMATE

Existing Conditions

The climate of Hawai'i Island is influenced by its geologic features. The towering Mauna Loa (13,653 foot summit elevation) and Mauna Kea (13,796 foot summit elevation) extend above the inversion layer and affect the tradewind flow. Tradewinds are typical of the Hawaiian Islands, blowing predominantly in a northeast direction.

The Site's location in the southern portion of the island on the leeward side of Mauna Loa makes its rainfall pattern relatively dry with slightly higher rainfall in winter, a pattern typical of other leeward areas and unlike Kona which has a unique pattern of higher rainfall in the summer. The relatively drier climate indicates relatively less cloudiness and higher insolation potential (see Figure 8, Solar Radiation Intensity).

Rainfall and temperature vary with elevation. The Site's elevation ranges from sea level to 2000'. The mean annual rainfall ranges from 30" in the makai area to 40" in the mauka area (Figure 9). The mean temperature decreases at an approximate rate of 1 degree F for each 300' increase in elevation. Regional temperatures range from a record low 50° Fahrenheit (F) to a high of 93° F, but average from 66° F to 84° F. Humidity ranges throughout the year between 68 percent in the morning to 80 percent in the afternoon (DLNR 1970).



LEGEND

Project Boundary

Watts/sq meter	Solar Calories		
150	0	350	550
200	250	400	600
250	300	450	
300		500	

Source: State Department of Planning and Economic Development, Energy Division
Disclaimer: This graphic has been prepared for general planning purposes only.

FIGURE
Solar Radiation Intensity
NANI KAHUKU 'ĀINA
Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 3,500 7,000 14,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 8. Solar Radiation Intensity

LEGEND

- Project Boundary
- Major Roads
- Streams
- Rain Gauge

Rainfall

- Up to 10" (approx.)
- 10" to 20" (approx.)
- Up to 20" (approx.)
- 20" to 30" (approx.)
- Up to 30" (approx.)
- 30" to 40" (approx.)
- 40" to 60" (approx.)
- Up to 60" (approx.)
- 60" to 80" (approx.)
- 80" + (approx.)
- 80" to 120" (approx.)
- 120" + (approx.)
- 120" to 160" (approx.)
- 160"+ (approx.)
- 160" to 200" (approx.)
- 200" to 240" (approx.)
- 240" + (approx.)

Source: County of Hawaii (GIS)
Disclaimer: This graphic has been prepared for general planning purposes only.

FIGURE
Mean Annual Rainfall
NANI KAHUKU 'ĀINA

Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

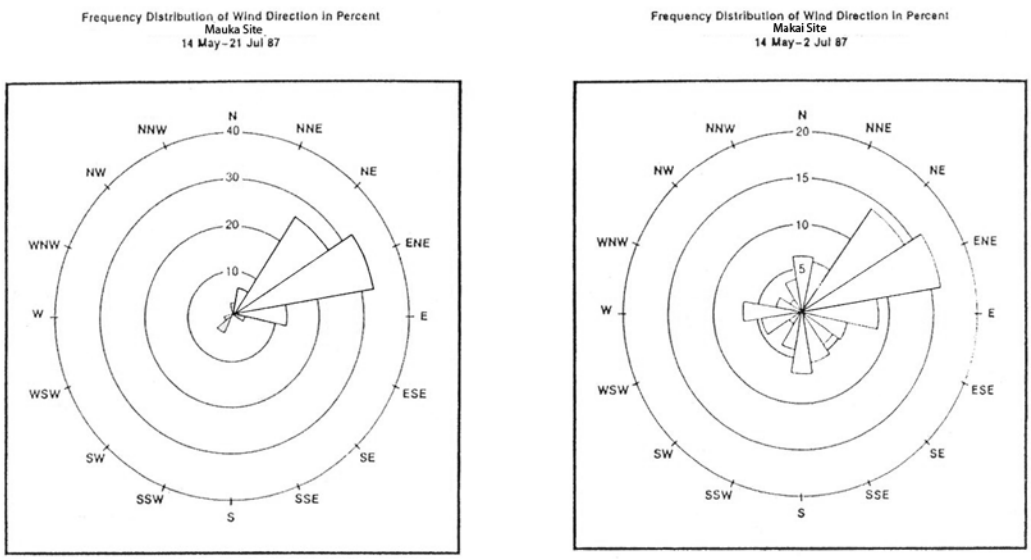
NORTH

LINEAR SCALE (FEET)
0 3,500 7,000 14,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 9. Mean Annual Rainfall

Onsite meterological data collected from May to July 1987 indicate the mauka area of the Site clearly dominated by east to northeast winds (greater than 71% of the time) while the coastal area showed much greater variability (see Figure 10, Wind Characteristics). General wind speeds at the Site were lower than those recorded at National Weather Service's (NWS) permanent South Point Wind Station during the sampling period. While the NWS station averaged 17.8 mph, the Site's coastal station averaged 11 mph. Meterological data collection at also included solar radiation. The results indicate the characteristic midday buildup of a cloud band along the southwest shores of the island, screening out about half of the solar radiation at midday (Morrow 1987)



Source: J.W. Morrow, Environmental Management Consultants (1987): Air Quality Impact Analysis
Disclaimer: This graphic has been prepared for general planning purposes only.

FIGURE
Predominant Wind Patterns, 1987
NANI KAHUKU 'ĀINA
Nani Kahuku 'Āina, LLC
KA'Ū, HAWAI'I
PBR HAWAII & ASSOCIATES, INC.

FIGURE 10. Wind Characteristics

Potential Impacts and Mitigation Issues

Climate affects suitability of proposed uses. Landscaping and agricultural endeavors need to consider the lower rainfall, implying the need for xeriscape type of plants or the need for irrigation. With the average rainfall less than 60", rainfall catchment systems are not suitable, implying the need for a water system. The favorable insolation implies a potential for solar photovoltaics. With additional studies being conducted, the Draft EIS will address landscaping water demand requirements, water system plans (drinking water and irrigation), and energy plans.

3.2 GEOLOGY AND TOPOGRAPHY

Existing Conditions

Of the five volcanoes that formed the Big Island—Kohala, Hualālai, Mauna Kea, Mauna Loa, and Kīlauea—only Mauna Loa and Kīlauea are presently considered active; the other three are considered dormant. The Site is located on the southwest flank of Mauna Loa below the Southwest Rift Zone. The shield of Mauna Loa has been built by eruptions along this Southwest Rift Zone and a Northeast Rift Zone that radiate out from a summit caldera. The summit is located approximately 30 miles north of the Site (see Figure 11, Regional Geologic Features).

Typically, shield volcanoes in Hawai‘i have a ground slope of approximately 10 percent. The Site slopes in an east to west (mauka to makai) direction, and is flatter than the average for both the geologic region and the typical ground slope. The makai portion of the Site has an approximate ground slope of 3 percent. The mauka portion of the Site has a relatively constant slope of 7.5 percent. The average slope across the Site is approximately 6 percent. The mauka extent of the Site is located at an elevation of approximately 2,000 feet above mean sea level (msl). The elevation of the makai extent of the Site is variable based on the shoreline sea cliff topography.

The Site is nearly entirely covered by ‘a‘ā and pahoehoe lava flows with pockets of developed topsoil. Most of the flows are prehistoric (pre-1789), with estimated ages ranging from 750 to 1,500 years old. There have been seven historic flows recorded along the Southwest Rift Zone, comprising about 20% of the 39 recorded flows from Mauna Loa (the other 80% flowed from the summit or Northeast Rift Zone). Three of these Southwest Rift Zone flows traverse the Site: 1868, 1887, and 1907. The scaly pāhoehoe lava flow of 1868 cuts across a small mauka section on the eastern perimeter of the Site. This eruption, however, caused the largest earthquake in Hawai‘i, registering as a magnitude 8 by modern methods. The 1887 eruption lasted 10 days and produced an ‘a‘ā flow that reached the sea within one day. The 1887 flow cuts through the center of the Site. The 1907 eruption lasted for 15 days and covered 8.1 square miles. This ‘a‘ā flow split into two lobes but did not reach the sea. The 1907 flow is located along the western edge of the property. It extends from the mauka Site boundary towards the coast and terminates approximately one mile from the shoreline (Lipman 1980a). Historic trends indicate that eruptive vent locations are moving upslope, and therefore further away from the Site (Lipman 1980b).

The Site is in the geologic region bounded by the Kealakekua and Kahuku faults. Inflation and deflation of the magma chamber within the rift zone causes the area between the faults to break into large regional slump blocks. However, the fact that the slump blocks between these two faults have been covered by lava flows suggests that regional block faulting has not been active for decades or centuries (Dames & Moore, 1987). The Site is in subsidence zone 4, the lowest risk zone on the island (Mullineax et al 1987).

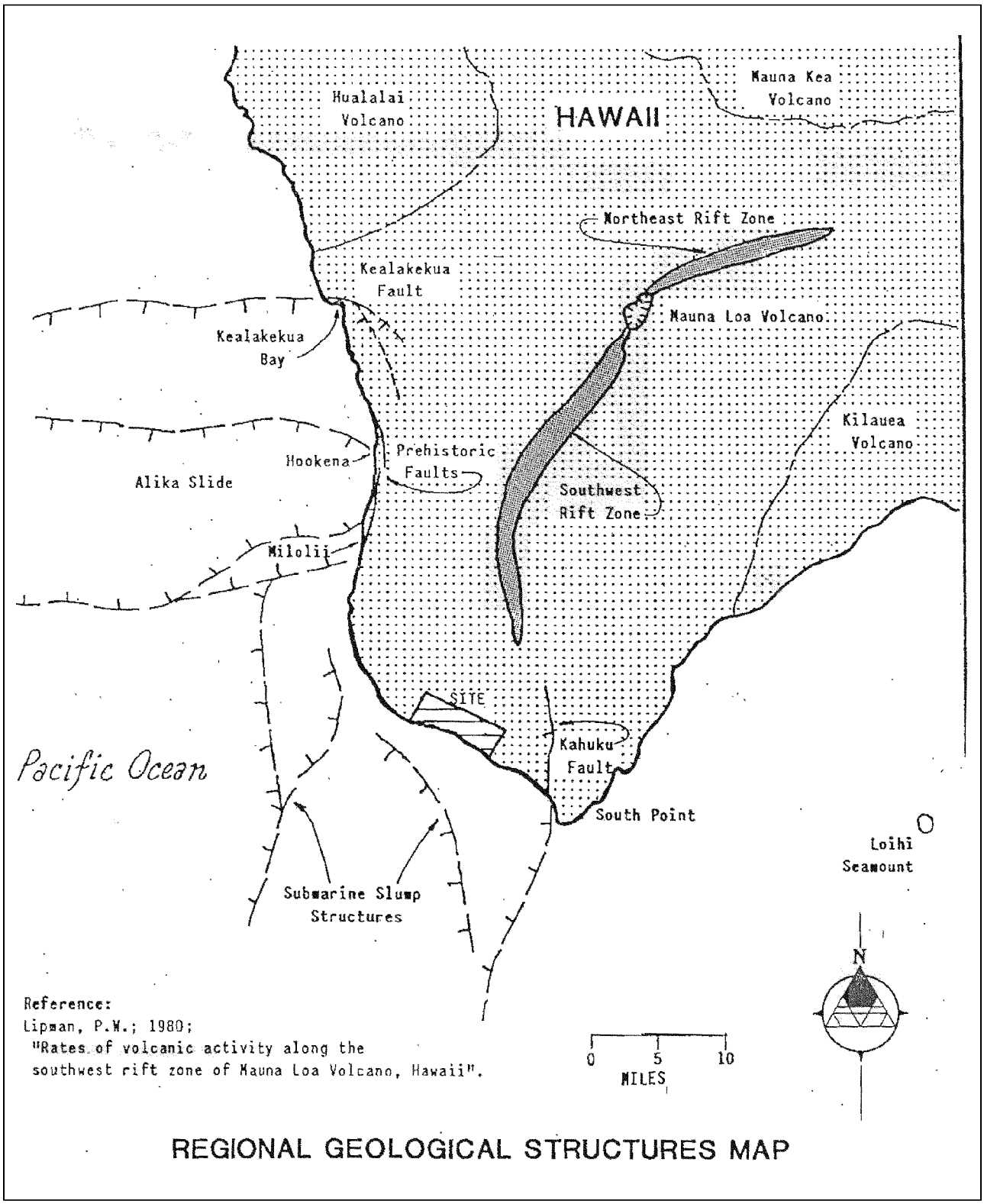


FIGURE 11. Regional Geologic Features

Besides the historic lava flows, other geological features within the Site include pu‘u, beaches, ground cracks, and brackish water ponds (see Figure 12, Site Geological Features). A characteristic feature of this barren coastline from South Point to Kauna Point is a series of littoral cones (pu‘u) formed by the debris thrown up in the air as lava from the southwest rift of Mauna Loa flowed into the ocean. These pu‘u are in two distinct rows along the coast, the ones closer inland being geologically older marking the location of a former shoreline. The most prominent cone within the Site is Pu‘u Kī. Black volcanic cinder sand beaches are located at the base of these littoral cones, a product of wave erosion of the cones. Pōhue Bay is a white coralline sand beach. Some of the shoreline areas have coarse to cobble-sized basaltic and coralline materials strewn up to 200’ inland likely the result of storm waves (Dames & Moore 1987).

Littoral cones south of Pōhue Bay.

Pōhue Bay.

There are several large cracks in the ground surface along the coast. These cracks, averaging 1.5 feet wide and up to 4.5 feet wide, are between 30 and 1,800 feet long. The cracks generally orient parallel with the shoreline. Most of the cracks appear to have a slight vertical offset, although there are some where one side of the crack is up to 2 feet lower than the other side. The ground cracks extend through both the pahoehoe and the ‘a‘ā flows. The cracks are believed to have formed several hundred to 500 years ago from seismic activity of high magnitude resulting from the movement of underlying lava. Future movements are likely to occur along the same ground crack systems that now exist. Although structural loading by buildings is not considered to be a cause of significant additional movement, mitigation measures would include not straddling the cracks, mat foundations for buildings near any cracks, and best of all to setback away and not in line with the cracks (Dames & Moore 1988).

Anchialine ponds are shoreline pools with subsurface connection to the ocean. There are six known ponds along the coast within the Site; an additional eleven ponds are located to the northwest adjacent to the Site (Marine Research Consultants 1987). Just northwest of Pōhue Bay is the most prominent of the ponds encircled by coconut and hala trees called Kanonone. Anchialine ponds may be classified according to the stage of their successional process. The youngest ponds have no bottom sediment and no plant life. Gradually sediment accumulates on the bottom from decayed aquatic and riparian plants nurtured by the dissolved nutrients in the groundwater that flows to the ponds, as well as deposits of wind-transported materials. Algae also forms distinctive crusts that line the ponds. As the sediment layer deepens, emergent plants such as sedges, rushes, and grasses take root and succulents and vines encroach from the edges. In the final stages of senescence, the deposited organic material completely fills the basin and forms a marshy region of vegetation. The marine study being conducted for the Draft EIS will classify the successional phase of the ponds on the Site.

LEGEND

- A'a Lava
- Pahoehoe Lava
- Scaly Pahoehoe Lava
- Littoral Cone
- Beach Sand & Gravel
- Tumuli Area
- Anchialine Pond
- Ground Crack
- Ground Crack Containing Brackish Water
- Depression
- Jeep Trail
- Approximate boundary of this geologic study
- Property Line

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

FIGURE
Geologic Map
NANI KAHUKU 'ĀINA

Nani Kahuku 'Aina, LLC — KA'U, HAWAII

NORTH

LINEAR SCALE (FEET) 0 2,000 4,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 12. Site Geological Features

Potential Impacts and Mitigation Issues

The development of Kahuku Village, the primary entry road as well as two resort centers have been proposed to be situated on portions of the 1887 lava flow. The coastal pu'us and anchialine ponds are significant landforms, and will remain within the State Conservation District. The Draft EIS will describe the nature and adequacy of protection given to these features. The Site is located in a high-risk lava hazard zone (see section 3.4 "Natural Hazards" on page 30). The Draft EIS will provide the best available knowledge estimating the probable lava flow speed and provide corresponding evacuation mitigation measures. Grading will be necessary to accommodate the proposed Project. The Draft EIS will identify appropriate engineering, design, and construction mitigation measures to minimize land alteration. Buildings and infrastructure will be sited away from the ground cracks. The Draft EIS will specify setback requirements perpendicular to the axis of the cracks, as well as setback distances in the longitudinal direction of the cracks.

3.3 SOILS

There are three soil suitability studies prepared for lands in Hawai'i whose principal focus has been to describe the physical attributes of land and the relative productivity of different land types for agricultural production: 1) the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Soil Survey; 2) the University of Hawai'i Land Study Bureau (LSB) Detailed Land Classification; and 3) the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH).

Existing Conditions

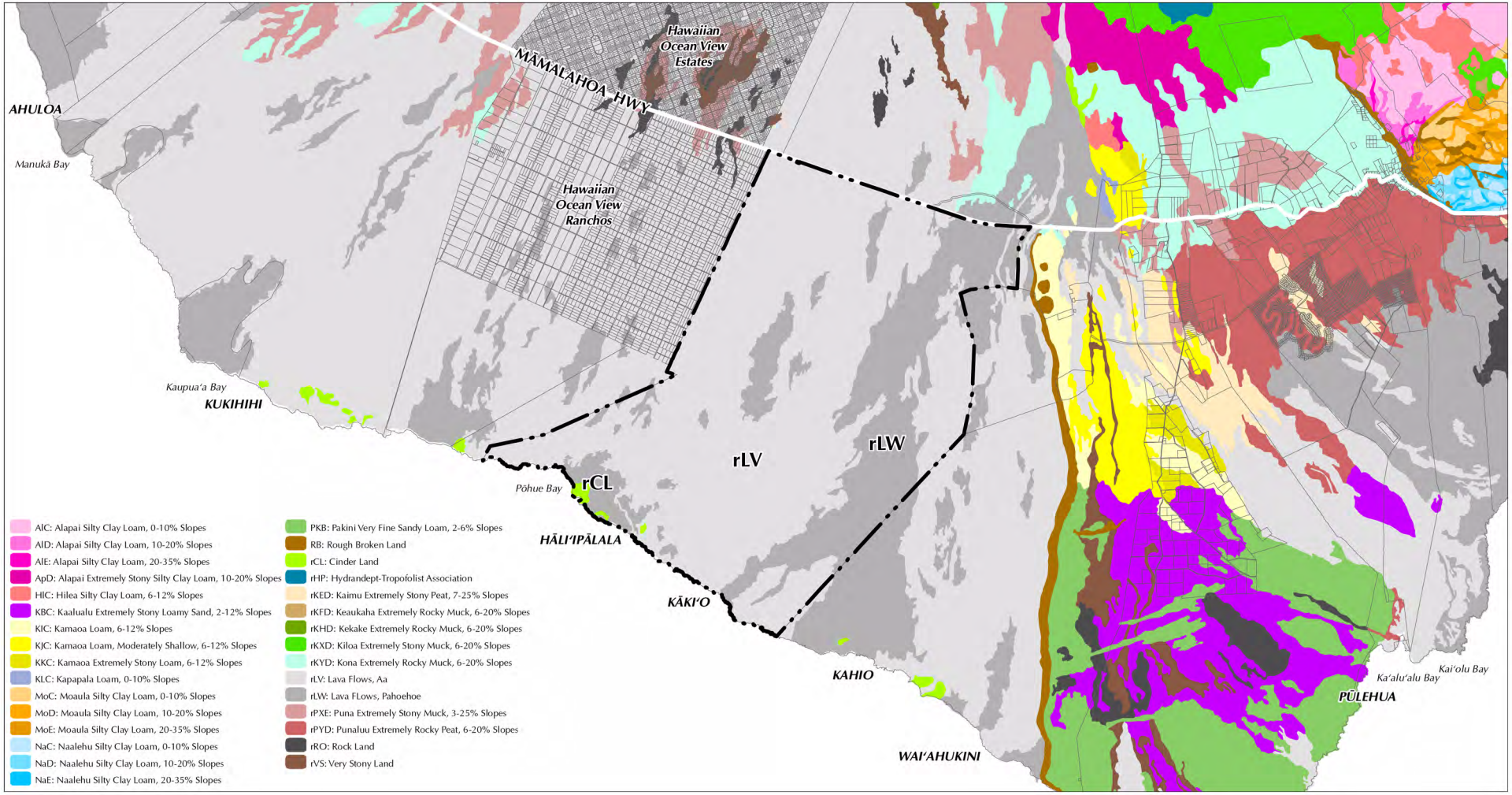
NRCS Soil Survey

The NRCS Soil Survey shows that the Site contains soil from the lava flows association, which is characterized as gently sloping to excessively drained soils that are coarse-textured and medium-textured formed in volcanic ash, pumice and cinders (see Figure 13, Soils Map). The soil is found on nearly barren lava flows and upland areas at elevations ranging from near sea level to approximately 2,000 feet. A majority of the Site consists of 'a'ā lava flows (rLV). From mauka to makai along the southeast boundary, pāhoehoe flows (rLW) dominate the landscape. The land along the coast, specifically near Pōhue Bay and Hāli'ipalala, consists of cinder land (rCL) surrounded by pāhoehoe lava. A few small beaches (BH) are located at Pōhue and Kāki'o. Descriptions of the soil classifications are as follows:

Lava Flows, pāhoehoe (rLW) - This soil has a billowy, glassy surface that is relatively smooth. In some areas, the surface is rough and broken and there are hummocks and pressure domes. The soil has no cover and is typically bare of vegetation, except for mosses and lichens. In the areas of higher rainfall, however, scattered 'ōhi'a trees, ohelo berry, and a'ali'i have gained a foothold in cracks and crevices. Some flat slabs are used as facings on buildings and fireplaces.

The NRCS Land Capability Grouping, rates soil types according to eight levels, ranging from the highest classification level, I, to the lowest level, VIII. The capability classification, an indicator of suitability of soil for field crop cultivation, for this soil is VIIIs, non-irrigated, meaning the soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife or water supply or aesthetic purposes. The subclass is "s," meaning the soil is limited because it is shallow, droughty, or stony.

Lava Flows, 'a'ā (rLV) – This soil is rough and broken, consisting of a mass of clinkery, hard, glassy, sharp pieces piled in tumbled heaps. There is practically no soil covering and it is typically bare of vegetation, except for mosses, lichens, ferns and a few small 'ōhi'a trees. In areas of high rainfall, it contributes substantially to the underground water supply and is used for watershed. The capability classification is VIIIs, non-irrigated. Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife or water supply or aesthetic purposes. The subclass is "s," meaning the soil is limited because it is shallow, droughty or stony.



LEGEND

Project Boundary

Source: Natural Resource Conservation Service (GIS)
Disclaimer: This graphic has been prepared for general planning purposes only.

FIGURE
NRCS Soil Survey
NANI KAHUKU 'ĀINA

Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 3,500 7,000 14,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 13. Soils Map

Cinder Land, (rCL) - Cinder land (rCL) consists of areas of bedded magmatic ejecta associated with cinder cones. It is a mixture of cinders, pumice, and ash. These materials are black, red, yellow, brown, or variegated in color. They have jagged edges and a glassy appearance and show little or no evidence of soil development.

Although Cinder land commonly supports some vegetation, it has no value for grazing, because of its loose nature and poor trafficability. It is used for wildlife habitat and recreational areas. The capability classification is VIIIs, non-irrigated. Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife or water supply or aesthetic purposes. The subclass is "s," meaning the soil is limited because it is shallow, droughty, or stony.

Beaches (BH) – These are long, narrow, sloping areas of sand and gravel along the coastline, typically used for recreation and are sometimes covered by waves during storms or high tide. The sand and gravel vary in color, ranging from yellowish or white sand, formed in coral and sea shells, black sand, formed in lava rocks and green sand formed in olivine. The capability classification is VIIIw, non-irrigated. Class VIII soils and landforms have limitations that preclude its use for commercial plants and restrict their use to recreation, wildlife or water supply or aesthetic purposes. The subclass is "w," meaning that water in or on the soil interferes with plant growth or cultivation and in some instances the wetness can be corrected by artificial drainage.

Land Study Bureau Detailed Land Classification

The University of Hawai'i Land Study Bureau (LSB) document titled *Detailed Land Classification, Island of Hawai'i* classifies non-urban land by a five-class productivity rating system, using the letters A, B, C, D and E, where "A" represents the highest class of productivity and "E" the lowest. The productivity rating system was based on soil texture, structure, depth, drainage, parent material, stoniness, topography, climate, and rainfall in a given area. The LSB classified the entire Sites productivity as very poor, "E".

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH) system rates agricultural land as "Prime," "Unique" or "Other" lands. The remaining land is not classified.

"Prime" agricultural land is best suited for production of food, feed, forage and fiber crops. The land has the soil quality, growing season and moisture supply necessary economically to sustain high yields of crops when treated and managed including water management, according to modern farming methods.

"Unique" agricultural land can be used for specific high-value food crops. The land has a special combination of soil quality, growing season, temperature, humidity, sunlight, air drainage, elevations, aspect, moisture supply, or other conditions that favor the production of a specific crop of high quality and/or high yield when the land is treated and managed according to modern farm methods.

"Other" agricultural land is vital to production of food, feed, fiber and forage crops, yet they exhibit properties, such as seasonal wetness, erosion, and limited rooting zone, slope, flooding, or drought. The land can be farmed satisfactorily through greater fertilization and other soil amendment, drainage improvement, erosion control practices, flood protection and produce fair to good crop yields when properly managed.

According to the ALISH system, the land on Site are not classified and are therefore, not considered important agricultural land.

Potential Impacts and Mitigation Issues

As noted in the NRCS Soil Survey, the Site is predominantly lava rock with little soil. The predominance of rock has two implications for site development impacts: blasting may be necessary; and importation of soil is likely especially for the proposed golf course. The Draft EIS will assess the likelihood of blasting and necessary mitigation measures and/or alternatives to blasting. The Draft EIS will also identify mitigation measures for soil importation to ensure best practices that would prevent runoff and sedimentation into the nearshore coastal waters caused by storm events during construction. The Draft EIS will also assess to what extent balanced excavation and fill is possible to minimize construction traffic, and the extent of resulting land alteration to achieve that balance. The Draft EIS will also discuss potential means to implement necessary construction mitigation measures through grading permit, NPDES permit, and/or construction contract conditions.

Although the soils at the Site are not well suited for agricultural cultivation, the master plan proposes some agricultural lots. The Draft EIS will assess the feasibility of alternative agricultural endeavors that could thrive in the rocky substrate (e.g., papaya), bench agriculture, or even aquaculture or hydroponics if sufficient water is available.

3.4 NATURAL HAZARDS

The Hawaiian Islands are susceptible to potential natural hazards, such as flooding, tsunami inundation, hurricanes, volcanic eruptions, wild fires, landslide/sea cliff erosion, and earthquakes. In 2005, the County of Hawai‘i assessed these hazards, and developed a *Multi-Hazard Mitigation Plan.* This section provides an analysis of site vulnerability to such hazards.

Existing Conditions

Flooding

The Federal Emergency Management Agency (FEMA) has not conducted a flood study for the area. Therefore, the Site is not included in any Flood Insurance Rate Map (FIRM).

Tsunami

Twenty-five of the tsunamis recorded since 1812 had an adverse impact on the island of Hawai‘i; seven caused major damage and three were generated locally. According to the *Hawai‘i County Multihazard Mitigation Plan,* locally generated tsunamis are most frequent along the south coast, and the probability of impacts to Ka‘ū-Puna districts are higher than in other areas. The 1946, 1960, and 1975 tsunamis generated waves that caused localized inundation and damage in the district of Ka‘ū, east of Ka Lae, South Point and also in Halapē (see see Figure 14, Volcanic Hazards and Tsunami Historical Runup). There are, however, no records of inundation in Kahuku ahupua‘a during any of the recorded tsunamis. The current tsunami evacuation zone, which is in the process of being updated by the Hawai‘i County Civil Defense Agency, does not show any evacuation zone for the Site because it is not a populated or frequently used recreational area. In the process of approving any development in the area, tsunami evacuation zones should be determined.

Hurricane

Since 1980, two hurricanes have had a devastating effect on Hawai‘i. They were Hurricane ‘Iwa in 1982 and Hurricane ‘Iniki in 1992. In 2007, Hurricane Flossie threatened to reach Hawai‘i, putting Hawai‘i on a hurricane watch. The hurricane, however, was downgraded from a hurricane to a tropical storm after passing Hawai‘i Island, 95 miles south of South Point. While the island of Hawai‘i has not been in the direct path of a hurricane since recordation began in 1950, hurricane probability models indicate that the island has a long-term hurricane hazard higher than any of the other islands.

Volcanic Hazards

The volcanic hazard zone map for Hawai‘i Island divides the island into zones ranked from one (1) through nine (9) (with one (1) being the area of greatest hazard and nine (9) being the area of least hazard) based on probability of coverage by lava flows. The Site is located in zone 2 (see Figure 14, Volcanic Hazards and Tsunami Historical Runup). Other direct volcanic hazards such as tephra fallout, ground cracking and settling were not specifically considered in the development of the volcanic hazard zone map. These hazards, however, tend to be greatest in the highest lava flow hazard areas.

Lava flows present potential threats to homes, infrastructure, natural and historic resources, and entire communities. The areas exposed to the highest risk from lava flows are those situated down slope and in close proximity to the active rift zones. Steep slopes may allow lava flows to move quickly from the summit to the ocean in a matter of hours. Besides the direct threat of inundation, lava flows may also cut across a community's single roadway escape route limiting the amount of time available for evacuation. Between 1868 and 1950, five eruptions from Mauna Loa’s southwest rift zone have reached the ocean. These flows traveled quickly and in at least one instance reached the ocean in three hours. Two of these flows entered the ocean in the Kahuku ahupua‘a in the district of Ka‘ū.

Earthquake

In Hawai‘i, most earthquakes are linked to volcanic activity, unlike other areas where a shift in tectonic plates is the cause of an earthquake. Earthquakes can also produce other ground failure hazards including liquefaction, landslide, subsidence and surface rupture. Earthquakes can also generate local tsunamis. Each year, thousands of earthquakes occur in Hawai‘i, the vast majority of which are so small they are detectable only with highly sensitive instruments. However, moderate and disastrous earthquakes have occurred in the islands. Since 1868, nine disastrous earthquakes have occurred in Hawai‘i County. While several earthquakes occurred in Ka‘ū, none were centered within Kahuku Ahupua‘a... The largest earthquake series occurred in March 27 and April 2, 1868 with an epicenter a few miles north of Pāhala in the district of Ka‘ū. It is estimated that the magnitude of these earthquakes were 7.1 and 7.9. These earthquakes resulted in 77 deaths (46 from tsunami and 31 from landslides triggered by the earthquake). In 1929, an earthquake with an epicenter in Hualālai and a magnitude of 6.5 resulted in extensive damage. Another earthquake in 1951, with its epicenter in Kona area and a magnitude of 6.9 also resulted in extensive damage. A recent series of earthquakes, with magnitudes of 6.7 and 6.0, occurred at Kīholo Bay on October 15, 2006. The earthquakes resulted in more than $100 million in damages to the northwest area of the island (USGS, 2006). Within the District of Ka‘ū, the last major earthquake occurred in 1975. While the earthquake resulted in minimal property damage, it was the second largest recorded earthquake in Hawai‘i (magnitude 7.2). Two deaths occurred at Halapē Beach from tsunami inundation, a result of the quake.

The Uniform Building Code (UBC) (Chapter 5 of the Hawai‘i County Code), designates Hawai‘i County into six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10 percent chance of severe shaking in a 50-year interval). The Site is located in Seismic Zone 4.

Wildland Fires and Drought

Approximately 70 to 80 wildfires occur annually island-wide. Droughts increase the vulnerability to wildfires. Due to the sparse vegetation on the Site, the potential fuel load to cause a wildfire is relatively low. Prevailing winds in the area, however, can exacerbate a wildfire should one start.

Sea Cliff Erosion

The Site’s five miles of coastline consists predominantly of low sea cliffs. Sea cliffs are vulnerable to erosion from wave action or earthquakes.

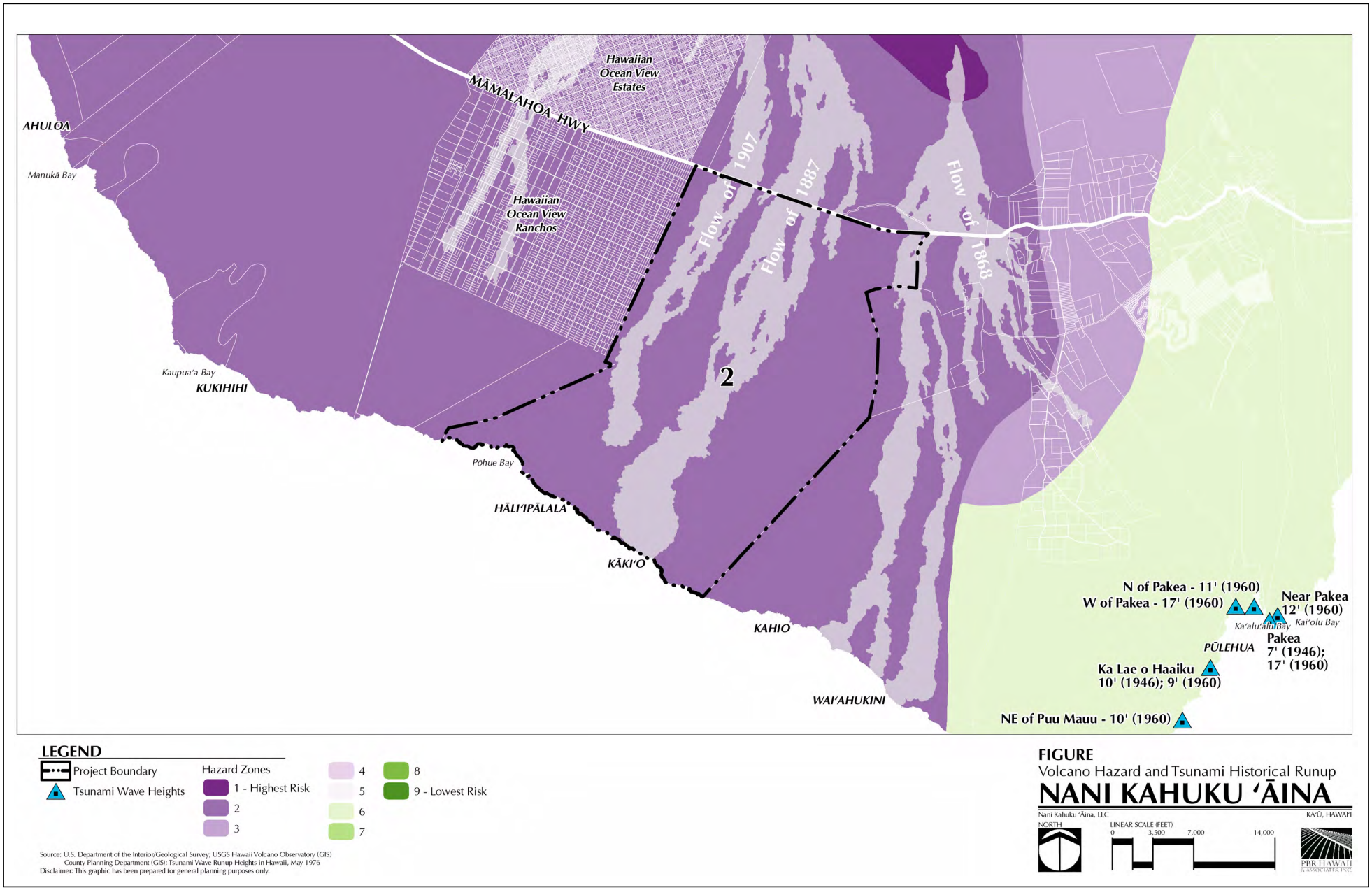


FIGURE 14. Volcanic Hazards and Tsunami Historical Runup

Warning Sirens and Shelters

The State of Hawai‘i‘i Department of Defense, Office of Civil Defense operates a system of civil defense sirens to alert the public of emergencies and natural hazards, particularly tsunamis and hurricanes. The County of Hawai‘i currently has 68 sirens and 12 simulators in operation. There are two sirens located in the vicinity of Māmalahoa Highway in Hawaiian Ocean View Estates. Due to the limited range of these sirens (approximately one half-mile), the audible alarms will not reach all portions of the Site, and specifically will not reach any development along the coast. Should evacuation of the Site be necessary due to natural hazard conditions, the nearest evacuation center is located at the Nā‘ālehu Community Center. Two additional emergency shelters located at the Ka‘ū High/Pahala Elementary Schools, and in Hawaiian Ocean View Estates are also available for non-hurricane disasters.

Potential Impacts and Mitigation Issues

The Draft EIS will address the following issues:

- **Flooding**. A drainage study will assess the potential for stormflow flooding;
- **Tsunami**. In consultation with the County Civil Defense, tsunami evacuation zone mapping requirements (if any) will be determined, and special warning or response measures as deemed necessary by the Civil Defense will be identified to mitigate local tsunami hazards;
- **Hurricane shelters**. In consultation with the County Civil Defense, the Project could provide opportunities to create additional hurricane-proof shelters to serve the region;
- **Lava flow**. In consultation with the County Civil Defense and the USGS Hawaiian Volcanoes Observatory, the latest information on predictive lavashed modeling for Mauna Loa will be incorporated to assess the probability and response time of a southwest rift eruption;
- **Earthquake**. Geotechnical studies will advise the need for special structural measures and areas to avoid placing a building;
- **Wildfire**. In consultation with the Fire Department, mitigation measures will be identified as needed to prevent or mitigate this risk;
- **Sea Cliff erosion**. Site planning will direct development away or setback from the sea cliffs;
- **Warning sirens**. In consultation with the State Civil Defense, the location and timing of sirens will be identified.
- **Emergency response.** Private helicopters and/or airplanes and the airport and/or helipad facilities would be available to supplement evacuation or emergency response capabilities as required by Civil Defense or the Fire Department.

3.5 Flora and Fauna

Existing Conditions

Based on botanical surveys conducted on or near the Site in the past, the Site has six known plant communities: flora found in and around the anchialine ponds, coastal plant communities, cinderland vegetation, lava field vegetation, ‘ōhi‘a communities (from pioneer to developed forests), and grassland-scrub communities (Char & Associates 1987). The Draft EIS will include a botanical survey for the Site to confirm the comprehensiveness of this classification and document any changes. The following is a description of the plant communities.

Pond Communities

Previously surveyed ponds are located primarily between Kanonone and Kāki‘o. The current condition of these ponds will be determined during an anchialine pond assessment that will be conducted as part

of the marine water quality assessment scheduled to be performed as part of the Draft EIS development. Vegetation in the vicinity of the pond areas are primarily native (indigenous but not endemic), including sedges such as uki (*Cladium leptostachyum),* makaloa (c*yperus laevigatus*) manu'u 'aki 'aki (*Fimbristylis pycnocephala*). Other common plants are Polynesian-introduced including *Pycreus polystachyos*; trees such as coconut (*Cocos nucifera*), kou (*Cordia subcordata*), false kamani (*Terminalia catappa*) milo (*Thespesia populnea*) and hala (*Pandanus odortissimus*). Aquatic plants that may be encountered in the ponds include orange mineralized algal crusts (*Schizothrix sp.*), widgeon grass (*Ruppia maritima var. pacifica*), and dense waterweed (*Egaria densa*). Based on a previous survey conducted on the Site (Marine Research Consultants 1987), the following types of pond fauna are expected to be encountered: shrimp species such as the 'ōpae'ula (*Halocaridina rubra*), *Metabetaeus lohena*, 'ōpae huna (*Paleaemon debilis*), and 'ōpae 'oeha'a (*Macrobrachium grandimanus*); snails such as the Assiminea *sp., Melania sp., Theodoxus cariosa*; and fish such as the predaceous goby *Eleotris sandwicensis* and 'ahole (*Kuhlia sandvicensis*). Due to the limited post-contact impact humans have had on these ponds, exotics such as topminnow, tilapia or guppies are not anticipated to be present. The ponds do not attract native waterbirds—there were no sightings, tracks, or droppings in a 1987 survey (Bruner 1987).

Coastal Plant Communities

Salt-tolerant coastal vegetation can be found along rocky outcrops, coastal cliffs and sandy beaches along the coast. This band of vegetation varies from just 50 feet to nearly 500 feet wide in some areas. In the rocky areas, native sedge *(Fimbristylis pycnocephala)* is likely the dominant species, but vegetative cover is sparse. The following species are also likely to be encountered in the rocky coastal areas hi'aloa (*Waltheria indica var. americana*), ironweed (*Vernonia cinerea*), lovegrass (*Eragrostis tenella*), natal redtop (*Rhynchelytrum repens*), balloon plant (*Gomphocarpus physocarpus*), pua kala (*Argemone glauca*), and 'ihi (*Portulaca cyanosperma*). In the sandy beach areas such as Pōhue Bay, Kanonone, and Kāki'o vegetation is more abundant than in the rocky areas. Large mats of pōhuehue (*Ipomea sp*.), pau o hi'iaka (*Jacquemontia sandwicensis*) and thickets of shrubs such as pluchea (*Pluchea odorata*) are likely to be encountered.

Cinderland Vegetation

Plants can also be found along the coast on the littoral cones that are scattered along the shoreline. Thatching grass (*Hyparrhenia rufa*) is the most likely species to be encountered. In addition, natal redtop, *F.pycnocephala,* barbwiregrass *(Cymopogon refractus),* fountain grass *(Pennisetum setaceum),* pluchea*,* hi'aloa, swordfern (*Nephrolepis multiflora*), and broomsedge (*Andropogon virginicus*) are likely to be encountered on the littoral cones.

Lava Field Vegetation

There are vast areas of the Site that are covered by lava flows and nearly devoid of vegetation. Just the very hardy species such as the natal redtop, pluchea, hi'aloa, and 'ihi are expected to be encountered in areas where soil has accumulated. Along the margins of the flow, plants from the adjacent plant communities may be found.

'Ōhi'a Forest Community

The upland, mauka areas of the Site, areas with pre-historic 'a'ā lava flows, are capable of supporting forest communities where 'ōhi'a trees (*Metrosideros collina ssp.polymorpha*) are the dominant species. In addition to 'ōhi'a a number of small tree species such as mamane (*Sophora chrysophylla*), sandalwood or 'ili ahi (*Santalum paniculaturm)*, false sandalwood (*Myoporum sandwicense)*, lama (*Diospyros ferrea)*; and shrubs such as pukiawe can be found. Where the canopy cover is more open, sedge, grass, and ferns are expected to be encountered. Climbing plants such as kaona'oa, (*Cassytha filiformis*) are likely to be found within the 'ōhi'a forest community. An individual hala pepe, an endangered plant, was encountered during a previous survey of this plant community. A 1987 survey

identified the presence of apapane and amakihi. Although native bird species, they are not endangered.

Grass-Scrub Communities

There are grass-scrub communities both in the coastal areas and in the upland areas of the Site. It is expected that the upland grass-scrub communities will be dominated by shrubs, both native and introduced. These would include ʻulei (*ʻOsteomeles anthyllidifolia*), pukiawe (*Styphelia tameiameiae),* lantana *(Lantana camara)* and Christmas berry (*Schinus terebinthifolius*). Although not shrubs, both broomsedge and barbwiregrass will likely be encountered frequently. However, within depressions in the scrub areas, where it is damp, molassesgrass (*Melinis minutiflora*), foxtail (*Stearia geniculata*), and guinea grass (*Pennisetum clandestium*) will likely be encountered. The coastal scrub community will likely be dominated by natal redtop and hiʻaloa with scattered patches of lovegrass, balloon plant, plucha, ironweed, and ʻilima (*Sida fallax*).

In addition to the coastal and upland grassland-scrub communities, a distinct grassland-scrub community has developed at Kipuka Kanohina. In addition to the species found in the other grass-scrub communities, one can expect to encounter scattered ʻōhiʻa trees, and a number a species not found anywhere else on-Site. These include aʻaliʻi (*Dodonaea sandwicensis*), ʻenaʻena (*Gnaphalium sandwicensium*), pili (*Heteropogon contortus*), ʻahuhu (*Tephosia purpurea*), golden beardgrass (*Chrysopogon aciculatus*), and West Indian dropseed (*Sporobolus indicus*).

Other Fauna Species

During the 1987 survey of a portion of the Site, the only mammal observed was the mongoose (*Herpestes auropunctatus*). However, skeletal remains, scats, and tracks confirmed the presence of both feral goats and pigs. Numerous local sightings suggest that the endangered Hawaiian hoary bat or ʻopeʻapeʻa (*Lasiurus cinereus semotus*) may also be present on the Site, although not encountered during official surveys.

Six native species of birds were observed during the 1987 survey. They included two migratory birds the Pacific Golden-Plover or Kōlea (*Pluvialis fulva*), Wandering Tattler or ʻŪlili (*Heteroscelus incanus*), and four resident endemic birds, the apapane (*Himatione sanguine*), common amakihi (*Hemignathus virens*), the Hawaiian hawk or ʻio (Buteo solitaries) and the short-eared owl or pueo (*Asio flammeus sandwichensis*) While the Ruddy Turnstone or ʻAkekeke (*Arenaria interpres*) and Sanderling or hunakai (*Calidris alba*) were expected, neither were encountered. Ten introduced species were encountered during the survey.

Endangered Terrestrial Species

The hala pepe (*Pleomele hawaiiensis)* plant, a close relative to cultivated dracaena, was identified in the mauka portion of the Site during a survey conducted in 1987. The hala pepe is endemic to the island of Hawaiʻi where it was traditionally found on open ʻaʻā lava flows in lowland dry forest on the island of Hawaiʻi. The hala pepe population has been reduced to less than 150 individuals and has been listed by the U.S. Fish and Wildlife Service as endangered. The hala pepe was use in traditional medicine for the treatment of chills, fevers, and asthma. It was also used in lei making, woodworking, and by hula practitioners.

The Hawaiian hoary bat, Hawaiʻi's only terrestrial native mammal, was initially listed as endangered on October 13, 1970 by the Federal Register Conservation of Endangered Species and Other Wildlife. Sightings of the hoary bat have occurred on several different occasions in the area. While little is known about the bats, it is assumed that they roost primarily in trees, but forage in a variety of environments from the seacoast to forests and open pastures. The hoary bat feeds primarily on flying insects.

Potential Impacts and Mitigation Measures

The Draft EIS will include a vegetation map (the 1987 surveys did not produce a map). The proposed shoreline setback shown in the master plan will protect the pond and coastal strand habitats. The proposed preserves will protect the ohia forest and Kipuka Kihana habitats, including the endangered hala pepe. Where the master plan proposes development, the affected habitats are primarily lava fields and the grass-scrub community. The Draft EIS will assess the adequacy of measures to protect any sensitive native habitats. A potentially sensitive habitat that has not been previously surveyed is the lava tube caves. The Draft EIS will report the findings of a survey to determine the presence or absence of this cave habitat and any associated arthropod inhabitants, and append the study to the Draft EIS.

The Draft EIS will also assess whether any special mitigation measures are necessary to protect the endangered hala pepe, over and beyond the preservation of the ohia forest habitat. In this regard, the Draft EIS will review whether any of the recommendations of the *Recovery Plan for the Big Island Plant Cluster* and addendums are applicable. To ensure the Project does not impact the Hawaiian hoary bat population, development will follow the recommendations of the US Fish and Wildlife Service's, *Recovery Plan for the Hawaiian Hoary bat, Lasiurus cinereus semotus.*

The Draft EIS will address opportunities for restoration, if appropriate. Also, as appropriate, the Draft EIS will include landscaping mitigation measures to promote native and non-invasive, drought-tolerant plants species to minimize irrigation.

3.6 MARINE ENVIRONMENT

Existing Conditions

Shoreline Topography. The shoreline within the Site is predominantly rocky cliffs exposed to wave action. Pōhue Bay is one of the few protected areas along this southwest coast. During calm seas, this sandy beach is one of the safest swimming areas in Ka'ū; however, the moderately steep slope of the sand is a good indication that dangerous water conditions sometime occur during high surf (Clark 1985:79).

Nearshore Topopgraphy. The nearshore topography off the Site is characterized by a narrow basaltic shelf 50-70' wide terminating in a shelf break and steep sandy slope extending to abyssal depths. As a result, offshore depths greater than 200' occur within 100' from the shore (Marine Research Consultants 1987). The substrate of the narrow shelf is primarily rock and boulders with scattered coral at a coverage of 10 to 50%. Due to the location of pockets of very deep water that is accessible from the shore, Kahuku ahupua'a has been known for its great fishing. This area has been known to local fishermen as their "ice box" for fish like 'ahi, aku, a'u, ulua, mahimahi, and 'ōpelu, especially the fishing grounds off of flat-topped sea cliffs fronting Pu'u Kī (Clark 1985).

Water Quality. The Department of Health's water quality classification for the nearshore waters is AA open coastal waters. A 1987 water quality survey measured at 13 stations located at the surface and 10' depth found the nearshore waters to be of pristine quality. There was evidence of groundwater seepage along the shoreline (Marine Research Consultants 1987).

Biological Community. The diversity of benthic organisms and fish species is typical of nearshore Hawaiian reef habitats; however, for a remote area, there was surprising evidence of fishing pressure (Marine Research Consultants 1987). Pōhue Bay is the nesting ground for two native sea turtle species, the green sea turtle, honu, (*Chelonia mydas*), and the Hawksbill sea turtle, honu 'ea (*Eretmochelys imbricate*). Both of these turtles are endangered. Pōhue Bay is one of four sites that have been intensively monitored under the Hawai'i Island Hawksbill Turtle Recovery Project. Ten other sites are also frequently monitored for nesting activity under this program but to a lesser degree than the four sites. Of all the sites, the highest numbers of nesting turtles, newly tagged adult females, nests, and hatchlings were documented at Pōhue Bay. Nesting activity has increased since stricter public access controls were imposed in 2004. Typically, the turtle's nesting season at Pōhue starts in March when

the first nests are laid and continues through November when the last nests are excavated (Seitz and Kagimoto 2008).

Potential Impacts and Mitigation Issues

Because this coastline is exposed to relatively high energy from waves and currents, there is no extensive coral reef that would require heightened measures beyond what is normally required for runoff impacts. The issues the Draft EIS will focus on include:

- **Public Access.** The sheltered Pōhue Bay is one of the few safer areas for swimming in the region, and is therefore a significant recreational resource. However, access to this bay must be managed to protect the turtles' nesting habitat. The Draft EIS will offer mitigation alternatives such as managed access through the Hawaiian Heritage Center or seasonal restrictions, as well as water safety measures recognizing the occasional dangerous swimming conditions. For an area known for its fishing grounds but historically difficult to access, suddenly opening up the area for easy public access may exacerbate the already evident overfishing. The Draft EIS will offer mitigation measures to manage fishing and gathering. In conjunction with the Hawaiian Heritage Center, a modernized konohiki program will be proposed using education as the means of enforcement.
- **Turtle Nesting Habitat.** In recognition of Pōhue Bay as a prime turtle nesting habitat, the Draft EIS will address the adequacy of the protection measures, and the potential to support further scientific research to improve knowledge and stewardship capabilities.
- **Anchialine Ponds.** The Draft EIS will assess the condition, need for restoration, and adequacy of protection measures.

In short, the Draft EIS will include a shoreline access management plan, as well as coastal preserves measures, designed to protect both cultural and environmental resources. A marine resources study will be included with the Draft EIS as an appendix.

CHAPTER

4

ENVIRONMENTAL SETTING AND IMPACT ASSESSMENT ON THE HUMAN ENVIRONMENT

This section describes the existing conditions of the human environment, potential impacts of the proposed Project, and mitigation measures to minimize any impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Existing Conditions

Pre-Contact History. The district of Ka‘ū has historically been a relatively independent district, isolated from the rest of the island. Ka‘ū was probably settled very early on by the Polynesian voyagers. The natural setting of Ka‘ū when first colonized looked much different from today. Early settlers found Manuka habitable, although it is now a desolation of recent and older lava. Large sections of this area, including Kahuku, are known to have been cultivated garden spots before their devastation by dated lava flows. Forested areas reached down to the coast fed by dewfall from the cold mist-laden breeze (kehau) that blows down from the wet or snow-clad heights of Mauna Loa. With more forests and dew condensation, there was probably more percolation and underground flow of water feeding spings and waterholes. In addition to a reduction of forested areas, earthquakes have also been known to diminish the groundwater flow. In short, the early colonists found a much more favorable habitat, climate, and water supply (Handy and Handy 1972:545). As population increased, the rest of the island was inhabited. Most of the early settlement in Ka‘ū consisted of small fishing villages.

Post-Contact History. By the time Captain Cook arrived in 1779, the Ka‘ū they saw was a dreary lava-covered landscape. Around the time of western contact, the ruler of Ka‘ū was Keoua. With his death during the dedication of Heiau Pu‘ukoholā, Kamehameha I became the ruler of the entire island. Within the Kahuku ahupua‘a, at this time, the interior was populated and the shoreline was relatively devoid of permanent residents as documented in the claims for lands at the time of the Great Mahele. As a result of the Great Mahele, Kahuku ahupua‘a was awarded to W. P. Leleiokoku, the husband of Nahienaena who was the sister of Liholiho (King Kamehameha IV) (LCAw. 9971), but later surrendered the lands due to nonpayment of commutation fees. The government subsequently designated Kahuku as School Lands—i.e., lands to be used for educational purposes as dictated by the Department of Public Instruction. The next record of transaction was to C.C. Harris, who purchased 184,298 acres of Kahuku lands under Patent 279. Although there were several kuleana claims in Kahuku, few were actually awarded. (Silva 1987).

The Pōhue shoreline is known to some local residents as Glover's Beach, for James W. Glover, a former owner of Kahuku Ranch, who founded the general construction firm, James W. Glover, Ltd. After Glover's death, the Glover's executor sold the ranch under court order to pay estate debts to the Samuel Damon Estate, the successful bidders in 1958 for the 158,000-acre ranch (Clark 1985).

A 1987 archaeological survey summarized previous archaeological work and conducted a reconnaissance-level field survey (Haun and Walker 1987) (see Figure 15, Previous Archaeological Survey). The survey relocated 32 previously identified sites and 232 new sites for a total of 298 archaeological sites. Only one previously recorded site was not found. Uses and functions of the sites probably included habitation, temporary habitation, quarry, transportation (trails), water source (ponds), storage, tool preparation, recreation, religious, and rock art (petroglyphs). A majority of the sites are believed to be temporary habitation sites. Most of the sites were concentrated along the coast near anchialine ponds, Pōhue Bay, Kipuka Kanohina, or trails. Of the 298 sites, the study recommended 103 to be significant as preserved sites. Many of the cultural assets found here are similar to those found in other areas on the island of Hawai'i, but there are several that are rare or unique to Kahuku ahupua'a. These features include a large collection of petroglyphs, a village site at Pōhue that is built vertically up a pu'u rather than the traditional method spreading out along the coast, and an expansive pre-contact stone quarry. These archaeological features along with the iwi discovered at two burial sites, and several traditional trails such as the *Ala Loa* and *Alanui Aupuni,* are important to this 'āina and will continue to be protected by maintaining large conservation zones to limit the encroachment of development.

Potential Impacts and Mitigation Issues

Tom S. Dye is conducting an archaeological inventory survey of the Site. The objective of the inventory survey will be to reconfirm the presence/absence, nature, extent, and significance of resources on the Site to ensure adequate protection and conservation of significant cultural resources. The scope of work for this investigation will include evaluation, documentation, recordation, and, where necessary, limited subsurface testing of recorded sites, to meet the requirements of the State Historic Preservation Division (SHPD).

The Draft EIS will contain results of the survey and the complete study will be included as an appendix. Appropriate mitigations measures will be implemented based on the results of the survey. Applicant will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. Given the nature of the volcanic substrate within the Site, there is a potential for concealed tubes and blisters to be discovered during construction. The Draft EIS will include appropriate mitigation measures to ensure that should historic remains, such as artifacts, burials, concentrations of shell or charcoal be encountered in these geologic features, or elsewhere on the Site during construction activities, work will cease in the immediate vicinity of the find and the SHPD will be contacted for appropriate mitigation, as necessary.

LEGEND

- Highest Rating
- High Rating
- Significant Trails
- Anchialine Pond (P)

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

FIGURE
Geologic Map
NANI KAHUKU 'ĀINA

Nani Kahuku 'Aina, LLC
KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 2,000 4,000

PBR HAWAII & ASSOCIATES INC.

FIGURE 15. Previous Archaeological Survey

4.2 CULTURAL RESOURCES

Existing Conditions

The Draft EIS will include a cultural impact assessment to identify traditional customary practices associated with the Site. The cultural assessment will include archival research and interviews from people knowledgeable of the area to obtain information relating to practices and beliefs of indigenous Hawaiians within and surrounding the subject area. Such practices may include access-driven subsistence, agricultural, recreational, healing and burial practices, and religious or spiritual traditions. The selected consultant will have expertise in conducting archival research and collection of critical data through personal interviews.

Potential Impacts and Mitigation Issues

Based on the findings of the cultural research, the Draft EIS will include appropriate mitigation measures to enhance or minimize impact on cultural practices.

4.3 NOISE

Existing Conditions

The Project will generate noise that may impact surrounding settlements and future residents and visitors of the Site. Sources of noise stem from:

- Aircraft flying to/from the proposed airport;
- Traffic traveling along Māmalahoa Highway and other surrounding roads;
- Construction activities associated with the development of the Project.

Potential Impacts and Mitigation Issues

Y. Ebisu & Associates is preparing a noise assessment study for the Project that will address potential impacts of aircraft, traffic, and construction activities. The Draft EIS will contain conclusions from the study and the complete assessment will be included as an appendix.

As a result of findings of the noise assessment study, further refinement of the land use plan or other design or operational conditions may be required to mitigate noise during the operational phase.

During the construction phase, there will likely be noise impacts associated with operation of heavy construction machinery, paving equipment, and material transport vehicles. However, the impact will only be temporary. To mitigate noise levels, the Draft EIS will include mitigation measures such as requiring the contractor to adhere with State DOH regulations, use of proper equipment and regular vehicle maintenance. Equipment mufflers or other noise attenuating equipment may also be employed as required. All construction activities will be limited to daylight work hours.

4.4 AIR QUALITY

Existing Conditions

Regional and local climate, together with the amount and type of activity generally dictate the air quality of a given location. In the vicinity of the Site, winds are predominantly trade winds. During winter, storms may generate strong winds from the south (Kona winds) for brief periods. When the trade winds or Kona winds are weak or absent, landbreeze-seabreeze circulations may develop.

Generally, air quality in the vicinity is good and meets State and Federal Air Quality Standards. There are no anthropogenic stationary point sources of airborne emission that exceed federal or state standards within close proximity to the Site.

Pollutants that exist may be attributable to a variety of sources: including traffic traversing Māmalahoa Highway and volcanic activity at Kīlauea, where volcanic pollution (vog) is brought along the western coast by northeasterly tradewinds. Emissions from man-made sources are intermittent and minimal and are quickly dispersed by prevailing tradewinds.

The Island of Hawai‘i is unique from the other islands in the state in terms of the natural volcanic air pollution emissions that occur. The impact of vog on air quality in Ka‘ū is highly variable, and primarily dependent upon activity of Kīlauea Volcano. Air pollution emissions from the Hawaiian volcanoes consist primarily of sulfur dioxide. After entering the atmosphere, sulfur dioxide emissions are carried away by the wind and either washed out as acid rain or gradually transformed into particulate sulfates or acid aerosols. Temporary spikes in emissions of sulfur dioxide (SO2) and particles 2.5 microns (PM2.5) from Kīlauea’s Halema‘uma‘u and Pu‘u O‘o craters along with changes in wind and weather patterns will occasionally cause a reduction in air quality at the Site.

The Hawai‘i County Civil Defense Agency has a system in place to issue advisories for vulnerable populations based on these natural conditions. From April 1, 2008 through December 11, 2008, four cities on Hawai‘i exceeded the National Ambient Air Quality Standards (NAAQS) for PM2.5. Three cities also exceeded NAAQS for SO2 (Table 3). There are no monitoring stations in the Kahuku ahupua‘a area, so the concentration of air contaminants in this region is not known.

Table 4-1. NAAQS Exceedences in 2008

	SO2 (Standard = 0.14 ppm)	PM2.5 (Standard 35 ug/m^3)
Pahala	35	14
Kona	2	10
Mtn View	1	7
Hilo	0	1

Data collected from April 1 through December 31, 2008, Hawaiÿi State Department of Health

An air quality study is being prepared and findings will be included in the Draft EIS, along with a copy of the study.

Potential Impacts and Mitigation Issues

Emissions derived from operation of construction equipment and other vehicles involved in construction activities may temporarily affect the ambient air quality in the immediate vicinity. However, these effects will be minimized through proper maintenance of construction equipment and vehicles. In addition, there may be a temporary adverse impact on air quality attributable to dust generated during the Project construction, particularly earthmoving activity, including excavating, trenching, and filling. Proposed grading activities will occur in proximity to existing industrial businesses and major thoroughfares, posing potential impacts from dust.

With the exception of emissions created by Kīlauea, it is anticipated that no State or Federal air quality standards will be violated during or after the creation of the proposed Project. A dust control plan will be implemented during all phases of development. All construction activities will comply with the provisions of Chapter 11-60.1-33, HAR on fugitive dust. Measures to control dust during various phases of construction may include:

- Planning phases of construction to minimize the amount of dust-generating materials and activities, centralizing onsite vehicular traffic routes, and locating potential dust-generating equipment in areas of least impact;

- Providing an adequate water source at the Site prior to start-up construction activities;
- Landscaping and 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 before daily start-up of construction activities; and
- Controlling dust from debris being hauled away from the Site.

In the long term, motor vehicle traffic on Project roadways may potentially cause long-term impacts on ambient air quality in the vicinity. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide that emit nitrogen oxides and other contaminants. However, federal air pollution control requirements regulate and restrict the emissions from vehicles; therefore, additional traffic generated as a result of the proposed Project is not expected to significantly impact the ambient air quality. A more detailed discussion of short- and long-term impacts to air quality will be addressed in the forthcoming Draft EIS.

The Applicant is also considering the possibility of assisting with mitigation measures to assist residents with respiratory problems who suffer during high vog events by providing additional air-conditioned buildings that could serve as "safe rooms" for those susceptible to vog.

4.5 VISUAL RESOURCES

Existing Conditions

Mauna Loa is the dominant scenic vista looking mauka from the Site. From the Māmalahoa Highway, the ocean can only be seen intermittently since it is over six miles away. Along the coastline, scenic landmarks are the littoral cones, the ponds, Pōhue Bay, and the barren openness along the desolate coastline. The General Plan identifies the following areas as natural beauty sites: Pōhue Bay, the Volcano National Park area mauka of the Site, and the lava flows of 1868, 1887, and 1907 that traverse through the Site.[2]

Potential Impacts and Mitigation Issues

Potential impacts and mitigation measures affecting the visual resources are as follows:

- Pōhue Bay, littoral cones, and other coastal resources. The coastal resources will be protected by keeping them within the existing Conservation District.
- Ocean view from the highway. The view of the ocean from Māmalahoa is quite distant. Nevertheless, the impact on this will be mitigated by a clustered defined limit of the mauka Kahuku Village that will keep more than half of the highway frontage undeveloped and height limits of buildings along the coast comparable to the height of coconut palms. This height limit will enable views from the highway to look over the buildings. Building massing will also allow for openings between structures for coastal views. Height limits will be in accordance with Hawai'i County Code requirements. Under the Code, all designs must undergo Plan Approval (except for single-family residential homes) prior to commencement of construction**.** A 150-foot landscape buffer along the highway will serve to mitigate visual impacts to and from Māmalahoa Highway.
- Historic lava flows. There will be limited but unavoidable incursion onto the historic lava flows of 1887 and 1907; the Project will not impact 1868 flow. The proposed Kahuku Village, the airfield, and portion of the makai village will be built on the 1887 and 1907 flows. On the other hand, by

2. County of Hawai'i General Plan (February 2005 as amended), section 7.5.8, Table 7-14, "Natural Beauty Sites, District of Ka'ū."

developing on the historic lava flows, there is less incursion on prehistoric lava flows that may have higher probability to contain archaeological remains.

In total, approximately 1,240 acres, exclusive of parks and trails, will be maintained as open space. The Draft EIS will provide more detailed impact analysis of the above issues and address any other issues raised by reviewers of this EISPN.

4.6 SOCIO-ECONOMIC CHARACTERISTICS

A market and economic impact study is currently being prepared for the proposed Project. Conclusions of the report will be included in the Draft EIS and the complete report will be included as an appendix to the Draft EIS.

Existing Conditions

Population and Housing

The 2000 Census reported the population of Hawai‘i County at 148,677. According to the data for the Hawaiian Ocean View Census Designated Place (CDP), which includes the Site, the population for that region was 2,178 persons. Table 4-2., “Demographic Characteristics: 2000”, shows a comparison of the population of Hawai‘i County as a whole to the Hawaiian Ocean View CDP.

In 2005, the County of Hawai‘i population rose to 167,293, a 12.5 percent increase (DBEDT 2006). The population for the County is anticipated to increase to 176,750 persons by 2010, 203,050 persons by 2020 and 229,700 by 2030 (DBEDT 2004).

The Hawai‘i County median year-to-date single-family home sales price for 2008 decreased 13 percent from $395,000 to $345,000. The median sales price for condos decreased 6 percent from $394,900 to $370,000. The year-to-date sales were down 32.5 percent from 1,136 single-family home sales compared to 1,684 homes sold in 2007. The 2008 year-to-date sales were down 29 percent from 368 condominium sales compared to 368 sold in 2007, according to the Hawai‘i Information Service (Pacific Business News, January 2009).

Table 4-2. Demographic Characteristics: 2000

Subject	Hawaiian Ocean View CDP		Hawai'i County	
	Number	Percent	Number	Percent
Total Population	2,178	100.00	148,677	100.00
AGE				
Under 5 years	124	5.7	9,130	6.1
5 – 20years	461	21.1	35,558	23.9
21– 64 years	1,315	60.4	83,870	56.4
65 years and over	278	12.8	20,119	13.5
Median Age (years)	43.1		38.6	
HOUSEHOLD (By type)				
Total Households	941	100.0	52,985	100.0
Family Households (families)	541	57.5	36,903	69.6
With own children under 18 years	235	25.0	17,086	32.2
Married-couple family	396	42.1	26,828	50.6
With own children under 18 years	150	15.9	11,295	21.3
Female householder, no husband present	90	9.6	7,000	13.2
With own children under 18 years	54	5.7	4,095	7.7
Non-families	400	42.5	16,082	30.4
Living alone	317	33.7	12,240	23.1
65 years and over	69	7.3	4,214	8.0
Average persons per household	2.31		2.75	
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	1,394	100.0	62,674	100.0
Occupied units	953	68.4	52,985	84.5
By owner	709	74.4	34,166	64.5
By renter	244	25.6	18,819	35.5
Vacant units	441	31.6	9,689	15.5

Source: U.S. Census Bureau, Census 2000.

Economy

While Ka'ū is the largest district on the island, it is the second smallest in population. The local economy is agrarian in nature. Coffee, orchids, vegetables, flowers, cattle, and macadamia nuts are grown in this district. According to the *Hawai'i County General Plan,* approximately five million dollars have been invested in Ka'ū to establish a forestry industry. The macadamia nut industry remains the primary industry in the district. Tourism currently plays a very limited role in the local economy. There are 68 transient units located at two facilities providing the only transient accommodations within Ka'ū.

With relatively few nearby employment opportunities, Ka'ū is an impoverished area. In 1999, nearly 17 percent of families surveyed had an annual income below the national poverty level. Hawaiian Ocean View CDP fared slightly better than the district did in 1999; 13 percent of the families surveyed had an annual income below the national poverty level. Additionally, over 30 percent of the children in Hawaiian Ocean View CDP live in poverty.

Employment

As of November 2008, Hawai'i County's unemployment rate was 7.0 percent, compared to 3.3 percent in 2007 (State of Hawai'i Department of Labor and Industrial Relations, 2008). In the Hawaiian Ocean View CDP, approximately 866 persons ages 16 years and older were listed as employed. Approximately 24 percent of the population was employed in the management, professional or related occupations, 21 percent in service occupations, 23 percent in sales and office occupations and 20 percent in construction. The remaining 11 percent were employed in the farming, fishing and forestry occupations, or production, transportation and material moving occupations.

Potential Impacts and Mitigation Measures

The Draft EIS will include a market study and economic impact analysis prepared by the Hallstrom Group, Inc. The housing and economic impacts are expected to be beneficial. The proposed Project will meet or exceed affordable housing requirements, as well as workforce and market housing, that may be on smaller lots than the surrounding area but would have infrastructure and be located within walking distance to various services to distinguish these units from the surrounding affordable but substandard lots. The Draft EIS will estimate the affordable and workforce housing requirements based on prevailing regulatory standards and proposed master plan land uses. The Project will generate job opportunities—the Draft EIS will estimate the number and types of jobs. The Project will generate tax revenues—the Draft EIS will estimate the amount of revenues by tax (e.g., property tax, excise tax), and whether the taxes generated will pay for the additional County services required to serve this Project. The economic impact analysis will address the impact of the proposed Project to the local economy.

4.7 Infrastructure and Utilities

Gray Hong Nojima & Associates is preparing a preliminary engineering report for the proposed Project. Conclusions and recommendations of the report will be included in the Draft EIS. The report will be attached as an appendix to the Draft EIS.

4.7.1 Roadways and Traffic

Existing Conditions

The Site is bordered to the north by Māmalahoa Highway (Hawai'i Belt Road), a two-lane State arterial highway facility. Currently, there is a permitted highway access opening along the mauka boundary of the Site.

A Traffic Impact Assessment Report (TIAR) will analyze traffic counts for existing, ambient, and future conditions associated with the Project at build-out. Level of Service (LOS), circulation patterns, and mitigation measures will be addressed in the TIAR.

Potential Impacts and Mitigation Measures

Access to the Project is proposed from an improved intersection to the Site acceptable to the State Department of Transportation. The Draft EIS will propose an access design from the State highway to mitigate any traffic impacts from turning movements in and out of the Project. The Draft EIS will also propose typical sections within the Project and state whether these roads are intended to meet County dedicable standards or be private resort or rural standard roads.

The TIAR will identify measures to mitigate any other traffic impacts resulting from this Project. The TIAR will also verify whether the Project may actually result in beneficial cumulative traffic impacts by providing job opportunities for Ka'ū residents who normally commute to Kona.

4.7.2 Water System

Existing Conditions

Currently, the Hawai‘i County Department of Water Supply’s (DWS) system ends 25 miles away at Ho‘okena in South Kona, and 10 miles away at Wai‘ōhinu. The nearby residential communities of Hawaiian Ocean View Estates and Hawaiian Ocean View Ranchos primarily rely on roof catchment systems. During drought periods, residents pay truckers to haul water to fill their water tanks. To reduce the hauling cost, the DWS will soon place in service a spigot with water from a well located in Hawai‘i Ocean View Estates.

Potential Impacts and Mitigation Measures

The Draft EIS will identify the source of water to serve the Project, whether it be potable groundwater from a mauka well or treated brackish groundwater. Depending on the capacity, the Draft EIS will explore the potential to dedicate the water system to the County to be able to serve areas beyond the Project, or whether this will be a private system limiting service to the Project. The Draft EIS will append the hydrogeological findings by Water Resource Engineering and Blackhawk, and the preliminary engineering by Gray Hong Nojima and Associates, Inc. for the source, treatement, and distribution system to meet potable, fire-fighting, and irrigation needs.

4.7.3 Wastewater System

Existing Conditions

There is no County wastewater system in the vicinity of the Site. Wastewater from the existing communities in the Kahuku ahupua‘a of the District of Ka‘ū is treated and disposed of by individual wastewater systems or private treatment facilities. Many of the single-family residential lots and public parks in the region are still connected to septic and cesspool systems. For smaller facilities, systems consist of a septic tank and corresponding leach field.

The Department of Health (DOH) Critical Wastewater Disposal Map designates the makai portion of the Site up to approximately the 400’ elevation as a Critical Wastewater Disposal Area (CWDA) (see Figure 16, Critical Wastewater Disposal Area). The balance of the Site is in the non-CWDA zone. Within the CWDA, cesspools are severely restricted or prohibited, and the DOH director may impose more stringent requirements such as meeting higher effluent standards, limiting the method of effluent disposal, and requiring flow restriction devices on water fixtures (HAR section 11-62-05). Cesspools could be permitted in the non-CWDA zone with the approval of the Department of Health Director; however, it is DOH’s general policy to disallow the disposal of untreated sewage into the environment (HAR section 11-62-36 (cesspools), -01 (general policies)). Wastewater from farm buildings and operations may have special exemptions (HAR section 11-62-06(d)(2)).

Potential Impacts and Mitigation Measures

Since the proposed makai village is within the CWDA, the proposed wastewater system to service this area is a private wastewater treatment plant with the treated effluent reused for irrigation. For the proposed mauka Kahuku Village, individual septic systems will likely be used. Gray Hong Nojima & Associates is preparing a preliminary engineering report that will include further discussion on the wastewater collection and treatment required for the proposed Project.

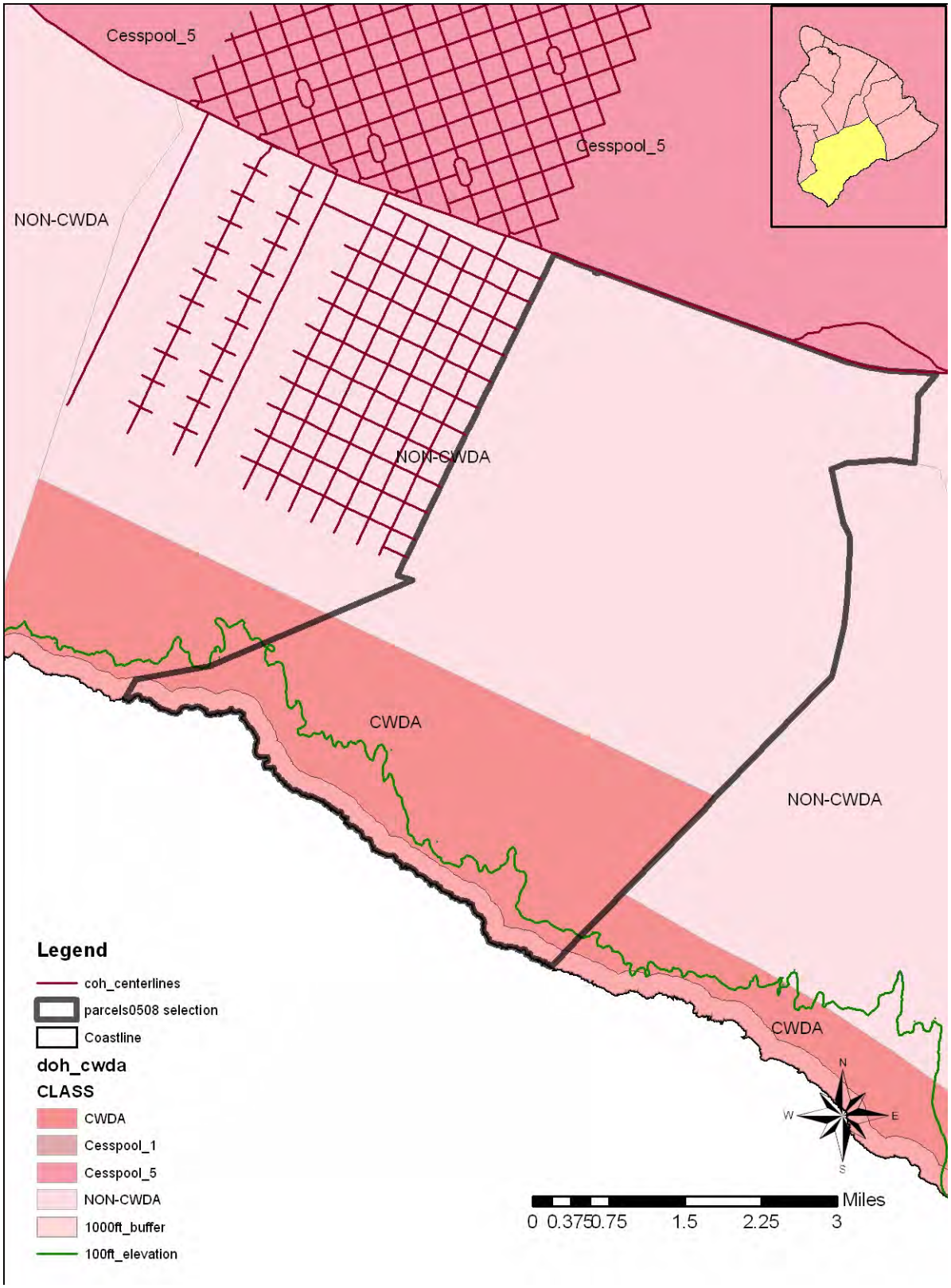


FIGURE 16. Critical Wastewater Disposal Area

4.7.4 Drainage System

Existing Conditions

There are no flood control structures within the vicinity. Runoff from Mauna Loa sheet flows and is conveyed via gullies that run east to west (mauka to makai) near the Site. Similarly, runoff from the undeveloped Site sheet flows east to west (mauka to makai) and is conveyed by gullies, discharging into the low lands near the shoreline.

Potential Impacts and Mitigation Measures

The Project will result in increased impervious surface area, such as from the installation of roads and buildings, resulting in an increase of runoff generated. However, landscaped areas will improve water retention in areas currently covered by lava flows with limited soil horizon development. The proposed Project will collect runoff by a drywell/drain inlet system with detention basins, as determined during the design phase. Any increase in runoff will temporarily be retained onsite and released slowly based on the area's natural infiltration and runoff rate.

To mitigate storm runoff impacts to the nearshore coastal waters, the County requires a storm water disposal system to contain runoff caused by the proposed improvements within the property boundaries up to a one-hour, ten-year storm event. The disposal method shall be by drywells, infiltration basins, or other infiltration methods that would filter sediment and other potential pollutants (HCC sections 23-92(a) (subdivision code) and 25-2-72 (3) (plan approval pursuant to zoning code)). The Draft EIS and appended preliminary engineering report will describe how the Project will meet these standards. Moreover, the Draft EIS will discuss the potential for the golf course to serve as a sediment basin to moderate surface flow from the mauka areas and ameliorate the water quality.

During construction, a particular concern is to protect any erosion and sedimentation that would affect Pōhue Bay and anchialine ponds. The Draft EIS will include best practice measures that could be incorporated into the grading plan and verified during the review of the grading permit. The design and construction of the drainage system will be in accordance with existing requirements of the County of Hawai'i Storm Drainage Standards and the Standard Details and Specifications for Public Works Construction. A detailed discussion of drainage flows and proposed mitigation measures will be included in the Draft EIS, along with a copy of the preliminary engineering report.

4.7.5 Electrical and Communications Systems

Existing Conditions

In areas with electrical, telephone and cable service, it is provided by Hawai'i Electric Light Company, Inc. (HELCO), Hawaiian Telcom, and Oceanic/Time-Warner Cable, respectively. However, many homes and businesses in Kahuku, including those in Hawaiian Ocean View Estates and Hawaiian Ocean View Ranchos are not connected to the electrical, telephone or cable networks. These services are often individually developed utilizing a variety of off-grid options. Solar options, such as the use of photovoltaic cells and thermal collectors are very successful in the area due to the high solar radiation intensity in the area.

Details of the existing electrical and communication systems in Kahuku will be described in the Draft EIS.

Potential Impacts and Mitigation Measures

In January 2008, the State of Hawai'i and the U.S. Department of Energy signed a long-term Memorandum of Understanding (MOU) aimed at having 70 percent of Sate's energy needs generated by renewable sources. As a result of this MOU, the development of all new projects should consider both energy demands and the type of energy that will be developed to meet the demand.

If feasible, the proposed Project will include the development of an energy farm on-site to provide Kahuku Village, the makai village, the airport facilities, and water/wastewater treatment facilities with power necessary for operation. Utilization of both conventional and alternative energy options are being explored to meet the energy demands of the Project. The development of a utility company to facilitate the distribution is also being considered.

The proposed development of Kahuku Village is located in an area that could be incorporated into the existing utility system and the connection of this portion of the Project to existing systems will be explored as part of the Draft EIS.

Coordination and consultation with the various utility and energy development companies is being undertaken for preparation of the Draft EIS. Energy development undertaken to meet the needs of this Project will consider the goals of the MOU. The Draft EIS will include a discussion of estimated electrical demand as well as potential impacts and mitigation measures.

Energy conservation measures will be implemented where ever possible in the design of the proposed Project. Some of the energy-saving technologies being considered for incorporation include:

- Solar energy for water heating;
- Maximum use of day lighting;
- Installation of high efficiency compact fluorescent lighting;
- Roof and wall insulation, radiant barriers and energy efficient windows;
- Installation of light colored roofing;
- Utilization of landscaping for shading of buildings;
- Utilization of biofuels grown onsite;
- Use of photovoltaics, fuel cells, and other renewable energy sources; and
- Installation of "district cooling" system, which utilizes cold sea water as a chilling agent for air conditions systems.

4.7.6 Solid Waste

Existing Conditions

The County of Hawai‘i currently maintains two active landfills: South Hilo Landfill and the Pu‘uanahulu Landfill. According to the County of Hawai‘i, as of April 2008, the Pu‘uanahulu landfill has an anticipated remaining life of 47 years and meets all current EPA requirements for landfills. The South Hilo Landfill is rapidly filling up and will have to close within the next two to five years.

Island residents collect their solid waste trash and transport it to any one of the 21 solid waste transfer stations located around the island. In some areas of the island, residents may hire a private collection company to pick-up their solid waste for disposal. The nearest transfer station to the Site is the Wai‘ōhinu Transfer Station, located approximately nine miles to the east of the Site. A Transfer Station is being proposed for Ocean View, less than one mile away from the Site.

Currently, solid waste is not being generated on the Site.

Potential Impacts and Mitigation Measures

The Draft EIS will include more information on solid waste disposal facilities, and the impact of the proposed Project on landfill capacity and future solid waste solutions being pursued by the County.

A solid waste management plan for reduction of solid waste disposal will be prepared in accordance with County standards at the appropriate time as required by the County. Waste generated by site preparation will primarily consist of debris associated with the removal of lava rock and shrub vegeta-

tion onsite. Where possible, green waste from grubbing will either be chipped into mulch for use onsite or recycled, thereby minimizing the amount of solid waste generated. It will be recommended to contractors that a job-site recycling plan be developed. Construction waste that cannot be recycled will be disposed of in the County's landfill.

After construction, recycling will be encouraged. Recycling provisions, such as collection systems and space for bins, may be incorporated into the proposed Project. The proposed Project will most likely be serviced by a private refuse collection agency, possibly contracted by a homeowner's association(s). Waste that cannot be recycled will be disposed of at the County landfill.

4.7.7 Airport Site Assessment

Existing Conditions

Currently, there are no air transit facilities in southern Hawai‘i. Area residents must drive to either Kona or Hilo for air transportation. The closest airport, Kona International at Keāhole Airport is over 50 miles away. In the event of a medical emergency that require access to off island facilities, an individual in Ka‘ū must be taken to Hilo or Kona first. While the Ka‘ū hospital, located in Pahala, does provide emergency and acute care, it does not have a heliport to quickly transport critical patients to either the Hilo or Kona airports for eventual transport to O‘ahu.

Potential Impacts and Mitigation Measures

The development of an air transit facility will have numerous impacts on the environment. These impacts include increased noise both on the ground at the airport, and in the air, increase generation of waste, potential degradation of air quality created from emissions from both aircraft and support equipment, and modification of groundwater infiltration rates based on the development of the runways/ taxiways and support structure.

Several locations were assessed based on prevailing wind speed/direction and ground slope/elevation. These variables affect the size of a runway necessary to safely take off and land aircrafts.

Various consultants including R.W. Armstrong (site selection), Gray Hong Nojima & Associates (engineering support), and Y. Ebisu & Associates (noise impacts) have been consulted to address impacts and develop mitigation measures. The potential impact and mitigation strategies will be discussed in the Draft EIS. Assessment reports will be included in the Draft EIS.

4.8 PUBLIC SERVICES AND FACILITIES

4.8.1 Police, Fire, and Medical Services

Existing Conditions

The District of Ka‘ū is served by the County of Hawai‘i Police Department through the Ka‘ū District Station located in Nā‘ālehu and a police substation located in Pōhue Plaza in Ocean View Estates. While the nearest facility to the Site is the substation located approximately one mile away in Pōhue Plaza, it is not a manned station. The nearest manned station is the Ka‘ū District Station approximately 10 miles away in Nā‘ālehu.

Fire prevention, suppression, and protection services for Kahuku are provided by a fire station located on Orchid Circle in Hawaiian Ocean View Estates. The station is manned 24 hours a day, seven days a week by a combined volunteer professional force. Another fire station is located approximately 10 miles away in Nā‘ālehu.

The nearest critical access health care facility to the Site is the Ka‘ū Hospital, located on Kamani Street in Pahala, approximately 17 miles east of the Site. The 21-bed facility provides acute and long-term care services (Hawai‘i Health Systems Corporation, 2009). The Ka‘ū Family Health Center operated by the Bay Clinic is a Federally Qualified Health Center providing non-emergency medical, dental and behavioral health care during regular business hours. The Ka‘ū Family Health Center is located approximately 10 miles away on Māmalahoa Highway in Nā‘ālehu.

Potential Impacts and Mitigation Measures

The Kahuku region is currently underserved by existing emergency services, particularly emergency transportation to Hilo or Kona hospitals for cases that exceed the capabilities of Ka‘ū Hospital. A private helicopter could be available for emergency response to transport patients or accident victims to Ka‘ū Hospital, Kona, Hilo, or even Honolulu. The Draft EIS will address whether the County prefers that the Project provide new medical, police, and fire facilities within the Kahuku Village or to contribute to the enhancement of existing facilities.

4.8.2 Recreational Facilities

Existing Conditions

Recreational parks and facilities located in close proximity to the Site are extremely limited. The nearest County parks for active recreational activities include: Kahuku Park (located approximately one mile away in Hawaiian Ocean View Estates), Wai‘ōhinu Park (located approximately ten miles to the east in Wai‘ōhinu), and Nā‘ālehu Park (located approximately 12 miles away in Nā‘ālehu) (Figure 17). Manukā State Wayside Park, located approximately five miles west of the Site, is a State park for passive recreational activities.

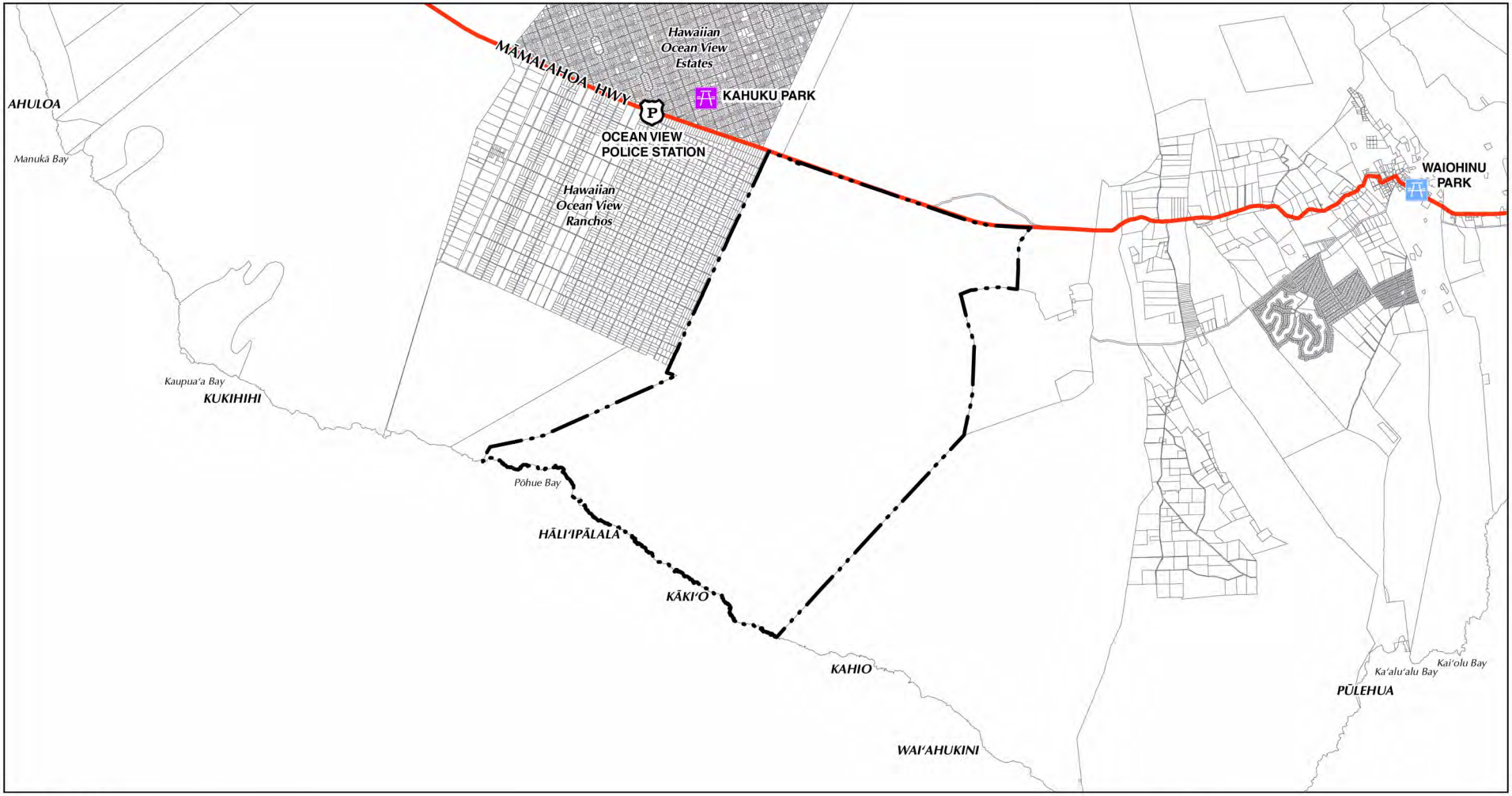
On-shore pole fishing and camping is possible along the Site’s coast with a permit from the landower. Along the shoreline, there are existing trails situated on private lands, with no public facilities. The nearest boating facilities are located approximately 15 miles (by road) at Ka Lae (South Point).

The National Park Service is developing a trail system called the Ala Kahakai National Historic trail. Upon completion, this trail (which includes portions of the traditional trails *Ala Loa* and *Alanui Aupuni)* will include approximately 175 miles of linked trails along the western coast of the island of Hawai‘i from ‘Upolu Point down to Ka Lae (South Point). Portions of the traditional trails (*Ala Loa* and *Alanui Aupuni*) can be seen parallel to the coastline at various locations across the Site.

Potential Impacts and Mitigation Measures

The proposed Project will consist of approximately 729 acres of parks and open space. Near the shore, there will be approximately 709 acres of parks and open space consisting of approximately 631 acres of shoreline conservation, and a 78-acre Hawaiian Heritage Village. There will also be an approximately 20-acre District park within the Kahuku Village near Māmalahoa Highway. The open space trails would be able to connect to the Ala Kahakai Trail in the future, if so desired. An extensive network of trails and open space are planned to connect the residences to the shoreline, the mixed-use villages, and various neighborhoods that comprise the community. Multi-modal paths are planned. Applicant will coordinate with the County Department of Parks and Recreation to ensure that community park requirements are satisfied.

As part of the proposed development, the Applicant will work with the National Park Service to assist in the development of the Ala Kahakai National Historic trail along the five miles of coastline on the Site. This partnership could include the creation of conservation buffers along the trail(s) parallel to the coastline as well as some of the mauka-makai trails that were a traditional part of Kahuku ahupua‘a. The Applicant or Applicant’s archaeologist will also consult with the Na Ala Hele program to assess the presence/absence of historical trails on the Site.



LEGEND

- Project Boundary
- Major Roads
- Police Station
- County Park - Community
- County Park - Other
- Major Roads

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

FIGURE
Public Facilities
NANI KAHUKU 'ĀINA
Nani Kahuku 'Āina, LLC
KA'Ū, HAWAI'I
NORTH
LINEAR SCALE (FEET)
0 3,500 7,000 14,000
PBR HAWAII & ASSOCIATES, INC.

FIGURE 17. Public Facilities

4.8.3 Schools

Existing Conditions

Presently, the State of Hawai‘i Department of Education operates three (3) public schools in the District of Ka‘ū. They are the combined campus of Ka‘ū High School/ Pahala Elementary School (grades K-12) and Nā‘ālehu Elementary School (grades K-7) (Figure 17). There is no public charter or private schools in the district of Ka‘ū. Table 5 contains current and projected school enrollment information.

Table 4-3. Capacity and Enrollment for Public Schools

School	Capacity for 2005-2006 School Year	Enrollment in 2007-2008 School Year	Projected Enrollment 2011-2012
Ka‘ū High School/Pahala Elementary School (Grades K-12)	1,480	512	1,395
Nā‘ālehu Elementary School (Grades K-7)	983	414	1,118

Source: State of Hawaiÿi Department of Education, 2008

Potential Impacts and Mitigation Measures

According to the 2005 *County of Hawai‘i General Plan* the population of the District of Ka‘ū increased by 31 percent between 1990 and 2000. In 2000, there were 448 school aged children in Hawaiian Ocean View CDP (2000 U.S. Census). The only educational options available then and now to families in west Ka‘ū were/are Nā‘ālehu Elementary (10 miles away), the combined campus of Ka‘ū High School/Pahala Elementary School (20 miles away) or home schooling. Families from Hawaiian Ocean View Estates/Hawaiian Ocean View Ranchos sent 406 of the 448 school aged children to one of these public schools rather than homeschooling. Presently, 1,837 of the nearly 12,000 lots have been developed. When these subdivisions were originally subdivided, no provisions were made for the development of school sites. At complete build out, it is estimated that over 2,000 school age children will reside in Hawaiian Ocean View Estates, and Hawaiian Ocean View Ranchos. The needs of these communities alone necessitate development of additional school sites in west Ka‘ū. The Draft EIS will address the State Department of Education “fair-share” impact assessment for the proposed Project.

CHAPTER

5

RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

The processing of various permits and approvals are prerequisites to the implementation of the proposed Master Plan. Relevant State of Hawai‘i and Hawai‘i County land use plans, policies, and ordinances are described below.

5.1 STATE OF HAWAI'I

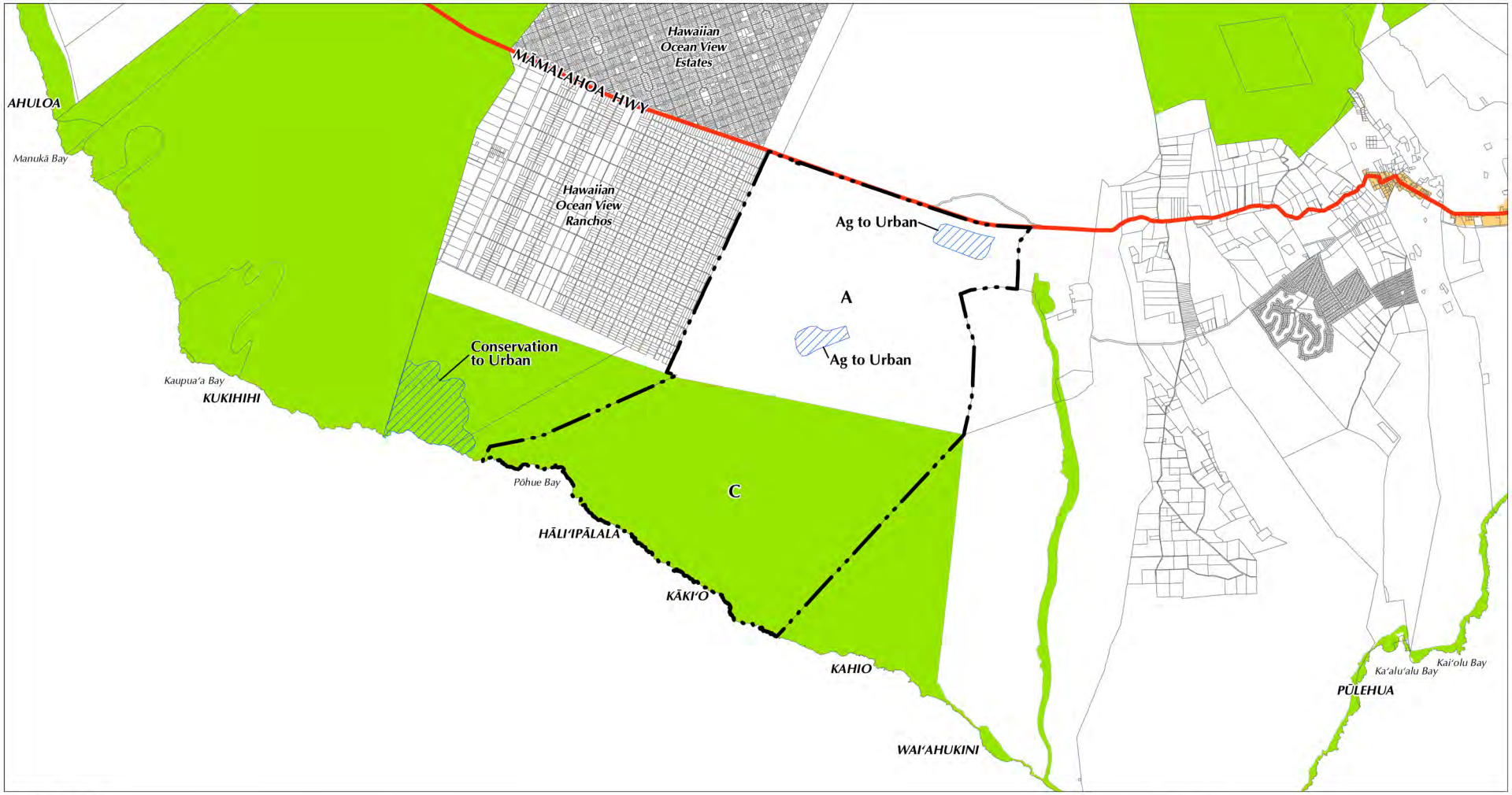
5.1.1 State Land Use Law, Chapter 205, Hawai‘i Revised Statutes

The State Land Use Law (Chapter 205, HRS), establishes the State Land Use Commission (LUC) and authorizes this body to designate all lands in the State into one of four (4) Districts: Urban, Rural, Agricultural, or Conservation.

In 1991, the LUC reclassified approximately 732 acres of the Site and adjacent parcel from the Conservation District and 440 acres from the Agricultural District to the Urban District (Decision and Order dated June 4, 1991, in Docket No. A88-630). The Petitioners in that Docket were Palace Development Corporation, a Hawai‘i corporation and Hawai‘i Ka‘ū ‘Āina a Hawai‘i general partnership. On December 13, 1995, the LUC rescinded the reclassification through a “constructive withdrawal” of Docket No. A88-630.

As a result of the rescission, the existing Site classification consists of approximately 8,056 acres within the Conservation District and 8,400 acres within the Agricultural District (see Figure 18, Existing State Land Use Classification, and Table 5-1). Within the Site, the Conservation District boundary extends inland from the shoreline at about the 560’ elevation at the Site’s northern boundary to Kumukaumaha cinder cone at about 800’ elevation at the Site’s southern boundary. The rationale for the inland extent of the Conservation District is not readily evident based on the standards for what normally is included within Conservation District areas:

> Conservation districts shall include areas necessary for pretecting watersheds and water sources; preserving scenic and historic areas; providing park lands, wilderness, and beach reserves; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods and soil ersion; forestry; open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources; areas of value for recreational purposes; orther related activities; and other permitted uses not detrimental to a multiple use conservation concept (Hawai‘i Revised Statutes section 205-2(e).



LEGEND

- Project Boundary
- Rescinded Urban Classification

Land Use District Code

- A - Agricultural
- C - Conservation
- R - Rural
- U - Urban

Source: State Land Use Commission (GIS)
Disclaimer: This graphic has been prepared for general planning purposes only.

FIGURE
Rescinded Urban Classification Areas
NANI KAHUKU 'ĀINA
Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 3,500 7,000 14,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 18. Existing State Land Use Classification

To implement the proposed master plan, the Applicant will petition the LUC to reclassify certain Conservation District lands to Urban (approximately 1,240 acres), Rural (approximately 2,430 acres), and Agricultural (approximately 3,660 acres), and to reclassify certain Agricultural District lands to Urban (approximately 1,090 acres) (see Figure 18 and Table 5-1). The result of the reclassification would be: Urban (approximately 2,330 acres), Rural (approximately 2,430 acres), Agricultural (approximately 10,970 acres), and Conservation (aproximately 720 acres). The areas in the resulting Conservation District would include the significant archaeological, cultural, and natural features of the Site, which more explicitly conforms with the standard for Conservation districts cited above.

Table 5-1. State Land Use District Boundary Amendment Reclassification Petition

State Land Use District	Existing Classification (approx. acres)	Reclassify to Urban (approx. acres)	Reclassify to Rural (approx. acres)	Reclassify to Agriculture (approx. acres)	Acres to Remain in Existing Classification
Agriculture	8,400	1,090	0	NA	7,310
Conservation	8,050	1,240	2,430	3,660	720

The proposed Urban areas include those areas proposed for the Kahuku Village, the airport, and the clusters of resort. For the proposed Rural district, the master plan is consistent with the standard for Rural Districts that such districts include activities or uses characterized by low density residential lots of not more than one dwelling per one-half acre, in areas where city-like concentration of people, structures, streets, and urban level of services are absent, and where small farms are intermixed with low density residential lots (HRS section 205-2(c)). The balance of the Site's open area is appropriate in the Agricultural District since such districts "include areas that are not used for, or that are not suited to, agricultural and ancillary activities by reason of topography, soils, and other related characteristics." (HRS section 205-2(d)). The Applicant may consider using the lands in the Agricultural District for various uses permitted in this district including cultivation of crops for food, bioenergy, forage, orchards, or forestry; pasture; aquaculture; wind-generated energy production; biofuel production; solar energy facilities; scientific or environmental studies; agricultural tourism conducted on a working farm; agricultural processing; wireless communication antennas; or farm dwellings (HRS sections 205-2(d) and -4.5).

The Draft EIS will discuss whether and how the proposed reclassification meets the decision-making criteria for reclassifications:

(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawai'i state plan and relates to the applicable priority guidelines of the Hawai'i state plan and the adopted functional plans;

(2) The extent to which the proposed reclassification conforms to the applicable district standards;

(3) The impact of the proposed reclassification on the following areas of state concern:

(A) Preservation or maintenance of important natural systems or habitats;

(B) Maintenance of valued cultural, historical, or natural resources;

(C) Maintenance of other natural resources relevant to Hawai'i's economy, including agricultural resources;

(D) Commitment of state funds and resources;

(E) Provision for employment opportunities and economic development; and

(F) Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups;

(4) The standards and criteria for the reclassification or rezoning of important agricultural lands in section 205-50;

(5) The county general plan and all community, development, or community development plans adopted pursuant to the county general plan, as they relate to the land that is the subject of the reclassification petition; and

(6) The representations and commitments made by the petitioner in securing a boundary change. (HRS section 205-17)

5.1.2 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (HRS Chapter 205A) defines the coastal zone management area to include all the lands of the State, thereby subjecting all lands to the CZMA policies. The CZMA also delegates authority to the counties to define a Special Management Area that would be subject to regulatory control. Within the Site, the SMA averages approximately six hundred feet inland along the entire Site coastline (see Figure 19, Special Management Area (SMA)). The proposed master plan proposes no structures within the SMA; however, lot boundaries may extend into the SMA which require subdivision approval. To the extent that this or any other activity triggers the need for a Special Management Area Major Use Permit, the Applicant intends to apply for one concurrently with the Change of Zone application. There will not be a need for a shoreline setback variance since no structures are proposed within the 40' shoreline setback area.

The Draft EIS will discuss whether and how the proposed uses conform with the relevant objectives and policies of the CZMA.

5.1.3 Conservation District Use Application

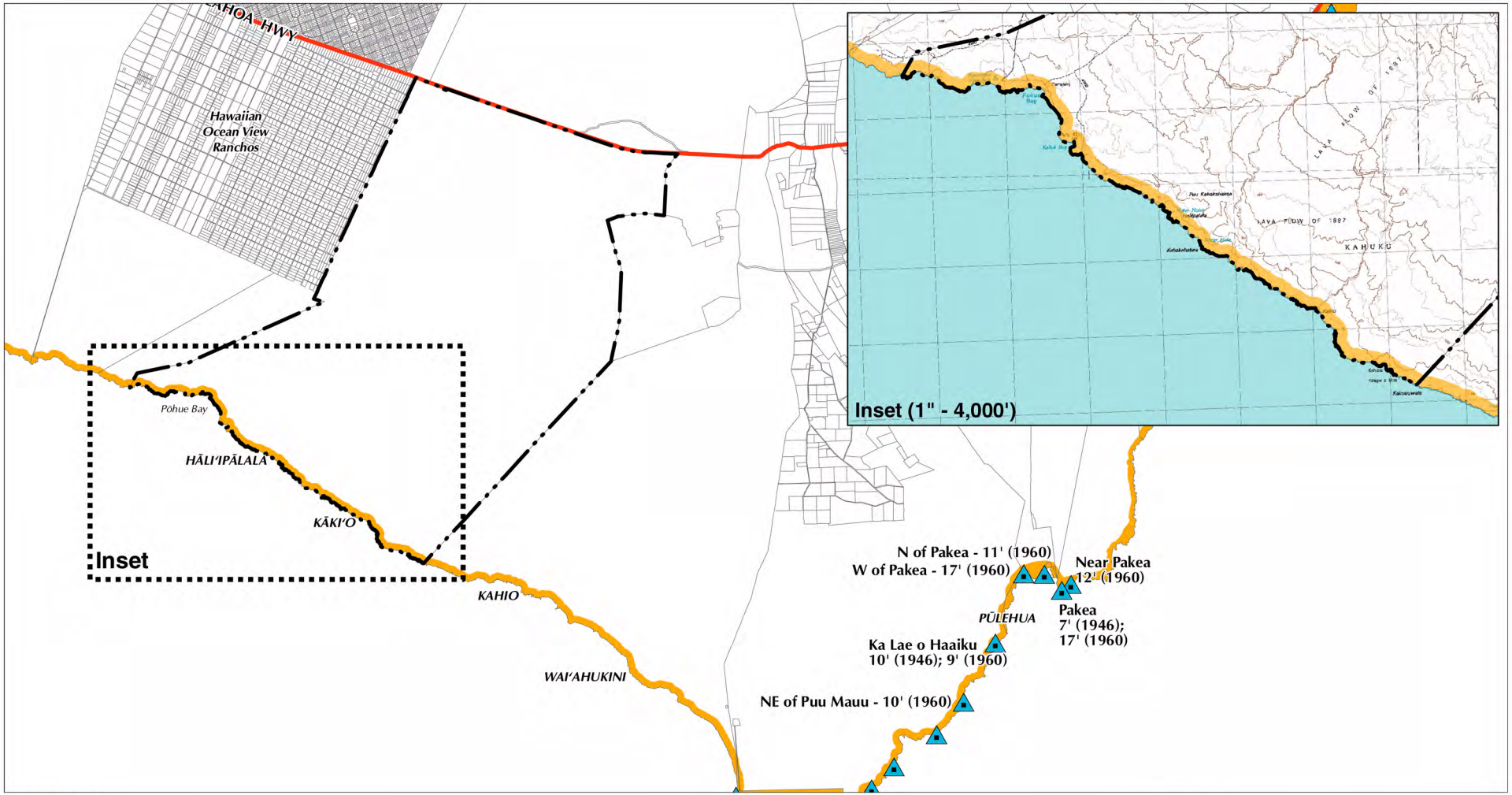
The State Department of Land and Natural Resources classifies all lands in the Conservation District into one of five subzones: Protective, Limited, Resource, General, and Special. The portion of the Site in the Conservation District is in the General Subzone. The objective of the General Subzone is "to designate open space where specific conservation uses may not be defined, but where urban use would be premature." (Hawai'i Administrative Rules section 13-5-14). The Conservation District Rules (Hawai'i Administrative Rules Title 13 Chapter 5) specify the permitted uses within each subzone. A specified use is either permitted with no permit, requires site plan approval, requires a departmental permit, or requires a board permit from the Board of Land and Natural Resources. For the Project, the proposed uses within the Conservation District are related to the Hawaiian Heritage Center or landscaping. According to the Conservation District Rules, research and education activities with incidental ground disturbance (e.g., posting of interpretive signs or installation of boardwalks) will require a departmental permit. Anchialine pond restoration may require a departmental permit. Landscaping involving more than 10,000 s.f. will require a departmental permit. Any other open space use "promoting natural open space and scenic value including those with accessory structures," except golf courses, requires a board permit (Hawai'i Administrative Rules section 13-5-25).

5.1.4 Hawai'i State Plan, Chapter 226, Hawai'i Revised Statutes

The *Hawai'i State Plan* (Chapter 226, HRS) establishes a set of goals, objectives and policies that serve as long-range guidelines for the growth and development of the State. The sections of the State Plan directly applicable to the proposed Project, along with a discussion of how the proposed Project conforms to the State Plan, will be included in the Draft EIS.

5.1.5 State Functional Plans

The *Hawai'i State Plan* directs State agencies to prepare functional plans for their respective program areas. There are 14 State Functional Plans that serve as the primary implementing vehicle for the goals, objectives, and policies of the *Hawai'i State Plan*. The functional plans applicable to the proposed Project, along with each plan's applicable objectives, policies, and actions will be discussed in the Draft EIS.



LEGEND

- Project Boundary
- Within the Special Management Area
- Tsunami Wave Heights

Source: County Planning Department (GIS); Tsunami Wave Runup Heights in Hawaii, May 1976
Disclaimer: This graphic has been prepared for general planning purposes only.

FIGURE
Special Management Area, Tsunami Wave Heights

NANI KAHUKU 'ĀINA

Nani Kahuku 'Āina, LLC — KA'Ū, HAWAI'I

NORTH

LINEAR SCALE (FEET)
0 3,500 7,000 14,000

PBR HAWAII & ASSOCIATES, INC.

FIGURE 19. Special Management Area (SMA)

5.2 COUNTY OF HAWAI'I

5.2.1 County of Hawai'i General Plan and Community Development Plans

The *County of Hawai'i General Plan (February 2005 as amended)* is a policy document adopted by ordinance intended to guide the long-range development of the island and county of Hawai'i. The plan contains goals, objectives, policies, courses of action, a land use map, and facilities maps.

The land use map, referred to as the *Land Use Pattern Allocation Guide (LUPAG) Map,* designates the Site as Open Space, Conservation, and Extensive Agriculture (Figure 20, Table 5-2). The Open Space and Conservation boundaries are coterminous with the existing State Conservation District. The Extensive Agricultural boundary is coterminous with the existing State Agricultural District.

To implement the proposed master plan, the Applicant will apply for a General Plan Amendment pursuant to section 16.2 of the General Plan (for "interim" as compared with "comprehensive review" amendments). This EISPN is submitted as part of the General Plan Amendment petition. However, the Planning Department will deem the application complete upon submittal of the Final EIS; hence, the Applicant understands that no further processing of the petition is expected to occur until the Final EIS has been accepted.

The proposed interim General Plan amendment is to the LUPAG Map (with associated updates to tables 14-4 and 14-5 that tabulate the acreage and urban uses from the LUPAG Map). There are no proposed text amendments to the General Plan goals, objectives, or policies. The affected map is LUPAG Map 23. The proposed amendment would result in Extensive Agriculture (10,970 acres), Open Space (720 acres), Medium Density Urban (280 acres), Urban Expansion (810 acres), Resort (Intermediate) (600 acres), Industrial (640 acres), and Rural (2,430 acres), with changes to the existing designations as follows:

Table 5-2. Proposed General Plan LUPAG Map Amendment

PROPOSED DESIGNATIONS	EXISTING DESIGNATIONS		
	Extensive Agriculture (approx. acres)	Conservation (approx. acres)	Open Area (approx. acres)
	8,310	**7,560**	**580**
MAKAI VILLAGE			
Resort		520	80
Rural		2420	10
Conservation			
Open Area		230	
Remaining in Existing Designation			490
SUBTOTAL		3,170	580
MAUKA VILLAGE			
Medium Density Urban	280		
Urban Expansion	810		
SUBTOTAL	1,090		
AGRICULTURAL LOTS			
Reclassified to Ext. Ag		3,750	
Remaining in Existing Designation	7,220		
AIRPORT			
Reclassified to Industrial		640	

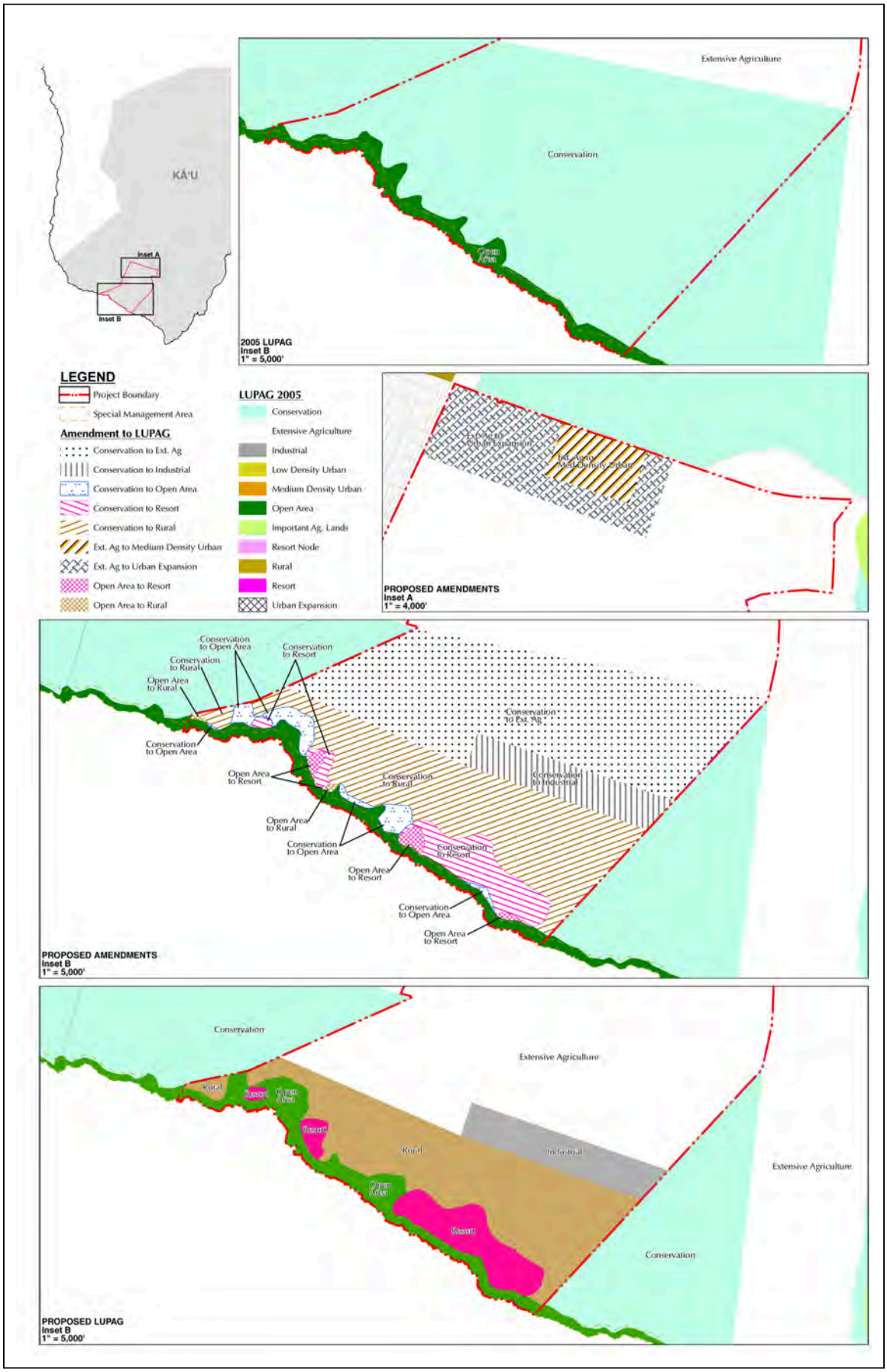


FIGURE 20. Proposed General Plan LUPAG Map Amendment

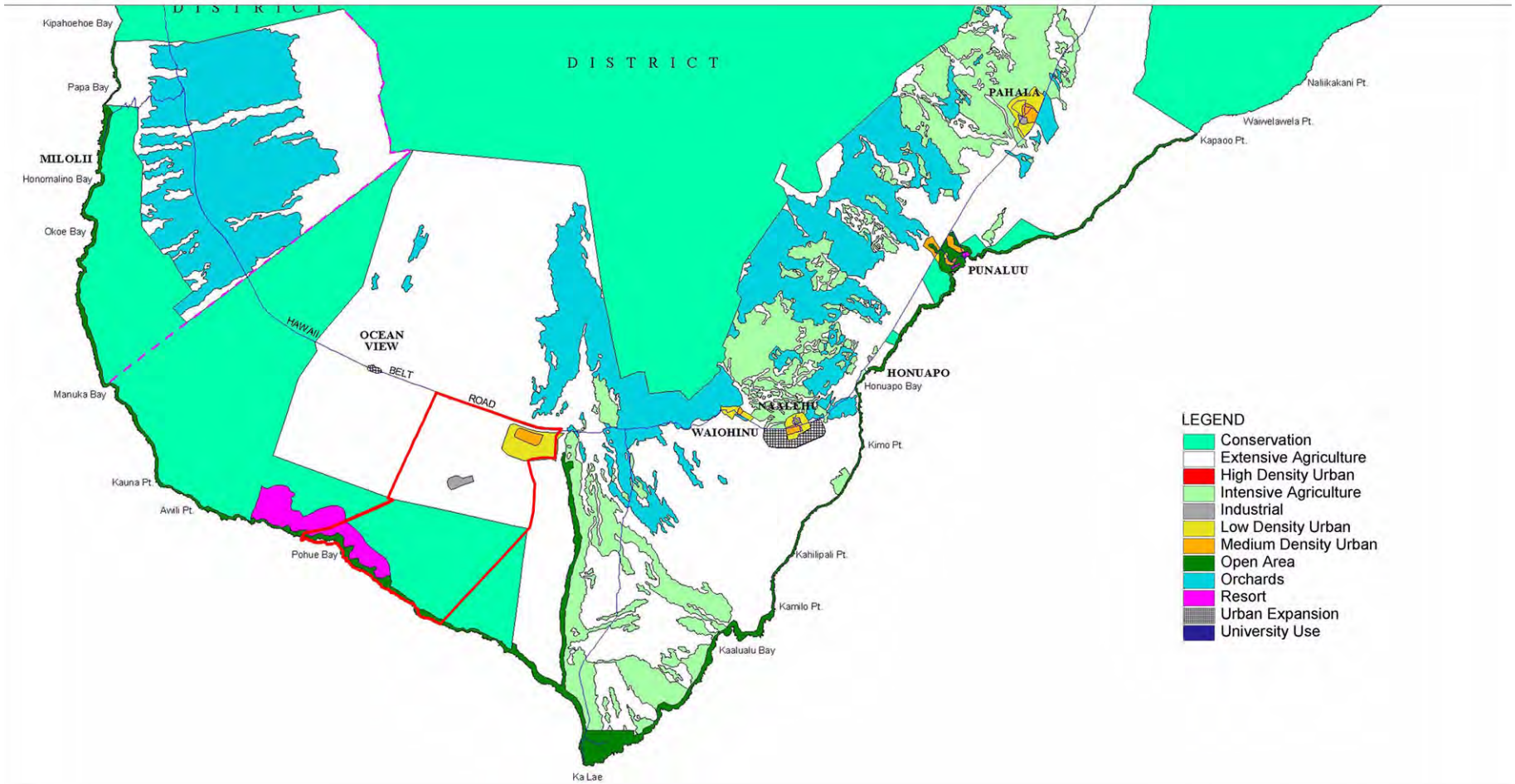
The current Open Space boundary approximates the SMA boundary, except in the locations of the littoral cinder cones and Pōhue Bay where the Open Space boundary is further inland than the SMA. Only a few changes are proposed to the Open Space boundary-- reduction in areas that are not resource-sensitive but suitable for development, and expansion in other areas to better encompass the littoral cones or other resources. The sensitive areas along the coast, such as the anchialine ponds, Pōhue Bay, littoral cinder cones, and sufficient setback for the Ala Kahakai lateral public access trail, are all encompassed and protected within the existing Open Space designation. Goals, objectives, and policies from the General Plan relevant to the proposed Project will be discussed in the Draft EIS.

Before the County amended the General Plan in 2005, the Site had similar LUPAG designations that are being requested, but at a more extensive scale and in more sensitive areas (see Figure 21, 1989 LUPAG Map). The differences between the 1989 LUPAG and the subject request are as follows:

- Makai area. Where the Resort designation in the 1989 LUPAG totalled approximately 6,000 acres centered around Pōhue Bay (including the area extending west outside the Site of which 890 acres are within the Site), the proposed designation in this request is for pockets of Resort away from Pōhue Bay totaling 600 acres. Rather than developing around Pōhue Bay, the subject request proposes to expand the Open Space or Conservation designation around Pōhue Bay. The subject request includes a Rural designation mauka of the proposed Resort areas for the planned golf course(s) and large residential lots. While this type of upscale large-lot golf course residential concept would be appropriate for a Resort designation, the Rural designation reduces the range of permitted uses and densities for this area compared to a Resort designation.
- Industrial area for airport. Where the 1989 LUPAG had an Industrial designation in the middle of the Petition Area for a planned airport, the subject request moves the proposed Industrial designation to the south where it would reduce intrusion onto the 1887 lava flow with more favorable topographic conditions.
- Mauka area. Where the 1989 LUPAG had medium- and low-density urban for a mauka village at the northeast corner of the Site, the subject rqeuest reduces the extent of the urban designation for a more compact village, and moves the location to the northwest corner of the Site where it can potentially tie into an existing settlement area (HOVE Ranchos) and avoid a potentially sensitive dryland forest kipuka at the northeast corner of the Site as well as a potential burial site.

Compared to the 1989 LUPAG designation, it seems the designations proposed in the subject request are more in in keeping with the social, cultural, historic, economic, and physical environment in furtherance of the General Plan policies.

The General Plan authorized the preparation of community development plans “to translate the broad General Plan statements to specific actions as they apply to specific geographical areas.” (Hawai‘i County General Plan section 15.1). The Site would be in the Ka‘ū Community Development Plan (Ka‘ū CDP) planning area. The planning process to develop the Ka‘ū CDP has just started. This planning process will track concurrently with the preparation of the Project’s EIS. The EIS will be the means to listen, incorporate, and revise the proposed plans to be consistent with the emerging Ka‘ū CDP.



LEGEND

Project Boundary

Source: County of Hawaii General Plan (1989)
Disclaimer: This graphic has been prepared for general planning purposes only.

County of Hawai'i General Plan (1989)

NANI KAHUKU 'ĀINA

Nani Kahuku 'Aina, LLC

NORTH

NOT TO SCALE

FIGURE 21. 1989 LUPAG Map

5.2.2 County of Hawai‘i Zoning

The zoning should be consistent with the General Plan. Hence, the existing zoning for the Site is consistent with the existing General Plan LUPAG designations: The General Plan Open and Conservation areas are zoned Open (O), and the Extensive Agricultural area is zoned Agricultural-20 (minimum 20-acre lot size) (see Figure 22).

If the General Plan Amendment is approved, then the Applicant will petition to rezone the Site to be consistent with the amended General Plan. To implement the proposed master plan, the Applicant intends to seek rezoning to a Project District to encompass all General Plan designations outside the Conservation and Open areas. Project Districts are “intended to provide for a flexible and creative planning approach rather than specific land use designations, for quality developments.” (HCC section 25-6-40) Any uses permitted in the Residential (RS, RD, RM), Commercial (RCX, CN, CG), or Resort (V) districts are permitted within a Project District, provided these uses are also consistent with the underlying General Plan and State Land Use designations. A master plan approved by the Planning Director would control the permitted uses and density.

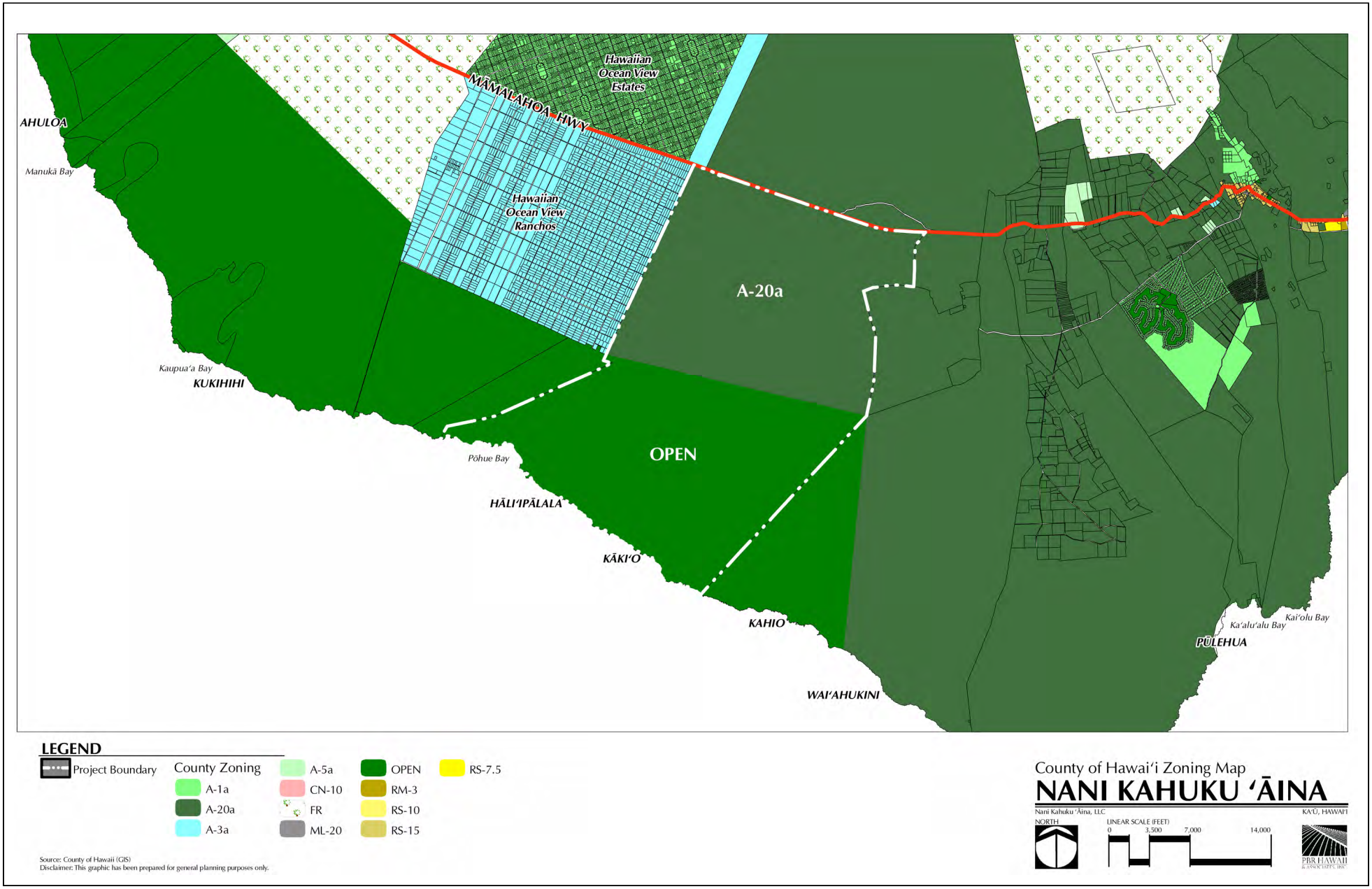


FIGURE 22. Existing Zoning

5.3 APPROVALS AND PERMITS

A listing of anticipated permits and approvals required for the Project is presented below sorted by project phase:

Table 5-3. List of Anticipated Permits and Approvals

Permit/Approval	Responsible Agency
Planning Phase Approvals	
General Plan Amendment	County Planning Commission/County Council
State Land Use District Boundary Amendment	State Land Use Commission
Change of Zone Request	County Planning Commission/County Council
Special Management Area Use Permit (Major)	County Planning Commission
Conservation District Use Permit	State Department of Land & Natural Resources
Design/Construction Phase Approvals	
Subdivision and/or Planned Unit Development (PUD) Approval	County Planning Department
Conservation District Use Application	State Department of Land & Natural Resources
FAA Form 7460-1 (Notice of Proposed Construction or Alteration)	Federal Aviation Administration
National Pollutant Discharge Elimination System (NPDES) Permits	State Department of Health
NEPA EA or EIS (for Federal airport approvals)	Federal Aviation Administration
Air Permits	State Department of Health, Clean Air Branch
Plan Approval	County Planning Department
Grading/Building Permits	County Department of Public Works
Approval for Wastewater Treatment Facility	State Department of Health
Underground Injection Control Permit	State Department of Health
Well Construction/Pump Installation Permits	State Commission on Water Resource Management
Permit to Perform Work within a State Right-of-Way	State Department of Transportation
Operational Phase Approvals	
Approval for sale and distribution of potable water	Public Utilities Commission
Approval for sale and distribution of energy	Public Utilities Commission
Approval for sale and distribution/collection of wastewater treatment services	Public Utilities Commission

CHAPTER

6

ALTERNATIVES TO THE PROPOSED ACTION

The Draft EIS will assess alternatives to the proposed action, including the "No-Action" alternative, as briefly described below.

6.1 NO ACTION ALTERNATIVE

Under the No Action alternative, the Draft EIS will identify the range of possible uses permitted under the existing State Land Use, General Plan, and zoning designations. The Site would remain in its current state. The analysis will also cover the foregone potential beneficial impacts from the proposed Project. The No Action alternative will result in continued negative employment and socio-economic impacts to existing residents and their families within the District of Ka'ū. This will be offset somewhat by leaving the property in its mostly unused state, a large expanse of undeveloped lava fields, occasionally traversed by those doing research or fishing and camping (with permission).

In comparison, the Project will provide back-up emergency services, a regional airport or helipad, medical facilities, housing, recreational facilities, access to recreational and cultural facilities, research and education facilities as well as employment opportunities to local residents. There will be market priced homes and affordable homes that will contribute to the local economy through expenditures associated with construction (as well as repairs and remodeling) and subsequently through the generation of property taxes. The proposed Project will provide an economic environment that allows new, expanded, or improved economic opportunities that are compatible with the County's cultural, natural and social environment that provide residents with more occupation choices. This Project would provide job opportunities both during construction and at full build-out. The Project would create jobs necessary for the operation and maintenance of resort facilities, wastewater treatment plant, power generation facilities, water treatment plant, airport facilities, and medical facilities. The development of the Kahuku Village will also produce job opportunities in the education, commercial and industrial sectors significantly diversifying economic opportunities in Ka'ū. Currently there are limited employment opportunities in the region. This Project will provide both Ka'ū and neighboring Puna District residents with alternatives to driving to Kona-Waikoloa or Hilo for employment.

6.2 ADDITIONAL ALTERNATIVES

The Draft EIS will analyze the advantages and disadvantages of other development concepts considered for the Site. Some of these alternatives concepts include:

- Development of 400 agriculture lots based on existing zoning without provisions to provide additional services for this Project or the underserved communities in the Hawaiian Ocean View Estates, and Hawaiian Ocean View Ranchos or the remainder of the Ka‘ū District.;
- Alternative locations for the airport or no airport facilities;
- Higher or lower density resort;
- Reduced densities for all components;
- Alternative construction methods (e.g., alternatives to blasting).

CHAPTER

7

SIGNIFICANCE FINDINGS AND DETERMINATION

Based upon the assessment in this EISPN, the Planning Department as the accepting agency, has determined that the Project has the potential to cause significant impacts and has therefore required that an EIS be prepared. The findings below support this determination and relate to the significance criteria set forth in HAR Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 200.

Potential significant impacts include:

- May substantially (positively) affect the economic or social welfare of the community or state;
- May involve secondary impacts, such as population changes or effects on public facilities;
- May increase the range of beneficial uses of the environment;
- May have a considerable effect upon the environment or involves a commitment for larger actions;
- May impact air quality;
- May impact ambient noise levels in the vicinity of the proposed airport and flight path;
- May substantially affect scenic vistas and viewplanes identified in county or state plans or studies;
- May affect, or be likely to suffer damage by being located within an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;
- Will result in additional energy consumption.

Potential impacts that are likely to be avoided or mitigated include:

- Is not likely to involve an irrevocable commitment to loss or destruction of any natural or cultural resources;
- Is not likely to conflict 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;
- Is not likely to substantially affect public health;
- Is not likely to involve a substantial degradation of environmental quality;
- Is not likely to substantially affect a rare, threatened, or endangered species, or its habitat;
- Is not likely to detrimentally affect water quality;

CHAPTER

8

CONSULTATION

8.1 PRE-ASSESSMENT CONSULTATION

In the course of planning for the proposed Project and preparing this EISPN, the following agencies or individuals were consulted and/or provided information and comments:

Federal

- Natural Resources Conservation Service
- U.S. Geological Survey, Hawaiian Volcano Observatory
- National Park Service, Ala Kahakai Trails

State of Hawai‘i

- Department of Agriculture
- Department of Business Economic Development & Tourism (DBEDT), Office of Planning
- Department of Hawaiian Home Lands
- Office of Hawaiian Affairs
- Land Use Commission
- Department of Transportation
- University of Hawai‘i at Hilo
- University of Hawai‘i at Mānoa
- Department of Defense, Office of the Adjutant General

Hawai‘i County

- Planning Department
- Department of Public Works
- Department of Water Supply
- Mayor
- Fire Department
- Police Department
- Council Members

Other

- Ka‘ū Hawaiian Civic Club
- Ka‘ū Preservation Council
- Ka‘ū Chamber of Commerce
- Hawaiian Ocean View Ranchos Road Maintenance Corporation
- Hawaiian Ranchos Community Association
- Ocean View Community Association
- Ocean View Community Development Corporation
- Ocean View Neighborhood Watch
- Nā‘ālehu Main Street
- Kona Historical Society

8.2 EIS CONSULTATION

In addition to those listed above, the following individuals and organizations will be consulted in preparation of the EIS, and the EISPN will be sent to them. Comment letters received for the EISPN will be included in the Draft EIS. If other stakeholders should be consulted who may be impacted by the Project or could provide information to better assess the Project, please notify the Applicant or EIS Consultant.

Federal

- U.S. Army Corp. of Engineers Division
- U.S. Department of the Interior, Fish and Wildlife Service
- National Park Service, Volcanoes National Park

State of Hawai‘i

- DBEDT Energy, Resources & Technology Division
- Department of Education
- Department of Health (DOH)
- DOH Office of Environmental Quality Control
- Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands
- DLNR Historic Preservation Division
- University of Hawai‘i at Mānoa (UHM) Environmental Center
- Department of Defense, Office of Veterans Services
- Department of Natural Resources, Na Ala Hele Program

County of Hawai‘i

- Civil Defense
- Department of Environmental Management
- Department of Parks and Recreation
- Mass Transit Agency
- Department of Research and Development

- Ka‘ū Community Development Plan Steering Committee

Utilities

- Hawai‘i Electric Light Company (HELCO)
- Hawaiian Telcom
- Oceanic/Time Warner Cable

CHAPTER

9

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