UNIVERSITY OF THE NATIONS, KONA
2020 MASTER PLAN UPDATE

Kailua-Kona, Island of Hawai‘i, Hawai‘i

TMK (3) 7-5-010:085 and (3) 7-5-017:006

ENVIRONMENTAL PLANNING REPORT

Prepared For:

University of the Nations, Kona Campus
75-5952 Kuakini Highway
Kailua-Kona, HI 96740

Prepared By:

G70
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Honolulu, Hawai‘i 96813

March 2020

EXHIBIT 3

Table of Contents

List of Figures

List of Tables

Appendices

A. Natural Resources Surveys for University of Nations Expansion Property (TMK: (3) 7-5-010:085) North Kona District, Island of Hawai‘i, AECOS Inc., January 2020.

B. Mobility Analysis Report for the University of the Nations Kona Master Plan Update, Kona, Hawai‘i, Fehr & Peers, Inc., February 2020.

C. Preliminary Infrastructure Assessment, University of the Nations Master Plan Update, G70, February 2020.

D. Water Supply Study for the Planned Expansion of University of the Nations, Kona, Hawai‘i, Tom Nance Water Resource Engineering, February 2020.

E. An Archaeological Inventory Study of TMKs: 3-7-5-10:85 and 3-7-5-17:06, Wai‘aha Ahupua‘a, North Kona District, Island of Hawai‘i, Retchman Consulting, 2003.

F. SHPD Approval Letter for Chapter 6E-42 Historic Preservation Review of a Final Report RC-0153: “An Archaeological Inventory Survey of TMK’s: 3-7-5-10:85 and 3-7-5-17:06” (Clark and Retchman, 2003) Wai‘aha, North Kona, Hawai‘i Island, Dated November 17, 2003.

G. Burial Site Component of a Preservation Plan for Three Sites in the Proposed Hualālai Village Development Area (TMKs: 3-7-5-10:85 and 3-7-5-17:06) Wai‘aha Ahupua‘a, North Kona District, Island of Hawai‘i, Rechtman Consulting, September 2003.

H. SHPD Approval Letter for DRAFT Burial Treatment Plan for Three Sites in the Proposed Hualālai Village Development Area Located in Wai‘aha Ahupua‘a, North Kona District, Island of Hawai‘i, TMK: (3) 7-5-010:085 and (3) 7-5-017:006, Dated August 20, 2019.

I. Archaeological Data Recovery at Ten Sites on TMKs: 3-7-5-10:85 and 3-7-5-17:06, Wai‘aha Ahupua‘a, North Kona District, Island of Hawai‘i, Rechtman Consulting, October 2007.

J. Preservation Plan for SIHP Site 6032 and Site 23681 (TMKs: 3-7-5-10:085 and 3-7-5-17:006) Wai‘aha 1st Ahupua‘a, North Kona District, Island of Hawai‘i, Rechtman Consulting, October 2013.

K. SHPD Approval Letter for Chapter 6E-42 Historic Preservation Review – Revised Archaeological Preservation Plan for the University of the Nations, Wai‘aha Ahupua‘a, North Kona District, Island of Hawai‘i, TMK: (3) 7-5-010:085 and 7-5-017:006 (portion), Dated June 19, 2014.

L. Dismantling/Restoration Plan for a Portion of the Kuakini Wall (SIHP 5-10-28-6302) TMKs: (3) 7-5-010:085 and (3) 7-5-017:006, Wai‘aha 1st Ahupua‘a, North Kona District, Island of Hawai‘i, ASM Affiliates, September 2019.

M. Cultural Impact Assessment for the Update to the Master Plan for the Proposed 62-Acre Hualālai Village-Pacific Islands Cultural Center Development, Wai‘aha, Kona District, Island of Hawai‘i, TMK (3)-7-5-10:085; 7-5-17:006, Originally Prepared by Group 70 International, Inc., Updated by ASM Affiliates, February 2020.

N. Ka Pa‘akai O Ka ‘Aina Analysis, University of the Nations, TMKs: (3) 7-5-010:085 and (3) 7-5-017:006, ASM Affiliates, February 2020.

Section 1

Project Summary

1.0 Project Summary

In 2003, the University of the Nations, Kona, Inc. (“U of N Kona”) was granted a State Land Use (“SLU”) District Boundary Amendment in LUC Docket No. A02-737 to reclassify approximately 62 acres of land in Kailua-Kona, North Kona District, County and Island of Hawai‘i, from the SLU Agricultural District to the SLU Urban District ("Petition Area"). U of N Kona is filing a Motion to Amend the Findings of Fact, Conclusions of Law, and Decision and Order for a State Land Use District Boundary Amendments filed on August 8, 2003 ("Motion to Amend"). The Motion to Amend is being filed to revise the land use plan and development proposal for the Petition Area described herein and shown on U of N Kona's 2020 Master Plan Update (*Figure 2-2*), which generally provides for the expansion of the U of N Kona's present campus, to include a lower, middle and high school, as well as an athletic center, Discipleship Learning Center, dormitories, and supportive facilities. The following summary provides an Environmental Planning Report for the Petition Area, including the technical studies in support of the Motion to Amend.

1.1 Project Information Summary

Project Name:	University of the Nations, Kona 2020 Master Plan Update
Prepared for:	University of the Nations, Kona, Inc. 75-5851 Kuakini Highway Kailua-Kona, HI 96740
Agent:	G70 111 S. King St., Suite 170, Honolulu, HI 96813 Contact: Jeff Overton, Principal Telephone: (808) 523-5866
Project Location:	University of the Nations, Kona, Inc. 75-5943 & 75-5911 Kuakini Highway Kailua-Kona, HI 96740
Tax Map Keys (TMK):	(3) 7-5-010:085 and (3) 7-5-017:006
Project Area:	62-acres
State Land Use District:	Urban (Reclassified from Agricultural to Urban in 2003)
County of Hawai‘i Zoning:	TMK (3) 7-5-010:085, A-1a, Agricultural District TMK (3) 7-5-017:006, RD-3.75 and RS-7.5, Residential District
County of Hawai‘i General Plan:	Medium Density Urban Development
Special Management Area:	Not Within SMA
Flood Zone:	Zone X (Outside 500-year Floodplain)

1.2 Location and Property Description

The Petition Area is located on the west coast of the Island of Hawai'i, approximately one mile southeast of the town center of Kailua-Kona, in the North Kona District (*Figure 1-1*). The Petition Area is within the traditional moku of Kona and ahupua'a of Wai'aha 1st on the lower western slopes of Mount Hualālai. The Petition Area is approximately 62 acres in size and presently identified by Tax Map Key Nos.: (3) 7-5-010:085 and 7-5-017:006 (*Figure 1-2*).

The Petition Area is generally gently sloped at an elevation ranging from approximately 100 to 360 feet, rising in elevation from approximately 100 feet at Kuakini Highway to 360 feet with steeper slopes on the upper mauka side just below Hualālai Road. The parcels in the vicinity of the Petition Area are classified in the SLU Urban District. The Petition Area is bordered by Kuakini Highway on the west, Queen Ka'ahumanu Highway and Hualālai Road on the east, another parcel owned by U of N Kona ("Existing Campus Site") on the north and the Kona Hillcrest subdivision on the south.

1.3 Land Ownership and Background

The Petition Area is owned in fee simple by U of N Kona, a Hawai'i 501(c)(3) non-profit corporation and mission-based educational institution. U of N Kona was founded in 1978 and serves as a training center to prepare followers for Christian service throughout the world, specifically for Asia and the Pacific. Unique in the field of higher education, this non-traditional, globally networked learning center offers learning opportunities for emerging Christian leaders with branches in 1,200 locations with programs in over 100 languages around the world.

In 2000, U of N Kona purchased the 62-acre Petition Area immediately adjacent to the Existing Campus Site. Under the University of the Nations, Bencorp ("U of N Bencorp"), a 501(c)(2) title holding company, the planned Hualālai Village Development Project was proposed for the Petition Area. In 2003, U of N Bencorp was granted a SLU District Boundary Amendment to reclassify the Petition Area from the SLU Agricultural District to the SLU Urban District for the Hualālai Village Development Project. In 2005, U of N Bencorp changed its name to "AEKO Hawai'i." In 2011, AEKO Hawai'i transferred the Petition Area by deed to Ka 'Ohana Wai'aha, a Hawai'i nonprofit corporation and land trust created by U of N Kona for the purpose of providing housing to U of N Kona faculty and staff. In 2018, Ka 'Ohana Wai'aha transferred the land by deed to U of N Kona.

1.4 Overview of Proposed Project

The 2020 U of N Kona Master Plan Update was prepared for U of N Kona by G70 and includes plans for the Petition Area as well as the Existing Campus Site. Its purpose is to update the Master Plan and to reflect current and upcoming priorities since the 2002-2005 master planning and land use entitlements period. Future buildings and projects planned in 5-10 year phases are projected into the 2020 U of N Kona Master Plan Update.

Projected future buildings and projects fall into three categories:

- Phase 1: Planning Program Projects anticipated for development within the next 5-10 years.
- Phase 2: Planning Program Projects anticipated for development beyond the 10-year period.
- Phase 3: Planning Program Projects anticipated for development beyond the 20-year period.

Proposed buildings and projects for the Petition Area are as follows:

Petition Area Phase 1 – Within 5-10 Years

- Discipleship Learning Center:
  - Chapel
  - Instruction Building
  - Student Resident Dormitory Buildings
  - Parking Areas for Instruction and Dormitory Buildings
- Athletic/Training Complex:
  - Gymnasium and Locker Rooms
  - Athletic Practice Field
  - Parking Areas for Athletic/Training Complex
- Lower School:
  - Instruction Building
  - Playground/Field
  - Drop-off and Parking Area
- Archaeological Preservation Sites:
  - Restoration of Identified Burial Sites
  - Installation of Rock Walls, Permanent Preservation Buffers for Identified Burial Sites
  - Kuakini Wall Dismantling/Restoration Plan
- Agricultural Exhibit:
  - Garden and Food Forest
  - Instruction Building, Plant Nursery & Storage Sheds
- Maintenance and Storage Facilities:
  - Maintenance Shops and Storage Warehouse
  - Delivery, Loading and Parking Area
- Roadways and Pathways:
  - Connections to Center "Spine" Road and Existing Access Points/Driveways
  - ADA Compliant Pathways
- Open Space Areas and Landscaping

Petition Area Phase 2 – Beyond 10 Years

- Discipleship Learning Center:
  - Student Resource Center
  - Instruction Building
  - Student Resident Dormitory Buildings
  - Parking Area for Instruction and Dormitory Buildings
- Athletic/Training Complex:
  - Athletic/Soccer Field
  - Athletic Courts
  - Athletic Building and Locker Rooms
  - Aquatic Center: Warm-up Pool
- Discovery Center:
  - Entry Exhibit Building
  - Driveway and Parking Area
- Lower School:
  - Instruction Buildings
  - Lower Field

- Middle School:
  - Instruction Buildings
  - Lower Field & Athletic Courts
  - Drop-off/Parking Area
- High School:
  - Instruction Buildings & Gymnasium/Cafetorium
  - Upper Field & Athletic Courts
  - Drop-off/Parking Area
- Youth Camp:
  - Cabins
- Maintenance and Storage Facilities:
  - Maintenance Shops and Storage Warehouse
  - Garage and Storage Warehouse
  - Food and Supply Storage Warehouse
- Roadways and Pathways:
  - Kuakini Highway Entry, Connection to Center "Spine" Road, Periphery Campus Road
  - ADA Compliant Pathways
- Open Space Areas and Landscaping

Petition Area Phase 3 – Beyond 20 Years

- Discipleship Learning Center:
  - Instruction Buildings
  - Café/Outdoor Dining Space
  - Outdoor Terraced-Gathering Space
  - Student Resident Dormitory Buildings
  - Private Park/Open Space Area
  - Parking Area for Instruction and Dormitory Buildings
- Athletic/Training Complex:
  - Aquatic Center: Pool Complex & Parking Area
- Discovery Center: Exhibit Buildings
- Lower, Middle & High School:
  - Instruction Buildings
- Youth Camp:
  - Cabins
- Vocational Training and Future Expansion Area
- Roadways and Pathways:
  - Connections and Periphery Campus Road
  - ADA Compliant Pathways
- Open Space Areas and Landscaping

1.5 Purpose of Environmental Planning Report

This Environmental Planning Report is being submitted in conjunction with the Motion to Amend. This Environmental Planning Report was prepared for the Petition Area encompassed within the 2020 U of N Kona Master Plan Update.

1.6 Supportive Technical Studies and Investigations

For the Environmental Planning Report, additional technical resource surveys and investigations include:

- Natural Resources Surveys for University of Nations Expansion Property, TMK: (3) 7-5-010:085, North Kona District, Island of Hawai'i, AECOS Inc., January 2020.
- Mobility Analysis Report for the University of the Nations Kona Master Plan Update, Kona, Hawai'i, Fehr & Peers, Inc., February 2020.
- Preliminary Infrastructure Assessment, University of the Nations Master Plan Update, G70, February 2020.
- Water Supply Study for the Planned Expansion of University of the Nations, Kona, Hawai'i, Tom Nance Water Resource Engineering, February 2020.
- Archaeological Inventory Study of TMKs: 3-7-5-10:85 and 3-7-5-17:06, Wai'aha Ahupua'a, North Kona District, Island of Hawai'i, Retchman Consulting, 2003.
- Burial Site Component of a Preservation Plan for Three Sites in the Proposed Hualālai Village Development Area, TMKs: 3-7-5-10:85 and 3-7-5-17:06, Wai'aha Ahupua'a, North Kona District, Island of Hawai'i, Retchman Consulting, 2003.
- Archaeological Data Recovery at Ten Sites on TMKs: 3-7-5-10:85 and 3-7-5-17:06, Wai'aha Ahupua'a, North Kona District, Island of Hawai'i, Retchman Consulting, October 2007.
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- Ka Pa'akai O Ka 'Aina Analysis, University of the Nations, TMKs: (3) 7-5-010:085 and (3) 7-5-017:006, ASM Affiliates, February 2020.

1.7 Agencies, Organizations and Individuals Consulted

The following agencies and groups with jurisdiction or interest have been consulted in the preparation of the Environmental Planning Report for the proposed action.

State of Hawai'i Agencies

Department of Business, Economic Development & Tourism – Land Use Commission
Office of Planning – Land Use Division
Department of Land and Natural Resources – Historic Preservation Division
Department of Transportation – Highways Division
Department of Health
Department of Agriculture

County of Hawai'i Agencies

Department of Public Works
Department of Water Supply
Department of Environmental Management
Police Department
Fire Department
Department of Finance – Real Property Tax Division

Community Groups/Individuals

Civil Defense
Office of Housing and Community Development
Kailua Village Design Commission

Figure 1-1 **Project Location Map**

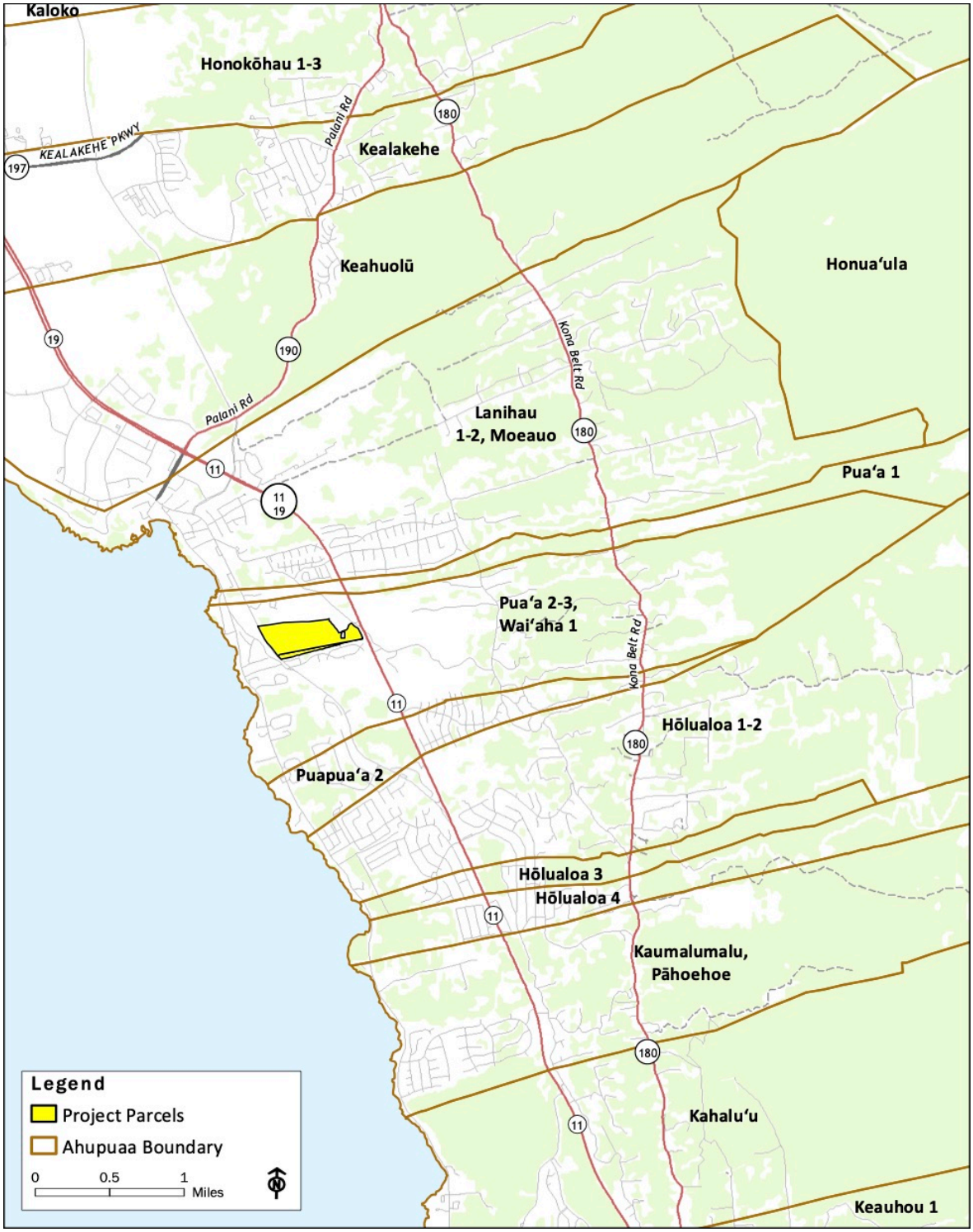


Figure 1-2 **Moku and Ahupua'a Map**

Figure 1-3 **TMK Parcel Map**

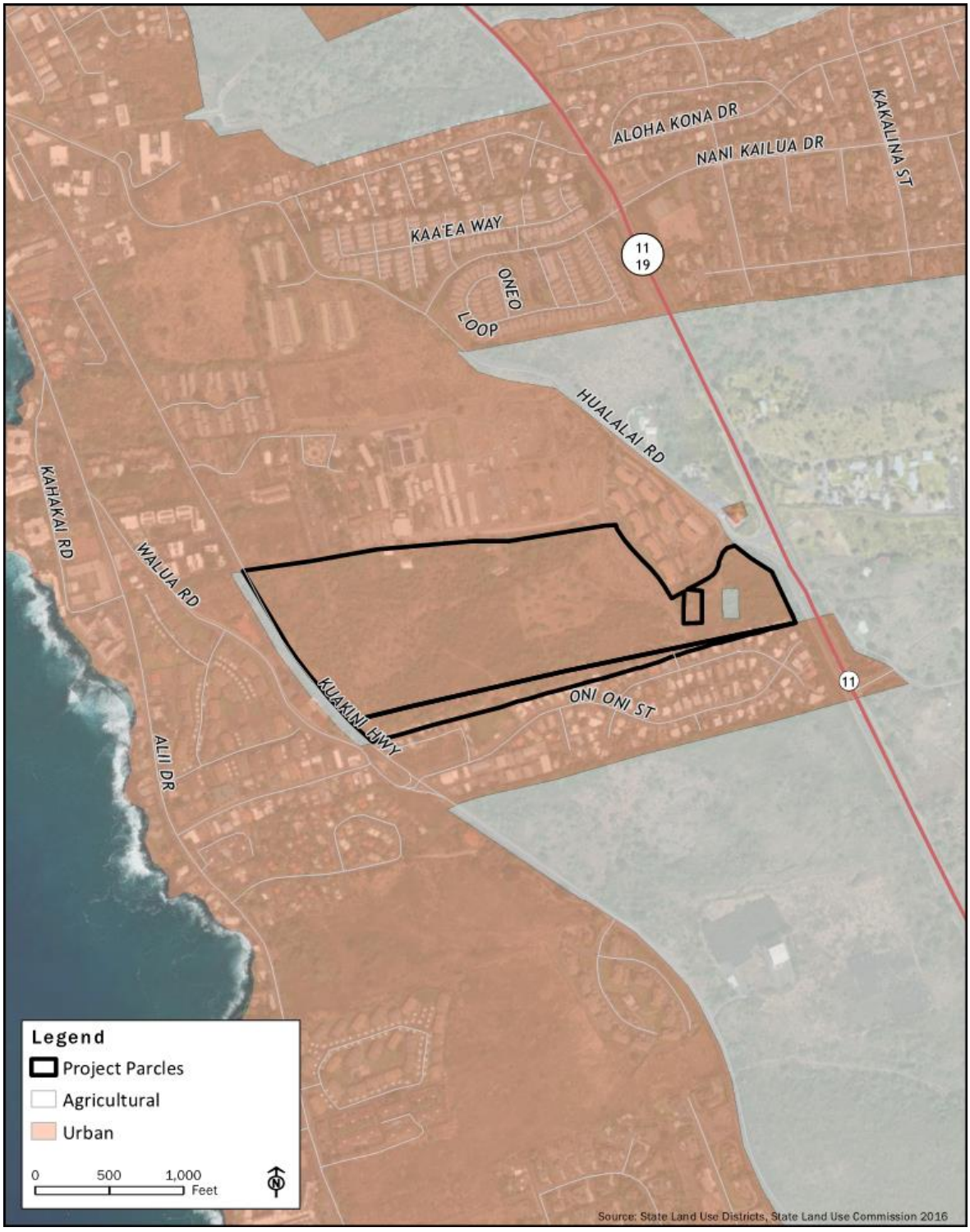


Figure 1-4 **State Land Use District Designation Map**

Figure 1-5 **County of Hawai'i Zoning Map**

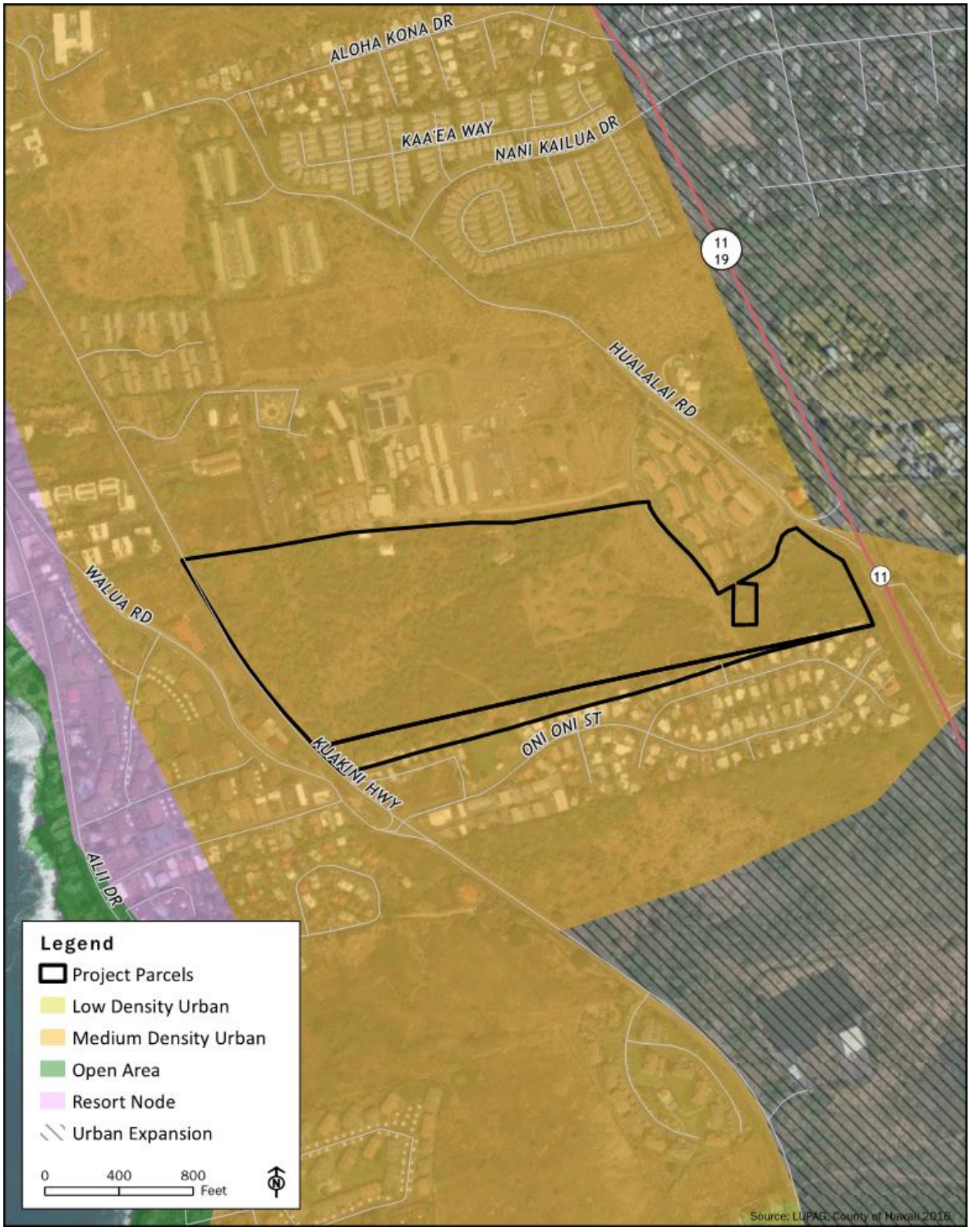


Figure 1-6 **Land Use Pattern Allocation Guide (LUPAG) for Island of Hawai'i**

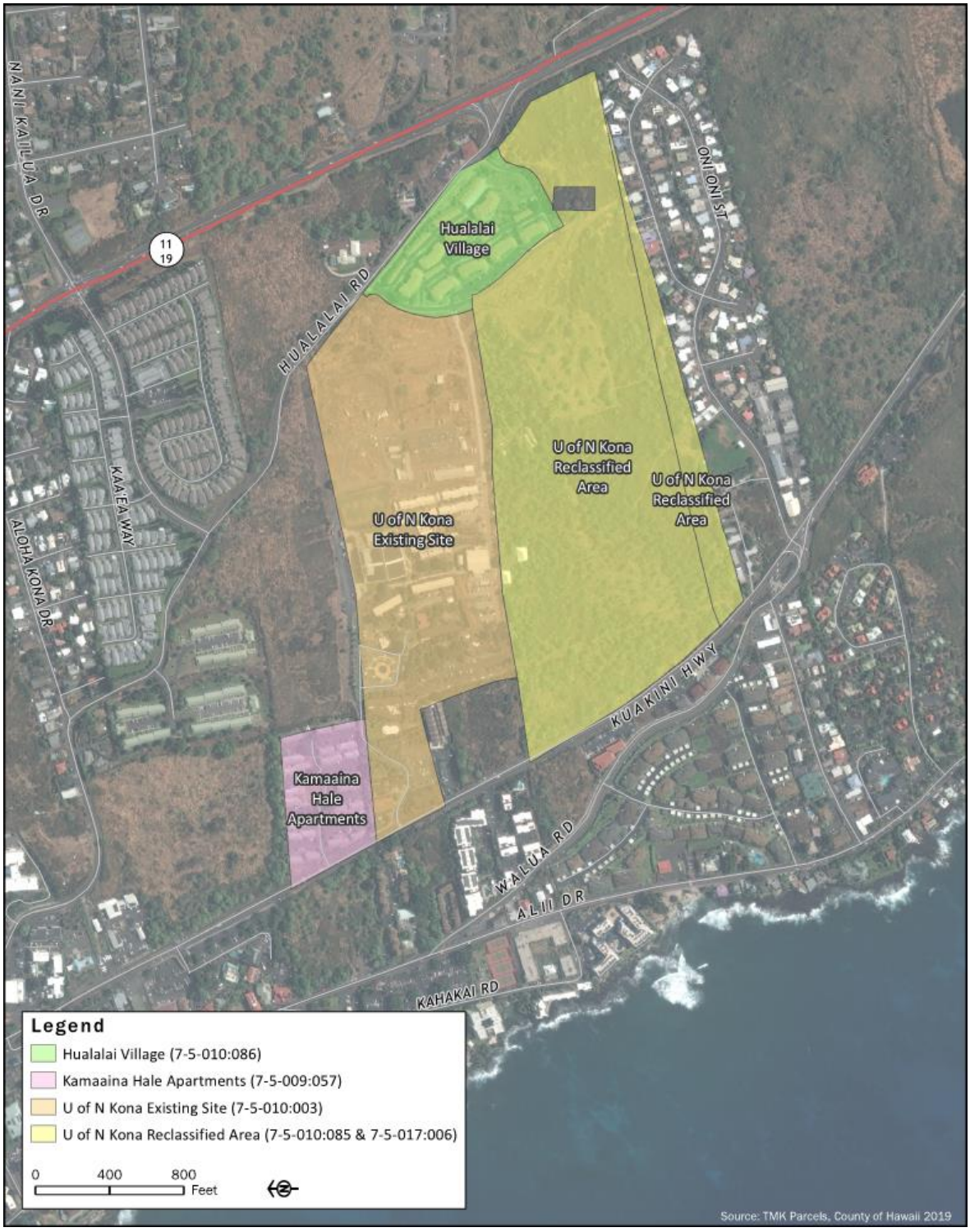


Figure 1-7 **U of N Kona Land Ownership Map**

Section 2

Project Description

2.0 Project Description

2.1 U of N Kona Existing Site & Program

U of N Kona was founded in 1978 at its permanent 45-acre Existing Campus Site in Kona. U of N Kona serves as a training center to prepare followers for Christian service throughout the world, specifically for Asia and the Pacific. Unique in the field of higher education, this non-traditional, globally networked learning center offers learning opportunities for emerging Christian leaders with branches in 1,200 locations with programs in over 100 languages around the world.

2.2 Summary of 2003 U of N Kona 62-Acre Hualālai Village Project State Land Use Commission, Urban Reclassification

In 2000, U of N Kona purchased the 62-acre Petition Area adjacent to the Existing Campus Site. Under U of N Bencorp, the planned Hualālai Village Development Project was proposed for the 62-acre Petition Area. In 2003, U of N Bencorp was granted a SLU District Boundary Amendment to reclassify the Petition Area from the SLU Agricultural District to the SLU Urban District for the Hualālai Village Development Project. In 2005, U of N Bencorp changed its name to AEKO Hawai‘i and ultimately transferred the land by deed to U of N Kona.

The vision of the planned Hualālai Village Development Project proposed for the 62-acre Petition Area was focused on the economic benefit that the planned market-rate condominiums and for-profit Pacific Cultural Center could bring. Soon after the reclassification of the 62-acre Petition Area was granted, U of N Kona began to have financial strain derived from the Hualālai Village Development Project business model. During this time, in 2006 U of N Kona filed a Motion to Amend, but the hearing on the 2006 Motion to Amend was not concluded and no action was taken. In the interim, U of N Kona realized the need to realign itself with the mission’s original faith-based value system, a system focused on service rather than financial gain.

Outside of the Petition Area, Hualālai Village Phase 1 is located on 5 acres subdivided from the U of N Kona’s original 45-acre Existing Campus Site and consists of eight residential apartment buildings with a total of 105 condominium housing units. Three of the buildings were sold in fee simple on the open market and the remaining five buildings have been transferred to Ka ‘Ohana Wai‘aha, a non-profit land trust, management company and home owners association.

Phases 2-4 of the Hualālai Village Development Project were originally proposed on 31 acres of the Petition Area, and would have included approximately 21 two-three story residential apartment buildings, with a total of 297 market-rate condominium housing units. Also, within the Petition Area, the Hualālai Village Development Project was to include a for-profit Pacific Cultural Center, which was to include an outside performance arena, museum complex, restaurant and shops on 26.5-acres of the Petition Area. The Hualālai Village Development Project also proposed development of an educational facility to support U of N Kona’s mission on 5-acres of the Petition Area.

2.3 2020 U of N Kona Master Plan Update

The 2020 U of N Kona Master Plan Update builds on planning principles and concepts based on the mission's faith-based value system. Its purpose is to update the plan for the 62-acre Petition Area to reflect current and upcoming priorities and to outline the expansion of the Existing Campus Site. Future buildings and projects, planned on the Existing Campus Site as well as on the Petition Area, are included in the 2020 U of N Kona Master Plan Update. The update incorporates several new themes developed through a process of consultation with the U of N Kona founders and representatives.

Cultural Context for Master Plan – Kailua-Kona Setting

Located within the ahupua'a of Wai'aha 1st on the lower western slopes of Mount Hualālai within the traditional moku of Kona, U of N Kona serves as a premier globally networked learning center to prepare followers for Christian service throughout the world. Wai'aha – which means "gathering water" in Hawaiian – reflects the ideas, hopes and dreams of what U of N Kona's founders and representatives envisioned during the planning and design phases of the 2020 U of N Kona Master Plan Update. U of N Kona is envisioned as a place for coming together or "gathering" to broaden the scope of evangelistic endeavors and prepare followers for Christian service with spiritual, cultural, intellectual, and professional training.

The 2020 U of N Kona Master Plan Update is envisioned as a sustainable campus environment that provides a mission-based setting for its faculty and student population that incorporates the unique historical and cultural legacy specific to the Petition Area, Wai'aha Ahupua'a and the greater Kona Region. Preservation and restoration of significant cultural resources within the Petition Area are highlighted and interpreted as focal features in the design. A historical walk is planned, connecting the idea of "gathering water" to a landscape feature envisioned as a dry-stream bed. The proposed dry-stream bed is planned to begin at the Existing Campus Site, meander through the site and connect to the principal gathering area proposed for the Petition Area, the Chapel. The central gathering area at the Chapel is envisioned as the "Piko" of the campus. The design of the Chapel is encircled by a stepped water feature and complemented with a natural, terraced seating area for gathering, featuring views of the campus and Kona Coast.

The 2020 U of N Kona Master Plan Update prioritizes historical restoration of identified cultural sites at the Petition Area. The planned restoration includes installation of rock walls along permanent preservation easement buffers at each of the cultural sites, connecting pathways, and preservation of access and trails. To feature the historical significance of the sites, traditional Hawaiian Hale structures are designed to complement the historical restoration and interpretation of the cultural sites. Overall, the proposed development incorporates guiding cultural principles in the physical design of the facilities and the surrounding landscape in the selection of appropriate plantings and exterior features.

The 2020 U of N Kona Master Plan Update includes guidelines to address building design, as well as guidelines for sustainability and landscape design. Strategically, the architectural design amends to the natural terrain of the topography, incorporating a natural integration with the Petition Area. A unified architectural theme is established to ensure that the buildings are scaled to reflect a distinct sense of place of the Kona Region.

Proposed buildings will be designed to be flexible and accommodate diverse space needs, creating an environment that comfortably supports innovative teaching, learning opportunities, and gathering

venues. The 2020 U of N Kona Master Plan Update incorporates green building design using water saving features and energy saving features, such as photovoltaic panels and green roofs. In addition, the proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that complements the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation.

Much of the proposed design for the Petition Area reflects and capitalizes upon the beauty of the surrounding Kona Region. The spaces between buildings are envisioned as either "outdoor rooms" functioning in concert with indoor spaces as venues for learning, gathering, recreation, or as outdoor corridors. Outdoor open spaces or "outdoor rooms" linked through a pedestrian network is envisioned to create outdoor learning environments that promote interaction between students and faculty. The 2020 U of N Kona Master Plan Update strives to embrace all elements of sustainability, and its architecture, open space, and landscape will work together to foster a Hawaiian sense of place that is also reflective of the Kona region, both its natural attributes and its cultural history.

Figure 2-1 2020 U of N Kona Master Plan Update, Conceptual Rendering (G70, February 2020)

2.4 2020 U of N Kona Planning Program

The 2020 U of N Kona Master Plan Update was prepared for U of N Kona by G70 and includes plans for the Petition Area as well as the Existing Campus Site. Future buildings and projects are projected into three (3) phases with 5-10-year allocated for each development phase. For the 2020 U of N Kona Master Plan Update Projected Planning Program, future buildings and projects fall into three categories (*Table 2-1)*.

Table 2-1 2020 U of N Kona Master Plan –Planning Program

Phase 1: 5-10 Years	Planning Program Projects anticipated for development with the next 5-10 years.
Phase 2: Beyond 10 Years	Planning Program Projects anticipated for development beyond the 10-year period.
Phase 3: Beyond 20 Years	Planning Program Projects anticipated for development beyond the 20-year period.

The 2020 U of N Kona Master Plan Update sets current and upcoming mission-based learning priorities, including a physical vision of the campus and an expanded organizational schematic program that defines future uses of the site. The 2020 U of N Kona Master Plan Update separates the Petition Area into five distinct geographic areas: Lower School, Middle School, High School, expansion of the Discipleship Learning Center, Athletic Complex and Training Areas, including an Agricultural Exhibit and Storage and Maintenance Yard. The 2020 U of N Kona Master Plan Update illustrates the design considerations for projects within these areas. In addition, the 2020 U of N Kona Master Plan Update identifies key features to create an integrated campus community, such as entrances and arrival areas, a central gathering space at the chapel, outdoor courtyards and pathways, buildings, landscaping, preservation of archaeological sites, and sustainability and design guidelines to define the overall relationship of the Petition Area. All building projects will be designed and constructed to meet applicable codes and ordinance rules and regulations governing the construction of facilities. The necessary permits and approvals will be secured prior to the commencement of construction. Refer to *Figures 2-2a-d* and *Tables 2-2a-d* for a list of the proposed improvements.

As a part of the entitlement process, in addition to the Motion to Amend, a change in zoning will need to be processed with the County to facilitate the project on the Petition Area. The Petition Area is currently zoned A-1a, Agricultural District and a portion of the Petition Area is split zoned RD-3.75 and RS-7.5, Residential District. A change in zoning application with the County would be required for approval from A-1a to RM-4 (Multiple-Family Residential) or possibly RCX (Residential–Commercial Mixed Use) or CV (Village Commercial) prior to plan approval(s) and issuance of building permits. U of N Kona is also considering establishing Project District zoning for the project, which would provide flexibility in relocating elements within the Project District.

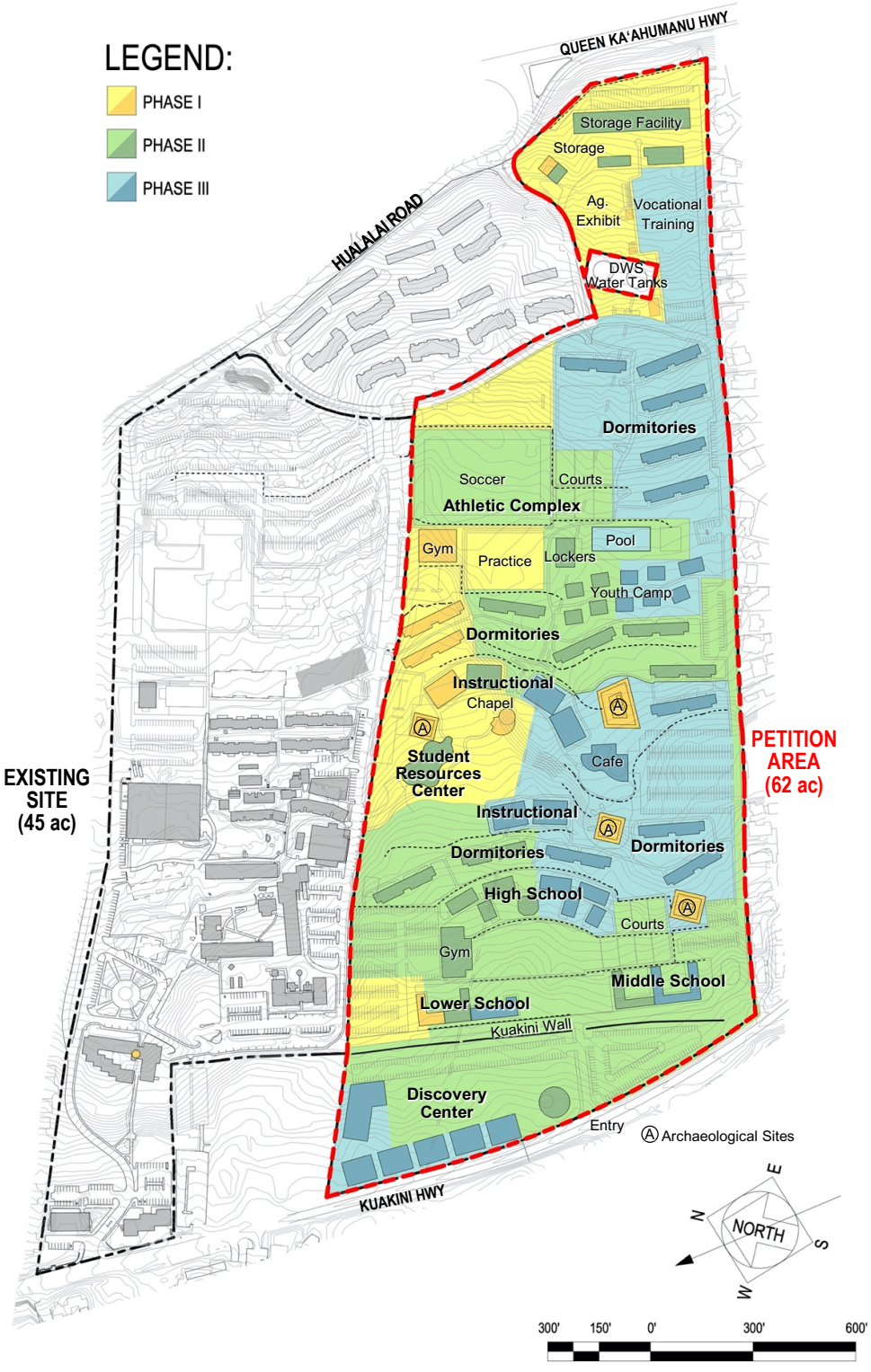


Figure 2-2 2020 U of N Kona Master Plan Update, Conceptual Master Plan (G70, 2020

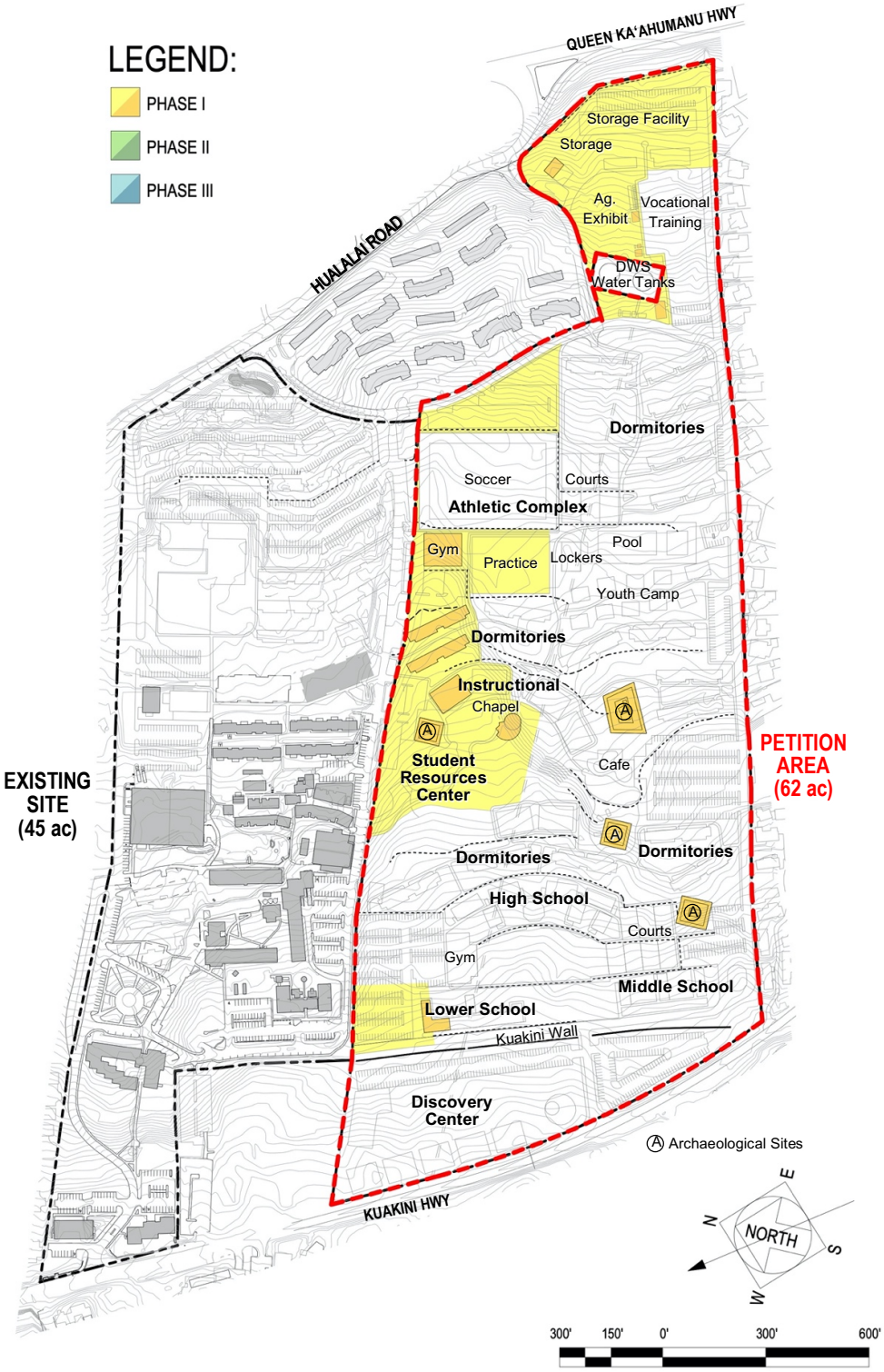


Figure 2-2a 2020 U of N Kona Master Plan - Phase 1 Proposed Projects for Petition Area

Table 2-2a 2020 U of N Kona Master Plan –Phase 1 Proposed Projects for Petition Area

Petition Area Proposed Projects Phase 1 – Within 5-10 Years	Foot Print (SqFt)	Acreage
Discipleship Learning Center		
Chapel	4,010	0.1
Instruction Building	7,000	0.2
Student Resident Dormitory Buildings (2)	14,000	0.3
Athletic/Training Complex		
Gymnasium/Locker Rooms	10,450	0.2
Lower School		
Instruction Building	3,420	0.1
Agricultural Exhibit		
Instruction Building	1,500	0.03
Maintenance/Storage Facilities		
Maintenance Shops/Storage Warehouse	1,700	0.04
SUBTOTAL BUILDING FOOTPRINT AREA	**42,080**	**1.0**
Roadway Connections to Existing Campus Site & Access Points	3,000	0.1
ADA Compliant Pathways	21,040	0.5
SUBTOTAL ROADWAY & PATHWAY AREA	**24,040**	**0.6**
Parking Area for Instruction & Dormitory Buildings	31,000	0.7
Parking Area for Gymnasium & Practice Field	25,000	0.6
Parking Area for Athletic/Training Complex	33,500	0.8
Parking/Drop-off Area for Lower School	27,300	0.6
Parking & Delivery/Loading Area for Storage Facilities	33,200	0.8
SUBTOTAL PARKING AREA	**150,000**	**3.4**
Athletic/Training Complex Practice Field	37,150	0.9
Agricultural Exhibit Garden & Food Forest	61,500	1.4
Archaeological Preservation Sites	25,300	0.6
Lawn Areas and Landscaping	180,800	4.2
SUBTOTAL OPEN SPACE/PERVIOUS AREA	**304,750**	**7.1**
TOTAL PHASE 1 AREA	**520,870**	**12**

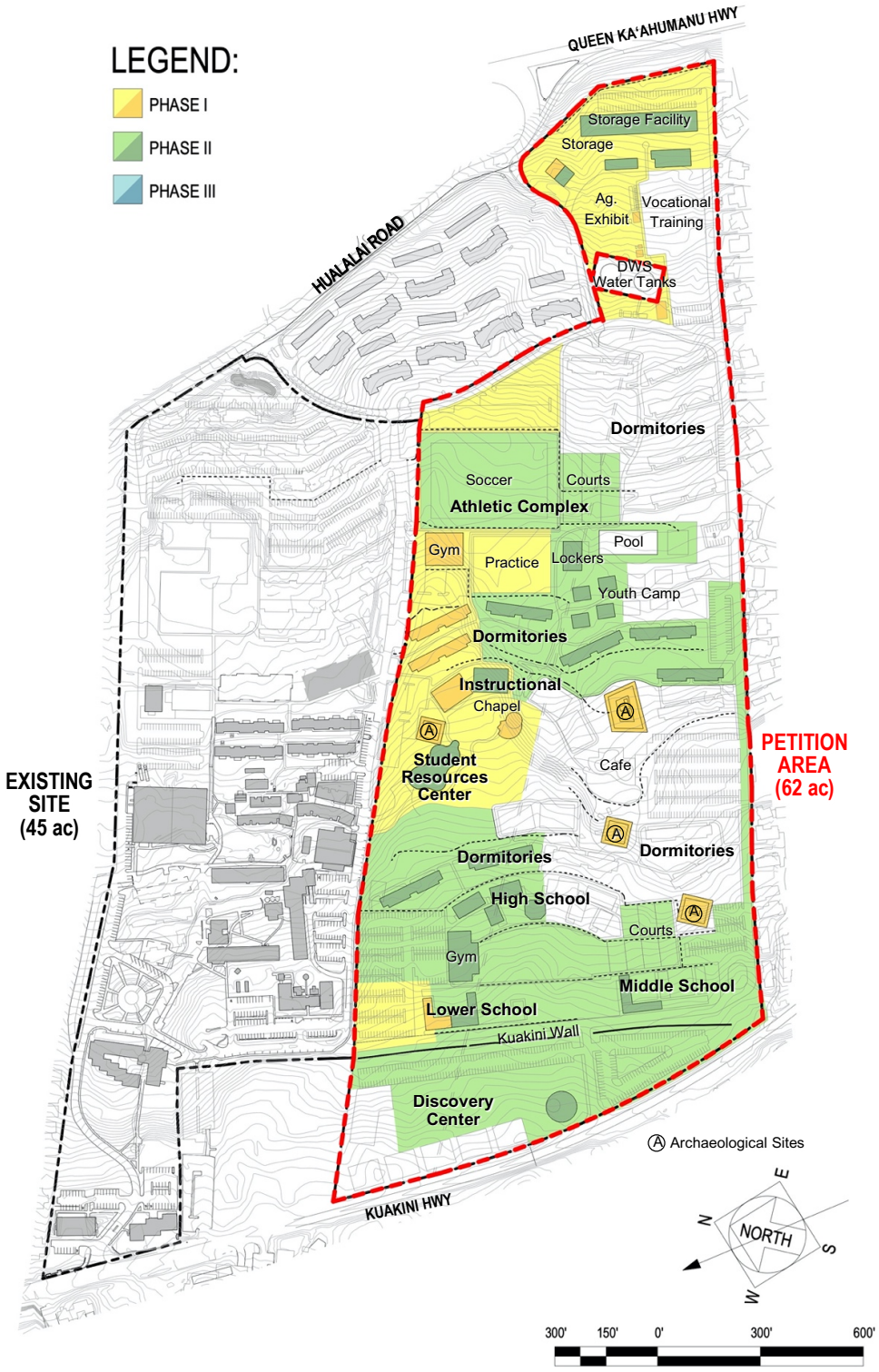


Figure 2-2b 2020 U of N Kona Master Plan - Phase 2 Proposed Projects for Petition Area

Table 2-2b 2020 U of N Kona Master Plan – Phase 2 Proposed Projects for Petition Area

Petition Area Proposed Projects Phase 2 – Beyond 10 Years	Foot Print (SqFt)	Acreage
Discipleship Learning Center		
Student Resource Center	12,300	0.3
Instruction Building	7,000	0.2
Student Resident Dormitory Buildings (6)	42,000	1.0
Athletic/Training Complex		
Athletic Courts	33,000	0.8
Athletic Building and Locker Rooms	4,675	0.1
Aquatic Center: Warm-up Pool	4,200	0.1
Discover Center		
Entry Exhibit Building	6,360	0.1
Lower School		
Instruction Buildings	4,300	0.1
Middle School		
Instruction Buildings	5,400	0.1
Athletic Courts	19,175	0.4
High School		
Instruction Buildings & Gymnasium/Cafetorium	24,125	0.6
Athletic Courts	14,120	0.3
Youth Camp		
Cabins	8,000	0.2
Maintenance/Storage Facilities		
Maintenance Shop/Storage Warehouses	4,650	0.1
Garage/Storage Warehouse	5,500	0.1
Food & Supply Storage Warehouse	20,400	0.5
SUBTOTAL BUILDING FOOTPRINT AREA	**215,230**	**5**
Roadways and Pathways	144,240	3.3
SUBTOTAL ROADWAY & PATHWAY AREA	**144,240**	**3.3**
Parking Area for Instruction and Dormitory Buildings	29,900	0.7
Parking Area for Discovery Center	77,510	1.8
Parking/Drop-off Area for Middle School	30,065	0.7
Parking/Drop-off Area for High School	30,070	0.7
Parking & Delivery/Loading Area for Storage Facilities	35,340	0.8
SUBTOTAL PARKING AREA	**202,885**	**4.7**
Athletic/Soccer Field	111,720	2.6
Fields/Playground for Lower, Middle & High School	103,400	2.4
Lawn Areas and Landscaping	466,750	10.7
SUBTOTAL OPEN SPACE/PERVIOUS AREA	**681,870**	**15.7**
TOTAL PHASE 2 AREA	**1,244,225**	**29**

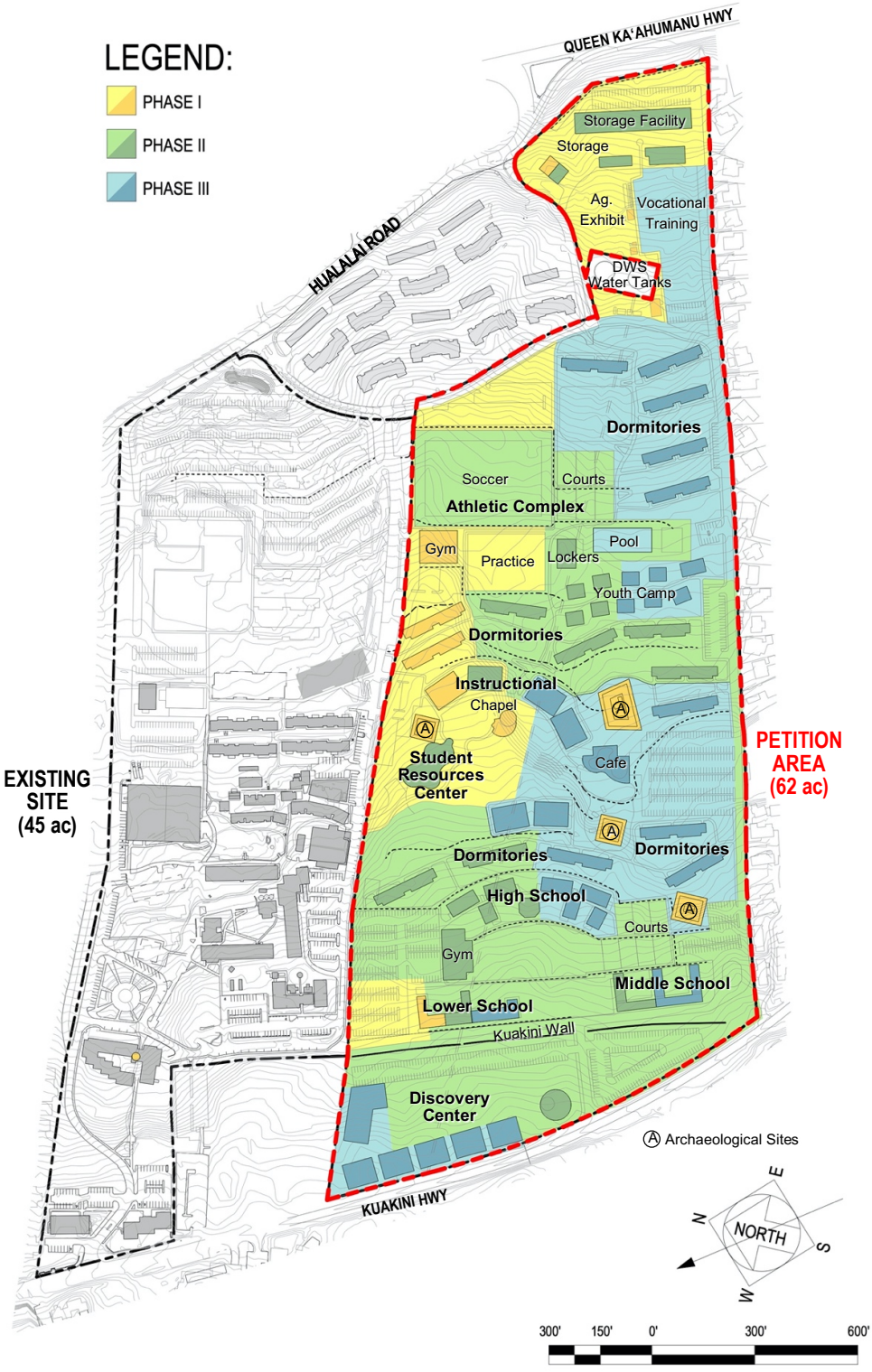


Figure 2-2c 2020 U of N Kona Master Plan - Phase 3 Proposed Projects for Petition Area

Table 2-2c 2020 U of N Kona Master Plan – Phase 3 Proposed Projects for Petition Area

Petition Area Proposed Projects Phase 3 – Beyond 20 Years	Foot Print (SqFt)	Acreage
Discipleship Learning Center		
Instruction Buildings	28,000	0.6
Café/Outdoor Dining Space	9,900	0.2
Student Resident Dormitory Buildings (9)	63,000	1.4
Athletic/Training Complex		
Aquatic Center Pool Complex	11,900	0.3
Discovery Center		
Exhibit Buildings	46,540	1.1
Lower School		
Instruction Buildings	5,440	0.1
Middle School		
Instruction Buildings	7,975	0.2
High School		
Instruction Buildings	11,610	0.3
Youth Camp		
Cabins	12,000	0.3
SUBTOTAL BUILDING FOOTPRINT AREA	**196,365**	**4.5**
Roadways and Pathways	126,560	2.9
SUBTOTAL ROADWAY & PATHWAY AREA	**126,560**	**2.9**
Parking Area for Instruction and Dormitory Buildings	68,370	1.6
Parking Area for Aquatic Center	3,700	0.1
SUBTOTAL PARKING AREA	**72,070**	**1.7**
Gathering Space Lawn Area	32,730	0.8
Training and Future Expansion Area	61,500	1.4
Open Space and Landscaping	444,020	10.2
SUBTOTAL OPEN SPACE/PERVIOUS AREA	**538,250**	**12.4**
TOTAL PHASE 3 AREA	**933,245**	**21**

2.5 Description of the Proposed Improvements

Proposed buildings and projects are as follows:

Discipleship Learning Center

Chapel:
The Chapel proposed for the Petition Area will connect with and play a key role in the development of the center of the Discipleship Learning Center. Consisting of almost 4,000 square feet, the proposed Chapel is envisioned to be an iconic, round structure. The architectural character of the building will create a centralized gathering space fitting with its surroundings. The proposed project may also include a stepped-level entry with an outside seating area and a courtyard to create a welcoming and pleasant outdoor meeting and gathering space, which is envisioned to be available for weddings and other gatherings.

Instruction Buildings:
The expansion of the Discipleship Learning Center is proposed to include additional instruction and classroom space. For the Phase 1 Planning Program, one new Instruction Building is planned. The intent for the proposed expansion is to build six new Instruction Buildings, generally not to exceed three-stories in height, organized around quadrangles and courts. The new Instruction Buildings are an opportunity to upgrade and provide modern learning spaces that accommodate new interactive forms of teaching and learning for both students and faculty.

Student Resident Dormitory Buildings:
Student dormitory housing will be provided throughout the campus. Existing dormitories are over 30 years old and are badly in need of refurbishing to meet current student needs and building codes. The seventeen (17) new student dormitory buildings proposed would provide modern medium-density student housing facilities and accommodate approximately 80-100 beds on average for each dormitory building. The new student housing will be contained in two- to three- story wings connected by a two-story building containing common facilities. Parking areas are planned to accommodate the proposed Student Resident Dormitory Buildings.

Student Resource Center:
The Student Resource Center proposed for the Petition Area is an opportunity to provide an upgraded facility and a modern library space that accommodates new interactive forms of teaching and learning for both students and faculty. Consisting of a footprint of approximately 12,300 square feet, the proposed Student Resource Center will be a two to three-story structure with a specific architectural character, rounded-shaped modern building. The proposed structure will create a new gateway to the Petition Area fitting with its surroundings. The proposed project may also include an entry courtyard with landscaped pavers and a variety of new planting to create a welcoming and pleasant outdoor meeting, study, and informal gathering space for students, faculty and visitors.

Café/Outdoor Dining Area:
The Café/Outdoor Dining Area proposed is expected to provide food service and an outdoor dining space in a courtyard setting, envisioned as an excellent space for casual dining in a café like setting for students, faculty and visitors.

Athletic/Training Complex

The proposed Athletic/Training Complex is envisioned to include a multi-phased development of a new gymnasium and athletic facilities. The design of the gymnasium would be able to accommodate the evolving curriculum of physical education and function as a space for competitive sport activities. The proposed multi-story design of the gymnasium would accommodate a basketball court and a regulation volleyball court, spectator seating, locker rooms, public facilities, offices, training facilities, lighting, and storage amenities. In addition, the Athletic/Training Complex is envisioned to have an outside practice field and a full-sized athletic soccer field directly adjacent to the gymnasium. The full-sized soccer field would be developed to accommodate competitive sport activities and the practice field would accommodate additional physical education and outdoor competitive sport activities. Athletic courts are also envisioned to be located adjacent to the athletic field. Another athletic building is included and would provide an additional locker room for visiting teams with athletic team meeting rooms and offices. In addition, as a part of the Athletic/Training Complex an Aquatic Center is envisioned to include an Olympic-sized swimming pool and warm-up pool with spectator seating and facilities. Parking areas would be provided adjacent to the proposed gymnasium, athletic fields and aquatic center for the Athletic/Training Complex.

Lower School

The Lower School proposed for the Petition Area is envisioned to include a multi-phased development of a new primary school to accommodate students ranging from Kindergarten to Grade 5. The expansion of the school will help to address the demand for primary educational facilities for family residents enrolled at U of N Kona. The Lower School will be situated along the main center road of the site and the entry is envisioned to have a circular pick-up and drop-off area for the parents and children. For the Phase 1 Planning Program, one Instruction Building is planned. The intent for the proposed expansion is to build four new Instruction Buildings, which will be single-story and organized around quadrangles and courts. Adjacent to the Instruction Building, a new playground and field is proposed for recess and outdoor educational activities. Parking areas are also planned to accommodate the Lower School.

Middle School

The Middle School proposed for the Petition Area is envisioned to include a multi-phased development of a new intermediate school to accommodate students ranging from Grade 6 to 8. The expansion of the school will help to address the demand for intermediate educational facilities for family residents enrolled at U of N Kona. The Middle School will be situated along the southern road of the site and the entry is envisioned to have a circular pick-up and drop-off area for the parents and students. The plan for the Middle School envisions five new Instruction Buildings, two-story and organized around quadrangles and courts. Adjacent to the Instruction Buildings, a Lower Field and Athletic Courts are proposed for recess and outdoor educational activities. Parking areas are also planned to accommodate the Middle School.

High School

The High School proposed for the Petition Area is envisioned to include a multi-phased development of a new high school to accommodate students ranging from Grade 9 to 12. The expansion of the school will help to address the demand for high school educational facilities for family residents enrolled at U of N Kona. The High School will be situated above the Lower and Middle School. The plan for the High School envisions eight new Instruction Buildings, two-story and organized around quadrangles and courts. Located below the Instruction Buildings, a large field “Upper Field” and Athletic Courts are proposed for recess and outdoor educational activities. In addition, a Gymnasium/Cafetorium would support additional instruction and training activity space, and to

accommodate cafeteria dining space and student gatherings. Parking areas are also planned to accommodate the High School.

Discovery Center

The Discovery Center is proposed to be located along the makai border of the Petition Area. The Discovery Center is planned to build six multi-story buildings, generally not to exceed three-stories in height. The proposed buildings are intended to house the Discipleship Learning Center's expansive language library, informational resources, and function as an instructional and research facility with administrative and staff office spaces. The design of the Discovery Center includes a main entry building, circular in shape, located along the entrance to the Petition Area from Kuakini Highway. The main circular building at the entrance will guide pedestrian entry to the Discovery Center complex. The design of the Discovery Center also incorporates a large courtyard space with pathways, landscaping and parking areas to accommodate visitors, students, faculty and staff.

Youth Camp

The Youth Camp proposed for the Petition Area is intended to provide a camping ministry for families and youth of all ages with a place of physical and spiritual refreshment. The design of the cabins is envisioned to include facilities and amenities to support camping activities for students, families, counselors and staff.

Agricultural Exhibit

The proposed project is intended to include the expansion of the training areas, including a planned Agricultural Exhibit Area located in the mauka portion of the Petition Area. The proposed Agricultural Exhibit Area would include a garden and food forest to support educational activities related to permaculture gardening, food sustainability and sustainable agriculture. In addition, the proposed Agricultural Exhibit Area would include a designated pen area for the safe keeping of animals and possibly an aquaponics exhibit. In addition, a small Instruction Building is planned to support the educational activities, as well as small storage/tool sheds, a plant nursery and amenities.

Maintenance Storage and Facilities

A new Maintenance Storage and Facilities Area is proposed to be located along the mauka border of the Petition Area. The proposed Maintenance Storage and Facilities Area is planned to include four new warehouse buildings, generally not to exceed three-stories in height. The planned warehouse buildings would include maintenance facilities storage, maintenance shops, storage for food and supplies, garage space, and a parking area with a delivery and loading area for large containers and delivery trucks.

Archaeological Preservation Sites

For the Phase 1 Planning Program, restoration of the archaeological sites is planned in conjunction with an approved SHPD preservation plan. The preservation plan includes implementation of permanent rock wall buffers around each of the four identified burial sites on the Petition Area. The installation of the rock walls will create a permanent preservation buffer for the identified burial sites and meet requirements identified by the preservation plan. In addition, a dismantling and restoration plan for Kuakini Wall, located along the makai portion of the Petition Area, would be implemented, in coordination with SHPD.

VOC Training and Future Expansion Area

The Vocational Training and Future Expansion Area proposed for the Petition Area is intended to provide an expanded training area necessary to the U of N Kona program. Vocational education provides training necessary to become qualified professionals in a variety of trades and would blend

training and technical instruction to prepare students for direct entry into trades and mission activities.

Roadways and Parking

The overall design concept of the roadways and parking for the Petition Area is to give priority to pedestrian circulation. Vehicular arrival points such as parking lots and driveways are indicated on the periphery of the Petition Area. The peripheral design of the roadways and parking areas provides significant areas for pedestrian use and open space in the interior of the Petition Area. The location of the additional parking areas easily provide connections and access to the proposed roadways bordering the Petition Area.

Landscape, Open Space and Pathways

The vision of the U of N Kona landscape plan for the Petition Area, as derived during the development of the 2020 Master Plan Update is that of a tropical, compatible landscape that supports a Hawaiian sense of place, including views as well as native plants, and makes a substantial contribution to environmental sustainability concerns, including drought-tolerant and storm water management. Overall, the landscape plan for the Petition Area should integrate Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. Tree-covered terraces would provide shade and areas for reading, sitting, and eating. A system of pathways is planned to allow for safe day and night travel for pedestrians, including persons with disabilities. The pathways would begin at arrival areas and parking areas, lead to major walking pathways, and connect to active and functional gathering places, such as outdoor courtyards and sitting areas fronting buildings. Walking surfaces should be permeable whenever possible.

2.6 Overview of Need

The 2020 U of N Kona Master Plan Update addresses current and projected space and activity needs for U of N Kona. Enrollment is projected to increase over the next planning period, as indicated by the U of N Kona. The proposed development is intended to expand the learning and training centers to support U of N Kona's mission.

Current enrollment is approximately 840 students per quarter. In addition to student enrollment, faculty and staff number is approximately 252. Currently, 90% of the students live on the site, totaling an estimated 756 student and 101 staff residents. The de facto daytime population of the Existing Campus Site is about 1,092.

In the next 5-10 years, enrollment is projected to increase to 1,500 students. In addition to student enrollment, faculty and staff numbers are projected to increase to approximately 450. An estimated 80% of the students are expected to live on the site, for a total of approximately 1,050 student residents over the Phase 1 Planning Program. In addition, an estimated 20% of faculty and staff are expected to live on the site, for a total of approximately 180 staff residents over the Phase 1 Planning Program. The total residents is projected to be 1,230 and the de facto daytime population is projected to be about 1,950 for the Existing Campus Site and the Petition Area.

The Phase 1 Planning program estimates the daytime population for the Petition Area to be 819 of the total daytime population and approximately 200 of the total students and staff residents are expected to live on the Petition Area.

U of N Kona has been successful in establishing and growing its existing programs, such that the expansion of the campus onto the 62-acre Petition Area and proposed facilities and projects are necessary to support the growth of U of N Kona.

2.7 Infrastructure and Improvements

In support of the U of N Kona expansion within the Petition Area, off-site spine infrastructure improvements designed to service both the Existing Campus Site and the Petition Area have already been completed. Within the Petition Area, on-site infrastructure facilities to be expanded or improved within the Phase 1 Planning Program include circulation roadways, water transmission lines, wastewater collection lines, drainage systems, and electrical/communication systems. All infrastructure improvements will be designed and signed to accommodate the proposed project. Construction will begin with development of infrastructure after applicable grading permits have been issued.

2.8 Summary of Phasing Schedule and Costs

The 2020 U of N Kona Master Plan Update focuses on projects that are anticipated for development within the next 30 years, with each phase taking 5-10 years for development. For the Phase 1 Planning Program, future buildings and projects are anticipated for development within the next 5-10 years. The estimated cost of construction for the Phase 1 Planning Program is approximately $19 million. For the Phase 2 Planning Program, future buildings and projects are anticipated for development beyond the 10-year period. The estimated cost of construction for the Phase 2 Planning Program is $59 million. For the Phase 3 Planning Program, future buildings and projects are anticipated for development beyond the 20-year period. The estimated cost of construction for the Phase 3 Planning Program is approximately $85 million.

Section 3

Description of the Environmental Setting, Potential Impacts and Mitigation Measures

3.0 Description of the Environmental Setting, Potential Impacts, and Mitigation Measures

The environmental setting, potential impacts and mitigation measures for the proposed 2020 U of N Kona Master Plan Update improvements planned for the Petition Area are addressed in the discussion below.

3.1 Climate

Existing Conditions

The climate on the Island of Hawai'i can be characterized as mild and subtropical. Overall, the conditions on the Kona Coast are somewhat warmer and drier, with relatively low variability. According to the *University of Hawai'i Geography Department Climate of Hawai'i Interactive Mapping Tool*, the temperatures at the Petition Area are very moderate with an average annual air temperature of approximately 74°F. The average monthly low temperature is around 70°F in January and the average monthly high temperature is around 77°F in August. The windward and northern regions of the Island of Hawai'i are typically wetter than the western and southern regions. The annual rainfall at the Petition Area is 30 inches with February being the driest month with 1.5 inches and September the wettest with 3 inches of rainfall. The winds on the Island of Hawai'i include trade winds, Kona winds and winds associated with hurricanes and tropical storms. Trade winds from the northeast prevail most of the year with an average wind speed of 5-10mph (Giambelluca, et al., Department of Geography, University of Hawai'i at Manoa, State of Hawai'i, 2014).

Anticipated Impacts and Mitigation Measures

There may be some localized temperature increases resulting from paved surfaces and roofs. However, landscaping the Petition Area with shade trees, using grass-paved material, and using light-colored roof or incorporating green roofs and roof gardens will help mitigate localized temperature increases from roadways and buildings. Impacts on regional climate are not anticipated to occur as a result of the proposed 2020 U of N Kona Master Plan Update. No mitigation measures are required.

3.2 Geology and Topography

Existing Conditions

The Petition Area is located on the west coast of the Island of Hawai'i, approximately one mile southeast of the town center of Kailua-Kona, in the North Kona District. The Petition Area is within the traditional moku of Kona and ahupua'a of Wai'aha 1st on the lower western slopes of Mount Hualālai. The Island of Hawai'i is comprised of several volcanoes: Kohala, Mauna Kea, Hualālai, Mauna Loa, and Kīlauea. Of these volcanoes, only Mauna Loa and Kīlauea are considered active in

addition to one active seamount, Lō‘ihi located offshore. The Petition Area is situated on the western slopes of Hualālai volcano, which is dormant with its last eruption ending sometime in 1800-1801. The Hualālai volcano is composed of two (2) types of lava flows: ‘a‘ā lava flow and pāhoehoe lava flow. The ‘a‘ā lava flow was formed by a slow moving and very viscous molten rock. The ‘a‘ā flow consists of a layer of clinkers and a core of hard massive basalt originated from Hualālai between 1,500 and 3,000 years ago. The pāhoehoe lava is a fluid type of molten rock that flows relatively quickly down the slope with no overlying soil. The pāhoehoe lava was originated from Hulalālai 3,000 to 5,000 years ago (Wolfe and Morris, 1996). Most of the Petition Area is covered in ‘a‘ā and pāhoehoe lava flow.

The Petition Area is generally gently sloped at an elevation ranging from approximately 100 to 360 feet. The Petition Area rises in elevation from approximately 100 feet at Kuakini Highway to 360 feet at its highest point, with steepest slopes on the upper mauka side just below Hualālai Road (*Figure 3-1*). The overall slope of the Petition Area is approximately 5-10% and increases to as much as 25% just below Hualālai Road.

Anticipated Impacts and Mitigation Measures

The 2020 U of N Kona Master Plan Update will generally follow the existing terrain. Existing slopes will accommodate buildings, walkways, and parking lots without requiring any significant re-shaping of the land. The proposed grading concept is intended to conform to the surrounding grades of the adjacent developments in the area. Portions of the Petition Area will require some grading. During Phase 1 of the development, grading will consist of shallow embankments for the parking lots, immediate campus, and primary access roads. Future campus expansion and development of the Petition Area will require additional amounts of shallow embankment and retaining walls. All grading operations will be conducted in full compliance with dust and erosion control requirements. Prior to grading, necessary grading permits and a National Pollutant Discharge Elimination System (NPDES) permit will be acquired and all earthwork and grading will conform to Hawai‘i County Code, Chapter 10, Erosion and Sediment Control. Grading activities will follow Best Management Practices (BMPs) as described in the grading permit. After construction, establishment of permanent landscaping will provide long-term erosion control. Construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control.

3.3 Soils

Existing Conditions

The physical attributes of Hawai‘i’s soils and the relative productivity of different Hawai‘i soil types for agricultural production purposes are addressed in three (3) studies including: (1) the U.S. Department of Agriculture Natural Resource Conservation Services (NRCS) Soil Survey, (2) the University of Hawai‘i Land Study Bureau (LSB) Detailed Land Classification; and (3) the State of Hawai‘i Department of Agriculture’s, Agricultural Lands of Importance to the State of Hawai‘i (ALISH) system. Soil information for the Petition Area was obtained from these studies, as summarized below.

Natural Resource Conservation Service Soil Survey (NRCS)

The NRCS Soil Survey for the Island of Hawai‘i classifies the two primary soils of the Petition Area as: Wai‘aha-Punalu‘u Lava Flows Complex, 10-20% slopes, and Kainaliu Cobbly Silty Clay Loam, 10-20% slopes (*Figure 3-2*).

Figure 3-1 Topography Map


ALOHA KONA DR
KAA'E'A WAY
NANI KAILUA DR
ONEO LOOP
11
19
HUALALAI RD
WALUA RD
Waiaha-Punaluu-Lava flows complex, 10 to 20 percent slopes
Kainaliu cobbly silty clay loam, 10 to 20 percent slopes
11
ONI ONI ST
ALII DR
KUAKINI HWY
Legend
Project Parcels
250: Waiaha-Punaluu-Lava flows complex, 10 to 20 percent slopes
223: Kainaliu cobbly silty clay loam, 10 to 20 percent slopes
0
400
800
Feet
N
Source: Soils, USDA NRCS SSURGO 2017

3-2 Soils Map

The Wai‘aha-Punalu‘u series consists of medial silt loams soils that formed in volcanic ash over pāhoehoe lava flows. The Kainaliu Cobbly Silty Clay Loam series consists of moderately deep, silty clay loams that formed in volcanic ash in ‘a‘ā lava flows. Both soils are located on low elevation, leeward slopes of Hualālai volcano at elevations from sea level to 1,000 feet and slope gradients range from 2 to 40 percent. Both soils are well drained, permeability is moderately rapid in the soils and very slow in the underlying bedrock with slow runoff, and erosion hazard is slight. The typical uses identified are for grazing and homesites. On the Petition Area, the ground surface is very broken with heaps of sharp broken lava rock appearing more like ‘a‘ā than the smooth pāhoehoe. These fragments have been piled, apparently by hand, to facilitate cattle grazing.

Land Study Bureau Detailed Land Classification

The University of Hawai‘i Land Study Bureau (LSB), Detailed Land Classification, Island of Hawai‘i document classifies soils based on a productivity rating. Letters indicate class of productivity with A representing the highest class and E the lowest. The Land Study Bureau map classification for the Petition Area is “E”/Very Poor, or among the lowest levels of agricultural productivity.

Agricultural Lands of Importance to the State of Hawai‘i (ALISH)

The ALISH system classifies important agricultural lands as Prime, Unique, or Other Important Agricultural Land, as well as Unclassified Land. According to the ALISH system, the Petition Area is classified as Unclassified. The nearest rated ALISH parcel is roughly three-quarters of a mile south.

Anticipated Impacts and Mitigation Measures

The Petition Area is not classified under the LSB and ALISH classification system. The proposed project will not reduce the inventory of agriculturally significant land. The Petition Area consists of lands having poor agronomic conditions. The Petition Area has a NRCS land capability classification of soils that have very severe agricultural limitations that make them unsuited to cultivation and that restrict their use mainly to grazing or homesites.

The 2020 U of N Kona Master Plan Update will generally follow the existing terrain. Existing slopes will accommodate buildings, walkways, and parking lots without requiring any significant re-shaping of the land. The proposed grading concept is intended to conform to the surrounding grades of the adjacent developments in the area. However, portions of the Petition Area will require some grading to provide adequate slopes for drainage and the proposed development. All grading operations will be conducted in full compliance with dust and erosion control requirements of the Hawai‘i County Code, Chapter 10, Erosion and Sediment Control. All construction activities will comply with the provisions of Section 11-60.1-33, HAR, on Fugitive Dust. A grading permit is required to modify the topography, and a National Pollutant Discharge Elimination System (NPDES) permit is required before construction begins to address non-point source discharges. Prior to grading, necessary grading permits and a National Pollutant Discharge Elimination System (NPDES) permit will be acquired and all earthwork and grading will conform to Best Management Practices (BMPs) as described in the grading permit. After construction, establishment of permanent landscaping will provide long-term erosion control. Construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control.

Impacts to the soils of the Petition Area include the potential for soil erosion and the generation of dust during grading and construction. Clearing and grubbing activities will temporarily disturb the soil retention values of the existing vegetation and expose soils to erosional forces. Erosion control practices will comply with County, State, and Federal regulations. BMPs will be implemented pursuant to the required Grading Permit to mitigate potential impacts of soil erosion and fugitive

dust during grading or excavation. These practices will include sediment traps, silt fences, dust fences. BMPs that include both structural and non- structural controls will be incorporated into temporary construction practices and permanent site design to minimize impacts. BMPs utilized during construction may include the following:

- Minimizing the time of construction including coordinated phasing for site control;
- Retaining existing ground cover as long as possible;
- Constructing drainage and erosion control features early;
- Using temporary area sprinklers in non-active construction areas when ground cover is removed;
- Providing a water truck on-site during the construction period to provide for immediate sprinkling, as needed;
- Using temporary, groundcover, berms and cut-off ditches, where needed, for control of erosion;
- Watering graded areas when construction activity for each day has ceased;
- Grassing or planting all cut and fill slopes immediately after grading work has been completed; and
- Installing silt fences, sediment traps, and diversion swales, where appropriate.

After construction, establishment of permanent landscaping will provide long-term erosion control. Construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control.

3.4 Surface Waters & Drainage

Existing Conditions

For the 2020 U of N Kona Master Plan Update a Preliminary Infrastructure Assessment was prepared by G70, including an assessment of the existing and proposed drainage systems for the Petition Area. According to the assessment, U of N Kona has not reported any drainage issues onsite. The Petition Area has no perennial streams, existing drainage facilities, or defined natural drainage ways. The Petition Area is located in Kailua-Kona on the slopes of Hualālai below Hualālai Road. The Petition Area generally slopes from mauka to makai in the east to west direction. Elevations onsite range from approximately 360 to 90 above mean sea level with the lowest point located at the main campus entrance along Kuakini Highway. According to the USDA Natural Resources Conservation Service, the soil groups present are typically well drained. It is anticipated that stormwater generated on the Existing Site currently overland flows to the undeveloped Petition Area to the south where it is slowed by heavy vegetation and ultimately infiltrates into the ground.

A drainage report prepared by Ross Engineering, Inc. for U of N Bencorp was completed in September 2002 to analyze the offsite stormwater drainage conditions that affect the Petition Area. Concentrated stormwater run-on enters the various properties at four different locations from the mauka direction. Three culverts discharge runoff onto the Petition Area; an 84-inch pipe culvert crosses Hawai‘i Belt Road/Queen Ka‘ahumanu Highway and discharges runoff at the southeastern corner of the Existing Site and a 36-inch and 30-inch culvert located at the intersection of Hawai‘i Belt Road/Queen Ka‘ahumanu Highway and Hualālai Road discharge runoff onto the 62-acre expansion parcel, Petition Area. On the Existing Site (TMK (3) 7-5-010:003), stormwater run-on sheet flows across Hualālai Road and enters the Existing Site north of the Hualālai Village Condominiums.

No drainage report was found for the Hualālai Village Condominiums, but during a site visit, multiple dry wells were identified along the private road along the makai edge of the condo property adjacent to the Existing Site. It is assumed that these dry wells dispose of all runoff generated and collected on the condominium site and no runoff flows onto the Petition Area.

The runoff that flows onto the Petition Area from the culverts flows through the undeveloped 62 acres toward Kuakini Highway or is infiltrated into the ground. At Kuakini Highway, there is an existing 24-inch culvert which conveys runoff across of the highway. Immediately downstream of the culvert, there is a series of six (6) dry wells located on TMK (3) 7-5-018:094 (Owner: Walua Professional Center). No other culverts or drain structures were identified along Kuakini Highway. It is assumed run-on as well as runoff at the Petition Area is either disposed of by on-site or off-site drywells (across Kuakini Highway) or is slowed by heavy vegetation and the natural terrain as it infiltrates into the ground.

The runoff that enters onto the Petition Area with the Existing Site continues to flow overland through the undeveloped area mauka of the existing campus before flowing off of the property onto the neighboring undeveloped property to the north.

Anticipated Impacts and Mitigation Measures

The Petition Area is undeveloped and on-site precipitation currently percolates to the underlying groundwater. The 2020 U of N Master Plan Update will require the development of drainage infrastructure. Stormwater management for the campus expansion will focus on both the adequate conveyance and disposal/retention of stormwater runoff generated by the proposed development and increase in impervious areas, but will also prioritize maintaining predeveloped hydrologic conditions through the utilization of Best Management Practices (BMPs) that focus on protecting and restoring natural ecosystems near the source of runoff generation. A Low Impact Development (LID) approach to development will be utilized in developing a storm water management plan for the Petition Area.

Additional and increased stormwater runoff, due to project development and addition of impervious areas, will be mitigated with the introduction of BMPs and other drainage infrastructure such as infiltration trenches, drywells and detention/retention basins in or to attenuate any increases in peak flow to prevent adverse impacts downstream of the Petition Area.

Integration of LID Best Management Practices (BMPs) can also minimize detrimental downstream stormwater impacts by working to treat and retain runoff generated from a range of storm events. The LID BMPs are typically microscale in size and distributed throughout the development area and designed to treat runoff, reduce erosion, protect habitats, recharge groundwater. A well designed and integrated LID strategy may reduce infrastructure costs by reducing the need of larger more costly traditional stormwater drainage systems. LID BMPs should be incorporated into the site, building and landscape designs. Examples of LID practices and techniques are listed below:

- Permeable pavements, sidewalks and hardscape
- Rain gardens
- Biofiltration including vegetated swales, planters, filter strips
- Rainwater harvesting such as cisterns and irrigation systems
- Green roofs
- Infiltration trenches and basins
- Infiltration sumps and drywells

An effective LID strategy will need to be developed in conjunction with the proposed water and wastewater infrastructure so that stormwater can be harvested and reused for non-potable water uses throughout the campus. Offsetting irrigation demand by rainwater capture and xeriscape design, will result in significant reduction in demand for potable water which is very limited in allocated quantity, and will reduce the size of additional infrastructure needed to serve the campus expansion.

The NPDES permit requirements, including erosion and sediment control, will require contractors to manage materials to prevent discharge of pollutants into the ground during construction. Long-term sustainable design measures for management of storm water runoff will be integrated, as practical. Landscape management practices will be applied to minimize the use of fertilizers and pesticides that could potentially enter the surface waters. The project design will comply with the County's Storm Drainage Standards and will not result in increases in runoff volumes and rates. No significant long-term effects on surface waters are anticipated.

3.5 Groundwater Resources/Hydrology

Existing Conditions

On the Island of Hawai'i, groundwater is the primary source of drinking water. In Kona, groundwater occurs as both basal groundwater and high-level (dike-impounded perched) groundwater. The rainfall pattern of the region is responsible for the recharge of the basal aquifer that extends from the upper slopes of Hualālai to the shoreline. The basal lens in Kona is relatively thin and inconsistent due to the low rainfall input and the leakage of groundwater at the coastline. Wells drawing from basal groundwater in Kona are susceptible to salinity if they are drilled too deep or if they are over-pumped. The Petition Area is situated in the Keauhou Aquifer System (80901), which currently has an existing usage of 15.4 million gallons per day (mgd) and a sustainable yield of 38 MPD. Brackish water is another groundwater resource reserve type in Kona. Brackish water is created as a result of seawater intrusion at the shoreline. Groundwater beneath the Petition Site occurs as a thin brackish basal lens underlain by saline groundwater of seawater salinity.

The County of Hawai'i adopted by ordinance the Water Use and Development Plan Update dated August 2010 and the Commission on Water Resource Management granted approval in December 2011. The Keauhou Aquifer System Area was identified to be considered for further evaluation and detailed assessment. Therefore, the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*, dated March 2017, guides the County in an integrated approach to land use planning and water resource development and provides an estimate of anticipated future water demand projections based on County land use/zoning policies and water use rates for the Keauhou Aquifer System.

The *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*, identifies the Petition Area as located in the Kona Water System, which extends from the Keahole-Kona International Airport south to the South Kona boundary where interconnection with the South Kona Water System is made. Historically, surface water from Wai'aha Stream was diverted into large storage tanks located in Wai'aha above Māmalahoa Highway, filtered, then piped down to Kailua-Kona by a small transmission line to large tanks above Kailua-Kona Village. The first potable water wells were placed in service in 1967 and most of the small pipelines initially installed have been replaced with larger mains. The County of Hawai'i, Department of Water Supply (HDWS) is supplied

by ground water sources, including 12 wells and allocates existing water use. Five-year incremental water needs for the next 20 years based on population and growth rate projections are projected by the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*. The anticipated future water demand defined for the Keauhou Aquifer System Area by the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update* reflects and considers proposed improvements with appropriate State Land Use Designation approvals, including consideration of the Petition Area's proposed improvements.

The *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update* encourages development of future high-level wells for the HDWS system in areas generally between 1,500-feet and 1,800-feet ground elevations mauka of Māmalahoa Highway, with the overall goal of sustainability throughout the region. The goal of this source development strategy is to accommodate future anticipated demands defined by the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*. According to the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*, the Petition Area is depicted to have a Future Anticipated Demand of 100,000 GPD by the *Conceptual Ground Water Source Development and Anticipated Water Demands Map, Aquifer Sector, Hualālai 809, Aquifer Systems, Keauhou 80901*.

For the 2020 U of N Kona Master Plan Update a Preliminary Infrastructure Assessment was prepared by G70, including an assessment of the existing and proposed water systems for the Petition Area. The Existing Campus Site is supplied by the County of Hawai'i Department of Water Supply (DWS) off of the DWS 325 reservoir. There are no onsite water sources or sources of recycled or non-potable water. The Existing Campus Site is averaging a daily water use of 70,341 gallons per day (gpd) based on records from 2017 and 2019. This is in excess of the DWS water allocation for the Existing Campus Site of 45,200 gallons per day, and no additional water is available from the County water system for future development of the Petition Area. While the Project Site is being developed in three phases over 30 years, a new water source(s) will be needed to support buildout of each phase and the expansion of the Petition Area. New wells may be drilled and treated to provide additional potable water onsite. For the 2020 U of N Kona Master Plan Update, a hydrogeologist has been contracted to study the feasibility of developing wells onsite. U of N Kona has also been in discussions with neighboring landowners to potentially form partnerships to develop new wells and water sources offsite. Any offsite water source improvements would likely be dedicated to the County and additional DWS water unit credits would be secured for the expansion Petition Area.

Anticipated Impacts and Mitigation Measures

U of N Kona is committed to green infrastructure by aiming to be as self-sufficient as possible. To support the development and expansion of the Petition Area, water management strategies incorporating water re-use and repurposing will be included in the water infrastructure development program and additional source development will be needed. The goals of the water resource management strategies will be to:

1. Reduce the water demand by introducing water efficient fixture units, promote conservation measures, and introduce native and climate appropriate landscaping.
2. Develop non-potable water sources onsite by capturing stormwater runoff.
3. Develop additional potable water sources by drilling and developing one or more groundwater wells.
4. Match source water quality with end-user requirements to minimize potable water use.
5. Promote groundwater recharge by maximizing infiltration across the campus.

To help reduce the potable water needed, potable water on the new development will be used primarily for domestic purposes with limited irrigation use. Non-potable water will be used for irrigation and be supplied by treated grey water from the different buildings onsite and harvested storm water runoff.

Anticipated escalation in water costs, the environmental impacts of pumping and "over-treating" water in relation to its end use, and climate change and its effect on the availability of groundwater are all drivers for water resource management goals. A full Water Master Plan is being developed for U of N Kona to model the anticipated water demands and required water source and supply improvements required to meet those demands and is being done in conjunction with the development of the 2020 U of N Kona Master Plan Update. Significant long-term impacts upon the local groundwater quality are not anticipated. U of N Kona will take measures to avoid the potential for pollutant contributions to groundwater.

3.6 Natural and Manmade Hazards

Existing Conditions

Earthquakes

On the Island of Hawai'i the majority earthquakes are linked to volcanic activity and the movement of magma within the Kīlauea Volcano or Mauna Loa Volcano. Based on the 2006 United States Geological Survey (USGS) International Building Code (IBC) Seismic Design Map, the County of Hawai'i could experience severe seismic activity with ground motion anywhere from 0.30 up to 1.23 of the earth's ground motion accelerations (g-force). The seismic hazard is highest along the southeast coast of the Island of Hawai'i, followed by the Kona coast. The most recent large earthquake on Hawai'i Island occurred on May 4, 2018, on the south flank of Kīlauea, with a magnitude 6.9. Seismic tremors on the Island of Hawai'i have caused ground cracks, landslides, ground settlement, damaging tsunami, and mudflows. Existing buildings and infrastructure have been destroyed or damaged, and new construction could be impacted by seismic activity resulting in destruction and possible injury or loss of life (Fletcher III, Grossman, Richmond & Gibbs, 2002). The proposed project must comply with IBC and County of Hawai'i design standards.

Lava Hazards

Hazard zones from lava flows are based mainly on the location and frequency of both historic and prehistoric eruptions. Volcanic hazard zone maps developed for the Island of Hawai'i were revised by the U.S. Geological Survey in 1987. The Island of Hawai'i is divided into nine (9) hazard zones according to the level and degree of potential hazards related to lava flows. An area designated as Zone 1 is considered to be an area of greatest potential hazard. The Petition Area is within lava hazard Zone 4, indicating a moderate hazard. Zone 4 includes all of Kailua-Kona and the entire Hualālai Volcano. The rating of 4 is for areas having a greater distance from active vents and topography making it less likely that flows will cover that area. The Petition Area is situated on the west-facing flank of the Hualālai Volcano. Hualālai Volcano is considered dormant, having last erupted in 1801. The percentage of Mount Hualālai that has been subject to damage from lava in the last 750 years is less than 15 percent. The Hualālai Volcano is considered by geologists to represent a post-shield stage of Hawaiian volcanism, characterized by a marked decrease in the eruption rate as the volcano drifts off the Hawaiian hotspot. Property loss and economic devastation are the most frequent consequences of lava flow. Based on the probability of lava flows in Zone 4, there is a low concern for developing structures in the Petition Area (Figure 3-3).

Hurricanes and Tropical Storms

Hurricanes and tropical storms are both categorized as tropical cyclones, which are warm-core storms which originate over tropical waters with well-defined centers of closed surface wind circulation. A hurricane is a tropical cyclone which sustains surface winds of 64 knots (74 mph) or more. Tropical storms are categorized as an organized system of strong thunderstorms with defined circulation and maximum sustained winds of 39-73 mph (National Oceanic and Atmospheric Administration, 2015).

Hurricanes are considered to be relatively rare events in the Hawaiian Islands. Records show that strong wind storms have struck all major Hawaiian Islands. The first officially recognized hurricane in Hawaiian waters was Hurricane Hiki in August 1950. Since that time, five hurricanes have caused serious damage in Hawai'i: Nina (1957), Dot (1959), 'Iwa (1982), Estelle (1986), and 'Iniki (1992).

However, with rising global temperatures, Hawai'i is expected to experience a higher incidence of tropical storm events. In most recent history, Tropical Storm Iselle made landfall on Hawai'i Island in 2014, causing considerable damage to utility poles, roadways, and homes on the windward side of the island.

Flooding

The Federal Emergency Management Agency's Flood Rate Insurance Maps indicate that the Petition Area is within Zone X, which represents areas with minimal flood hazards. Zone X is defined as areas determined to be outside the 500-year flood plain (Figure 3-4).

Tsunami

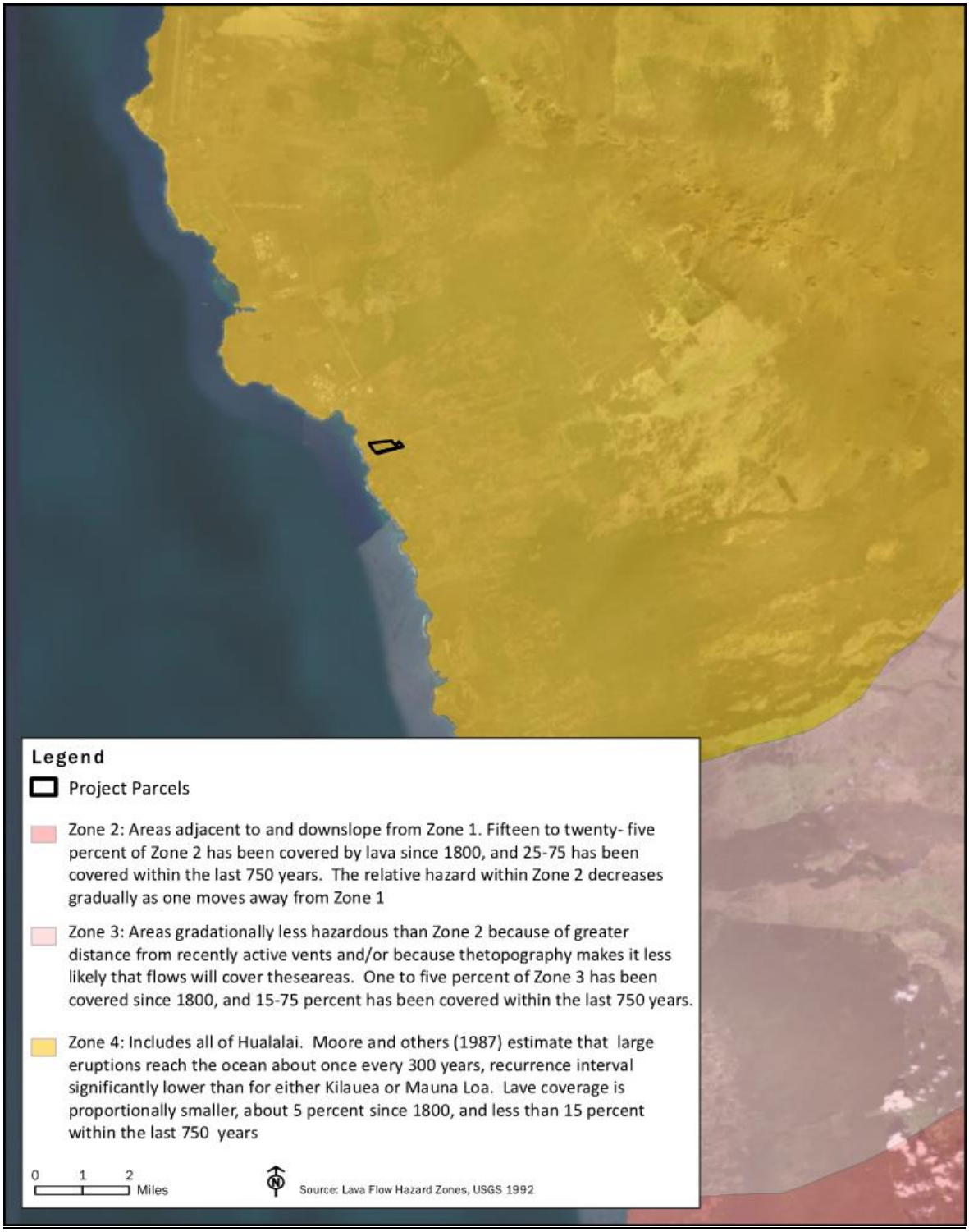
The Petition Area is not located within the Federal Emergency Management Area (FEMA) designated Tsunami Inundation Zone (Figure 3-5). Twenty-five of the tsunamis recorded in Hawai'i since 1812 have had an adverse impact on the Island of Hawai'i, seven caused major damage, and three were generated locally. The most recent tsunami to impact Hawai'i Island occurred on March 11, 2011, causing property damage at several locations on the Kona coast.

Wild-land Fires

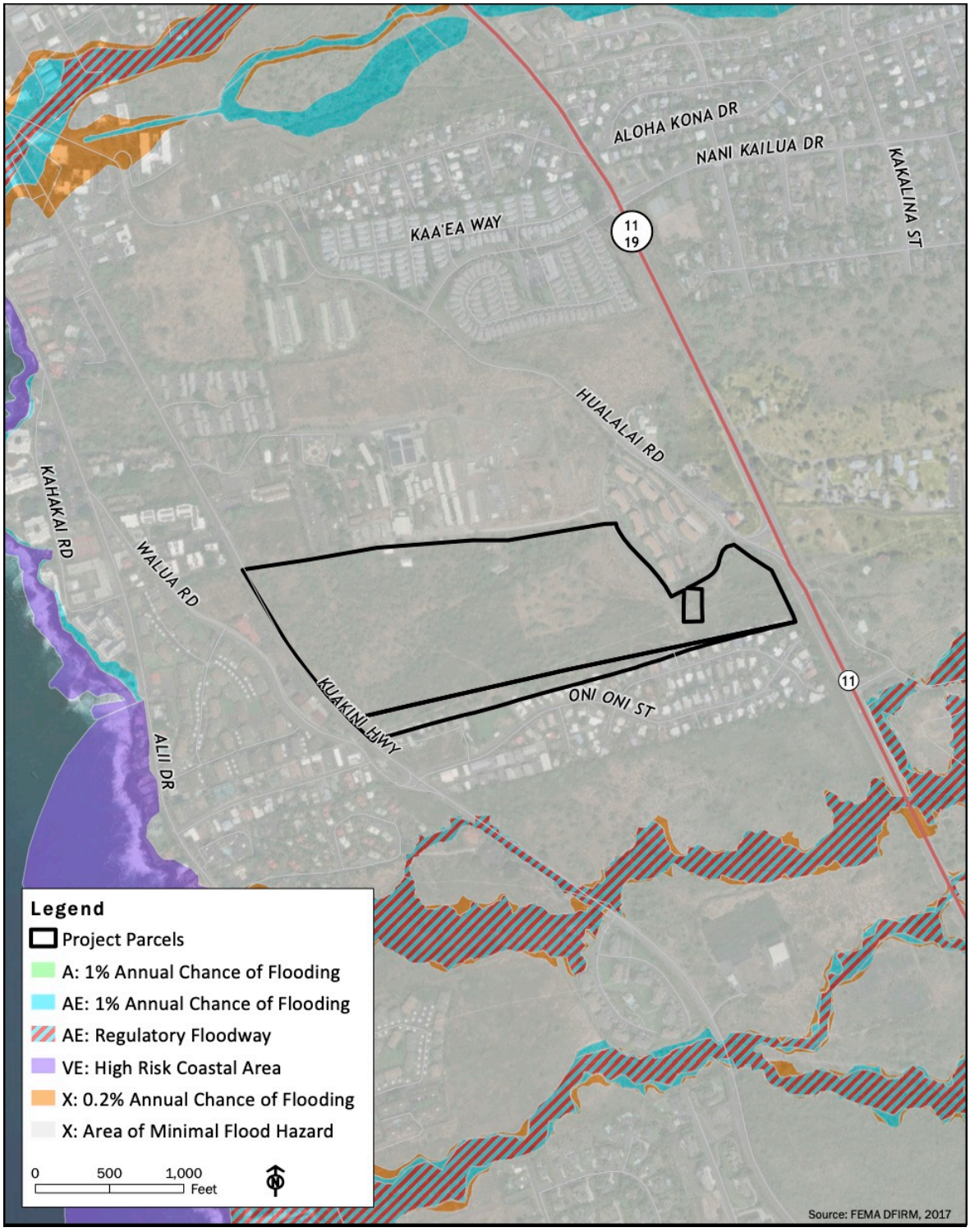
The greatest danger of fire is where wild-land (trees and brush) borders urban areas. Although all the Hawaiian Islands are vulnerable to wild-land fires (especially during the summer months, prolonged drought and/or high winds), the great majority of wildfires are human-caused (intentionally caused or by negligence) and start along roadsides. The numbers of such fires are increasing. Wildfires can and do also occur naturally. Hawai'i County has a Fire Prevention Bureau that works to prevent fires before they can cause injuries and property damage. The proposed project will comply with all fire code requirements.

Climate Change and Sea Level Rise

As global temperatures increase, established patterns of weather and climate are shifting. These erratic changes in weather patterns have increased the severity of events like droughts, storms, floods, and even hurricanes, while at the same time causing these events to be more difficult to predict and protect against. The fragility of the ecosystems and unique island nature of the Hawaiian Islands make the state particularly vulnerable to the damaging effects of climate change. Among the impacts associated with climate change is the threat of rising sea levels. Recent projections of global sea level rise estimate an increase of up to 1-meter or higher above current sea levels. This is of particular concern to low-lying coastal communities and ecosystems that are exposed to a variety of coastal hazards, such as tsunamis and hurricanes. These hazards and the resulting risk to coastal areas can be exacerbated by sea level rise.



3-3 Lava Hazard Zone Map



3-4 Flood Zone Map

3-5 Tsunami Inundation Zone Map

Anticipated Impacts and Mitigation Measures

The proposed project is not anticipated to increase the Petition Area's exposure to any natural hazard. However, the proposed project is anticipated to increase the amount of impervious surfaces which may cause increased runoff and flooding, especially during a storm or heavy rain event. Storm water will be managed to ensure that there are negligible increases to the volume of flow leaving the site from current conditions. Hawai'i County Code Storm Drainage Standards will be incorporated into drainage design to ensure the proposed project does not impact the existing storm water quality or volume of runoff. In addition, Low-Impact Development (LID) features will be integrated into the design to maintain or improve the existing storm peak flows and storm water quality exiting the Petition Area. Filtration/infiltration through vegetation will capture the majority of the increased runoff resulting from the proposed project and allowing it to seep into the ground rather than leaving the Petition Area. Overflow from the LID features will primarily be conveyed to grassed areas. Additional LID design measures may include pavers or pervious pavement to counteract the increase in impervious surface area, and to help groundwater recharge and decrease stormwater runoff. During construction, BMPs will be implemented to reduce the potential for storm water pollution leaving the Petition Area.

With the exception of an increase in impervious surface area, construction of the proposed project will not exacerbate any natural hazard conditions. Should there be a hurricane or earthquake, the potential impact of destructive winds and torrential rainfall and earth movement will be mitigated through compliance with the International Building Code. Based on the probability of lava flows in Zone 4, there is a low concern for volcanic hazards in the area. The proposed project will comply with all fire code requirements, mitigating potential impacts from wild- land fire hazards. The Petition Area is located in Zone X, which includes areas of minimal hazard from the principal source of flood in the area and the National Flood Insurance Program does not have any regulations for development within this district. The Petition Area is located outside the designated tsunami evacuation zone and is at an elevation that is very unlikely to be impacted by a tsunami, high waves, or sea level rise.

3.7 Botanical Resources

Existing Conditions

The 2020 U of N Kona Master Plan Update has been designed to ensure that facility types and the physical attributes of each facility site are compatible with urban development. The Petition Area was surveyed to ensure that the physical, environmental, and cultural attributes of the property were compatible with the land uses proposed. For the 2020 U of N Kona Master Plan Update, an updated *Natural Resources Surveys for University of Nations Expansion Property North Kona District, Island of Hawai'i* was prepared by AECOS, Incorporated (January 30, 2020). Refer to *Appendix A*. A flora and fauna study and biological study of the Petition Area was completed in July 2002 (Terry & Hart, 2002). At that time all portions of the Petition Area were surveyed, and no threatened or endangered plant or animal species were present or would be expected to be present on the Petition Area. For the updated *Natural Resources Surveys Study* the entire Petition Area was re-surveyed by AECOS. The botanical survey found that most natural features on the property have been extensively modified by past agricultural activities. The Petition Area was found to be characterized by a mixture of scattered kiawe (*Prosopis pallida*) and short-stature koa haole (*Leucaenaleucocephala*) with moderately dense Guinea grass (*Megathyrsus maximus*) at the upper end and more open koa haole and areas of dense herbaceous growths of coffee senna (*Senna occidentalis*) and 'uhaloa (*Waltheria*

americanas) in disturbed areas. Of the total list of botanical species, the botanical resources survey recorded only four native (indigenous) plants: 'ilima (*Sida fallax*), 'uhaloa (*Waltheria indica*), 'ilie'e (*Plumbago zeylanica*), and a common sedge (*Cyperus polystachyos*). All three are widespread in the Islands and of no conservation concern and 'uhaloa is known to be common in disturbed areas as well as areas of marginal growing conditions.

Anticipated Impacts and Mitigation Measures

According to the botanical survey, the development of the Petition Area is not expected to have a significant negative impact on the botanical resources in the area. During the course of the survey, no plant or botanical species urgently protected or proposed for protection under either the Federal or State of Hawai'i endangered species programs was detected on the Petition Area. Additionally, no federally delineated Critical Habitat for any species is included in or is located close to the Petition Area. Thus, modifications of habitats on the Petition Area will not result in impacts to federally designated Critical Habitat. The landscape architectural design for the proposed 2020 U of N Kona Master Plan Update will incorporate native species and/or plants proven to be adaptable to the area.

3.8 Fauna

Existing Conditions

The 2020 U of N Kona Master Plan Update has been designed to ensure that facility types and the physical attributes of each facility site are compatible with urban development. The Petition Area was surveyed to ensure that the physical, environmental, and cultural attributes of the property were compatible with the land uses proposed. For the 2020 U of N Kona Master Plan Update, an updated *Natural Resources Surveys for University of Nations Expansion Property, North Kona District, Island of Hawai'i* was prepared by AECOS, Incorporated (January 30, 2020). *Refer to Appendix A*. A flora and fauna study and biological study of the Petition Area was completed in July 2002 (Terry & Hart, 2002). At that time all portions of the Petition Area were surveyed, and no threatened or endangered plant or animal species were present or would be expected to be present on the Petition Area. For the updated *Natural Resources Surveys Study* the entire Petition Area was re-surveyed by AECOS and a bird and mammal survey was conducted.

The avian resources survey recorded a total of 21 avian species. One of the species recorded, the Hawaiian Hawk (*Buteo solitarius*) was observed flying over the site, which was listed as an endangered species. However, effective February 3, 2020, the Hawaiian Hawk has been delisted as an endangered species by the U.S. Fish and Wildlife Service, but remains listed by the State of Hawai'i. The remaining twenty other species recorded across the Petition Area are all commonly occurring established alien species.

During the mammalian survey, five mammalian species were recorded. All of the mammalian species are deleterious to native ecosystems and the native faunal species dependent on them. No Hawaiian hoary bats were detected during the course of this survey. It is likely that this species forages over the site on a seasonal basis. The current vegetation on the site is not typical of that in which one would expect to find roosting Hawaiian hoary bats. It is not expected that the proposed action will result in deleterious impacts to the Hawaiian Hoary bat.

Anticipated Impacts and Mitigation Measures

The findings of the avian and mammalian surveys are consistent with the location of the Petition Area and the vegetation present. The fauna on the Petition Area is dominated by non-native species. In summary, with respect to protected species, with one exception as noted above, no animal species urgently protected or proposed for protection under either the Federal or State of Hawai'i endangered species programs was detected on the Petition Area during the course of the survey. Additionally, no federally delineated Critical Habitat for any species is included in or is located close to the Petition Area. Thus, modifications of habitats on the Petition Area will not result in impacts to federally designated Critical Habitat.

Although not detected during the avian survey, the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), Band-rumped Storm Petrel (*Hydrobates castro*), and Newell's Shearwater (*Puffinus newelli*) may over-fly the Petition Area between April and the end of November each year. The petrel and storm-petrel are listed as endangered, and the shearwater as threatened under both federal and State of Hawai'i endangered species statutes. Collision with man-made structures is considered to be second-most significant cause of mortality of these seabirds in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds can collide with man-made structures and, if not killed outright, dazed or injured birds become prey to feral mammals. Neither nesting colonies nor appropriate nesting habitat for either of these listed seabird species occur within or close to the current Petition Area.

Potential for impact on protected seabirds that the proposed project poses is an increased threat to transiting birds disoriented by lights associated with the proposed project during the seabird nesting season from September 15 through December 1 each year. If, during construction, it is deemed expedient to conduct night-time construction activities, or if streetlights are installed as part of the proposed action, these must be shielded. Shielding of lights would serve the dual purpose of minimizing disorientation and downing of petrels and shearwaters, and complying with Hawai'i County Code §14 – 50 et seq., which requires shielding of exterior lights to lower ambient glare reaching the astronomical observatories located on Mauna Kea.

Mitigation measures for the Hawaiian seabirds, Hawaiian Petrel, Band-rumped Storm Petrel and Newell's Shearwater, include light shielding during any nighttime construction and it is recommended that streetlights or exterior facility lighting installed in conjunction with the project be shielded to reduce the potential for interactions with nocturnally flying seabirds with external lights and man-made structures.

3.9 Air Quality

Existing Conditions

The U.S. Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS) per the requirements of the Clean Air Act (last amended in 1990) to protect public health and welfare and prevent the significant deterioration of air quality. These standards account for seven major air pollutants: carbon monoxide (CO), nitrogen oxides (NOX), ozone (O3), particulate matter smaller than 10 microns (PM10), particulate matter smaller than 2.5 microns (PM2.5), sulfur oxides (SOX), and lead. The State of Hawai'i, Department of Health (DOH), Clean Air

Branch (CAB) has also established State Ambient Air Quality Standards (SAAQS) for six of these air pollutants to regulate air quality statewide. The SAAQS for carbon monoxide and nitrogen dioxide are more stringent than NAAQS. Hawai'i also has a stringent standard for hydrogen sulfide, which is a common odorous pollutant associated with wastewater treatment facilities.

Air quality in the State of Hawai'i is generally characterized as relatively clean and low in pollution. According to the *Annual Summary 2014 Hawai'i Air Quality Data,* air quality monitoring data compiled by the DOH indicates that the established air quality standards for all monitored parameters are consistently met throughout the State and on the Island of Hawai'i. DOH, CAB regularly samples ambient air quality at monitoring stations throughout the State, and annually publishes this information. The DOH has monitoring stations on the Island of Hawai'i, which mainly measure air quality impacts from the volcano and geothermal energy production. The closest air monitoring station to the Petition Area is the Kailua-Kona Station, which is located approximately 2 miles south. Air quality data from the Kailua-Kona Station suggests that all National and State air quality standards are currently being met.

Present air quality at the Petition Area is primarily affected by natural, industrial, agricultural, and/or vehicular sources. Natural sources that may affect the Petition Area include wind-blown dust and volcanoes. Volcanic emissions (vog) consist of sulfur dioxide and persistently hangs over a majority of the West Hawai'i area. Occasionally, wind patterns carry emissions from Kīlauea Volcano to the northwest, in the direction of the Petition Area. Kīlauea Volcano is recognized as the largest point source of SO_2 gas in the United States. Gaseous emissions increased dramatically in 2008 when a new vent opened at the volcano's summit. Emission estimates increased to 3,000 – 5,000 tons per day (TPD) of SO_2, in contrast to previous average emission of 1,700 TPD. The 2018 eruptions at the Kīlauea summit and Lower East Rift Zone also resulted in highly elevated gas emissions. Air flow from this direction carrying vog can result in an increase in pollution.

Anticipated Impacts and Mitigation Measures

Short-term air quality impacts due to the proposed project may result from construction activities. On a localized level during construction, air quality in the area may be impacted by exhaust generated from construction equipment and fugitive dust. All construction activities will comply with County and State Air Pollution Control regulations on Fugitive Dust. A combination of BMPs and other measures necessary to mitigate potential construction-related air quality impacts will be implemented as appropriate to reduce any negative air quality impacts. Exhaust emissions from construction equipment and increased vehicular traffic should not violate State or Federal air quality standards based on the moderate level of existing traffic volumes in the region.

Long-term air quality impacts due to the proposed project are not expected. As the proposed uses are primarily educational facilities and residential, air quality impacts to the surrounding area are expected to be minimal, mainly from cars entering and exiting the Petition Area. The vehicular emissions associated with the proposed project are not expected to exceed any State or Federal air quality standards based on the moderate level of existing traffic volumes in the region.

3.10 Noise

Existing Conditions

Existing background ambient noise levels within the Petition Area are largely attributed to motor vehicle traffic along the highways bordering the Petition Area, including Kuakini Highway on the west and Queen Ka'ahumanu Highway and Hualālai Road on the east. The noise levels around the project site are consistent with noise levels found in typical residential and school areas.

Anticipated Impacts and Mitigation Measures

There will be short term increased noise levels generated during construction; however noise levels are not expected to adversely affect residents near the Petition Area. Construction noise impacts will be relatively short-term during daytime hours. Construction activities will comply with the "Community Noise Control" and State of Hawai'i's DOH noise regulations. When construction noise exceeds or is expected to exceed the maximum permissible property line noise levels, a noise permit must be obtained from the State DOH to allow the operation of vehicles, cranes, construction equipment, and power tools, which emit noise levels in excess of maximum permissible levels. Over the long term, the project is not anticipated to affect ambient noise levels. Upon completion of the proposed project, since the proposed uses are primarily educational and will occur within buildings, the primary source of noise emission to the surrounding area is expected to be minimal, primarily from cars entering and exiting the site. Any mechanical equipment (e.g., ventilation and air conditioning systems) will be mitigated (e.g., enclosure) such that noise levels do not exceed the maximum permissible noise levels. Noise mitigation measure will be implemented with respect to the abutting residential areas.

3.11 Utilities and Infrastructure

For the 2020 U of N Kona Master Plan Update a Preliminary Infrastructure Assessment (February, 2020) was conducted by G70, providing an assessment of the existing and proposed infrastructure systems for the Petition Area, included as *Appendix C*.

Water

Existing Conditions

U of N Kona's water is supplied by the County of Hawai'i Department of Water Supply (DWS) off of the DWS 325 reservoir. Its service zone limits are from 0 feet to the 225-foot elevation (while the existing campus is approximately 90 feet to 360 feet above sea level). There are no onsite water sources or sources of recycled or non-potable water. The campus is served from two DWS meters: a 6"x3" master FM meter located near the main campus entrance along Kuakini Highway which connects to a 6" DWS main in Kuakini Highway and an 8"x2" master FM meter located near the top of the spine road which connects to an 8" DWS main in the Hualālai Village lower driveway. The average daily water use at the Existing Campus Site was analyzed using meter data from the two DWS meters serving the property. The entire Existing Campus Site is averaging a daily water use of 70,341 gallons per day (gpd) based on records from 2017 to 2019. This is in excess of the DWS water allocation for the property of 45,200 gallons per day.

Over the past year, U of N Kona has assessed the existing water system, added flow metering and initiated an intensive leak repair program that has resulted in a reduction in water use. The repairs have already resulted in a decrease in average daily water usage for the months of January and February of this year to approximately 54,000 gpd. This reduction in water use brings U of N Kona much closer to the current DWS water allocation. As further repairs are completed, it is expected that water usage as measured through the water meters will normalize to more closely match the actual demand, and move closer to the DWS allocated amount. The existing water usage onsite can be further reduced by incorporating efficient water fixtures and replacing replanting landscape areas with native plants that require less irrigation.

According to the Preliminary Infrastructure Assessment, the anticipated additional water demands attributable to the development of the 62-acre Petition Area, are shown below:

Table 3-1 2020 U of N Kona Master Plan Update Projected Water Demand

Use [4]	Phase 1	Phase 2	Phase 3
P-12 Students (FTE) [1]	30,000	45,000	60,000
University Students (FTE) [1]	7,800	20,700	56,400
P-12 & University Students (Dorm) [2]	20,000	110,000	140,000
Total	**57,800**	**175,700**	**256,400**
DWS Water Units [3]	145	439	641

[1] 60 gallons per capita day (DWS Water System Standards)
[2] 100 gallons per capita day (DWS Water System Standards)
[3] 400 gpd per water unit (DWS Water System Standards)

Additional water infrastructure improvements may be required to serve the upper reaches of the Petition Area above the 225' service elevation of the DWS 325 reservoir. In lieu of pumps, a new service connection to the existing DWS water main in the Hawai‘i Belt Road is proposed to extend water service from the DWS 595 shaft to the upper elevations of the Existing Campus Site and Petition Area situated above the 225' service elevation.

Anticipated Impacts and Mitigation Measures

According to the Preliminary Infrastructure Assessment, the U of N Kona Existing Campus Site is currently using more water than it is allocated, and no additional water is available from the County water system for future development of the Petition Area. Simultaneously, the U of N Kona has expressed a desire to show their commitment to green infrastructure and a sustainable future by aiming to be as self-sufficient as possible. To support the development and expansion of the campus, water management strategies incorporating water re-use and repurposing will be included in the infrastructure development program and additional source development will be needed. The goals of the water resource management strategies will be to:

1. Reduce the water demand by introducing water efficient fixture units, promote. conservation measures, and introduce native and climate appropriate landscaping.
2. Develop non-potable water sources onsite by capturing stormwater runoff.
3. Develop additional potable water sources by drilling and developing one or more. groundwater wells.

4. Match source water quality with end-user requirements to minimize potable water use.
5. Promote groundwater recharge by maximizing infiltration across the campus.

While the Petition Area is being developed in three phases over 30 years, a new water source(s) will be needed to support buildout of each phase. Source development should be planned to meet the immediate needs of each phase but also plan for the full buildout and expansion of the entire Petition Area.

The Petition Area is located within the Keauhou Aquifer System. This aquifer currently has an existing usage of 15.4 million gallons per day (mgd) and a sustainable yield of 38 MPD. New wells may be drilled and treated to provide additional potable water onsite. U of N Kona has contracted a hydrogeologist to study the feasibility of developing wells onsite and for the 2020 U of N Kona Master Plan Update a *Water Supply Study* has been conducted for the Petition Area. Refer to *Appendix D*. U of N Kona has also been in discussions with neighboring landowners to potentially form partnerships to develop new wells and water sources offsite. Any offsite water source improvements would likely be dedicated to the County and additional DWS water unit credits would be secured for the expansion of the Petition Area.

To help reduce the potable water needed, potable water on the new development will be used primarily for domestic purposes with limited irrigation use. Non-potable water will be used for irrigation and be supplied by treated grey water from the different buildings onsite and harvested storm water runoff.

Anticipated escalation in water costs, the environmental impacts of pumping and "over-treating" water in relation to its end use, and climate change and its effect on the availability of groundwater are all drivers for water resource management goals. A full Water Master Plan is being developed for the campus to model the anticipated water demands and required water source and supply improvements required to meet those demands and is being done in conjunction with the 2020 U of N Kona Master Plan Update.

Wastewater

Existing Conditions

According to the Preliminary Infrastructure Assessment, U of N Kona's Existing Campus Site is connected to the County of Hawai'i Department of Environmental Management's wastewater system. There is an existing 8" private sewer main onsite along the Center "Spine" Road that collects wastewater from the individual campus buildings and discharges it to an existing municipal 18" gravity sewer main within Kuakini Highway. The County gravity sewer main flows to the Kealakehe Pump Station and continues to the Kealakehe Wastewater Treatment Plant (WWTP) in Kailua-Kona.

There is existing wastewater infrastructure only on the Existing Campus Site at this time, and there is no wastewater infrastructure on-site at the Petition Area. The existing 18" County sewer main is assumed to continue fronting the Petition Area within Kuakini Highway.

Anticipated Impacts and Mitigation Measures

The onsite wastewater system will continue to be connected to the existing County wastewater system. A wastewater service request has been submitted to the County of Hawai'i Department of Environmental Management Wastewater Division for the 2020 U of N Kona Master Plan Update,

expansion of the campus planned for the Petition Area. The County has noted that the Kealakehe WWTP has a committed capacity of 3.8 mgd, while the rated capacity is 5.3 mgd, indicating that there is available capacity at the treatment plant.

It is expected that the existing wastewater conveyance system could accommodate some level of increase in flows, but that at some point in the future, offsite improvements to the County wastewater conveyance system may be required. Once those requirements are identified, proposed design and construction budgets and phasing will be developed and included in an Infrastructure Master Plan.

In conjunction with the proposed water system sustainability planning efforts, the reductions in water use will likely result in a reduction in wastewater generation. Water management strategies incorporating onsite treatment of wastewater into grey water re-use will further reduce the contribution of wastewater flows to the County system. In particular, grey water use in irrigation of landscaping is an alternative that will likely be pursued.

Power and Communication System

Existing Conditions

According to the Preliminary Infrastructure Assessment, electrical service to U of N Kona's Existing Campus Site is currently provided by Hawaiian Electric (HE) and communication services are provided by both Hawaiian Tel (HTCO) and Spectrum. As State Public Utility Commission (PUC) regulated public utilities, HE and HTCO are responsible for the development of off-site facilities that meet island-wide needs, such as power generating plants and power and signal transmission lines, and facilities that serve regional needs of Kailua-Kona. Presently, the Existing Campus Site is served by these utilities off of Kuakini Highway. The HE electrical service is at the primary distribution voltage of 12.47kV, three phase, through a single metering point. The power is further distributed at 480/277v, 208/120v, three and single phase, to the campus buildings and facilities. This electrical infrastructure is owned and maintained by U of N Kona.

Spectrum is a State Department of Commerce and Consumer Affairs cable television franchisee that is the sole land-line provider of cable television service to Hawai'i Island. Although not a PUC regulated utility, Spectrum's off-site facility construction policy is to provide such facilities where the anticipated revenue from the prospective service connections warrants the expenditure. HTCO has a similar policy with regard to new developments.

Anticipated Impacts and Mitigation Measures

As State Public Utility Commission (PUC) regulated public utilities, HE and HTCO are responsible to provide utility service to the public with reasonable requirement to those in their service area. Presently, U of N Kona's Existing Campus Site is served by these utilities off of Kuakini Highway. Once utility demands are established, service requests to each utility can be submitted to determine cost and requirement to upgrade existing services to the Petition Area. Service upgrades or new services are likely required.

The development of renewable energy sources is feasible based upon the 2020 U of N Kona Master Plan Update's proposed development plans and will likely consist of photovoltaic panels over covered parking and building rooftops, and will consist of battery storage. It is possible the U of N Kona could have its own micro-grid. In addition, the installation of energy monitoring equipment and

controls are recommended to better identify areas for conservation and optimization. Energy conservation measures will be implemented throughout U of N Kona's Existing Campus Site and Petition Area for both existing and proposed systems.

Spectrum is a State Department of Commerce and Consumer Affairs cable television franchisee that is the sole land-line provider of cable television service to Hawai'i Island. Although not a PUC regulated utility, Spectrum off-site facility construction policy is to provide such facilities where the anticipated revenue from the prospective service connections warrants the expenditure. Once utility demands are established, a service request to Spectrum can be submitted to determine cost and requirements to upgrade existing services to U of N Kona's Existing Campus Site and Petition Area.

Roadways and Vehicular Access

Existing Conditions

U of N Kona's Existing Campus Site is accessed from Kuakini Highway through several driveways along the makai side of the property. The Existing Campus Site has a series of onsite roadways and parking lots connecting the campus' different areas of interest that are linked by a Center "Spine" Road. The Center "Spine" Road is located along the Existing Campus Site's southern property line (between TMK (3) 7-5-0010:003 and TMK (3) 7-5-010:085 - the Petition Area) and extends from Kuakini Highway to Hualālai Road.

The privately owned Hualālai Village condominiums located just mauka of the existing campus have privately-owned perimeter roads that abut the Existing Campus Site and Petition Area. U of N Kona has only limited rights to these roads.

Anticipated Impacts and Mitigation Measures

The proposed expansion of 2020 U of N Kona Master Plan Update on the 62-acre Petition Area, as well as improvements to the Existing Campus Site, is phased to allow for incremental development of the campus extending from the existing Center "Spine" Road. Three major phases of improvements are anticipated. Additional roadways and parking facilities will be constructed in each phase of the project. This approach will allow for the new development to be integrated into the Existing Campus Site and for more holistic circulation and operations onsite.

Along its mauka boundary, the Petition Area is adjacent to Hualālai Road and Hawai'i Belt Road/Queen Ka'ahumanu Highway. The State of Hawai'i Department of Transportation (HDOT) has not confirmed if there are any mapped access restrictions along the Petition Area's property lines adjacent to Hawai'i Belt Road/Queen Ka'ahumanu Highway, but the Petition Area is located within 250 feet of the Hualālai Road intersection and this limited distance makes a connection from the Petition Area to Hawai'i Belt Road/Queen Ka'ahumanu Highway infeasible. Additionally, there is steep bank separating the Hawai'i Belt Road/Queen Ka'ahumanu Highway and the Petition Area and this considerable elevation change makes a driveway undesirable.

For the 2020 U of N Kona Master Plan Update, traffic consultant Fehr & Peers, Incorporated has conducted a Mobility Analysis Report (MAR) for the future phases of the proposed developments. The MAR evaluates traffic flows for each phase of the project and provide analysis and recommendations for new vehicular access points at Kuakini Highway and Hualālai Road, included in the following Section 3.12 and *Appendix B*.

It is anticipated that two-way, two-lane paved access roads will loop around the Petition Area to provide both vehicular and fire/emergency access throughout U of N Kona's Existing Campus Site and the Petition Area.

3.12 Traffic and Mobility Analysis

Existing Conditions

For the 2020 U of N Kona Master Plan Update, a Mobility Analysis Report (MAR) was conducted by Fehr and Peers, Incorporated (February, 2020). Refer to *Appendix B*. According to the MAR, the University of the Nations Kona campus is located at 75-5952 Kuakini Highway in the community of Kona in Hawai'i County. The project site is on tax map key parcels TMK (4) 7-5-010: 085 and (4) 7-5-017: 006, between Kuakini Highway and Hualālai Road. The existing campus includes the following mix of uses: residential (student and faculty housing), religious land (chapel), educational land use (classrooms, campus services, cafeteria), and recreational land use (sports complex, swimming pool). For the MAR, a comprehensive data collection effort was undertaken to identify existing transportation conditions in the vicinity of the proposed project. The assessment of existing conditions relevant to this study includes an inventory of the street system, traffic volumes on these facilities, and operating conditions at key intersections.

Existing Roadway System

The existing key roadways providing access to or in the vicinity of the Petition Area include:

- *The University of the Nations Driveway* provides direct access from Kuakini Highway to the University of the Nations of Kona campus and serves as the primary internal campus roadway providing access to existing campus facilities. The roadway terminates just west of the Aloha Lanai Cafeteria. The unnamed road has speed bumps and is currently two lanes. The posted speed limit is 15 miles per hour (mph).

- *Kuakini Highway* is the primary street that provides access to the Petition Area. Adjacent to the Petition Area, it is a two-lane collector roadway that extends generally from the north end of the town of Kailua-Kona to Queen Ka'ahumanu Highway. The posted speed limit is 35 mph. Kuakini Highway is under the jurisdiction of the County of Hawai'i Department of Public Works (DPW). Sidewalks are not provided on either side of Kuakini Highway. No bicycle facilities exist along Kuakini Highway within the study area. Crosswalks are provided at the intersection of Kuakini Highway and Hualālai Road.

- *Hualālai Road* is a two-lane local roadway that is under the jurisdiction of DPW. It runs east-west between Ali'i Drive and Queen Ka'ahumanu Highway. The posted speed limit is 25 mph. Sidewalks are provided on both sides of the roadway makai of Kuakini Highway, on the north side of the roadway between Kuakini Highway and the Regency at Hualālai, and on the south side of the roadway just makai of Queen Ka'ahumanu Highway. No bicycle facilities exist along Hualālai Road within the study area. On-street parking is not provided.

- *Queen Ka'ahumanu Highway* is a two-lane highway that is under the jurisdiction of the State of Hawai'i Department of Transportation (HDOT). It is a major component of the Hawai'i Belt Road and runs from Hwy 19 in Kailua-Kona to Hwy 19 in Hilo. The posted speed limit within the study area is 45 mph. Neither sidewalks nor bicycle facilities are provided along the roadway. On-street parking is not provided.

- *Nani Kailua Drive* is a two-lane local roadway that is under the jurisdiction of DPW. It runs east-west and extends from Hualālai Road to just mauka of Pikake Place. The posted speed limit is 25 mph. Neither sidewalks nor bicycle facilities are provided along the roadway. On-street parking is provided on both sides of the roadway.

Existing Transit Facilities and Services

According to the MAR, the County of Hawai'i Mass Transit Agency provides island-wide commuter and fixed-route service on the Island of Hawai'i, where it served over 800,000 riders in the fiscal year of 2016-2017. Hele-On offers fixed- route transit service in the Hilo and Kona areas Monday through Saturday, and limited commuter services to the South Kohala Resort (SKR) areas seven days a week. Within the Petition Area, the Pahala-Kailua- Kona-South Kohala Resorts Route provides daily service along Queen Ka'ahumanu Highway with transit stops both north and south of the Petition Area. Detailed route schedule information, such as operating hours and frequencies, was not available.

Existing Bicycle Activity

According to the MAR, the study area has a low level of bicycle activity. Based on the peak period traffic counts, a range of 0-16 bicyclists were observed at each intersection during the AM peak hour and a range of 0-6 bicyclists were observed at each intersection during the PM peak hour. In general, most bicyclists were traveling mauka- bound along Hualālai Road.
At the intersection of Kuakini Highway and the University of the Nations Driveway, the highest level of morning bicycle activity occurred from 7:15 to 8:15 AM, with a total of two (2) bicyclists traveling through the intersection. In the evening, the highest level of bicycle activity occurred from 4:15 to 5:15 PM with a total of two (2) bicyclists traveling through the intersection.

Existing Pedestrian Activity

According to the MAR, the study area generally has a low level of pedestrian activity, except for the intersection of Kuakini Highway and Hualālai Road, where pedestrian activity is high. During the AM peak hour, 46 pedestrians were observed at the intersection of Kuakini Highway and Hualālai Road, and between zero (0) and three (3) pedestrians were observed at the other study intersections. During the PM peak hour, 32 pedestrians were observed at the intersection of Kuakini Highway and Hualālai Road, and between zero (0) and 11 pedestrians were observed at the other study intersections.

At the intersection of Kuakini Highway and the University of the Nations Driveway, the highest levels of pedestrian activity occurred in the morning from 7:15 to 8:15 AM with one (1) pedestrian, and in the evening from 4:15 to 5:15 PM with a total of 11 pedestrians. At the intersection of Kuakini Highway and Hualālai Road: 28 AM and six (6) PM peak hour pedestrian trips crossed the north leg of the intersection, five (5) AM and three (3) PM pedestrian trips crossed the south leg of the intersection, five (5) AM and 22 PM pedestrian trips crossed the mauka leg of the intersection, and a total of eight (8) AM trips and one (1) PM pedestrian trip crossed the makai leg of the intersection.

Existing Traffic Volumes/Lane Configurations

Operations of the seven (7) existing study intersections were evaluated for the weekday AM and PM peak hours. Traffic counts were collected during the weekday AM and PM peak periods in October 2019 while university classes were in session. The weekday peak hours of traffic for the study area generally occurred between the hours of 7:15 to 8:15 AM and 4:15 to 5:15 PM. Existing lane configurations and signal controls were obtained through field observations and the following key observations were made:

- *Kuakini Highway/Hualālai Road*: Vehicular congestion along Kuakini Highway limits the number of vehicles that can pass through this intersection during the peak hour than would in free-flow conditions. As fewer vehicles pass through the intersection, intersection delay is lower, and LOS is more desirable, than existing field observations indicate.

- *Queen Ka'ahumanu Highway & Nani Kailua*: Vehicular congestion along Queen Ka'ahumanu Highway limits the number of vehicles that can pass through this intersection during the peak hour than would in free-flow conditions. As fewer vehicles pass through the intersection, intersection delay is lower, and LOS is more desirable, than existing field observations indicate.

- *Queen Ka'ahumanu Highway & Lako Street*: Though not located within the study area, delays at this intersection cause substantive amounts of queuing in the southbound direction along Queen Ka'ahumanu Highway. This queuing spills back into the intersection of Queen Ka'ahumanu Highway & Kuakini Highway and can disrupt intersection operations.

Existing Intersection Levels of Service

According to the MAR, peak hour intersection capacity analysis was performed for the study intersections and the recently collected peak hour traffic count data. The following *Table 3-2* summarizes the results of the intersection operations analysis for Existing Conditions.

Table 3-2 Existing Peak Hour Intersection Levels of Service

Intersection	Traffic Control	Peak Hour	Existing Conditions	
			(sec/veh)[1,3]	LOS[2,3]
1. Kuakini Hwy & Hualālai Rd	Signalized	AM	17.4	B
		PM	19.2	B
2. Kuakini Hwy & University of the Nations Kona Driveway	SSSC	AM	**38.7**	**E**
		PM	33.0	D
3. Hualālai Rd & Nani Kailua Rd	SSSC	AM	10.6	B
		PM	10.5	B
4. Queen Ka'ahumanu Hwy & Nani Kailua Dr[4]	Signalized	AM	11.1	B
		PM	11.9	B
5. Hualālai Village Driveway & Hualālai Rd	SSSC	AM	11.3	B
		PM	10.4	B
6. Queen Ka'ahumanu Hwy & Hualālai Rd[4]	SSSC	AM	32.9	D
		PM	23.5	C
7. Queen Ka'ahumanu Hwy & Kuakini Hwy	SSSC	AM	**38.4**	**E**
		PM	28.7	D

Source: Fehr & Peers, 2020 Notes:
[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. The vehicular delay for the worst movement is reported for the side-street stop-controlled (SSSC) intersection, and traffic along the main roadways typically moves more efficiently.
[2] LOS calculations performed using the Highway Capacity Manual (HCM) method.
[3] Unacceptable seconds of delay per vehicle and LOS highlighted in **bold**.
[4] Congestion along Queen Kaahumanu Highway limits the number of vehicles that can pass through this intersection. Actual intersection operations operate worse than indicated.

As shown in *Table 3-2*, intersections operate at less-than-desirable LOS:

- Kuakini Highway and University of the Nations Kona Driveway: LOS E (AM Peak)
- Queen Ka‘ahumanu Highway and Kuakini Highway: LOS E (AM Peak)

Intersection results are generally consistent with field observations, except for the intersections of Kuakini Highway/Hualālai Road and Nani Kailua/Queen Ka‘ahumanu Highway. These intersections operate worse than what is shown above, primarily because congestion along Kuakini Highway and Queen Ka‘ahumanu Highway limits the number of vehicles that are able to pass through the intersection during the peak hour than would pass in free-flow conditions.

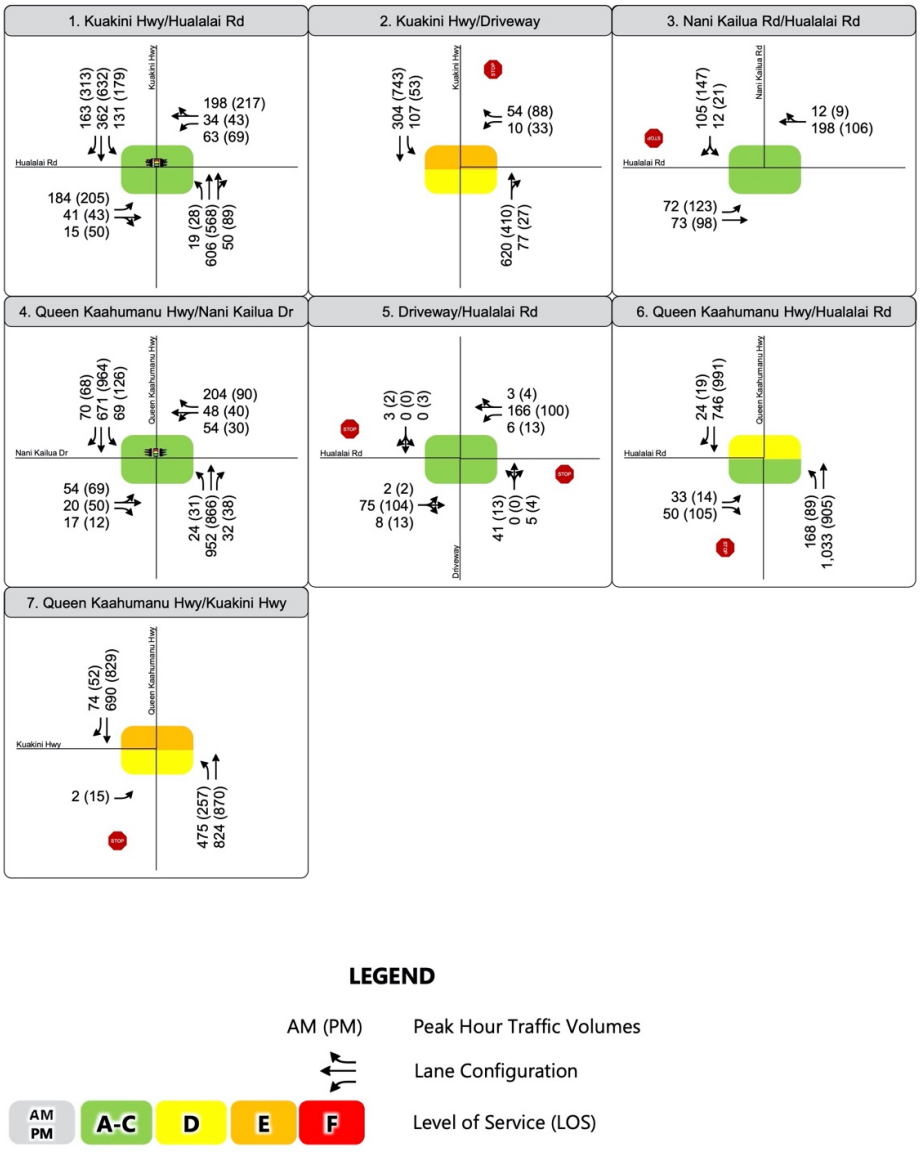


Figure 3-6 Existing Peak Hour Traffic Volumes and Lane Configurations

Figure 3-7 Existing Peak Hour Traffic Volumes and Lane Configurations Map

Anticipated Impacts and Mitigation Measures

Project Trip Generation Estimates

According to the MAR, since the Existing Campus Site is self-contained, and existing access is limited to one location, it can be assumed that any growth in student and/or faculty/staff levels would directly result in an increase in trips to and from the Existing Campus Site and Petition Area, and that any trips going in or coming from the University of the Nations Driveway are those generated by U of N Kona itself.

To estimate Phase 1 traffic generated by the 2020 U of N Kona Master Plan, a growth factor was first developed by comparing the total number of students, faculty, and staff projected to be living off campus (487) in Phase 1 to the number of existing students, faculty, and staff living off-campus (870). This growth factor (1.8) was then applied to existing count data taken at the project driveway along Kuakini Highway to derive future peak hour U of N Kona-generated vehicle trips. Total peak hour trips were then split into inbound and outbound trips. For this step, the ratio of inbound and outbound trips is assumed to be the same as under existing conditions. Phase 1 of the 2020 U of N Kona Master Plan Update is estimated to generate up to 215 new AM peak hour trips (154 inbound/62 outbound) and up to 161 PM peak hour trips (64 inbound/97 outbound). These represent vehicle trips that are estimated to be added to the surrounding network with the implementation of Phase 1 as proposed.

For the MAR, to forecast the peak hour operating conditions at each study intersection, project trip volumes were added to Phase 1 (2030) No Project traffic volumes to derive Phase 1 (2030) Plus Project volumes. The results presented in Table 3-3 indicate that under Phase 1 (2030) Plus Project conditions, all study intersections are anticipated to continue to operate at LOS D or better during the AM and PM peak hours with the addition of project-generated traffic except for the following unsignalized intersections:

- Kuakini Highway and University of the Nations Kona Driveway (LOS F, AM and PM peaks)
- Queen Ka‘ahumanu Highway and Hualālai Road (LOS F, AM peak; LOS E, PM peak)
- Queen Ka‘ahumanu Highway and Kuakini Highway (LOS F, AM and PM peaks)

The intersections of Kuakini Highway and University of the Nations Kona Driveway (AM and PM peaks) and Queen Ka‘ahumanu Highway and Hualālai Road (AM peak) operate at undesirable LOS, and the addition of project traffic would cause operations at each location to degrade further. However, as noted in Section 2.4.3, one or more signal warrants must also be met at unsignalized intersections for a direct impact to occur.

It is important to note that the intersections of Kuakini Highway/Hualālai Road and Nani Kailua/Queen Ka‘ahumanu Highway would likely operate worse than what is shown above, primarily because congestion along Kuakini Highway and Queen Ka‘ahumanu Highway limits the number of vehicles that are able to pass through the intersection during the peak hour than would pass in free-flow conditions.

For the MAR, to determine whether significant impacts would occur at any of these intersections, four-hour and eight-hour signal warrant analyses were performed. The Queen Ka‘ahumanu Highway and Hualālai Road and Queen Ka‘ahumanu Highway and Kuakini Highway intersections did not meet any of the signal warrants in this scenario. However, the Kuakini Highway and University of the Nations Kona Driveway meets both signal warrants in the Phase 1 Plus Project Scenario.

Based upon the impact significance criteria and the results of the operations analysis presented, development of Phase 1 of the proposed project is forecast to result in a significant traffic impact at the intersection of Kuakini Highway and the University of the Nations Kona Driveway. However, the impact at this intersection can be mitigated by adding a refuge lane along Kuakini Highway to receive westbound left-turn movements from the University of the Nations Kona Driveway. With a refuge lane, intersection operations would improve to LOS C in both AM and PM peak hours.

Table 3-3 Phase 1 (2030) With and Without Project Peak Hour Intersection Levels of Service

Intersection	Traffic Control	Peak Hour	Phase 1 Conditions		Phase 1 & Project Conditions		Change in Delay
			(sec/veh)[1,3]	LOS[2,3]	(sec/veh)[1,3]	LOS[2,3]	
3. Kuakini Hwy & Hualālai Rd	Signalized	AM	20.8	C	21.1	C	0.3
		PM	26.4	C	26.7	C	0.3
4. Kuakini Hwy & University of the Nations Kona Driveway	SSSC	AM	**54.4**	**F**	**77.6**	**F**	23.2
		PM	**47.4**	**E**	**51.2**	**F**	3.8
3. Hualālai Rd & Nani Kailua Rd	SSSC	AM	11.5	B	13.2	B	1.7
		PM	11.6	B	12.4	B	0.8
4. Queen Kaʻahumanu Hwy & Nani Kailua Dr[4]	Signalized	AM	23.6	C	24.5	C	0.9
		PM	27.1	C	30.3	C	3.2
5. Hualālai Village Driveway & Hualālai Rd	SSSC	AM	12.6	B	14.2	B	1.6
		PM	11.1	B	11.8	B	0.7
6. Queen Kaʻahumanu Hwy & Hualālai Rd[4]	SSSC	AM	**64.7**	**F**	**84.3**	**F**	19.6
		PM	**36.4**	**E**	**39.1**	**E**	2.7
7. Queen Kaʻahumanu Hwy & Kuakini Hwy	SSSC	AM	**90.6**	**F**	**90.7**	**F**	0.1
		PM	**51.1**	**F**	**52.4**	**F**	1.3
8. Campus Driveway & Hualālai Rd	SSSC	AM	-	-	10.7	B	-
		PM	-	-	10.3	B	-

Source: Fehr & Peers, 2020 Notes:
[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. The vehicular delay for the worst movement is reported for the side-street stop-controlled (SSSC) intersection, and traffic along the main roadways typically moves more efficiently.
[2] LOS calculations performed using the Highway Capacity Manual (HCM) method.
[3] Unacceptable seconds of delay per vehicle and LOS highlighted in **bold**.
[4] Congestion along Queen Kaahumanu Highway limits the number of vehicles that can pass through this intersection. Actual intersection operations operate worse than indicated.

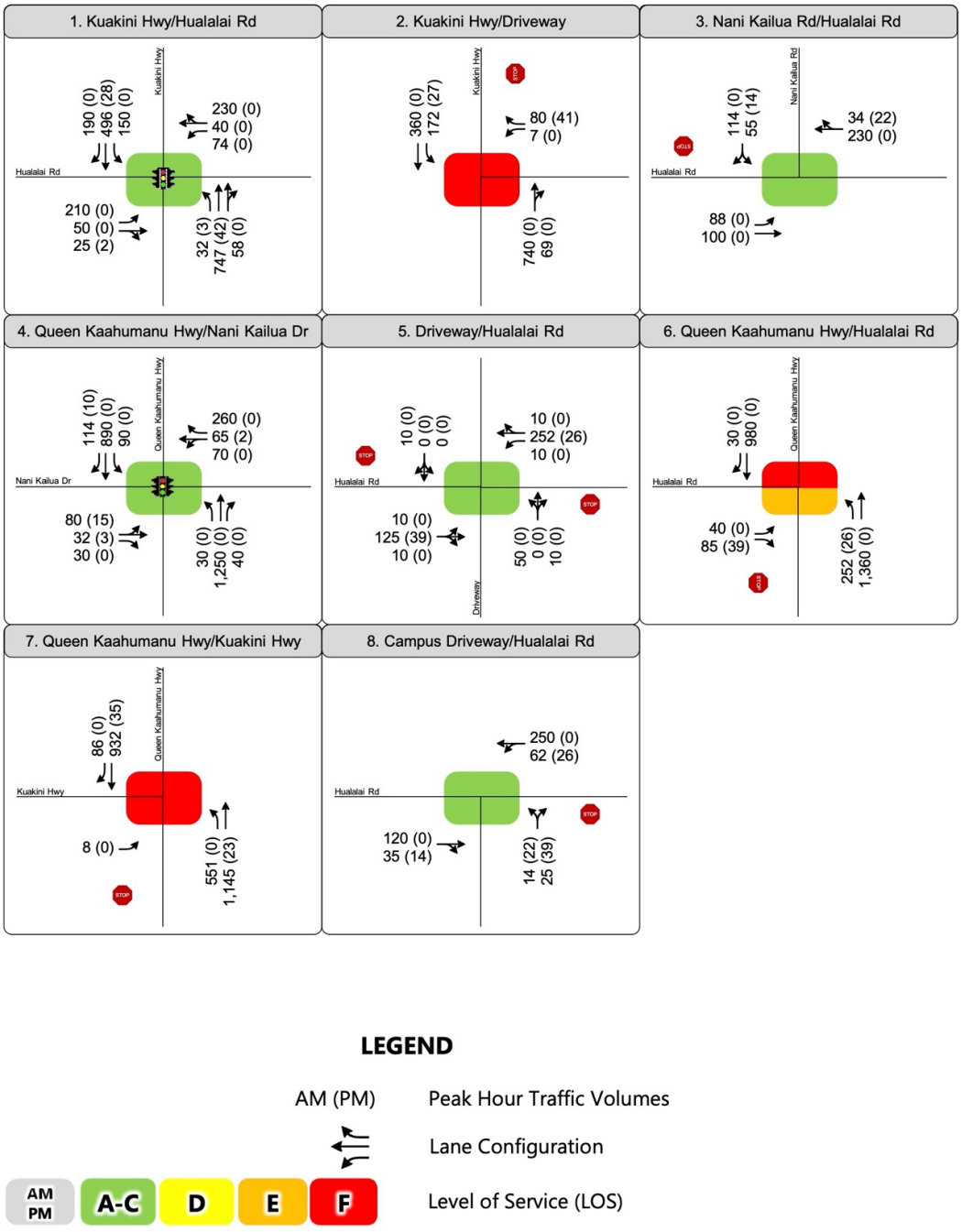


Figure 3-8 Phase 1 (2020) Plus Project Conditions Traffic Volumes and Lane Configurations

Figure 3-9 Phase 1 (2020) Plus Project Conditions Traffic Volumes and Lane Configurations Map

Phase 2 and Phase 3 "Hot Spot" Assessment

For the MAR, a future Phase 2 and Phase 3 "hot spot" assessment was conducted to determine that the intersections below could either have project-related impacts during Phase 2 or may require additional attention for reasons noted.

Queen Ka'ahumanu Highway/Hualālai Rd and Queen Ka'ahumanu Highway/Kuakini Highway

Based on a limited amount of traffic expected to use the eastbound left turns at the intersections of Queen Ka'ahumanu Highway/Hualālai Rd and Queen Ka'ahumanu Highway/Kuakini Highway, signal warrants are not anticipated to be met. However, HDOT may express concern that Phase 2 campus development will add traffic to the northbound left-turn movements at both intersections, which would contribute to increased delays for the left-turn movement on the minor street approach, therefore exacerbating the need for a traffic signal to enhance traffic operations and safety.

Kuakini Highway and the University of the Nations Kona Driveway

The intersection of Kuakini Highway and the University of the Nations Kona Driveway is expected to operate at LOS C under Phase 1 conditions with the addition of a southbound refuge lane along Kuakini Highway for westbound vehicles that will turn left out of the campus driveway. As part of the hot spot assessment, the project team tested the sensitivity of this intersection to degrading to a less-than-desirable LOS with the addition of Phase 2 project trips. To do so, projected Phase 2 project trips were estimated using the trip generation methodology described in Section 5.1 and informed by campus student, faculty, and staff projections provided by U of N Kona. Projected Phase 2 project trips were added to the Phase 1 No Project volumes and evaluated using Synchro software. The refuge lane mentioned in Section 6.3 was assumed to be in place, as this would represent mitigated intersection lane configurations under Phase 1.

The sensitivity test found that the intersection would operate at LOS E in the AM peak and LOS C in the PM peak. Further, it was determined that the intersection would also meet both 4-hour and 8-hour signal warrants with the addition of Phase 2 project trips. As such, it is likely that a signal would be required with Phase 2 of the project to enhance intersection operations, site access, and safety.

It should be noted that the U of N Kona site plan includes an additional access point along Kuakini Highway, south of the University of the Nations Kona Driveway. The addition of a second access point along Kuakini Highway would likely relieve some of the congestion at the existing University of the Nations Kona Driveway, however a series of improvements (e.g. refuge lanes or others) would be required at this location to allow for acceptable intersection operations.

Queen Ka'ahumanu Highway and Nani Kailua Drive

The intersection of Queen Ka'ahumanu Highway and Nani Kailua Drive is projected to operate at acceptable levels of service under Phase 1 conditions, however it is recognized that the intersection is operating at a worse level than the initial calculated LOS. This is primarily because of congestion along Queen Ka'ahumanu Highway that limits the number of vehicles that are able to pass through the intersection during the peak hour. Intersection conditions would likely continue to degrade with the addition of ambient and project-related traffic in Phase 2. If it is determined that Phase 2 of the project would create a significant impact, the project may be required to make a fair-share contribution to funding for anticipated roadway improvements (e.g. widening of Queen Ka'ahumanu Highway at the intersection including lane and/or signal modifications.

Kuakini Highway Widening

Kuakini Highway could be widened by 2040. If the roadway widening does occur by 2040, the UOFN Kona could be required to contribute funding for select improvements within the widened corridor if it is determined future on-campus growth would significantly impact intersections along the highway.

All of the other study intersections are forecast to operate at LOS C or better at the completion of Phase 1, and additional capacity is available to absorb some additional traffic from ambient growth and Phase 2 development expected under the campus master plan. A more detailed analysis will need to be conducted once Phase 2 development approvals are in process to determine potential project impacts at these intersections.

Phase 3 Development Beyond 2040

According to the MAR, beyond 2040, the potential operational issues noted above would continue to persist and operations would likely degrade further without additional improvements. Additionally, with planned regional improvements such as the widening of Queen Ka'ahumanu Highway, the U of N Kona could be required to contribute funding for select improvements within the widened corridor if it is determined future on-campus growth would significantly impact intersections along the highway.

3.13 Socio-Economic Characteristics

Existing Conditions

The U.S. Census reported that the population of the County of Hawai'i was 185,079 in 2010. The overall population increased by approximately 9% between 2000 and 2010 according to the U.S. Census 2010. The Petition Area is located in the U.S. Census Bureau's Holualoa Census Designated Place. In 2010, the Holualoa CDP population was 8,538 compared to 6,107 in 2000.

Table 3-4 below summarizes the population and characteristics of the Holualoa CDP compared to the County and State. The median age for the Holualoa CDP is 43.5. The 2010 U.S. Census reported 3,372 households in the Holualoa CDP with an average of 2.7 persons per household. The permanent population of North Kona is very ethnically diverse, with about 25% of the population being Hawaiian or Part-Hawaiian. The median income for a household in the Holualoa CDP was $85,81, higher than the average median income for the County of Hawai'i. About 8.6% of the population are below the poverty line.

Table 3-4 Population Characteristics

Area	Population (2010)	Median Age (years)	Persons/ Household	Ethnicity (percent)
Holualoa CDP	8,538	43.5	2.7	White: 55.6% Asian: 19.7% Hawaiian: 5.3% Other/Mixed: 19.4%
County of Hawai'i	185,079	40.9	2.7	White: 33.7% Asian: 22.2% Hawaiian: 8.5% Other/Mixed: 35.6%
State of Hawai'i	1,360,301	38.6	2.89	White: 24.7% Asian: 38.6% Hawaiian: 5.9% Other/Mixed: 30.8%

Source: (U.S. Census Bureau, 2010)

The local economy within the Holualoa CDP is primarily based on accommodation and food services, followed by retail trade, finance and real estate, professional/management/administrative, and construction. Within the Holualoa CDP, approximately 60% of the population is employed, 5.7% unemployed, and 30% not in the labor force (based upon the employment status of the population 16 years or older).

The State of Hawai'i projects a 95% increase in multi-national immigration, with increasing numbers of English as a Second Language students entering the schools. The cultural diversity of North Kona is evident in the non-white population which includes Japanese, Filipinos, Portuguese, Mexicans, Africans, Vietnamese, Native Americans, Eskimos, Aleuts, Koreans, Micronesians, Samoans, Guamanians, and other Pacific Islanders. Of these, 17% speak a language other than English, with 43% able to speak only limited English. Many of those able to speak English speak a different language at home.

Anticipated Impacts and Mitigation Measures

The project is not expected to result in adverse socio-economic impacts. The project will increase the population of the Kona CDP. The project will generate short-term economic benefits through construction materials expenditures and construction employment. Upon completion, the proposed project will have beneficial long-term impacts by providing employment and educational facilities.

3.14 Public Facilities and Services

This section discusses the potential for impacts to public facilities and services.

Educational Facilities

Existing Conditions

The State of Hawai'i Department of Education (DOE) runs the State's public schools. The Board of Education considers the County of Hawai'i the Hawai'i District. Within this district, the Kailua-Kona urban area is part of the Kealakehe Complex subsection.

Anticipated Impacts and Mitigation Measures

The project is not expected to affect educational facilities. The 2020 U of N Kona Master Plan Update will help to meet the demand for educational facilities in the Kona region, for U of N Kona and Island of Hawai'i residents. Residents of Hawai'i would have the opportunity to attend U of N Kona. U of N Kona programs include discipleship learning opportunities, to attend courses and attain a two-year Associate Degrees in either dance, biblical studies, counseling, early childhood education or photography. There are nine colleges in addition to offering courses in practical training subjects. U of N Kona also offers master-degree level programs. Additional support facilities and planned programs include vocational training, sustainable agriculture, athletic complex and a Word by Heart English Youth Camp. The 2020 U of N Kona Master Plan Update includes a gymnasium and Olympic-sized pool, which will support training and cross-fit programs. In addition to these educational programs, U of N Kona is committed to training the next generation by providing a full-program for K-12 students, including Lower, Middle and High School. Collaborative efforts with local organizations will continue to create new linkages and applications, such as the development of outreach

programs like the Aloha Kona Urgent Care, Community Emergency Response Team and Haleo Hawaiian Language Course. No mitigation is proposed.

Recreational Facilities

Existing Conditions

There are many recreational facilities and public parks in the greater Kailua-Kona region. They are run by the U.S. National Park Service, DLNR, County of Hawai'i Parks and Recreation, or the local municipality. Some of the parks closest to the Petition Area are:

- Hale Halwai Park to the north on Ali'i Drive.
- Kamakahonu Beach to the north next to Kailua Pier.
- Old Kona Airport State Recreation Area, County of Hawai'i Kailua Beach, Kekuaokalani Gymnasium, and Kona Community Aquatic Center located to the north on Kuakini Highway.
- Kaloko-Honokohau National Historic Park to the north on Queen Ka'ahumanu Highway.
- Pahoehoe Beach Park and Magic Sands Beach Park to the south on Ali'i Drive.
- Hillcrest Park located to the south on Oni Oni Street.

Anticipated Impacts and Mitigation Measures

The proposed project will not displace any existing recreational facilities and is not anticipated to create any additional demand on the existing or proposed recreation facilities in the vicinity of the Petition Area, as the 2020 U of N Kona Master Plan Update will provide new recreational facilities for U of N Kona. The 2020 U of N Kona Master Plan Update plans for new recreational facilities including the planned Athletic Complex with a gymnasium, athletics courts, full-sized soccer/athletic field, practice field with locker rooms, athletic facility building, and an Aquatics Center with an olympic-sized swimming pool, warm-up pool and locker room/facilities. In addition, the 2020 U of N Kona Master Plan Update includes plans for new open space areas to allow for outdoor gathering spaces, studying and outdoor recreational activity for U of N Kona students and faculty. An open space/private park area is planned adjacent to the student dormitory buildings to accommodate recreational activity space for students and faculty, picnicking, gathering spaces and outdoor recreation. In addition, the 2020 U of N Kona Master Plan envisions an historic walk to create an interpretative pathway leading throughout the campus with shaded pedestrian pathways to create a landscape design, which would encourage walking and bicycling instead of driving.

Police

Existing Conditions

The Petition Area is located in the Hawai'i Police Department Area II, Kona Patrol District. The Kona Patrol District encompasses 834 square miles and is between the South Kohala District at Kaauau Point and the Ka'ū District at Kaulanamauna. Its officers operate from a central station in Kealakehe and from district stations in Keauhou and Captain Cook, as well as a mini-station in Kailua Village. The central Kona Station is located at 74-611 Hale Mākai'i Place, Kailua-Kona, an approximately 3.2-mile drive north from the Petition Area.

Anticipated Impacts and Mitigation Measures

This project will not impact the Police Department's operations or ability to provide adequate services to the surrounding community. No adverse impacts are anticipated and no mitigation measures are proposed.

Fire

Existing Conditions

The Hawai'i County Fire Department's (HCFD) Fire Protection Division protects the County from fire and fire hazards. The Department also provides emergency medical services, rescue services, extrication services, and emergency hazardous material mitigation. The Kailua-Kona Fire Station, Hawai'i County Fire Station #7, West Battalion, is located approximately 1.5-miles north from the Petition Area.

Anticipated Impacts and Mitigation Measures

This project is not expected to impact the Fire Department's operations or ability to provide fire protection services to the project area and the surrounding residential neighborhood.

Emergency Medical Services

Existing Conditions

The Kona Community Hospital services the Kona community, and is located in Kealakekua approximately 9.4 miles north of the Petition Area. Other health care facilities in the vicinity of the Petition Area include Kaiser Permanente Kona Medical Office approximately 4-miles to the north, and West Hawai'i Community Health Center (Kealakehe) approximately less than 0.5-mile to the north. In addition, Aloha Kona Urgent Care is a healthcare clinic associated with U of N Kona located less than 0.6-mile to the south from the Petition Area.

Anticipated Impacts and Mitigation Measures

This project is not expected to impact the EMS or medical emergencies operations or ability to provide emergency medical services to the project area and the surrounding residential neighborhood. No mitigation is proposed.

Solid Waste Management

Existing Conditions

The County of Hawai'i, Department of Environmental Management Wastewater/Solid Waste Division operates two County landfills, one in Kona (Pu'uanahulu Landfill) and the other in Hilo (Hilo Landfill). There are also several solid waste transfer stations located around the island. The nearest transfer station is the Kealakehe Transfer Station and Recycling Center in Kailua-Kona, located an approximately 3-miles drive north from the Petition Area.

Anticipated Impacts and Mitigation Measures

Solid waste generated at the Petition Area during the construction phase will increase over current conditions. Waste is expected to include materials from construction and grading activities. Every effort will be made to reduce the waste generated during the construction phase and when possible materials/structures will be re-used and or recycled. The proposed project will also comply with the provisions of Chapters 11-260 to 11-280, HAR, relating to hazardous waste.

In the long-term, although a moderate increase in solid waste generation is expected due to the proposed project, no significant impacts to solid waste services are anticipated. Efforts to encourage recycling and waste diversion will be considered for the 2020 U of N Kona Master Plan Update.

3.15 Archaeological Resources

Existing Conditions

For the 2020 U of N Kona Master Plan Update, a Cultural Impact Assessment was conducted by ASM Affiliates (February 2020). The 2020 Cultural Impact Assessment is an update to a previous Cultural Impact Assessment conducted for the Petition Area by G70 in 2003. The findings of the updated assessment are included as *Appendix M*.

According to the Cultural Impact Assessment, there have been a number of archaeological and cultural studies conducted within Waiʻaha Ahupuaʻa in the vicinity of the Petition Area within the coastal *kula* areas of Kailua-Kona (Refer to *Table 3-5*). These studies have included Archaeological Inventory Surveys (AIS), Archaeological Data Recovery projects, subsurface testing, and burial treatment planning. Collectively, these studies have identified a range of both late Precontact and early Historic residential sites, many of which were associated with elite members of Hawaiian society. Also prevalent in the region are features associated with transportation, opportunistic and more formalized agriculture, temporary and permanent habitation, burials, and ceremony. The extent, distribution, and temporal affiliation of archaeological sites within the Petition Area represents a microcosm land use, exemplifying a much broader settlement and subsistence pattern for Kona and any other given region in Hawaiʻi. Typical agricultural features in Waiʻaha have proven to be mostly, but not always, associated with habitation sites within the agricultural fields of the *ahupuaʻa* which are generally lumped into the recognized confines of the Kona Field System (a large portion of which is designated as State Inventory of Historic Places [SIHP] Site 50-10-37-6601 and eligible for inclusion in the National Register of Historic Places [NRHP]). Ceremonial sites such as *heiau* have also been identified within coastal Waiʻaha, including Maʻo Heiau, a *heiau kālua ua* intended for controlling rainfall. Additionally, burial sites are common elements of the cultural landscape within Waiʻaha, both in dedicated monument settings and also in settings where they coincide with habitation features.

Collectively, the findings of previous archaeological and cultural investigations conducted within and in the general vicinity of the Petition Area allow for a holistic portrayal of past land use and settlement patterns for Kailua-Kona's *kula* lands and other contributing factors to the overall cultural landscape. According to the Cultural Impact Assessment, data that has been derived from the existing archaeological record has undoubtedly contributed to the budding corpus of knowledge concerning Precontact use of Kona's *kula* zone. Furthermore, these studies document the gradual yet dramatic shift away from a traditionally rooted subsistence economy to a market economy developed primarily for trade and export of goods, the acceleration of which was exacerbated by privatization of lands subsequent to the *Māhele ʻāina* of 1848. As a result, land use within Waiʻaha, and elsewhere throughout Hawaiʻi continued to transform during the Historic Period, fueled by promise held by burgeoning economic ventures such as commercial sugar cultivation and ranching. This shift is reflected in the archaeological record as evidence of stone walls (such as the Kuakini Wall) and cattle enclosures were constructed to ward off free-ranging feral animals that were infiltrating the countryside, resulting in contributing tangible elements to the Historic vernacular landscape of the region.

Table 3-5 Previous Archaeological Studies Conducted in the Vicinity of the Petition Area

Year	Author	Type of Study
1994	Head et al.	Inventory Study
1996	Walker et al.	Data Recovery
2000	Rechtman	Inventory Study
2002	Corbin and Rosendahl	Archaeological Assessment
2002	Rosendahl	Burial Site Testing
2002	McKeague	Cultural Impact Assessment
2003	Clark and Rechtman	Inventory Study
2003	Rechtman	Burial Treatment
2007	Rechtman and Loubser	Data Recovery
2013	Rechtman	Preservation Plan
2019	Barna	Dismantling/Restoration Plan

One of the most proximate studies to the current project area was an Archaeological Inventory Study (AIS) (Head et al. 1994) conducted by Paul H. Rosendahl, Inc. (PHRI) for the proposed Ali'i Drive Sewer Project within the *ahupua'a* of Wai'aha 1st and 2nd and Pua'a 2nd and 3rd. As a result of the study, a total of 20 archaeological sites comprised of at least 38 associated features were identified. A variety of formal site types were documented during the study including but not limited to mounds, alignments, walls, enclosures, trails, and lava blisters and caves, and were assigned functional interpretations relating to agriculture, temporary and permanent habitation, transportation, animal husbandry, landscape clearance, and potential ceremonial and burial functions. It was recommended by Head et al. (1994) that data recovery be conducted at 17 of the sites, all of which were assessed as significant under Criterion D and five of which were recommended for preservation. The remaining three sites were recommended for no further work, and it was proposed that although they contained only limited potential with regards to future potential research, they be integrated into the then-proposed landscaping of the project area. It was determined that while construction activities for the then-proposed development did not threaten the integrity of 17 of the sites, three could not be avoided.

In 1996, PHRI conducted data recovery (Walker and Rosendahl 1996) at selected sites identified during the AIS conducted by Head et al. (1994). Data recovery was conducted on three archaeological sites that were purported to be unavoidable during construction activities: Site 15507, two modified outcrops and a terrace; Site 15511, a small lava tube and two additional adjacent caves; and Site 15526, originally assigned as a coral and waterworn cobble- paved area with scattered midden and reinterpreted during the Phase II work as a platform. A total of 20 units (four each in Sites 15507 and 15511 and 12 in Site 15526) were excavated within the data recovery sites. Cultural material and portable remains (e.g. charcoal, *kukui*, gourd, and coconut fragments, marine shell, lithic and volcanic glass debitage and shatter, basalt hammerstones, possible adze fragments, echinoid and coral abraders, a bone awl and pick, fishhooks, shell ornament, historic glass and metal fragments, and a stone pendant) were recovered along with varying amounts of mammal, bird, turtle, lizard, rat, mouse, pig, and fish bone. Additionally, and more importantly, human skeletal remains were recovered from all three sites, although the remains recovered from 15511 and 15526 were likely deposited secondarily as a result of natural processes rather than being in an *in situ* context. The human skeletal remains associated with Site 15507,

however, were determined to be representative with an articulated individual *in situ* and were ultimately recommended for preservation in place.

In 2000, Rechtman Consulting, LLC conducted an AIS (Rechtman 2000) of a 19-acre parcel *makai* of Kuakini Highway within Waiʻaha. Small portions of this property had also been previously surveyed by Head et al. (1994) and data recovered by Walker and Rosendahl (1996) as part of a sewer easement mitigation project. Of the 29 sites previously recorded in the project area, 28 were extant at the time of the Rechtman (2000) study. Of these, one (Site 15525) was reevaluated as non-cultural. Twelve of the remaining sites were assessed as likely deriving from the Precontact Period: two were agricultural in nature (Sites 21992 and 22065), nine were associated with habitation (Sites 15517, 15518, 15521, 15524, 21991, 22067, 22068, 22069, and 22070), and one was a habitation/burial site (Site 15507). Three of the identified sites (Sites 21194, 21196, and 22063) were concluded to date to the late Precontact/early Historic Period and may have been associated with one another. Rechtman (2000) opined that these three sites appeared to be of religious significance, and noted the presence of human remains at one of them (Site 22063). Twelve of the 28 sites dated to the Historic Period, all of which consisted of stone walls or enclosures likely associated with cattle ranching practices during the early to mid-twentieth century.

In 2002, PHRI conducted an Archaeological Assessment (AA) survey (Corbin and Rosendahl 2002) of the Petition Area. As a result of the fieldwork, 28 archaeological sites encompassing 45 features were documented, and a single previously identified site, the Kuakini Wall (Site 6302), was relocated. Other recorded feature types included walls, terraces, mounds, modified outcrops, platforms, enclosures, and lava blister caves. Identified site types were assigned various functions including habitation, ranching, agricultural, and burial. Later that same year, PHRI conducted subsurface testing (Rosendahl 2002) of a sample of possible burial features. Eleven features at eleven different sites were tested for the presence of burials, however this investigation yielded negative results. A small amount of cultural material including a coral abrader, adze fragment, and marine shell fragments were documented during these excavations but appeared to never have been collected.

In 2003, Rechtman Consulting, LLC conducted an *Archaeological Inventory Survey of TMKs: 3-7-5-10:85 and 3-7-5-17:06* (Clark and Rechtman 2003) of the 62-acre Petition Area for U of N Kona (U of N Bencorp), which included the current Petition Area. *Refer to Appendices E and F*. As a result of the study, twenty-five previously unrecorded sites and a single previously recorded site were identified (Refer to *Table 3-6*). Site types identified during the study were both Historic and Precontact in nature and were grouped into seven categories: Historic ranching related sites and boundary walls, Precontact habitation sites, trails, ceremonial sites, game boards, burials, and agricultural sites. As part of the investigation, twenty-two 1 x 1 meter test units (TUs) were excavated at ten sites (Sites 23668, 23670 Feature B, 23672 Features A and B, 23673 Feature A, 23675, 23676, 23677, 23681 Feature A, 23683, 23684, 23685, and at 23686 Features 183, 187, 189, 201, 204, 239, 262, 266, 271, and 297. Subsurface testing of multiple sites/features yielded numerous examples of cultural material including volcanic glass flakes and shatter, charcoal fragments, groundstone, waterworn, and fire cracked basalt, branch and waterworn coral, marine shell (*Cellana* sp., *Conus* sp., *Drupa* sp., *Nerita* sp., *Echinoidea* sp., *Cypraea* sp., *Strombina* sp., *Venus* sp., and *Cantharus* sp.), *kukui* and an unidentified seed, shark teeth, a mostly intact *lūheʻe* lure, as well as dog, rodent and fish bone. Additionally, human skeletal remains identified during excavation of Sites 23683, 23684, and 23685.

All sites were assessed as significant under Criterion D, with eleven being recommended for no further work (Sites 23662 through 23669, 23679 and 23680, and 23682). Four of the sites were

also assessed as significant under both Criteria D and E and recommended for preservation (Sites 23681 and Sites 23683 through 23685), one was assessed as significant under Criteria A, D, and D and also recommended for preservation (Site 6302), and ten were recommended for data recovery (Sites 23670 through 23678 and 23686).

Later that same year, Rechtman Consulting, LLC prepared a Burial Treatment Plan (Rechtman and Ketner 2003) for the three burial sites (Sites 23683 through 23685) identified during the Clark and Rechtman (2003) AIS that were assessed as significant under Criteria D and E. Refer to *Appendices G and H*. All three sites consisted of square or rectangular stone platforms constructed of *ʻaʻā* and/or *pāhoehoe* boulders and cobbles. Unlike the other two burial sites which were determined to function solely as burial monuments, Site 23684 consisted of a platform and an attached enclosure, and it was concluded by Rechtman (2003) that the both features may have been utilized for habitation purposes prior to the internment of the deceased individual. As previously mentioned, Site 23683 was also previously subject to burial testing in June 2002 by Rosendahl (2002) but yielded negative results. As part of the fieldwork conducted during the Clark and Rechtman (2003) AIS, a 1 x 1 meter test unit was excavated in the central interior portion of the platform, and the presence of a burial was confirmed. Similarly, single 1 x 1-meter test units were excavated in the central interior sections of the Site 23684 and 23685 platforms yielding identical results. In the case of Sites 23684, pockets of deliberately and carefully cached branch coral were observed throughout the architectural layer, and cultural material (e.g. marine shell, coral, and waterworn pebbles) were observed in strata below the architectural layer. With respect to Site 23685, a possible hearth was identified, the remains of which included a scant amount of cultural materials including various marine shell, *wana* (sea urchin), and *kukui* (candlenut; *Aleurites mollucana*). Immediately following the discovery of human skeletal remains in all three test units, excavation ceased, the remains were stabilized and left in their original positions and were reburied (along with any identified cultural material and/or artifacts) using excavated soils, and the architectural layer was rebuilt on top of the burial as close to original specifications as possible.

The approved *Burial Site Component of a Preservation Plan for Three Sites 23683, 23684, and 23685* by Rechtman in 2003 was preservation in place which would be achieved through the establishment of a minimum 20-foot permanent preservation easement buffer for each respective site. Refer to *Appendix H*. These preservation easements were to be defined by stone walls (traditionally Hawaiian in appearance) constructed of dry-stacked local basalt boulders and cobbles and discretely core-filled with smaller cobbles. It was also suggested that inconspicuously situated narrow gated openings be incorporated into each easement wall to facilitate access for site maintenance and appropriate visitation by cultural and/or lineal descendants, and that appropriate native foliage be planted along the exterior perimeter of the easement walls. An additional 10- foot buffer zone beyond the 20-foot buffer was also set aside as a no construction zone as part of the plan for the installation of three interpretive/cautionary signs, one to be placed immediately adjacent to each respective walled preservation easement. Finally, accepted treatment for the burial sites included a provision provided by Rechtman (2003) for the development and submittal of a formal landscaping plan to the DLNR-SHPD Burial Sites Program for approval, which would lay out measures that the respective sites be cleared of all non-native/non-Polynesian introduced vegetation prior to their reconstruction.

Four years later in 2007, an *Archaeological Data Recovery at Ten Sites on TMKs: 3-7-5-10:85 and 3-7-5-17:06, Sites 23670 through 23678 and 23686*, was conducted by Rechtman Consulting, LLC (2003). Refer to *Table 3-6* and *Appendix I*. Nine of the sites subject to data recovery were inferred to have been utilized for habitation (four with permanent habitation and five with temporary habitation) and one was associated with agricultural use. All of the sites dated to the Precontact

period. The primary objectives of the data recovery were centered around establishing the sequence of Precontact land use within the Petition Area and within the general *kula* lands of Kona, refining the precise nature of data recovery sites associated with habitation, and refining the age estimate and functional interpretation of the documented agricultural features. It was proposed by Rechtman and Loubser (2007) that conducting data recovery of these sites would establish whether or not short-term habitation and associated opportunistic agriculture was indeed followed by recurrent habitation and associated formal agriculture, and finally by more consistent habitation with associated household gardens and animal pens.

The data recovery effort was accomplished by conducting thorough redocumentation of the data recovery sites, the process of which included clearance of vegetation to assess the then-current conditions of the sites, site photography, and the illustration or update of existing site plan views from the Clark and Rechtman (2003) AIS to show the placement of the excavation units, and subsurface testing to determine the presence or absence of buried cultural deposits. As part of the fieldwork, a total of 39 Excavation Units (EU) and 17 Test Units (TU) were excavated. These units ranged in configuration from 1 x 1 meters, 1 x 2 meters, and 2 x 2 meters, and generally, multiple units were excavated into each site. With respect to the habitation sites (Sites 23670 through 23678), there were a total of 22 EU and 7 TU excavated. For Site 23686, 17 EU and 10 TU were excavated. As a result of excavations, a wide assemblage of cultural material was collected including intact and fragmented marine shell (e.g. *Cypraea*, sp., *Conus* sp., *Drupa* sp., *Cellana* sp., *Morula* sp., *Isognomon* sp., *Fimbria* sp., *Brachiodontes* sp., *Turbo* sp., *Nerita* sp., *Mitra* sp., *Terebra* sp., *Cantharus* sp., *Chama* sp., *Venus* sp., *Nassarius* sp., *Strombina*, sp., *Serpuloris variabilis*, *Thais* sp., *Cymatium* sp., *Fimbria* sp., and an unidentifiable bivalve fragment), echinoderms, a crustacean fragment, and both branch and waterworn coral pieces. Lithic assemblages identified during fieldwork included worked and unworked volcanic glass flakes and shatter, fire-cracked basalt, basalt flakes, waterworn and groundstone basalt fragments. Additionally, a variety of faunal remains were recovered including worked and unworked bones (e.g. rodent, pig, dog, cow, bird, and some which were unidentifiable) as well as bird, fish, dog, cow, and shark teeth. A variety of portable remains (artifacts) were also recovered during data recovery excavations including coral abraders, intact and fragmented echinoderm abraders, a fine-grained basalt adze fragment, a *lūhe'e* lure, an awl manufactured from unidentifiable materials, a bone awl, a .166 lead pellet, an iron horseshoe nail, a steel nail, a steel nut, rusted iron fragments, and fragments of brass buttons. Fragments of *kukui* (candlenut; *Aleurites moluccana)* and an unidentifiable seed and nut were also recovered during excavations, as were numerous charcoal samples: 17 of which were submitted for radiocarbon assaying.

Following the synthesis of field and laboratory results it was proposed by Rechtman and Loubser (2007) that the data recovered sites were collectively representative of four relatively arbitrary time periods which they assigned as phases A through D, each were interpreted as more extensive than the one preceding: Phase A from A.D. 1400 to A.D. 1460, Phase B from A.D. 1460 to A.D. 1580, Phase C from A.D. 1580 to A.D. 1680, and Phase D from A.D. 1680 to A.D. 1850. Phase A occupation encompassed Site 23686 Features 247, 293, and 294; Phase B occupation pertained to Site 23676, Site 23673 Features A and B; and Site 23671; Phase C related to Site 23686 Features 250, 254, 282, and 289; possibly Site 23674; Site 23672 Features A and B; and potentially Site 23674; and Phase D occupation was concluded to be associated with nine excavated features including Site 23675, Site 23670 Features A, B, and C, Site 23678, Site 23677 Features A and B, Site 23686 Feature 251, and potentially also the *kuaiwi* associated with Site 23686.

In 2013, Rechtman Consulting, LLC prepared a *Preservation Plan for SIHP Site 6032 and Site 23681* (Rechtman et al. 2013) initially documented during the inventory survey conducted by Clark

and Rechtman (2003). Refer to *Appendix J* and *Appendix K*. The first preservation site, a 340-meter-long section of the Kuakini Wall (Site 6302), was likely constructed during Governor Kuakini's administration (A.D. 1820-1844), coinciding with the latter portion of Phase D occupation previously hypothesized by Rechtman and Loubser (2007). Initially, the wall served to protect cultivated agricultural fields *mauka* of the wall from feral animals, however Rechtman (2013) opined that the function of the Kuakini Wall likely transformed over time, and in later years served primarily to protect coastal settlements situated *makai* of the wall. Site 6302 was assessed by Clark and Rechtman (2003) as significant under Criteria A, C, and D, and was determined to be eligible for listing (but is not formally listed) in the National Register of Historic Places (NRHP). Preservation measures were centered primarily around avoidance and protection (conservation) of the site, however the plan set forth by Rechtman (2013) also included provisions for stabilization/restoration, dismantling/restoration, and the installation of interpretive/cautionary signage at intervals around the twenty-foot permanent preservation easement buffer.

The second preservation site consisted of an agricultural *heiau* (shrine; Site 23681), a traditional ceremonial site referred to as *heiau ho'oūluulu 'ai* or *heiau ho'oūluulu ua* where Hawaiians would conduct rituals to ensure agricultural fertility and/or to induce rain. The proposed permanent preservation measures for Site 23681 were avoidance and protection (conservation) which was to be achieved through the establishment of a twenty-foot preservation easement buffer. Rechtman et al. (2013) recommended that this permanent buffer be marked by a stone wall (traditionally Hawaiian in appearance) constructed of dry-stacked local basalt boulders and cobbles and discretely core-filled with smaller cobbles, and recommended that an inconspicuously situated narrow gated opening be present to allow access for site maintenance and appropriate visitation.

Most recently in 2019, ASM Affiliates prepared a *Dismantling/Restoration Plan for a Portion of the Kuakini Wall (Site 6302)* prepared by ASM Affiliates (Barna 2019). Refer to *Table 3-6*, *Figure 3-10, Figure 3-11 and Appendix L*. The Dismantling/Restoration Plan outlines measures to be followed during the process of dismantling/restoration of collapsed portions of and three breaches in Site 6302.

Table 3-6: Archaeological Sites Recorded (ASM Affiliates, 2020)

Site No.	Formal Type	Functional Type	Age	Significance	Treatment
6302	Wall	Kuakini Wall	Historic	a, c, d	Preservation
23662	Enclosure	Ranching	Historic	d	No further work
23663	Wall	Ranching	Historic	d	No further work
23664	Wall	Ranching	Historic	d	No further work
23665	Wall	Landscape Marker	Historic	d	No further work
23666	Wall	Landscape Marker	Historic	d	No further work
23667	Wall	Landscape Marker	Historic	d	No further work
23668	Lava Blister	Temporary Habitation	Precontact	d	No further work
23669	Modified Outcrop	Temporary Habitation	Precontact	d	No further work
23670	Platform Complex	Permanent Habitation	Precontact	d	Data Recovery
23671	Platform	Temporary Habitation	Precontact	d	Data Recovery
23672	Enclosure Complex	Temporary Habitation	Precontact	d	Data Recovery
23673	Platform/Enclosure	Permanent Habitation	Precontact	d	Data Recovery
23674	Platform/Enclosure	Temporary Habitation	Precontact	d	Data Recovery
23675	Platform	Temporary Habitation	Precontact	d	Data Recovery
23676	Platform	Temporary Habitation	Precontact	d	Data Recovery
23677	Platform/Enclosure	Temporary Habitation	Precontact	d	Data Recovery
23678	Enclosure	Temporary Habitation	Precontact	d	Data Recovery
23679	Trail	Trail	Precontact	d	No further work
23680	Trail	Trail	Precontact	d	No further work
23681	Platform/Enclosure	Ceremonial	Precontact	d, e	Preservation
23682	Game Board	Game Board	Precontact	d	No further work
23683	Platform	Burial	Precontact	d, e	Preservation
23684	Platform/Enclosure	Burial	Precontact	d, e	Preservation
23685	Platform	Burial	Precontact	d, e	Preservation
23686	Complex	Agricultural	Precontact	d	Data Recovery

***SIHP Site numbers are preceded by the state, island, and U.S.G.S. quad prefix 50-10-28-**

Figure 3-10 Photo of a Portion of the Kuakini Wall on the Petition Area

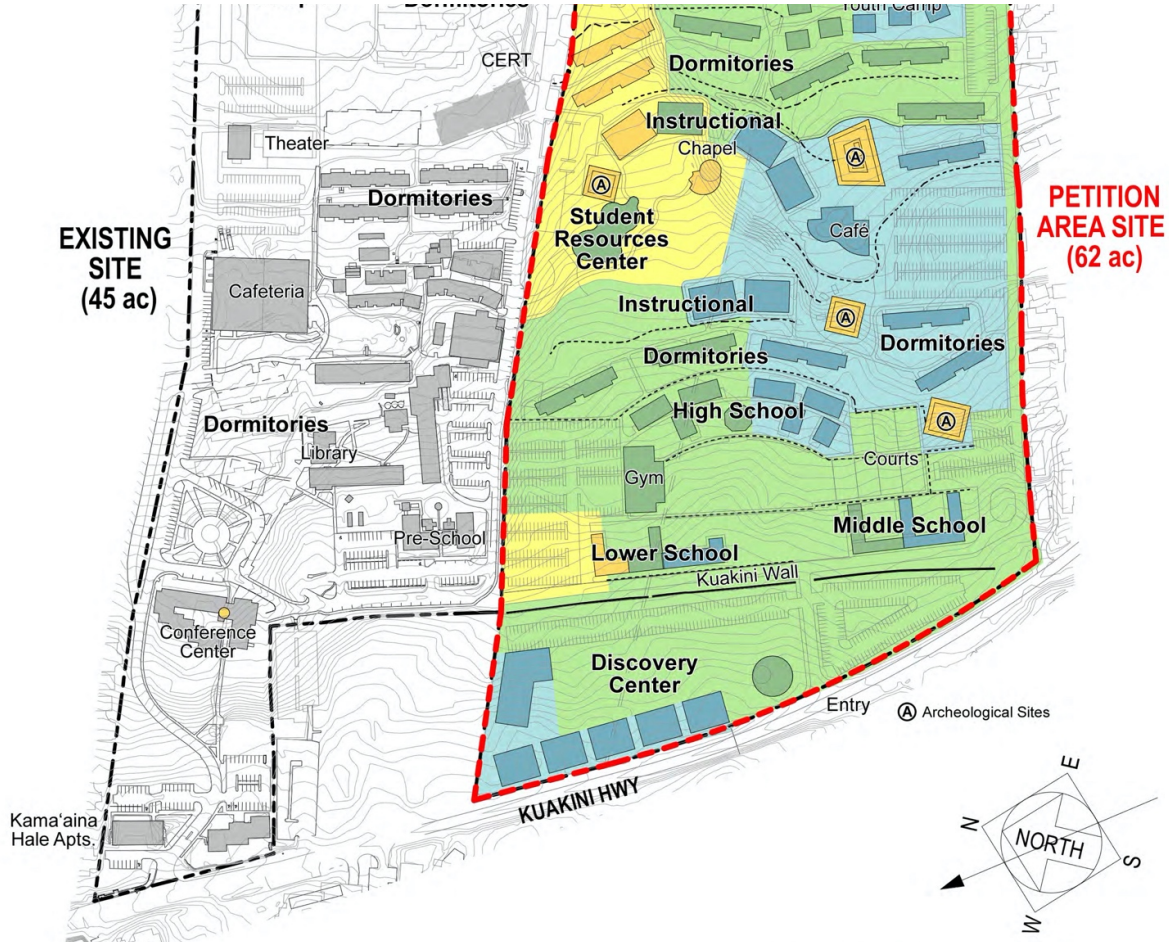


Figure 3-11 2020 U of N Kona Master Plan, Archaeological, Preservation Plan and Burial Sites

Anticipated Impacts and Mitigation Measures

For the 2020 U of N Kona Master Plan Update, ASM Affiliates is in consultation with the State of Hawai'i, Department of Land and Natural Resources, State Historic Preservation Division ("SHPD") regarding Final Acceptance of the Data Recovery Report and Burial Treatment Plan for the Petition Area. Final Acceptance of the Burial Treatment Plan was obtained from SHPD by letter dated August 20, 2019 (log No. 2019.01527, Doc No. 1908CJ001). The Data Recovery Report was submitted to SHPD for review and acceptance on August 30, 2019, which was received by their office on September 5, 2019 (Log No. 2019.01980). ASM Affiliates is presently waiting for SHPD to complete its review and issue its acceptance of the Data Recovery Report.

For the 2020 U of N Kona Master Plan Update, the implementation of the Burial Treatment Plan is dependent upon U of N Kona hiring rock masons to complete the rock walls around the permanent preservation buffers of the three burial sites and the restoration of Site 23683. Once the construction of the rock walls along the permanent preservation buffers of the three burial sites and

the restoration of Site 23683 is complete, ASM Affiliates would be able to verify in writing to SHPD that the preservation measures have been implemented.

For the 2020 U of N Kona Master Plan Update, the implementation of the Archaeological Preservation Plan is dependent upon U of N Kona hiring rock masons to complete the rock walls around the permanent preservation buffers of Site 23681. Once the construction of the rock walls along the permanent preservation buffer of Site 23681 is complete, ASM Affiliates would be able to verify in writing to SHPD that the preservation measures have been implemented.

For the 2020 U of N Kona Master Plan Update, the Dismantling/Restoration Plan for Site 6302 (Kuakini Wall) prepared by ASM Affiliates (2019) will be submitted to SHPD for review and acceptance.

As discussed, several measures have already been undertaken by the U of N Kona to reasonably mitigate and protect the cultural resources located within the Petition Area and to ensure that the rights of the descendant community to access and care for their *iwi kupuna* are not impinged. These mitigation measures included archaeological data recovery, and the establishment of permanent preservation easements with associated access rights for any identified lineal and cultural descendants to the three known burial sites, a *heiau*, and the Kuakini Wall. Also, at the recommendation of OHA, the landowner has agreed to preserve a portion of a historic trail across the property. If all of the conditions and measures (both interim and permanent) set forth in the Burial Treatment Plan and Preservation Plan are adhered to and implemented as part of the proposed project, then there will be no anticipated adverse impacts to the three burial sites (Sites 23683, 23684, and 23685) and the two preservation sites (Sites 6302 and 23681). To further avoid potential impacts to valued cultural resources, the LUC can condition any approval to include the recommended archaeological/cultural precautionary monitoring measures as additional mitigation during all ground- disturbing development activities. ASM Affiliates is available to provide provide archaeological monitoring services, if required by SHPD. In response to SHPD's review of the grading permit for construction activities, SHPD may provide a letter requesting archaeological monitoring during construction activities at the Petition Area.

As human burials have been documented within the Petition Area, the appropriate effectual treatment of the identified burial sites will be applied. The interim and permanent preservation measures set forth in the approved burial treatment plan prepared by Rechtman (2003) for Sites 23683, 23684, and 23685 shall be implemented under the direct supervision of a qualified archaeologist. Additionally, cultural concerns that were expressed by those in the Hawaiian community of Kona regarding recommendation protocols in properly handling *iwi*, ancestral remains, as well as consultation with appropriate parties and final disposition any burial, shall be taken into consideration. It is stressed that utmost sensitivity, caring, and understanding be employed when dealing with burial issues and *iwi*.

1) In the event of an inadvertent discovery of ancestral remains, the applicable processes outlined in existing State regulations, specifically those provided in the Hawai'i Administrative Rules, Title 13, Chapter 300, Section 40 and Section 33, will be employed.
2) If for some reason, *iwi* must be moved or touched, it is highly recommended that an identified cultural monitor, a lineal/cultural descendant or someone of Hawaiian ancestry work in conjunction with a qualified archaeological monitor to complete this task. It is highly recommended that U of N Kona (U of N Bencorp) coordinate the selection of a cultural monitor with known lineal and cultural descendants as well as other appropriate cultural entities or organizations.

3) Notify and consult with known and potential lineal and cultural descendants as it relates to any burial relocation or inadvertent discovery.
4) Consult with the appropriate agencies and organizations including: State Department of Land and Natural Resources, Historic Preservation Division (DLNR/SHPD), SHPD Burial staff, the Hawai'i Island Burial Council (HIBC), the Office of Hawaiian Affairs (OHA), and other interested Hawaiian organizations.
5) Implementation of the interim and permanent preservation measures set forth in the approved burial treatment plan for Sites 23683, 23684, and 23685.
6) Implementation of the interim and permanent preservation measures set forth in the approved preservation plan for Sites 6302 and 23681.
7) Implementation of the measures to be followed during the process of dismantling/restoring of collapsed portions of and three breaches in Site 6302.
8) Archaeological monitoring is recommended for all ground-disturbing activities associated with the proposed development within the project area.

3.16 Historical and Cultural Resources

Cultural Impact Assessment

Existing Conditions

For the 2020 U of N Kona Master Plan Update, a Cultural Impact Assessment was conducted by ASM Affiliates (February 2020). The 2020 Cultural Impact Assessment is an update to a previous Cultural Impact Assessment conducted for the Petition Area by G70 in 2003. The findings of the updated assessment are included as *Appendix M*.

The methodology for the Cultural Impact Assessment was primarily based upon the following scope:

2) A review and summary of historical documentation for purposes of identifying potential traditional cultural properties, features, resources, beliefs, and practices within or near the project area.
3) An analysis of information provided in archaeological reports and known oral traditions of areas near or within the project area as a means of identifying traditional land use activities, cultural resources, and associative practices and beliefs.
4) Compilation and Summary of information obtained from informal discussions and formal interviews with identified knowledgeable individuals regarding historic and traditional practices that are site-specific and inclusive of the *ahupua'a* of Wai'aha.
5) A report that summarizes the information obtained from research conducted from which an evaluation of the potential cultural impacts related to proposed development area will be provided. As necessary, recommendations to mitigate potential impacts will also be included.

As part of the 2003 CIA, various agencies and organizations (e.g. OHA, Hawai'i Island Burial Council, Queen Lili'uokalani Trust, etc.), community members, and cultural/lineal descendants with ties to Wai'aha were contacted in order to identify traditional cultural properties, practices, and contemporary cultural uses associated with the current project area and surrounding lands. A total of thirty-four individuals were contacted for consultation based on their potential to provide intimate knowledge of Wai'aha, in particular *nā kupuna, nā kumu hula, and nā kua 'āina*. Twenty- one individuals responded to the request, although several declined to be interviewed, directed

consultation to other individuals (besides themselves), or expressed that they did not have intimate knowledge of Waiʻaha.

Historical documentation indicates that as early as the 15th century during the reign of ʻEhukaimalino, the mokuoloko, the interior land district of Kona with its vast natural resources was a preferential location for royal residence, particularly between the regions of Lanihau to Keauhou. Numerous native oral traditions and foreign accounts illustrate that the ahupuaʻa of Waiʻaha was part of a larger and significant political and population center that was primarily sustained by a variety of dryland agricultural practices.

Waiʻaha was also a favored retreat for Emma Naea Rooke and her husband, Alexander Kalanikualiholihokekapu ʻIolani (Kamehameha IV), who acquired land in the upland regions of the ahupuaʻa, and their son Prince Albert Edward Kauikeaouli Leiopapa a Kamehameha. Upon the king's death in 1865, the Dowager Queen Emma purchased the land of Waiʻaha from the estate of her late husband, where she retained a home on the estate until her death in 1885. Several recorded oral accounts, one composed by the Queen herself, speak of the verdant uplands of Waiʻaha and the general Kona region in a poetic and honorific tribute through the compositions of nā kanikau, lamentation chants that marked the death of the young Prince Albert, who died at the age of four from acute appendicitis.

Sources suggest that by the late 1890s, much of the land within the Waiʻaha ahupuaʻa was utilized by the Kona Sugar Company to support the sugarcane industry that was emerging within the region. Following the closure of the plantation and the mill site in 1926, much of the land within Waiʻaha, including a large portion of the project area, was purchased by Manuel Gomes as part of an immense cattle and ranching operation.

The upper slopes of Waiʻaha are utilized today for ranching and diversified agriculture and coffee production. The coastal regions are part of an immense industry that is primarily focused on tourism with a wide variety of vacation timeshares and visitor accommodations, serving as a venue for major sporting events like the Billfish Tournament and Ironman Triathlon.

Anticipated Impacts and Mitigation Measures

Based upon the information obtained from the review of historical documentation, archaeological reports, oral traditions, informal discussions, and formal interviews, the following is a summary of the findings and proposed recommendations.

1) Regarding the native Hawaiian epistemological approach to "land use," three prevalent and generally applied principles that continue to be perpetuated are:

   a) Recognizing that all *ʻāina* (literally translated as "that which feeds", but commonly applied as a definition for "land") is born of Papahānaumoku (Earth Mother). This guiding principle is the foundation from which the cultural values of *aloha ʻāina* and *mālama ʻāina* are derived.

   b) Acknowledging that although traces of a physical imprint and its integrity of traditional cultural properties, resources, features, beliefs, and practices either may no longer remain, there is a thriving spiritual imprint that remains in the form of *mana*, the spiritual essence of those *kūpuna* and *nā mea loea* that have come before.

c) Understanding that place names, like Waiʻaha, illustrate a collective history of a geographical region, reiterate community and familial genealogy, characterize and describe the natural resources within a prescribed physical space, and define recognized cultural mores and values of the existing community.

As such, it is recommended that the proposed development incorporate the guiding cultural principles in the physical design of the facilities and the surrounding landscape in the selection of appropriate plantings and exterior features.

2) The *moku o loko* was a recognized residence and political center for ruling *aliʻi* as early as the 15th century. The *mauka* region of Waiʻaha, west of the existing project area, includes the cultural landscape that once defined the royal residence of Kamehameha IV and Queen Emma and the former site of the old Kona sugar mill. Portions of the project area illustrate the influence of the cattle and ranching industry that emerged within the region. The coastal waters along the *makai* portion of the *ahupuaʻa* are part of two traditional surfing grounds, called Koʻokā and Kahopuka, which extended from the *ahupuaʻa* of Puaʻa, situated just north of Waiʻaha. Additionally, several other traditional and historic sites including identified springs, enclosures, and mounds, which have been recorded within the general vicinity of the Petition Area.

As a cultural landscape, the *ahupuaʻa* of Waiʻaha reveals a kaleidoscope of historical and cultural features and properties. It is recommended that the proposed development incorporate the unique historical and cultural legacy specific to the subject parcels, Waiʻaha Ahupuaʻa and the greater Kona region.

3) Beginning in 2003, Rechtman Consulting, LLC conducted a series of archaeological investigations within the project area, the first of which consisted of an AIS. As part of the AIS study, two preservation sites (Sites 6302 and 23681) were documented within the project area. Additionally, the presence of three burial sites were confirmed within the project area (Sites 23683, 23684, and 23685). Prior to the establishment of the burial laws (specifically the Native American Graves Protection and Repatriations Act of 1990 and State of Hawaiʻi burial laws (1990), there was no generally agreed upon methodology to the effective treatment of both identified burial sites and inadvertent discoveries. However, the establishment of these laws has helped to facilitate a process that provides a guideline for agencies and communities to derive an appropriate plan of action in the protection and preservation of ancestral remains.

Collectively, the individuals interviewed relayed similar concerns regarding the potential impacts of the proposed project on the known archaeological and burial sites, and the potential for encountering previously unidentified burials. Also expressed was the concern for proper stewardship of the lands by the landowner in order to maintain its cultural integrity, and the need for involvement in the proposed project by cultural and lineal descendants, particularly *kūpuna*. These concerns and recommendations expressed in 2003 were synthesized (with consent) with those expressed during previously conducted consultations and were then used to formulate a set of project-specific recommendations.

The CIA concluded that the cultural landscape in the *ahupuaʻa* of Waiʻaha possesses a kaleidoscope of historical and cultural features and properties. Thus, it was recommended that the proposed development incorporates the unique historical and cultural legacy specific to the project area, Waiʻaha Ahupuaʻa and the greater Kona region, and that the proposed development incorporates

the guiding cultural principles in the physical design of the facilities and the surrounding landscape in the selection of appropriate plantings and exterior features. Furthermore, it was recommended that the cultural concerns expressed by those in the Hawaiian community of Kona regarding recommendation protocols in properly handling *iwi*, ancestral remains, proper consultation with appropriate parties, and the final disposition of any burial, be taken into consideration, and that the utmost sensitivity, caring, and understanding be employed when dealing with burial issues and *iwi*.

Ka Pa'akai O Ka 'Aina Analysis

Existing Conditions

For the 2020 U of N Kona Master Plan Update, a Ka Pa'akai O Ka 'Aina Analysis (Ka Pa'akai Analysis) was completed by ASM Affiliates (ASM) to examine the project's potential effect on or impairment of valued cultural, historical, or natural resources in the Petition Area, including traditional and customary native Hawaiian rights. Refer to *Appendix N*. The Ka Pa'akai analysis is based on the Hawai'i Supreme Court's decision in *Ka Pa'akai v. Land Use Commission*, 94 Hawai'i 31, 74, 7 P.3d 1068, 1084 (2000), which sets forth the State's (and its agencies') duty to protect traditional and customary practices and resources under the Hawai'i Constitution.

ASM's Ka Pa'akai Analysis identifies valued cultural, historical, and natural resources present within the Petition Area, and identifies the extent to which any traditional and customary native Hawaiian rights are, or have been, exercised. Historical archival information was investigated for the Petition Area, including several previous archaeological studies and prior cultural studies that included consultation and oral-historical interviews conducted were reviewed and summarized. Under the Second Step, ASM's Ka Pa'akai Analysis describes the extent to which the valued cultural, historical or natural resources and customary native Hawaiian rights will be impacted by the proposed project. Finally, under the third step, ASM's Ka Pa'akai Analysis recommends feasible actions and mitigation measures that may be undertaken to reasonably protect native Hawaiian cultural practices and resources, to the extent they were found to exist or occur within the Petition Area.

Records on file at DLNR-SHPD indicate that several previous archaeological studies have been conducted in the vicinity of the project area. These studies have identified a variety of formal site types including but not limited to mounds, alignments, walls, enclosures, trails, lava blisters and caves, and were assigned functional interpretations relating to agriculture, temporary and permanent habitation, transportation, animal husbandry, landscape clearance, and potential ceremonial and burial functions.

In summary, previous archaeological studies conducted within the subject property have identified significant, valued cultural resources, including sites traditionally used for ceremonial, habitation, agricultural, burial, and transportation purposes. In addition, a previous Cultural Impact Assessment was conducted in 2003 for the Petition Area. Although the 2003 CIA did not identify any specific past or ongoing traditional or customary practices occurring within the Petition Area, concerns were expressed by the consulted parties regarding the presence of burials on the property, the possibility of encountering additional *iwi kupuna* during development activities, and the potential effects that the proposed development would have on the ability of the descendant community to care for those ancestral remains. This concern is legitimate given that the proposed project will alter the traditional cultural landscape of the subject parcels and, as a result, have an effect on the valued cultural resources located therein. Such landscape alteration also has the potential to adversely affect the ability of the descendant communities to access and care for their ancestral remains.

ASM Affiliates is in consultation with the State of Hawai'i, Department of Land and Natural Resources, State Historic Preservation Division (SHPD) regarding Final Acceptance of a Burial Treatment Plan and Data Recovery Report, originally submitted to SHPD in October 2007 and resubmitted on August 30, 2109. The Burial Treatment Plan received Final Acceptance from SHPD by letter dated August 20, 2019 (log No. 2019.01527, Doc No. 1908CJ001).

In addition, ASM Affiliates has prepared a Dismantling/Restoration Plan for a Portion of the Kuakini Wall, which is awaiting submittal to the SHPD for review and acceptance. For the implementation of the Archaeological Preservation Plan, the 2020 U of N Kona Master Plan Update includes planning for the construction of rock walls around the permanent preservation buffers of the identified burial and preservation sites, which would compete the implementation of Burial Treatment and Archaeological Preservation Plans. For the 2020 U of N Kona Master Plan Update, ASM Affiliates has prepared an updated Cultural Impact Assessment, which utilizes information from the previous 2003 Cultural Impact Assessment prepared by G70.

Anticipated Impacts and Mitigation Measures

Several measures have already been undertaken by the U of N Kona to reasonably mitigate and protect the cultural resources located within the Petition Area and to ensure that the rights of the descendant community to access and care for their *iwi kupuna* are not impinged. These mitigation measures included archaeological data recovery, and the establishment of permanent preservation easements with associated access rights for any identified lineal and cultural descendants to the three known burial sites, a *heiau*, and the Kuakini Wall. Also, at the recommendation of OHA, the landowner has agreed to preserve a portion of a historic trail across the property. If all of the conditions and measures (both interim and permanent) set forth in the Burial Treatment Plan and Preservation Plan are adhered to and implemented as part of the proposed project, then there will be no anticipated adverse impacts to the three burial sites (Sites 23683, 23684, and 23685) and the two preservation sites (Sites 6302 and 23681). To further avoid potential impacts to valued cultural resources, the LUC can condition any approval to include the recommended archaeological/cultural precautionary monitoring measures as additional mitigation during all ground- disturbing development activities.

3.17 Visual Resources

Existing Conditions

The Hawai'i County General Plan (2005) has identified the backdrop of Hualālai Volcano as the predominant visual attribute of the region. Its steep green slopes can be viewed from the coast, and from higher elevations, spectacular vistas can be seen of the coastline, ocean, and horizon (County of Hawai'i, 2005). The Keahuolu coastline and the Holualoa-Keauhou viewplane from Kuakini Highway going mauka and makai are other notable sites of natural beauty identified by the General Plan that are visible from the Petition Area.

Anticipated Impacts and Mitigation Measures

As the proposed project will not exceed three stories in height, no important view planes or scenic sites recognized in the Hawai'i County General Plan would be affected. Neither the view of Hualālai Volcano from the coast nor the view of the Keahuolu coastline or Honokōhau coastline from higher elevations would be substantially affected. Some initial impact to visual character may occur on a

localized scale because of construction activities and vegetation clearing, mostly involving landscaped or non- native wild vegetation, and creation of paved surfaces. In the long-term, the proposed project is not anticipated to substantially affect the scenic character of this area due to the modest building heights and design, and the proposed landscaping improvements and green roofs on the Petition Area will complement the natural beauty of the area.

3.18 Potential Cumulative and Secondary Impacts

Cumulative effects are impacts which result from the incremental effects of an activity when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertake such other actions.

The proposed 2020 U of N Kona Master Plan Update is consistent with the applicable development plans and policies. U of N Kona will seek a County Zone Change and associated construction permits, and will adhere to the applicable terms and conditions of approval tied to these permits.

Construction activity during the proposed project will generate direct employment as well as indirect and induced employment in construction-related industries. The project is expected to cost approximately $19 million which will be spent in the State of Hawai‘i.

Short-term construction-related impacts on the environment will be generated by the project, and mitigation measures will be implemented to minimize these impacts. Construction related impacts will be temporary and will be in the immediate vicinity of the project site. Federal, State and County environmental regulations will be met throughout the construction and operation of the project.

Overall the long-term benefits of the 2020 U of N Kon Master Plan will help to meet the demand for educational facilities in the Kona region, for U of N Kona and Island of Hawai‘i residents. Residents of Hawai‘i would have the opportunity to attend U of N Kona. U of N Kona programs include discipleship learning opportunities, to attend courses and attain a two-year Associate Degrees in either dance, biblical studies, counseling, early childhood education or photography. There are nine colleges in addition to offering courses in practical training subjects. U of N Kona also offers master-degree level programs. Additional support facilities and planned programs include vocational training, sustainable agriculture, athletic complex and a Word by Heart English Youth Camp. The 2020 U of N Kona Master Plan Update includes a gymnasium and Olympic-sized pool, which will support training and cross-fit programs. In addition to these educational programs, U of N Kona is committed to training the next generation by providing a full-program for K-12 students, including Lower, Middle and High School. Collaborative efforts with local organizations will continue to create new linkages and applications, such as the development of outreach programs like the Aloha Kona Urgent Care, Community Emergency Response Team and Haleo Hawaiian Language Course. No mitigation is proposed.

Section 4

Plans and Policies

4.0 Relationship to Land Use Plans and Policies

In this section, the project's consistency with applicable Federal, State of Hawai'i and County of Hawai'i land use plans, policies, principles and guidelines are discussed below.

4.1 Hawai'i State Plan

The Hawai'i State Plan establishes a statewide planning system that sets forth goals, objectives, and policies, and priority directions to provide for wise use of Hawai'i's resources and guide the future long-range development of the State.

One of the overall themes of the Hawai'i State Plan states: *Community or social well-being is a value that encompasses many things. In essence, it refers to healthy social, economic, and physical environments that benefit the community as a whole. A sense of social responsibility, of caring for others and for the well-being of our community and of participating in social and political life, are important aspects of this concept. It further implies the aloha-spirit - - attitudes of tolerance, respect, cooperation and unselfish giving, within which Hawai'i's society can progress.*

U of N Kona's vision begins at home by loving their neighbors. U of N Kona students and staff participate in a wide range of community service projects such as serving the homeless, tutoring in schools, conducting community service projects, assisting with projects at the Kona Adult Day Care Center, supporting a foster care program, and rehabilitating the Kama'aina Hale Apartments in Kona. Another core belief and fundamental value of U of N Kona is to practice hospitality as an expression of God's character and the value of people. They believe that it is important to open their hearts, homes, campuses and bases to serve and honor one another, their guests and the poor and needy not just as parts of social protocol, but as expressions of generosity. The 2020 U of N Kona Master Plan Update will allow U of N Kona to continue their support of the community as well as equip the students and staff to spread the word of God and their aloha spirit around the world.

Discussed below is the project's relationship to the goals and applicable objectives, policies, and priority directions.

The goals of the State, as stated under the Hawai'i State Planning Act (Chapter 226, HRS), is to achieve the following:

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai'i's present and future generations.
- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- Physical, social, and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participation in community life.

The objectives and policies of the Hawai‘i State Plan that are pertinent to the proposed project are as follows:

§226-5: Objectives and Policies for Population.

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

(b) Policies:

(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.

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

Discussion:

The 2020 U of N Kona Master Plan Update represents an increase of less than two percent in the population of North Kona and an increase of around three percent in the population of Kailua-Kona and Holualoa combined.

§226-6: Objectives and Policies for the Economy in General.

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

(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.

(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.

(b) Policies:

(3) Promote Hawai'i as an attractive market for environmentally and socially sound investment activities that benefit Hawai'i's people.

(6) Seek broader outlets for new or expanded Hawai'i business investments.

(7) Expand existing markets and penetrate new markets for Hawai'i's products and services.

(9) Strive to achieve a level of construction activity responsive to, and consistent with, State growth objectives.

Discussion:

The mission of the 2020 U of N Kona Master Plan Update is consistent with the provisions of the Hawai‘i State Plan (Chapter 226, Hawai‘i Revised Statutes [HRS]), which serves as a guide for the future long-range development of the State. The 2020 U of N Kona Master Plan Update will provide an impetus for future economic growth in mission-based learning and educational opportunities. The proposed project includes a new discipleship learning center, which may contribute to new market and industry growth and investment opportunities in Hawai'i. The proposed 2020 U of N Kona Master Plan Update will provide for a diverse range of employment and economic opportunities for Hawai‘i residents, both during and after project construction. Short-term construction-related jobs as well as permanent long-term operational jobs will be offered directly and indirectly, increasing employment throughout the region and State. Other socio-economic benefits to Kona residents

include opportunities to attend the U of N Kona courses and attain a two-year associate degrees in either dance, biblical studies, counseling, early childhood education or photography. Additional support facilities and planned programs include vocational training, sustainable agriculture, athletic complex and a Word by Heart English Youth Camp. The 2020 U of N Kona Master Plan Update reflects its commitment to the continued development of mission-based education, training, services, and curriculum programs.

§226-8: Objectives and Policies for the Economy – Visitor Industry

(a) Objectives: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai'i's economy.

(b) Policies:

(6) Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the visitor industry.

(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawai'i's cultures and values.

Discussion:

The Kona coast has relatively few visitor destinations besides its traditional beaches and luxury hotels. Annually, U of N Kona is visited by thousands of young students to encounter Jesus and discover the world of Christianity. U of N Kona's educational model conveys information and then immediately applies it in a practical way. Many staff leaders are young promising leaders between 18-24 years old. U of N Kona believes in walking beside them as they develop in their skills and leadership. The 2020 U of N Kona Master Plan Update will attract even more visitors to the Kona region by allowing enhanced learning opportunities for the students by improving the adequacy of campus and allowing more educational options. It is estimated that U of N Kona brings in *approximately $15M a year* of revenue each year to the Island of Hawai'i. As noted above, one of U of N Kona's core beliefs and fundamental values is to practice hospitality as an expression of God's character and the value of people. U of N Kona believes it is important to open their hearts, homes, campuses and bases to serve and honor one another, their guests and the poor and needy not just as acts of social protocol, but as expressions of generosity. In this way the students are taught the very essence of the aloha spirit.

U of N Kona also supports the Island Breeze hula academy, which takes Hawaiian culture to many nations and encourages those nations to rise up using their own culture and language to redeem the cultures of the world. U of N Kona also supports the Haleo Hawaiian language programs. The 2020 U of N Kona Master Plan Update also will be dedicating land to teach Hawaiian Christian history and culture around the archeological sites.

§226-10: Objectives and Policies for the Economy – Potential Growth and Innovative Activities.

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

(b) Policies:

(1) Facilitate investment and employment in economic activities that have the potential to expand and diversify Hawai'i's economy, including but not limited to diversified

agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.

(6) Expand Hawai'i's capacity to attract and service international programs and activities that generate employment for Hawai'i's people.

(7) Enhance and promote Hawai'i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.

(12)Develop, promote, and support research and educational and training programs that will enhance Hawai'i's ability to attract and develop economic activities of benefit to Hawai'i.

Discussion:

The proposed improvements, buildings and projects will provide new opportunities for economic growth in education, training and development at U of N Kona for the State of Hawai'i. The proposed improvements that are on the Planning Program and/or are anticipated for development within the next 5-10 years and beyond are projected into the 2020 U of N Kona Master Plan and reflects U of N Kona's educational priorities. These projects will further propel and stimulate local and international interest and participation at U of N Kona.

§226-11: Objectives and Policies for the Physical Environment – Land-Based, Shoreline, and Marine Resources

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

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

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

(b) Policies:

(1) Exercise an overall conservation ethic in the use of Hawai'i's natural resources.

(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

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

(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

(6) Encourage the protection of rare of endangered plant and animal species and habitats native to Hawai'i.

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

Discussion:

The 2020 U of N Kona Master Plan Update has been designed to ensure that facility types and the physical attributes of each facility site are compatible with urban development. The Petition Area was surveyed to ensure that the physical, environmental, and cultural attributes of the property were compatible with the land uses proposed. A flora and fauna study and biological study of the Petition Area was completed in July 2002 (Terry & Hart, 2002). At that time all portions of the Petition Area were surveyed, and no threatened or endangered plant or animal species were present or would be expected to be present on the Petition Area. For the 2020 U of N Kona Master Plan Update, an updated *Natural Resources Surveys Study for University of Nations expansion property (TMK: (3) 7-5-010:085) North Kona District, Island of Hawai'i* was prepared by AECOS Incorporated (January 30, 2020). For the updated Natural Resources Survey the entire Petition Area was re-surveyed by AECOS. The survey found that most natural features on the property have been extensively modified by past agricultural activities. The Petition Area was found to be characterized by a mixture of

scattered kiawe (*Prosopis pallida*) and short-stature koa haole (*Leucaenaleucocephala*) with moderately dense Guinea grass (*Megathyrsus maximus*) at the upper end and more open koa haole and areas of dense herbaceous growths of coffee senna (*Senna occidentalis*) and 'uhaloa (*Waltheria americanas*) in disturbed areas. Of the total list of botanical species, the botanical resources survey recorded only four native (indigenous) plants: 'ilima (*Sida fallax*), 'uhaloa (*Waltheria indica*), 'ilie'e (*Plumbago zeylanica*), and a common sedge (*Cyperus polystachyos*). All three are widespread in the Islands and of no conservation concern and 'uhaloa is known to be common in disturbed areas as well as areas of marginal growing conditions.

The avian resources survey recorded a total of 21 avian species. One of the species recorded, the Hawaiian Hawk (*Buteo solitarius*) was observed flying over the site, which was listed as an endangered species. However, effective February 3, 2020, the Hawaiian Hawk has been delisted as an endangered species by the U.S. Fish and Wildlife Service, but remains listed by the State of Hawai'i. The remaining twenty other species recorded across the Petition Area are all commonly occurring established alien species.

Although not detected during the survey, the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), Band-rumped Storm Petrel (*Hydrobates castro*), and Newell's Shearwater (*Puffinus newelli*) may over-fly the Petition Area between April and the end of November each year. The petrel and storm-petrel are listed as endangered, and the shearwater as threatened under both federal and State of Hawai'i endangered species statutes. Collision with man-made structures is considered to be second-most significant cause of mortality of these seabirds in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds can collide with man-made structures and, if not killed outright, dazed or injured birds become prey to feral mammals. Neither nesting colonies nor appropriate nesting habitat for either of these listed seabird species occur within or close to the current Petition Area. Potential for impact on protected seabirds that the proposed project poses is an increased threat to transiting birds disoriented by lights associated with the proposed project during the seabird nesting season from September 15 through December 1 each year. If, during construction, it is deemed expedient to conduct night-time construction activities, or if streetlights are installed as part of the proposed action, these must be shielded. Shielding of lights would serve the dual purpose of minimizing disorientation and downing of petrels and shearwaters, and complying with Hawai'i County Code §14 – 50 et seq., which requires shielding of exterior lights to lower ambient glare reaching the astronomical observatories located on Mauna Kea.

During the mammalian survey, five mammalian species were recorded. All of the mammalian species are deleterious to native ecosystems and the native faunal species dependent on them. No Hawaiian hoary bats were detected during the course of this survey. It is likely that this species forages over the site on a seasonal basis. The current vegetation on the site is not typical of that in which one would expect to find roosting Hawaiian hoary bats. It is not expected that the proposed action will result in deleterious impacts to the Hawaiian Hoary bat.

In summary, with respect to protected species, with one exception as noted above, no plant or animal species urgently protected or proposed for protection under either the Federal or State of Hawai'i endangered species programs was detected on the Petition Area during the course of the survey. Additionally, no federally delineated Critical Habitat for any species is included in or is located close to the Petition Area. Thus, modifications of habitats on the Petition Area will not result in impacts to federally designated Critical Habitat.

Mitigation measures include light shielding during any nighttime construction and that streetlights or exterior facility lighting installed in conjunction with the project it is recommended that the lights be shielded to reduce the potential for interactions with nocturnally flying seabirds with external lights and man-made structures. The 2020 U of N Kona Master Plan incorporates green building design using water saving features and energy saving features, such as photovoltaic panels and green roofs. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that compliments the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation. In addition, the proposed improvements involve improved stormwater management through low-impact development (LID) features which would be supportive of many of these objectives and policies.

§226-12: Objectives and Policies for the Physical Environment – Scenic, Natural Beauty, and Historic Resources.

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

(b) Policies:

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

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

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

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

Discussion:

The planning and design of the 2020 U of N Kona Master Plan Update reflects the history, location, topography and setting of the Petition Area, and also provides opportunities to enhance the preservation and restoration of significant historical resources. Prominent view corridors and major topographical features will be maintained and highlighted in the design. For the 2020 U of N Kona Master Plan Update, an updated *Natural Resources Surveys Study for University of Nations expansion property (TMK: (3) 7-5-010:085) North Kona District, Island of Hawai'i* was prepared by AECOS Incorporated (January 30, 2020). For the updated Natural Resources Survey the entire Petition Area was re-surveyed by AECOS. The survey found that most natural features on the property have been extensively modified by past agricultural activities. One of the species recorded, the Hawaiian Hawk (*Buteo solitarius*) was observed flying over the site, which was listed as an endangered species. However, effective February 3, 2020, the Hawaiian Hawk has been delisted as an endangered species by the U.S. Fish and Wildlife Service, but remains listed by the State of Hawai'i. The remaining twenty other species recorded across the Petition Area are all commonly occurring established alien species. With respect to protected species, with one exception as noted, no rare or endangered plant or animal species or habitats urgently protected or proposed for protection under either the Federal or State of Hawai'i endangered species programs are present on the Petition Area.

The historical setting of the region will be reflected in its traditionally based planning, architecture, site amenities and operation. The 2020 U of N Kona Master Plan Update is committed to the protection, preservation and restoration the identified significant historical resources.

Archaeological Assessments have been previously prepared for the Petition Area. For the 2020 U of N Kona Master Plan Update, an Archaeological Preservation Plan, Data Recovery Report, and Burial Treatment Plan for the Petition Area have been conducted in compliance with State historic preservation requirements. A Dismantling and Restoration Plan has also been prepared for the preservation and restoration of the Kuakini Wall for the Petition Area. In addition, for the 2020 U of N Kona Master Plan Update a Cultural Impact Assessment and Ka Pa'akai Analysis were performed for the Petition Area in compliance with State historic preservation requirements, which utilizes information from a 2003 Cultural Impact Assessment. The proposed improvements will not alter recognized view planes from higher or lower elevations. Landscaping improvements on the Petition Area will complement the natural beauty of the Kona landscape. Proposed buildings and improvements will follow guidelines to incorporate a Hawaiian sense of place and be reflective of the greater Kona Region.

Outreach programs at U of N Kona include collaborative efforts with local organizations to support preservation and restoration of significant natural and historical resources. U of N Kona participated in the clean-up at Honokohau Harbor with the State of Hawai'i, Department of the Land and Natural Resources and in the restoration of historic native Hawaiian fish ponds in the Kona region.

§226-13: Objectives and Policies for the Physical Environment – Land, Air, and Water Quality.

(a) Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed toward achievement of the following objectives:
(1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.
(2) Greater public awareness and appreciation of Hawai'i's environmental resources.
(b) Policies:
(2) Promote the proper management of Hawai'i's land and water resources.
(6) Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities.
(7) Encourage urban developments in close proximity to existing services and facilities.

Discussion:

The 2020 U of N Kona Master Plan Update is consistent with the intent of this objective and policies, as the Petition Area is adjacent to an existing community and development. The 2020 U of N Kona Master Plan Update is intended to cluster development and compatible activities and facilities in appropriate areas of the Petition Area. The Petition Area is located in a general area of existing and planned urban development as evidenced by the Kona CDP, which is reflected by the Petition Area's "Urban" designation. This reflects the desirability to have proposed developments like the 2020 U of N Kona Master Plan Update to be in close proximity to public infrastructure and services.

The 2020 U of N Kona Master Plan incorporates green building design by using energy and water saving features, such as photovoltaic panels and low-flow devices, rain catchment systems for agricultural non-potable water needs, recycled water for irrigation/non-potable uses and green roofs. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that complements the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation. In addition, the proposed improvements involve improved stormwater management through LID features that would be supportive of many of these objectives and policies.

§226-21: Objectives and Policies for Socio-Cultural Advancement – Education.

(a) Objectives: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.

(b) Policies:

(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.

(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

(3) Provide appropriate educational opportunities for groups with special needs.

(4) Promote educational programs which enhance understanding of Hawai'i's cultural heritage.

(5) Provide higher education opportunities that enable Hawai'i's people to adapt to changing employment demands.

(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.

(8) Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.

Discussion:

The 2020 U of N Kona Master Plan Update supports the objectives and policies of the State as it relates to education through its mission-based educational programs and opportunities. The 2020 U of N Kona Master Plan Update reflects its commitment to the continued development of mission-based education, training, services, and curriculum programs. The Existing Campus is over-utilized and inadequate to meet the needs of the current and projected student population. U of N Kona has nine colleges and has developed a modular approach to education, which also allows for increased mobility. U of N Kona programs include discipleship learning opportunities, to attend courses and attain a two-year Associate Degrees in either Biblical Studies, Counseling, Communication Arts and Media, Christian Ministries, Early Childhood Education or Photography. Additional support facilities and planned programs include vocational training, sustainable agriculture, athletic complex and a Word by Heart English Youth Camp. The 2020 U of N Kona Master Plan Update includes a gymnasium and Olympic-sized pool, which will support training and cross-fit programs. In addition to these educational programs, U of N Kona is committed to training the next generation by providing a full-program for K-12 students, including Lower, Middle and High School. Collaborative efforts with local organizations will continue to create new linkages and applications, such as the development of outreach programs like the Aloha Kona Urgent Care, Community Emergency Response Team and Haleo Hawaiian Language Course. Additional outreach programs at U of N Kona include collaborative efforts with local public schools. In 2019, U of N Kona provided over 1,500 hours of volunteer hours to assist with painting, cleaning, and tutoring at local public schools in the Kona region.

The following is a list of courses currently offered at U of N Kona:

- Additive Behavior Counseling School
- Apostello School of Missions
- Counter Culture School of Apologetics
- Creative Media & Communication Course
- Directed Studies
- Discipleship Bible School
- School of Dance
- School of Digital Filmmaking
- School of Illustration
- School of Photography I
- School of Truth & Transformation
- School of Worship

- Foundations for Bibilical Counseling
- Foundations for Revival & Reformation
- Foundations in Education
- Internships & Field Assignments
- Primary Health Care School
- School of Biblical Studies
- School of Writing
- Stewardship & Sustainability School
- Teleios
- Transformation Business School
- Word By Heart

The following is a list of ministry programs offered at U of N Kona:

- 24 Frames of Light
- 4K Mapping
- 99 4 1
- Apostello
- Awaken
- Bible Innovations
- Brave Love
- Centre for Christian Formation
- Chosen & Dearly Loved
- Community Kokua
- Compassion Ablaze
- CoreLife Ministry
- CROWN
- DBS International
- Deep & Beyond
- End Bible Poverty Now
- Edballo Project
- Educating for Life
- Fire & Fragrance
- Foundations in Education
- Founder's Office
- French Ministries Department
- Global Initiatives
- Heartbridge
- Indigineous To All
- Innovision
- Island Breeze
- Kairos Visual
- Life Empowering Technology & Science
- PhotogenX
- REACH
- Respect the Corners
- Schools for Cambodia
- Steps of Justice
- Symphony of Hope
- Tekton Trades
- The Send
- Uniquip
- UniSkript
- Water for Life
- Word Alive
- Word by Heart
- YWAM Kona Dance
- YWAM Kona Music
- YWAM/UofN DNA

§226- 23: Objectives and Policies for Socio-Cultural Advancement – Leisure.

(a) Objectives: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.

(b) Policies:

(1) Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.

(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.

(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.

(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai'i's people.
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai'i's population to participate in the creative arts.

Discussion

The 2020 U of N Kona Master Plan Update supports the objectives and policies of the State as it relates to leisure through its mission-based educational programs and opportunities. U of N Kona programs includes discipleship learning opportunities with leisure activities, such as the Heartbridge Performing Arts/Fire and Fragrance program. The courses include music, fitness, trades, farm, business and other life skill tracks. Additional U of N Kona courses involve theater and film course opportunities. U of N Kona also creates opportunities for the disadvantaged and disabled to explore nature, participate in adventure activities and experience freedom through "Snorkel Day," which invites people of all ages with any special need or disability to participate in a beach day where families and caregivers can relax. U of N Kona also offers the Haleo Hawaiian language program, Island Breeze Hula which teaches hula to ages 4 and up, a dance and fine arts studio. U of N Kona's ministry Symphony of Hope teaches violin, viola, and cellos to local children. The 2020 U of N Kona Master Plan Update involves planning for the Athletic Training Complex, which includes a gymnasium, soccer/athletic field, practice field, athletic courts, Olympic-sized swimming pool, warm-up pool, athletic storage and locker room facilities. Additional programs at U of N Kona include a foster partnership program, "Family Fridays" and Keiki closet to help with supporting children and families on the Island of Hawai'i.

§226-25 Objective and Policies for Socio-Cultural Advancement–Culture

(a) Objectives: Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people.
(b) Policies:
(1) Foster increased knowledge and understanding of Hawai'i's ethnic and cultural heritages and the history of Hawai'i.
(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai'i's people and which are sensitive and responsive to family and community needs.
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawai'i's people and visitors.

Discussion

The planning and design of the 2020 U of N Kona Master Plan Update reflects the history, location, topography and setting of the site, and also provides opportunities to enhance the preservation and restoration of significant historical resources. Prominent view corridors and major topographical features will be maintained and highlighted in the design. The historical setting of the region will be reflected in its traditionally based planning, architecture, site amenities and operation. The 2020 U of N Kona Master Plan Update is committed to the protection, preservation and restoration the identified significant historical resources. Archaeological Assessments have been previously

prepared for the Petition Area. For the 2020 U of N Kona Master Plan Update, an Archaeological Preservation Plan, Data Recovery Report, and Burial Treatment Plan for the Petition Area have been conducted in compliance with State historic preservation requirements. A Dismantling and Restoration Plan has also been prepared for the preservation and restoration of the Kuakini Wall. In addition, a Cultural Impact Assessment and Ka Pa'akai Analysis were performed for the Petition Area in compliance with State historic preservation requirements, both of which utilize information from a 2003 Cultural Impact Assessment. The proposed improvements will not alter recognized view planes from higher or lower elevations. Landscaping improvements on the Petition Area will complement the natural beauty of the Kona landscape. Proposed buildings and improvements will follow guidelines to incorporate a Hawaiian sense of place and be reflective of the greater Kona Region. U of N Kona also supports the Island Breeze hula academy, which takes Hawaiian culture to many nations and encourages those nations to rise up using their own cultural and language to redeem the cultures of the world. U of N Kona also supports the Haleo Hawaiian language programs.

§226-102: Overall Direction.
The State shall strive to improve the quality of life for Hawai'i's present and future population through the pursuit of desirable courses of action in seven major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education, principles of sustainability, and climate change adaptation.

Discussion:
The 2020 U of N Kona Master Plan Update supports the overall direction of the State of Hawai'i in the areas of economic development, population growth and land resource management, quality education and sustainability. U of N Kona contributes to Hawai'i economic development through wages and related taxes. In the area of education, U of N Kona provides unique and mission-based educational programs. The 2020 U of N Kona Master Plan incorporates green building design using water saving features and energy saving features, such as photovoltaic panels and green roofs. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that compliments the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation. In addition, the proposed improvements involve improved stormwater management through low-impact development (LID) features which would be supportive of the overall direction of HRS Chapter 226. The project will support U of N Kona's demands for expanded facilities and improvements. Together, the proposed improvements support the overall direction of HRS Chapter 226 by enhancing opportunities that will benefit the present and future population of the State of Hawai'i.

4.2 Hawai'i State Functional Plan

The Hawai'i State Functional Plans implement the Goals, Objectives, Policies and Priority Guidelines of the Hawai'i State Plan. The Functional Plans provide the connection between State programs and State policy. Twelve functional plans have been adopted by the State Legislature, which includes the areas of Agriculture, Conservation Lands, Education, Energy, Health, Higher Education, Historic Preservation, Housing, Recreation, Tourism, Transportation and Water Resources. The Functional Plans are designed to address issues pertaining to physical resource needs and development.

Discussion
The functions and activities of the 2020 U of N Kona Master Plan Update are in conformance with the State Functional Plans, particularly the Educational Functional Plan. Educational facilities will be enhanced at U of N Kona and will provide all residents with greater access to mission-based educational learning centers and opportunities.

4.3 Hawai‘i 2050 Sustainability Plan

The long-term strategy of the Hawai‘i 2050 Sustainability Plan is supported by its main goals and objectives of respect for culture, character, beauty, and history of the State's island communities; balance among economic, community, and environmental priorities; and an effort to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The 2050 Plan delineates five goals toward a sustainable Hawai‘i accompanied by strategic actions for implementation and indicators to measure success or failure. The goals and strategic actions that are pertinent to the 2020 U of N Kona 2020 Master Plan Update are as follows:

Goal One: *Living sustainably is part of our daily practice in Hawai‘i Strategic Actions: Develop a sustainability ethic.*

Goal Two: *Our diversified and globally competitive economy enables us to meaningfully live, work, and play in Hawai‘i.* Strategic Actions: *Develop a more diverse and resilient economy; support the building blocks for economic stability and sustainability.*

Goal Three: *Our natural resources are responsibly and respectfully used, replenished, and preserved for future generations*. Strategic Actions: *Provide greater protection for air, and land-, fresh water- and ocean-based habitats; conserve agricultural, open space and conservation lands and resources.*

Goal Four: *Our community is strong, healthy, vibrant and nurturing, providing safety nets for those in need.* Strategic Actions: *Provide access to diverse recreational facilities and opportunities.*

Goal Five: *Our Kanaka Maoli and island cultures and values are thriving and perpetuated.* Strategic Actions: *Honor Kanaka Maoli culture and heritage; Celebrate our cultural diversity and island way of life.*

Discussion:
The 2020 U of N Kona Master Plan Update addresses sustainability through incorporating the goals and visions of U of N Kona as a model for environmental sustainability. The 2020 U of N Kona Master Plan incorporates green building design, including through the use of water-saving and energy-saving features, such as photovoltaic panels and green roofs. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating a sustainable landscape that complements the dry climate, pays tribute to the region's agricultural past, and incorporates the planting of native vegetation. In addition, the proposed improvements involve improved stormwater management through LID features which would be supportive of many of these objectives and policies. U of N Kona is committed to perpetuating Hawai‘i's culture while furthering educational and economic development in an environmentally sensitive way.

The 2020 U of N Kona Master Plan Update reflects its commitment to the continued development of mission-based education, training, services, and curriculum programs for the next generation. U of N Kona is committed to collaborative efforts with local organizations and will continue to create new linkages and applications, such as the development of outreach programs, including the Aloha Kona Urgent Care, Community Emergency Response Team and Haleo Hawaiian Language Course. The 2020 U of N Kona Master Plan Update will strengthen learning and training opportunities at U of N Kona and will lend to the future support, economic incentives and opportunities, and the continuation of U of N Kona's discipleship outreach programs. The themes and visions of the 2020 U of N Kona Master Plan Update include a globally connected place of learning for discipleship missionary training, leadership and service, all of which are key components integrated into the planning and design of the proposed project.

4.4 Hawai'i State Land Use District Boundaries

State Land Use Districts are established by the State Land Use Commission (LUC) in accordance with the State of Hawai'i Land Use Law, Chapter 205 HRS. The basic intent of the law is to regulate the classification and uses of lands in the State in order to accommodate growth and development as needed, and to retain and protect important agricultural and natural resources areas. All State lands are classified as Urban, Rural, Agricultural, or Conservation, with consideration given to county general and development plans in determining the classification.

The LUC, an agency of the State Department of Business, Economic Development, and Tourism (DBEDT), is responsible for each district's standards and for determining the boundaries of each district (Chapter 205-2(a), HRS). The LUC is also responsible for administering all requests for district reclassifications and/or amendments to district boundaries, pursuant to Chapter 205-4, HRS, and the HAR, Title 15, Chapter 15 as amended.

Discussion

The Petition Area is situated on lands designated as "Urban" by the LUC, pursuant to Chapter 205, HRS (*Figure 4-1*). The use of lands for an educational center, residential dormitory housing, a chapel and athletic complex conforms to the Urban designation. In 2000, U of N Kona purchased the 62-acre Petition Area adjacent to the Existing Campus Site. Under U of N Bencorp, the planned Hualalai Village Development Project was proposed for the 62-acre Petition Area. In 2003, U of N Bencorp was granted a SLU District Boundary Amendment to reclassify the Petition Area from the SLU Agricultural District to the SLU Urban District for the Hualalai Village Development Project. In 2005, U of N Bencorp changed its name to AEKO Hawai'i and ultimately transferred the land by deed to U of N Kona. The Hualalai Village Development Project was focused on the economic benefit that the planned market-rate condominiums and for-profit Pacific Cultural Center could bring. Soon after the reclassification of the 62-acre Petition Area was granted, U of N Kona began to have financial strain derived from the Hualalai Village Development Project business model. During this time, in 2006 U of N Kona filed a Motion to Amend with the LUC, but the hearing on the 2006 Motion to Amend was not concluded and no action was taken. In the interim, U of N Kona realized the need to realign itself with the mission's original faith-based value system, a system focused on service rather than financial gain. The 2020 U of N Kona Master Plan Update builds on planning principles and concepts based on the mission's faith-based value system. Its purpose is to update the plan for the 62-acre Petition Area to reflect current and upcoming priorities and to outline the expansion of the Existing Campus Site. Future buildings and projects, planned on the Existing Campus Site as well as on the Petition Area, are included in the 2020 Master Plan Update. As a part of the entitlement process, and in addition to the Motion to Amend, a change in zoning will need to be processed with

the County to facilitate the project on the Petition Area. The Petition Area is currently zoned A-1a, Agricultural District and a portion of the Petition Area is split zoned RD-3.75 and RS-7.5, Residential District. A change in zoning application with the County would be required for approval from A-1a to RM-4 (Multiple-Family Residential) or possibly RCX (Residential–Commercial Mixed Use) or CV (Village Commercial) prior to plan approval(s) and issuance of building permits. U of N Kona is also considering establishing Project District zoning for the project, which would provide flexibility in relocating elements within the Project District.

4.5 Ka Pa‘akai v. Land Use Commission

For the 2020 U of N Kona Master Plan Update, a Ka Pa‘akai O Ka ‘Aina Analysis (Ka Pa‘akai Analysis) was completed by ASM Affiliates (ASM) to examine the project’s potential effect on or impairment of valued cultural, historical, or natural resources in the Petition Area, including traditional and customary native Hawaiian rights. Refer to *Appendix N*. The Ka Pa‘akai analysis is based on the Hawai‘i Supreme Court’s decision in *Ka Pa‘akai v. Land Use Commission*, 94 Hawai‘i 31, 74, 7 P.3d 1068, 1084 (2000), which sets forth the State’s (and its agencies’) duty to protect traditional and customary practices and resources under the Hawai‘i Constitution. Article XII, Section 7 of the Hawai‘i Constitution obligates the State and its agencies, including the LUC, “*to protect the reasonable exercise of customarily and traditionally exercised rights of native Hawaiians to the extent feasible when granting a petition for reclassification of district boundaries*.” In *Ka Pa‘akai*, the court set forth a three-step process that agencies must undertake to determine:

1. The identity and scope of valued cultural, historical, or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area;

2. The extent to which those resources - including traditional and customary native Hawaiian rights - will be affected or impaired by the proposed action; and

3. The feasible action, if any, to be taken by the Land Use Commission to reasonably protect native Hawaiian rights if they are found to exist.

Discussion:
Under the first step, ASM’s Ka Pa‘akai Analysis identifies valued cultural, historical, and natural resources present within the Petition Area, and identifies the extent to which any traditional and customary native Hawaiian rights are, or have been, exercised. Historical archival information was investigated for the Petition Area, including several previous archaeological studies and prior cultural studies that included consultation and oral-historical interviews conducted were reviewed and summarized. Under the Second Step, ASM’s Ka Pa‘akai Analysis describes the extent to which the valued cultural, historical or natural resources and customary native Hawaiian rights will be impacted by the proposed project. Finally, under the third step, ASM’s Ka Pa‘akai Analysis recommends feasible actions and mitigation measures that may be undertaken to reasonably protect native Hawaiian cultural practices and resources, to the extent they were found to exist or occur within the Petition Area.

Records on file at DLNR-SHPD indicate that several previous archaeological studies have been conducted in the vicinity of the project area. These studies have identified a variety of formal site types including but not limited to mounds, alignments, walls, enclosures, trails, lava blisters and caves, and were assigned functional interpretations relating to agriculture, temporary and

permanent habitation, transportation, animal husbandry, landscape clearance, and potential ceremonial and burial functions.

In summary, previous archaeological studies conducted within the subject property have identified significant, valued cultural resources, including sites traditionally used for ceremonial, habitation, agricultural, burial, and transportation purposes. In addition, a previous Cultural Impact Assessment was conducted in 2003 for the Petition Area. Although the 2003 CIA did not identify any specific past or ongoing traditional or customary practices occurring within the Petition Area, concerns were expressed by the consulted parties regarding the presence of burials on the property, the possibility of encountering additional *iwi kupuna* during development activities, and the potential effects that the proposed development would have on the ability of the descendant community to care for those ancestral remains. This concern is legitimate given that the proposed project will alter the traditional cultural landscape of the subject parcels and, as a result, have an effect on the valued cultural resources located therein. Such landscape alteration also has the potential to adversely affect the ability of the descendant communities to access and care for their ancestral remains.

For the 2020 U of N Kona Master Plan Update, ASM Affiliates has prepared an updated Cultural Impact Assessment, which utilizes information from the previous 2003 Cultural Impact Assessment prepared by G70. Refer to *Appendix M*.

In addition, for the 2020 U of N Kona Master Plan Update, ASM Affiliates is in consultation with the State of Hawai'i, Department of Land and Natural Resources, State Historic Preservation Division (SHPD) regarding Final Acceptance of a Burial Treatment Plan and Data Recovery Report. The Data Recovery Report was resubmitted to SHPD for review and acceptance on August 30, 2019, received on September 5, 2019 (Log No. 2019.01527, Doc No. 1908CJ001). The Burial Treatment Plan received, Final Acceptance from SHPD by letter dated August 20, 2019. Refer to *Appendices G, H, I, J and K*. For the implementation of the Burial Treatment Plan and Restoration of Site 23683 and implementation of the Archaeological Preservation Plan for Sites 6302 and 23681, the 2020 U of N Kona Master Plan Update includes planning for the construction of rock walls around the permanent preservation buffers of the identified burial and preservation sites, which would compete the implementation of Burial Treatment and Archaeological Preservation Plans.

For the 2020 U of N Kona Master Plan Update, ASM Affiliates has also prepared a Dismantling/Restoration Plan for a Portion of the Kuakini Wall, which is awaiting submittal to the SHPD for review and acceptance. Refer to *Appendix L*.

Several measures have already been undertaken by the U of N Kona to reasonably mitigate and protect the cultural resources located within the Petition Area and to ensure that the rights of the descendant community to access and care for their *iwi kupuna* are not impinged. These mitigation measures included archaeological data recovery, and the establishment of permanent preservation easements with associated access rights for any identified lineal and cultural descendants to the three known burial sites, a *heiau*, and the Kuakini Wall. Also, at the recommendation of OHA, the landowner has agreed to preserve a portion of a historic trail across the property. If all of the conditions and measures (both interim and permanent) set forth in the Burial Treatment Plan and Archaeological Preservation Plan are adhered to and implemented as part of the proposed project, then there will be no anticipated adverse impacts to the three burial sites (Sites 23683, 23684, and 23685) and the two preservation sites (Sites 6302 and 23681). To further avoid potential impacts to valued cultural resources, the LUC can condition any approval to include the recommended archaeological/cultural precautionary monitoring measures as additional mitigation during all ground- disturbing development activities.

4.6 Hawai'i Coastal Zone Management Program

The Coastal Zone Management Program (CZMP) is a comprehensive nationwide program that establishes and enforces standards and policies to guide the development of public and private lands within the coastal areas. In the State of Hawai'i, the CZMP is implemented through the State Coastal Zone Management Law codified in Chapter 205A of the HRS (State CZM Law). The State CZM Law's objectives and policies address ten subject areas. These subject areas include recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources. Virtually all relate to potential development impacts on the shoreline, near shore, and ocean area environments. The State CZM Law charges each county with designating and administering Special Management Areas (SMA) within the State's coastal areas. Any "development," as defined by the State CZM, located within the SMA requires a SMA permit.

The Petition Area is not within the SMA as delineated by the County of Hawai'i. However, HRS Chapter 205A requires all state and county agencies to enforce objectives and policies as set forth in HRS §205A-2. The following subsections address the applicability of the objectives/policies to the 2020 U of N Kona Master Plan Update in relation to the ten subject areas mentioned above.

RECREATIONAL RESOURCES

Objective: *Provide Coastal Recreational Opportunities Accessible to the Public.*

Policies:

(A) Improve coordination and funding of coastal recreation planning and management; and

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

- *i. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
- *ii. Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites and sandy beaches, when such resources will be unavoidable damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;*
- *iii. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
- *iv. Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
- *v. Encouraging expanded public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value;*
- *vi. Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters;*
- *vii. Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, artificial reefs for surfing and fishing; and*
- *viii. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use Commissions, board of land and natural resources, county planning commissions, and crediting such dedication against the requirements of Section 46-6.*

Discussion

The 2020 U of N Kona Master Plan Update will not affect coordination and funding of coastal recreation planning and management. The Petition Area is located in Zone X, which are areas

determined to be outside of the 500-year floodplain. Uncontrolled flooding and associated water quality impacts on coastal resources can result from the existing undeveloped condition of the Petition Area. However, with the proposed development and associated drainage improvements, surface flows will be better managed. Retention walls are planned and retention basins within the Petition Area will collect silt on-site before it is discharged off-site through control structures. Drainage improvements will comply with all applicable Federal, State and County rules and regulations. Since the property is located inland, the project will not impact access to coastal resources.

HISTORIC RESOURCES

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

Policies:

(A) Identify and analyze significant archaeological resources;

(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and

(C) Support state goals for protection, restoration, interpretation and display of historic resources.

Discussion

The 2020 U of N Kona Master Plan Update provides opportunities to enhance the preservation and restoration of significant historical resources. The 2020 U of N Kona Master Plan Update is committed to the protection, preservation and restoration the identified significant historical resources. Archaeological Assessments have been previously prepared for the Petition Area. For the 2020 U of N Kona Master Plan Update, an Archaeological Preservation Plan, Data Recovery Report, and Burial Treatment Plan for the Petition Area have been conducted in compliance with State historic preservation requirements. A Dismantling and Restoration Plan has also been prepared for the preservation and restoration of the Kuakini Wall for the Petition Area, and is currently awaiting approval from SHPD. In addition, a Cultural Impact Assessment and Ka Pa'akai Analysis were performed for the Petition Area in compliance with State historic preservation requirements, both of which utilize information from a 2003 Cultural Impact Assessment. The proposed improvements will not alter recognized view planes from higher or lower elevations. Landscaping improvements on the Petition Area will complement the natural beauty of the Kona landscape. Proposed buildings and improvements will follow guidelines to incorporate a Hawaiian sense of place and be reflective of the greater Kona Region.

SCENIC AND OPEN SPACE RESOURCES

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

Policies:

(A) Identify valued scenic resources in the coastal zone management area;

(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion

The Petition Area is not located on the shoreline, is not coastal dependent, and proposed development of the Petition Area will not adversely affect vistas or scenic resources as described in *Section 3.17*.

COASTAL ECOSYSTEMS

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

Policies:

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

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

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

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

(E) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

Discussion

The 2020 U of N Kona Master Plan Update is anticipated to reduce impacts to the coastal ecosystem through implementation of sustainability guidelines and LID techniques that manage stormwater in a way that better replicates natural systems, thereby slowing the flow of storm runoff from the Petition Area and reducing pollutants in the process.

ECONOMIC USES

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

Policies:

(A) Concentrate coastal dependent development in appropriate areas;

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

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

(i) Use of presently designated locations is not feasible;

(ii) Adverse environmental effects are minimized; and

(iii) The development is important to the State's economy.

Discussion

These policies are not applicable because the proposed project is not coastal or shoreline dependent.

COASTAL HAZARDS

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

Policies:

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

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

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

(D) Prevent coastal flooding from inland projects.

Discussion

The Petition Area is not anticipated to be impacted by storm waves, tsunamis, flooding, erosion, subsidence, or pollution hazards. Natural and manmade hazards are discussed in Section 3.6. The proposed project will comply with the requirements of the Federal Flood Insurance Program, and because the proposed project does not involve alterations to the floodway, it is not anticipated to have any impact or deleterious effects on natural hazard conditions.

MANAGING DEVELOPMENT

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

Policies:

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and

(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion

The Petition Area reclassified from the State Land Use Agricultural District to Urban District in 2003. The Petition Area is zoned A-1a, Agricultural District and a portion of the Petition Area is split zoned RD-3.75 and RS-7.5, Residential District. All improvement activities will be conducted in compliance with State and County environmental rules and regulations. This Environmental Planning Report (EPR) identifies potential impacts and, where necessary, proposes mitigation measures to address impacts from the construction and operation of the project.

PUBLIC PARTICIPATION

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

Policies:

(A) Promote public involvement in coastal zone management processes;

(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion

The filing of the Motion to Amend for the Petition Area will be a matter of public record. Refer to Section 1.7 of this EPR for a list of agencies, organizations and individuals consulted in the preparation of the project EPR.

BEACH PROTECTION

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

Policies:

(A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;

(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities;

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

(D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and

(E) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Discussion

The Petition Area is located a considerable distance from the shoreline and will have no impact on beach access, use or recreational activities.

MARINE RESOURCES

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

Policies:

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

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

(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion

The project will not directly affect marine resources. The use of green building design and LID techniques to manage stormwater at the Petition Area is a step toward ensuring development of marine and coastal resources are both ecologically sound and economically beneficial.

4.7 County of Hawai'i General Plan

The County of Hawai'i General Plan is the policy document for the long-range comprehensive development of the Island of Hawai'i. The General Plan is intended to guide the pattern of future development in the County based on long-term goals, while identifying and promoting the visions, values, and priorities important to its people. Specific General Plan goals and polices most applicable to the 2020 U of N Kona Master Plan Update are described below.

ECONOMIC

Goals:

(A) Provide residents with opportunities to improve their quality of life through economic development that enhances the County's natural and social environments.

(B) Economic development and improvement shall be in balance with the physical, social and cultural environments of the Island of Hawai'i.

Policies:

a. Assist in the expansion of the agricultural industry through the protection of important agricultural lands, development of marketing plans and programs, capital improvements, and continued cooperation with appropriate State and Federal agencies.

b. Encourage the expansion of research and development industry by working with and supporting the University of Hawai'i at Hilo and West Hawai'i, the Natural Energy Laboratory at Hawai'i Authority (NELHA) and other agencies' programs that support sustainable economic development in the County of Hawai'i.

f. Support all levels of educational, employment and training opportunities and institutions.

Discussion

The 2020 U of N Kona Master Plan Update will bring full-time employment opportunities through new construction jobs and continued employment for faculty and staff who will work in the new facilities. Project planning will strive for a contextually appropriate facility that honors the balance between physical, social, and cultural environments in Hawai'i. U of N Kona hosts international students from over 30 nations and makes significant contributions to cultural diversity and training in cross-cultural relationships. The proposed project will enhance further growth of U of N Kona and add opportunities for improved mission-based educational opportunities.

ENVIRONMENTAL QUALITY

Goals:

(A) Define the most desirable use of land with the County that achieves an ecological balance providing residents and visitors the quality of life and an environment in which the natural resources of the island are viable and sustainable.

(B) Maintain and, if feasible, improve the existing environmental quality of the land.

Policies:

a. Take positive action to further maintain the quality of the environment.

k. Require implementation of the management measures contained in Hawai'i's Coastal Nonpoint Pollution Control Program as a condition of land use permitting.

Discussion

Pollution prevention measures will be implemented through environmental planning and design requirements, including LEED and on-site BMPs. The project will adhere to Federal and State environmental regulations, as applicable.

FLOODING AND OTHER NATURAL HAZARDS

Goals:

(A) Protect human life.
(B) Prevent damage to man-made improvements.
(C) Control pollution.
(D) Prevent damage from inundation.
(E) Reduce surface water and sediment runoff.
(F) Maximize soil and water conservation.

Policies:

g. Development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works and in compliance with all State and Federal laws.
m. Encourage grassed shoulder and swale roadway design where climate and grade are conducive.
n. Develop drainage master plans from a watershed perspective that considers non-structural alternatives, minimizes channelization, protects wetlands that serve drainage functions, coordinates the regulation of construction and agricultural operation, and encourages the establishment of floodplains as public green ways.
p. Where applicable, natural drainage channels shall be improved to increase their capacity with special consideration for the practices of proper soil conservation, and grassland and forestry management.
q. Consider natural hazards in all land use planning and permitting.
r. Discourage intensive development in areas of high volcanic hazard.

Discussion

The Petition Area is located outside of the flood and tsunami inundation zones. Adherence to adopted building codes will help to reduce hazard-related structural damage. The project will consider responsible drainage plans and natural hazards throughout project planning and design. The Petition Area is not located in high volcanic hazard areas. The project will comply with applicable Federal, State and County standards.

HISTORIC SITES

Goals:

(A) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawai'i.
(B) Appropriate access to significant historical sites, buildings, and objects of public interest should be made available.
(C) Enhance understanding of man's place on the landscape by understanding the system of ahupua'a.

Policies:

a. Agencies appropriate ordinances, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.
c. Require both public and private developers of land to provide historical and archaeological surveys and cultural assessments, where appropriate, prior to the clearing or development of land when there are indications that the land under consideration has historical significance.
d. Public access to significant historic sites and objects shall be acquired, where appropriate.
e. Embark on a program of restoring significant historic sites on County lands. Assure the protection and restoration of sites on other public lands through a joint effort with the State.
f. Encourage the restoration of significant sites on private lands.

g. Collect and distribute historic sites information of public interest and keep an inventory of sites.
m. All new historic sites placed on the State or Federal Register after the adoption of the General Plan shall be included in the General Plan.
n. Consider requiring Cultural Assessments for certain developments as part of the rezoning process.
o. *Recognize the importance of certain natural features in Hawaiian culture by incorporating the concept of "cultural landscapes" in land use planning.*

Discussion

The 2020 U of N Kona Master Plan Update is committed to the protection, preservation and restoration the identified significant historical resources. Archaeological Assessments have been previously prepared for the Petition Area. For the 2020 U of N Kona Master Plan Update an Archaeological Preservation Plan, Data Recovery Report, and Burial Treatment Plan for the Petition Area have been conducted in compliance with State historic preservation requirements. A Dismantling and Restoration Plan has also been prepared for the preservation and restoration of the Kuakini Wall for the Petition Area. In addition, a Cultural Impact Assessment and Ka Pa'akai Analysis were performed for the Petition Area in compliance with State historic preservation requirements, both of which utilize information from a 2003 Cultural Impact Assessment. The proposed improvements will not alter recognized view planes from higher or lower elevations. Landscaping improvements on the Petition Area will complement the natural beauty of the Kona landscape. Proposed buildings and improvements will follow guidelines to incorporate a Hawaiian sense of place and be reflective of the greater Kona Region. The historical setting of the region will be reflected in its traditionally based planning, architecture, site amenities and operation. Recommendations of the SHPD will be adhered to.

NATURAL BEAUTY

Goals:

(A) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
(B) Protect scenic vistas and view planes from becoming obstructed.
(C) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

Policies:

a. Increase public pedestrian access opportunities to scenic places and vistas.
e. Develop standard criteria for natural and scenic beauty as part of design plans.
f. Consider structural setback from major thoroughfares and highways and establish development and design guidelines to protect important view planes.
h. Protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.

Discussion

The 2020 U of N Kona Master Plan Update will seek to minimize impacts on scenic views of the mountain and coastline.

NATURAL RESOURCES AND SHORELINE

Goals:

(A) Protect and conserve the natural resources from undue exploitation, encroachment and damage.

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

(C) Protect and promote the prudent use of Hawai'i's unique, fragile, and significant environmental and natural resources.

(D) Protect rare or endangered species and habitats native to Hawai'i.

(E) Protect and effectively manage Hawai'i's open space, watersheds, shoreline, and natural areas.

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

Policies:

a. Require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.

h. Encourage public and private agencies to manage the natural resources in a manner that avoids or minimizes adverse effects on the environment and depletion of energy and natural resources to the fullest extent.

i. Encourage an overall conservation ethic in the use of Hawai'i's resources by protecting, preserving, and conserving the critical and significant natural resources of the County of Hawai'i.

p. Encourage the use of native plants for screening and landscaping.

r. Ensure public access is provided to the shoreline, public trails and hunting areas, including free public parking where appropriate.

w. Implement Council Resolution Nos. 330-96 and 58-97 in land use approvals.

Discussion

The 2020 U of N Kona Master Plan Update will seek to protect significant natural resources through incorporation of appropriate mitigation measures to minimize environmental impacts. The planning and design of the 2020 U of N Kona Master Plan Update reflects the history, location, topography and setting of the site, and also provides opportunities to enhance the preservation and restoration of significant natural and historical resources. Prominent view corridors and major topographical features will be maintained and highlighted in the design. For the 2020 U of N Kona Master Plan Update, an updated *Natural Resources Surveys Study for University of Nations expansion property (TMK: (3) 7-5-010:085) North Kona District, Island of Hawai'i* was prepared by AECOS Incorporated (January 30, 2020). For the updated Natural Resources Survey the entire Petition Area was re-surveyed by AECOS. The survey found that most natural features on the property have been extensively modified by past agricultural activities. One of the species recorded, the Hawaiian Hawk (*Buteo solitarius*) was observed flying over the site, which was listed as an endangered species. However, effective February 3, 2020, the Hawaiian Hawk has been delisted as an endangered species by the U.S. Fish and Wildlife Service, but remains listed by the State of Hawai'i. The remaining twenty other species recorded across the Petition Area are all commonly occurring established alien species. With respect to protected species, with one exception as noted, no rare or endangered plant or animal species or habitats urgently protected or proposed for protection under either the Federal or State of Hawai'i endangered species programs are present on the Petition Area.

The historical setting of the region will be reflected in its traditionally-based planning, architecture, site amenities and operation. In addition, the 2020 U of N Kona Master Plan incorporates green building design using water saving features and energy saving features, such as photovoltaic panels and green roofs. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that complements the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation. In addition, the proposed improvements involve improved stormwater management through LID features which would be supportive of many of these goals and policies.

LAND USE

The General Plan's accompanying Land Use Pattern Allocation Guide (LUPAG) Map establishes the future land use patterns for the Island of Hawai'i, including the community of Kailua-Kona. The LUPAG designates the Petition Area, "Medium Density Urban" (*Figure 4-2*). This designation includes "*village and neighborhood commercial and single family and multiple family residential and related functions (3-story commercial; multiple family residential – up to 35 units per acre)*."

Discussion

The 2020 U of N Kona Master Plan Update is consistent with the "Medium Density Urban" LUPAG Designation, as it involves a proposed medium density educational center and related functions within an area designated as desirable for new improvements.

4.8 Kona Community Development Plan

The Hawai'i County General Plan requires that Community Development Plans be adopted by the County Council for each judicial district in the County. The Kona Community Development Plan (CDP), which the County Council adopted in September 2008, covers the judicial districts of North and South Kona. The Kona CDP establishes a framework for future growth by identifying the County's major policies concerning the type and location of future development. The Kona CDP delineates Urban and Rural areas where future growth should be directed. Most of the future growth in Kona will be directed to the defined "Urban Area" and compact villages located along proposed transit routes or Transit-Oriented Development (TOD) zones. The "Rural Area" consists of the lands outside of the Kona Urban Area where limited future growth should be directed to the existing rural towns and villages in a way that revitalizes and enhances the existing rural lifestyle and culture of those communities.

The Kona CDP articulates the area residents' vision for Kona's future: "*A more sustainable Kona characterized by a deep respect for the culture and the environment and residents that responsively and responsibly accommodate change through an active and collaborative community*."

In order to achieve this vision, the Kona CDP presents guiding principles which are the foundation for the goals, objectives, policies, and implementation actions for eight thematic "elements": 1) transportation; 2) land use; 3) environmental resources; 4) cultural resources; 5) housing; 6) public facilities, infrastructure and services; 7) energy; and 8) economic development. Specific Kona CDP guiding principles, goals, objectives, and policies most applicable to the Project follow:

GUIDING PRINCIPLES

1. *Project Kona's natural resources and culture.*
2. *Provide connectivity and transportation choices.*
3. *Provide housing choices.*
4. *Provide recreation opportunities.*
5. *Direct future growth patterns toward compact villages, preserving Kona's rural, diverse, historical character.*
6. *Provide infrastructure and essential facilities concurrent with growth.*
7. *Encourage a diverse and vibrant economy emphasizing agriculture and sustainable economies.*
8. *Promote effective governance.*

LAND USE

Objective LU-1: Overall Growth Pattern. *To identify areas where higher intensity growth areas should occur and areas where the rural character and open space along the shoreline should be preserved.*

- ***Policy LU-1.2: Urban Area.*** *The majority of future growth in Kona shall be directed to the Kona UA shown on the Official Kona Land Use Map, which spans from the Kona International Airport to Keauhou subject to the policies set forth under Objective LU-2.*
- ***Policy LU-1.4: Consistency with LUPAG.*** *The current LUPAG accommodates the vision and needs for the Kona CDP area planning horizon and should be amended only for compelling reasons. Any rezoning application shall be consistent with the LUPAG.*

ENVIRONMENTAL RESOURCES

Objective ENV-1: Managing Impacts. *In order to minimize impacts on the land, make use of best management planning practices for any land-based endeavor by balancing public and private rights, and taking advantage of an ever-improving knowledge of resource sensitivity and natural processes.*

- ***Policy ENV-1.5: Sensitive Resources****. In the context of Kona's ecology and history, the following natural and cultural resources shall be considered sensitive and therefore shall be inventoried, as part of any permit application to the County Planning Department.*
    - *Critical habitat areas as identified by the U.S. Fish and Wildlife or County General Plan;*
    - *Predominantly native ecosystems, which may not be considered endangered but are valued because of their nearly pristine condition;*
    - *Anchialine ponds subject to a management Program addressed in Policy ENV-1.10: Non- Degradation of Anchialine Ponds;*
    - *High-level groundwater recharge area which shall initially be defined as all lands mauka of the 1,500 foot elevation and which may be refined by the Kona Mauka Watershed Management Program;*
    - *Historic trails;*
    - *Archaeological and historic sites subject to protection under HRS Chapter 6E; and,*
    - *Enhanced Shoreline Setback (see Policy LU-1.5).*

CULTURAL RESOURCES

Objective CR-1: Community-Based Program. *Develop a community-based program to evaluate and to protect Kona's cultural resources. Kona is rich with historic and cultural resources, but organized, proactive processes to provide stewardship for these resources are lacking.*

Objective CR-2: Funding of Kona Historic Resources Programs. *In addition to budgeting general fund revenues, the County of Hawai'i shall seek and participate in programs that can provide resources serving to protect and enhance Kona's historic resources.*

Objective CR-3: Preservation of Kanaka Maoli Culture and Island Values. *Ensure that our Kanaka Maoli and island values and cultures are preserved and perpetuated.*

- ***Policy CR-3.1: Honor Kanaka Maoli culture and heritage****. The Kanaka Maoli culture is the foundation of Hawai'i's living culture. We must ensure that the Kanaka Maoli people are supported and that this part of our culture is perpetuated. The success of this endeavor will ensure that the way of the Kanaka Maoli will guide our actions and behaviors in the years ahead.*
- ***Policy CR-3.2: Preserve and perpetuate our Hawaiian and island cultural values by celebrating our cultural diversity and island way of life****. Our diversity likewise defines us. Ensuring that our cultural practices flourish through language, dance, song, and art is crucial to sustaining who we are as a people. We must protect and nurture all aspects of our diverse history, traditions and cultures.*
- ***Policy CR-3.3: Enable Kanaka Maoli and others to pursue traditional Kanaka Maoli lifestyles and practices.*** *We must provide opportunities to those who want to pursue and perpetuate the way of the Kanaka Maoli.*
- ***Policy CR-3.4: Provide support for subsistence-based businesses and economies****. We must create opportunities for the Kanaka Maoli practice of subsistence-based businesses and economies, and remove the hurdles to their start-ups and development. Such traditional cultural practices are an economic alternative to Western forms of trade and commerce. Subsistence fishing, gathering, hunting and farming are examples of subsistence-based economies that are viable.*
- ***Policy CR-3.5: Ahupua'a Resource and Management.*** *Integrate the values and principles of the traditional ahupua'a resource and management systems as a basis for a sustainable Hawai'i.*

ECONOMIC DEVELOPMENT

Objective ECON-1: Strategic Public Facilities and Business Opportunities as Economic Stimuli.
To optimize the potential of certain public facilities and policies to stimulate ancillary economic growth that is desirable because they are environmentally clean, diversify the economy (i.e., not visitor- dependent), pay decent wages, and demand skills and intellect that challenge Kona's existing and upcoming workforce.

Discussion:

The 2020 U of N Kona Master Plan Update is consistent with the above guiding principles, including the associated goals, objectives, policies and actions of the Kona CDP. The 2020 U of N Kona Master Plan Update will be planned in accordance with County land use regulations including the Kona CDP and County LUPAG. The County shoreline setback rules are not applicable to the Petition Area. The Petition Area is located within the "Kona Urban Area" defined by the Official Kona CDP Land Use Map (*Figure 4-3*). In addition, the Petition Area is located within the boundary of the "Pua'a-Wai'iaha Village, Transit-Oriented Development (TOD) Zone" on the Official Kona Land Use Map. The 2020 U of N Kona Master Plan Update is consistent with the "Medium Density Urban" LUPAG Designation for the Petition Area as it involves a proposed medium density educational center and related functions within an area designated as desirable for new improvements. The Petition Area is not located within the Kona Mauka Watershed Planning Area.

The proposed project will make use of green building design guidelines, BMP planning and be sustainably designed to mitigate any environmental effects. The planning and design of the 2020 U of N Kona Master Plan Update reflects the history, location, topography and setting of the site, and also provides opportunities to enhance the preservation and restoration of significant natural and historical resources. Prominent view corridors and major topographical features will be maintained

and highlighted in the design. No rare or endangered plant or animal species or habitats are present on-site. Native habitats do not exist on the site given its history as an agricultural parcel and the introduction of non-native species over time. The historical setting of the region will be reflected in its traditionally based planning, architecture, site amenities and operation. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that complements the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation. Construction of the proposed project has the potential to stimulate diversified ancillary economic growth, pay decent wages, and create an ongoing demand for skilled employees.

4.9 Kailua-Kona Master Plan

The Kailua-Kona Master Plan was adopted in 1994 to help advise the Hawai'i County Planning Director and guide urban design in the Kailua Village area. The Kailua Village planning area is defined by the "Kailua Village Special District," as described in Chapter 25 of the County of Hawai'i Zoning Code and Kailua Village Design Commission, Article 24, Section 25-265(a)(1) to (8). The Kailua-Kona Master Plan defines goals, objectives and urban design guidelines for the Kailua Village Special District, including a designated land use master plan and urban design recommendations intended to preserve and enhance the "Village core" and set reasonable limits on the spread of resort and commercial development.

Discussion:
The 2020 U of N Kona Master Plan Update is consistent with the goals, objectives, and design guidelines of the Kailua-Kona Master Plan. The Petition Area is defined as "Low-Density Residential" by the Kailua-Kona Master Plan. In addition, the Petition Area is located within the boundaries of the "Kailua-Kona Village Special District" according to the Kailua-Kona Master Plan. The 2020 U of N Master Plan Update would require Plan Approval issued by the Kailua Village Design Commission and Hawai'i County Planning Department.

4.10 County of Hawai'i Zoning

The zoning regulations for the County of Hawai'i are prescribed in Chapter 25 of the Hawai'i County Code and applied and administered within the framework of the Hawai'i County General Plan. Under the Zoning Code, various zoning districts are established which regulate the type of development and permitted uses of property and are depicted on zoning district maps.

Discussion:
The Petition Area is currently zoned A-1a, Agricultural District, one-acre minimum lot size, and a portion of the Petition Area is split zoned RD-3.75 and RS-7.5, Residential District (*Figure 4-4*). A change in zoning application with the County would be required for approval from A-1a to RM-4 (Multiple-Family Residential) or possibly RCX (Residential–Commercial Mixed Use) or CV (Village Commercial) prior to plan approval(s) and issuance of building permits. U of N Kona is also considering establishing Project District zoning for the project, which would provide flexibility in relocating elements within the Project District.

4.11 Hawai'i County Water Use and Development Plan Update, Hawai'i Water Plan, Keauhou Aquifer System (March 2017)

The primary objective of the Water Use and Development Plan is to set forth the allocation of water to land use. As required by the Hawai'i Administrative Rules (HAR) Title 13, Chapter 170, Hawai'i Water Plan, each of the four counties is responsible to prepare a Water Use and Development Plan to include, but not be limited to the following:

1. *Status of county water and related land development including an inventory of existing water uses for domestic, municipal, and industrial users, agriculture, aquaculture, hydropower development, drainage, reuse, reclamation, recharge, and resulting problems and constraints;*
2. *Future land uses and related water needs; and*
3. *Regional plans for water developments including recommended and alternative plans, costs, adequacy of plans, and relationship to the water resource protection plan and water quality plan.*

The County of Hawai'i adopted by ordinance the Water Use and Development Plan Update dated August 2010 and the Commission on Water Resource Management granted approval in December 2011. The Keauhou Aquifer System Area was identified to be considered for further evaluation and detailed assessment. Therefore, the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*, dated March 2017, guides the County in an integrated approach to land use planning and water resource development and provides an estimate of anticipated future water demand projections based on County land use/zoning policies and water use rates for the Keauhou Aquifer System.

The Hawai'i Water Use and Development Plan Update for the Keauhou Aquifer System Area (ASYA) promotes overall themes common to several other Hawai'i Water Plan components:

- *Public Trust Doctrine – the State holds ownership over public water resources as a trustee for the benefit of the people of the State.*
- *Water is a most precious resource, shall be used wisely and conserved, not wasted.*
- *The highest quality water shall be used for the public's highest beneficial uses.*
- *Lower quality water (e.g. recycled water, surface water, brackish water) should be used whenever feasible.*

Specific recommendations for the Keauhou ASYA are as follows:

1. *Development of new ground water well sources is encouraged in areas within the high-level aquifer generally from the vicinity of the HDWS Queen Lili'uokalani Trust Deepwell extending south into the Kealakekua AYSA.*
2. *Continue studies of the ground water hydrology in the Keauhou ASYA, particularly the mid-elevation deep water source, which potentially could be a long-term solution.*
3. *Water purveyors are encouraged to assist in the development of non-potable water resource enhancement measures that do not involve ground water, such as recycled water, to satisfy non-potable demands. This may reduce reliance on ground water sources.*
4. *State and County agencies and private entities with water interests in the Keauhou ASYA are encouraged to participate and/or coordinate with the Three Mountain Alliance major landowners (KS, DOFAW and NPS) to assist in the preservation and restoration of*

watersheds in the Keauhou ASYA which will ultimately protect and potentially augment the ground water resources.

5. *State and County agencies are encouraged to develop and implement ground water well protection initiatives and to participate in the State of Hawai'i Department of Health, Safe Drinking Water Branch (SDWB) Wellhead Protection Financial Assistance Program.*
6. *County of Hawai'i, Department of Water Supply (HDWS) will continue to work with 'Aha Moku to ensure that its proposed source development strategies are properly vetted for Traditional and Customary Native Hawaiian Rights (T&C) issues.*

Discussion:

The *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*, identifies the Petition Area as located in the Kona Water System, which extends from the Keahole-Kona International Airport south to the South Kona boundary where interconnection with the South Kona Water System is made. Historically, surface water from Wai'aha Stream was diverted into large storage tanks located in Wai'aha above Māmalohoa Highway, filtered, then piped down to Kailua-Kona by a small transmission line to large tanks above Kailua-Kona Village. The first potable water wells were placed in service in 1967 and most of the small pipelines initially installed have been replaced with larger mains. The County of Hawai'i, Department of Water Supply (HDWS) is supplied by ground water sources, including 12 wells and allocates existing water use. Five-year incremental water needs for the next 20 years based on population and growth rate projections are projected by the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*. The anticipated future water demand defined for the Keauhou Aquifer System Area by the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update* reflects and considers proposed improvements with appropriate State Land Use Designation approvals, including consideration of the Petition Area's proposed improvements.

The *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update* encourages development of future high-level wells for the HDWS system in areas generally between 1,500-feet and 1,800-feet ground elevations mauka of Māmalahoa Highway, generally in vicinity between the QLT Deepwell in the Keauhou ASYA and the Haleki'i Deepwell in the Kealakekua AYSA with the overall goal of sustainability throughout the region. The goal of this source development strategy is to accommodate future anticipated demands defined by the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*. According to the *Keauhou Aquifer System, Hawai'i Water Use and Development Plan Update*, the Petition Area is depicted to have a Future Anticipated Demand of 100,000 GPD by the *Conceptual Ground Water Source Development and Anticipated Water Demands Map, Aquifer Sector, Hualālai 809, Aquifer Systems, Keauhou 80901*.

The 2020 U of N Kona Master Plan is committed water conservation measures to promote conservation and efficient water use. The 2020 U of N Kona Master Plan incorporates green building design using water saving features, such as low-flow devices, rain catchment systems for agricultural non-potable water needs, recycled water for irrigation/non-potable uses and green roofs. The proposed landscaping integrates Hawaiian culture through the use of native plants and landscaping elements that are representative of the natural and cultural landscape. The landscape design will incorporate xeriscape techniques aimed at creating sustainable landscape that complements the dry climate, pays tribute to the region's agricultural past, and incorporates planting of native vegetation. In addition, the proposed improvements involve improved stormwater management through LID features which would be supportive of many of these objectives and policies.

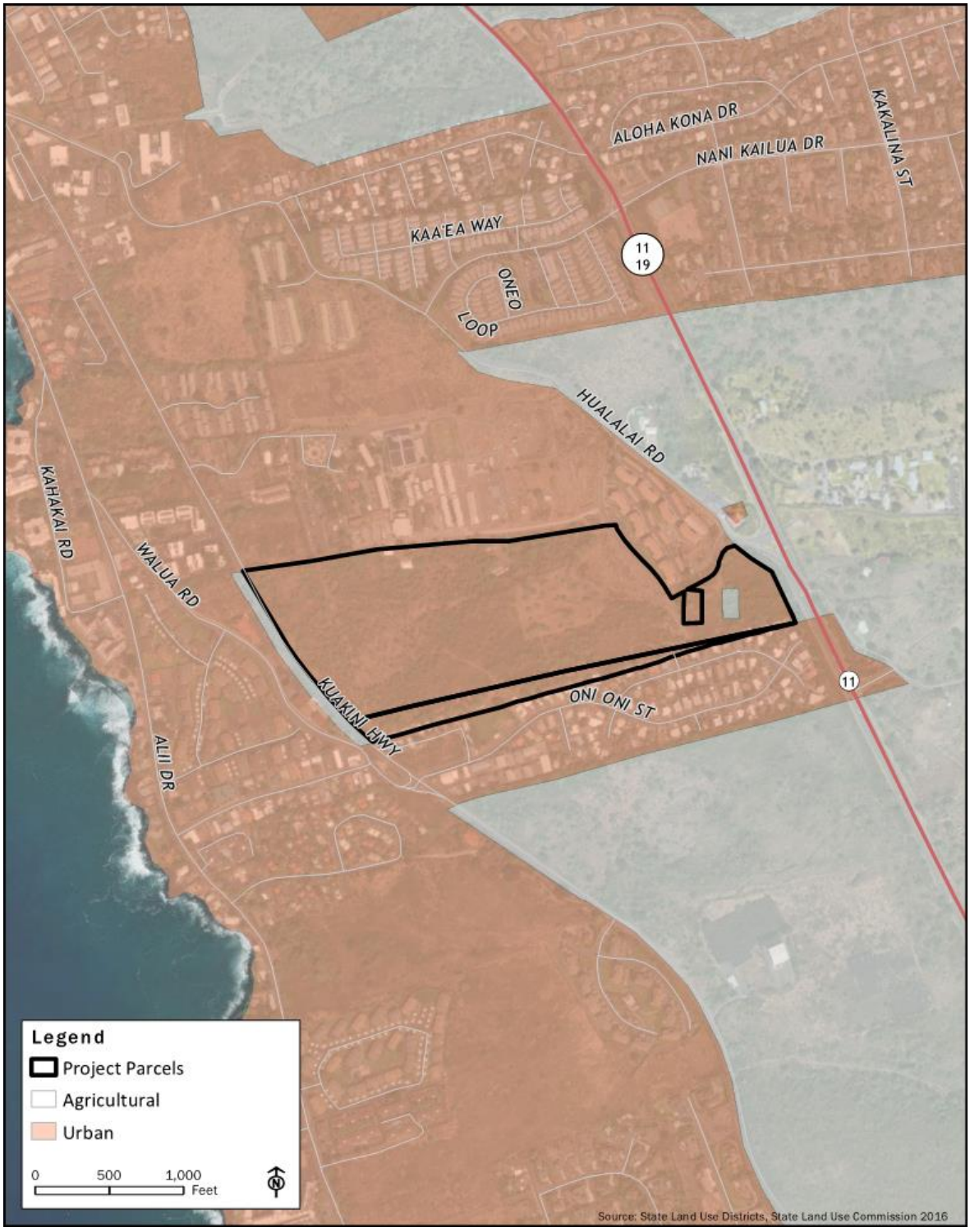


Figure 4-1 State Land Use District Designation Map

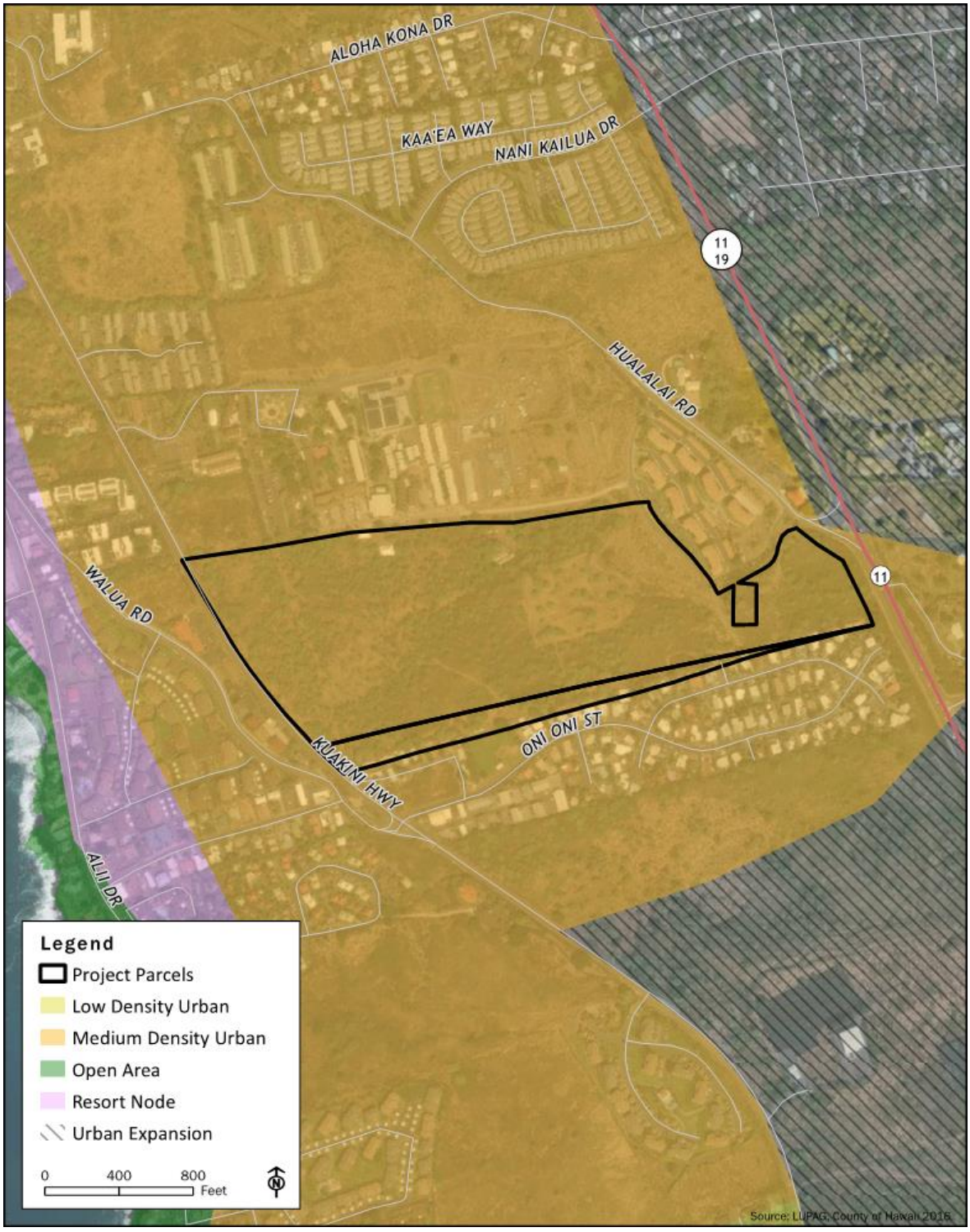


Figure 4-2 Land Use Pattern Allocation Guide (LUPAG) for Island of Hawai'i

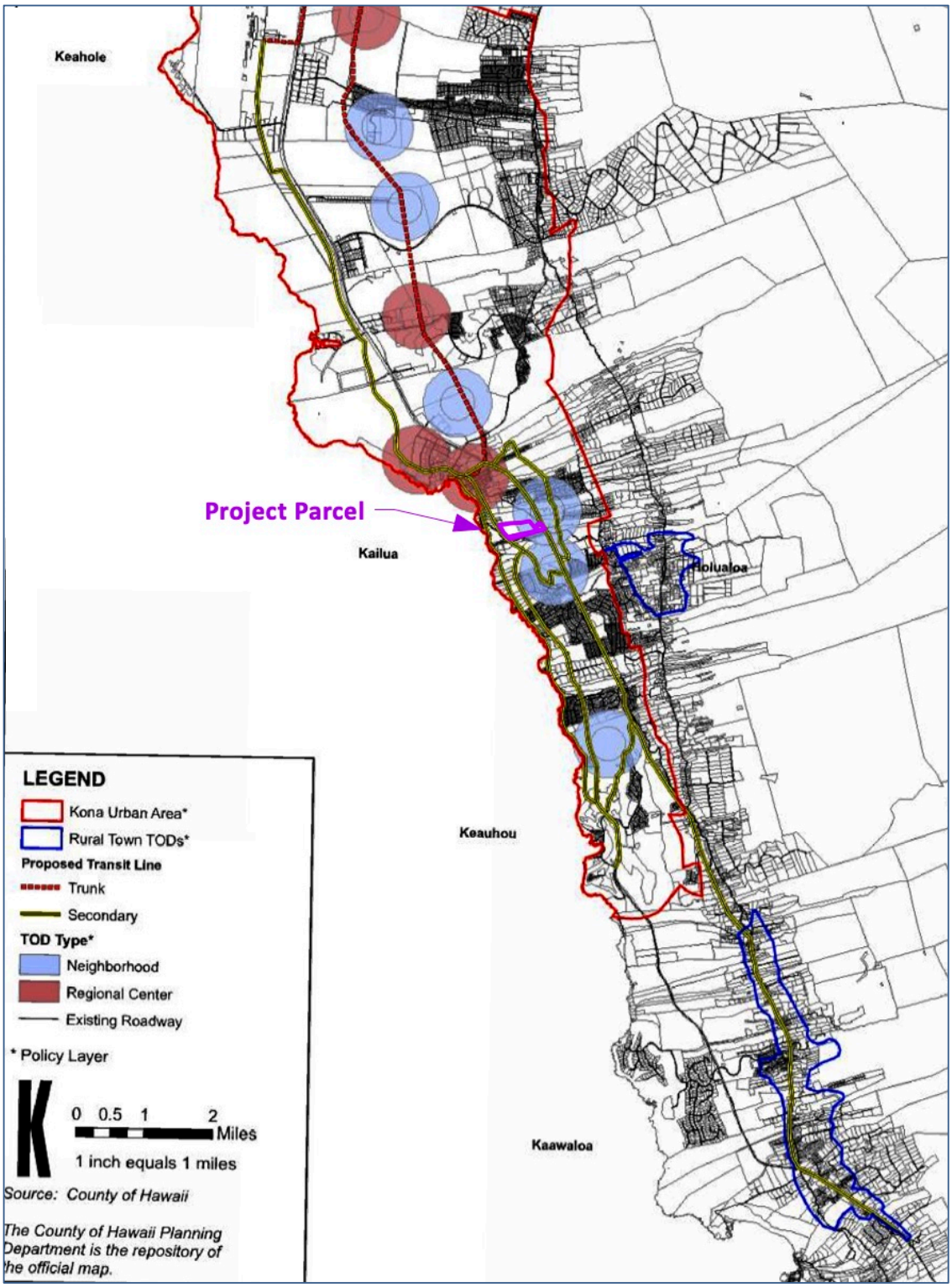


Figure 4-3 **Kona Community Development Plan, Land Use Map**

Figure 4-4 **County of Hawai'i Zoning Map**

Section 5

List of References

5.0 List of References

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Geographical Information Systems Data

Aerial Imagery

Google Earth Aerial Imagery, 2013.

Tax Map Key

City and County of Honolulu, February 2016.

Appendices