HILO BENIOFF MEDICAL CENTER
HONOKA`A HOSPITAL
KA`U HOSPITAL
Y. OKUTSU STATE VETERANS HOME

1190 WAIANUENUE AVENUE
HILO, HAWAII 96720
PHONE (808) 932-3000
FAX (808) 974-4746

May 1, 2026

Mary Alice Evans, Director
Office of Planning and Sustainable Development
Environmental Review Program
235 S. Beretania Street, Suite 702
Honolulu, HI 96813

Dear Ms. Evans:

Subject: Environmental Assessment (EA) Finding of No Significant Impact (FONSI) (PL-ENV-2025-000051)
Project: Hilo Benioff Medical Center Kea'au Outpatient Center; TMK: (3) 1-6-003:127 and 1-6-003:007 (por.), Kea'au, Puna, Hawai`i

The EA (EA) assesses the potential effects of constructing and operating the proposed project. Hawai`i Health Corporation, East Hawaii Region as the proposing and approving agency, anticipates that the proposed action is not likely to have a significant effect and therefore is issuing a notice of an Finding of No Significant Impact, subject to the public review provisions of HAR Section 11-200.1-20. Please publish a notice of the EA and FONSI in the next edition of The Environmental Notice. Please contact me at (808) 932-3802 if you have any questions.

We are also providing a pdf copy of the EA, the action summary, significance criteria, and other required information via the Environmental Notice online submittal platform. Please contact our project consultant, John Pipanof Pipan Consulting, at (808) 430-1441, if you have any questions concerning the submittal.

Sincerely,

Kris Wilson
Assistant Hospital Administrator
East Hawaii Region
kwilson@hhsc.org

Enclosures as noted above
cc: Dan Brinkman, East Hawaii Region CEO
John Pipan, President Pipan Consulting LLC

From: dbedt.opsd.erp@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Friday, May 1, 2026 3:55:45 PM

Action Name

Hilo Benioff Medical Center Construction of Medical Offices in Kea'au (FONSI)

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

Puna, Hawaiʻi

Tax Map Key(s) (TMK(s))

(3)1-6-003:127, (3)1-6-003-007

Action type

Agency

Other required permits and approvals

Use Permit, Special Permit, Plan Approval, Building Permits, Grubbing & Grading, Permit to Perform Work Upon State Highways, Permit for the Occupancy and Use of State Highways, National Pollutant Discharge Elimination System (NPDES) Permit, Storm Water Pollution Prevention Plan (SWPPP), Department of Health Individual Wastewater Treatment Works (WWTW), Department of Health Construction-Environmental Hazard Management Plan (C-EHMP), Potential Noise Permit

Proposing/determining agency

Hawaii Health Systems Corporation (HHSC)

Agency jurisdiction

State of Hawaiʻi

Agency contact name

Kris Wilson

Agency contact email (for info about the action)

kwilson@hhsc.org

Email address for receiving comments

john@landplanninghawaii.com

Agency contact phone

(808) 932-3802

Agency address

1190 Wainuenue Ave

Hilo, HI 96727
United States
Map It

Is there a consultant for this action?

Yes

Consultant

Land Planning Hawaii

Consultant contact name

John Pipan

Consultant contact email

john@landplanninghawaii.com

Consultant contact phone

(808) 333-3391

Consultant address

194 Wiwoole Street
Hilo, HI 96720
United States
Map It

Action summary

HMC is proposing to construct a new medical facility in Keaʻau known as the Keaʻau Outpatient Center (KOC). The subject property is located to the west of Volcano Road, including the intersections with Keaʻau Bypass Road and Hawaiʻi Belt Road. The property is 108.8 acres and owned by W.H. Shipman Ltd. The project site is proposed to be constructed on a 20-acre portion of the parcel zoned Agricultural 20-acres (A-20a) which will be subdivided from the larger parcel. The clinic will be sited on 13-acres of this 20-acre area. The current extent of the proposed project includes the 20-acre area and the proposed access driveway. The new access driveway would be built within a new 4.4-acre roadway lot to be subdivided from parcel 007. Plans include construction of a single-story medical office building complex consisting of a clinical wing and a behavioral health wing, totaling approximately 40,000 square feet. Sufficient paved parking stalls and loading zones are proposed meeting zoning code requirements. The total disturbance area for the project is proposed to be approximately 13 acres, along with 4.4 acres for the construction of the access driveway. Selected clearing and grubbing are proposed to maintain a buffer around the facility and optimize the appearance of the site.

Reasons supporting determination

Please refer to Section 5.2 of the Environmental Assessment.

Attached documents (signed agency letter & EA/EIS)

- HMC_Keaau_Medical_Clinic_FEA_ADA_CHECKSv4.pdf
- FONSI_Keaau-Benioff.pdf

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- HBMC_Action_Location.zip

Compliance certification (HRS §368-1.5):

The authorized individual listed below certifies that documents submitted are unlocked, searchable, and compliant with the Hawaii Electronic Information Technology Disability Access Standards (including, but not limited to transcripts, captions, and other descriptions accompanying audio/video files). The individual acknowledges that the submitter retains the responsibility for compliance after documents have been published and any compliance queries will be directed back to the agency and/or applicant.

Authorized individual

John Pipan

Authorized individual email

john@landplanninghawaii.com

Authorized individual phone

(808) 333-3391

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

HILO BENIOFF MEDICAL CENTER
KEA‘AU ~~OUTPATIENT CENTER~~ BENIOFF MEDICAL CENTER

~~DRAFT~~ FINAL ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT FOR
HILO BENIOFF MEDICAL CENTER (HBMC)
CONSTRUCTION OF MEDICAL OFFICES
KEA‘AU, PUNA, ISLAND OF HAWAI‘I
TMK (3) 1-6-003: 127
TMK (3) 1-6-003: 007 (por.)

~~December 2025~~ April 2026

Prepared by
Land Planning Hawai‘i LLC
194 Wiwo‘ole Street
Hilo, Hawai‘i 96720

LAND PLANNING HAWAII LLC

This document is prepared pursuant to:
The Hawai‘i Environmental Policy Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200.1, Hawai‘i Department of Health Administrative Rules (HAR)

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Note: Page numbers have been updated in the Table of Contents, tables and Figures Lists for the Final EA

ABBREVIATIONS

HMC	Hilo Medical Center
HBMC	Hilo Benioff Medical Center
KOC	Kea‘au Outpatient Center
DWS	Department of Water Supply
BMPs	Best Management Practices
TIAR	Traffic Impact Analysis Report
HDOT	Hawai‘i Department of Transportation
SHPD	State Historic Preservation Division
GP	Hawai‘i County General Plan
PCDP	Puna Community Development Plan
EA	Environmental Assessment
DEA	Draft Environmental Assessment
FEA	Final Environmental Assessment
HEPA	Hawai‘i Environmental Policy Act
HRS	Hawai‘i Revised Statutes
HAR	Hawai‘i Administrative Rules
FONSI	Finding of No Significant Impact
EIS	Environmental Impact Statement
DOH	Department of Health
USGS	United States Geological Survey
USDA	United States Department of Agriculture
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
SMA	Special Management Area
HWMO	Hawai‘i Wildfire Management Organization
UIC	Underground Injection Control
DOFAW	Division of Forestry and Wildlife
DLNR	Department of Land and Natural Resources
ROD	Rapid ‘Ōhi‘a Death
CAA	Clean Air Act
PPE	Personal Protective Equipment
WWTW	Wastewater Treatment Works
LUPAG	Land Use Pattern Allocation Guide
CDP	Community Development Plan
NPDES	National Pollutant Discharge Elimination System
SWPPP	Storm Water Pollution Prevention Plan
SWMP	Solid Waste Management Plan

ABBREVIATIONS

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SUMMARY OF PROJECT, ENVIRONMENTAL IMPACTS, AND MITIGATION MEASURES

Hilo Medical Center (HMC), recently renamed Hilo Benioff Medical Center (HBMC) has served as the largest hospital and primary healthcare provider on the Island of Hawaiʻi since 1897. They have also played a vital role in expanding healthcare access to rural areas of the island by establishing primary and specialty care clinics throughout Puna. The Puna District faces many healthcare challenges including increasing demand, overcrowding, and accessibility issues. Therefore, HMC is proposing to construct a new medical facility in Keaʻau known as the ~~Keaʻau Outpatient Center (KOC)~~ Keaʻau Benioff Medical Center to help address these issues.

The subject property is located to the west of Volcano Road, including the intersections with Keaʻau Bypass Road and Hawaiʻi Belt Road (**Figure 1**). The property is 108.8 acres and owned by W.H. Shipman Ltd. The project site is proposed to be constructed on a 20-acre portion of the parcel zoned *Agricultural 20-acres* (A-20a) which will be subdivided from the larger parcel. The clinic will be sited on 13-acres of this 20-acre area. The current extent of the proposed project includes the 20-acre area and the proposed access driveway. The new access driveway would be built within a new 4.4-acre roadway lot to be subdivided from parcel 007.

Plans include construction of a single-story medical office building complex consisting of a clinical wing and a behavioral health wing, totaling approximately 40,000 square feet. Sufficient paved parking stalls and loading zones are proposed meeting zoning code requirements. The total disturbance area for the project is proposed to be approximately 13 acres, along with 4.4 acres for the construction of the access driveway (**Figure 2).** Selected clearing and grubbing are proposed to maintain a buffer around the facility and optimize the appearance of the site.

On-site infrastructure is expected in the form of driveways, parking, electrical, water supply, storm water management, and wastewater disposal facilities. Electricity will be available to the site via HELCO. The Department of Water Supply (DWS) has confirmed that the clinic will be connected to county water supply. Consultation with DWS indicates that adequate water is available for the proposed use and for fire suppression. Water calculations will be developed in consultation with DWS to determine appropriate water supply lateral size for the proposed development. New water mains will be extended to the site. There is no County sewer line in the area. Wastewater will be handled through a wastewater treatment facility that provides secondary treatment required by the Department of Health rules.

Minor and short-term construction phase impacts to noise, air and water quality will be mitigated by Best Management Practices (BMPs) associated with Department of Health regulations, Grubbing and Grading Permits, a National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Pollution Prevention Plan (SWPPP).

Access to the clinic is proposed via a new access driveway from the highway. The approximately 0.5-mile access driveway will be constructed through the adjacent Shipman property identified as TMK (3) 1-6-003: 007 and connect to the highway across from the intersection with Keaʻau-Pāhoa Road. The 4.4-acre roadway area will be subdivided from the property.

Figure 1: Location Map

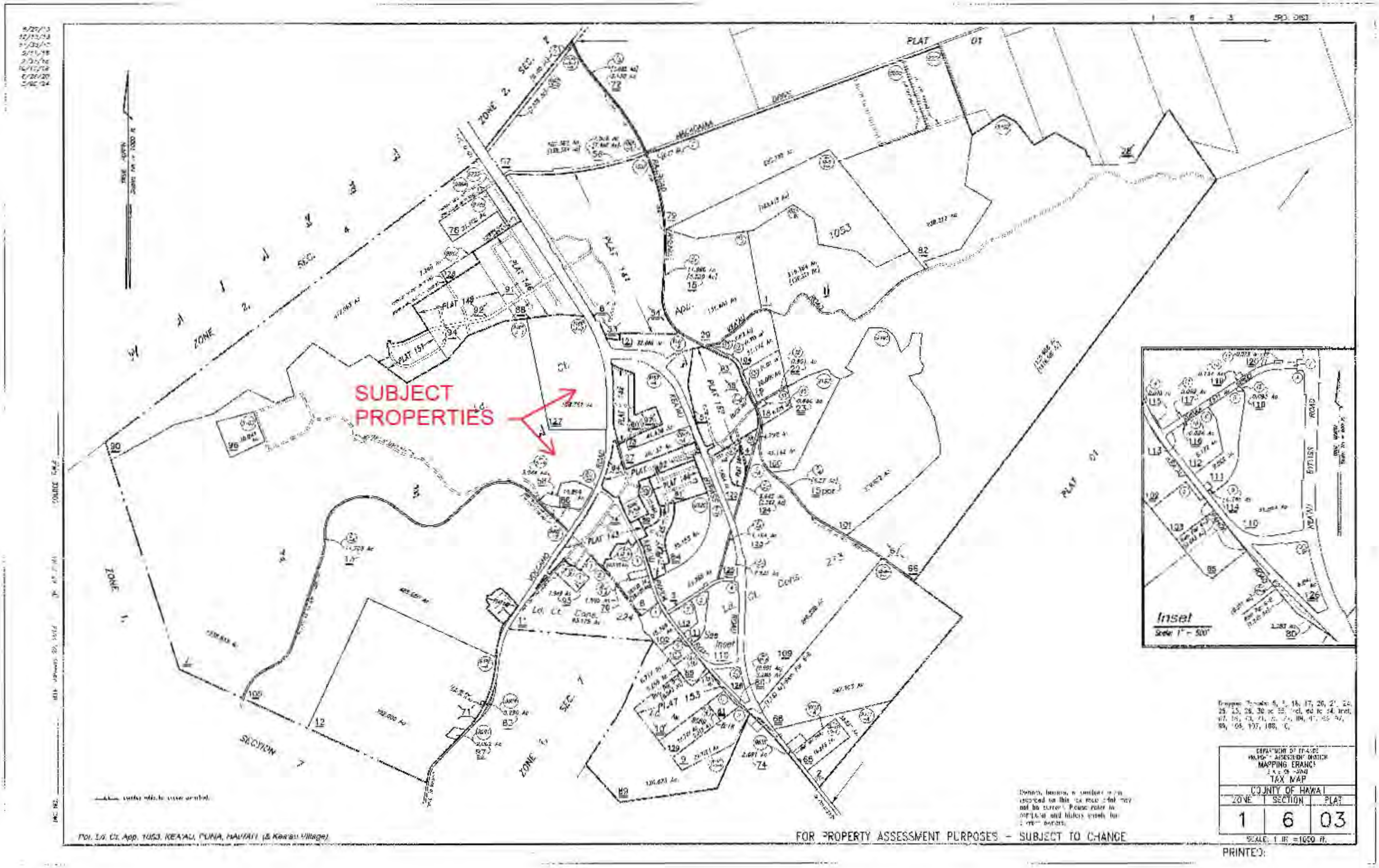
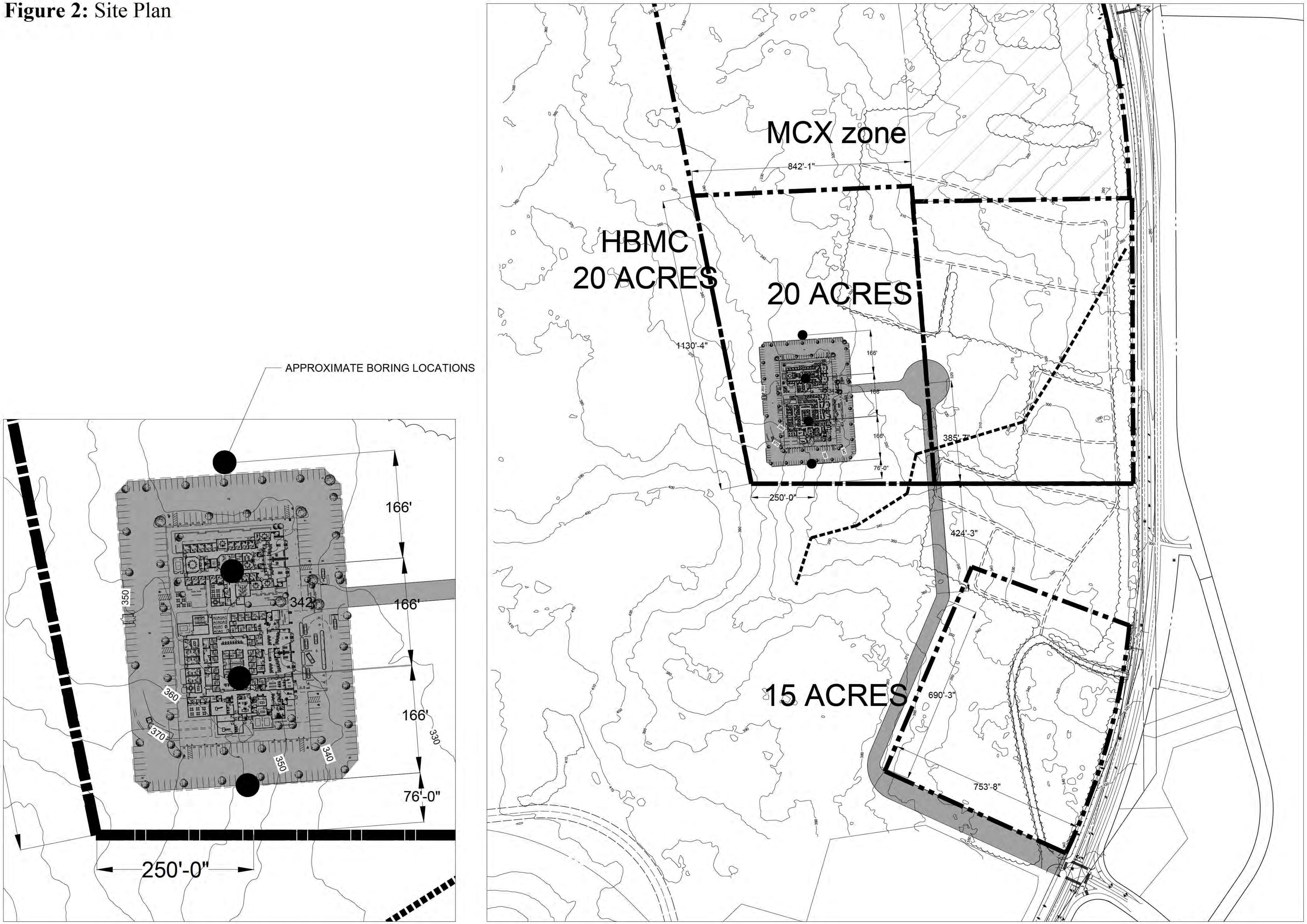


Figure 2: Site Plan



1 OVERALL SITE PLAN AND ENLARGED SITE PLAN
SCALE: NTS

FLEMING & Associates, LLC
557 MANONO STREET
HILO, HAWAII

SCOTT E. FLEMING
LICENSED PROFESSIONAL ARCHITECT
No. 11441
HAWAII, U.S.A.

EXP. DATE: 04/30 2026

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION AS DETAILED IN CHAPTER 16-115 OF THE HAWAII ADMINISTRATIVE RULES, DEPT. OF COMMERCE AND CONSUMER AFFAIRS, ENTITLED PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.

THE KEA'AU BENIOFF HEALTH CENTER
WELLNESS AND BEHAVIORAL HEALTH

CONSULTANT:

REVISIONS

Rev	Descrip ion	Date

PROJECT NO. 24007.00
PROJECT ARCH.: SF
PROJECT PLANS:

SHEET CONTENTS:
OVERALL SITE PLAN
ENLARGED SITE PLAN

DATE: MAY 21 2025

SHEET:
A01

A Traffic Impact Analysis Report (TIAR) was completed in September 2025. The TIAR is summarized in Section 3.3.1 and the full report can be found in **Appendix A**. All traffic and access improvements will be completed in consultation with HDOT.

No threatened or endangered flora or fauna species are expected to be present within the project site. Vegetation primarily consists of introduced and invasive species such as gunpowder tree (*Trema orientale*), albizia (*Falcataria Moluccana*), Honohono grass (*Commelina diffusa*), Guinea grass (*Megathyrsus maximus*), and others.

The subject site has been previously cleared and used for agricultural purposes, primarily for sugarcane and papaya production. In the unlikely event that undocumented archaeological resources, including shells, bones, midden deposits, lava tubes, or similar finds, are encountered during construction, work in the immediate area of the discovery will be halted, and the State Historic Preservation Division (SHPD) will be contacted to determine the appropriate actions.

The proposed action does not conflict with the Hawaiʻi County General Plan (GP) or the Puna Community Development Plan (PCDP). A Use Permit will be submitted to the Hawaiʻi County Planning Department in line with § 25-2-61 (9) and § 25-5-72 (d) (7) in conjunction with this EA to justify unusual and reasonable use according to State Land Use Regulations. In addition, a Special Permit will be submitted to the Hawaiʻi County Planning Department to allow the construction of the access road. As the Special Permit petition area does not exceed 15 acres in land area, the authority to grant the request remains with the County Planning Commission. Establishment of the proposed use will not be contrary to the objectives sought to be accomplished by State Land Use Laws and Regulations.

PART 1: PROJECT DESCRIPTION AND ENVIRONMENTAL ASSESSMENT PROCESS

1.1 Purpose and Need

Hilo Benioff Medical Center is tasked with serving not only the residents of Hilo but also those from surrounding areas including Puna, Volcano, and the Hāmākua Coast. Puna is the fastest growing region in the state. According to census data, it has seen a population increase from about 31,000 people in 2000 to nearly 52,000 people in 2020 and is expected to top 75,000 residents within the next 6 years. Its rapid population growth has created increased pressure on the existing healthcare services, which are currently insufficient to serve the growing population, especially with regard to urgent health care and specialty services. The entire Puna District currently contains two East Hawaiʻi Health Urgent Care clinics – the East Hawaiʻi Health Clinic in Keaʻau and the East Hawaiʻi Health Clinic in Pāhoa, along with Keaʻau Urgent Care. Urgent care services are only provided by these clinics between 7:00 a.m. and 7:00 p.m., 7:00 a.m. and 5:00 p.m., and 9:00 a.m. and 7:00 p.m. respectively. Additionally, access to specialty care, EKG and imaging services are also very limited in Puna and currently only offered at the Keaʻau East Hawaiʻi Health Clinic. Insufficient access to health services in Puna requires many Puna residents to seek care in Hilo. As a result, Hilo Medical Center has strained to accommodate the influx of patients, resulting in long wait times and overcrowding. Development of the new Hilo Medical

Center facilities in Kea‘au will help to fill in existing gaps in availability of urgent care, specialty care and imaging services for Puna residents.

The Hawai‘i County General Plan discusses the importance of social services including:

Social services include not only programs to provide assistance to special needs populations, but also health and medical facilities to serve the entire community. "Medical facilities", in this instance, does not apply to County emergency paramedical services (...). With a growing population, Puna clearly needs more social and health care services within the district. Yet, there are two major challenges to making them accessible to residents:

- *As a rural area with a rudimentary transportation system and dispersed population, it is difficult for residents in need to reach the services; and*
- *Puna's high percentage of low-income residents tends to increase the need for social services, yet discourages private health care providers from locating in Puna due to insurance issues.*

1.2 Project Description and Location

The subject property is located to the west of Highway 11, across from the intersection with Kea‘au-Pāhoa Road.

Plans include construction of a single-story medical office building complex consisting of a clinical wing and a behavioral health wing totaling approximately 40,000 square feet. Sufficient paved parking stalls and loading zones are proposed meeting zoning code requirements. The parking lot will include 22 Americans with Disabilities (ADA) compliant perpendicular parking stalls and 182 standard perpendicular parking stalls. The total disturbance area for the project is proposed to be approximately 17.4 acres.

The proposed facilities will provide urgent care services seven (7) days per week, including holidays, from 8:00 a.m. to 8:00 p.m. Primary care services, specialty clinic services (e.g. cardiology), imaging services (e.g. X-rays, CT scans, ultrasounds), laboratory services, and behavioral health and counseling services will be available Monday – Friday from 8:00 a.m. – 4:00 p.m. The facilities will serve the general public but will be primarily focused on residents of Puna and South Hilo. It is anticipated that the facility will serve over 100 patients per day.

The facility will provide outpatient care only and will not be an emergency room or provide drug rehabilitation services. The clinic will not receive ambulances, although ambulance transportation of patients from the facility to the Hilo Benioff Medical Center may occur when warranted.

1.3 Cost and Schedule

Total project costs are roughly $90 million and completion is estimated by ~~the end of 2028~~ late 2028 or early 2029.

1.4 Environmental Assessment Process

In 1974 the Hawaiʻi State Legislature enacted the Hawaiʻi Environmental Policy Act (HEPA), which requires State and County agencies to conduct an environmental impact analysis prior to making decisions on actions that may impact the environment.

This Environmental Assessment (EA) is being conducted in accordance with Chapter 343 of the Hawaiʻi Revised Statutes (HRS), along with the implementing regulations, Title 11, Chapter 200.1, of the Hawaiʻi Administrative Rules (HAR). This law is the basis for the environmental impact assessment process in the State of Hawaiʻi. An EA is necessary for the proposed project since the project involves the use of State of Hawaiʻi funds or land. Improvements within the State Right-Of-Way are anticipated for the proposed access to the project. Additionally, the project will utilize public funding sources for its completion. Since discretionary approval is required for the project in the form of a Use Permit and Special Permit, HRS 343-5.5 requires the EA to be completed.

According to Chapter 343, an EA is prepared to determine impacts associated with a proposed action, develop mitigation measures for any discovered adverse impacts, and determine whether the impacts are significant (according to the thirteen specific criteria). If a study concludes that no significant impacts would occur from implementation of the proposed action, a Finding of No Significant Impact (FONSI) is prepared. If a study finds that significant impacts are expected to occur because of a proposed action, then an Environmental Impact Statement (EIS) is prepared to allow deeper investigation of impacts and allow more extensive public involvement.

The following EA discusses alternatives to the proposed action, existing environment and impacts associated with the proposed action, the anticipated determination and the findings made by HBMC in consultation with the County of Hawaiʻi Planning Department and the expert consultants who prepared supporting studies for this EA.

1.5 Public Involvement and Agency Coordination

Agency coordination and public involvement are crucial components of the environmental assessment process to understand the impacts caused by the proposed action. The agencies, organizations, and individuals below have been consulted as part of the environmental assessment process and have also been provided a link with the full text of the DEA for review and comment. Copies of correspondence during the early consultation and draft review period can be found in **Appendix B and Appendix E.**

State of Hawaiʻi

- Department of Land and Natural Resources, Land Division
- Department of Land and Natural Resources, Division of Aquatic Resources
- Department of Land and Natural Resources, Division of Forestry and Wildlife
- Department of Land and Natural Resources, Office of Conservation & Coastal Lands
- Department of Land and Natural Resources, Engineering
- Department of Land and Natural Resources, Historic Preservation

- Hawaiʻi Department of Transportation
- Office of Hawaiian Affairs
- State Department of Health
- State Office of Planning and Sustainable Development
- Department of Education
    - DOE Schools in the area: Keaʻau Elementary, Middle, and High schools

County of Hawaiʻi:

- Planning Department
- Fire Department
- Police Department
- Department of Environmental Management
- Department of Public Works
- Department of Water Supply
- Civil Defense

Private

- Surrounding Property Owners within 300 feet of the Property outline
- Stakeholder Meeting August 25th
- Community Stakeholder Meetings October 9th and 15th
- Community Informational Meeting Scheduled for December 16th, 2025
- W.H. Shipman Ltd.

A comment letter was received from the Office of Hawaiian Affairs after their review of the Draft EA and is included in **Appendix E**. Per their comments, additional consult letters were mailed to the following organizations in an attempt to gain additional consult from the community and cultural practitioners:

- Association of Hawaiian Civic Clubs
- Cultural Resources Division of the Bernice Pauahi Bishop Museum
- The Department of Hawaiian Home Lands
- Hui Mālama I Nā Kupuna O Hawaiʻi Nei
- Ka Haka ʻUla O Keʻelikōlani — College of Hawaiian Language, UH Hilo

The above agencies were given a 30-day period to respond to the comment letters. To date, no responses have been received.

Community Engagement

A list of community stakeholders was compiled for the purpose of conducting meetings to garner feedback from these community stakeholders on the impact of the project on the community. These meetings were subsequently held on October 9th and 15th. A variety of stakeholders attended the meetings, including representatives from the Puna Community Development Action

Plan Committee (PCDAC) and the Hawaii DOE and area schools. Community Stakeholder meeting attendees are listed below:

Table 1: October Stakeholder Meeting Attendance

Attendee	Organization/Affiliation
Matthew Kanealii-Kleinfelder	County Council
C. Kimo Alameda, Mayor	County of Hawai'i
Adria Medeiros	Hawai'i DOE, Mountain View Elementary School
Dennis Onishi	Hawai'i County Council Vice Chair
'Iwalani Harris	Hawai'i DOE Ka'ū-Kea'au-Pāhoa Complex Area
Elaine Higa	Hawai'i DOE Ka'ū-Kea'au-Pāhoa Complex Area
Kazuo Todd	Hawai'i Fire Department
Joy San Buenaventura	Hawai'i State Senate
Jim Staub	HFS Federal Credit Union
Shawn Slater	Hawai'i DOE Ka'ū-Kea'au-Pāhoa Complex Area
Brenda Dunne	Hilo/ Kea'au Urgent Care
Jeanne Kapela	House of Representatives
Darryl Oliveira	HPM Building Supply
Kanoe Wilson	Kamehameha Schools & PCDAC
Kehaulani Aipia-Peters	Ke Kula O Nawahiokalaniopuu
Mitchell Gacula	Kea'au Filipino Food Store
Dean Cevallos	Hawai'i DOE, Kea'au High School
Kasey Eisenhour	Keonepoko Elementary School
Bob Hamilton	Plant it Hawai'i
Greg Henkel	PCDAC
M. Leilani DeMello	PCDAC
Stephanie Bath	PCDAC
Richard Solie	Puna Hongwanji Buddhist Temple
Jennifer Kurohara	Puna Hongwanji Buddhist Temple

A Community Informational Meeting was held on December 16th, 2025, at Kea‘au High School to further engage with community stakeholders and the general public. Community comments and HBMC responses are summarized below:

1. Physician Staffing and Continuity of Care
Community members expressed concern about the high turnover of cardiology providers and questioned how the proposed clinic would be staffed sustainably. There was a strong desire for long-term physician relationships and stability. Facility representatives acknowledged the concern and explained that physician turnover is now common nationwide, particularly in specialty care. The facility’s approach emphasizes maintaining a small number of community-anchored physicians, supported by rotating providers, with an ongoing focus on recruitment and continuity to ensure access to care.

2. Trust and Past Experience with Staffing
Some attendees shared that their personal experiences have made them skeptical about promises of staffing stability, particularly in specialty services. Facility leadership acknowledged this

perspective and noted that success varies by specialty. Primary care was cited as an area of relative stability, while cardiology was recognized as an ongoing challenge that leadership is actively working to stabilize.

3. Community Character and Sense of Place
Participants reflected on changes in Keaʻau over time and the loss of historic structures and local character. Questions about building design and infrastructure reflected a broader concern about preserving community identity while accommodating growth. Facility representatives confirmed that the project includes standard safety and building requirements while acknowledging the community's connection to place.

4. Land Use, Environmental Review, and Cultural Sensitivity
Questions were raised regarding the agricultural history of the site and whether environmental, archaeological, or cultural issues could delay the project. The facility explained that a formal Environmental Assessment (EA) is underway, including soil testing and industry-standard due diligence. Because the land has been in long-term agricultural use, the likelihood of undiscovered cultural or archaeological resources is considered low, though mitigation processes are in place should anything be identified. Community members were informed that the environmental assessment will be publicly available, with opportunities for public comment.

5. Communication and Transparency
Attendees appreciated the option to receive updates and requested notification when environmental documents become available. Facility staff committed to ongoing communication and maintaining sign-in lists to support future updates and transparency.

6. Traffic and Transportation Impacts
Traffic congestion in Puna was a significant concern. Community members asked whether the project could contribute to solutions, such as partnerships on road improvements. Facility representatives emphasized that the project is designed to avoid adding traffic burden, and noted that broader road planning falls under state and county jurisdiction. Leadership expressed a commitment to ensuring the project does not worsen existing traffic conditions.

7. Obstetrics, Birthing Care, and Maternal Health
There was strong community interest in obstetrics, birthing support, and emergency services, particularly for lower Puna. While a full birthing facility was described as outside the scope of the outpatient clinic due to regulatory and resource requirements, leadership acknowledged opportunities to improve prenatal care, maternal support, and partnerships, including services aligned with more natural or home-birth preferences. Declining birth volumes were also noted as a factor in service planning.

8. Community Safety and Access to Care
Participants highlighted concerns that limited access to prenatal and maternal care may lead families to pursue unsafe alternatives. There was shared recognition that local prenatal services and supportive care options could help bridge gaps and improve safety, even if full inpatient services remain centralized elsewhere.

9. Ongoing Engagement
Community members asked whether additional meetings would be held beyond those already scheduled. Facility leadership stated that future meetings will be driven by interest and need, and that additional public comment opportunities will occur as part of permitting and regulatory processes. Leadership emphasized a philosophy of over-communication rather than under-communication.

PART 2: ALTERNATIVES

2.1 Alternate Location

During early phases of project planning HBMC evaluated alternate locations for the project in the general area. After full consideration the property was selected as it provides the best overall location for the proposed facility. The property is centrally located and of sufficient size for the full buildout. Necessary utilities and infrastructure can be made available at the project site. A fundamental purpose of the project is to provide outpatient medical services to the underserved Puna District community, which currently lacks a comparable outpatient clinic facility. The proposed Kea‘au location, at the intersection of Routes 11 and 130, is the most accessible point in Puna for residents traveling from throughout the district.

There do not appear to be any significant environmental or other factors relating to the proposed use of the site. As such no alternative sites have been identified for study in the Environmental Assessment. The selected site satisfies the project’s key siting criteria: sufficient acreage for a phased multi-building medical campus, proximity to the primary regional highway corridor for patient access, availability of water and electrical utilities, and absence of significant environmental constraints. No other evaluated location in the Puna District met this combination of criteria. The site’s adjacency to Shipman Business Park and Kea‘au town center further supports the integration of medical services within the existing commercial and community node at Kea‘au.

2.2 Alternate Site Layout, Phasing, Access & Building Design

Aside from the proposed action, two alternative site designs were evaluated for the project. The first included constructing three (3) two-story 20,000 square foot buildings over two (2) construction phases. The second alternatve design proposed constructing two (2) single-story 20,000 square foot buildings over two (2) construction phases. These alternative designs or other similar designs would entail similar overall impacts to the proposed action. The phasing alternatives similarly, do not affect the overall impact of the project.

Access Alternatives

The access to the project would be from a new access driveway proposed to be constructed off Route 11 and Route 139 to connect the Medical Clinic to Shipman Park Driveway at Route 11. This driveway is intended to permit access to the site from an appropriate intersection with the highway. One alternative to the proposed access driveway would be to develop an access from the opposite side of the property extending through Shipman Business Park, extending from Kalara Street. This alternative is not ideal given that the proposed access driveway would be shorter than access through the Business Park and W.H. Shipman Ltd. has noted topographic concerns with this alternative. Further, the proposed access was planned in consultation with WHS with consideration of future plans they are developing for the northern portion of the parcel. Additionally, the intersection with Kea‘au-Pahoa Road is better able to accommodate traffic generated by the medical clinic than the highway intersection at Shipman Business Park as discussed in the TIAR.

2.3 No Action

Under a No Action alternative, the medical facility would not be built, and no improvements would be made to the land. The lot would remain undeveloped. The potential for economic development and positive community impact would largely be lost. This EA considers the No Action alternative as the baseline for this project and all environmental effects will be based off this alternative.

PART 3: ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION

3.1 Physical Environment

The proposed medical clinic will be located to the west of Highway 11, across from the intersection with Kea‘au-Pāhoa Road. The subject property is located adjacent to the Kea‘au town center and borders open and agricultural land to the west. The entirety of the property and surrounding areas were cultivated with sugarcane until the closure of Puna Sugar Company in

1982. The property has since been utilized for the cultivation of other crops, such as papaya. Due to the extensive agricultural history, the project area and wider property are vegetated with non-native plants.

3.1.1 Geology, Geologic Hazards, and Soils

Environmental Settings

Volcanic Activity

Geological hazards are frequent island wide, but particularly so in the Puna area. According to the Puna Community Development Plan, all of Puna lies within the three most hazardous geological risk zones, Lava Zone 1, 2 and 3, on a scale ranging from 9 to 1, ranking least hazardous to most. The subject property lies within Lava Zone 3, approximately 1-5 percent of which has been covered by lava flows since 1800, and 15-75 percent within the past 750 years (Thomas et al., 1992).

The subject property sits close to the boundary between Mauna Loa and Kīlauea volcanoes. Nonetheless, according to most geological maps, the site falls just within the boundaries of Mauna Loa.

Mauna Loa is the largest active volcano on earth, rising over 13,500 feet above sea level and extending to a depth of 16,400 feet below sea level. The sea floor is depressed another 26,250 feet due to the volcano's enormous mass. Therefore, from the base to the summit, Mauna Loa is more than 56,000 feet high (HVO, 2022). Since 1843, Mauna Loa has erupted 33 times with an average of one eruption every five years. Exceptions to this pattern occurred during a 25-year hiatus between 1950 and 1975 and a 38-year hiatus from 1984 to 2022. On Sunday November 27, 2022, an eruption began in the summit caldera, Mokuʻāweoweo. After some hours, new fissures opened along the Northeast Rift Zone. By December 2, the eruption was limited to one fissure, which advanced less than 2 miles from Saddle Road. On December 13, 2022, the eruption ceased.

It's probable that the subject property hasn't experienced a lava flow for thousands of years because of its considerable distance from Mauna Loa's most active rift zones. Furthermore, Moore and Trusdell (1991), suggest only eleven lava flows have traveled northeast from Kilauea's East Rift Zone over the past 1,500 years.

Earthquake Activity

Aside from lava, the Island of Hawaiʻi is also susceptible to earthquakes. The USGS recently came out with a model of earthquake probability for the Hawaiian Islands, which better estimates hazard probability compared to previous models. The ground shaking model indicates that Hawaiʻi Island has a greater than 90 percent chance of experiencing an earthquake with slight (or greater) damage during the next 100 years (**Figure 3**).

The Kea'au area is susceptible to ground shaking from earthquakes originating from both Mauna Loa and Kīlauea volcanoes. It is not uncommon to experience frequent slight tremors in Kea'au as a result. Larger events, however, occur much less frequently and are more difficult to predict.

Notable earthquakes that have impacted the area occurred in 1973, 1975, and 2018. In 1973, a magnitude-6.2 earthquake struck 29 miles beneath the town of Honomu, just north of Hilo. The depth of the earthquake is what caused such widespread and severe damage. Eleven people were reported injured in Hilo, four of which were hospitalized. An unknown number of injuries were also reported in Waimea. Approximately $5.6 million dollars of structural damage was recorded across the island (~$40 million today). In 1975, a magnitude-7.2 earthquake struck the southern flank of Kīlauea volcano near the town of Kalapana and caused significant shaking throughout the entire island. This earthquake also caused significant subsidence along southeastern shores of the island. Most recently, the 2018 Kīlauea eruption proved to be historic in many ways, including the magnitude-6.9 earthquake that rattled the entire island. This earthquake caused significant shaking throughout Puna and Hilo. There were even some reports of shaking as far as O'ahu.

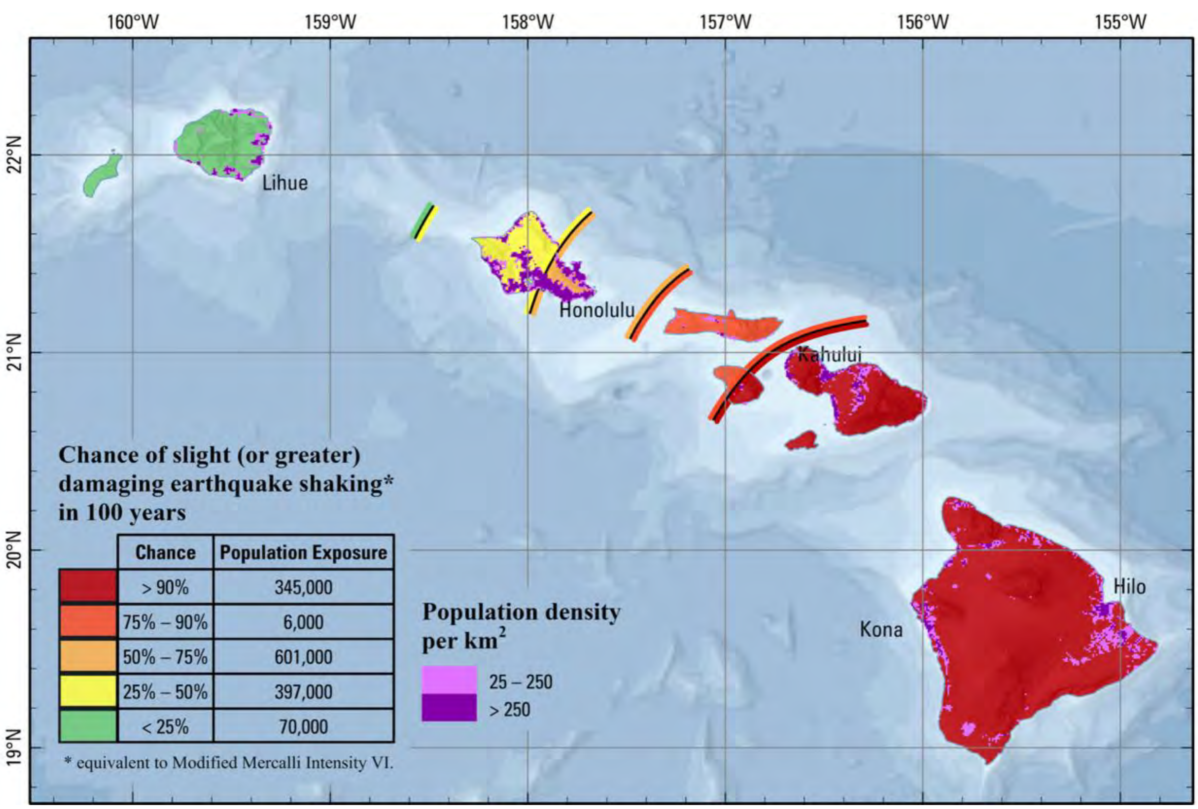


Figure 3: 2021 USGS Model of Earthquake Probability for the Hawaiian Islands

Topography and Soil

The topography of the property slightly decreases from the western end at approximately 350 feet in elevation, to the eastern end, roughly 280 feet above sea level. <u>According to the Land Study Bureau Productivity Rating, soils in the project area are classified as C (Fair Soils) and D</u>

(Poor Soils) and the Agricultural Land of Importance to the State of Hawaiʻi (ALISH) classification identifies the project area as Other or Unclassified.

The United States Department of Agriculture (USDA) Natural Resources Conservation Service Soils Survey Report classifies approximately 92 percent of the soil in this area as Panaewa very cobbly hydrous loam with 2 to 10 percent slopes (*2klkz*). This series is basic volcanic ash over pahoehoe lava and is moderately well drained with a high runoff class. The remaining soil is classified as Papai extremely cobbly highly decomposed plant material with 2 to 10 percent slopes (*2klky*). This soil type consists of organic material over ʻaʻa lava and is well drained with a low runoff class. Neither soil type is considered prime farmland. **Figure 4** shows the Papai series on the northern portion of the property identified as 628 and the Panaewa series lies on the southern portion, labeled 629. The 20-acre project area is within the area with Panaewa series soil.

Potential Environmental Impact from Proposed Action

Potential impacts from volcanic activity and earthquakes are expected to be minimal. Potential impacts from geological hazards and soils will not change appreciably under any alternative action, except a no action alternative. In the event of an earthquake, there may be some ground shaking, particularly during a significant seismic event. However, all structures will be designed and engineered to withstand seismic activity, adhering to the standards outlined in the Hawaiʻi County Code.

Should a lava flow pose a threat to Keaʻau, there would likely be adequate time to evacuate to a secure location. Located just west of Highway 11, the subject property offers a strategic position for swift and efficient evacuation. However, considering the intended use of the project as a medical facility, it may be necessary to develop an emergency response plan. If required, HBMC will ensure the development and implementation of a comprehensive evacuation strategy to safeguard the safety and well-being of all occupants.

Mitigating Measures Geology, Geological Hazards, and Soils

Considering and implementing appropriate safety measures and protocols associated with geological hazards is essential in the development of any public facility. All buildings intended for the proposed development will be engineered and designed to endure seismic hazards, in compliance with the Hawaiʻi County Code. If required, an Emergency Preparedness and Response Plan will be submitted to the Hawaiʻi County Civil Defense Agency for review and approval.

Best Management Practices for construction activities will be strictly followed to prevent adverse impacts to soil. Hawaiʻi Administrative Rules Chapter 11-55, Appendix C, under Special Conditions for Land Disturbances, describes the following construction management techniques to protect soil:

Figure 4: Soil Map

Soil Map—Island of Hawaii Area, Hawaii
(TMK (3) 1-6-003: 127)

a. Clearing and grubbing shall be held to the minimum necessary for grading and equipment operation.
b. Construction shall be sequenced to minimize the exposure time of the cleared surface area.
c. Construction shall be staged or phased for large projects. Areas of one phase shall be stabilized before another phase is initiated. Stabilization shall be accomplished by temporarily or permanently protecting the disturbed soil surface from rainfall impacts and runoff.
d. Erosion and sediment control measures shall be in place and functional before earth moving operations begin. These measures shall be properly constructed and maintained throughout the construction period.
e. All control measures shall be checked and repaired as necessary, for example, weekly in dry periods and within twenty-four hours after any rainfall of 0.5 inches or greater within a 24-hour period. During prolonged rainfall, daily checking is necessary. Record of checks and repairs must be maintained.
f. Records of the duration and estimated volume of storm water discharge must be maintained.
g. A specific individual shall be designated to be responsible for erosion and sediment controls on the project site.

3.1.2 Flood Zones

Environmental Setting

According to the Federal Emergency Management Agency (FEMA), the subject property is located within Flood Zone X, which is outside the 500-year floodplain (**Figure 5**). It is also located 4 miles from the coast and is not within the County Special Management Area (SMA) or the County Tsunami Evacuation Zone. The proposed project will not be impacted by any coastal hazards or affect erosion, coastal ecosystems, or marine resources. There are no naturally occurring wetlands, ponds, or lakes in the area. USGS Stream Stats indicate the presence of several unnamed drainage paths that run through the property; however, the project has been sited to avoid issues with drainage or flooding.

A drainage basin extends to cover a portion of the southern end of the property. The drainage basin is calculated to generate 2,720 cubic feet per second (cfs) of runoff in a 100-year storm event (USGS, 2024).

Potential Environmental Impact from Proposed Action

Since the property is outside of the 500-year floodplain, overall flooding risk for the site is low. Project construction is proposed to be sited within an area that will not be affected by the existing drainage basin. A proper drainage feature will be installed where the drainage basin crosses under the new access road.

Figure 5: Flood Hazard Map

Legend

Subject Property

Flood Hazard

X

Hawaii Statewide GIS Program, County of Hawaii, Esri

Potential impacts from flooding will not change appreciably under any alternative action, except a no action alternative. However, a no-action alternative lacks significant justification since appropriate measures will properly mitigate risks.

Impacts and Mitigating Measures

Improvements to onsite drainage must adhere to the Drainage Standards of the Hawaiʻi County Department of Public Works. The drainage study will undergo review and approval by DPW-Engineering before plan submission for approval. The design for storm drainage will be based on a 10-year, one-hour storm event, with all post-development increases required to be retained on-site.

3.1.3 Climate and Climate Change

Environmental Settings

Climate

The climate in the subject area is warm and moist, with an average annual rainfall of 142 inches and a mean annual temperature of 75 degrees Fahrenheit (Giambelluca et al., 2013).

Climate Change

The Hawaiʻi Revised Statues §226-109 and Hawaiʻi Administrative Rules §11-200.1 strongly encourages a climate change perspective be incorporated into the environmental assessment process. This entails evaluating how the outcomes of the analysis may be influenced by foreseeable future conditions impacted by climate change. Given the widespread impact of climate change on U.S. communities, it is imperative to assess the vulnerability of each factor under review to present and anticipate climate change effects. Additionally, careful consideration should be given to ensuring that the project and its occupants are adequately safeguarded from the potential impacts of climate change. This proactive approach aligns with the commitment to environmental responsibility and resilience in the face of evolving climatic conditions.

Human activities, particularly the emissions of greenhouse gases, have undeniably caused global warming, resulting in a 1.1°C increase in global surface temperature from 2011 to 2020 compared to 1850-1900 levels. The rise in greenhouse gas emissions stems from unsustainable practices in energy use, land use, lifestyle, and consumption patterns, contributing to an uneven global impact. This has triggered widespread and rapid change across the atmosphere, ocean, cryosphere, and biosphere, influencing various weather and climate extremes globally. These changes have led to adverse impacts on nature and people, causing significant losses and damage. Regional effects include heightened tropical cyclones, extratropical storms, increased aridity, and elevated fire weather. Continued emissions are projected to further raise global temperatures, potentially reaching 1.5°C in the near term, intensifying multiple concurrent hazards with each incremental warming (IPCC, 2023).

The University of Hawaiʻi's Sea Grant College Program confirms that Hawaiʻi is getting warmer. Data shows an increase in air temperature over the last 30 years of roughly 0.3°F per decade. For Hawai‘i this not only means rising sea levels, but also more contrast in the wet and dry season, which may lead to more frequent and intense precipitation and flooding (Tetra Tech, 2020).

In general, rainfall in Hawai‘i has been variable in the recent past with some drier years and some wetter years on average. El Niño provides periodic variation in winds and sea surface temperatures in the Pacific contributing to warming phases, while La Niña contributes to cooling phases. Increases in air temperature related to climate change will lead to more evaporation and more moisture in the air, which will contribute to variability in El Niño and La Niña events.

The 2019 Intergovernmental Panel on Climate Change (IPCC) Special Report on the Ocean and Cryosphere in a Changing Climate explicitly highlights a rise in the frequency of Category 4 and 5 tropical cyclones, commonly referred to as ‘hurricanes’ in the central Pacific.

> The average intensity of tropical cyclones, the proportion of Category 4 and 5 tropical cyclones and the associated average precipitation rates are projected to increase for a 2^{o}C global temperature rise above any baseline period (*medium confidence*). Rising mean sea levels will contribute to higher extreme sea levels associated with tropical cyclones (*very high confidence*). Coastal hazards will be exacerbated by an increase in the average intensity, magnitude of storm surge and precipitation rates of tropical cyclones (Collins et al., 2019).

In addition, according to the AR6 Synthesis Report produced by the IPCC in 2023, “It is *likely* that the global proportion of major (Category 3–5) tropical cyclone occurrence has increased over the last four decades”.

Historically, the Island of Hawai‘i has been viewed as largely protected from experiencing storms of this magnitude due to the presence of Mauna Loa and Mauna Kea. However, recent years have shown that storms such as Iselle (2014) and Lane (2018) can have very damaging effects to the island.

On August 8, 2014, Hurricane Iselle made landfall in the Puna District of Hawai‘i County as a moderate tropical storm with sustained wind speeds of 70 miles per hour. Significant damage was felt in the southeastern portions of the Big Island, especially in the Wai‘ōpae area, which is a coastal stretch dotted with anchialine ponds and tidepools, known as Kapoho Tide Pools. Many homes were heavily damaged in this area. This was the most heavily damaged area, which is approximately 23 miles southeast of the subject site. Most of the southeastern portion of the Big Island experienced high winds, heavy rain, downed trees, and powerlines, cutting thousands of people off from electricity, water, and transportation for several days (Kimberlain et al., 2018).

Hurricane Lane occurred in late August 2018 and brought significant damage to the Hawaiian Islands from flash flooding and mudslides. Over a four-day period, Hawai‘i Island received an average of 17 inches of rain. Up to 159 structures were damaged, making it the wettest tropical storm to impact the Island. Although most of the flooding impacts were concentrated to Hilo, much of the southern windward side, including southern Puna, experienced impacts (Beven, 2019).

Wildfires are becoming more frequent and intense due to rising temperatures, change in rainfall patterns and the growth of non-native, fire prone grasses and shrubs. According to the Pacific Fire Exchange (PFE) (2021), "Fire risk is closely tied to wet and dry cycles where grasslands and savannas grow and then dry out". Up to 25% of land in Hawaiʻi is at fire-prone risk. According to the Hawaiʻi Wildfire Management Organization (HWMO), about 0.5% of Hawaiʻi's total land area burns every year. Climate change is beginning to play a very serious role in the frequency and intensity of fires seen across the state. "Human ignitions coupled with an increasing amount of non-native, fire-prone grasses and shrubs and a warming, drying climate have greatly increased the wildfire problem" (HWMO, 2018). Further, expanding non-native, fire-prone grasses are less likely to recover from wildfires. Wildfires were once limited to active volcanic eruptions and infrequent lightning strikes. The increase in wildfire prevalence poses threats to safety, agricultural production, natural and cultural resources (PFE, 2014).

In early August 2021, a vegetation fire ignited near Mana Road and traveled throughout Waimea and South Kohala. Approximately 40,000 acres were burned according to estimates from fire officials. It was the largest wildfire every recorded in Hawaiʻi County. Thousands of people were forced to evacuate from Waikiʻi Ranch and Puʻu Kapu Hawaiian Homesteads, where two homes were destroyed. Governor David Ige declared a state of emergency on August 4, 2021, to protect the health, safety, and welfare of Hawaiʻi (West Hawaiʻi Today, 2021). **Figure 6** is a map of wildfires in Hawaiʻi between 1999 and 2022, including the Mana Road Fire depicted in dark red.

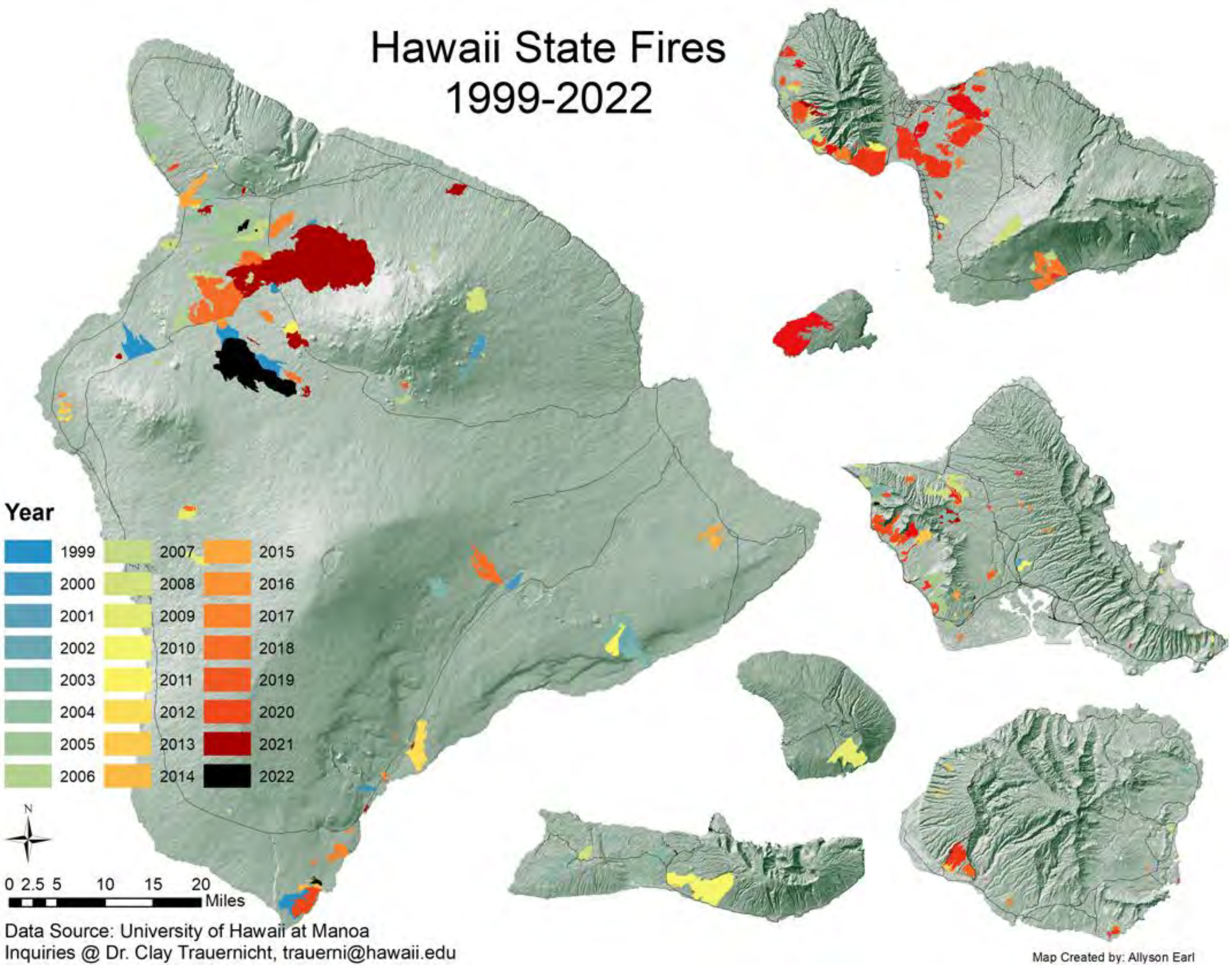


Figure 6: Hawaiʻi State Fires Between 1999 and 2022

Not depicted on the above map are the devastating wildfires that occurred in August 2023. Hurricane Dora, moving south of the Island of Hawaiʻi, interacted with a robust anticyclone north of the Hawaiian Islands. This interaction resulted in a sharp pressure gradient, generating powerful winds. Coupled with prevailing drought conditions, it led to wildfires on both Maui and Hawaiʻi Island.

Early on August 8, 2023, several brush fires fueled by strong winds ignited on Maui. A Lahaina fire flareup prompted evacuations, road closures, and shelter-in-place advisories on western Maui. However, little warning, few escape routes, and interruption to cell phone service created a perfect storm of disastrous conditions. The Lahaina wildfire has since become the largest natural disaster in Hawaiʻi's state history and one of the deadliest wildfires in recorded U.S. history. More than 100 lives were lost, and over 2,200 buildings destroyed in Lahaina alone.

On the same day, wildfires ignited in the Kohala District on Hawaiʻi Island, prompting evacuations for several nearby subdivisions and beach resorts. Roughly 1,000 acres of land burned with no loss of life.

Communities on the leeward side of the Hawaiian Islands are generally characterized by drier conditions and are therefore particularly vulnerable to wildfires. However, those on the windward side are progressively at greater risk due to the islands undergoing more frequent episodes of drought.

Potential Environmental Impact on the Proposed Action

While the proposed action will not exacerbate the adverse effects of climate change, it may be at risk of experiencing impacts from climate events. Coastal flooding and sea level rise do not currently pose a threat to the subject parcel due to its distance from the shoreline; however, hurricanes have the potential to extend their impact several miles inland. Potential impacts from hurricanes could include high winds, heavy rainfall, and localized flooding from mountain regions and overwhelmed drainage systems. Additionally, wildfires in the vicinity have the potential to produce poor air quality, disruptions to power, and property damage in extreme cases. Any potential impacts relating to climate change will not change appreciably under any alternative action.

Impacts and Mitigating Measures for Climate and Climate Change

It is imperative the development of any public facility implements appropriate safety measures and protocols in case of an adverse climate event. All buildings will be designed and engineered to withstand wind hazards according to the Hawai‘i County Building Codes.

The proposed action will comply with all required codes and regulations regarding drainage and runoff mitigation. These protections will prevent any adverse impacts relating to flooding potential in a storm event.

The proposed action will not contribute to adverse impacts resulting from climate change. The development will not promote any fire prone vegetation.

As these protective regulations apply equally to each alternative, there are no appreciable differences in potential impacts between project alternatives. If required, an emergency response plan will be drafted for the proposed development in the case of potential adverse impacts from a storm event.

3.1.4 Water Quality

Environmental Setting

According to the State Department of Health, the Underground Injection Control (UIC) line was established to protect ground water resources with drinking water potential. Areas *mauka* of the line are considered potential drinking water sources from the Hilo Aquifer. This is where most municipal water comes from. In contrast, areas *makai* of the line are considered non-potable. The subject property lies above the UIC line, therefore, a UIC permit may be required at the time of engineering site design, depending on whether deep or shallow drywells are used.

Potential Environmental Impact from the Proposed Action

The proposed action is not expected to pose a significant adverse risk to water quality, aquatic, or marine habitats due to the establishment of mitigating measures and BMPs. Additionally, the proposed action would control stormwater runoff from the site with appropriate drywells or similar drainage features. Furthermore, current construction plans do not anticipate encountering groundwater at the site.

No jurisdictional water bodies are present on site per Section 404 of the Clean Water Act, and a jurisdictional determination from the U.S. Army Corps of Engineers will not be necessary.

The implementation of mitigating measures means potential impacts to water quality won't change appreciably under any alternative action.

Impacts and Mitigating Measures

To safeguard near-shore waters and marine ecosystems, Best Management Practices will be implemented before and after construction to effectively contain soil and sediment and prevent potential harm. HBMC will ensure all earthwork and grading will be conducted in compliance with:

(a) "Storm Drainage Standards," County of Hawai'i, 1970 and as revised
(b) "Flood Control," Chapter 27 of the Hawai'i County Code
(c) Standards and regulations of the Federal Emergency Agency (FEMA)
(d) "Erosion and Sedimentation Control," Chapter 10 of the Hawai'i County Code
(e) Conditions of an NPDES permit, if required, and any additional Best Management Practices required by the Department of Health Clean Water Branch

Construction activities may occur in an area greater than one acre and thus may require a National Pollutant Discharge Elimination System (NPDES) permit and a Storm Water Pollution Prevention Plan (SWPPP). A list of Best Management Practices (BMPs) will be established to properly manage storm water runoff. These BMPs may include, but are not limited to:

- Minimizing soil loss and erosion by revegetating and stabilizing slopes and disturbed areas of soil.
- Minimizing sediment loss by placing structural controls including silt fences, gravel bags, sediment ponds, check dams, and other barriers.
- Applying sediment wattles and protective covers to soil and material stockpiles.
- Gravel check dams in gutters.
- Constructing and using a stabilized construction vehicle entrance, with a designated vehicle wash area that discharges to a sediment pond.
- Washing of all vehicles in the designated wash area before leaving the project site.
- Use of drip pans beneath vehicles to trap vehicle fluid.
- Performing routine inspection and maintenance of structural BMPs by trained personnel.
- Properly cleaning significant leaks or spills and disposing at an approved site.

Impermeable surfaces can increase the volume and rate of stormwater runoff. However, per Hawaiʻi County Code, Chapter 27, the volume of stormwater leaving the site will not increase. Wastewater will be managed by a wastewater treatment plant on site designed and permitted according to DOH standards.

3.1.5 Flora and Fauna

Environmental Settings

Flora

Section 7(c) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), requires an official species list from the United States Fish and Wildlife Service (USFWS) of identified threatened and endangered species, as well as critical habitat, that may occur within the boundary of the project area.

According to the USFWS, it would be possible for the following six (6) endangered flowering plants and one (1) endangered fern to possibly exist in the area, although no critical habitat exists on or near the property:

1. Alani (*Melicope zahlbruckneri*)
2. Haiwale (*Cyrtandra nanawaleensis*)
3. Hau Kuahiwi (*Hibiscadelphus giffardianus*)
4. Holei (*Ochrosia haleakalae*)
5. Holei (*Ochrosia kilaueaensis*)
6. Nanu (*Gardenia remyi*)
7. Palapalai *(Microlepia strigosa var. mauiensis)*

A biotic survey of the site was conducted on 9/30/25, only one species of native plant was observed on the property and it is not likely that any endangered species would be affected due to extensive past agricultural development. Plant species that were observed on the property are listed below.

Table 2: Flora Species Observed on Property – Under Status: A = Alien or Non-native species, I = Indigenous species, PI = Polynesian Introduced species, E = Endemic, En = Endangered

Latin Name	**Common Name**	**Family**	**Status**
Trema orientale	Gunpowder Tree	Cannabaceae	A
Commelina diffusa	Honohono grass	Commelinaceae	A
Momordica charantia	Bitter Melon	Cucurbitaceae	A
Macaranga mappa	Bingabing	Euphorbiaceae	A
Macaranga tanarius	Parasol leaf tree	Euphorbiaceae	A
Ricinus communis	Castor Bean	Euphorbiaceae	A
Falcataria moluccana	Albizia	Fabaceae	A

Desmodium incanum	Creeping Beggarweed	Fabaceae	A
Clidemia hirta	Koster's curse	Melastomataceae	A
Tibouchina urvilleana	Glory Bush	Melastomataceae	A
Cecropia obtusifolia	Trumpet tree	Moraceae	A
Megathyrsus maximus	Guinea Grass	Poaceae	A
Paederia foetida	Stinkvine	Rubiaceae	A
Solanum nigrum	Popolo	Solanaceae	I
Nephrolepis brownii	Asian sword fern	Nephrolepidaceae	A
Spathodea campanulata	African tulip tree	Bignoniaceae	A
Cenchrus purpureus	Cane Grass	Poaceae	A
Hyptis pectinata	Comb hyptis	Lamiaceae	A
Setaria palmifolia	Palm Grass	Poaceae	A

Fauna

It is not likely that any threatened or endangered species exist on the subject property. Common non-native birds were observed, such as common myna (*Acridotheres Trista*), house sparrow (*Passer domesticus*), house finch (*Haemorhous mexicanus*), yellow billed cardinal *(Paroaria capitata*), and spotted dove (*Spilopelia chinensis*). It would be possible for one (1) mammal and seven (7) federally listed bird species to fly over, roost, or utilize resources near the subject property. While not on the federal list, it may also be possible for one (1) state listed bird to frequent the area. These include the following:

Federally Listed:

1. Hawaiian Hoary Bat (‘Ope‘ape‘a) (*Lasiurus cinereus semotus*)
2. Hawaiian Coot (Alae ke‘oke‘o) (*Fulica alai*)
3. Hawaiian Duck (Koloa Maoli) (*Anas wyvilliana*)
4. Hawaiian Stilt (Ae‘o) (*Himantopus mexicanus knudseni*)
5. Band-rumped Storm-petrel (‘Akē‘akē) (*Hydrobates castro*)
6. Hawaiian Goose (Nēnē) (*Branta (=Nesochen) sandvicensis*)
7. Hawaiian Petrel (‘Ua‘u) (*Pterodroma sandwichensis*)
8. Newell’s Shearwater (‘A‘o) (*Puffinus newelli*)

State Listed:

9. Hawaiian Hawk (‘Io) (*Buteo solitarius*)

This Environmental Assessment will focus on the nine (9) State and Federally listed mammal and bird species that may fly over, roost, or otherwise utilize resources near the subject property, as they are the most likely to be potentially impacted by the proposed project. The following provides a description of each species, their range, and preferred habitat.

1. Hawaiian Hoary Bat (‘Ope‘ape‘a) (*Lasiurus cinereus semotus*)

   Federally Listed Endangered

   The Hawaiian Hoary Bat prefers roosting within the foliage of both native and non-native trees. Their foraging grounds encompass a diverse range of habitats, such as forest gaps, clearings, areas above the forest canopy, and alongside roads. Notably, on the Big Island, the Ōpe‘ape‘a engage in seasonal migration, with summers spent in the lowlands and overwintering occurring in higher altitude regions.

2. Hawaiian Coot (Alae ke‘oke‘o) (*Fulica alai*)

   Federally Listed Endangered

   The Hawaiian Coot typically inhabits lowland wetland environments, generally below 1,300 feet in elevation, such as the Waiaka-Loko Waka ponds located on Hawai‘i Island. However, instances of their presence have been documented at altitudes as high as 6,600 feet on the island. These birds display a preference for wetland habitats characterized by the presence of appropriate emergent plant species amidst open water, particularly favoring freshwater wetlands and reservoirs.

3. Hawaiian Duck (Koloa Maoli) (*Anas wyvilliana*)

   Federally Listed Endangered

   The Hawaiian duck is found in various habitats such as low wetlands, river valleys, coastal ponds, lakes, swamps, flooded grasslands, and mountain streams, ranging from sea level to elevations of 3,300 meters. Social interactions may occur more frequently in managed wetlands for waterbirds compared to wetlands cultivated with taro, while resting was observed more often in taro cultivated wetlands. This suggests that both managed and cultivated wetlands are crucial for meeting the basic daily and seasonal needs of this species. However, the wider array of activities and foraging techniques observed in managed wetlands may indicate a greater diversity of habitats in these areas.

4. Hawaiian Stilt (Ae‘o) (*Himantopus mexicanus knudseni*)

   Federally Listed Endangered

   Hawaiian stilts make use of diverse aquatic environments, mostly in lower-altitude areas, yet their presence is influenced by water depth and the density of vegetation. These birds depend on early-stage marshlands with water depths below 24 centimeters (9 inches), and they frequent regions with scant, short perennial plants or open tidal flats. Hawaiian stilts seem to prefer nesting sites with minimal or no surrounding vegetation, likely to maintain visibility and better detect potential predators.

5. Band-rumped Storm-petrel (‘Akē‘akē) (*Hydrobates castro*)

   Federally Listed Endangered

   The Band-rumped Storm-petrel is a seabird known to nest in remote cliff locations on, in steep open to vegetated cliffs, and in little vegetated, high-elevation lava fields. These birds are regularly seen in and around coastal waters of Kaua‘i, Niihau, and Hawai‘i Island. Band-rumped storm-petrels are long-lived (15 to 20 years). When not at nesting sites, adults spend their time foraging on the open ocean for small fish, squid, and crustaceans.

6. Hawaiian Goose (Nēnē) (*Branta (=Nesochen) sandvicensis*)

   Federally Listed Threatened

   Historically, The Hawaiian Goose (Nēnē) (*Branta sandvicensis*) were found in lowland dry forests, shrublands, grasslands, and montane dry forests. Their current habitat preferences may be influenced by the release locations of captive-bred birds. Presently, they inhabit a diverse array of environments, such as coastal dune vegetation and non-native grasslands (like golf courses, pastures, and rural areas), sparsely vegetated low- and high-elevation lava flows, mid-elevation native and non-native shrublands, early successional cinderfall, cinder deserts, native alpine grasslands and shrublands, and open interfaces between native and non-native alpine shrubland-woodland communities. Nēnē nest in various habitats, including beach strands, shrublands, grasslands, lava rocks, and across different elevations.

7. Hawaiian Petrel (‘Ua‘u) (*Pterodroma sandwichensis*)

   Federally Listed Endangered

   The Hawaiian Petrel is found in remote and high elevation areas on the island of Hawai‘i, Maui, Moloka‘i, Lanai, and Kaua‘i. The majority of known nests on Hawai‘i island are within Hawai‘i Volcanoes National Park on the lower alpine and subalpine slopes of Mauna Loa. Wildlife biologists estimate only 50 to 60 breeding pairs remaining.

8. Newell’s Shearwater (‘A‘o) (*Puffinus newelli*)

   Federally Listed Threatened

   The Newell’s Shearwater nest on the slopes and cliffs of Kaua‘i. Small colonies also exist on Moloka‘i, Maui, and Hawai‘i Island. On the island of Hawai‘i, they nest within forested cinder cones. Colonies are usually located in areas of open native forest dominated by ‘ōhi‘a (*Metrosideros polymorpha*) with a dense understory of ‘uluhe fern (*Dicranopteris linearis*).

9. Hawaiian Hawk (Iʻo) (*Buteo solitarius*)

   Formerly State Listed Endangered

   The Hawaiian Hawk (Iʻo) (*Buteo solitarius*) inhabits lowland non-native forests, urban locales, agricultural fields, pasturelands, and high-elevation native forests. Primarily, nesting takes place within native 'ōhi'a trees, though instances also occur in non-native tree species such as eucalyptus, ironwood, mango, coconut palm, and macadamia. During winter, sightings have been recorded in subalpine māmane-naio forests, indicating potential seasonal migrations. Their habitat can range between near sea level and 8,000 feet above sea level.

Potential Environmental Impact from the Proposed Action

The Hawaiian Hoary Bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. During the pupping season, clearing trees or shrubs taller than 15 feet poses a danger, as the young bats, unable to fly and still very vulnerable, may inadvertently suffer harm or death if they are unable to move away. Furthermore, these bats search for insects anywhere from as low as 3 feet to heights exceeding 500 feet above ground level, putting them at risk of becoming tangled in barbed wire typically used for fencing.

Hawaiian waterbirds, such as the Hawaiian stilt, coot, and duck listed by the USFWS, inhabit fresh and brackish-water marshes as well as natural or man-made ponds. Hawaiian stilts can also be seen in areas with temporary or permanent standing water. These species face challenges from non-native predators, loss of habitat, and habitat deterioration. Additionally, Hawaiian ducks are at risk due to hybridization with introduced mallards. The creation of standing or open water may result in the attraction of Hawaiian waterbirds to a site. In particular, the Hawaiian stilt is known to nest in sub-optimal locations (e.g. ponding water), if water is present. Hawaiian waterbirds attracted to sub-optimal habitat may suffer adverse impacts, such as predation and reduced reproductive success.

Hawaiian seabirds might pass through the project area during the nighttime breeding, nesting, and fledging seasons, spanning from March 1st to December 15th. The presence of outdoor lighting could lead to disorientation, fallout, and potential injury or death for these seabirds. These birds are naturally drawn to lights, and after circling them, they may become fatigued and collide with nearby structures such as wires, buildings, or other objects, or they may even land on the ground. Seabirds that have landed are at a higher risk of mortality due to collisions with vehicles, starvation, and attacks by predators such as dogs, cats, and other wildlife. Young birds, particularly fledglings, traversing the project area between September 15th and December 15th, during their first flights from mountain nests to the sea, are especially susceptible to being attracted to lights. Permanent lighting also poses a risk of seabird attraction, and as such should be minimized or eliminated to protect seabird flyways and preserve the night sky. Additionally, seabirds have been known to collide with fences, powerlines, and other structures near nesting colonies.

Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid ʻŌhiʻa Death), vertebrate and invertebrate pests (e.g., Little Fire Ants and Coqui Frogs), or invasive plant parts (e.g., African Tulip, Octopus Tree, Trumpet Tree, etc.) that could harm native species and ecosystems. Additionally, the invasive Coconut Rhinoceros Beetle (CRB) scientifically known as *Oryctes rhinoceros,* is an invasive species present on the islands of Oʻahu, Hawaiʻi Island, Maui, and Kauaʻi. On July 1, 2022, the Hawaiʻi Department of Agriculture implemented Plant Quarantine Interim Rule 22-1. This regulation imposes restrictions on the transportation of CRB-host material within or to and from Oʻahu, which is defined as the Quarantine Area. Items considered regulated materials (such as host plants or materials) pose a potential risk for CRB infestation.

Specifically, CRB-host materials include:

a. Entire dead trees;
b. Mulch, compost, trimmings, fruit, and vegetative scraps;
c. Decaying stumps.

CRB host plants encompass live palm plants from the following genera:

- Washingtonia, Livistona, and Pritchardia (all commonly known as fan palms)
- Cocos (coconut palms)
- Phoenix (date palms)
- Roystonea (royal palms)

The movement of such materials or these specified plants carries the risk of CRB spread, as they could harbor CRB at any stage of their life cycle. Mitigating measures will be implemented to avoid or minimize all potential impacts from plant material.

HBMC will adhere to all mitigating measures to protect listed mammals and birds as outlined in the section below.

Impacts and Mitigating Measures

The Hawaiʻi Division of Forestry and Wildlife (DOFAW) recommends minimizing the movement of plant or soil material between worksites to avoid or reduce potential impacts from fungal pathogens. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

Native plant species that are appropriate for the area will be used for landscaping. No detrimental invasive species will be planted on site. DOFAW recommends consulting with the Big Island Invasive Species Committee (BIISC) to help plan, design, and construct the project, learn of any high-risk invasive species in the area, and ways to mitigate their spread. The Plant Pono guide found at www.plantpono.org can also be used for guidance on the selection and evaluation of landscaping plants and to determine the potential invasiveness of plants to be used on site.

Cats are natural predators of native birds, including State-listed endangered waterbirds, seabirds, and forest birds. Their hunting instincts mean that even well-fed cats will actively hunt and prey on wildlife. As a result, DOFAW advises that no feeding of feral cats takes place on the property.

With the mitigating measures outlined below impacts to native flora and fauna will not change appreciably under any alternative action, except a no action alternative.

3.1.6 Air Quality

Environmental Setting

Air quality in this area is currently very good. In the past, volcanic emissions such as sulfur dioxide from the Kīlauea volcano, have resulted in “vog,” which can impact air quality in the Puna District at times. Vog is created when sulfur dioxide reacts chemically with sunlight, oxygen, dust particles and water in the air. During eruptions, the trade winds generally keep the Kea‘au area free from severe vog, however, weak winds particularly in the winter may result in worse conditions. In the future, during episodes of volcanic eruptions, HBMC would have no worse air quality conditions than the rest of the Puna District.

Vehicles are another source of minor air pollution, which is minimal on Hawai‘i Island. Vehicle emissions in the area would mainly come from Hawai‘i Belt Road (Hwy 11), which is adjacent to the subject site and Highway 130. All Hawai‘i Island meets the standards set by the Clean Air Act (CAA) and HRS §342B.

Potential Environmental Impact from the Proposed Action

Air pollutants during construction will be limited and temporary. The main sources of short-term air pollutants are construction equipment exhaust and dust. During operation, the main source of air pollution will be through regular vehicle trips including the movement of employees and patients. With the outlined mitigation measures, potential impacts to air quality will not change appreciably under any alternative action.

Mitigating Measures

Air pollutants during construction will be limited and temporary. The main sources of short-term air pollutants are construction equipment exhaust and dust. HAR §11-60 on Fugitive Dust prohibits visible emissions of dust from construction activities. These regulations will be strictly followed to prevent dust impacts to Hawai‘i Belt Road. In addition, reasonable measures to control airborne and visible fugitive dust from road areas are outlined by the Department of Health’s Clean Air Branch. These measures include, but are not limited to:

- Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact.
- Providing adequate water sources at the site prior to start-up of construction activities; Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase.
- Minimizing airborne, visible fugitive dust from shoulders, and access roads.

- Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities.
- Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

These mitigating measures will be used during all phases of construction to prevent significant impacts to the Hawaiʻi Belt Road, Highway 130, and surrounding areas.

3.1.7 Noise

Environmental Setting

Noise on the project site varies from low to moderate, with the main source being from vehicles on Hawaiʻi Belt Road and Highway 130.

Potential Environmental Impact from Proposed Action

Short-term noise impacts may occur during construction from excavation, grading, vehicle and equipment operation, and the construction of new infrastructure, which will be mitigated by BMPs.

Noise levels are expected to increase moderately during operation with higher levels of traffic to and from the proposed medical center and operational noise sources for the clinic, as well as more occupants and users from the community. Traffic noise along the highway is expected to remain the primary source of noise in the area following project development. Careful siting of HVAC equipment should mitigate for any noise impacts due to the use outside of construction. However, hours of operation will be primarily Monday – Friday from 8:00 a.m. – 4:00 p.m., with urgent care services available seven (7) days per week from 8:00 a.m. to 8:00 p.m. The facility will not be an emergency room, will not receive ambulances, and will not provide drug rehabilitation services. Thus, noise impacts should be similar to those of other nearby commercial and community uses. Potential impacts relating to noise will not change appreciably under any alternative action, except a no action alternative.

Mitigating Measures

Rules and regulations outlined in Hawaiʻi Administrative Rules Title 11, Chapter 46 “Community Noise Control,” will be followed during all construction and operation activities. If there is a potential for construction noise to exceed the State Department of Health’s maximum permissible noise levels, a noise permit will be sought. During operation, appropriate landscaping will be incorporated to screen the property and buffer noise to surrounding areas.

3.1.8 Scenic Resources

Environmental Setting

There are no scenic resources listed in the Hawaiʻi County General Plan on or near the subject parcel.

Potential Environmental Impact from Proposed Action

No significant impacts are expected to scenic resources. The grounds and buildings will be aesthetically pleasing and screened by appropriate landscaping vegetation. While there is a risk of light pollution affecting scenic views, the night sky visibility, and potentially impacting seabirds utilizing nearby resources, these concerns will be effectively addressed through the implementation of BMPs discussed below. Views to and from the shoreline will not be impacted by the project. Potential impacts to scenic resources will not change appreciably under any alternative action.

Mitigating Measures

Light pollution is another important aspect of maintaining scenic resources and the visibility of the night sky. Therefore, the following guidelines to minimize light pollution will be adhered to:

1. Any outdoor lighting must conform to the standards established by the Hawaiʻi County Outdoor Lighting Ordinance (Hawaiʻi County Code Chapter 14, Article 9: "Outdoor Lighting").
2. The minimum possible amount of outdoor/exterior lighting should be used and should be turned off when not needed. Motion sensor activated lighting will be used wherever feasible.
3. All exterior lighting should be fully shielded. This means that all lighting fixtures must emit zero light above the horizontal plane.
4. Conformity to the Outdoor Lighting Ordinance also requires the use of blue-deficient exterior lighting. This means that exterior LED lighting must emit less than 2% of its total energy at wavelengths less than 500 nm. The best choice for this is either filtered LED lights, or amber LED lights.
5. White light should be avoided. Any white light used should have Correlated Color Temperature of 2700 K or below.
6. Rig lights during construction must be shielded to minimize stray lighting.

3.1.9 Hazardous Substances, Toxic Waste, and Hazardous Conditions

Environmental Setting

The subject property has a history of being utilized for commercial agricultural purposes, including sugarcane production, dating back to at least 1900. Previous studies on former commercial agricultural lands in Hawaiʻi have indicated higher concentrations of pesticides and metals in the soil. Additionally, there have been findings of increased levels of arsenic in the soil within the vicinity. A Soil Screen Report was conducted on the subject Property in September 2025 by Lehua Environmental Inc (**Appendix C**). The objective of the Soil Screen was to identify the presence (if any) of Resource Conservation Recovery Act (RCRA) 8 metals- and organochlorine pesticide-contaminated soils within the areas of planned disturbance for the Project at the Subject Site, so that the information can be incorporated in the design of the Project.

The soil survey identified twenty-four (24) decision units at the Subject Site and collected a total of thirty (30) multi-increment (MI) soil samples from the 24 decision units of the Subject Site, which included duplicate and triplicate samples per the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Technical Guidance Manual (TGM) recommendations. Each MI soil sample included 50 increments collected utilizing DOH recommended hand tools and equipment. Samples were collected from surface soils (0-6" below ground surface (bgs)) and shallow subsurface soils (6"-12" bgs). Decision unit (DU) sizes ranged from 16,250 square feet to 20,000 square feet and the volumes ranged from 301 cubic yards (cy) to 370 cy.

The collected soil samples were tested according to the following analysis:

- MIS laboratory preparation non-volatile
- RCRA 8 metals by EPA 6020B/EPA 3050B
- Bioaccessible arsenic by EPA 1340
- Organochlorine pesticides by EPA 8081B/3550C

Bioaccessible arsenic was detected above the Tier 1 (unrestricted land use) EAL in decision units: DU-23 and DU-24 at the Subject Site. Additionally, total arsenic was detected above the Tier 1 (unrestricted) and/or Tier 2 (commercial/industrial) EAL in decision units: DU-1, DU-2, DU-3, DU-4, DU-5, DU-6, DU-7, DU-8, DU-9, DU-10A, DU-10B, DU-10C, DU-11, DU-12, DU-13, DU-14, DU-15, DU-16, DU-17, DU-18, DU-19, DU-20A, DU-20B, DU-20C, DU-21, DU-22, DU-23, DU-24A, DU-24B and DU-24C. However, further analysis via bioaccessible arsenic did not detect concentrations of bioaccessible arsenic that exceed the Tier 1 EAL. The requirements and recommendations listed in the report will be followed.

Potential Environmental Impact from Proposed Action

The soil contaminants found in the soil screening survey pose potential environmental hazards should there be any direct exposure of construction workers, site personnel, and future users of the site to contaminated soil during project activities. The Conceptual Site Model (CSM) outlines the potential exposure pathways and hazards (**Table 3**). The CSM identifies the hazards to be limited to direct exposure to construction workers through dust or vapors during remediation. There is no identified risk to the general public. Any potential impacts from the contaminants in

Conceptual Site Model

Primary Sources	Primary Release Mechanism	Secondary Sources	Potential Environmental Hazards	Hazard Present Under Current Site Conditions						
Presence of arsenic in soil	Improper handling of contaminated soil during site remedial activities	Soil	Risk to Human Health	*Exposure Type*	*Secondary Release Mechanism*	*Exposure Route*	*Receptors*			
							Construction Workers		*Offsite Residents/General Public*	
							During Remediation	*Post-Remediation*	*During Remediation*	*Post-Remediation*
				Direct Exposure	Dust/Vapors	Ingestion	Yes	No	No	No
						Dermal	Yes	No	No	No
						Inhalation	Yes	No	No	No
				Vapor Intrusion into Buildings	Vapors	Inhalation	No	No	No	No
			Leaching	During Remediation - No expected				Post-Remediation – No		
			Gross Contamination	During Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded				Post-Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded		
		Groundwater	Risk to Human Health	*Exposure Type*	*Secondary Release Mechanism*	*Exposure Route*	*Receptors*			
							Onsite Workers		*Offsite Residents/General Public*	
							During Remediation	*Post-Remediation*	*During Remediation*	*Post-Remediation*
				Direct Exposure	Dust/Vapors	Ingestion	No	No	No	No
						Dermal	No	No	No	No
						Inhalation	No	No	No	No
				Vapor Intrusion into Buildings	Vapors	Inhalation	No	No	No	No
			Leaching	During Remediation - No				During Remediation - No		
			Gross Contamination	During Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded				Post-Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded		

Table 3:

the soil will be mitigated through strict adherence to the requirements and recommendations of the soil report.

Medical facilities generate a variety of hazardous waste, which requires specialized handling and disposal procedures. Effective waste management practices are vital to ensure the safety of staff, patients, and the environment.

Petroleum products may be used for landscaping equipment such as lawnmowers, weedwhackers, and other machinery for general maintenance. Petroleum products can be considered hazardous if not handled or stored properly.

Compliance with Department of Health mitigation and remediation procedures will ensure potential impacts relating to Hazardous Materials will not change appreciably under any alternative action, except a no action alternative.

Mitigating Measures

Appropriate mitigating measures outlined in the soil screen report will be strictly adhered to. This will include the following:

- Assume subsurface soils ≥ 12” bgs within DU-23, DU-24A, DU-24B and DU-24C boundaries are arsenic-impacted soils until further testing determines otherwise.
- Contaminated soil removed from the Subject Site must be disposed of in accordance with Federal and State rules and regulations.
- Dust control practices should include both wetting during soil disturbance activities and monitoring by a designated competent person, in addition to containing temporary soil stockpiles.
- Use of good general hygiene practices for tenants, public, employees and workers to avoid soil exposure.
- Long-term controls should be implemented on the site to minimize the potential for exposure to contaminated soil by tenants, public, employees and workers
- Possible need to cover any bare soil, if subject to wind or water transport off-site.
- Limit exposure to the contaminated soils to properly trained personnel.
- Prepare and submit for approval to the DOH HEER office a C-EHMP which outlines the proper handling and management of soil and/or groundwater, sampling and analysis protocol for soil, the planned re-use/disposal locations for excavated soil, health and safety measures to be taken to protect workers, environment and the general public. The project specific C-EHMP must be approved by the DOH HEER office prior to the start of any construction activity that disturbs the identified contaminated soils at the Subject Site.
- Have air monitoring conducted for airborne arsenic-impacted dust by qualified personnel during any contaminated soil disturbance.

If at any time, any additional hazardous substances or waste are discovered on the property during construction, all work will cease, and appropriate authorities will be contacted. A remediation specialist will be contacted to supervise the appropriate disposal and management of substances deemed necessary. HBMC will require all users and occupants of the proposed facilities to follow all government regulations pertaining to hazardous and toxic substances.

All petroleum products, pesticides, and herbicides used for landscaping purposes will be stored properly in a secure location. Personnel who have completed the proper education and training will be the only qualified individuals to handle such products, which will only be used according to the original label on the container. Material Safety Data Sheets (MSDS) must be made readily available and visible in an appropriate area. Personal Protective Equipment (PPE) will be used at all times and checked regularly.

Following the guidelines of State and County requirements, to minimize the possibility for spills and hazardous materials during construction, HBMC proposes the following:

- Unused materials and excess fill (if any) will be properly disposed of at an authorized waste disposal site.
- During construction, emergency spill treatment, storage, and disposal of all hazardous materials, will be explicitly required to meet all State and County requirements, and the contractor will adhere to "Good Housekeeping" for all appropriate substances, with the following instructions:
  - Onsite storage to minimum practical quantity of hazardous materials necessary to complete the job;
  - Fuel storage and use will be conducted to prevent leaks, spills or fires;
  - Products will be kept in their original containers unless non-resealable, and original labels and safety data will be retained
  - Disposal of surplus will follow manufacturer's recommendation and all regulations;
  - Manufacturers' instructions for proper use and disposal will be strictly followed;
  - Regular inspection by contractor to ensure proper use and disposal;
  - Onsite vehicles and machinery will be monitored for leaks and receive regular maintenance;
  - Construction materials, petroleum products, wastes, debris, and landscaping substances (herbicides, pesticides, and fertilizers) will be prevented from blowing, falling, flowing, washing or leaching into the ocean; and
  - All spills will be cleaned up and properly disposed of immediately after discovery.

3.1.10 Solid Waste

Environmental Setting

The County of Hawaiʻi Solid Waste Division operates the landfill and transfer stations on island. There is only one landfill on island, the West Hawaii Sanitary Landfill, which is located approximately 57 miles from the subject site. The nearest transfer station is located approximately 2 miles away in Keaʻau. Solid waste is expected to be generated by standard operational activities of the medical center. All solid waste will be properly recycled and/or disposed of in accordance with County and State DOH rules.

Potential Environmental Impact from Proposed Action

The quantity of waste to be produced from the medical facility is not known. However, a solid waste management plan will be developed prior to any project activities to determine potential impacts and appropriate mitigating measures. Potential impacts relating to solid waste will not change appreciably under any alternative action, except a no action alternative.

Mitigating Measures

During operation, local waste management companies will be contracted to dispose of waste on site. HBMC will also plan for recycling stations throughout the facilities. Waste disposal will adhere to Department of Health regulations as outlined in HAR §11-104.1 and §11-58.1.

Additionally, HBMC will comply with the following regulations outlined by the Hawaiʻi County Department of Environmental Management (DEM) Solid Waste Division:

- Commercial operations, State and Federal agencies, religious entities and non-profit organizations may not use transfer stations for disposal.
- Aggregates and any other construction/demolition waste should be responsibly reused to its fullest extent.
- Ample room should be provided for rubbish and recycling.
- Green waste may be transported to the green waste sites located at the West Hawaiʻi Organics Facility and East Hawaiʻi Organics Facility, or other suitable diversion programs.
- Construction and demolition waste is prohibited at all County Transfer Stations.
- All construction and demolition waste shall be transported to the West Hawaiʻi Sanitary Landfill for disposal.

HBMC will also submit a Solid Waste Management Plan (SWMP) completed by a licensed engineer or architect in accordance with DEM guidelines. The SWMP will be used to:

1. Promote and implement recycling and recycling programs.
2. Predict the waste generated by the proposed development and anticipate the impacts on County Solid Waste Management Facilities.
3. Predict the additional vehicular traffic being generated because of waste and recycling transfers.

According to DEM guidelines, the SWMP will contain the following:

1. A description of the project and the potential waste that may be generated: e.g. analysis of anticipated waste volume and composition. This includes waste generated during the construction and operation or maintenance phases. Waste types shall include (but not be limited to):

a. Organics (including food waste and green wastes);
b. Construction and demolition materials;
c. Paper (including cardboard);
d. Metal (including ferrous and non-ferrous metals);
e. Plastic;
f. Special (including ash, sludge, treated medical waste, bulky items, tires);
g. Hazardous (including paint, vehicle fluids, oil, batteries); and
h. Glass.

2. Indicate onsite source separation by waste type, e.g. source separation bins for glass, metal, plastic, cardboard, aluminum, etc. Provide ample space for rubbish and recycling.
3. Identification and location of the proposed waste reduction, waste re-use, recycling facility or disposal site and associated transportation methods for the various components of the development's waste management system, including the number of vehicle movements and associated routes that will be used to transport the waste and recycled materials.
4. The report will include identification of any impact to County-operated waste management facilities, and the appropriate mitigation measures that will be implemented by the development to minimize these impacts.
5. Analysis will be based on the highest potential use or zoning of the development.

3.2 Socioeconomic and Cultural

3.2.1 Land Use

Environmental Setting

Puna is desirable for its relatively inexpensive land, which typically ranges in size from 1 to 3 acres. Residents from the U.S. mainland and other parts of the State of Hawaiʻi continue to seek these affordable properties. The basis of the economy of Puna has evolved from cattle ranching and sugar to diversified agriculture and tourism stimulated by Kīlauea volcano. The Puna District is a significant socioeconomic area for Hawaiʻi County. It is the leader in the agriculture industry on the Island of Hawaiʻi. Some Puna subdivisions between Pāhoa and Hilo (including Hawaiian Paradise Park, Hawaiian Beaches, and Hawaiian Shores), are now primarily bedroom communities for Hilo's workforce. Keaʻau has become a convenient central hub for services within the Puna District including grocery and retail stores, restaurants, cafes, gas stations, and healthcare facilities. The subject property and the adjacent parcels to the south, west, and northeast are zoned Agricultural – 20 acres (A-20a). To the north is the Shipman Business Park, which is zoned MG-20. To the east there are also various residential, family agricultural, and industrial zoned properties. Keaʻau Village Center is located to the southeast with mixed commercial and residential zoning. A portion of the subject property is zoned MCX-20, which was rezoned from A-20a in 2002 under Ordinance No. 02-023.

The property is located within 1.5 miles of multiple schools, all located to the south. These include Keaʻau High School, Keaʻau Middle School, Keaʻau Elementary, Keaʻau Preschool, Kamehameha Schools Hawaiʻi, Christian Liberty Academy, Ke Kula ʻo Nāwahīokalaniʻōpuʻu Iki Lab Public Charter School, and Pūnana Leo o Hilo.

Potential Environmental Impact from Proposed Action

The proposed development aligns with the existing and proposed land use patterns in the surrounding area, characterized by a mix of schools, businesses, housing, and community spaces. Potential impacts to land use will not change appreciably under any alternative.

Mitigating Measures

The proposed land use will require a Use Permit and Special Permit approved by the County Windward Planning Commission to ensure the proposed use is compatible and complies with all land use laws.

3.2.2 Socioeconomic Characteristics

Environmental Setting

According to the 2022 United State Census Bureau, the two most populated census county divisions (CCD) within the Puna District are the Keaʻau-Mountain View CCD, with a population of 41,210 and a median household income of $65,750 and the Pāhoa-Kalapana CCD, with a population of 10,494 and a median houshold income of $38,162. These average median incomes are notably lower than the State median of $83,173. Furthermore, a significant 58% of families in State House District 4, which contains the majority of the Puna District, are classified as Asset Limited, Income Constrained, Employed (ALICE), a term used to describe households in the community earning more than the Federal Poverty Level, yet falling short of covering the basic cost of living in Hawaiʻi County, often despite working multiple jobs (ALICE Threshold, 2022; American Community Survey, 2022). Even though these households are employed, they grapple with meeting essential expenses such as housing, childcare, food, transportation, and healthcare. By far, the largest employment industry in both CCDs is *educational services, health care and social assistance*, which comprises approximately 25.9% of the Kea'au-Mountain View CCD workforce (**Figure 7**) and 33.1% of the Pāhoa-Kalapana CCD workforce (**Figure 8**).

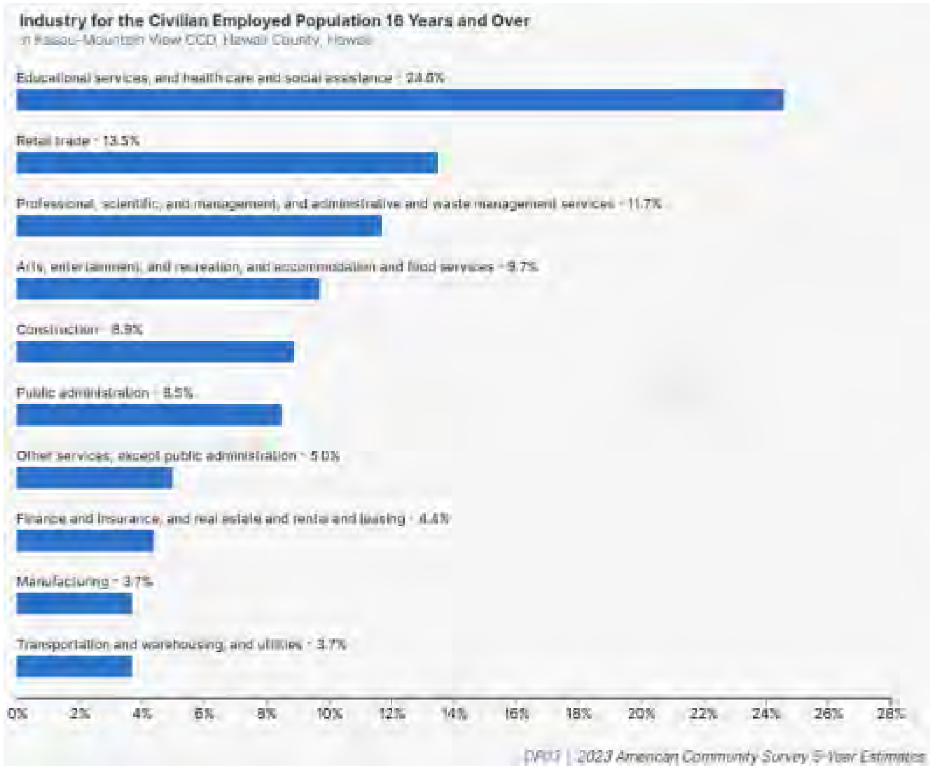


Figure 7: Employment Industries in Kea‘au-Mountain View CCD

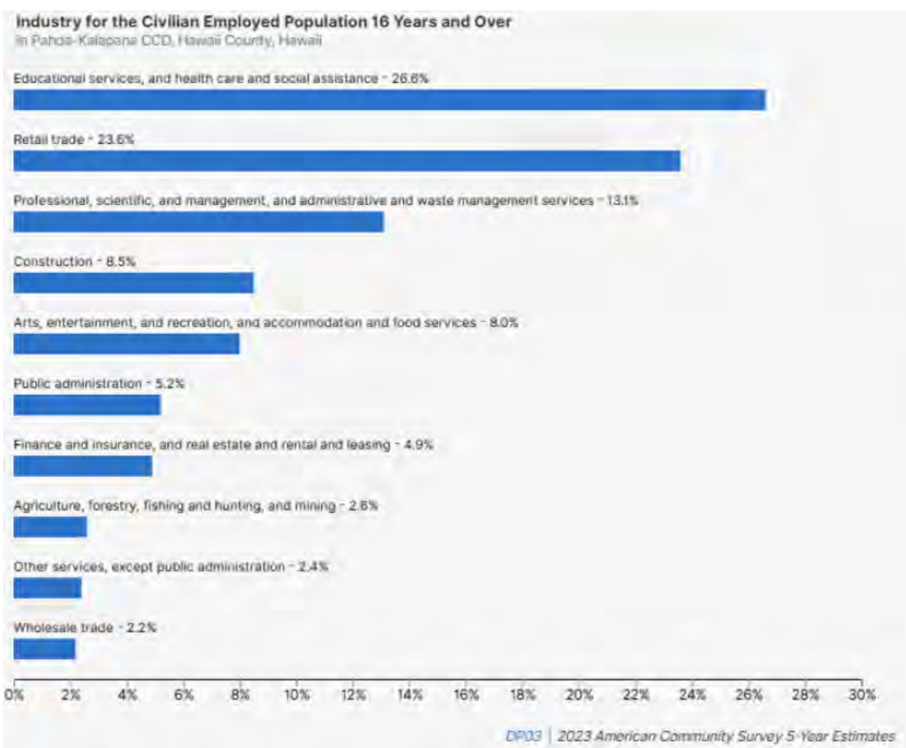


Figure 8: Employment Industries in Pāhoa-Kalapana CCD

Potential Environmental Impact from Proposed Action

The proposed project will have a positive impact on socioeconomic characteristics in the Kea‘au area and larger Puna District by stimulating economic growth through job creation and increased access to essential healthcare services. In the short term, the project is estimated to create upwards of 50 full-time & temporary jobs related to the design and build-out phase of the project. These jobs will include professional services (i.e. architectural, engineering, etc.) as well as trade workers (i.e. contractors, builders, masons, electricians, plumbers, landscapers, etc.).

In the long term, the proposed medical facility is anticipated to create approximately 120 full-time positions. These positions would include medical professionals, administrators, therapists, social workers and maintenance and custodial workers. As noted above, the primary labor industry in the area is *educational services, health care and social assistance.* Employees are anticipated to be primarily Puna and Hilo residents making the creation of additional health care and social assistance jobs appropriate for this area. Furthermore, in addition to alleviating travel time for patients who would otherwise have to go to Hilo to receive health care services, the creation of additional health care related employment opportunities in Puna will decrease commute times for health care workers living in the Puna District.

Mitigating Measures

The project is expected to have a measurable positive impact on socioeconomic characteristics through the creation of over 170 short and long-term employment opportunities and increased access to healthcare services for Puna residents. Therefore, no mitigating measures are required.

3.2.3 Parks and Recreation

Environmental Setting

Herbert Shipman Park is located approximately 0.3 miles south of the subject parcel.

Potential Environmental Impact from Proposed Action

The proposed action will have negligible impact on nearby parks and recreation activities. Public access to the parks and ocean will not be impacted by the request. This will not change under any action alternative.

Mitigating Measures

No mitigating measures are expected to be necessary for parks and recreation.

3.2.4 Cultural and Historic Resources

Environmental Settings

Ahupua'a

Hawai'i is believed to be first inhabited by voyagers from the Marquesas around 1,000 A.D, however, recent studies have shown that initial Polynesian colonization of Hawai'i Island occurred between 1220 and 1261 A.D.

Early Hawaiian settlements incorporated new strategies and structures to adapt to their new environment. Traditional Polynesian philosophies and ideals were used to form new societal standards and structures including the principle of genealogical seniority, observance of gods such as *Kāne, Ku, and Lono*, the *kapu* system of law and order, *ahupua'a* land systems, and various beliefs and values that determined day-to-day protocol and lifestyle such as *mana* and the *'aumakua*.

It is believed that Hilo is likely one of the first settlements on Hawai'i Island. Hilo is known to have rich marine resources accessed at Hilo Bay and additional abundant resources from the forests that descend from Mauna Loa and Mauna Kea. Ancient Hawaiians understood the critical importance of fresh water. Fresh water streams and springs were believed to be created by the gods Kāne and Kanaloa, which established a spiritual connection between people and water. In accordance with the native Hawaiians respect for water, land management units were organized around freshwater supplies in a traditional system known as the *ahupua'a* resource-management system (CWRM, 2019). According to the Water Resource Protection Plan, "water was viewed as such a critical resource to the health and well-bring of the people of ancient Hawai'i, that the concept of private ownership did not exist" (CWRM, 2019).

The *ahupua'a* system, divided near the end of the 16th century, or early 17th century, was designed to provide all the necessary resources to live including agricultural resources inland and ocean resources at the coast. The subject property is located within the Kea'au Ahupua'a.

Puna District

The earliest documentation of Hilo is found in 'Umi-a-Liloa's conquest of Hawai'i Island in the sixteenth century, which established Hilo as a royal center for the island. In the account, 'Umi-a-Liloa began his conquest of the Island of Hawai'i by defeating chief Kulukulu'ā, who lived in Waiākea, and the other chiefs of Hilo. 'Umi-a-Liloa's son Keawe-nui-a-'Umi ruled Hamākua, Hilo and Puna. After the death of Keawe-nui-a-'Umi, the ruling kingdom was divided into three parts and was established under warring chiefs (Kamakau, 1992).

In 1738 Kamehameha I was born. Chief Kalani'opu'u was the high chief during Cook's arrival in 1779. After the chief's death in 1782, his son Kiwala'o, and his nephew, Kamehameha I began to compete for control of the west side of Hawai'i Island. Kamehameha won the battle of Moku'ohai against Kiwala'o in Kona, officially controlling the western half of the island. In 1791, Kamehameha, having gained control of Hilo, fought, and won a battle against his cousin Keoua at Kawaihae for control of the entire Island of Hawai'i. In 1795, Kamehameha conquered

Maui, Molokaʻi, Lanaʻi and Oʻahu. He also received Kauaʻi by cession in 1810 (Kamakau, 1992). Kamehameha's son Liholiho was born in Hilo in November 1797. Waiākea was inherited by Lihiliho after Kamehameha's death. The *ʻili kūpono* of Piʻopiʻo and its royal fishpond were given to his favorite wife, Kaʻahumanu (Escott and Dols, 2020).

The Puna District was originally one of six chiefdoms or *moku* of the island of Hawaiʻi. Puna was not a district that produced any great and powerful chiefs; the area was often controlled by chiefs and rulers from the Hilo District to the north, or the Kaʻu District to the south (Cordy, 2000). Puna is historically known for its rich soils, high rainfall, and frequent volcanic activity. Many parts of the district have been covered in lava over the past 1,000 years. The coastal areas are characterized by thin soil and steep volcanic cliffs, which are met by rough and wind-blown ocean. Historic settlement patterns reflected favorable agricultural activities, which were found inland from the coast. Villages were often spread out across large areas and abundant in population (Kelly et al. 1981).

The Puna District is known for its valuable products, such as hogs, gray *kapa* cloth (*ʻeleuli*), tapas made of *mamaki* bark, fine mats made of young pandanus blossoms (ʻ*ahuhinalo*), mats made of young pandanus (*Hala*) leaves (*ʻahuao*), and feathers of the *ʻoʻo* and *mamo* birds. Puna was also famous for its abundant *ulu* (breadfruit) (Ellis, 1963). Neighboring villages in the ʻOlaʻa Ahupuaʻa were known for their hand made products. These two Ahupuaʻa were important sources of forest and agricultural products for the ruling elite in Hilo.

In 1839, King Kamehameha III signed the Bill of Rights, which sought to ensure that the people's land would not be taken from them. In 1840, the first Constitution of Hawaiʻi was enacted. In 1845, the Land Commission was created by Kamehameha III to award land claims, although this could not be done under the current feudal system of land tenure as individuals did not hold title to the land. In 1848 The Great Māhele (Land Division) established a system of private land ownership, which divided all Hawaiʻi's land into three classifications: Crown Lands, Government Lands and Konohiki Lands. The Keauohana, Kehena Ahupuaʻa was deemed Government Lands. Crown, Government and Konohiki lands remained subject to the rights of the *kanaka* who were in possession and cultivating the lands. As land sales between the Crown, Government and Konohiki continued, the rights of the kanaka became an issue. In 1850, the Land Commission moved to award title of land to kanaka who remained in physical possession, cultivated, or improved any portion of Konohiki Lands. These became Kuleana Lands. Very few Kuleana Land claims were made during the Māhele for Puna (McGregor, 1999). Only 19 Land Commission awards were granted in the entire Puna District. Of these, 16 awards were made in large tracts to 10 chiefs who lived outside of Puna. The ahupuaʻa of Keaʻau was granted to William C. Lunalilo as part of Land Commission Award (LCA) 8559-B.

In 1893, the Hawaiian Monarchy was overthrown, and Queen Liliuokalani was imprisoned. The remaining Crown Lands were confiscated by the government and made a part of the public domain (Chinen, 1961).

Between 1845 and 1900 Hilo began to significantly change through the increased presence of foreign vessels, expansion and growth of tourism, the establishment of missions, private land ownership legalization, the presence of the whaling, cattle, and sugar industries, and the construction of Government roads and railroad lines (Kelly et al. 1981). The changes that occurred in the Hilo district began to dictate and impact surrounding districts such as the Puna district to the south. Changes and patterns of residential locations and growth of towns and villages in the Puna district were driven by the demand for agricultural products, thus prompting settlement near land suited to commercial crops and near newly constructed roads and transportation networks.

In 1882, the entire Keaʻau Ahupuaʻa was purchased by William H. Shipman who operated cattle ranches across the island in places such as Kapoho, Waiakea, and Keaʻau. Portions of Keaʻau Ahupuaʻa were leased to the Olaʻa Sugar Company in 1899. The expansion and operation of the Olaʻa Sugar Company led to the construction of the sugar mill in Keaʻau, numerous sugar company camps, which created and influenced modern day Keaʻau as a small residential and commercial center in the district. Olaʻa Sugar Company became the largest sugar cane operation in the district. It was eventually sold to American Factors (AMFAC) in 1969, who expanded production to include a bagasse and trash burning power plant that produced 12.5KW of power for Hawaiian Electric Light Company (HELCO). By 1982, AMFAC closed Puna Sugar Company and sold it to Fiji Sugar Corporation in 1988.

Potential Environmental Impact from Proposed Action

Archaeological

~~Although an archaeological survey was not conducted on the site, it is highly unlikely any such resources exist due to the prior clearing of the property and its use for agriculture. The subject site has been cleared repeatedly and used extensively for agricultural purposes, primarily for sugarcane production. Aerial imagery from 1965 and present day shows the extent of clearing and land disturbance for agricultural use on the property in relation to the project area (**Figure 9**). Further, imagery from 2019 compared to present day shows that significant clearing and agricultural use of the property have occurred recently (**Figure 10**). The entirety of the project area has been affected, and it is highly unlikely any historic resources exist in the area.~~

Rechtman Consulting, LLC conducted an Archaeological Assessment of an approximately 112 Acre portion of TMKs (3) 1-6-003:007 and (3) 1-6-146:017 in September of 2004 **(Appendix F)**. That assessment, which included the entirety of the subject project area, produced no evidence of early historic or traditional Hawaiian remains. The survey confirmed that most of the area consisted of fallow sugarcane fields. The small, seemingly uncultivated portion of the assessed area was intensively surveyed and contained no cultural remains. The assessment recommended that no further archaeological work need be conducted of the area prior to development. That report was accepted by SHPD on February 16, 2005.

Additionally, Scientific Consultant Services (SCS) conducted an Archaeological Inventory Survey (AIS) of approximately 254.1 acres of the broader W.H. Shipman property in Keaʻau, which encompasses and surrounds the project site (Escott, G.G., 2018). “Area C” in that study includes the area of the proposed access road. Fieldwork was conducted between January and December 2016, and SCS submitted the AIS to the State Historic Preservation Division (SHPD) for review in May 2017. The survey was conducted in accordance with Hawaiʻi Administrative Rules 13-284 and the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports contained in Hawaiʻi Administrative Rules 13-276. In a letter dated February 12, 2018, SHPD accepted the findings and recommendations of the AIS. Additionally, an earlier archaeological field investigation conducted by SCS in July 2014 covering adjacent portions of the Shipman property was accepted by SHPD in a letter dated September 4, 2014, with SHPD concurring that no historic properties would be affected within that surveyed area.

The AIS identified three surface historic properties within the broader Shipman Master Plan Area: Site TS-001 (consisting of six plantation dwellings and six garden features associated with Luna Row) and Site TS-002 (a rock wall enclosing the former plantation doctor's house lot). Both sites are associated with historic-era plantation housing constructed between the early 1900s and the 1950s. Thirteen (13) historic era sugarcane features (SIHP 50-10-44-30646), consisting of twelve (12) rock clearing mounds and a retaining wall were also documented in the AIS. No pre-Contact archaeological sites were identified within any of the surveyed portions of the Shipman property. All three sites were adequately documented and SHPD concurred that no further work was necessary.

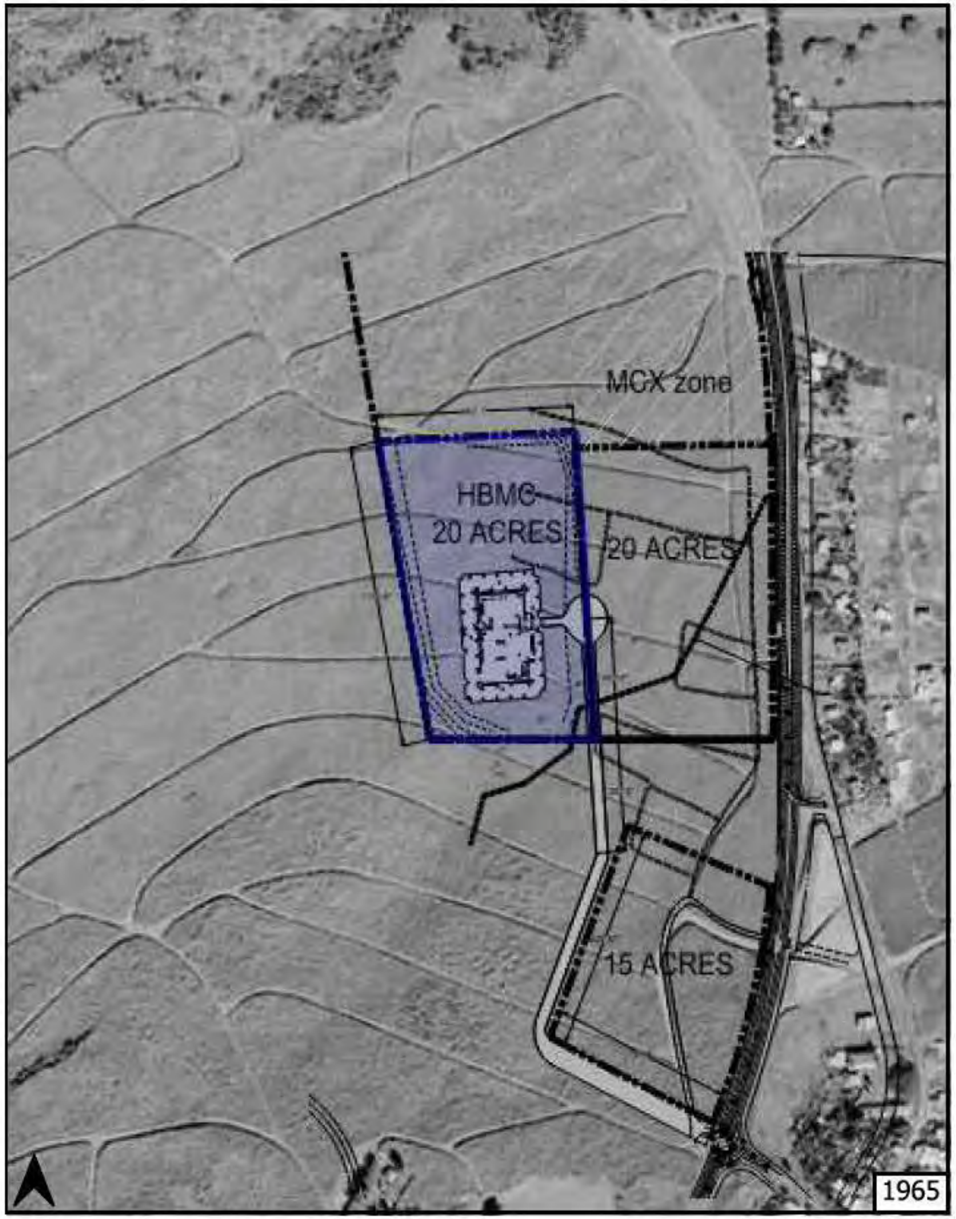
Based on historical research and prior archaeological studies, the Keaʻau area was not known to be inhabited prior to its development as a sugar plantation town. Plantation-era foundations, footings, and constructed boundaries from the early to mid-1900s may remain on portions of the broader Shipman property; however, these site types are not anticipated within the subject 20-acre project area given its uninterrupted history of sugar cultivation and repeated land clearing. Aerial imagery from 1965 and present day confirms the extent of clearing and land disturbance for agricultural use (**Figure 9**). Imagery from 2019 compared to present day further confirms that significant clearing and agricultural use of the property have continued (**Figure 10**). The entirety of the project area has been heavily disturbed by sustained agricultural operations, and it is highly unlikely that any pre-Contact or historic archaeological resources remain within the project area.

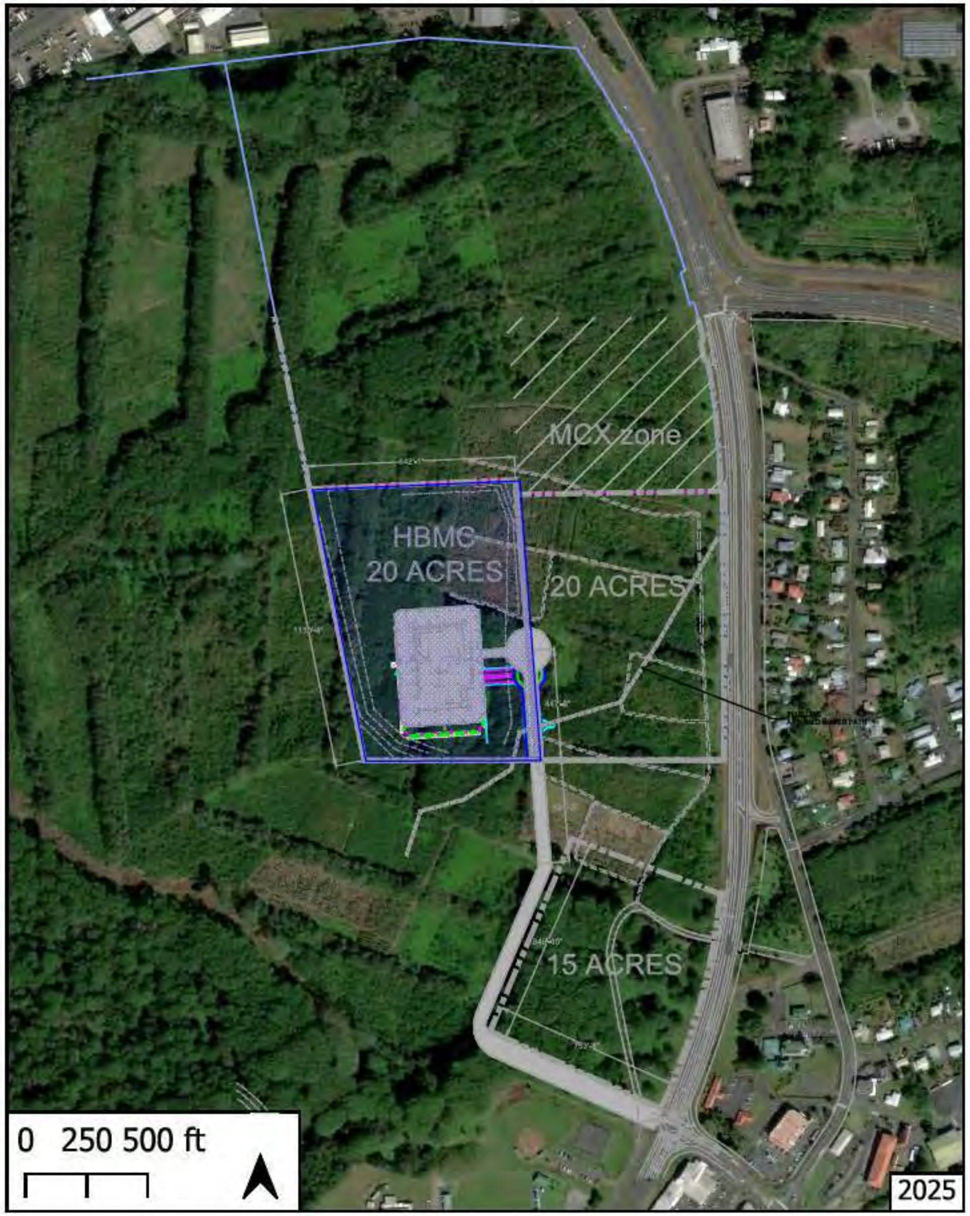
Cultural

PBR HAWAII prepared a Cultural Impact Assessment (CIA) for the Keaʻau Village Master Plan, which covers the W.H. Shipman property that encompasses the subject project site (PBR Hawaii & Associates Inc. 2017). The CIA provides detailed information on the cultural and historical context of the Keaʻau ahupuaʻa, prior archaeological work, and summaries of community consultations regarding cultural practices in the area. The findings and conclusions of the CIA are applicable to the subject project site, as it is located within the same ahupuaʻa and on the same landholding. Key cultural background and findings from the CIA are summarized below.

Aerial Images of TMK (3) 1-6-003: 127 and Project Area

Figure 9





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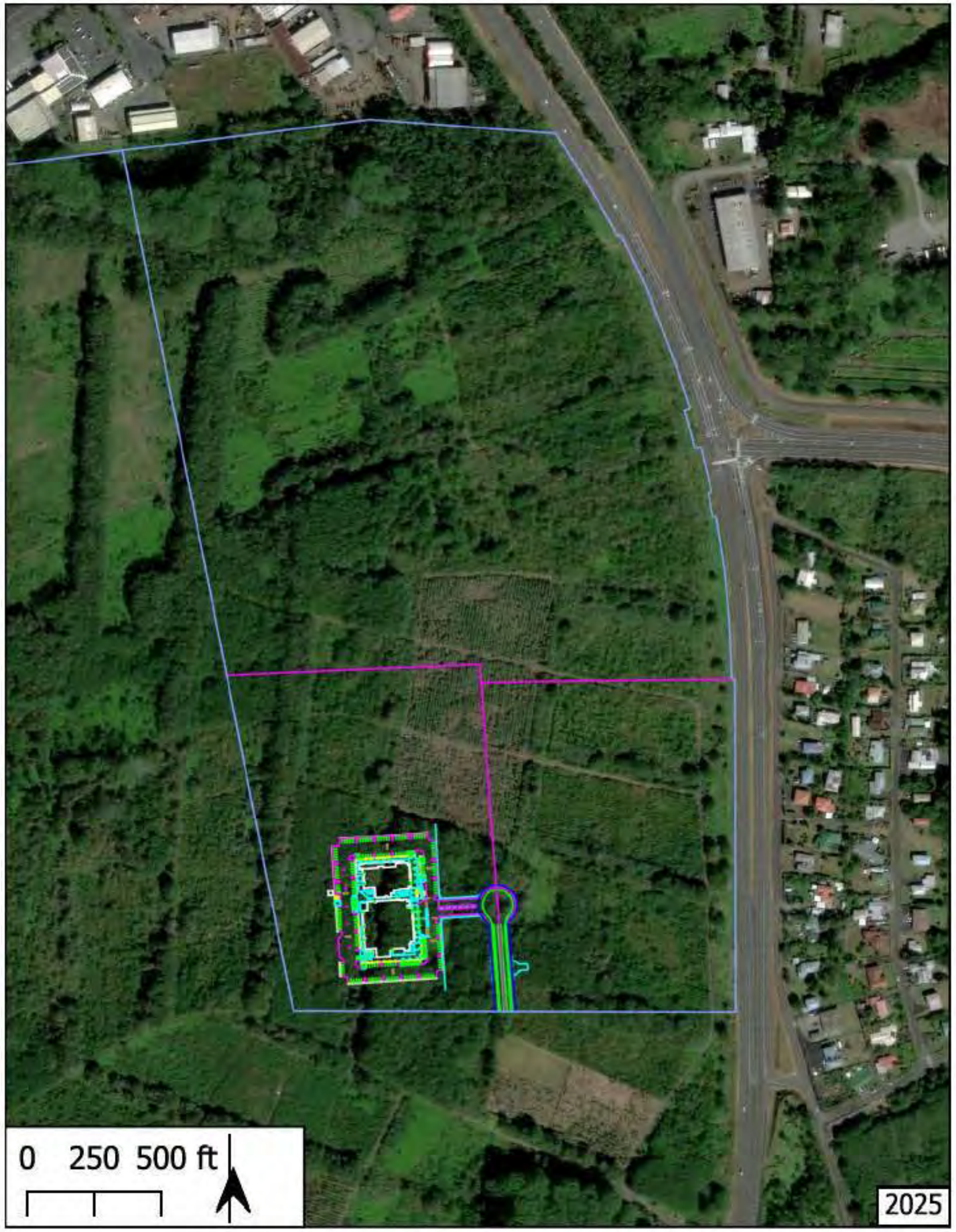
County of Hawaii
Esri

United States Geological Survey (USGS)
United States Department of Agriculture (USDA)
National Oceanic and Atmospheric Administration (NOAA)

Aerial Images of TMK (3) 1-6-003: 127 and Project Area

Figure 10



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United States Geological Survey (USGS)
United States Department of Agriculture (USDA)
National Oceanic and Atmospheric Administration (NOAA)

Nā ʻŌlelo Noʻeau

Many ʻōlelo noʻeau (Hawaiian proverbs and poetical sayings) speak to the people and natural elements of Puna and Keaʻau, and to connections with the Hawaiian deities Kāne and Pele. Among those recorded in the CIA are: He ike hala au no Keaʻau, ʻaʻohe pōhaku ʻalā e nahā ai — "I am a small hala fruit of Keaʻau, but there is no rock hard enough to smash me" (the boast of a Puna man — I am small, perhaps, but mighty) (Pukui, 1983; No. 624); Ka makani hali ʻala o Puna — "The fragrance-bearing wind of Puna," referring to Puna's fame for the fragrance of maile, lehua, and hala carried to fishermen at sea (Pukui, 1983; No. 1458); and Ka ua kāhiko hala o Keaʻau — "The rain that adorns the pandanus trees of Keaʻau," referring to the pandanus grove of Keaʻau, Puna (Pukui, 1983; No. 1560).

Moʻolelo

By cultural tradition, Kīlauea is home to the goddess Pele, giving the volcano and its surroundings sacred status. Ancient Hawaiians recognized Puna as Pele's land, with human habitation subject to Pele's will. Many legends record Pele's interactions with Puna chiefs. The Legend of Kumukahi and The Legend of Kahawali are both set in the Puna District and speak to the sacred relationship between the Hawaiian people and the volcanic landscape (Westervelt, 1916).

Community Consultations and Traditional Practices

The CIA includes information from community consultations and "talk story" interviews with individuals knowledgeable about the cultural resources and practices of the Keaʻau area. A review of these consultations did not reveal or identify historic or cultural resources or practices that may be adversely affected by development within the project area. Ongoing cultural activities in the broader Puna District include those at the Makuʻu Farmers Market, the Kamehameha Schools Hawaiʻi campus, ʻAha Pūnana Leo, and Ke Kula ʻO Nāwahīokalaniʻōpuʻu, all of which are located outside the project area. The ʻōlelo noʻeau and cultural traditions of Keaʻau speak to the lush vegetation of these lands, including maile, lehua, and hala. The people of Puna were historically known as master weavers; cultural practices including lāʻau lapaʻau (Hawaiian herbal medicine) and the gathering of lauhala (pandanus leaf) for weaving were recorded and continue to be practiced in the broader Puna District. The subject project site, given its long history of commercial sugarcane cultivation and repeated clearing, does not appear to contain the native plant resources typically associated with traditional Hawaiian gathering practices.

The Hawaiʻi State Supreme Court's PASH and Ka Paʻakai O Ka ʻAina decisions require decision-makers to consider a project's impact to native Hawaiian practices and resources. Specifically, prior to making a decision, State and County agencies must identify the cultural, historical, and natural resources and associated traditional and customary practices of the subject site, the impacts of the proposed project to those resources and practices, and the feasible action (i.e. mitigating measures), if any, to protect such resources and practices.

~~It is not known whether the subject property or immediate surrounding area have ever been used for the gathering of plants by native Hawaiians in the past. However, it would appear very unlikely that the site would serve such a purpose today and/or in the recent past due to past~~

~~commercial agricultural use. Therefore, it does not appear that the project would have any potential adverse impact relating to cultural practices in the area. These potential impacts will not change appreciably under any alternative.~~ Based on the CIA prepared by PBR HAWAII, the AIS conducted by Scientific Consultant Services, and the Archaeological Assessment conducted by Rechtman Consulting, LLC for the broader Shipman property, and consistent with the Hawaiʻi State Supreme Court's PASH and Ka Paʻakai O Ka ʻAina decisions, no significant adverse impacts to cultural resources, traditional practices, or gathering rights are anticipated from the proposed project. Archeological studies conducted throughout the Keaʻau area since the 1990s have not found evidence of pre-Contact habitation or traditional resource use within the sugarcane cultivation areas of the property; rather, they have identified only sites related to plantation-era railroad, commercial sugar, and residential uses during the Historic or Modern eras. No cultural informants or community consultees identified cultural resources or practices that would be adversely impacted by the proposed development. These conclusions will not change appreciably under any alternative.

Mitigating Measures

~~In the event any undocumented archaeological or cultural resources are found on site, all work will cease in the immediate area of the find, and the State Historic Preservation Division will be contacted for appropriate action.~~ Construction documents for the proposed project will include a provision that should any undocumented archaeological or cultural resources — including artifacts, shells, bones, midden deposits, charcoal deposits, lava tubes, stone platforms, pavings, or rock walls — be encountered during grading or construction, all work in the immediate vicinity of the find will cease and the State Historic Preservation Division (SHPD) will be contacted to determine the significance of the find and to approve an acceptable mitigation plan as needed. If human burials are encountered, they will be treated in accordance with the specific provisions of Chapter 6E, HRS.

3.3 Public Roads, Services, and Utilities

3.3.1 Roads and Access

Environmental Setting

The property is currently accessed via a partially paved driveway off Hawaiʻi Belt Road approximately 640 feet north of the intersection with Keaʻau Bypass Road and an unpaved road through the adjacent Shipman property to the south.

The proposed access to the medical clinic would be from a new proposed access driveway. The driveway is proposed to be constructed off Route 11 and Route 139 to connect the Medical Clinic to Shipman Park Driveway at Route 11. It is proposed to run east-west from Shipman Park Driveway before turning north-south, connecting to the proposed Medical Clinic. WHSL plans to subdivide a separate roadway lot that will be used to access future developments as well as the medical clinic. The road will eventually be constructed to county dedicable standards, however, will be initially constructed as a driveway for the clinic. Proper standards for road development will be determined by conditions of the Use Permit and Special Permit.

Potential Environmental Impact from the Proposed Action

A letter requesting comments was sent to the Hawaii Department of Transportation (HDOT) on July 24, 2025. In a letter dated August 27, 2025, the HDOT indicated that a Traffic Impact Analysis Report (TIAR) should be prepared. This correspondence can be found in **Appendix B**. SSFM International was contracted to perform the TIAR. Their office corresponded directly with the HDOT to ensure a thorough evaluation of traffic impacts in accordance with the requirements of the HDOT. SSFM received concurrence via email from HDOT that the intersections that were included in the study were adequate.

The Traffic Impact Analysis Report (TIAR) was completed in September 2025, by SSFM International to evaluate potential traffic impacts from the proposed project based on Existing Conditions (2025), and Future Without Project and Future With Project Conditions in 2028. The TIAR analyzed peak period turning movements at the following four (4) intersections based on three (3) Hawaiʻi Department of Transportation 24-hour traffic count locations (**Figure 11**).

Study Intersections:

1. Route 11 and Route 130
2. Route 11 and Route 139/Shipman Park Driveway
3. Route 11 and Paʻahana Street/Naʻauao Road
4. Route 130 and Route 139

HDOT 24-Hour Traffic Count Locations

A. Route 11 between Old Volcano Road to Paʻahana Street
B. Route 130 between Keaʻau Bypass Road to Kukula Street
C. Route 139 between Keaʻau Pāhoa Road to Keaʻau Kula Road

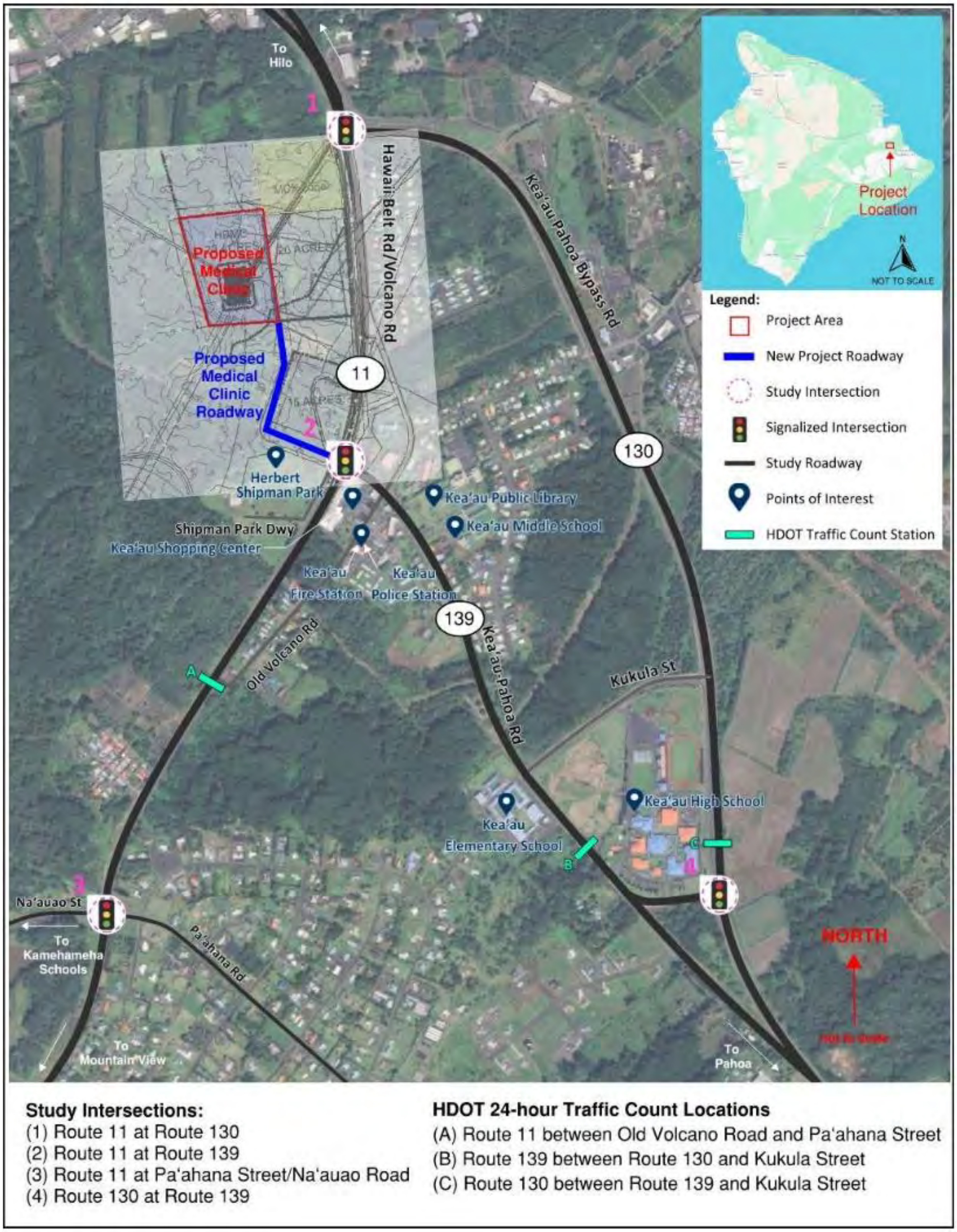

Figure 11: Map of Study Intersections and 24-Hour Traffic Count Locations

Several other intersections in the area were not analyzed by the TIAR. Analysis of the intersection of Route 11 and Kipimana Street was determined, in consultation with HDOT, to be unnecessary due to project trip expectations. As most project trips are expected to originate from or travel to the communities of Kea‘au, Pāhoa, or Mountain View, and very few trips are expected to be associated with travel to or from Hilo, this intersection is not expected to be impacted by the project. Additionally, the intersection of Old Volcano Road and Route 139 was analyzed in three previous traffic reports in the area from 2020, 2023, and 2024. The intersection operated at an acceptable level of service or better in each report and was therefore assumed not to require further analysis. SSFM International consulted with DOT regarding the choice of study intersections for the TIAR. The TIAR was submitted to HDOT in October 2025 and to date no comments have been received.

Turning movement counts were taken on Wednesday, May 7, 2025, at the designated study intersections. Counts were observed from 6:30-8:30 AM and 3:00-5:00 PM and peak hours were found to vary between the study intersections. The AM and PM peak hour at the Route 11 and Route 130 intersection was selected to be used for the study given the project location off Route 11. The resulting peak hours were determined to be 6:45-7:45 AM and 3:00-4:00 PM.

Existing (2025) intersection Levels of Service for AM and PM peak hours were determined using *Synchro 11* traffic analysis software. Level of Service is a quantitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A, with little to no delays, to congested conditions at LOS F, where extreme delays exist. Guidelines state that LOS D or better is appropriate for the study intersection and movements.

Existing (2025) Intersection LOS Analysis

The following are the existing (2025) LOS at each study intersection. All study intersections operated at an overall acceptable LOS; however, several left-turn movements were found to operate at LOS E during AM or PM peak hours. The remaining study intersections had all movements operate at LOS C or better (**Table 4**).

1. Route 11 and Route 130
    a. All movements occurred at LOS C or better.
2. Route 11 and Route 139/Shipman Park Driveway
    a. The Route 11 southbound left turn operates at LOS E (v/c of 0.89 and v/c of 0.92) during the AM and PM peak hours, respectively.
3. Route 11 and Pa‘ahana Street/Na‘auao Road
    a. The Route 11 northbound and southbound left turns operate at LOS E (v/c of 0.31 and v/c of 0.61) during the PM peak hour.
4. Route 130 and Route 139
    a. The Route 130 northbound left turn operates at LOS E (v/c of 0.87) during the PM peak hour.

Table 4: Existing (2025) LOS

Intersection Movement	AM Peak			PM Peak		
	LOS	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c
Route 11 and Route 130	**B**	**13.0**	**-**	**B**	**18.3**	**-**
Route 11 NB Through	B	13.3	0.66	C	26.1	0.73
Route 11 SB Left	C	25.2	0.82	C	3.0	0.88
Route 11 SB Through	A	1.9	0.28	A	34.7	0.41
Route 130 WB Left	C	32.5	0.49	C	26.5	0.62
Route 11 and Route 139/Shipman Park Driveway	**C**	**23.0**	**-**	**C**	**22.5**	**-**
Route 11 NB Left	D	35.8	0.48	C	32.9	0.48
Route 11 NB Through-Right	C	22.1	0.79	B	19.9	0.68
Route 11 SB Left	E	63.4	0.89	E	60.9	0.92
Route 11 SB Through-Right	B	13.7	0.37	B	16.3	0.63
Shipman Park EB Left-Through-Right	B	12.5	0.07	B	11.2	0.08
Route 139 WB Left-Through	B	19.3	0.56	B	14.5	0.39
Route 11 and Pa'ahana Street/Na'auao Road	**C**	**24.3**	**-**	**C**	**20.8**	**-**
Route 11 NB Left	D	41.6	0.71	E	69.1	0.31
Route 11 NB Through-Right	B	19.6	0.68	A	9.8	0.29
Route 11 SB Left	D	46.0	0.52	E	61.2	0.61
Route 11 SB Through	C	26.4	0.65	B	19.0	0.82
Route 11 SB Right	B	19.6	0.29	A	5.7	0.02
Pa'ahana EB Left	C	31.3	0.60	D	50.6	0.43
Pa'ahana EB Left-Through-Right	C	29.1	0.52	D	52.3	0.53
Na'auao WB Left-Through-Right	C	30.5	0.28	D	53.8	0.09
Route 130 and Route 139	**B**	**17.2**	**-**	**C**	**25.9**	**-**
Route 130 NB Left	D	40.4	0.91	E	59.4	0.87
Route 130 NB Through	B	11.5	0.84	A	7.9	0.39
Route 11 SB Through	B	19.6	0.43	C	32.1	0.92
Route 139 EB Left	C	24.9	0.28	C	21.6	0.10
Route 139 EB Right	B	12.3	0.41	C	25.7	0.76

Future Without Project Conditions

A. Background Growth Rate

The historical average annual daily traffic (AADT) data for Route 11, 130, and 139 within the study area between 2016 and 2022 demonstrated annual growth rates ranging from 0.46% to 3.86%. According to the Federal-Aid Highways 2035 Transportation Plan for the District of Hawai‘i, the forecast anticipates a compounded annual increase of 2.12% in traffic within the planning district of Puna from 2020 to 2035. A 2.12% compounded annual growth rate was therefore applied to through volumes on Route 11, 130, and 139, as well as to the southbound left-turn movement from Route 11 to Route 130 and the westbound right-turn movement from Route 130 to Route 11, given their regional significance between Hilo and Pāhoa. This forecasted growth rate reflects the anticipated future growth within the area and accounts for developments that may be completed but not individually included in the 2028 background growth projection.

B. Surrounding Projects

1. HS17 Kea‘au -Pāhoa Route (Route 130) Improvements, Kea‘au Bypass to Pāhoa-Kapoho Road
   Research was completed in July 2025 for the Statewide Transportation Improvements Program (STIP) four year forecast outlining state and county transportation projects. One project, HS17 Kea‘au -Pāhoa Route Improvements, is in the vicinity of the proposed medical clinic and may impact traffic operations in the area. This project proposes improvements to improve traffic circulation and safety along Route 130. However, no estimated construction timeline is available at this time.

2. Kea‘au Village Master Plan
   The Kea‘au Village Master Plan was proposed to construct 590 single-family homes, 350 multi-family homes, 220,408 square feet of commercial space, 43,600 square feet of office space, and 100 hotel rooms. The project was expected to be completed over 2023, 2028, and 2038.
   However, construction has not yet started, the project is delayed, and there is no current updated estimation on the completion of the Kea‘au Village Master Plan. Given this, it is assumed that no construction will begin within the three-year timeframe between the Existing conditions and the Kea‘au Villages Master Plan Future occupation year. Therefore, it is expected that the development of the Kea‘au Village would not impact the traffic operations of the proposed Medical Clinic. Traffic data for the Master Plan’s TIAR was collected in 2015 and 2016 and as such is not an ideal reference for additional traffic information to supplement the medical clinic TIAR. In addition, the development of the proposed medical clinic will not interfere with the future implementation of the Kea‘au Village Master plan but would instead compliment the vision of the plan by adding essential and beneficial services to the Kea‘au town center.

3. Kea‘au Mountain View Public Library
   A 12,000 square foot public library is proposed northeast of the intersection of Route 139 and Old Volcano Road to replace the existing library at the Kea‘au Middle School and Mountain View Elementary School. The project is expected to be complete by 2027 and therefore was included in the subject project’s traffic analysis. The library is projected to generate 42(43) AM(PM) peak hour trips and these trips were included in the Future Without Project and Future With Project conditions.

C. Future (2028) Without Project Traffic Volumes

Projected traffic volumes for Future (2028) Without Project were determined by combining Future (2028) background growth volume with projected trips generated from the Kea‘au Mountain View Public Library (**Figure 12**).

The following are the Future (2028) Without Project LOS at each study intersection (**Table 5**).

1. Route 11 and Route 130
    a. All movements occurred at LOS D or better.
2. Route 11 and Route 139/Shipman Park Driveway
    a. The Route 11 southbound left turn operates at LOS E (v/c of 0.94) during the PM peak hour.
3. Route 11 and Pa‘ahana Street/Na‘auao Road
    a. The Route 11 northbound left turn operates at LOS F (v/c of 0.36) during the PM peak hour.
    b. Four movements operate at LOS E during the PM peak hour: Route 11 southbound left turn (v/c of 0.63), Pa‘ahana eastbound left turn (v/c of 0.57), Pa‘ahana eastbound left-through-right (v/c of 0.48), and Na‘auao westbound left-through-right (v/c of 0.08).
4. Route 130 and Route 139
    a. The Route 130 northbound left turn operates at LOS E (v/c of 0.88) during the PM peak hour.

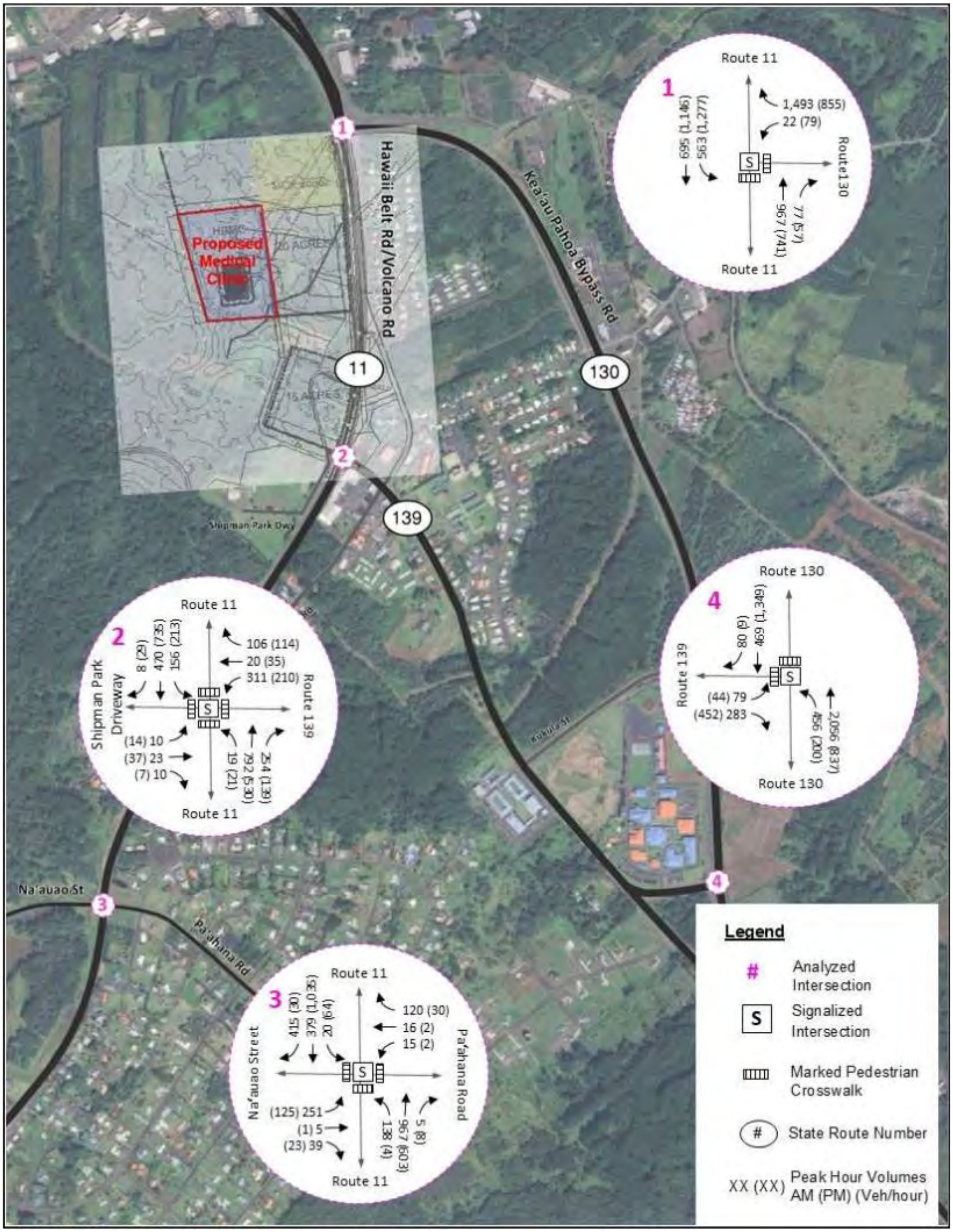

Figure 12: Future (2028) Without Project Intersection Peak Hour Volumes

Table 5: Future (2028) Without Project LOS

Intersection Movement	AM Peak			PM Peak		
	LOS	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c
Route 11 and Route 130	**B**	**13.9**	**-**	**C**	**20.2**	**-**
Route 11 NB Through	B	14.2	0.69	C	29.3	0.79
Route 11 SB Left	C	27.5	0.84	C	29.3	0.92
Route 11 SB Through	A	1.8	0.30	A	3.1	0.44
Route 130 WB Left	D	35.3	0.50	D	35.4	0.62
Route 11 and Route 139/Shipman Park Driveway	**C**	**23.2**	**-**	**C**	**23.3**	**-**
Route 11 NB Left	D	38.5	0.49	C	33.3	0.48
Route 11 NB Through-Right	C	24.2	0.81	B	19.9	0.69
Route 11 SB Left	D	52.5	0.83	E	66.3	0.94
Route 11 SB Through-Right	B	14.2	0.37	B	16.9	0.66
Shipman Park EB Left-Through-Right	B	13.5	0.07	B	11.5	0.08
Route 139 WB Left-Through	C	20.6	0.56	B	14.9	0.39
Route 11 and Pa'ahana Street/Na'auao Road	**C**	**25.0**	**-**	**C**	**22.4**	**-**
Route 11 NB Left	D	49.3	0.78	F	86.1	0.36
Route 11 NB Through-Right	C	20.6	0.73	A	9.8	0.29
Route 11 SB Left	D	46.1	0.52	E	72.5	0.63
Route 11 SB Through	C	26.4	0.67	B	19.9	0.84
Route 11 SB Right	B	19.1	0.29	A	5.4	0.02
Pa'ahana EB Left	C	31.4	0.60	E	64.4	0.57
Pa'ahana EB Left-Through-Right	C	29.2	0.52	E	61.4	0.48
Na'auao WB Left-Through-Right	C	30.6	0.28	E	63.2	0.08
Route 130 and Route 139	**B**	**18.1**	**-**	**C**	**26.8**	**-**
Route 130 NB Left	D	39.8	0.91	E	61.9	0.88
Route 130 NB Through	B	13.1	0.87	A	7.6	0.40
Route 11 SB Through	C	20.2	0.43	C	32.6	0.93
Route 139 EB Left	C	27.3	0.29	C	24.0	0.11
Route 139 EB Right	B	13.4	0.41	C	30.0	0.80

Future With Project Traffic Volumes

Future traffic volumes with the proposed project were analyzed using rates developed by the Institute of Transportation Engineers (ITE) and published in the Trip Generation Manual, 11th Edition.

A. Future (2028) With Project Traffic Volumes

Anticipated trip distribution was determined by analyzing historic HDOT traffic volumes and the population of the surrounding area. These numbers are the sum of Future (2028) without volumes and the project generated (**Figure 13**).

The following are the Future (2028) With Project LOS at each study intersection (**Table 6**).

1. Route 11 and Route 130
    a. All movements occurred at LOS D or better.
2. Route 11 and Route 139/Shipman Park Driveway
    a. The Route 11 southbound left turn operates at LOS E (v/c of 0.94) during the PM peak hour.
3. Route 11 and Paʻahana Street/Naʻauao Road
    a. The Route 11 northbound left turn operates at LOS F (v/c of 0.36) during the PM peak hour.
    b. Four movements operate at LOS E during the PM peak hour: Route 11 southbound left turn (v/c of 0.63), Paʻahana eastbound left turn (v/c of 0.57), Paʻahana eastbound left-through-right (v/c of 0.48), and Naʻauao westbound left-through-right (v/c of 0.08).
4. Route 130 and Route 139
    a. The Route 130 northbound left turn operates at LOS E (v/c of 0.91) during the PM peak hour.

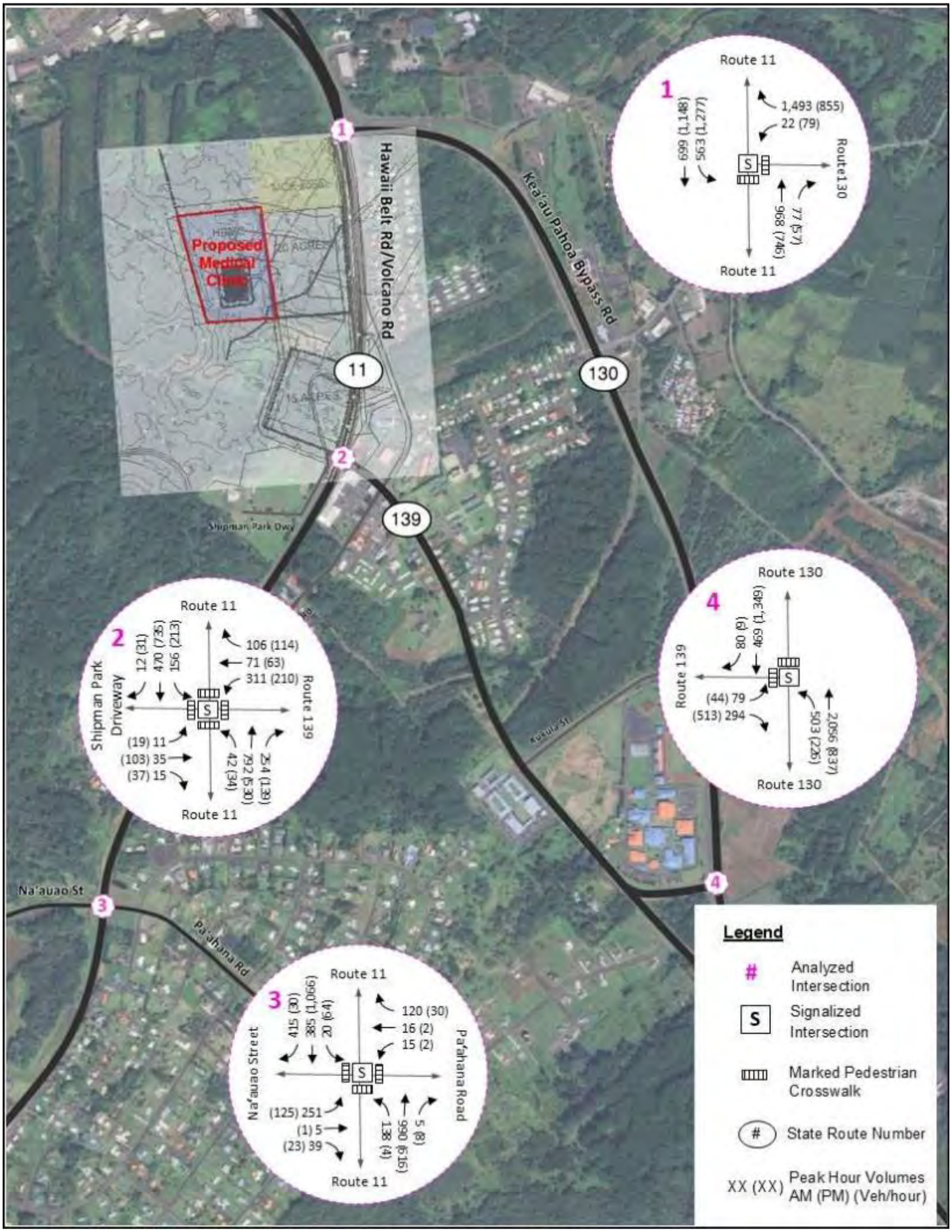

Figure 13: Future (2028) With Project Intersection Peak Hour Volumes

Table 6: Future (2028) With Project LOS

Intersection Movement	AM Peak			PM Peak		
	LOS	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c
Route 11 and Route 130	**B**	**13.9**	**-**	**C**	**20.2**	**-**
Route 11 NB Through	B	14.2	0.69	C	29.5	0.80
Route 11 SB Left	C	27.5	0.84	C	29.3	0.92
Route 11 SB Through	A	1.8	0.30	A	3.4	0.44
Route 130 WB Left	D	35.3	0.50	D	35.4	0.62
Route 11 and Route 139/Shipman Park Driveway	**C**	**26.9**	**-**	**C**	**23.1**	**-**
Route 11 NB Left	D	44.6	0.63	C	31.5	0.53
Route 11 NB Through-Right	C	28.8	0.82	B	19.9	0.69
Route 11 SB Left	D	54.5	0.82	E	66.3	0.94
Route 11 SB Through-Right	B	18.2	0.39	B	17.7	0.68
Shipman Park EB Left-Through-Right	B	14.4	0.09	B	12.8	0.23
Route 139 WB Left-Through	C	22.6	0.60	B	15.4	0.45
Route 11 and Pa'ahana Street/Na'auao Road	**C**	**25.2**	**-**	**C**	**23.2**	**-**
Route 11 NB Left	D	49.3	0.78	F	86.1	0.36
Route 11 NB Through-Right	C	21.0	0.74	A	9.8	0.29
Route 11 SB Left	D	46.1	0.52	E	72.5	0.63
Route 11 SB Through	C	26.7	0.68	C	21.7	0.86
Route 11 SB Right	B	19.1	0.29	A	5.4	0.02
Pa'ahana EB Left	C	31.4	0.60	E	64.4	0.57
Pa'ahana EB Left-Through-Right	C	29.2	0.52	E	61.4	0.48
Na'auao WB Left-Through-Right	C	30.6	0.28	E	63.2	0.08
Route 130 and Route 139	**B**	**18.6**	**-**	**C**	**30.6**	**-**
Route 130 NB Left	D	40.5	0.92	E	65.3	0.91
Route 130 NB Through	B	13.1	0.87	A	7.6	0.40
Route 11 SB Through	C	22.0	0.47	D	37.1	0.96
Route 139 EB Left	C	27.3	0.29	C	24.0	0.11
Route 139 EB Right	B	12.3	0.40	D	36.5	0.88

<u>Summary and Recommended Mitigating Measures</u>

Future (2028) Without Project analysis added 2.12% annual background growth for major movements, along with the project trips associated with the Kea'au Mountain View Public Library relocation. All signalized intersections are projected to operate at an acceptable overall LOS. Movements that are projected to operate at LOS E or worse are not significant and the TIAR did not recommend improvements for Future (2028) Without Project conditions.

Based on the *Trip Generation Manual 11th Edition*, the project is projected to generate up to 96 total trips during the AM peak hour and 144 total trips during the PM peak hour. All signalized intersections are projected to operate at an acceptable overall LOS under Future (2028) With Project conditions. Movements expected to operate at LOS E or worse are not considered significant. Therefore, no improvements are recommended for Future (2028) With Project conditions. In addition, no changes to the intersection configuration at Route 11 and Route

139/Shipman Park Driveway are required to accommodate the proposed Medical Clinic generated trips.

3.3.2 Public Utilities and Services

3.3.2.1 Water Supply

Environmental Setting

Consultation with DWS indicates that adequate water is available for the proposed use and for fire suppression. HBMC has engaged Engineering Partners, Inc. to estimate water demand for the proposed project. Daily water demand was calculated to be 3,960 gpd on average, or 10 water units (**Appendix D**). The proposed clinic has a water fixture unit count of 286.5, or 109 gpm of peak hour flow.

A meeting to discuss water access was held on August 18, 2025, and attended by representatives from WHS, East Hawaii Region (HER), Hawaii County, and DWS. Due to the availability of water service and the area and the community benefit provided by the proposed project, DWS has confirmed that HBMC will have access to the needed water units. Water can come from the highway and connect back to the main at Kea`au Pahoa highway. With this loop option, the project will be able to utilize an 8-inch water main instead of a 12-inch main as required for a direct connection.

Potential Environmental Impact from the Proposed Action

Estimated maximum daily water usage calculations, prepared by a professional engineer, licensed in the State of Hawaiʻi, were submitted to DWS for review and approval. These calculations include estimated peak flow in gallons per minute and the total estimated maximum daily water usage in gallons per day, including irrigation use. Based on the water demand calculations, the Department will determine the appropriate service lateral and meter size required to satisfy all water needs including fire suppression requirements. Differences in water main or lateral/meter size would not entail any changes in the environmental impacts of the proposed action.

Mitigating Measures

Water conservation measures will be implemented into the project design to minimize water use. Water efficient fixtures such as low flow systems and timed shut off in appropriate areas.

The Commission on Water Resource Management also recommends implementing appropriate landscaping irrigation conservation Best Management Practices endorsed by the Landscape Industry Council of Hawaiʻi. These include the following installation and maintenance BMPs:

Installation Best Management Practices:

1. Irrigation system plans and specifications should include post-construction documentation, including drawing of record (as-built drawings), maintenance recommendations, design precipitation rates and manufacturer's operational guide.
2. Design irrigation system with sprinklers spaced with head-to-head coverage or better.
3. Irrigate with a precipitation rate not exceeding soil infiltration rate.
4. Design systems to irrigate similar hydrozones such as slope, sun exposure, soil conditions, and plant materials with similar water use.
5. Use smart controllers.
6. Encourage the use of drip irrigation for individual specimen plants, shrubs, and trees during establishment period.
7. Use flow sensors with smart controllers to detect leaks or drastic changes in water use.
8. Use an irrigation submeter that measures water use on large sites.
9. Use water conservation irrigation components, such as rotary nozzles, pressure regulated spray heads and valves, rain switches, and high efficiency nozzles.
10. Sprinklers in low-lying areas and slopes should be equipped with check valves.
11. Incorporate Low Impact Development (LID) storm water design methods, including rain gardens, infiltration beds, rain barrels, swales, and basins, that allow water to collect and soak into the ground on site.
12. Preserve existing native trees and non-invasive vegetation where feasible during development and do not install irrigation in these areas.
13. Incorporate compost into soils at planting.
14. Encourage xeriscaping practices to include native and non-invasive ornamental plants.
15. Encourage the use of non-potable water for irrigation.
16. Use a qualified irrigation designer, irrigation supplier, landscape architect and installation contractor.

Maintenance Best Management Practices:

1. If not using a climate-based controller, manually manage controller run times and days to water according to soil conditions and seasonal weather conditions.
2. Program irrigation controller to encourage deep watering by using longer, less frequent watering times to improve deep rooting and increase drought resistance.
3. To reduce the amount of water evaporating from the soil surface, schedule night or early morning (5 p.m. to 9 a.m.) start times for established plantings. In areas where ponding, compaction, or runoff occurs, set 2-3 short run time cycles.
4. Mulch with wood chips around base of trees and shrub beds and refresh as necessary to maintain a minimum of two inches.
5. Allow grass to grow taller in summer months to conserve water and encourage deep rooting.
6. Aerate lawns when compaction occurs.
7. At a minimum, conduct a monthly inspection to verify system operation and correct deficiencies.
8. Conduct a practical water audit once every 2 to 5 years by a qualified irrigation professional.

9. Attend water conservation seminars and webinars including Board of Water Supply, Landscape Architects, University of Hawaiʻi, EPA Water Sense, and the Irrigation Association.
10. Use a licensed maintenance contractor with water conservation expertise.

3.3.3.2 Wastewater

Environmental Setting

There is no municipal sewer system available in the vicinity of the project and onsite wastewater treatment works (WWTW) will be required. Records from the Department of Health (DOH) indicate no existing Cesspool or Individual Wastewater System on the site.

Potential Environmental Impact from Proposed Action

Improper management of wastewater has the potential to contaminate ground and surface waters and could pose a hazard to human health. With a properly designed and maintained WWTW the potential for environmental impacts from wastewater are minimized.

Mitigating Measures

The project is anticipated to generate wastewater at more than 1,000 gallons per day (gpd), mandating compliance with DOH regulations for a package Wastewater Treatment Works (WWTW) providing secondary treatment. Acceptable treatment technologies include Activated Sludge, Sequential Batch Reactor, Fixed Bed Biofilm Reactor (FBBR), Moving Bed Biofilm Reactor (MBBR), Membrane Bioreactor (MBR), or other advanced methods ensuring effluent quality aligning with DOH's Chapter 11-62 standards. Detailed wastewater flow calculations will be prepared as part of the permit application submitted to DOH for the WWTW.

No injection wells will be used; treated wastewater effluent will be infiltrated into soils through properly sized leach fields or absorption beds. The treated effluent will be disposed of underground via an absorption bed or other types of drain field. A 100% backup of disposal system is required by DOH. Due to the potential fast percolation rate, soil replacement below the absorption bed may be required for septic effluent. However, the soil replacement requirement may be waived if it is used to receive WWTW effluent.

Efforts to minimize wastewater are reflected in the design of the project, including water efficient fixtures (e.g. low flow systems and timed shut off for appropriate devices in all bathroom and proposed kitchens) and landscaping practices as outlined above.

Medical and clinical operations generate regulated medical waste, including sharps, biological materials, and pharmaceutical waste. These materials will be managed separately from the general wastewater stream in accordance with HAR Chapter 11-104.1 (Regulated Medical Waste) and applicable DOH guidelines, and will be disposed of through licensed medical waste disposal contractors. Such waste will not enter the onsite WWTW.

The WWTW will be operated and maintained by a licensed operator in accordance with DOH Chapter 11-62 requirements. An operations and maintenance (O&M) plan will be submitted to DOH as part of the permit application, detailing inspection schedules, effluent sampling and monitoring requirements, and corrective action procedures to ensure the system performs as designed and protects groundwater quality.

3.3.2.3 Electricity

Environmental Setting

Electricity is available to the site via Hawaiʻi Electric Light Company (HELCO).

Potential Environmental Impact from the Proposed Action

The project would impose only modest demands on utility services and would not require any mitigation or special planning.

Mitigating Measures

HBMC is proposing to install solar photovoltaic and solar hot water systems for non-critical patient care areas.

3.3.2.4 Schools

Environmental Setting

Several schools are within the vicinity of the subject property. Keaʻau High School, Keaʻau Middle School, and Keaʻau Elementary School are all within 1.5 miles of the project site. Other schools in the general surrounding area include: Mountain View Elementary School, Christian Liberty Academy, Pūnana Leo o Hilo, Nāwahīokalaniʻopuʻu, and Kamehameha Schools.

Potential Environmental Impact from the Proposed Action

The proposed project is not expected to impact schools. No traffic impacts are expected both during and post construction. All construction on the proposed access road will not affect intersection or school operations.

During initial consultation with the DOE, consultation with school administrators in the Keaʻau area to discuss any potential vehicular or traffic impacts posed by construction to school operations was recommended. School administrators were contacted by email and provided with information regarding potential traffic impacts along with site plans for the proposed clinic and access road. Several DOE representatives were in attendance of the October Stakeholder meetings. No further comments from administrators or HIDOE were received.

Mitigating Measures

The project would not significantly impact schools and would not require any mitigation.

3.4 Secondary and Cumulative Impacts

The proposed project will not generate any long-term secondary impacts, such as population changes or effects on public facilities. Any effects on public facilities are expected to be minimal given the adherence to proposed mitigation measures.

Cumulative impacts occur when the implementation of multiple separate projects with limited individual impacts combine to produce more severe impacts or conflicts. Impacts should be considered with respect to past and current impacts on area resources. Planned projects in the area that reasonably could affect area resources include:

Kea‘au Village Master Plan Phase 1 and Phase 2
The proposed Master plan was projected to be completed in three construction phases over years 2023, 2028, and 2038 and would include:

- 590 single-family homes,
- 350 multi-family homes,
- 220,408 SF of commercial space,
- 43,600 SF of office space, and
- 100 hotel rooms

Construction for the project is currently on pause due to infrastructure costs and it is not known when it will proceed at this time. With this ambiguity it is difficult to predict when possible impacts from this development may occur. Therefore, it is assumed that should any portion of this development be completed in the next 13-16 years, it will be accounted for in the 2.12% annual background growth rate included in the TIAR calculations.

Kea‘au Mountain View Public Library
The Kea‘au Mountain View Public Library is proposed to be developed northeast of the intersection of Route 139 and Old Volcano Road. The proposed library will be 12,000 SF and will replace the existing library at the Kea‘au Middle School and Mountain View Elementary School. The project is anticipated to be completed in 2027 and anticipated traffic from the library has been incorporated into the TIAR calculations

Although there is the potential to increase traffic above future estimated levels without the project, the total traffic is expected to be within the capacity of the system to accommodate it without significant effects. Nearly all long-term impacts from the proposed project are negligible, with no meaningful effects on ecosystems or protected species, water quality, erosion and sedimentation, historic properties, noise and air quality and other measures.

The proposed project’s utility infrastructure is largely self-contained: wastewater will be treated and disposed of entirely on site through the package WWTW and leach field system, and stormwater will be managed on site in compliance with Hawai‘i County Code Chapter 27. This self-contained approach avoids placing additional demand on off-site utility systems and provides a net beneficial cumulative contribution to the area by supplying needed medical services without burdening regional infrastructure. However, water and electrical supply lines will be extended to the site.

Any future expansion of the medical campus beyond the scope described in this EA will require a separate environmental review under HRS Chapter 343 prior to approval. Such a review would evaluate cumulative impacts in light of conditions at the time of the proposed expansion, including the status of the Kea‘au Village Master Plan and other planned projects in the area.

PART 4: CONSISTENCY WITH GOVERNMENT PLANS AND POLICIES

4.1 Hawai‘i County General Plan

4.1.1 2005 Hawai‘i County General Plan

The Hawai‘i County General Plan serves as a guiding document for decision-making and the implementation of goals for Hawai‘i Island. The plan was adopted in 1989 by ordinance and most recently revised in 2005.

The General Plan uses the Land Use Pattern Allocation Guide (LUPAG) Map to designate land on Hawai‘i Island for future developments. The LUPAG is a broad, flexible design tool to guide the direction and quality of future developments in a coordinated manner. It indicates the general location of various land uses in relation to each other. The LUPAG map designates the project area as *Urban Expansion*, which allows for a mix of high density, medium density, low density, industrial, industrial-commercial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined. Additionally, the draft version of the 2045 General Plan designates the subject property as *Medium Density Urban*, which is intended for village and neighborhood commercial and single family and multiple family residential and related functions. Additionally, a small portion of parcel 007, which is outside of the project area is designated as Important Agricultural Land (IAL).

Due to the importance of the LUPAG designations in determining the suitability of land-use projects and developments, the following goals, policies, and standards that align with the proposed action are discussed below:

2.2 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.
c. Strive for diversity and stability in the economic system.

d. Provide an economic environment that allows new, expanded, or improved economic opportunities that are compatible with the County's cultural, natural, and social environment.
e. Strive for an economic climate that provides its residents an opportunity for choice of occupation.
f. Strive for diversification of the economy by strengthening existing industries and attracting new endeavors.
g. Strive for full employment.
h. Promote and develop the island of Hawaiʻi into a unique scientific and cultural model, where economic gains are in balance with social and physical amenities. Development should be reviewed on the basis of total impact on the residents of the County, not only in terms of immediate short run economic benefits.

2.3 ECONOMIC POLICIES

x. Encourage the health/wellness industry.

Discussion: The proposed project is set to advance economic development in the area by creating stable long-term employment opportunities, including roles such as doctors, nurses, medical technicians, office administrators, and grounds and maintenance workers.

4.2 ENVIRONMENTAL QUALITY GOALS

a. Define the most desirable use of land within 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 island.
c. Control pollution.

4.3 ENVIRONMENTAL QUALITY POLICIES

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

4.4 ENVIRONMENTAL QUALITY STANDARDS

a. Pollution shall be prevented, abated, and controlled at levels that will protect and preserve the public health and well-being, through the enforcement of appropriate Federal, State and County standards.
b. Incorporate environmental quality controls either as standards in appropriate ordinances or as conditions of approval.
c. Federal and State environmental regulations shall be adhered to.

Discussion: HBMC will adhere to all environmental quality goals, policies, and standards. The subject site will be serviced by a Wastewater Treatment Works and control potential stormwater runoff.

5.2 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.

5.3 FLOODING AND OTHER NATURAL HAZARDS POLICIES

d. Any development within the Federal Emergency Management Agency designated floodplain must be in compliance with Chapter 27.
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.
q. Consider natural hazards in all land use planning and permitting.
r. Discourage intensive development in areas of high volcanic hazard.

5.4 FLOODING AND OTHER NATURAL HAZARDS STANDARDS

a. "Storm Drainage Standards," County of Hawai'i, October 1970, and as revised.
b. Applicable standards and regulations of Chapter 27, "Flood Control," of the Hawai'i County Code.
c. Applicable standards and regulations of the Federal Emergency Management Agency (FEMA).
d. Applicable standards and regulations of Chapter 10, "Erosion and Sedimentation Control," of the Hawai'i County Code.
e. Applicable standards and regulations of the Natural Resources Conservation Service and the Soil and Water Conservation Districts.

Discussion: The Flood Insurance Rate Map (FIRM) designates the subject site to be in Flood Zone X (areas outside of the 500-year floodplain). There are no naturally occurring wetlands, ponds, lakes, or rivers on the parcel, however there is a small unnamed drainageway that crosses a portion of the site. The site has been previously cleared and has been in agricultural use for decades. Accordingly, the site has not been and should not be subject to flooding, coastal hazards, or erosion. The property is outside the Tsunami Evacuation Zone and Special Management Area.

6.2 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 historic sites, buildings, and objects of public interest should be made available.

6.3 HISTORIC SITES POLICIES

a. Agencies and organizations, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.
b. Amend appropriate ordinances to incorporate the stewardship and protection of historic sites, buildings, and objects.
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.

Discussion: There are no known archaeological or cultural resources on the property as it has been cleared and used for agricultural purposes and sugarcane production since at least the 1950s. In the event any inadvertent historic, archaeological, or cultural discoveries are made, all work will cease, and HBMC will immediately notify the Hawaiʻi County Planning Department and the DLNR SHPD and secure their clearances before proceeding further.

7.2 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.

7.3 NATURAL BEAUTY POLICIES

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

Discussion: There are no notable areas of natural beauty that would be impacted by the proposed action. The proposed improvements will be aesthetically pleasing and may improve the overall visual appeal and functionality of the site of the site. Appropriate landscaping will be incorporated to beautify the property and mitigate any possible negative visual impacts from the road.

8.2 NATURAL RESOURCES AND SHORELINES GOALS

a. Protect and conserve the natural resources from undue exploitation, encroachment, and damage.
b. Provide opportunities for recreation, 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 landforms, 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.

8.3 NATURAL RESOURCES AND SHORELINES POLICIES

a. Require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.
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.
u. Ensure that activities authorized or funded by the County do not damage important natural resources.

Discussion: The proposed project will adhere to strict environmental standards and will not encroach on any open spaces or areas of natural beauty. Wastewater will be handled by an on site WWTW. Contractors will follow all County and State laws to manage stormwater runoff during construction. Plantings will screen the property. The site is not adjacent to the ocean and does not have any access to shoreline areas, public trails, or hunting areas. It is roughly 4 miles inland at an elevation of approximately 300 feet above sea level. It is also outside the County Tsunami Evacuation Zone. As such, the proposed project should not have any adverse impacts on the area's coastal zone or shoreline resources.

10.1.2 PUBLIC FACILITIES GOALS

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

10.5.2 PUBLIC FACILITIES: HEALTH AND SANITATION POLICIES

e. Encourage the establishment or expansion of community health centers and rural health clinics.

10.5.3 PUBLIC FACILITIES: HEALTH AND SANITATION STANDARDS

b. Hospitals should be on sites capable of handling moderate expansion of facilities. Quiet surroundings, convenient and adequate access, and compatibility with adjoining uses shall be required.
c. Hospitals shall be served by a public sewage system or have self-contained sewage systems.
d. Hospital solid waste shall be disposed of in accordance with all Federal, State, and County laws and regulations.

10.5.4.2 PUBLIC FACILITIES: HEALTH AND SANITATION COURSES OF ACTION

a. Improvement and expansion of hospital facilities shall be undertaken as the need arises

Discussion: The proposed project would significantly increase access to health care services in a traditionally underserved and quickly growing area. The development of the new medical center will help to strengthen access to healthcare for rural communities. Should the project not proceed the improvements to health care would not be realized.

14.1.2 LAND USE GOALS

a. Designate and allocate land uses in appropriate proportions and mix and in keeping with the social, cultural, and physical environments of the County.
b. Protect and preserve forest, water, and natural and scientific reserves and open areas.

14.1.3 LAND USE POLICIES

f. Encourage the development and maintenance of communities meeting the needs of its residents in balance with the physical and social environment.

Discussion: There are no significant adverse land use concerns since the proposed action will be limited in extent and will fulfill a community need.

4.2 Puna Community Development Plan

The Puna Community Development Plan (PCDP) was developed through the implementation of the 2005 County of Hawaiʻi General Plan. CDP's are designed to translate and implement the goals, policies, and standards of the General Plan as they apply to specific communities and districts. Additionally, they serve as important framework for a community's intended outcome and vision and are often used as forum for community input in terms of land-use, availability of public resources, and overall development. The vision of the Puna CDP is for "residents of Puna live in harmony with the land, while promoting a sustainable vibrant local economy, healthy community, and a viable transportation system that is accessible, friendly and safe for now and future generations." The subject site is within the area identified as the Keaʻau Regional Town Center by the PCDP, which designates areas suitable for commercial development. The following goals and objectives outlined in the PCDP apply to the project area and proposed development:

2.1.1 Goals

a. Structures and cultural sites that are significant to Puna's history and cultural traditions are preserved.
b. The design character and natural setting of older communities that are representative of Puna's historic development are perpetuated.
c. Areas of scenic and cultural interest are accessible to the public in a manner that does not detract from their aesthetic, natural and cultural value.
d. Awareness and appreciation of the host culture is expanded.

3.1.1 Goals

a. Puna retains a rural character while it protects its native natural and cultural resources.
b. The quality of life improves, and economic opportunity expands for Puna's residents.
c. Services and community facilities are more accessible in village/town centers that are distributed throughout the region, including the underserved subdivisions that have been experiencing higher levels of development growth.
d. Exposure to high risk from natural hazards situations is reduced.

3.3.1 Goals

a. Puna residents have improved access to emergency and primary medical care and preventative public health programs.

3.3.3 Actions

a. Develop a centrally-located, 24-hour, full-service medical facility, with trauma care, in Puna.

3.4.1 Goals

a. All residents have an equitable level of service access to police, fire, and paramedical services.

3.4.2 Objectives

a. Provide additional locations for emergency services to reduce the response time to a larger percentage of residents.

4.1.1 Goals

b. The percentage of residents who commute to employment or travel for services outside of Puna is reduced.

4.1.2 Objectives

b. Provide more services and employment within Puna's village and town centers.
c. Create new employment opportunities in Puna to reduce long commuting.

Discussion: The proposed project would significantly increase access to health care services in a traditionally underserved and quickly growing area. There is a lack of adequate healthcare facilities within Puna and many residents have to drive significant distances to receive medical care. The establishment of a new medical center would make medical services much more accessible in the area. Should the project not proceed the improvements to health care would not be realized.

4.3 County Zoning and Special Management Area

The County Zoning of the property is currently A-20a. Although the property is designated for agricultural uses by County land use laws, the non-agricultural uses may be allowed through the issuance of a Use Permit and Special Permit. HBMC will prepare and submit a Use Permit and Special Permit application for review and approval by the County Windward Planning Commission.

The subject property has been subject to prior County zoning actions that are relevant to the present application. County Change of Zone Ordinance No. 02-23, approved on February 28, 2002, reclassified portions of the subject property from the Agricultural District (A-20a) to Industrial-Commercial Mixed Use (MCX-20). The MCX-20 zoning designation permits a range of commercial and light industrial uses subject to applicable development standards under Chapter 25 of the Hawaiʻi County Code. Any conditions of approval associated with Ordinance No. 02-23 remain binding on those portions of the property and must be reviewed prior to development of those areas. The proposed medical clinic use would occur on portions of the subject properties with A-20a zoning. Approvals will be addressed through the Use Permit and Special Permit process described above. The proposed development is designed to comply with all applicable County zoning standards, and the Use Permit and Special Permit proceedings will provide the appropriate forum for a full consistency determination.

The property does not lie within the Special Management Area. The subject property is located approximately 4 miles from the nearest shoreline and will not be impacted by coastal hazards or beach erosion. There is no designated public access to the mountain or shoreline areas over the property. As such, the proposed project will not adversely affect any recreational resources, including access to and along the shoreline, scenic and open space or visual resources, coastal ecosystems, and marine and coastal resources Therefore, the proposed use is not contrary to the objectives of Chapter 205 A, HRS relating to coastal zone management.

4.4 Hawai‘i State Land Use Law

All land in the State of Hawai‘i is classified into one of four categories for land use – Agricultural, Conservation, Rural, or Urban. These districts have been established by the State Land Use Commission pursuant to Chapter 205 HRS. In 1993, the State Land Use Commission amended several land use boundaries and designated several areas as Urban in Kea‘au under Docket BR93-699, including a 109.000 area referred to as “Area D” in the vicinity of the Property and project area. W.H. Shipman Ltd. has requested a boundary interpretation for confirmation, but it is expected that the Urban area will follow the parcel boundary, and the project area will be entirely within the SLU Urban district.

Per the Hawai‘i County Planning Department, Parcel 127 is primarily designated Urban, with a small portion designated Agricultural and Parcel 007 is designated Agricultural and Urban by the State Land Use Commission.

State Land Use Boundary Amendment No. 884 (LUC Docket No. BR96-699) was approved on July 18, 1994, amending approximately 660 acres in Kea‘au, Puna, Hawai‘i Island from the Agricultural District to the Urban District. This boundary amendment, in conjunction with the prior 1993 action under Docket BR93-699, established the Urban District classification for lands in the Kea‘au area, including portions of and in the vicinity of the subject property. Any conditions of approval imposed by the Land Use Commission in connection with Boundary Amendment No. 884 or LUC Docket BR93-699 remain applicable to the subject property. A recent status report on compliance with the conditions of the Decision and Order is included as Appendix G. The proposed project is located within the State Land Use Urban District as established by these prior boundary amendments. Development of a medical clinic and associated access improvements within the Urban District is consistent with the purposes and intent of the Urban District classification under Chapter 205, HRS, which is designed to accommodate areas where urbanization is appropriate and planned. The proposed medical clinic is an appropriate Urban District use and does not require a new boundary amendment or petition to the Land Use Commission.

4.5 Required Permits and Approvals

The following permits and approvals are required for the proposed construction of a medical clinic:

County of Hawai‘i

Use Permit
Special Permit
Building Permits
Grubbing/Grading Permits

Electrical Review
Mechanical/Plumbing Review
Fire Review

Engineering Review
Sanitation Review
Solid Waste Management Plan

State of Hawai'i

Permit to Perform Work Upon State Highways
Permit for the Occupancy and Use of State Highways
National Pollutant Discharge Elimination System (NPDES) Permit
Storm Water Pollution Prevention Plan (SWPPP)
Department of Health Individual Wastewater Treatment Works (WWTW)
Department of Health Construction-Environmental Hazard Management Plan (C-EHMP)
& if necessary, a Removal Action Work Plan (RAWP) and Removal Action Report (RAR)
Potential Noise Permit

PART 5: DETERMINATION, FINDINGS, AND REASONS

5.1 Determination

HBMC expects that the ~~County of Hawai'i Planning Department~~ Hawaii Health System Corporation will determine that the proposed action will not significantly alter the environment and will accordingly issue a Finding of No Significant Impact (FONSI). This determination will be based on comments to the Draft Environmental Assessment (DEA). The Final Environmental Assessment (FEA) will outline the final determination.

5.2 Findings and Supporting Reasons

Agencies must consider several factors to determine whether an Action has significant effects, as outlined in HAR Chapter 11-200.1. The following factors evaluate the sum of effects of the proposed action on the quality of the environment by considering every phase of a proposed action, the expected impacts, and the proposed mitigation measures:

1. ***The proposed project will not involve an irrevocable commitment or loss or destruction of any natural, cultural, or historic resource.***

   No valuable natural or cultural resources would be affected or lost due to construction of the proposed project. The property has been previously cleared and used agriculturally for many years; thus it is unlikely that the project would involve an irrevocable commitment or loss or destruction of any natural, cultural or historic resource.

2. ***The proposed project will not curtail the range of beneficial uses of the environment.***

No restriction of beneficial uses would occur under the proposed action. It is not known whether the Properties have been used for cultural practices in the past, however, it is very unlikely it is used in such a capacity today due to current and historic land use.

3. ***The proposed project will not conflict with the State's environmental policies or long-term environmental goals established by law.***

   The State's long-term environmental policies are set forth in HRS Chapter 344. The broad goals of this policy are to conserve natural resources and enhance quality of life. The requested action will have no significant impact to environmental processes, nor will it negatively impact quality of life.

   The proposed project would improve the quality of life for the community by providing access to required health care services. No significant impacts to natural resources will occur. It is therefore consistent with all elements of the State's long-term environmental policies.

4. ***The proposed project will not have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State.***

   The proposed action will create positive impacts on the economic and social welfare of the region by providing employment opportunities and vital health care options.

5. ***The proposed project will not have a substantial adverse effect on public health.***

   The proposed action would have a positive effect on public health by providing expanded, improved and more convenient health care services for the community. Minor and short-term impacts to air quality and noise levels may occur during construction but will be mitigated by using Best Management Practices and appropriate permitting such as noise permits. Public health is anticipated to improve with the proposed action by providing essential healthcare and emergency services to an underserved area.

6. ***The proposed project will not involve adverse secondary impacts, such as population changes or effects on public facilities.***

   The proposed action does not include new residential units and thus will not involve adverse impacts to population changes. The project aims to help manage the current upward trend in population growth by meeting the rising demand for healthcare services, enhancing accessibility, alleviating overcrowding, customizing healthcare services to fit community requirements, and strengthening emergency readiness in the area. The project will aid in retaining residents by providing accessible healthcare services and reducing the need for travel.

7. ***The proposed project will not involve a substantial degradation of environmental quality.***

The proposed action is relatively minor and environmentally benign and thus would not contribute to environmental degradation. The property has been previously cleared and used extensively for agricultural purposes.

8. ***The proposed project is not one which is individually limited and will not have substantial adverse effect upon the environment or involve a commitment for larger actions.***

   The proposed action will not have substantial adverse effect upon the environment or involve a commitment for larger actions. Nearly all long-term impacts from the proposed project are negligible, with no measurable effects on sensitive ecosystems or rare species, water quality, erosion and sedimentation, historic properties, noise and air quality, and other measures. Potential cumulative impacts on area traffic conditions has been detailed in the included traffic study which found that the total anticipated traffic is expected to be within the capacity of the system to absorb it and only modest mitigations are expected for traffic.

9. ***The proposed project will not have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat.***

   Although there was no formal biotic survey of the Property, there are likely no naturally occurring rare, threatened, or endangered species present due to past agricultural development. Additionally, the majority of species observed on the property are introduced. With the proposed mitigation measures, impacts to rare, threatened or endangered species will not occur.

10. ***The proposed project will not have a substantial adverse effect on air or water quality or ambient noise levels.***

    The proposed action would have minimal and short-term effects on air quality and ambient noise levels during construction. Mitigating measures will be strictly followed to reduce impacts to both air quality and noise during construction. If maximum permissible levels are exceeded during any stage, the contractor will consult with the Department of Health and determine whether permits are necessary.

    The facility will provide outpatient care only and will not be an emergency room and will not receive ambulances. Thus, the long-term noise impacts of the proposed project will be on par with other commercial-type uses in the area.

11. ***The proposed project will not have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.***

The subject property is located 4 miles inland from the shoreline and will not be impacted by any coastal hazards such as tsunamis, sea level rise, or erosion. The property is also in an area of minimal flood hazard. The property is located in an area subject to volcanic and seismic hazards, however much of the island shares these hazards. All buildings would be designed according to County building codes to withstand an acceptable level of seismic activity and wind resistance.

12. ***The proposed project will not have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies.***

    The proposed construction will not impose on views to or from any listed resource in the General Plan. After construction, landscaping will be incorporated to beautify the site.

13. ***The proposed project will not require substantial energy consumption or emit substantial greenhouse gases.***

    The proposed action will not emit substantial greenhouse gases. The main source of greenhouse gas emissions will be from vehicles. Energy consumption will be mitigated through energy and water conserving practices. Such methods include energy efficient appliances and lights, low flow systems in bathrooms for toilets and sinks with timed shut off for appropriate devices and landscaping vegetation that requires minimal watering.

REFERENCES

Beven, J. and Wroe, D. 2019. Hurricane Lane (EP142018). National Hurricane Center, Central Pacific Hurricane Center, Tropical Cyclone Report.

Collins M. et al., 2019: Extremes, Abrupt Changes and Managing Risk. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.-O. Partner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegr□a, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. In press.

Commission on Water Resource Management (CWRM). 2019a. Water Resource Protection Plan Update (WRPP) Appendix F. *Hawaiʻi Water Plan*, State of Hawaiʻi.

Department of Land and Natural Resources. 2024. Division of Forestry and Wildlife: Wildlife Program. Native Birds of Hawaiʻi. Hawaii.gov.

Escott, G. G, 2018. An Archaeological Inventory Survey Report For W.H. Shipman Keaʻau Town Property in Keaʻau Ahupuaʻa, Puna District, Hawaiʻi Island, Hawaiʻi

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: Online Rainfall Atlas of Hawaiʻi. *Bull. Amer. Meteor. Soc.* 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Hawaiʻi County Civil Defense Agency. 2023. Hawaiʻi County Volcano Hazards: know your indundation zone. Retrieved from: https://hawaiicountygis.maps.arcgis.com/apps/instant /lookup/index.html?appid=1ddc852f98854f3685ddacf62d5b2b10

Hawaiʻi County Planning Department. 2008. *Puna Community Development Plan*. Hilo.

Hawaiʻi County Planning Department. 2005. *General Plan, County of Hawaiʻi*. Hilo.

Hawaiʻi State Department of Land and Natural Resources (DLNR). 2017. *Rapid ʻŌhiʻa Death: Part I: Strategic Response Plan for Hawaiʻi, 2017-2019*. Prep. by Division of Forestry & Wildlife. Honolulu.

Hawaiian Volcano Observatory (HVO). 2022. Frequently Asked Questions about Mauna Loa Volcano. United States Geological Survey (USGS). Retrieved from: https://www.usgs.gov /observatories/hawaiian-volcano-observatory/frequently-asked-questions-about-mauna-loa-volcano.

Hoopes, Stephanie, Ph.D. 2024. ALICE in the Crosscurrents: An Update on Financial Hardship in the United States. United For ALICE.

Hoover, J. 2023. 2022 Hawaiʻi County Comprehensive Economic Development Strategy. Hawaiʻi Island Economic Development Board.

IPCC, 2023: Summary for Policymakers. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001

Kamakau, S.M. 1992. Ruling Chiefs of Hawaii. Kamehameha Schools Press, Honolulu.

Kelly, M., B. Nakamura, and D. Barrere. 1981 Hilo Bay: A Chronological History, Land and Water Use in the Hilo Bay Area, Island of Hawaiʻi. Department of Anthropology, Bernice P. Bishop Museum.

Kimberlain, T., Brennan, M., and Wroe, D. 2018. Hurricane Iselle (EP092014). National Hurricane Center, Central Pacific Hurricane Center, Tropical Cyclone Report.

PBR Hawaii & Associates Inc. 2017. Cultural Impact Assessment Keaʻau Village Master Plan, Phases 1 & 2

Rechtman Consulting, LLC, 2004. Archaeological Assessment of a 112 Acre Property

Tetra Tech. 2020. County of Hawaiʻi Multi-Hazard Mitigation Plan. Prepared for County of Hawaiʻi Civil Defense Agency.

Thomas, W. et al., 1992. Map Showing Lava-Flow Hazard Zones, Island of Hawaiʻi.

Trusdell, F.A., and Lockwood, J.P., 2017, Geologic map of the northeast flank of Mauna Loa volcano, Island of Hawaiʻi, Hawaii: U.S. Geological Survey Scientific Investigations Map 2932-A, pamphlet 25 p., 2 sheets, scale 1:50,000, https//doi.org/10.3133/sim2932A.

United States Geological Survey (USGS). 2024. Stream Stats. Web Application Retrieved from: https://streamstats.usgs.gov/ss/

U.S. Census Bureau. (n.d.) *Industry for Civilian Employed Population 16 Years and Over in Pāhoa-Kalapana CCD, Hawaii County, Hawaii*. U.S. Department of Commerce. Retrieved September 18, 2024, from https://data.census.gov/

U.S. Census Bureau. (n.d.) *Keaʻau -Mountain View CCD, Hawaii County, Hawaii*. U.S. Department of Commerce. Retrieved September 18, 2024, from https://data.census.gov/

West Hawaiʻi Today. 2021. Brush fire burns 40,000 acres on Hawaiʻi's Big Island. Retrieved from: https://wildfiretoday.com/2021/08/03/brush-fire-burns-40000-acres-on-hawaiis-big-island/

Keaʻau Medical Clinic

Traffic Impact Analysis Report

Keaʻau, Hawaiʻi
January 2026

Prepared for:
Hawaiʻi Health Systems Corporation

Prepared by:

SSFM International

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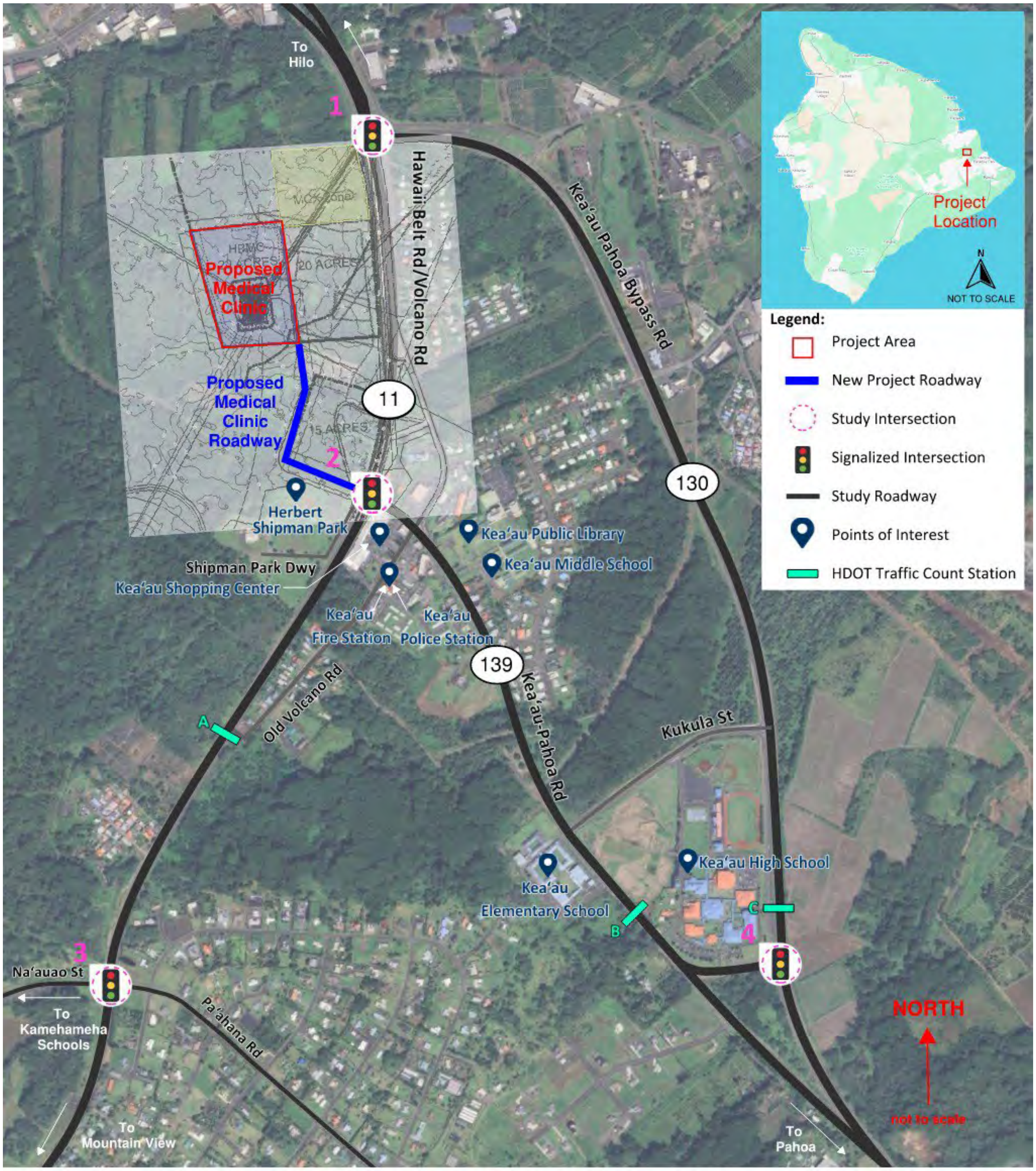
I. PROJECT DESCRIPTION

The Hawai‘i Health Systems Corporation (HHSC) is proposing to develop a new medical clinic (Medical Clinic) in Kea‘au, on the Island of Hawai‘i on an A-20a zoned parcel (Tax Max Key (TMK) (3) 1-6-003:127). The proposed Medical Clinic location map is shown in Figure 1. To support this effort, a Use Permit will be pursued. Should the Use Permit be approved, HHSC is proposing to construct a medical clinic with approximately 40,000 square feet (sf) of building space. The parking lot will include 22 Americans with Disabilities (ADA) compliant perpendicular parking stalls and 182 standard perpendicular parking stalls. The conceptual site plan is shown in Figure 2. Construction is estimated to be completed by 2028.

This Traffic Impact Analysis Report (TIAR) is being prepared in support of a Use Permit application to analyze the potential traffic impacts of the proposed Medical Clinic and recommended mitigations. The Hawai‘i County Code Chapter 25, Section 25-2-60 “Use Permits” permits medical clinics in districts zoned as RS, RD, RM, RA, FA, and A. There are no standards and regulations regarding traffic impacts resulting from the development of a medical clinic. Therefore, Existing (2025) and Future (2028) Without and With Project traffic impact were analyzed as part of this TIAR.



Study Intersections:
(1) Route 11 at Route 130
(2) Route 11 at Route 139
(3) Route 11 at Pa'ahana Street/Na'auao Road
(4) Route 130 at Route 139

HDOT 24-hour Traffic Count Locations
(A) Route 11 between Old Volcano Road and Pa'ahana Street
(B) Route 139 between Route 130 and Kukula Street
(C) Route 130 between Route 139 and Kukula Street

Figure 1: Proposed Medical Clinic Location Map

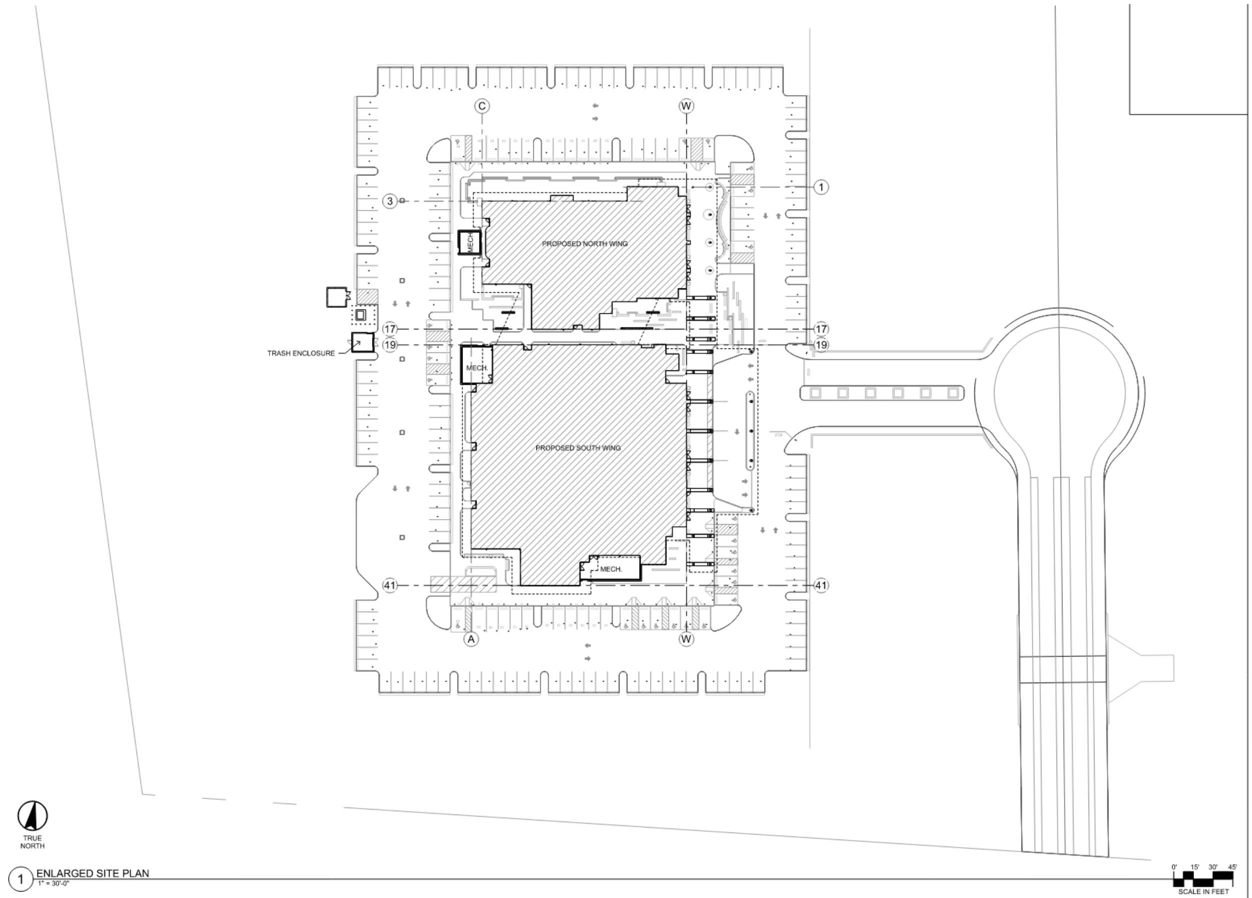


Figure 2: Conceptual Site Plan

II. EXISTING CONDITIONS

A. Geometric Configuration

1. State Route 11

Within the vicinity of the Medical Clinic, Route 11 is a State-owned small urban principal arterial north of Route 139 and a rural minor arterial to the south. It is a two-way divided arterial generally oriented north–south, with two travel lanes in each direction. Route 11 narrows to one lane in each direction south of Paʻahana Street/Naʻauao Road and north of Kipimana Street. No sidewalks, curbs, gutters, on-street parking or designated bike facilities exist along the corridor. Marked shoulders of variable width—ranging from 8 to 24 feet—exist on both sides. The posted speed limit is 45 miles per hour (MPH), decreasing to 35 MPH near Route 139 before returning to 45 MPH beyond the commercial area of Keaʻau. Route 11 is known by various names, including Kanoelehua Avenue, Māmalahoa Highway, Hawaiʻi Belt Road, Volcano Road, Kuakini Highway, and Queen Kaʻahumanu Highway Extension. To avoid confusion, the name "Route 11" will be used throughout this report.

2. State Route 130

Route 130 is a State-owned small urban minor arterial, generally oriented north–south, with two travel lanes in each direction. Approximately 2,200 feet north of its intersection with Route 139, it becomes divided by a concrete and grass median. No sidewalks, curbs, gutters, on-street parking or dedicated bike facilities exist in the Medical Clinic area. Marked shoulders ranging from 4 to 24 feet are present on both sides. The posted speed limit in the area is 45 MPH. Route 130 is also known by several names, including Keaʻau–Pāhoa Bypass Road, Keaʻau–Pāhoa Road, Pāhoa–Kalapana Road, and Kaimu–Chain of Craters Road. To avoid confusion, the name "Route 130" will be used throughout this report.

3. State Route 139

Route 139 is a State-owned two-way roadway, generally oriented east–west, with one travel lane in each direction. Within the commercial area of Keaʻau, it is divided by a concrete and grass median, transitioning to an undivided roadway south of its intersection with Old Volcano Road. Dedicated turn lanes are provided at major intersections. Paved sidewalks exist on both sides fronting the commercial area and Keaʻau Elementary School, extending approximately 300 feet from Old Volcano Road and continuing along the westbound (WB) direction. Bike lanes are located on the WB side between the Keaʻau High School northern driveway and southern exit driveway. Marked shoulders ranging from 4 to 10 feet are present along the entire WB side, while the eastbound (EB) side has intermittent shoulders ranging from 2 to 10 feet in width. The posted speed limit is 25 MPH. Route 139 is also known as Old Keaʻau-Pāhoa Road but to confusion, the name "Route 139" will be used throughout this report.

4. Naʻauao Road

Naʻauao Road is a privately-owned roadway extending approximately 630 feet west from its intersection with Route 11 to a guard shack owned and operated by the Kamehameha Schools Bishop Estate (Bishop Estate) trust. Naʻauao Road is classified as a local collector, generally oriented east–west. No sidewalks, curbs, gutters, on-street parking or designated bike facilities exist. The posted speed limit is 25 MPH.

5. Paʻahana Street

Paʻahana Street is a two-way, County of Hawaiʻi (COH)-owned, undivided local collector generally oriented east–west. East of Palula Place, it narrows to a one-lane roadway with two-way operations. A 20-foot centerline is marked in both directions at each intersection. No sidewalks, curbs, gutters, on-street parking or designated bike facilities exist along the corridor. Speed humps are located between Palula Place and Meaulu Street, and between Palaʻai Street and Ipuaiwaha Street. The posted speed limit is 25 MPH.

6. Shipman Park Driveway

Shipman Park Driveway extends internally within the park's off-street parking lot to Route 11 across of Route 139. No sidewalks, curbs, gutters, on-street parking or designated bike facilities exist along the roadway. There is no posted speed limit.

7. Proposed Medical Clinic Roadway

As part of this project, a new roadway is proposed to be constructed off Route 11 and Route 139 to connect the Medical Clinic to Shipman Park Driveway at Route 11. The proposed Medical Clinic roadway will pass through privately owned land. The proposed Medical Clinic roadway is proposed to run east-west from Shipman Park Driveway before turning north-south, connecting to the proposed Medical Clinic.

B. Study Intersections

The trip distribution section of this TIAR will detail how most project trips are expected to originate from or travel to the communities of Keaʻau, Pāhoa, or Mountain View, with a limited number associated with Hilo due to the travel distance and proximity to existing alternative facilities. Given these travel patterns, the Medical Clinic project trips are not anticipated to create any significant impacts at the intersection of Route 11 and Kipimana Street and therefore analysis of this intersection was determined to be unnecessary.

Separately, the intersection of Old Volcano Road and Route 139 was analyzed in three previous traffic reports in the area from 2020, 2023, and 2024. The intersection operated at an acceptable level of service (LOS) C or better in each report and was therefore assumed not to require further analysis.

Four study intersections were analyzed as a part of the proposed Medical Clinic. The existing lane configurations are shown in Figure 3.

1. Route 11 and Route 130

The intersection of Route 11 and Route 130 is a three-leg signalized intersection operating under actuated traffic signal control. The northbound (NB) approach on Route 11 consists of two through lanes and a channelized, yield-controlled right-turn lane. The southbound (SB) approach has two through lanes and two dedicated left-turn lanes operating under protected traffic signal phasing. The WB approach on Route 130 includes one dedicated left-turn lane with protected traffic signal phasing and two channelized, free-flowing right-turn lanes. Signal cycle lengths varied between the AM and PM peak periods, with the WB phase skipped when no vehicles were present. U-turns are prohibited at all left-turn locations. Marked crosswalks are present on the south leg of Route 11 and the east leg of Route 130.

Approximately 750 feet north of the intersection, Route 11 drops from four lanes to three lanes, Route 11 drops another lane, from three lanes to two lanes, about 0.70 miles north of Route 11 and Route 130. The combination of these lane drops with the significant NB volumes requires merging that result in long queues for the NB approach at times. During these times, vehicle queues reach Route 130, resulting in NB through vehicles not being able to enter the intersection. Therefore, traffic volumes counted during the AM peak hour is less than the traffic demand.

2. Route 11 and Route 139/Shipman Park Driveway

The intersection of Route 11 and Route 139 is a four-way signalized intersection operating under actuated traffic signal control. The NB and SB approaches of Route 11 each have a dedicated left-turn lane with protected traffic signal phasing, a through lane, and a shared through–right lane. Channelized, yield-controlled right turns are provided on the NB and WB approaches. The Route 139 approach consists of a shared left–through lane and a separate right-turn lane, while the Shipman Park Driveway approach has a shared left-through-right lane. Traffic signal cycle lengths varied between the AM and PM peak periods, with the NB and SB phases being skipped when no vehicles were present. Marked crosswalks exist on all legs of the intersection. As part of the proposed Medical Clinic, a new roadway will extend from Route 11 and Route 139 to connect the Medical Clinic with Route 11 at the Shipman Park Driveway.

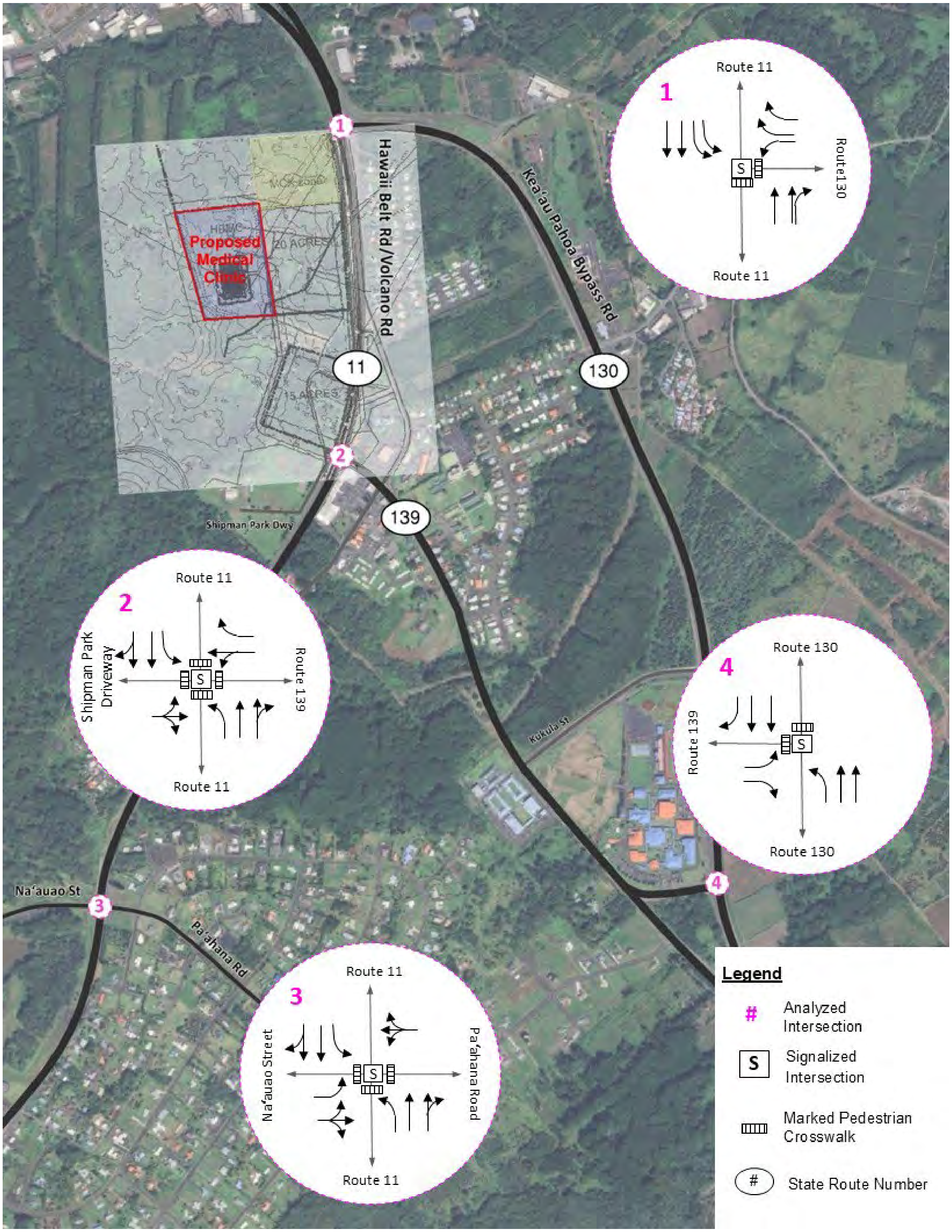


Figure 3: Existing (2025) Lane Configuration

3. Route 11 and Paʻahana Street/Naʻauao Road

The intersection of Route 11 and Paʻahana Street/Naʻauao Road is a four-leg, signalized intersection. The NB approach consists of one through lane, a dedicated left-turn lane, and a dedicated right-turn lane, with approximately 325 feet of storage. The SB approach includes one through lane, a dedicated left-turn lane, and a shared through–right lane, with approximately 450 feet of storage. The Naʻauao Road EB approach has a dedicated left turn lane and a shared left-through-right turn lane. The Paʻahana Street WB approach has a shared left-through-right turn lane. All left-turn movements operate with protected traffic signal phasing, and the EB and WB approaches operate with split phasing. Signal cycle lengths varied between the AM and PM peak periods, with the WB phase, NB left phase, and SB left phase being skipped when no vehicles were present, suggesting the intersection has actuated timing. Marked crosswalks exist on the western, southern, and eastern legs of the intersection.

4. Route 130 and Route 139

The intersection of Route 130 and Route 139 is a signalized T-intersection. The NB approach consists of two through lanes and a dedicated left-turn lane with approximately 1,350 feet of storage. The SB approach has two through lanes and a dedicated, channelized, yield-controlled right-turn lane with approximately 400 feet of storage. The EB approach includes a dedicated left-turn lane and a right-turn lane with permitted-overlap traffic signal phasing; both turn lanes are approximately 450 feet long. Traffic signal cycle lengths varied between the AM and PM peak periods. The signage prohibiting the EB right turn on red arrow is no longer present. Therefore, in accordance with the 2024 Hawaiʻi Revised Statutes §291C-32, a right turn on red is permitted after a complete stop and yielding to oncoming traffic and pedestrians, unless prohibited by signage. U-turn movements are prohibited for all left turns at this location.

C. Nearby Attractions and Destinations

1. HDOE Schools

There are three State of Hawaiʻi Department of Education (HDOE) public schools in the area: Keaʻau Elementary School, Keaʻau Middle School, and Keaʻau High School. Keaʻau Elementary School is located just east of the proposed Medical Clinic along Route 139 near the intersection of Kukula Street. Keaʻau Middle School is located near the Old Volcano Road and Route 139 intersection. Keaʻau High School is located along Route 139 near the intersection of Old Keaʻau-Pāhoa Road. Each school has a slightly different bell schedule. The AM traffic counts captures the school morning peak hours. The PM traffic count occurs later in the day and does not capture the after school peak hour but may have captured some of the parents who may still be in the process of picking up their students from school.

2. Kamehameha Schools

The Kamehameha Schools Hawaiʻi Island campus, located off Naʻauao Road, provides education to students from kindergarten through 12th grade. School starts at 7:45 AM and ends at 2:30 PM and 2:45 PM for *even* days and *odd* days, respectively. The AM traffic counts captures the school morning peak hours. The PM traffic count occurs later in the day and does not capture the after school peak hour but may have captured some of the parents who may still be in the process of picking up their students from school.

3. Keaʻau Public Library

Keaʻau Public Library is currently located on the Keaʻau Middle School campus at the southeast corner of the intersection of Old Volcano Road and Route 139. The library has varying operating hours, opening at 9:00 AM or 12:00 PM and closing at 4:00 PM or 7:00 PM. The library is proposed to be replaced by a 12,000 sf public library and 42-stall parking lot located in the currently empty grassy field closer to Route 139. The new library is scheduled to be completed by 2027.

4. Keaʻau Shopping Center

Keaʻau Shopping Center is bound by Route 11, Route 139, and Old Volcano Road. This shopping center has a variety of tenants including retail, fast-casual restaurants, and service providers. Major anchor stores include Foodland and Ace Hardware. The shopping center operating hours are from 6:00 AM to 9:00 PM, seven days a week.

5. Herbert Shipman Park

Herbert Shipman Park is located west of the intersection of Route 11 and Route 139. The park includes two tennis courts, a baseball field, a basketball court, a playground, a public restroom, and approximately 50 parking stalls. According to the COH Department of Parks & Recreation, the park also includes the Keaʻau Armory and the Buddy Perry Soccer Field. The parking lot to Shipman Park is open between 7:00 AM and 7:00 PM. The gated driveway to the Keaʻau Armory is open between 7:00 AM and 8:00 PM.

6. Transit Facilities

The COH operates the *Hele-On Bus (COH Bus)* throughout the island, of which five routes operate within the vicinity of the proposed Medical Clinic:

- Route 10 (Hilo to Ocean View)
    - Bus Route 10 operates a one-way round trip that begins in Hilo and ends in Kailua-Kona before returning to Hilo. Only one round trip is provided each day. The eastbound trip leaves Ocean View in Kona at 6:40 AM and arrives in Hilo at 9:08 AM. The returning westbound trips leaves Hilo at 3:30 PM and arrives in Ocean View at 6:04 PM. Within the vicinity of the proposed Medical Clinic, Route 10 stops at the intersection of Route 139 and Old Volcano Road.

- Route 11 (Red Line – Hilo to Volcanos National Park)
  - Bus Route 11 provides five round trips daily from Hilo to Hawaiʻi's Volcanoes National Park and back to Hilo. A total of two AM, one midday, and two PM round trips are provided. The first trip from Hilo to the Volcanoes National Park leaves Hilo at 5:00 AM. The last scheduled departure from Hawaiʻi's Volcanoes National Park leaves at 6:15 PM and arrives in Hilo at 7:22 PM. Within the vicinity of the proposed Medical Clinic, Route 10 stops at the intersection of Route 139 and Old Volcano Road.
- Route 40 (Hilo to Pāhoa)
  - Bus Route 40 provides 17 round trips from Hilo to Pāhoa. The first scheduled departure from Pāhoa leaves at 5:30 AM with busses running every hour. The last scheduled departure from Pāhoa leaves at 9:30 AM and returns to Hilo at 10:27 PM. Within the vicinity the proposed Medical Clinic, Bus Route 40 has six stops.
- Route 402 (Hawaiian Paradise Park/Hawaiian Acres/Ainaloa)
  - Bus Route 402 provides eight round trips from Pāhoa to Keaʻau. The first scheduled departure leaves from Hawaiian Acres at 5:00 AM and arrives in Pāhoa at 5:30 AM. The remaining departures from Pāhoa will make the full round trip from Pāhoa to Keaʻau with busses running every two hours. The last scheduled departure from Pāhoa leaves at 7:30 PM and arrives in Keaʻau at 8:25 PM. Within the vicinity of the proposed Medical Clinic, Route 10 stops at the intersection of Route 139 and Old Volcano Road.
- Route 403 (Fern Acres)
  - Bus Route 403 provides five round trips from Keaʻau to Forest Fern. The first scheduled departure form Keaʻau levaes at 9:00 AM with busses running every two hours. The last scheduled departure from Keaʻau leaves at 5:10 PM and arrives in Forest Fern at 5:45 PM. Within the vicinity of the proposed Medical Clinic, Route 10 stops at the intersection of Route 139 and Old Volcano Road.

COH bus routes and stops within the vicinity of the proposed Medical Clinic are shown in Figure 4. Most routes travel along Route 11, turn onto Old Volcano Road, and stop at the Route 139/Old Volcano Road bus stop before returning to Route 11. The exception is Route 40, which serves Route 139 and Keaʻau High School. Bus drivers will also stop for riders who flag them down, provided there is a safe location to pull over. The COH bus system offers connections to numerous other routes serving the entire island. COH bus fares are free through December 31, 2025.

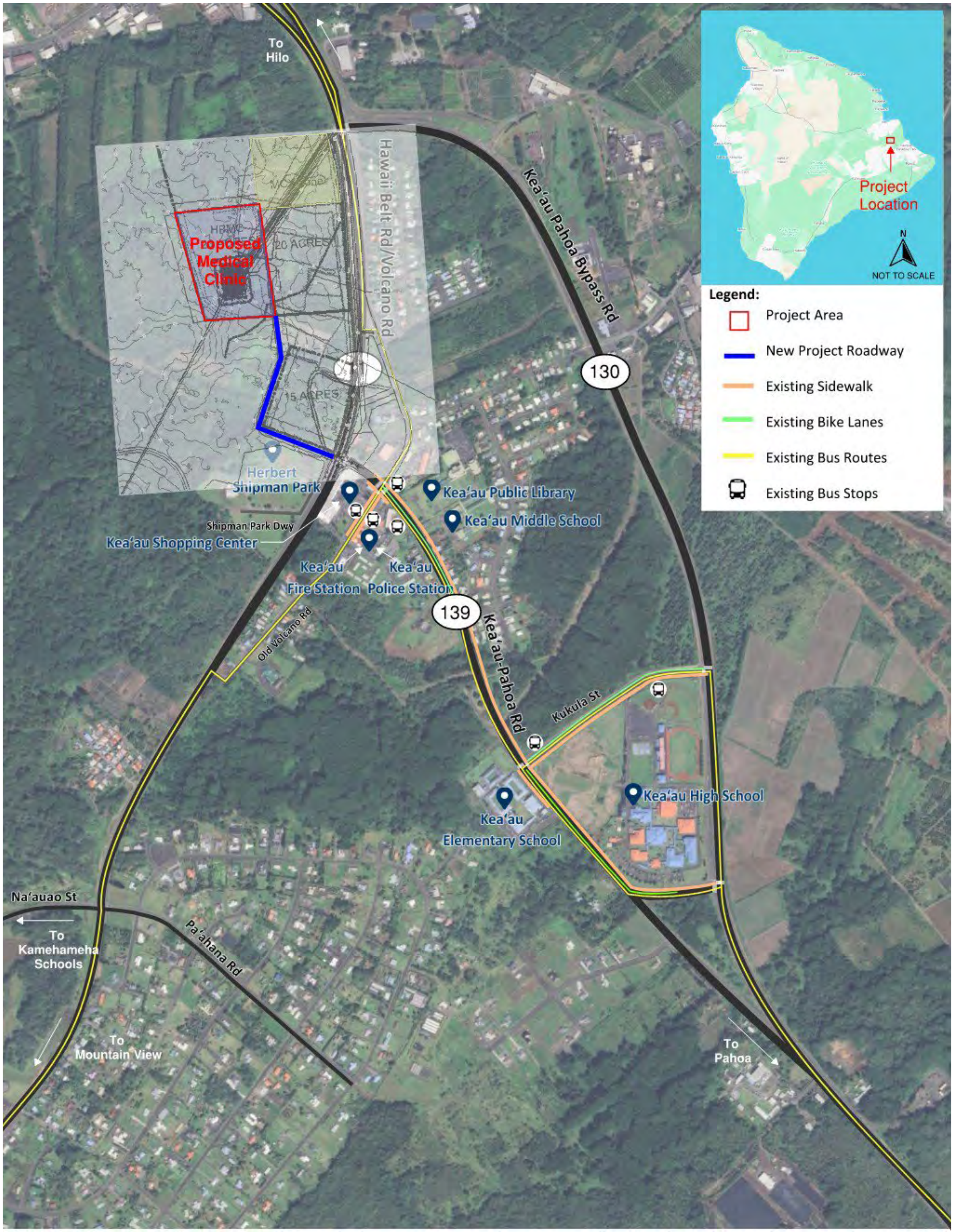


Figure 4: Existing (2025) Nearby Attractions, Destinations, and Multimodal Facilities

D. Vehicle Volumes

1. 24-Hour Volume

Historic Hawai'i Department of Transportation (HDOT) Annual Average Daily Traffic (AADT) counts were available between the years 2016 and 2022. Three HDOT stations were identified within the vicinity of the proposed Medical Clinic based on their proximity to regional travel routes:

- Route 11 between Old Volcano Road to Pa'ahana Street,
- Route 130 between Keaau Bypass Road to Kukula Street,
- Route 139 between Keaau Pahoa Road to Kea'au Kula Road.

Table 1 summarizes the AADT along all three HDOT stations identified along with its respective calculated growth rate from 2016-2022. The historic HDOT data can be found in Appendix A.

Table 1: Historic HDOT 2016-2022 AADT

Station	Location	Year	AADT	Growth Rate 2016-2022
B71001100777	Route 11 between Old Volcano Road and Pa'ahana Street	2016	19,400	3.86%
		2017	22,000	
		2018	22,000	
		2019	19,800	
		2020	17,400	
		2021	24,400	
		2022	24,351	
B71013900070	Route 139 Between Kea'au Pahoa Road to Kea'au Kula Road	2016	7,600	1.03%
		2017	7,100	
		2018	8,600	
		2019	8,600	
		2020	7,000	
		2021	8,100	
		2022	8,084	
B71013000138	Route 130 Between Kukula Street to Kea'au Bypass Road	2016	23,400	0.46%
		2017	23,634	
		2018	23,900	
		2019	24,330	
		2020	21,600	
		2021	24,100	
		2022	24,052	

2. Intersection Peak Turning Movement Counts

Turning movement counts were taken at the four study intersections on Wednesday, May 7, 2025, from 6:30–8:30 AM and 3:00–5:00 PM. AM and PM peak hours varied between the study intersections. Given that the Medical Clinic Roadway is proposed off Route 11 and Route 130, the Route 11 and Route 130 AM and PM peak hour was used for the remaining study intersections. The resulting peak hours were identified to be 6:45-7:45 AM and 3:00-4:00 PM, respectively. The AM and PM peak hour volumes at the study intersections are shown in Figure 5. Traffic count data at the study intersections are included in Appendix A.

3. Pedestrian and Bicycle Volumes

Peak hour intersection pedestrian and bicycle volumes were taken at the four study intersections on Wednesday, May 7, 2025, from 6:30–8:30 AM and 3:00–5:00 PM. Table 2 summarizes the total pedestrian and bicycle volume counted during the AM and PM peak hours. Generally, pedestrian and bicycle volumes remained low to none during both the AM and PM peak. However, pedestrian and bicycle volumes peaked during the PM hour at the intersection of Route 11 and Route 139. Pedestrian and bike at the study intersections are included in Appendix A.

Table 2: Peak Hour Pedestrian and Bicycle Volumes

Intersection	Pedestrian Volume		Bicycle Volume	
	AM Peak	PM Peak	AM Peak	PM Peak
Route 11 at Route 130	0	0	0	1
Route 11 at Route 139	0	12	0	3
Route 11 at Pa'ahana Street/Na'auao Road	1	0	0	0
Route 130 at Route 139	0	0	1	1

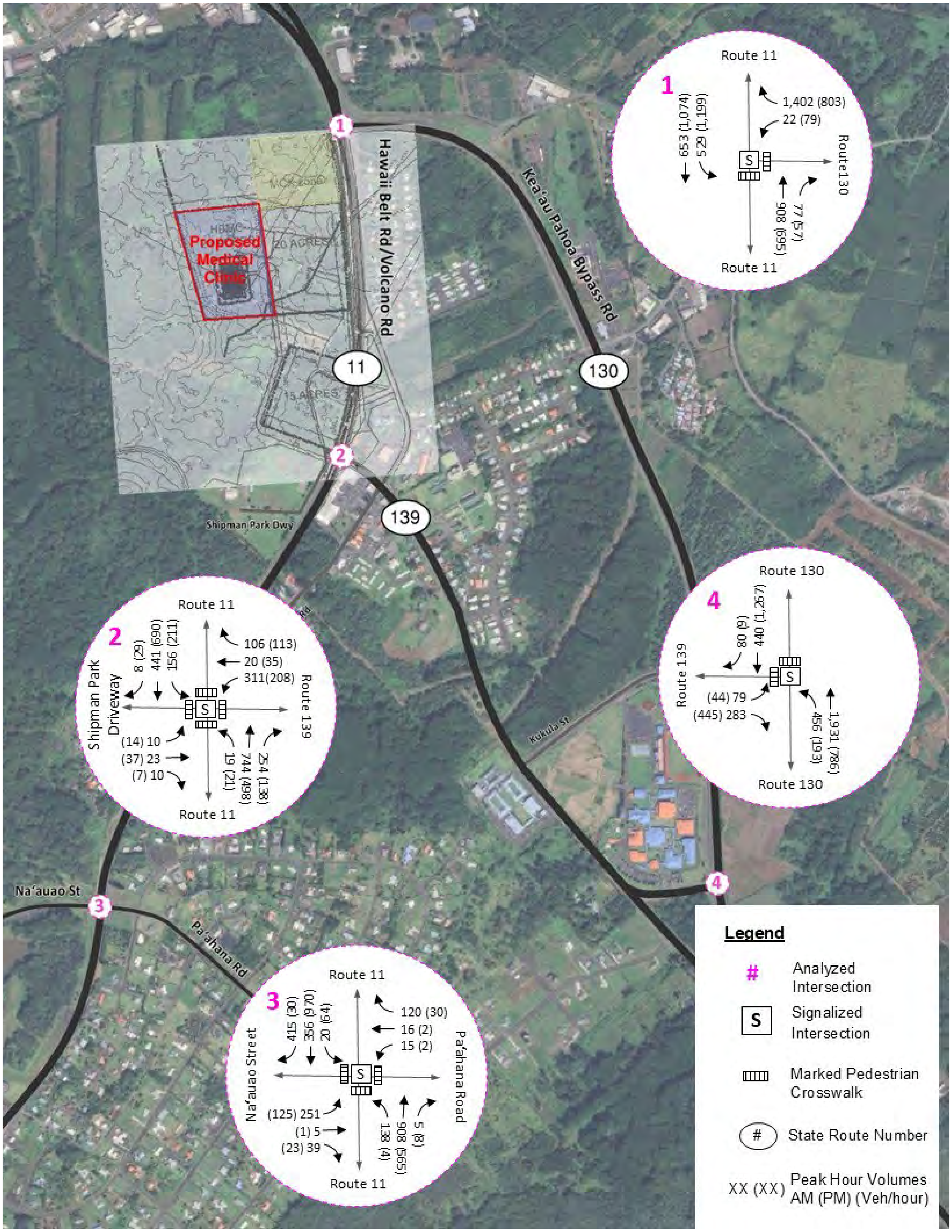


Figure 5: Existing (2025) Intersection Peak Hour Volumes

E. Highway Capacity Manual

LOS is a rating system used in traffic engineering to measure the effectiveness of roadway operating conditions. There are six LOS ranging from A to F. LOS A is defined as being the least interrupted flow conditions with little or no delays, whereas LOS F is defined as conditions where extreme delays exist. Intersection LOS and delay was determined for the AM and PM peak hours using Synchro Version 11.0 traffic analysis software which is based on the methodologies from the *Highway Capacity Manual 6th Edition* (*HCM6*) (TRB, 2016).

The *HCM6* was not able to be used to analyze Route 11 at Route 130, Route 139/Shipman Park Driveway and the Route 130 at Route 139 intersection as it does not analyze approaches that have both dedicated and shared turn lanes serving the same movement. The intersection of Route 11 at Pa'ahana Street/Na'auao Road has a dedicated left turn lane and a shared left-through-right turn lane and cannot be analyzed using *HCM6*. Therefore, the *Highway Capacity Manual 2000* (HCM2000) (TRB, 2000) was used to analyze the Route 11 at Pa'ahana Street/Na'auao Road intersection.

1. HCM6

The LOS analysis for signalized intersections is determined by average total vehicle delay based on the methodologies of the *HCM6* shown in Table 3. High numbers of vehicles passing through the intersection, long cycle lengths, inappropriate signal phasing, or poor signal progression can result in long delays, and consequently poor LOS.

Table 3: HCM6 LOS Criteria for Signalized Intersections

Average Control Delay (s/veh)	LOS by v/c Ratio	
	<=1.0	>1.0
≤10.0	A	F
>10 and ≤20	B	F
>35 and ≤55	C	F
>35 and ≤55	D	F
>55 and ≤80	E	F
>80	F	F

Another measure of intersection operation is the volume to capacity (v/c) ratio. This is the ratio of the volume of traffic utilizing the intersection compared to the maximum volume of vehicles that can be accommodated by the intersection during a specific period of time. A v/c ratio under 0.85 means the intersection is operating under capacity and excessive delays are not experienced. An intersection is operating near its capacity when v/c ratios range from 0.85 to 0.95. Unstable flows are expected when the v/c ratio is between 0.95 and 1.0. Any v/c ratio greater than or equal to 1.0 indicates that the intersection is operating at or above capacity which results in a LOS F per the *HCM6* (TRB, 2016). A traffic movement can have a poor LOS but low v/c which suggests that the traffic volumes along that movement are low but may have to wait a longer time to make the movement which may be due to longer cycle lengths or vehicles waiting for a sufficient gap before making left-turns.

2. HCM2000

The LOS analysis for signalized intersections were determined by control delay based on the methodologies of the *HCM2000* (TRB, 2000). The average control delay per vehicle for each lane group is aggregated to obtain the total control delay for each approach and for the intersection. Table 4 outlines the different LOS delay thresholds for signalized intersections according to the HCM2000. Unlike the *HCM6, HCM2000* does not utilize v/c ratios as part of the LOS threshold. However, v/c ratios were still calculated.

Table 4: HCM2000 LOS Criteria for Signalized Intersections

Average Control Delay (s/veh)	LOS
≤10.0	A
>10 and ≤20	B
>35 and ≤55	C
>35 and ≤55	D
>55 and ≤80	E
>80	F

F. Existing (2025) Intersection LOS Results

Existing (2025) intersection and movement LOS and delay (in seconds per vehicle) were determined for the AM and PM peak hours using *Synchro 11* traffic analysis software. Field observations confirmed that all signalized intersections operate with actuated control, and therefore, signal timings were optimized for all intersections prior to analysis. Existing (2025) traffic operations are shown in Table 5, with movements operating at LOS E or worse highlighted in yellow. The overall intersections operate at an acceptable LOS however, several left-turn movements operate at LOS E or worse. These delays result from the traffic signal prioritizing major movements. Green times for all left turn phases appeared to be adjusted to allow the queues clear the intersection each cycle. Existing (2025) Synchro worksheets can be found in Appendix B.

Table 5: Existing (2025) LOS

Intersection Movement	AM Peak			PM Peak		
	LOS	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c
Route 11 and Route 130	**B**	**13.0**	**-**	**B**	**18.3**	**-**
Route 11 NB Through	B	13.3	0.66	C	26.1	0.73
Route 11 SB Left	C	25.2	0.82	C	3.0	0.88
Route 11 SB Through	A	1.9	0.28	A	34.7	0.41
Route 130 WB Left	C	32.5	0.49	C	26.5	0.62
Route 11 and Route 139/Shipman Park Driveway	**C**	**23.0**	**-**	**C**	**22.5**	**-**
Route 11 NB Left	D	35.8	0.48	C	32.9	0.48
Route 11 NB Through-Right	C	22.1	0.79	B	19.9	0.68
Route 11 SB Left	E	63.4	0.89	E	60.9	0.92
Route 11 SB Through-Right	B	13.7	0.37	B	16.3	0.63
Shipman Park EB Left-Through-Right	B	12.5	0.07	B	11.2	0.08
Route 139 WB Left-Through	B	19.3	0.56	B	14.5	0.39
Route 11 and Paʻahana Street/Naʻauao Road	**C**	**24.3**	**-**	**C**	**20.8**	**-**
Route 11 NB Left	D	41.6	0.71	E	69.1	0.31
Route 11 NB Through-Right	B	19.6	0.68	A	9.8	0.29
Route 11 SB Left	D	46.0	0.52	E	61.2	0.61
Route 11 SB Through	C	26.4	0.65	B	19.0	0.82
Route 11 SB Right	B	19.6	0.29	A	5.7	0.02
Paʻahana EB Left	C	31.3	0.60	D	50.6	0.43
Paʻahana EB Left-Through-Right	C	29.1	0.52	D	52.3	0.53
Naʻauao WB Left-Through-Right	C	30.5	0.28	D	53.8	0.09
Route 130 and Route 139	**B**	**17.2**	**-**	**C**	**25.9**	**-**
Route 130 NB Left	D	40.4	0.91	E	59.4	0.87
Route 130 NB Through	B	11.5	0.84	A	7.9	0.39
Route 11 SB Through	B	19.6	0.43	C	32.1	0.92
Route 139 EB Left	C	24.9	0.28	C	21.6	0.10
Route 139 EB Right	B	12.3	0.41	C	25.7	0.76

1. Route 11 and Route 130

Route 11 and Route 130 operates at LOS B and LOS C during the AM and PM peak hour, respectively. All movements operate at LOS C or better. No mitigation is recommended for this intersection.

It should be noted that field observations showed queues along the NB through and WB right during the AM peak hour. This is likely due to the two lane drops located approximately 750 feet and 3,700 feet (0.70 miles) north of the intersection that result in four lanes of traffic merging into two lanes. The queues were observed to not last long, but it is noticeable as vehicles in the NB through and WB right lanes are sometimes delayed from moving through the intersection.

2. Route 11 and Route 139/Shipman Park Driveway

The intersection of Route 11 and Route 139 operate at LOS C for both the AM and PM peak hour. The SB left turn operates at LOS E during both peak hours, with a v/c of 0.89 and 0.92 during the AM and PM peak hour, respectively. The SB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. All other movements operate at LOS D or better. No mitigation is recommended for this intersection.

3. Route 11 and Paʻahana Street/Naʻauao Road

The intersection of Route 11 and Paʻahana Street/Naʻauao Road operates at LOS C during both the AM and PM peak hour. The NB and SB left turns operate at LOS E (v/c of 0.31 and 0.61, respectively). The higher v/c ratio may be due to the limited green time allocated to this movement. The NB and SB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. All other movements operate at LOS D or better during both peaks. No mitigation is recommended for this intersection.

4. Route 130 and Route 139

The intersection of Route 130 and Route 139 operates at LOS B and LOS C during the AM and PM peak hour, respectively. The Route 130 northbound left turn movement operates at LOS E (v/c of 0.87) during the PM peak hour. The NB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. All other movements operate at LOS D or better during both peaks. No mitigation is recommended for this movement.

III. Future (2028) Without Project Conditions

Regional traffic growth and future surrounding area development traffic were added to the roadway network and analyzed for the 2028 Opening Year.

A. Background Growth Rate

Historical HDOT counts between the years 2016-2022 were identified in the vicinity of the proposed Medical Clinic on Route 11, Route 130, and Route 139 along with its respective calculated growth rate (see Table 1). Separately, the *Federal-Aid Highways 2035 Transportation Plan for the District of Hawai‘i* (CH2M Hill, 2014) forecasts a compounded annual increase of 2.12% in the planning district of Puna between 2020 to 2035.

In the surrounding area, both the *Kea‘au Villages Master Plan TIAR* and the *Kea‘au Mountain View Public Library TIAR* applied a de facto growth rate of 0.50%, derived from the 2035 Travel Demand Forecasting Model. For the proposed Medical Clinic, a higher forecasted growth rate of 2.12% was used to better reflect anticipated future growth and account for developments that may be completed but not individually included in the 2028 background growth. Therefore, a 2.12% compounded annual growth rate was applied to through volumes along Route 11, Route 130, and Route 139, as well as to the southbound left-turn movement from Route 11 to Route 130 and the westbound right-turn movement from Route 130 to Route 11, given their regional significance between Hilo and Pahoa.

B. Upcoming Planned Projects

1. STIP

Research was completed on July 31, 2025 at the *Statewide Transportation Improvements Program* (STIP) FY 2025-2028 website. The STIP is a four-year forecast that identifies state and county transportation projects to be funded with Federal Highway and Federal Transit funds. The latest STIP was revised and processed on June 16, 2025. One project was identified within the vicinity of the proposed Medical Clinic which may impact traffic operations.

a) HS17 Keaau-Pahoa Route (RTE 130) Improvements, Keaau Bypass to Pahoa-Kapoho Road

The HS17 Keaau-Pahoa Route (RTE 130) Improvements, Keaau Bypass to Pahoa-Kapoho Road proposes to improve traffic circulation and safety along Route 130. The estimated project cost is $19,000,000. There is no estimated construction timeline available.

2. OEQC

Research was completed on July 31, 2025 at the State of Hawai‘i *Office of Environmental Quality Control* (OEQC) website. The OEQC website provides Environmental Impact Statement (EIS) and Environmental Assessments (EA) available to the public. As of July 2021, the OEQC was renamed the Environmental Review Program (ERP), but the URL led to the old OEQC website. Projects from the OEQC website in the surrounding area from (2020-2025) were reviewed. Two projects were identified to impact the proposed Medical Clinic.

a) Keaʻau Villages Master Plan

W.H. Shipman Limited is proposing to develop the *Keaʻau Villages Master Plan (Wilson Okomoto, 2020)* which will include residential, office, hotel, commercial and retail uses. This masterplan is an update to the previous 2016 *Traffic Impact Report for the Keaʻau Villages Master Plan Phase 1 & 2* to incorporate changes to the project development plan. The Keaʻau Villages is proposed to be constructed in three major phases. The completion years for Phase 1, Phase 2, and Phase 3 was estimated to be 2023, 2028, and 2038, respectively. However, the Keaʻau Villages Master Plan appears to be significantly delayed, and existing conditions show that construction has not yet started. Given this, it is assumed that no construction will begin within the three-year timeframe between the Existing conditions and the Keaʻau Villages Master Plan Future occupation year. Therefore, it is expected that the development of the Keaʻau Villages would not impact the traffic operations of the proposed Medical Clinic.

b) Keaʻau Mountain View Public Library (ATA, 2023)

The *Keaʻau Mountain View Public Library TIAR* analyzed a proposed 12,000 sf public library with 42 parking stalls located northeast of the intersection of Route 139 and Old Volcano Road. The proposed library will replace the existing library located on Keaʻau Middle School and Mountain View Elementary School campus. The library is anticipated to be completed in 2027 and therefore will be included in this proposed Medical Clinic's future analysis. The library is proposed to generate 42 and 43 AM and PM peak hour trips, respectively. Applicable library generated trips were included in the Future Without Project and Future With Project conditions. Library generated trips were distributed using Existing (2025) traffic patterns.

C. Future (2028) Without Project Traffic Volumes

The Future (2028) Without Project traffic volumes were calculated by adding the trips generated from the Keaʻau Public Library with the 2028 background growth volume (see Figure 6).

D. Future (2028) Without Project LOS

Future (2028) Without Project intersection and movement LOS and delay (in seconds per vehicle) were determined for the AM and PM peak hours using *Synchro 11* traffic analysis software. Results are shown in Table 6. Signal timings were optimized for analysis. Movements that operate at LOS E or worse are highlighted in yellow and discussed below. Future (2028) Without Project Synchro worksheets can be found in Appendix C.

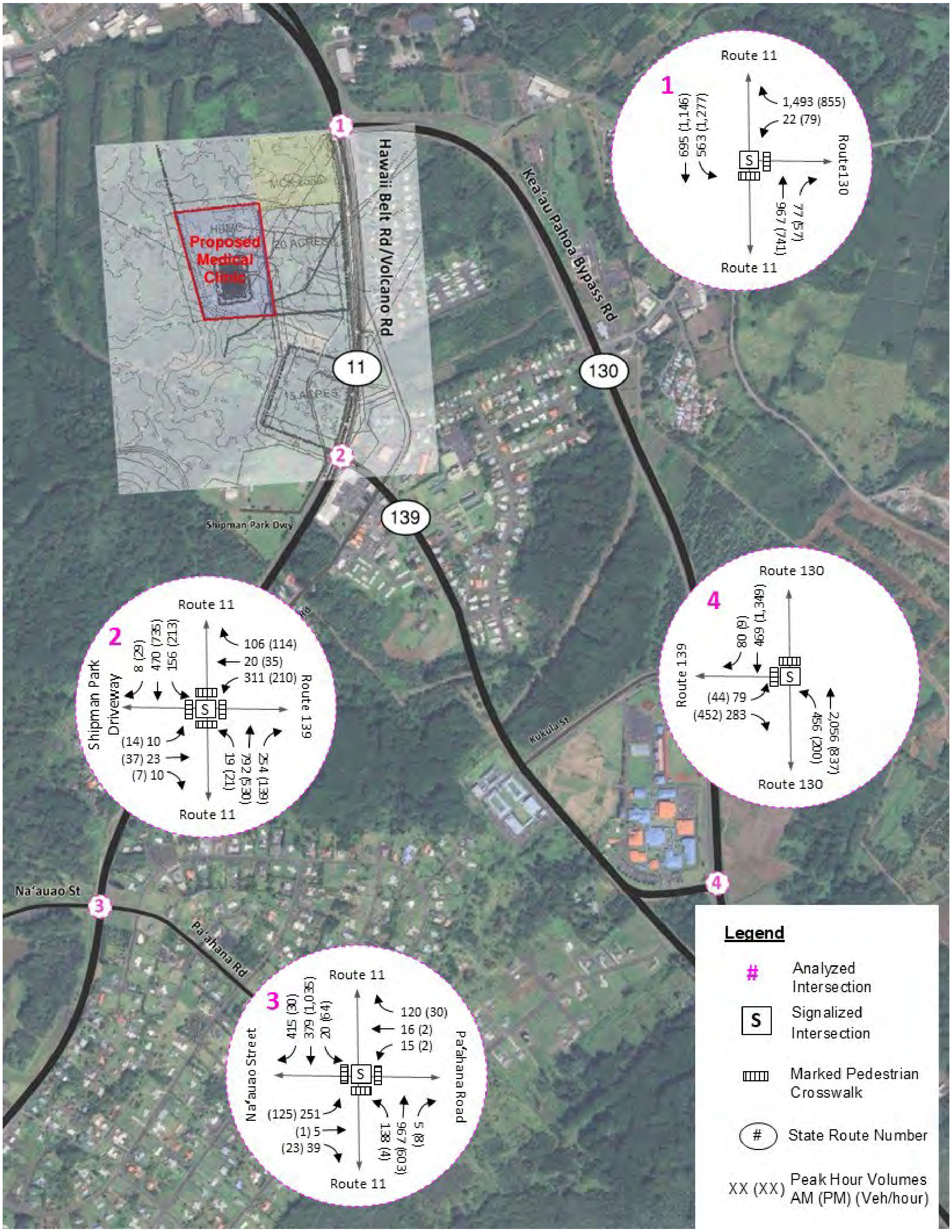


Figure 6: Future (2028) Without Project Intersection Peak Hour Volumes

Table 6: Future (2028) Without Project LOS

Intersection Movement	AM Peak			PM Peak		
	LOS	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c
Route 11 and Route 130	**B**	**13.9**	-	**C**	**20.2**	-
Route 11 NB Through	B	14.2	0.69	C	29.3	0.79
Route 11 SB Left	C	27.5	0.84	C	29.3	0.92
Route 11 SB Through	A	1.8	0.30	A	3.1	0.44
Route 130 WB Left	D	35.3	0.50	D	35.4	0.62
Route 11 and Route 139/Shipman Park Driveway	**C**	**23.2**	-	**C**	**23.3**	-
Route 11 NB Left	D	38.5	0.49	C	33.3	0.48
Route 11 NB Through-Right	C	24.2	0.81	B	19.9	0.69
Route 11 SB Left	D	52.5	0.83	E	66.3	0.94
Route 11 SB Through-Right	B	14.2	0.37	B	16.9	0.66
Shipman Park EB Left-Through-Right	B	13.5	0.07	B	11.5	0.08
Route 139 WB Left-Through	C	20.6	0.56	B	14.9	0.39
Route 11 and Pa'ahana Street/Na'auao Road	**C**	**25.0**	-	**C**	**22.4**	-
Route 11 NB Left	D	49.3	0.78	F	86.1	0.36
Route 11 NB Through-Right	C	20.6	0.73	A	9.8	0.29
Route 11 SB Left	D	46.1	0.52	E	72.5	0.63
Route 11 SB Through	C	26.4	0.67	B	19.9	0.84
Route 11 SB Right	B	19.1	0.29	A	5.4	0.02
Pa'ahana EB Left	C	31.4	0.60	E	64.4	0.57
Pa'ahana EB Left-Through-Right	C	29.2	0.52	E	61.4	0.48
Na'auao WB Left-Through-Right	C	30.6	0.28	E	63.2	0.08
Route 130 and Route 139	**B**	**18.1**	-	**C**	**26.8**	-
Route 130 NB Left	D	39.8	0.91	E	61.9	0.88
Route 130 NB Through	B	13.1	0.87	A	7.6	0.40
Route 11 SB Through	C	20.2	0.43	C	32.6	0.93
Route 139 EB Left	C	27.3	0.29	C	24.0	0.11
Route 139 EB Right	B	13.4	0.41	C	30.0	0.80

1. Route 11 and Route 130

Route 11 and Route 130 is projected to operate at LOS B and LOS C during the AM and PM peak hour, respectively. All movements are projected to operate at LOS D or better.

2. Route 11 and Route 139/Shipman Park Driveway

The intersection of Route 11 and Route 139 is projected to operate at LOS C for both the AM and PM peak hour. The SB left turn is projected to operate at LOS E (v/c of 0.94) during the PM peak hour. The existing SB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. The future SB left turn queue is expected to also clear every cycle. All other movements are projected to operate at LOS D or better. No mitigation is recommended for this intersection.

3. Route 11 and Pa'ahana Street/Na'auao Road

The intersection of Route 11 and Pa'ahana Street/Na'auao Road is projected to operate at LOS C during both the AM and PM peak hour. Several movements operate at LOS E or worse during the PM peak hour. The delays are caused by a combination of the cycle length, the signal prioritizing the major NB and SB through movements, and the split phasing for the EB and WB approaches. The NB left turn is projected to operate at LOS F (v/c of 0.36) but with a volume of only 4 vph. The NB left turn will not have any issues clearing the intersection. The SB left turn is projected to operate at LOS E (v/c of 0.63) with a volume of 64 vph, or about one vehicle per minute. The SB left turn will not have any issues clearing the intersection. The EB left and shared left-through-right lanes are projected to operate at LOS E, with a v/c of 0.57 and 0.48 respectively. The WB approach is projected to operate at LOS E with a v/c of 0.08. The minor street volumes are not significant, and the delays are caused by the cycle length and split phasing. The EB and WB approaches are not expected to have any issues clearing the intersection.

4. Route 130 and Route 139

The intersection of Route 130 and Route 139 operates at LOS B and LOS C during the AM and PM peak hour, respectively. The Route 130 northbound left turn movement operates at LOS E (v/c of 0.88) during the PM peak hour. The NB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. All other movements operate at LOS D or better during both peaks. No mitigation is recommended for this movement.

IV. Future (2028) With Project Conditions

Current plans are for the development of a medical office building with approximately 40,000 sf of building space with an associated 204-stall off-street parking lot. As part of the proposed Medical Clinic, a new roadway is proposed to be built off the intersection of Route 11 and Route 139 extending from the Shipman Park Driveway to provide access into the new medical office. Clinic hours have not been determined at this time. Most of the clinics in the surrounding region, including Hilo, are in operation during the both the AM and PM peak hours and so for the purposes of this study, it was assumed the proposed Medical Clinic will be open during those time as well.

A. Future (2028) With Project Generated Volumes

The expected traffic from the proposed Medical Clinic was determined using the following four-step methodology: trip generation, trip distribution, modal choice, and route assignment.

1. Trip Generation

The trip generation methodology is typically based upon rates developed by the ITE and published in the *Trip Generation Manual, 11th Edition* (ITE, 2021). The ITE trip rates are developed by correlating the total vehicle trip generation data with various activity/land use characteristics. Clinic (ITE Code 630) was used to generate trips for the planned development. Trip generation rates are shown in Table 7.

Table 7: ITE Trip Generation – Equation and Rates for Medical Clinics

Land Use	ITE Code	Independent Variable	AM Peak Hour of Adjacent Street (7 to 9 AM)			PM Peak Hour of Adjacent Street (4 to 6 PM)		
			Equation	In %	Out %	Equation	In %	Out %
Clinic	630	1,000 SF GLA	T = 2.19(X) + 8.68	81	19	T = 3.53(X) + 2.98	30	70

The resulting Medical Clinic generated volumes are shown in Table 8.

Table 8: ITE Trip Generation – Medical Clinic Related Trips

Land Use	ITE Code	Independent Variable	AM Peak Hour of Adjacent Street (7 to 9 AM)			PM Peak Hour of Adjacent Street (4 to 6PM)		
			In Trips	Out Trips	Total	In Trips	Out Trips	Total
Clinic	630	1,000 SF GLA	78	18	96	43	101	144

2. Trip Distribution/Assignment

The surrounding area population and historic HDOT traffic volumes were used to determine the anticipated trip distribution of the proposed Medical Clinic. Population size was obtained from the 2020 U.S Census Bureau *Census Designated Places* (CDP) (see Figure 7). The CDPs within the east Hawai'i region were geologically divided into three sections based on their proximities to

Route 11, Route 130, and Route 139. The population for each CDP was aggregated to determine the percentage of residents within each grouping as shown in Table 9.

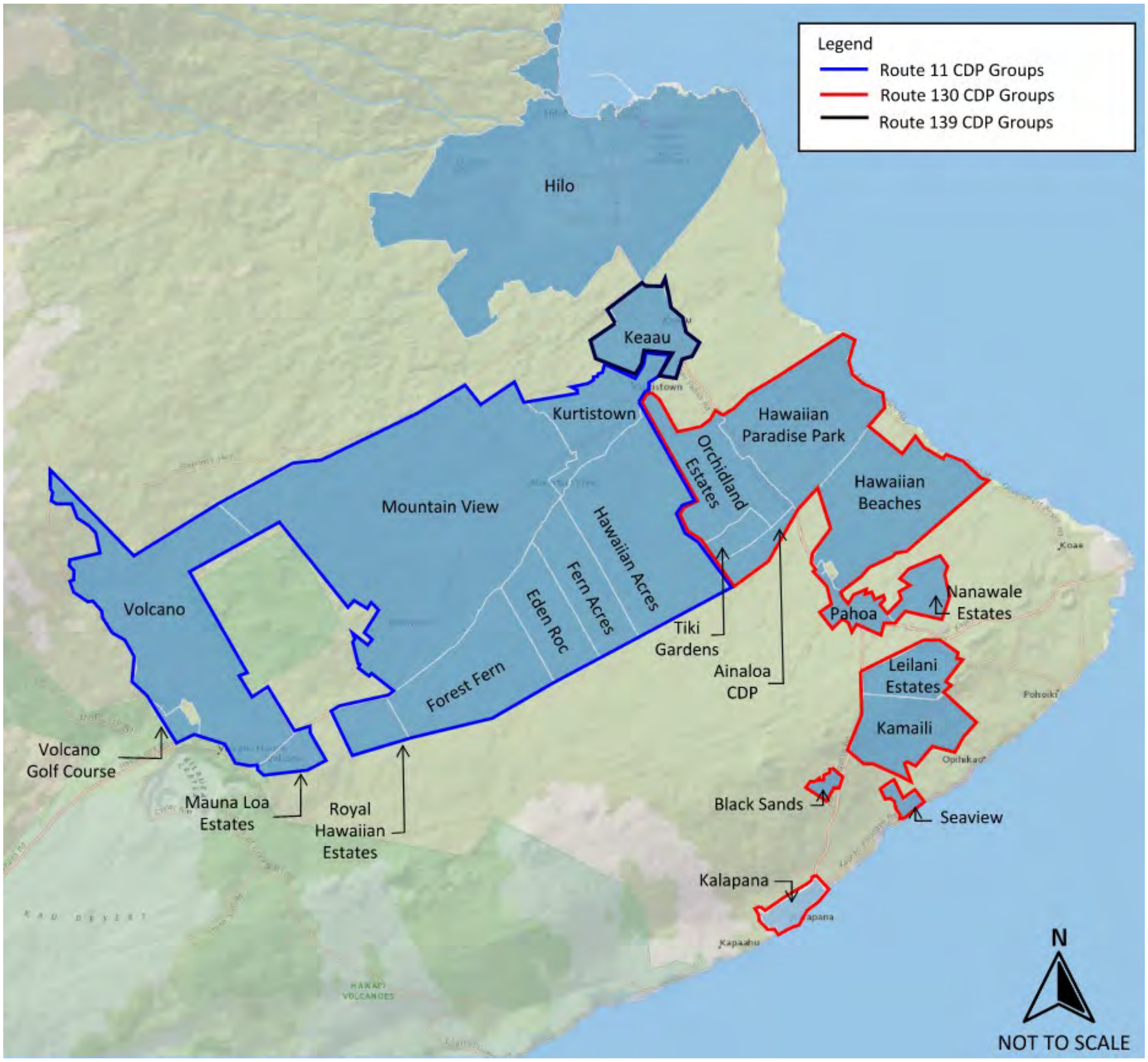


Figure 7: East Hawaii Census Designated Place Groupings

It was found that the 2020 Census volumes were comparable to the HDOT volume distribution along Routes 11, 130, and 139. It was assumed that the proposed Medical Clinic would serve residents of East Hawaiʻi proportional to their population with the exception of Hilo given that the majority of residents have closer facilities. Using the percentages shown in Table 10, it was assumed that 60%, 30%, and 5% would travel along Route 130, Route 11, and Route 139, respectively to get to and from the Medical Clinic. The remaining 5% was conservatively assumed to come from Hilo to capture any potential trips that may originate in that area. The proposed Medical Clinic generated trips are shown in Figure 8.

Table 9: Census Designated Places Population

To/From	CDP	2020 Population	Percentage
Pāhoa	Hawaiian Paradise Park	14,957	62%
	Hawaiian Beaches	3,976	
	Pāhoa	924	
	Nanawale Estates	1,652	
	Leilani Estates	1,139	
	Kamaili	157	
	Orchidlands Estates	3,165	
	Tiki Gardens	555	
	Ainaloa	3,609	
	Black Sands	416	
	Kalapana	167	
Mountain View	Kurtistown	2,151	35%
	Hawaiian Acres	3,426	
	Mountain View	4,215	
	Fern Acres	1,965	
	Eden Roc	1,386	
	Fern Forest	1,150	
	Royal Hawaiian Estates	790	
	Mauna Loa Estates	1,057	
	Volcano	736	
	Volcano Golf Course	363	
Kea'au	Kea'au	1,195	2%
Total		**49,151**	**100%**

Table 10: Census and Traffic Volume Comparison with Resulting Trip Distribution Percent

To/From	2020 CDP Population	24 Hour Bi-Directional AADT	Recommended Rounded Trip Distribution (%)
Route 130 From Pāhoa/HPP	62%	65%	60
Route 11 From Kurtistown/Mountain View	35%	35%	30
Route 139 From Downtown Kea'au	2%	-	5
Percentage from Hilo	-	-	5

3. Modal Choice

All Medical Clinic-related external trips were assumed to be by private vehicle. This reflects the worst-case traffic condition with all trips occurring by private vehicle. Resulting Future (2028) With Project volumes are shown in Figure 9.

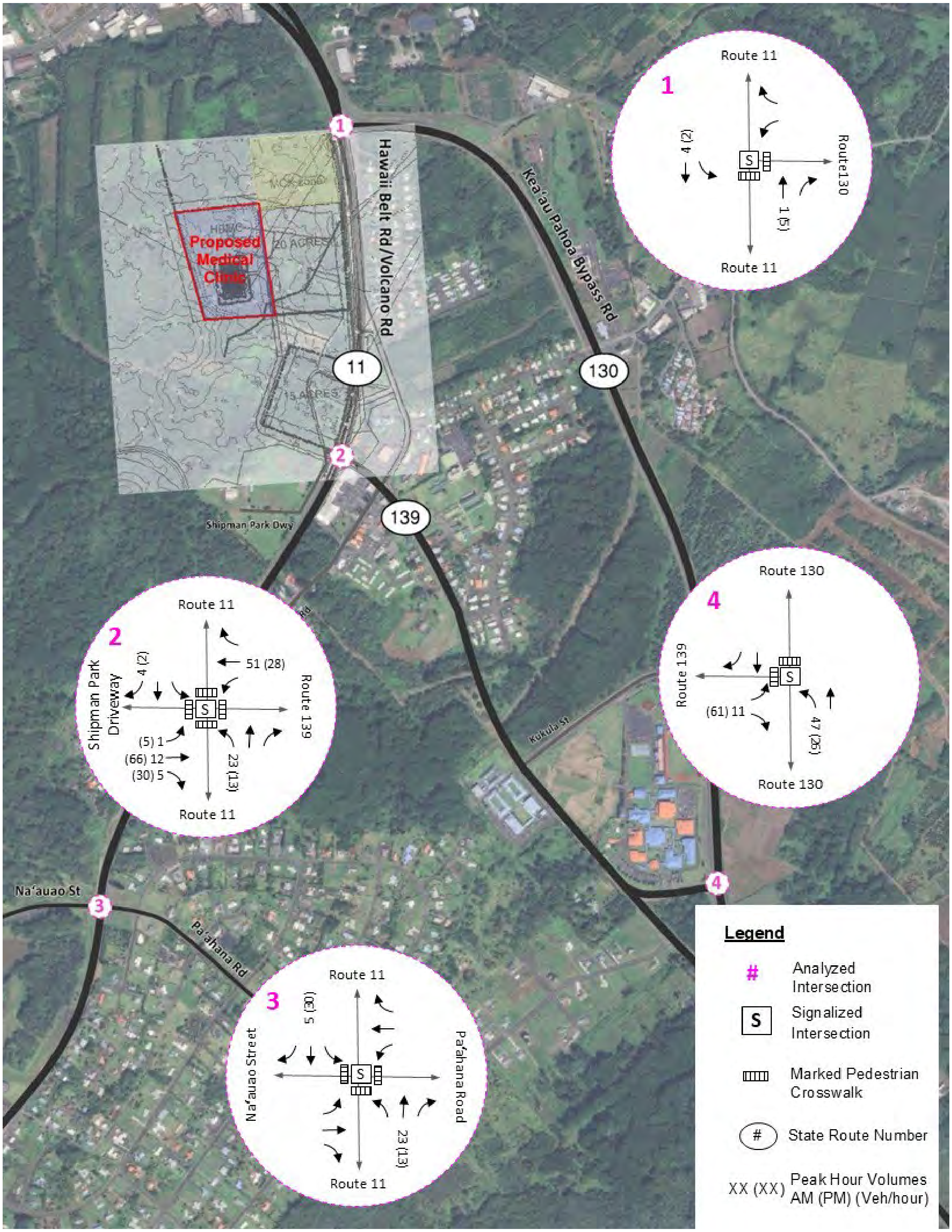


Figure 8: Proposed Medical Clinic Generated Trips

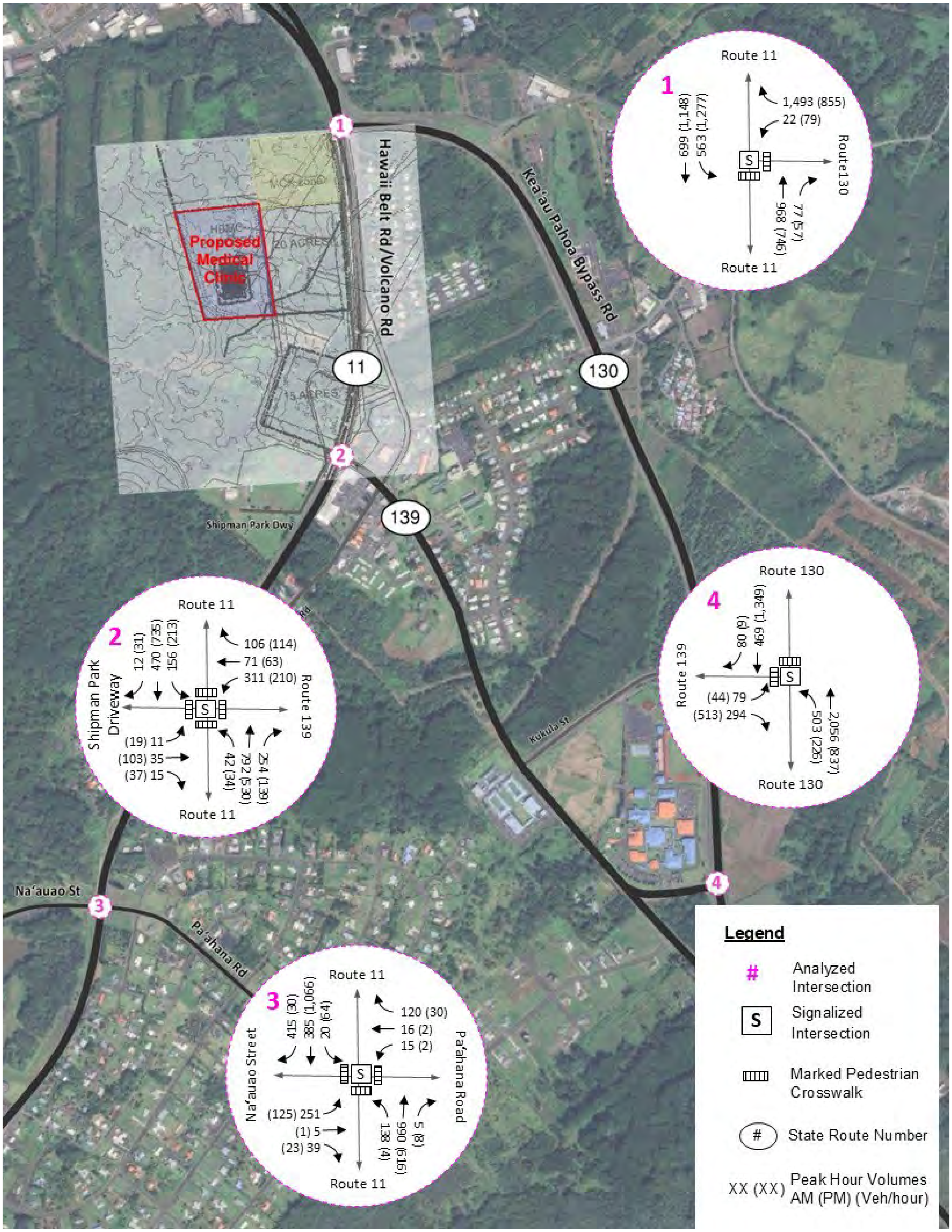


Figure 9: Future (2028) With Project Volumes

B. Future (2028) With Project LOS

Future (2028) with Project intersection and movement LOS and delay (in seconds per vehicle) was determined for the AM and PM peak hours using *Synchro 11* traffic analysis software. The Future (2028) with Project traffic operations is shown in Table 11. The signal timing was kept the same as in the Existing (2025) analysis to allow for a clearer comparison of operational impacts from increased traffic volumes using an identical cycle length. Movements that operate at LOS E or worse are highlighted in yellow and discussed below. Future (2028) With Project Synchro worksheets can be found in Appendix D.

Table 11: Future (2028) With Project LOS

Intersection Movement	AM Peak			PM Peak		
	LOS	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c
Route 11 and Route 130	**B**	**13.9**	**-**	**C**	**20.2**	**-**
Route 11 NB Through	B	14.2	0.69	C	29.5	0.80
Route 11 SB Left	C	27.5	0.84	C	29.3	0.92
Route 11 SB Through	A	1.8	0.30	A	3.4	0.44
Route 130 WB Left	D	35.3	0.50	D	35.4	0.62
Route 11 and Route 139/Shipman Park Driveway	**C**	**26.9**	**-**	**C**	**23.1**	**-**
Route 11 NB Left	D	44.6	0.63	C	31.5	0.53
Route 11 NB Through-Right	C	28.8	0.82	B	19.9	0.69
Route 11 SB Left	D	54.5	0.82	E	66.3	0.94
Route 11 SB Through-Right	B	18.2	0.39	B	17.7	0.68
Shipman Park EB Left-Through-Right	B	14.4	0.09	B	12.8	0.23
Route 139 WB Left-Through	C	22.6	0.60	B	15.4	0.45
Route 11 and Pa‘ahana Street/Na‘auao Road	**C**	**25.2**	**-**	**C**	**23.2**	**-**
Route 11 NB Left	D	49.3	0.78	F	86.1	0.36
Route 11 NB Through-Right	C	21.0	0.74	A	9.8	0.29
Route 11 SB Left	D	46.1	0.52	E	72.5	0.63
Route 11 SB Through	C	26.7	0.68	C	21.7	0.86
Route 11 SB Right	B	19.1	0.29	A	5.4	0.02
Pa‘ahana EB Left	C	31.4	0.60	E	64.4	0.57
Pa‘ahana EB Left-Through-Right	C	29.2	0.52	E	61.4	0.48
Na‘auao WB Left-Through-Right	C	30.6	0.28	E	63.2	0.08
Route 130 and Route 139	**B**	**18.6**	**-**	**C**	**30.6**	**-**
Route 130 NB Left	D	40.5	0.92	E	65.3	0.91
Route 130 NB Through	B	13.1	0.87	A	7.6	0.40
Route 11 SB Through	C	22.0	0.47	D	37.1	0.96
Route 139 EB Left	C	27.3	0.29	C	24.0	0.11
Route 139 EB Right	B	12.3	0.40	D	36.5	0.88

1. Route 11 and Route 130

Route 11 and Route 130 is projected to operate at LOS B and LOS C during the AM and PM peak hour, respectively. All movements are projected to operate at LOS D or better. No mitigation is recommended for this intersection.

2. Route 11 and Route 139/Shipman Park Driveway

The intersection of Route 11 and Route 139 is projected to operate at LOS C for both the AM and PM peak hour. The SB left turn is projected to operate at LOS E (v/c of 0.94) during the PM peak hour. The existing SB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. The future SB left turn queue is expected to also clear every cycle. All other movements are projected to operate at LOS D or better. No mitigation is recommended for this intersection.

3. Route 11 and Pa'ahana Street/Na'auao Road

The intersection of Route 11 and Pa'ahana Street/Na'auao Road is projected to operate at LOS C during both the AM and PM peak hour. Several movements operate at LOS E or worse during the PM peak hour. The delays are caused by a combination of the cycle length, the signal prioritizing the major NB and SB through movements, and the split phasing for the EB and WB approaches. The NB left turn is projected to operate at LOS F (v/c of 0.36) but with a volume of only 4 vph. The NB left turn will not have any issues clearing the intersection. The SB left turn is projected to operate at LOS E (v/c of 0.63) with a volume of 64 vph, or about one vehicle per minute. The SB left turn will not have any issues clearing the intersection. The EB left and shared left-through-right lanes are projected to operate at LOS E, with a v/c of 0.57 and 0.48 respectively. The WB approach is projected to operate at LOS E with a v/c of 0.08. The minor street volumes are not significant and the delays are caused by the cycle length and split phasing. The EB and WB approaches are not expected to have any issues clearing the intersection. No mitigation is recommended for this intersection.

4. Route 130 and Route 139

The intersection of Route 130 and Route 139 operates at LOS B and LOS C during the AM and PM peak hour, respectively. The Route 130 northbound left turn movement operates at LOS E (v/c of 0.91) during the PM peak hour. The NB left turn green time varied, with observations indicating that the signal adjusted to allow the queue to clear each cycle. All other movements operate at LOS D or better during both peaks. No mitigation is recommended for this movement.

V. Summary and Recommendations

HHSC is proposing to develop a new medical clinic in Kea'au, on the Island of Hawai'i, with approximately 40,000 square feet (sf) of building space. The parking lot will comprise of 22 ADA compliant perpendicular parking stalls and 182 standard perpendicular parking stalls. Construction is estimated to be completed by 2028. Site access is proposed off a new roadway proposed to run east-west from Shipman Park Driveway before turning north-south, connecting to the proposed Medical Clinic.

Future (2028) Without Project analysis added a 2.12% annual background growth for major movements, along with projected trips associated with the Kea'au Mountain View Public Library relocation. All signalized intersections are projected to operate at an acceptable LOS. Movements that are projected to operate at LOS E or worse are not significant. There are no recommended improvements for Future (2028) Without Project conditions.

All signalized intersections are projected to operate at an acceptable LOS under Future (2028) With Project conditions. Movements expected to operate at LOS E or worse are not considered significant. Therefore, no improvements are recommended for Future (2028) With Project conditions. In addition, no changes to the intersection configuration at Route 11 and Route 139/Shipman Park Driveway are required to accommodate the proposed Medical Clinic generated trips.

VI. References

ATA, Inc. *Kea'au-Mountain View Public Library TIAR*, July 2023.

County of Hawai'i. *Hawaii Island Hele-On Bus*, <http://heleonbus.org>. a

FHWA. *Manual on Uniform Traffic Control Devices*, 2023 Edition.

Office of Environmental Review Program (ERP). EA and EIS Online Library, Accessed 2023, <https://planning.hawaii.gov/erp/>.

State of Hawai'i, Department of Transportation. *Bike Plan Hawaii*, September 2003.

State of Hawai'i, Department of Transportation. *Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii*, July 2014.

State of Hawai'i, Department of Transportation. FY 2025-2028 Statewide Transportation Improvements Program (STIP), <http://hawaii.gov/dot/highways/STIP>

State of Hawai'i, Department of Transportation. Historical Traffic Station Maps 2013-2022.

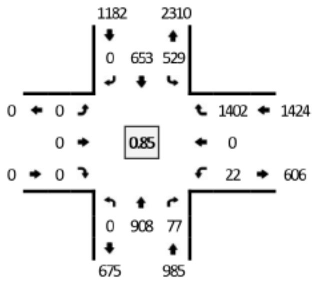
Transportation Research Board, National Research Council. *Highway Capacity Manual*, Washington, D.C., 2016 Edition.

Wilson Okamoto Corporation. *Kea'au Villages Master Plan Phase 1 & 2 TIR*, July 2017.

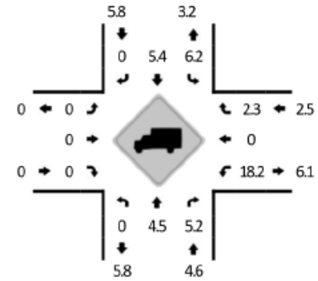
Appendix A
Traffic Count Data

Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

LOCATION: Hawaii Belt Rd (Rt 11) -- Keaau Pahoa Bypass Rd (Rt 130) | **QC JOB #:** 17049501
CITY/STATE: Keaau, HI | **DATE:** Wed, May 7 2025



Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 6:45 AM -- 7:00 AM



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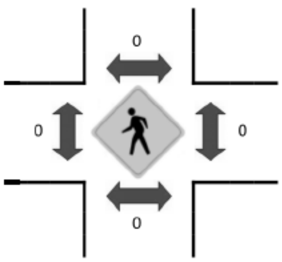
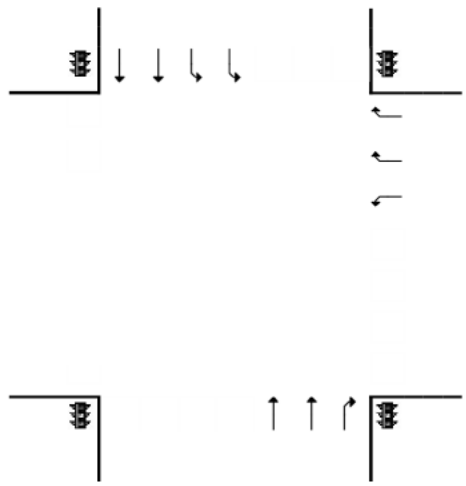
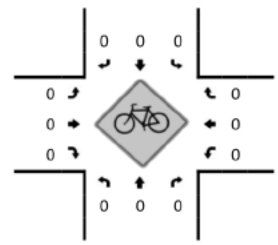
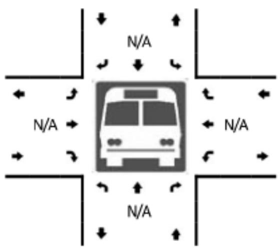
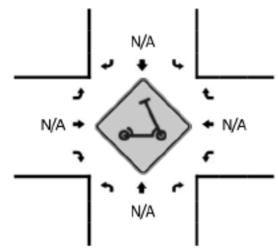










15-Min Count Period Beginning At	Hawaii Belt Rd (Rt 11) (Northbound)				Hawaii Belt Rd (Rt 11) (Southbound)				Keaau Pahoa Bypass Rd (Rt 130) (Eastbound)				Keaau Pahoa Bypass Rd (Rt 130) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	0	297	10	0	69	88	0	0	0	0	0	0	9	0	543	0	1016	
6:45 AM	0	283	16	0	108	136	0	0	0	0	0	0	6	0	504	0	1053	
7:00 AM	0	215	20	0	134	152	0	0	0	0	0	0	4	0	250	0	775	
7:15 AM	0	211	25	0	148	205	0	0	0	0	0	0	4	0	308	0	901	3745
7:30 AM	0	199	16	0	139	160	0	0	0	0	0	0	8	0	340	0	862	3591
7:45 AM	0	179	18	0	137	140	0	0	0	0	0	0	14	0	342	0	830	3368
8:00 AM	0	269	10	0	138	128	0	0	0	0	0	0	19	0	310	0	874	3467
8:15 AM	0	192	3	0	114	142	0	0	0	0	0	0	8	0	325	0	784	3350

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1132	64	0	432	544	0	0	0	0	0	0	24	0	2016	0	4212
Heavy Trucks	0	56	0		28	48	0		0	0	0		0	0	44		176
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

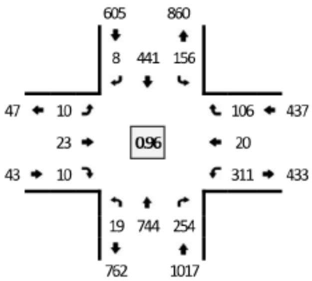
Comments:

Report generated on 6/4/2025 5:38 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

LOCATION: Hawaii Belt Rd (Rt 11) -- Keaau Pahoa Rd (Rt 139) | **QC JOB #:** 17049503

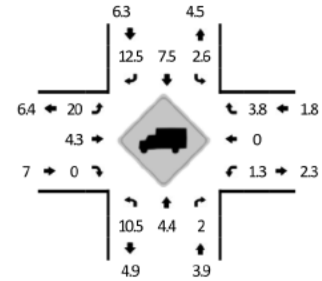
CITY/STATE: Keaau, HI | **DATE:** Wed, May 7 2025

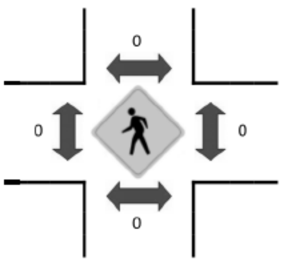


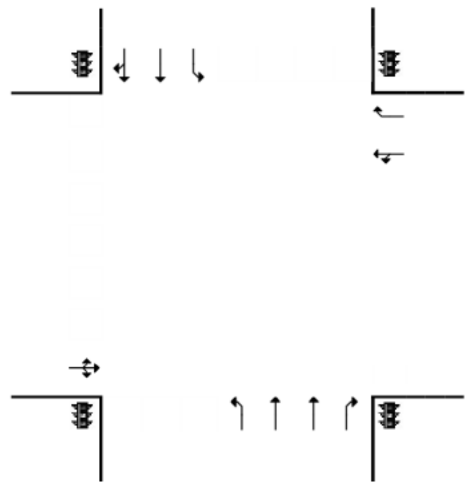
Peak-Hour: 6:45 AM -- 7:45 AM

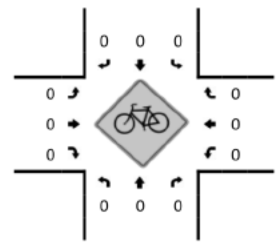
Peak 15-Min: 6:45 AM -- 7:00 AM

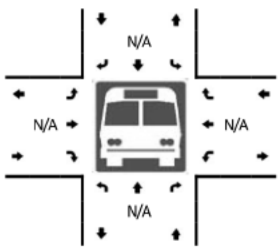
TRUE DATA TO IMPROVE MOBILITY

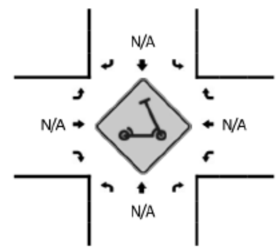












15-Min Count Period Beginning At	Hawaii Belt Rd (Rt 11) (Northbound)				Hawaii Belt Rd (Rt 11) (Southbound)				Keaau Pahoa Rd (Rt 139) (Eastbound)				Keaau Pahoa Rd (Rt 139) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	4	249	38	0	16	66	2	0	0	0	1	0	39	2	31	0	448	
6:45 AM	11	261	24	0	28	105	2	0	3	8	3	0	62	13	29	0	549	
7:00 AM	3	232	57	0	32	107	4	0	3	10	5	0	76	3	17	0	549	
7:15 AM	3	141	77	0	55	138	0	0	4	0	1	0	86	0	26	0	531	2077
7:30 AM	2	110	96	0	41	91	2	0	0	5	1	0	87	4	34	0	473	2102
7:45 AM	1	120	87	0	42	96	0	0	1	4	2	0	61	7	33	0	454	2007
8:00 AM	1	125	36	0	34	78	3	0	0	3	1	0	59	3	29	0	372	1830
8:15 AM	6	120	29	0	26	85	1	0	3	5	0	0	28	11	32	0	346	1645

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	1044	96	0	112	420	8	0	12	32	12	0	248	52	116	0	2196
Heavy Trucks	0	36	4		8	28	4		4	0	0		0	0	8		92
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/4/2025 5:38 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

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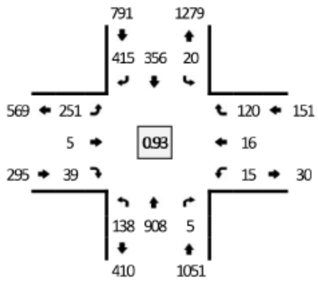
CITY/STATE: Kurtistown, HI | **DATE:** Wed, May 7 2025



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Peak 15-Min: 7:00 AM -- 7:15 AM

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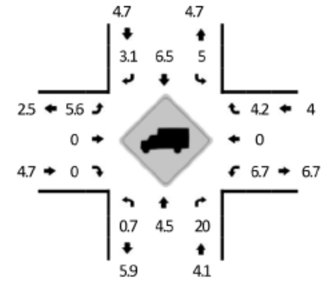
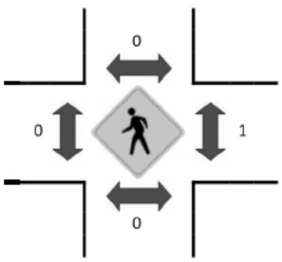
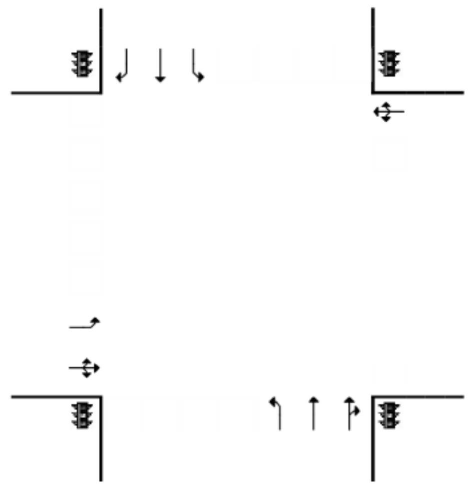
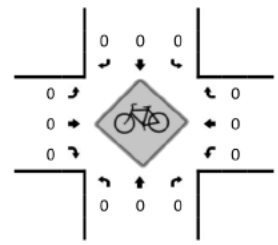
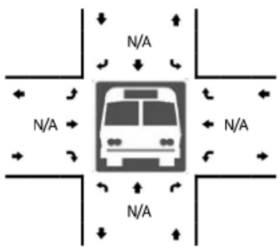
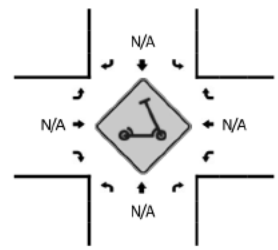












15-Min Count Period Beginning At	Volcano Rd (Rt 11) (Northbound)				Volcano Rd (Rt 11) (Southbound)				Naauao Rd/PaAhana St (Eastbound)				Naauao Rd/PaAhana St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	8	267	0	0	3	69	35	0	18	0	1	0	1	0	26	0	428	
6:45 AM	31	259	2	0	2	71	78	0	30	1	3	0	2	3	47	0	529	
7:00 AM	36	237	0	0	5	84	118	0	78	1	12	0	6	7	33	0	617	
7:15 AM	40	193	1	0	5	85	133	0	85	1	12	0	4	5	22	0	586	2160
7:30 AM	31	219	2	0	8	116	86	0	58	2	12	0	3	1	18	0	556	2288
7:45 AM	7	215	1	0	9	152	16	0	22	0	5	0	1	0	21	0	449	2208
8:00 AM	4	160	3	0	13	122	9	0	8	0	1	0	3	1	16	0	340	1931
8:15 AM	3	171	2	0	6	130	5	0	4	0	3	0	1	0	13	0	338	1683

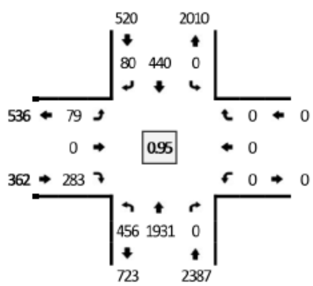
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	144	948	0	0	20	336	472	0	312	4	48	0	24	28	132	0	2468
Heavy Trucks	0	12	0		4	24	24		4	0	0		0	0	4		72
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

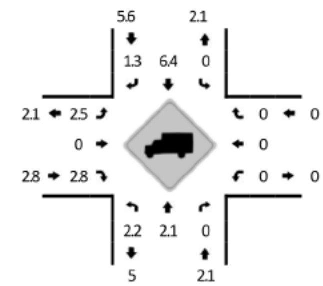
Report generated on 8/26/2025 1:28 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

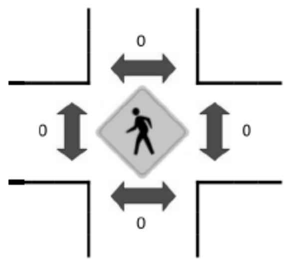
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

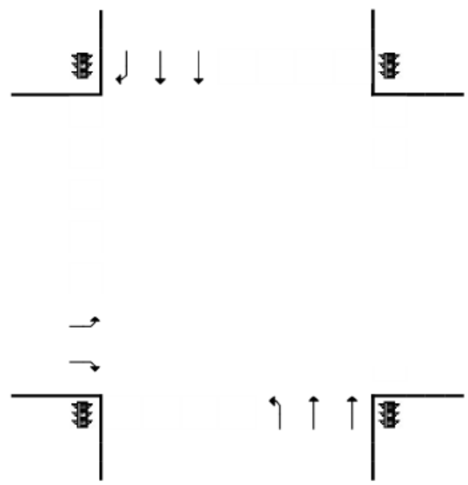
LOCATION: Keaau Pahoa Bypass Rd (Rt 130) -- Keaau Pahoa Rd (Rt 139) | **QC JOB #:** 17049507
CITY/STATE: Keaau, HI | **DATE:** Wed, May 7 2025

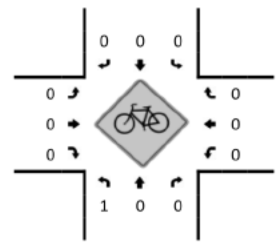


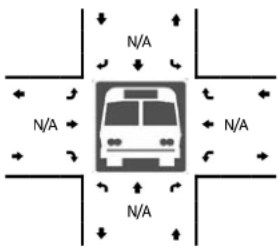
Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 6:45 AM -- 7:00 AM

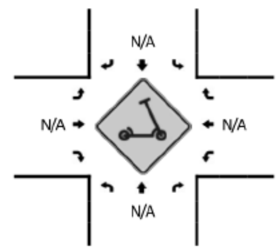












15-Min Count Period Beginning At	Keaau Pahoa Bypass Rd (Rt 130) (Northbound)				Keaau Pahoa Bypass Rd (Rt 130) (Southbound)				Keaau Pahoa Rd (Rt 139) (Eastbound)				Keaau Pahoa Rd (Rt 139) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	90	592	0	0	0	63	5	0	4	0	22	0	0	0	0	0	776	
6:45 AM	116	604	0	0	0	78	7	0	12	0	40	0	0	0	0	0	857	
7:00 AM	117	537	0	0	0	111	15	0	25	0	51	0	0	0	0	0	856	
7:15 AM	118	449	0	0	0	121	21	0	20	0	93	0	0	0	0	0	822	3311
7:30 AM	105	341	0	0	0	130	37	0	22	0	99	0	0	0	0	0	734	3269
7:45 AM	92	312	0	0	0	138	21	0	17	0	123	0	0	0	0	0	703	3115
8:00 AM	77	288	0	0	0	126	11	0	6	0	86	0	0	0	0	0	594	2853
8:15 AM	52	324	0	0	0	117	6	0	5	0	57	0	0	0	0	0	561	2592

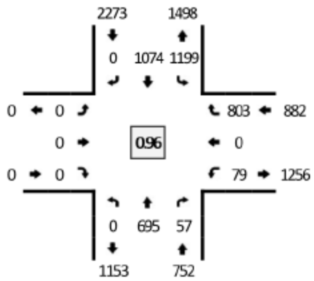
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	464	2416	0	0	0	312	28	0	48	0	160	0	0	0	0	0	3428
Heavy Trucks	16	52	0		0	20	0		0	0	12		0	0	0		100
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/4/2025 5:38 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

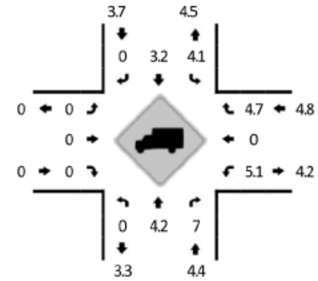
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

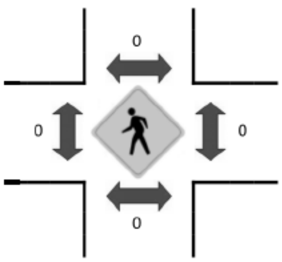
LOCATION: Hawaii Belt Rd (Rt 11) -- Keaau Pahoa Bypass Rd (Rt 130) | **QC JOB #:** 17049502
CITY/STATE: Keaau, HI | **DATE:** Wed, May 7 2025

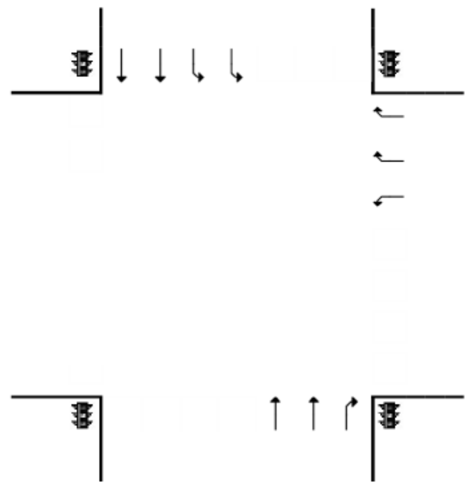


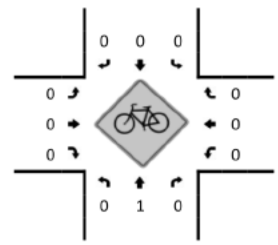
Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:15 PM -- 3:30 PM

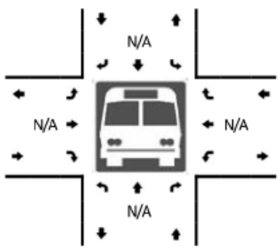
TRUE DATA TO IMPROVE MOBILITY

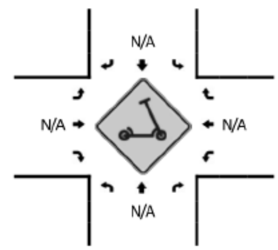












15-Min Count Period Beginning At	Hawaii Belt Rd (Rt 11) (Northbound)				Hawaii Belt Rd (Rt 11) (Southbound)				Keaau Pahoa Bypass Rd (Rt 130) (Eastbound)				Keaau Pahoa Bypass Rd (Rt 130) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	215	12	0	249	229	0	0	0	0	0	0	19	0	201	0	925	
3:15 PM	0	151	10	0	309	307	0	0	0	0	0	0	15	0	229	0	1021	
3:30 PM	0	184	19	0	318	258	0	0	0	0	0	0	25	0	189	0	993	
3:45 PM	0	145	16	0	323	280	0	0	0	0	0	0	20	0	184	0	968	3907
4:00 PM	0	190	8	0	330	293	0	0	0	0	0	0	9	0	195	0	1025	4007
4:15 PM	0	148	14	0	335	236	0	0	0	0	0	0	13	0	188	0	934	3920
4:30 PM	0	137	13	0	318	286	0	0	0	0	0	0	14	0	179	0	947	3874
4:45 PM	0	142	8	0	334	244	0	0	0	0	0	0	17	0	136	0	881	3787

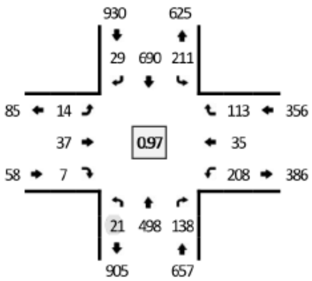
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	604	40	0	1236	1228	0	0	0	0	0	0	60	0	916	0	4084
Heavy Trucks	0	8	0		32	28	0		0	0	0		4	0	24		96
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/29/2025 7:50 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

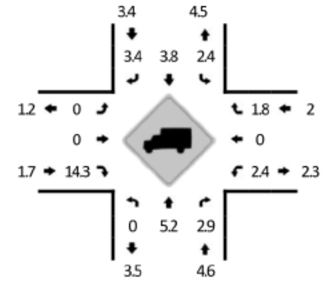
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

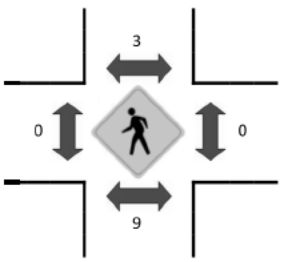
LOCATION: Hawaii Belt Rd (Rt 11) -- Keaau Pahoa Rd (Rt 139) | **QC JOB #:** 17049504
CITY/STATE: Keaau, HI | **DATE:** Wed, May 7 2025

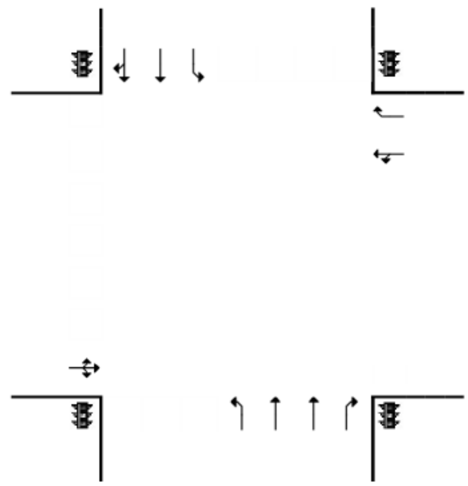


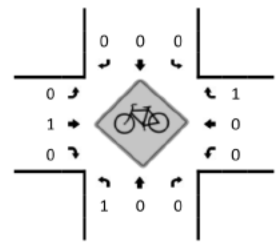
Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:45 PM -- 4:00 PM

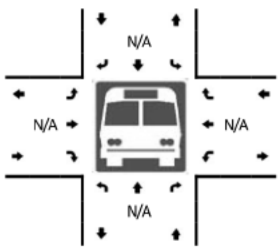
TRUE DATA TO IMPROVE MOBILITY

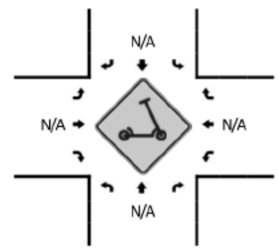












15-Min Count Period Beginning At	Hawaii Belt Rd (Rt 11) (Northbound)				Hawaii Belt Rd (Rt 11) (Southbound)				Keaau Pahoa Rd (Rt 139) (Eastbound)				Keaau Pahoa Rd (Rt 139) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	6	133	43	0	50	162	3	0	4	10	3	0	47	8	25	0	494	
3:15 PM	1	124	24	0	50	196	5	0	4	8	2	0	47	6	25	0	492	
3:30 PM	7	122	36	0	52	154	6	0	2	13	2	0	52	12	39	0	497	
3:45 PM	7	119	35	0	59	178	15	0	4	6	0	0	62	9	24	0	518	2001
4:00 PM	4	114	26	0	55	171	8	0	7	11	3	0	38	11	26	0	474	1981
4:15 PM	7	116	23	0	34	155	10	0	1	7	5	0	44	6	23	0	431	1920
4:30 PM	3	101	24	0	42	186	5	0	1	6	4	0	34	11	11	0	428	1851
4:45 PM	0	109	26	0	54	159	4	0	1	2	1	0	48	4	14	0	422	1755

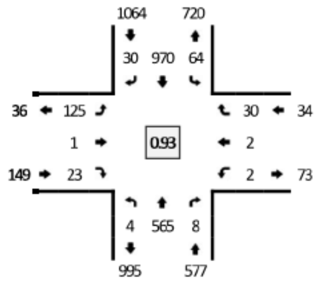
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	476	140	0	236	712	60	0	16	24	0	0	248	36	96	0	2072
Heavy Trucks	0	28	12		4	36	0		0	0	0		8	0	0		88
Buses																	
Pedestrians		8				12				0				0			20
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/29/2025 7:50 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

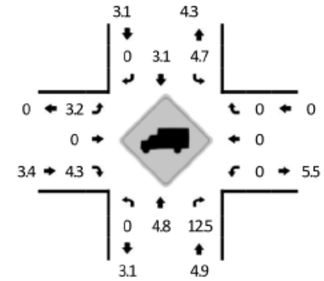
Type of peak hour being reported: User-Defined Method for determining peak hour: Total Entering Volume

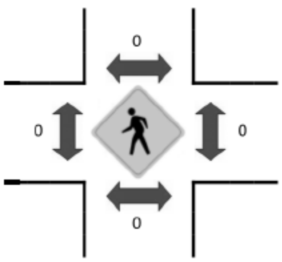
LOCATION: Volcano Rd (Rt 11) -- Naauao Rd/PaAhana St **QC JOB #:** 17049506
CITY/STATE: Kurtistown, HI **DATE:** Wed, May 7 2025

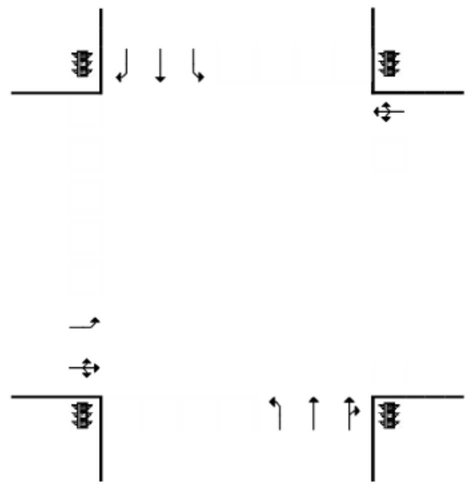


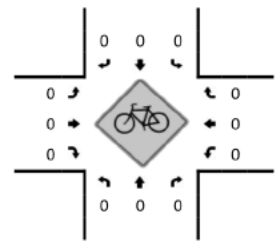
Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:00 PM -- 3:15 PM

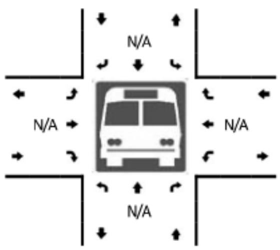
TRUE DATA TO IMPROVE MOBILITY

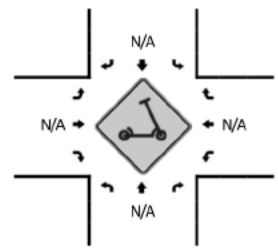












15-Min Count Period Beginning At	Volcano Rd (Rt 11) (Northbound)				Volcano Rd (Rt 11) (Southbound)				Naauao Rd/PaAhana St (Eastbound)				Naauao Rd/PaAhana St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	1	165	0	0	18	246	10	0	29	0	11	0	2	1	5	0	488	
3:15 PM	0	123	3	0	12	247	9	0	31	1	3	0	0	1	7	0	437	
3:30 PM	2	138	3	0	18	204	6	0	46	0	4	0	0	0	11	0	432	
3:45 PM	1	139	2	0	16	273	5	0	19	0	5	0	0	0	7	0	467	1824
4:00 PM	1	140	2	0	14	206	4	0	28	0	1	0	3	1	4	0	404	1740
4:15 PM	2	136	2	0	20	220	6	0	17	1	3	0	1	0	11	0	419	1722
4:30 PM	1	121	2	0	18	216	11	0	13	1	5	0	2	0	5	0	395	1685
4:45 PM	1	141	0	0	10	212	6	0	15	0	7	0	3	0	6	0	401	1619

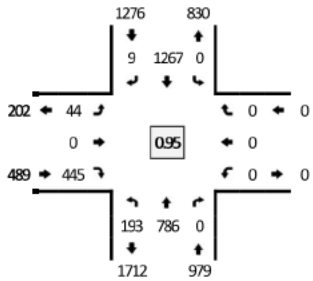
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	660	0	0	72	984	40	0	116	0	44	0	8	4	20	0	1952
Heavy Trucks	0	28	0		4	24	0		16	0	4		0	0	0		76
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/29/2025 7:50 PM SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

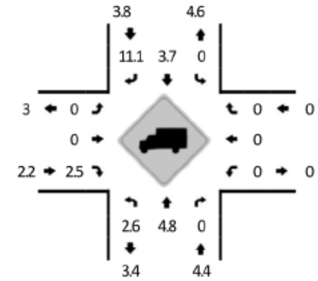
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

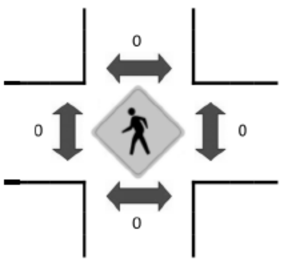
LOCATION: Keaau Pahoa Bypass Rd (Rt 130) -- Keaau Pahoa Rd (Rt 139) | **QC JOB #:** 17049508
CITY/STATE: Keaau, HI | **DATE:** Wed, May 7 2025

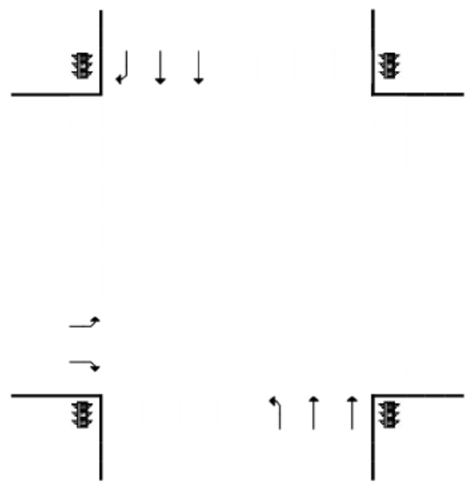


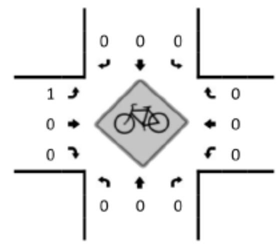
Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:45 PM -- 4:00 PM

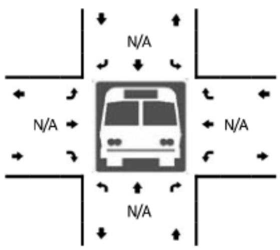
TRUE DATA TO IMPROVE MOBILITY

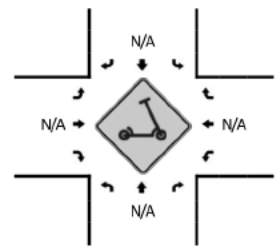












15-Min Count Period Beginning At	Keaau Pahoa Bypass Rd (Rt 130) (Northbound)				Keaau Pahoa Bypass Rd (Rt 130) (Southbound)				Keaau Pahoa Rd (Rt 139) (Eastbound)				Keaau Pahoa Rd (Rt 139) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	46	192	0	0	0	297	2	0	16	0	106	0	0	0	0	0	659	
3:15 PM	43	223	0	0	0	310	3	0	15	0	95	0	0	0	0	0	689	
3:30 PM	63	170	0	0	0	319	3	0	7	0	113	0	0	0	0	0	675	
3:45 PM	41	201	0	0	0	341	1	0	6	0	131	0	0	0	0	0	721	2744
4:00 PM	44	183	0	0	0	341	4	0	3	0	119	0	0	0	0	0	694	2779
4:15 PM	38	178	0	0	0	344	2	0	2	0	102	0	0	0	0	0	666	2756
4:30 PM	33	175	0	0	0	344	2	0	2	0	118	0	0	0	0	0	674	2755
4:45 PM	43	139	0	0	0	354	3	0	1	0	99	0	0	0	0	0	639	2673

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	164	804	0	0	0	1364	4	0	24	0	524	0	0	0	0	0	2884
Heavy Trucks	8	48	0		0	60	4		0	0	16		0	0	0		136
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/29/2025 7:50 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

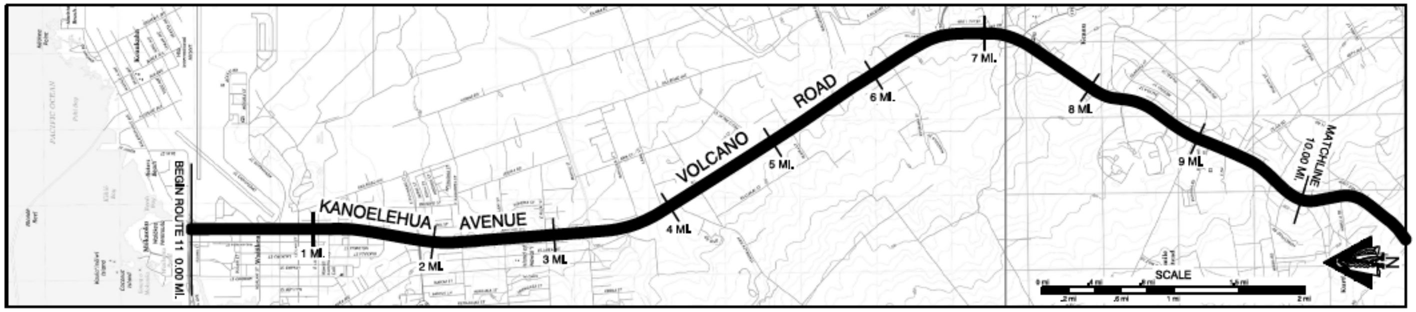
ROAD INVENTORY
HAWAII RTE 11
VOLCANO ROAD - KANOELEHUA AVE.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PREPARED BY THE
HIGHWAYS PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Total Designated Route Length:	121.970	MILES (a+b)
a. Existing Length:	121.970	MILES
b. Proposed Length:	0.000	MILES
Total Travel Way Length:	121.970	MILES (a+b, less c)
a. Existing Length:	121.970	MILES
b. Temporary Length:	0.000	MILES
c. Length used as T.W. for another Route:	NONE	MILES (-)

NEEDS STUDY ROUTE NO. ______ FUNCTIONAL CLASSIFICATION ______



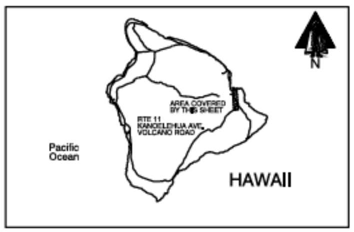
SCALE: (In Miles) 2" = 1 mile

Maintenance Control Sections : Length and Description — 11P (1.08 MI) | END 11N - BEGIN 11P ON KANOELEHUA AVENUE 100' SOUTH OF CENTERLINE WITH LANIKAULA STREET | 11N (6.24 MI) | END 11M - BEGIN 11N ON MAMALAHOA HWY, 150' SOUTH OF CENTERLINE WITH KEEAU-PAHOA ROAD. | 11M (9.12 MI)

Structure Carrying Road:
- Bridges (Over 20'): Length, Type, Capacity and Year Constructed — TEE BEAM 1960 HS-20, 108'; CONCRETE FRAME 1969 HS-20-44, 18'
- Vertical Clearance
- Horizontal Clearance — 28'; 92'

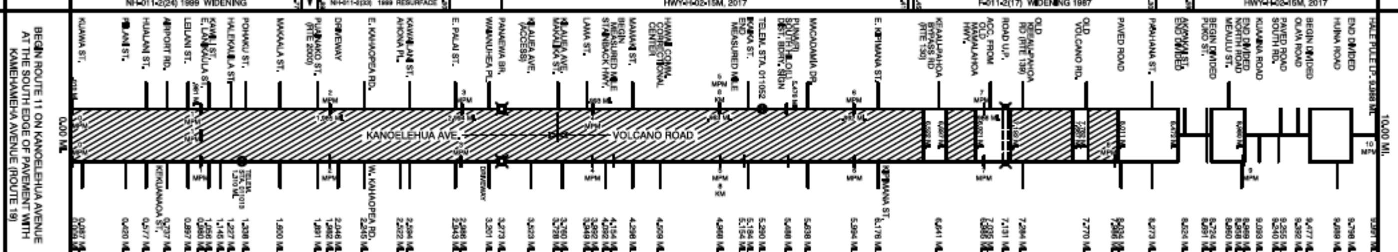
Structure Over Road:
- Vertical Clearance
- Horizontal Clearance

Right of Way Width (min.-max.) if varies — 125' | 125'-150' | 125' | 125'-185' | 80'
Available Right of Way Width (Needs Study) — COMMERCIAL | RESIDENTIAL AREA | TREES, BRUSH | RESIDENTIAL AREA, TREES
Right of Way Fence: Type - Right and Left — CHAIN LINK @ FROM PAVT
Control of Access: 1-None, 2-Partial, 3-Full — PARTIAL | NONE
Jurisdiction, Transfer Phase No. and Date (C to S or S to C) — C to S Phase I | STATE
Project No., Type of Construction, and Year Constructed — (HES-STP-011-2(20) 1999 IMPROVEMENTS) | (2000E-01-00, IMPRV., 2004) | STP-011-2(39), PAVEMENT PREVENTIVE MAINTENANCE, 2013 | STP-011-2(041), PREVENTIVE MAINTENANCE, 2014
Project No., Type of Construction, and Year Constructed — NH-011-2(24) 1999 WIDENING | NH-011-2(33) 1999 RESURFACE | HWY-H-02-15M, 2017 | F-011-2(17) WIDENING 1987 | HWY-H-02-15M, 2017



Indicates Grass & / or Physical Barrier on Median.

Road Diagram
* MPM = Milepost Marker



SCALE: (In Miles) 2" = 1 mile

Undivided:
- Shoulder: Width and Type (COMBINATION BIKELANE & SHOULDER FROM 0.00 MI.- 6.70 MI.) — 10' AC B.L./SHLDR. | 4'-11' AC BIKELANE/SHOULDER | 8'-11' AC
- Pavement: Width and Type — 12' AC | 24' AC | 36' AC | 24' AC | 22-24' AC | 22-24' AC

Divided Highway:
- Shoulder: Width and Type — 3'-4' AC | 4'-9' AC | 8'-15' AC | 8'-10' AC
- Median: Width and Type — 8'-68' GRASS | 84'-126' GRASS & TREES | TREES & GRASS | 0-10' PAINT
- Median Barriers: (M/M GUARDRAIL)
- Shoulder: Width and Type — 1' AC | 2' AC | 3' AC | 4' AC
- Pavement: Width and Type — 33' AC | 14' AC | 11'-12' AC
- Shoulder: Width and Type (COMBINATION BIKELANE & SHOULDER FROM 0.00 MI.- 2.60 MI.) — 4' AC BIKE LANE | 8'-10' AC | 6'-9' AC | 10'-12' AC | 8'-10' AC | 10' AC

Number of Traffic Lanes — 4 = 12' | 4 = 12' | 2-(11'-12')
Auxiliary Lanes and Parking Lanes: No. of Lanes and Width (Left Side) — ALL T. L. 12'
(Right Side) — ALL T. L. 12'
Frontage Road: No. of Lanes, and Width (Right and Left)
Sidewalk: Width and Type (Right and Left) — 8' CONCRETE SIDEWALK
Curb and/or Gutter: Type (Right and Left)
Protective Devices: Type, Location and Number — ALL GUARDRAILS METAL ON METAL UNLESS OTHERWISE NOTED
Illumination: Type, Location and Number — 33 M.V.
Curves Class: +/- Degree (A(0-3.45) B(3.45-5.44) C(5.44-8.48) D(8.48-13.85) E(13.85-28.62) F(<28.62) — A
Superelevation (Range)
Grades Class: +/- % (A(0-.45) B(.45-2.45) C(2.45-4.45) D(4.45-6.45) E(6.45-8.45) F(<8.45) — B | A | B | A | B | C | B | C
Vertical Curve: Crest or Sag, Curve Limits
Area and Development: — SMALL URBAN (99998) | RURAL (99999)
Terrain: 1-Flat, 2-Rolling, 3-Mountainous — FLAT (1) | ROLLING (2)
Speed: 1-Design, 2-Posted — 35 MPH (2) | 45 MPH (2) | 55 MPH (2) | 35 MPH (2)
Intersection Control Devices: Type, Location and Cycle Timing — ALL 4 PHASE UNLESS NOTED

Row								
Traffic Stations (Current Year)	B71 0011 00089	B71 0011 00074	P71 0011 00130	B71 0011 00032	P71 0011 00539	B71 0011 00664	B71 0011 00777	B71 0011 01063
HPMS Sections - AADT 2022	22,600	36,600	34,700	35,500	45,400	19,800	24,851	14,371
HPMS Sections - AADT 2021	29,200	27,300	34,200	33,500	44,800	23,600	24,500	14,400
HPMS Sections - AADT 2020	18,000	27,200	34,200	31,900	43,500	19,900	24,400	15,100

DOD Sections
Census Tracts
Functional Classification — PRINCIPAL ARTERIAL (3) | MINOR ARTERIAL (4)
National Highway System (NHS) — ON NHS (1) | NOT ON NHS (0)
Previous Projects: Project No., Date and Limits — NH-011-2(33) 1999 RESURFACE; 11N-01-07M, PREVENTIVE MAINTENANCE, 2010; 11N-01-01M 1990 RESURFACE 2 LANES; 11N-01-77M 1977 RESURFACE; F-011-2(6) WIDENING 1987; F-011-2(6) SURFACE 1981; F-011 OUTBOUND; NH-011-2(24) 1999 WIDENING; 11N-01-80M 1980 RESURFACE; 11P-01-70 1971; F-011-2(13) 1977; F-2(2) 1948; 11M-01-71 1971; 11M-01-80M 1990 RESURFACE

SCALE: (In Miles) 2" = 1 mile

Date Released	
Dec. 04, G.N.	
Revised	
5/06	G.N.
6/10	D.B.
2/11	D.B.
2/12	D.B.
8/12	E.P.A.
1/13	E.P.A.
12/13	E.P.A.
7/14	D.B.
1/16	E.P.A.
1/17	E.P.A.
2/18	D.B.
11/18	D.B.
12/19	D.B.
12/20	E.P.A.
11/21	D.B.

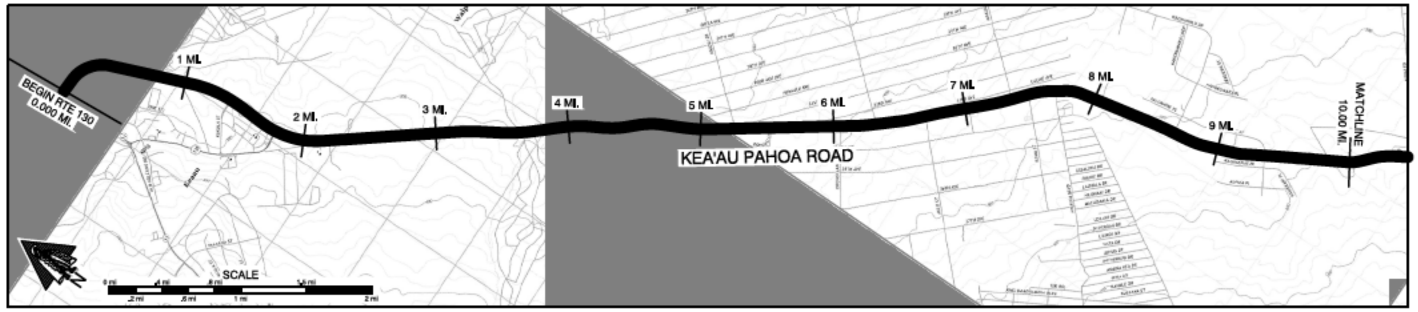
ROAD INVENTORY
HAWAII RTE 130
KEA'AU - PAHOA RD.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PREPARED BY THE
HIGHWAYS PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

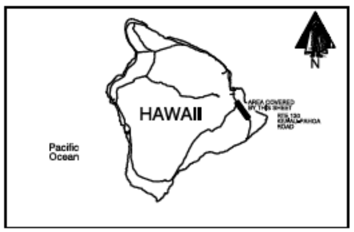
Total Designated Route Length:	21.639	MILES (a+b)
a. Existing Length:	21.639	MILES
b. Proposed Length:	0.000	MILES
Total Travel Way Length:	21.639	MILES (a+b, less c)
a. Existing Length:	21.639	MILES
b. Temporary Length:	0.000	MILES
c. Length used as T.W. for another Route:	0.000	MILES (-)

NEEDS STUDY ROUTE NO. ____ FUNCTIONAL CLASSIFICATION ____



SCALE: (In Miles) 2" = 1 mile

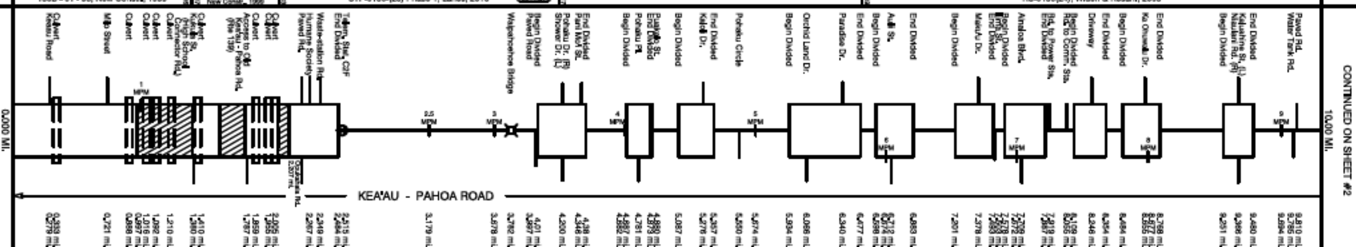
- Maintenance Control Sections : Length and Description — 130 B (12.12 mi.)
- Structure Carrying Road: Bridges (Over 20'): Length, Type, Capacity and Year Constructed — Conc. Rigid Frame 92' - 30, 1950
- Vertical Clearance
- Horizontal Clearance — 40'
- Structure Over Road: Vertical Clearance
- Horizontal Clearance
- Right of Way Width (min.-max.) if varies — 150' - 220'; 80' - 130'; 50'; 80'
- Available Right of Way Width (Needs Study) — Clear 1000' - Small Trees & Bushes - 8' From Pavement.
- Right of Way Fence: Type - Right and Left — Residential Area
- Control of Access: 1-None, 2-Partial, 3-Full — None
- Jurisdiction, Transfer Phase No. and Date (C to S or S to C) — State
- Project No., Type of Construction, and Year Constructed — (STP-0130(33), Inter. Imprv., 2018); (HSIP-0130-(30), 2012, INTERSECTION IMPROVEMENTS); (130B-01-07 ACCESS IMP., 2009)
- Project No., Type of Construction, and Year Constructed — 130B - 01 - 98, New Constr., 1999; 130B - 01 - 92, New Constr., 1999; STP-0130-(28) Phase 1, Lanes, 2016; RS-0130(24), Widen & Resurf., 2003



Indicates Grass & / or Physical Barrier on Median.

Road Diagram
* MPM = Milepost Marker

BEGIN RTE 130 ON KEA'AU-PAHOA ROAD AT THE SOUTH EAST EDGE OF PAVT. OF VOLCANO ROAD (RTE 11).



SCALE: (In Miles) 2" = 1 mile

- Divided Highway / Undivided: Shoulder: Width and Type — 10' AC; 8' AC
- Pavement: Width and Type — (12'AC); 24' AC; 36' AC; 12' AC; 24' AC
- Shoulder: Width and Type — 4' AC; 8' AC
- Median: Width and Type — 10' Painted AC; 10' Grass (Flush); Varies 0-22' Paint; 0-12' Painted AC; 0-18' Painted AC
- Shoulder: Width and Type — 4' AC
- Pavement: Width and Type — 24' AC; 12' AC
- Shoulder: Width and Type — 10' AC; 2' AC; 8' AC
- Number of Traffic Lanes — 4 - 12'; 2 - 12'; (2 - 12')
- Auxiliary Lanes and Parking Lanes: No. of Lanes and Width (Left Side); (Right Side) — All Turning Lanes 12'
- Frontage Road: No. of Lanes, and Width (Right and Left)
- Sidewalk: Width and Type (Right and Left)
- Curb and/or Gutter: Type (Right and Left)
- Protective Devices: Type, Location and Number — All Metal Rails on Metal Posts unless noted otherwise.
- Illumination: Type, Location and Number — Low Pressure Sodium
- Curves Class: +/- Degree (A(0-3.45) B(3.45-5.44) C(5.44-8.48) D(8.48-13.85) E(13.85-28.62) F(<28.62)
- Superelevation (Range)
- Grades Class: +/- % (A(0-.45) B(.45-2.45) C(2.45-4.45) D(4.45-6.45) E(6.45-8.45) F(<8.45)
- Vertical Curve: Crest or Sag, Curve Limits
- Area and Development: — Small Urban (99999)
- Terrain: 1-Flat, 2-Rolling, 3-Mountainous — Rolling (2); Flat (1)
- Speed: 1-Design, 2-Posted — (35 MPH (2) Not Posted); 45 MPH (1)
- Intersection Control Devices: Type, Location and Cycle Timing
- Traffic Stations (Current Year) — B71 0130 00138; P71 0000 00C3F; B71 0130 00007
- HPMS Sections - AADT 2022 — 24,052; 31,800; 16,600
- HPMS Sections - AADT 2021 — 24,100; 30,900; 13,500
- HPMS Sections - AADT 2020 — 20,909; 30,900; 11,402
- Rush Hour Shoulder Lane
- DOD Sections
- Census Tracts
- Functional Classification — Minor Arterial (4)
- National Highway System (NHS) — Not on NHS (0)
- Previous Projects: Project No., Date and Limits — RS-0130(24), Widen & Resurf., 2003; RS-0130(18), Widen & Resurf., 1993; 130B-01-72 (R) 1972; S-0130(1) 1952; 130B - 01 - 92 New Constr., 1999; STP-0130(28), Resurf. 1996

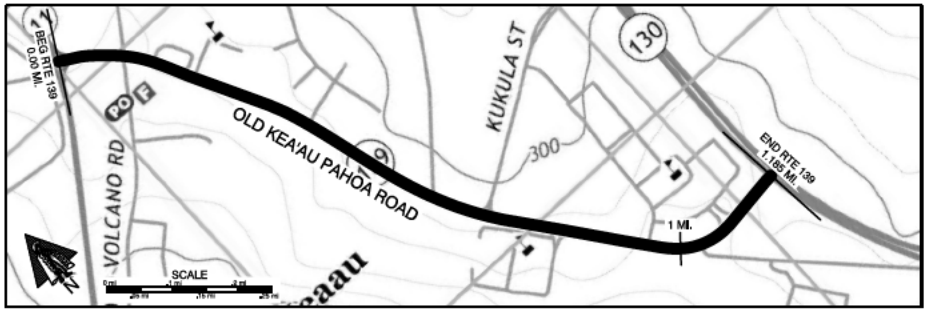
SCALE: (In Miles) 2" = 1 mile

Date Released	
Nov. 2000	
Revised	
Oct. 01	J.K.
Feb. 04	D.B.
May 04	D.B.
Sept 04	D.B.
7/06	D.B.
2/08	D.B.
8/10	D.B.
2/11	D.B.
2/12	D.B.
8/12	E.P.J.
12/13	EPU
7/14	D.B.
1/16	EPU
1/17	EPU
2/18	D.B.
11/18	D.B.
12/20	EPU

ROAD INVENTORY
HAWAII RTE 139
OLD KEA'AU - PAHOA ROAD
HAWAII RTE 163
CITY OF REFUGE SPAR

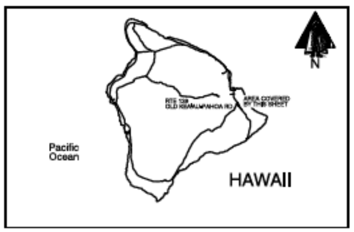
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PREPARED BY THE HIGHWAYS PLANNING BRANCH
IN COOPERATION WITH THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

Total Route Length: 1.185 miles
a. Survey Length: 1.185 miles
b. Proposed Length: 0.000 miles
c. Other Length: 0.000 miles



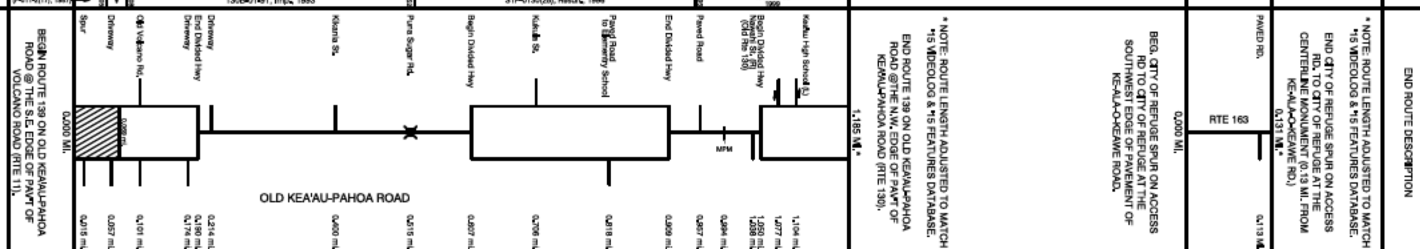
SCALE: (In Miles) 10" = 1 mile

Item	Route 139 (0.00 – 1.185)	Route 163 (0.00 – 0.131)
Maintenance Control Sections: Length and Description	End 139A same as Begin Route; 139A (1.19 mi.)	160 03 (0.13 MI.)
Bridges (Over 20'): Length, Type, Capacity and Year Constructed	Continuous Conc. Slab HS-20, 1968; 18'	
Vertical Clearance		
Horizontal Clearance	44'	
Vertical Clearance (Structure Over Road)		
Horizontal Clearance (Structure Over Road)		
Right of Way Width (min.-max.) if varies	80'-85'; 80'-130'; 90'-140'	
Available Right of Way Width (Needs Study)	Residential; Clear 100' - Sugar Cane - 6' from Pav't	
Right of Way Fence: Type - Right and Left	Chain Link	
Control of Access: 1-None, 2-Partial, 3-Full	None	(NONE)
Jurisdiction, Transfer Phase No. and Date (C to S or S to C)	State	(STATE)
Project No., Type of Construction, and Year Constructed	(RSG-0130(22), 1987); 139A-01-05M, Resurface, 2011	
Project No., Type of Construction, and Year Constructed	(F-011-2(17), 1987); 130B-01-81, Imp., 1993; STP-0130(25), Resurf., 1996; 130B-01-82 1999	



Indicates Grass & / or Physical Barrier on Median.

Road Diagram
* MPM=Milepost Marker



SCALE: (In Miles) 10" = 1 mile

Item	Route 139 (0.00 – 1.185)	Route 163 (0.00 – 0.131)
Undivided – Shoulder: Width and Type	6' AC; 10' AC; 8' Gravel; 4' AC	(4' AC)
Undivided – Pavement: Width and Type	12' AC; 24' AC; 12' AC; 24' AC; 12' AC	(24' AC)
Undivided – Shoulder: Width and Type	0; 0; 6' AC; 2' AC; 0; 8'-10' AC; 0	(4' AC)
Divided Highway – Median: Width and Type	8' Grass (Raised); 14' Painted Median; 12' Painted Median; 12' Painted Median	
Divided Highway – Shoulder: Width and Type	0; 0; 0	
Divided Highway – Pavement: Width and Type	12' AC; 12' AC; 12' AC	
Divided Highway – Shoulder: Width and Type	0; 2' AC; 8'-10' AC; 4' AC	
Number of Traffic Lanes	2-12'	(2-12')
Auxiliary Lanes and Parking Lanes: No. of Lanes and Width (Left Side)	12' TL; 1-12' TL; 12' TL	(N/A)
(Right Side)		(N/A)
Frontage Road: No. of Lanes, and Width (Right and Left)		
Sidewalk: Width and Type (Right and Left)		(N/A)
Curb and/or Gutter: Type (Right and Left)		
Protective Devices: Type, Location and Number (All Metal Rails on Metal Posts unless noted otherwise.)		METAL ON METAL
Illumination: Type, Location and Number		
Curves Class: +/- Degree (A(0-3.45) B(3.45-5.44) C(5.44-8.48) D(8.48-13.85) E(13.85-28.62) F(<28.62)	E; B; A; D; A	A D E
Superelevation (Range)		
Grades Class: +/- % (A(0-.45) B(.45-2.45) C(2.45-4.45) D(4.45-6.45) E(6.45-8.45) F(<8.45)	B; A; B; A; C; A; C	B
Vertical Curve: Crest or Sag, Curve Limits		
Area and Development	Rural (99999)	(RURAL (99999))
Terrain: 1-Flat, 2-Rolling, 3-Mountainous	Rolling (2)	(ROLLING (2))
Speed: 1-Design, 2-Posted	25 MPH (2)	(N/A)
Intersection Control Devices: Type, Location and Cycle Timing	2 Phase; 2 Phase	
Traffic Stations (Current Year)	B71 0139 00070	(B71 0163 00000)
HPMS Sections - AADT 2022	8,064	(1,000)
HPMS Sections - AADT 2021	8,100	(1,128)
HPMS Sections - AADT 2020	7,300	(1,100)
DOD Sections		
Census Tracts		
Functional Classification	Major Collector (5)	(MAJOR COLLECTOR (5))
National Highway System (NHS)	Not On NHS (0)	(NOT ON NHS (0))
Previous Projects: Project No., Date and Limits	STP-0130(25), Resurf., 1996; (RSG-0130(22), 1987); 130B-01-83M, (R), 1983; S-0130(2), 1966; S-130(7), 1967	(S-0160(3) UNIT 2, 1961)

SCALE: (In Miles) 10" = 1 mile

Date Released	
June 1999	
Revised	
7/04	D.B.
7/06	D.B.
8/10	D.B.
2/11	D.B.
2/12	D.B.
8/12	EPJ
12/13	EPJ
7/14	D.B.
1/16	EPJ
1/17	EPJ
2/18	D.B.
11/18	D.B.
12/20	EPJ

Appendix B
Analysis Report Existing Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	1402	908	77	529	653
Future Volume (veh/h)	22	1402	908	77	529	653
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1826	1826	1811	1811
Adj Flow Rate, veh/h	26	0	1068	0	622	768
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	5	5	6	6
Cap, veh/h	53		1608		758	2696
Arrive On Green	0.03	0.00	0.46	0.00	0.23	0.78
Sat Flow, veh/h	1767	2768	3561	1547	3346	3532
Grp Volume(v), veh/h	26	0	1068	0	622	768
Grp Sat Flow(s),veh/h/ln	1767	1384	1735	1547	1673	1721
Q Serve(g_s), s	0.8	0.0	12.8	0.0	9.5	3.3
Cycle Q Clear(g_c), s	0.8	0.0	12.8	0.0	9.5	3.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	53		1608		758	2696
V/C Ratio(X)	0.49		0.66		0.82	0.28
Avail Cap(c_a), veh/h	593		1608		874	2696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	11.1	0.0	19.7	1.6
Incr Delay (d2), s/veh	6.9	0.0	2.2	0.0	5.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.4	0.0	3.8	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.5	0.0	13.3	0.0	25.2	1.9
LnGrp LOS	C		B		C	A
Approach Vol, veh/h	26		1068			1390
Approach Delay, s/veh	32.5		13.3			12.3
Approach LOS	C		B			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.1	29.9				47.0		6.6
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	14.0	23.0				42.0		18.0
Max Q Clear Time (g_c+I1), s	11.5	14.8				5.3		2.8
Green Ext Time (p_c), s	0.7	4.5				6.0		0.0

Intersection Summary			
HCM 6th Ctrl Delay			13.0
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	23	10	311	20	106	19	744	254	156	441	8
Future Volume (veh/h)	10	23	10	311	20	106	19	744	254	156	441	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1870	1870	1870	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	10	24	10	324	21	0	20	775	0	162	459	8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	2	2	2	4	4	4	6	6	6
Cap, veh/h	169	367	135	589	30		42	982		182	1253	22
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.00	0.02	0.28	0.00	0.11	0.36	0.36
Sat Flow, veh/h	261	1045	384	1330	86	1585	1753	3589	0	1725	3460	60
Grp Volume(v), veh/h	44	0	0	345	0	0	20	775	0	162	228	239
Grp Sat Flow(s),veh/h/ln	1690	0	0	1416	0	1585	1753	1749	0	1725	1721	1800
Q Serve(g_s), s	0.0	0.0	0.0	10.8	0.0	0.0	0.6	11.7	0.0	5.3	5.6	5.6
Cycle Q Clear(g_c), s	1.0	0.0	0.0	11.8	0.0	0.0	0.6	11.7	0.0	5.3	5.6	5.6
Prop In Lane	0.23		0.23	0.94		1.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	670	0	0	619	0		42	982		182	623	652
V/C Ratio(X)	0.07	0.00	0.00	0.56	0.00		0.48	0.79		0.89	0.37	0.37
Avail Cap(c_a), veh/h	670	0	0	619	0		154	1166		182	623	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	0.0	15.7	0.0	0.0	27.5	18.9	0.0	25.2	13.4	13.4
Incr Delay (d2), s/veh	0.2	0.0	0.0	3.6	0.0	0.0	8.3	3.2	0.0	38.2	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	4.1	0.0	0.0	0.3	4.5	0.0	3.9	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	0.0	0.0	19.3	0.0	0.0	35.8	22.1	0.0	63.4	13.7	13.7
LnGrp LOS	B	A	A	B	A		D	C		E	B	B
Approach Vol, veh/h		44			345			795			629	
Approach Delay, s/veh		12.5			19.3			22.4			26.5	
Approach LOS		B			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.0	11.0	21.0		25.0	6.4	25.6				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		20.0	6.0	19.0		20.0	5.0	20.0				
Max Q Clear Time (g_c+I1), s		13.8	7.3	13.7		3.0	2.6	7.6				
Green Ext Time (p_c), s		1.1	0.0	2.3		0.1	0.0	2.1				
Intersection Summary												
HCM 6th Ctrl Delay			23.0									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	5	39	15	16	120	138	908	5	20	356	415
Future Volume (vph)	251	5	39	15	16	120	138	908	5	20	356	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1618	1579			1638		1703	3403		1719	1810	1538
Flt Permitted	0.95	0.97			0.94		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1618	1579			1551		1703	3403		1719	1810	1538
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	270	5	42	16	17	129	148	976	5	22	383	446
RTOR Reduction (vph)	0	18	0	0	115	0	0	1	0	0	0	301
Lane Group Flow (vph)	162	137	0	0	47	0	148	980	0	22	383	145
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	6%	6%	6%	5%	5%	5%
Turn Type	Split	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	12.1	12.1			7.8		8.8	30.4		1.8	23.4	23.4
Effective Green, g (s)	12.1	12.1			7.8		8.8	30.4		1.8	23.4	23.4
Actuated g/C Ratio	0.17	0.17			0.11		0.12	0.42		0.02	0.32	0.32
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	271	264			167		207	1434		42	587	499
v/s Ratio Prot	c0.10	0.09					c0.09	c0.29		0.01	0.21	
v/s Ratio Perm					c0.03							0.09
v/c Ratio	0.60	0.52			0.28		0.71	0.68		0.52	0.65	0.29
Uniform Delay, d1	27.7	27.3			29.6		30.4	16.9		34.7	20.9	18.2
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	1.7			0.9		11.1	2.7		11.3	5.6	1.5
Delay (s)	31.3	29.1			30.5		41.6	19.6		46.0	26.4	19.6
Level of Service	C	C			C		D	B		D	C	B
Approach Delay (s)		30.2			30.5			22.5			23.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↑↑	↑↑	↱
Traffic Volume (veh/h)	79	283	456	1931	440	80
Future Volume (veh/h)	79	283	456	1931	440	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1870	1870	1811	1811
Adj Flow Rate, veh/h	83	298	480	2033	463	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	2	6	6
Cap, veh/h	297	730	527	2428	1078	
Arrive On Green	0.17	0.17	0.30	0.68	0.31	0.00
Sat Flow, veh/h	1767	1572	1781	3647	3532	1535
Grp Volume(v), veh/h	83	298	480	2033	463	0
Grp Sat Flow(s),veh/h/ln	1767	1572	1781	1777	1721	1535
Q Serve(g_s), s	2.8	8.4	17.5	28.5	7.2	0.0
Cycle Q Clear(g_c), s	2.8	8.4	17.5	28.5	7.2	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	297	730	527	2428	1078	
V/C Ratio(X)	0.28	0.41	0.91	0.84	0.43	
Avail Cap(c_a), veh/h	499	909	582	2428	1078	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.4	11.9	22.8	7.9	18.3	0.0
Incr Delay (d2), s/veh	0.5	0.4	17.6	3.6	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.1	8.9	6.8	2.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.9	12.3	40.4	11.5	19.6	0.0
LnGrp LOS	C	B	D	B	B	
Approach Vol, veh/h	381			2513	463	
Approach Delay, s/veh	15.1			17.0	19.6	
Approach LOS	B			B	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		51.0		16.3	24.9	26.1
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		46.0		19.0	22.0	19.0
Max Q Clear Time (g_c+I1), s		30.5		10.4	19.5	9.2
Green Ext Time (p_c), s		12.1		0.9	0.4	1.9
Intersection Summary						
HCM 6th Ctrl Delay			17.2			
HCM 6th LOS			B			

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	803	695	57	1199	1074
Future Volume (veh/h)	79	803	695	57	1199	1074
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1826	1826	1841	1841	1841	1841
Adj Flow Rate, veh/h	82	0	724	0	1249	1119
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	4	4	4	4
Cap, veh/h	132		990		1419	2710
Arrive On Green	0.08	0.00	0.28	0.00	0.42	0.77
Sat Flow, veh/h	1739	2723	3589	1560	3401	3589
Grp Volume(v), veh/h	82	0	724	0	1249	1119
Grp Sat Flow(s),veh/h/ln	1739	1362	1749	1560	1700	1749
Q Serve(g_s), s	3.1	0.0	12.6	0.0	22.7	7.1
Cycle Q Clear(g_c), s	3.1	0.0	12.6	0.0	22.7	7.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	132		990		1419	2710
V/C Ratio(X)	0.62		0.73		0.88	0.41
Avail Cap(c_a), veh/h	207		990		1419	2710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	0.0	21.7	0.0	18.0	2.5
Incr Delay (d2), s/veh	4.7	0.0	4.8	0.0	8.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	5.4	0.0	9.3	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.7	0.0	26.5	0.0	26.1	3.0
LnGrp LOS	C		C		C	A
Approach Vol, veh/h	82		724			2368
Approach Delay, s/veh	34.7		26.5			15.2
Approach LOS	C		C			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	33.0	24.0				57.0		10.1
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	28.0	19.0				52.0		8.0
Max Q Clear Time (g_c+I1), s	24.7	14.6				9.1		5.1
Green Ext Time (p_c), s	1.8	1.9				10.3		0.0

Intersection Summary			
HCM 6th Ctrl Delay			18.3
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	37	7	208	35	113	21	498	138	211	690	29
Future Volume (veh/h)	14	37	7	208	35	113	21	498	138	211	690	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	14	38	7	214	36	0	22	513	0	218	711	30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	3	3	3
Cap, veh/h	185	455	75	561	85		45	756		236	1122	47
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.00	0.03	0.22	0.00	0.13	0.33	0.33
Sat Flow, veh/h	277	1255	206	1197	235	1585	1739	3561	0	1767	3447	145
Grp Volume(v), veh/h	59	0	0	250	0	0	22	513	0	218	363	378
Grp Sat Flow(s),veh/h/ln	1737	0	0	1432	0	1585	1739	1735	0	1767	1763	1829
Q Serve(g_s), s	0.0	0.0	0.0	5.7	0.0	0.0	0.7	7.1	0.0	6.4	9.2	9.2
Cycle Q Clear(g_c), s	1.1	0.0	0.0	6.8	0.0	0.0	0.7	7.1	0.0	6.4	9.2	9.2
Prop In Lane	0.24		0.12	0.86		1.00	1.00		0.00	1.00		0.08
Lane Grp Cap(c), veh/h	715	0	0	646	0		45	756		236	574	595
V/C Ratio(X)	0.08	0.00	0.00	0.39	0.00		0.48	0.68		0.92	0.63	0.63
Avail Cap(c_a), veh/h	715	0	0	646	0		166	1257		236	706	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	0.0	0.0	12.7	0.0	0.0	25.2	18.8	0.0	22.5	15.0	15.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.7	0.0	0.0	7.8	1.1	0.0	38.5	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	2.3	0.0	0.0	0.3	2.6	0.0	4.9	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.2	0.0	0.0	14.5	0.0	0.0	32.9	19.9	0.0	60.9	16.3	16.3
LnGrp LOS	B	A	A	B	A		C	B		E	B	B
Approach Vol, veh/h		59			250			535			959	
Approach Delay, s/veh		11.2			14.5			20.4			26.4	
Approach LOS		B			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		24.0	12.0	16.4		24.0	6.4	22.1				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		19.0	7.0	19.0		19.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		8.8	8.4	9.1		3.1	2.7	11.2				
Green Ext Time (p_c), s		1.0	0.0	2.3		0.2	0.0	3.1				
Intersection Summary												
HCM 6th Ctrl Delay			22.5									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1	23	2	2	30	4	565	8	64	970	30
Future Volume (vph)	125	1	23	2	2	30	4	565	8	64	970	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.95			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1614			1667		1719	3431		1752	1845	1568
Flt Permitted	0.95	0.97			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1614			1627		1719	3431		1752	1845	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	134	1	25	2	2	32	4	608	9	69	1043	32
RTOR Reduction (vph)	0	14	0	0	31	0	0	1	0	0	0	10
Lane Group Flow (vph)	82	64	0	0	5	0	4	616	0	69	1043	22
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	5%	5%	5%	3%	3%	3%
Turn Type	Split	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	10.7	10.7			4.0		0.9	71.7		7.4	78.2	78.2
Effective Green, g (s)	10.7	10.7			4.0		0.9	71.7		7.4	78.2	78.2
Actuated g/C Ratio	0.09	0.09			0.04		0.01	0.63		0.07	0.69	0.69
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	156	151			57		13	2161		113	1267	1077
v/s Ratio Prot	c0.05	0.04					0.00	0.18		c0.04	c0.57	
v/s Ratio Perm					c0.00							0.01
v/c Ratio	0.53	0.43			0.09		0.31	0.29		0.61	0.82	0.02
Uniform Delay, d1	49.1	48.7			53.1		56.1	9.5		51.8	12.8	5.6
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.2	1.9			0.7		13.0	0.3		9.4	6.1	0.0
Delay (s)	52.3	50.6			53.8		69.1	9.8		61.2	19.0	5.7
Level of Service	D	D			D		E	A		E	B	A
Approach Delay (s)		51.5			53.8			10.2			21.1	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	445	193	786	1267	9
Future Volume (veh/h)	44	445	193	786	1267	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1841	1841
Adj Flow Rate, veh/h	46	468	203	827	1334	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	4	4	4	4
Cap, veh/h	451	613	234	2145	1446	
Arrive On Green	0.25	0.25	0.13	0.61	0.41	0.00
Sat Flow, veh/h	1781	1585	1753	3589	3589	1560
Grp Volume(v), veh/h	46	468	203	827	1334	0
Grp Sat Flow(s),veh/h/ln	1781	1585	1753	1749	1749	1560
Q Serve(g_s), s	1.5	19.0	8.5	9.0	27.1	0.0
Cycle Q Clear(g_c), s	1.5	19.0	8.5	9.0	27.1	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	451	613	234	2145	1446	
V/C Ratio(X)	0.10	0.76	0.87	0.39	0.92	
Avail Cap(c_a), veh/h	451	613	234	2145	1446	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	20.0	31.9	7.3	20.9	0.0
Incr Delay (d2), s/veh	0.1	5.7	27.5	0.5	11.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	16.7	5.1	2.6	11.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.6	25.7	59.4	7.9	32.1	0.0
LnGrp LOS	C	C	E	A	C	
Approach Vol, veh/h	514			1030	1334	
Approach Delay, s/veh	25.3			18.0	32.1	
Approach LOS	C			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		51.0		24.0	15.0	36.0
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		46.0		19.0	10.0	31.0
Max Q Clear Time (g_c+I1), s		11.0		21.0	10.5	29.1
Green Ext Time (p_c), s		6.0		0.0	0.0	1.4

Intersection Summary		
HCM 6th Ctrl Delay		25.9
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Appendix C
Analysis Report Future Without Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱↱	↑↑	↱	↰↰	↑↑
Traffic Volume (veh/h)	22	1493	967	77	563	695
Future Volume (veh/h)	22	1493	967	77	563	695
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1826	1826	1811	1811
Adj Flow Rate, veh/h	26	0	1138	0	662	818
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	5	5	6	6
Cap, veh/h	52		1661		791	2754
Arrive On Green	0.03	0.00	0.48	0.00	0.24	0.80
Sat Flow, veh/h	1767	2768	3561	1547	3346	3532
Grp Volume(v), veh/h	26	0	1138	0	662	818
Grp Sat Flow(s),veh/h/ln	1767	1384	1735	1547	1673	1721
Q Serve(g_s), s	0.9	0.0	14.9	0.0	11.1	3.7
Cycle Q Clear(g_c), s	0.9	0.0	14.9	0.0	11.1	3.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	52		1661		791	2754
V/C Ratio(X)	0.50		0.69		0.84	0.30
Avail Cap(c_a), veh/h	542		1661		912	2754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	11.9	0.0	21.3	1.5
Incr Delay (d2), s/veh	7.2	0.0	2.3	0.0	6.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.3	0.0	4.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.3	0.0	14.2	0.0	27.5	1.8
LnGrp LOS	D		B		C	A
Approach Vol, veh/h	26		1138			1480
Approach Delay, s/veh	35.3		14.2			13.3
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	18.9	33.1				52.0	6.7
Change Period (Y+Rc), s	5.0	5.0				5.0	5.0
Max Green Setting (Gmax), s	16.0	26.0				47.0	18.0
Max Q Clear Time (g_c+I1), s	13.1	16.9				5.7	2.9
Green Ext Time (p_c), s	0.8	5.2				6.6	0.0

Intersection Summary			
HCM 6th Ctrl Delay			13.9
HCM 6th LOS			B

Notes
User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	23	10	311	20	106	19	792	254	156	470	8
Future Volume (veh/h)	10	23	10	311	20	106	19	792	254	156	470	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1870	1870	1870	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	10	24	10	324	21	0	20	825	0	162	490	8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	2	2	2	4	4	4	6	6	6
Cap, veh/h	167	367	136	583	31		41	1019		194	1319	22
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.00	0.02	0.29	0.00	0.11	0.38	0.38
Sat Flow, veh/h	270	1035	384	1330	86	1585	1753	3589	0	1725	3465	57
Grp Volume(v), veh/h	44	0	0	345	0	0	20	825	0	162	243	255
Grp Sat Flow(s),veh/h/ln	1689	0	0	1416	0	1585	1753	1749	0	1725	1721	1801
Q Serve(g_s), s	0.0	0.0	0.0	11.7	0.0	0.0	0.7	13.6	0.0	5.7	6.3	6.3
Cycle Q Clear(g_c), s	1.0	0.0	0.0	12.8	0.0	0.0	0.7	13.6	0.0	5.7	6.3	6.3
Prop In Lane	0.23		0.23	0.94		1.00	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	669	0	0	614	0		41	1019		194	655	685
V/C Ratio(X)	0.07	0.00	0.00	0.56	0.00		0.49	0.81		0.83	0.37	0.37
Avail Cap(c_a), veh/h	669	0	0	614	0		141	1183		194	655	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	17.0	0.0	0.0	29.9	20.4	0.0	27.0	13.9	13.9
Incr Delay (d2), s/veh	0.2	0.0	0.0	3.7	0.0	0.0	8.6	3.8	0.0	25.5	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	4.5	0.0	0.0	0.4	5.5	0.0	3.6	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	0.0	0.0	20.6	0.0	0.0	38.5	24.2	0.0	52.5	14.2	14.2
LnGrp LOS	B	A	A	C	A		D	C		D	B	B
Approach Vol, veh/h		44			345			845			660	
Approach Delay, s/veh		13.5			20.6			24.5			23.6	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	12.0	23.1		27.0	6.5	28.6				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	7.0	21.0		22.0	5.0	23.0				
Max Q Clear Time (g_c+I1), s		14.8	7.7	15.6		3.0	2.7	8.3				
Green Ext Time (p_c), s		1.2	0.0	2.5		0.1	0.0	2.5				

Intersection Summary			
HCM 6th Ctrl Delay			23.2
HCM 6th LOS			C

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥			✥		↰	↑↱		↰	↑	↱
Traffic Volume (vph)	251	5	39	15	16	120	138	967	5	20	379	415
Future Volume (vph)	251	5	39	15	16	120	138	967	5	20	379	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1618	1579			1638		1703	3403		1719	1810	1538
Flt Permitted	0.95	0.97			0.94		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1618	1579			1551		1703	3403		1719	1810	1538
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	270	5	42	16	17	129	148	1040	5	22	408	446
RTOR Reduction (vph)	0	18	0	0	115	0	0	1	0	0	0	296
Lane Group Flow (vph)	162	137	0	0	47	0	148	1044	0	22	408	150
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	6%	6%	6%	5%	5%	5%
Turn Type	Split	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	12.1	12.1			7.8		8.1	30.6		1.8	24.3	24.3
Effective Green, g (s)	12.1	12.1			7.8		8.1	30.6		1.8	24.3	24.3
Actuated g/C Ratio	0.17	0.17			0.11		0.11	0.42		0.02	0.34	0.34
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	270	264			167		190	1440		42	608	516
v/s Ratio Prot	c0.10	0.09					c0.09	c0.31		0.01	0.23	
v/s Ratio Perm					c0.03							0.10
v/c Ratio	0.60	0.52			0.28		0.78	0.73		0.52	0.67	0.29
Uniform Delay, d1	27.9	27.4			29.7		31.2	17.4		34.8	20.6	17.7
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	1.7			0.9		18.0	3.2		11.3	5.8	1.4
Delay (s)	31.4	29.2			30.6		49.3	20.6		46.1	26.4	19.1
Level of Service	C	C			C		D	C		D	C	B
Approach Delay (s)		30.3			30.6			24.1			23.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	283	456	2056	469	80
Future Volume (veh/h)	79	283	456	2056	469	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1870	1870	1811	1811
Adj Flow Rate, veh/h	83	298	480	2164	494	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	2	6	6
Cap, veh/h	291	726	529	2482	1145	
Arrive On Green	0.16	0.16	0.30	0.70	0.33	0.00
Sat Flow, veh/h	1767	1572	1781	3647	3532	1535
Grp Volume(v), veh/h	83	298	480	2164	494	0
Grp Sat Flow(s),veh/h/ln	1767	1572	1781	1777	1721	1535
Q Serve(g_s), s	3.0	9.2	18.9	34.3	8.2	0.0
Cycle Q Clear(g_c), s	3.0	9.2	18.9	34.3	8.2	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	291	726	529	2482	1145	
V/C Ratio(X)	0.29	0.41	0.91	0.87	0.43	
Avail Cap(c_a), veh/h	460	876	634	2482	1145	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.7	13.1	24.7	8.5	19.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	15.1	4.6	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	9.2	8.7	3.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.3	13.4	39.8	13.1	20.2	0.0
LnGrp LOS	C	B	D	B	C	
Approach Vol, veh/h	381			2644	494	
Approach Delay, s/veh	16.4			17.9	20.2	
Approach LOS	B			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		56.0		17.0	26.7	29.3
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		51.0		19.0	26.0	20.0
Max Q Clear Time (g_c+I1), s		36.3		11.2	20.9	10.2
Green Ext Time (p_c), s		12.1		0.8	0.8	2.1

Intersection Summary			
HCM 6th Ctrl Delay			18.1
HCM 6th LOS			B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	855	741	57	1277	1146
Future Volume (veh/h)	79	855	741	57	1277	1146
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1826	1826	1841	1841	1841	1841
Adj Flow Rate, veh/h	82	0	772	0	1330	1194
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	4	4	4	4
Cap, veh/h	131		975		1447	2720
Arrive On Green	0.08	0.00	0.28	0.00	0.43	0.78
Sat Flow, veh/h	1739	2723	3589	1560	3401	3589
Grp Volume(v), veh/h	82	0	772	0	1330	1194
Grp Sat Flow(s),veh/h/ln	1739	1362	1749	1560	1700	1749
Q Serve(g_s), s	3.1	0.0	13.9	0.0	25.1	7.8
Cycle Q Clear(g_c), s	3.1	0.0	13.9	0.0	25.1	7.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	131		975		1447	2720
V/C Ratio(X)	0.62		0.79		0.92	0.44
Avail Cap(c_a), veh/h	179		975		1447	2720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	0.0	22.7	0.0	18.5	2.6
Incr Delay (d2), s/veh	4.8	0.0	6.6	0.0	10.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	6.2	0.0	10.7	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.4	0.0	29.3	0.0	29.3	3.1
LnGrp LOS	D		C		C	A
Approach Vol, veh/h	82		772			2524
Approach Delay, s/veh	35.4		29.3			16.9
Approach LOS	D		C			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	34.0	24.0				58.0		10.1
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	29.0	19.0				53.0		7.0
Max Q Clear Time (g_c+I1), s	27.1	15.9				9.8		5.1
Green Ext Time (p_c), s	1.1	1.5				11.4		0.0

Intersection Summary		
HCM 6th Ctrl Delay		20.2
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	37	7	210	35	114	21	530	139	213	735	29
Future Volume (veh/h)	14	37	7	210	35	114	21	530	139	213	735	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	14	38	7	216	36	0	22	546	0	220	758	30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	3	3	3
Cap, veh/h	183	450	74	555	83		45	788		233	1151	46
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.00	0.03	0.23	0.00	0.13	0.33	0.33
Sat Flow, veh/h	277	1256	206	1199	233	1585	1739	3561	0	1767	3457	137
Grp Volume(v), veh/h	59	0	0	252	0	0	22	546	0	220	386	402
Grp Sat Flow(s),veh/h/ln	1739	0	0	1431	0	1585	1739	1735	0	1767	1763	1831
Q Serve(g_s), s	0.0	0.0	0.0	5.9	0.0	0.0	0.7	7.7	0.0	6.5	9.9	9.9
Cycle Q Clear(g_c), s	1.1	0.0	0.0	7.0	0.0	0.0	0.7	7.7	0.0	6.5	9.9	9.9
Prop In Lane	0.24		0.12	0.86		1.00	1.00		0.00	1.00		0.07
Lane Grp Cap(c), veh/h	707	0	0	639	0		45	788		233	587	610
V/C Ratio(X)	0.08	0.00	0.00	0.39	0.00		0.48	0.69		0.94	0.66	0.66
Avail Cap(c_a), veh/h	707	0	0	639	0		164	1242		233	698	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	0.0	13.1	0.0	0.0	25.5	18.8	0.0	22.8	15.1	15.1
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.8	0.0	0.0	7.8	1.1	0.0	43.4	1.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	2.4	0.0	0.0	0.3	2.8	0.0	5.2	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	0.0	14.9	0.0	0.0	33.3	19.9	0.0	66.3	16.9	16.8
LnGrp LOS	B	A	A	B	A		C	B		E	B	B
Approach Vol, veh/h		59			252			568			1008	
Approach Delay, s/veh		11.5			14.9			20.4			27.6	
Approach LOS		B			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		24.0	12.0	17.1		24.0	6.4	22.7				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		19.0	7.0	19.0		19.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		9.0	8.5	9.7		3.1	2.7	11.9				
Green Ext Time (p_c), s		1.0	0.0	2.4		0.2	0.0	3.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									
Notes												

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1	23	2	2	30	4	603	8	64	1035	30
Future Volume (vph)	125	1	23	2	2	30	4	603	8	64	1035	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.95			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1614			1667		1719	3431		1752	1845	1568
Flt Permitted	0.95	0.97			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1614			1627		1719	3431		1752	1845	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	134	1	25	2	2	32	4	648	9	69	1113	32
RTOR Reduction (vph)	0	12	0	0	31	0	0	0	0	0	0	9
Lane Group Flow (vph)	82	66	0	0	5	0	4	657	0	69	1113	23
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	5%	5%	5%	3%	3%	3%
Turn Type	Split	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	11.7	11.7			5.3		0.9	89.7		8.5	97.3	97.3
Effective Green, g (s)	11.7	11.7			5.3		0.9	89.7		8.5	97.3	97.3
Actuated g/C Ratio	0.09	0.09			0.04		0.01	0.66		0.06	0.72	0.72
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	144	139			63		11	2276		110	1327	1128
v/s Ratio Prot	c0.05	0.04					0.00	0.19		c0.04	c0.60	
v/s Ratio Perm					c0.00							0.01
v/c Ratio	0.57	0.48			0.08		0.36	0.29		0.63	0.84	0.02
Uniform Delay, d1	59.3	58.8			62.6		66.9	9.5		61.8	13.4	5.4
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	2.6			0.6		19.3	0.3		10.7	6.5	0.0
Delay (s)	64.4	61.4			63.2		86.1	9.8		72.5	19.9	5.4
Level of Service	E	E			E		F	A		E	B	A
Approach Delay (s)		62.9			63.2			10.3			22.5	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	452	200	837	1349	9
Future Volume (veh/h)	44	452	200	837	1349	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1841	1841
Adj Flow Rate, veh/h	46	476	211	881	1420	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	4	4	4	4
Cap, veh/h	423	594	241	2230	1530	
Arrive On Green	0.24	0.24	0.14	0.64	0.44	0.00
Sat Flow, veh/h	1781	1585	1753	3589	3589	1560
Grp Volume(v), veh/h	46	476	211	881	1420	0
Grp Sat Flow(s),veh/h/ln	1781	1585	1753	1749	1749	1560
Q Serve(g_s), s	1.6	19.0	9.4	9.8	30.8	0.0
Cycle Q Clear(g_c), s	1.6	19.0	9.4	9.8	30.8	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	423	594	241	2230	1530	
V/C Ratio(X)	0.11	0.80	0.88	0.40	0.93	
Avail Cap(c_a), veh/h	423	594	241	2230	1530	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.9	22.3	33.8	7.0	21.3	0.0
Incr Delay (d2), s/veh	0.1	7.7	28.1	0.5	11.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	18.4	5.6	2.8	13.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.0	30.0	61.9	7.6	32.6	0.0
LnGrp LOS	C	C	E	A	C	
Approach Vol, veh/h	522			1092	1420	
Approach Delay, s/veh	29.5			18.1	32.6	
Approach LOS	C			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		56.0		24.0	16.0	40.0
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		51.0		19.0	11.0	35.0
Max Q Clear Time (g_c+I1), s		11.8		21.0	11.4	32.8
Green Ext Time (p_c), s		6.6		0.0	0.0	1.7

Intersection Summary		
HCM 6th Ctrl Delay		26.8
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Appendix D
Analysis Report Future With Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	1493	968	77	563	699
Future Volume (veh/h)	22	1493	968	77	563	699
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1826	1826	1811	1811
Adj Flow Rate, veh/h	26	0	1139	0	662	822
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	5	5	6	6
Cap, veh/h	52		1661		791	2754
Arrive On Green	0.03	0.00	0.48	0.00	0.24	0.80
Sat Flow, veh/h	1767	2768	3561	1547	3346	3532
Grp Volume(v), veh/h	26	0	1139	0	662	822
Grp Sat Flow(s),veh/h/ln	1767	1384	1735	1547	1673	1721
Q Serve(g_s), s	0.9	0.0	15.0	0.0	11.1	3.7
Cycle Q Clear(g_c), s	0.9	0.0	15.0	0.0	11.1	3.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	52		1661		791	2754
V/C Ratio(X)	0.50		0.69		0.84	0.30
Avail Cap(c_a), veh/h	542		1661		912	2754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	11.9	0.0	21.3	1.5
Incr Delay (d2), s/veh	7.2	0.0	2.3	0.0	6.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.3	0.0	4.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.3	0.0	14.2	0.0	27.5	1.8
LnGrp LOS	D		B		C	A
Approach Vol, veh/h	26		1139			1484
Approach Delay, s/veh	35.3		14.2			13.3
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.9	33.1				52.0		6.7
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	16.0	26.0				47.0		18.0
Max Q Clear Time (g_c+I1), s	13.1	17.0				5.7		2.9
Green Ext Time (p_c), s	0.8	5.2				6.7		0.0

Intersection Summary			
HCM 6th Ctrl Delay			13.9
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	35	15	311	71	106	42	792	254	156	470	12
Future Volume (veh/h)	11	35	15	311	71	106	42	792	254	156	470	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1870	1870	1870	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	11	36	16	324	74	0	44	825	0	162	490	12
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	2	2	2	4	4	4	6	6	6
Cap, veh/h	137	416	169	556	107		70	1009		197	1246	30
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00	0.04	0.29	0.00	0.11	0.36	0.36
Sat Flow, veh/h	203	1046	425	1178	269	1585	1753	3589	0	1725	3433	84
Grp Volume(v), veh/h	63	0	0	398	0	0	44	825	0	162	245	257
Grp Sat Flow(s),veh/h/ln	1675	0	0	1447	0	1585	1753	1749	0	1725	1721	1796
Q Serve(g_s), s	0.0	0.0	0.0	15.2	0.0	0.0	1.9	16.6	0.0	6.9	8.0	8.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	16.9	0.0	0.0	1.9	16.6	0.0	6.9	8.0	8.0
Prop In Lane	0.17		0.25	0.81		1.00	1.00		0.00	1.00		0.05
Lane Grp Cap(c), veh/h	723	0	0	663	0		70	1009		197	625	652
V/C Ratio(X)	0.09	0.00	0.00	0.60	0.00		0.63	0.82		0.82	0.39	0.39
Avail Cap(c_a), veh/h	723	0	0	663	0		140	1206		206	662	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	0.0	0.0	18.6	0.0	0.0	35.6	25.0	0.0	32.6	17.8	17.8
Incr Delay (d2), s/veh	0.2	0.0	0.0	4.0	0.0	0.0	8.9	3.8	0.0	21.9	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	6.2	0.0	0.0	0.9	6.9	0.0	4.0	3.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	0.0	22.6	0.0	0.0	44.6	28.8	0.0	54.5	18.2	18.2
LnGrp LOS	B	A	A	C	A		D	C		D	B	B
Approach Vol, veh/h		63			398			869			664	
Approach Delay, s/veh		14.4			22.6			29.6			27.1	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		35.0	13.6	26.7		35.0	8.0	32.4
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		30.0	9.0	26.0		30.0	6.0	29.0
Max Q Clear Time (g_c+I1), s		18.9	8.9	18.6		3.7	3.9	10.0
Green Ext Time (p_c), s		2.0	0.0	3.2		0.3	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥			✥		↰	↑↱		↰	↑	↱
Traffic Volume (vph)	251	5	39	15	16	120	138	990	5	20	385	415
Future Volume (vph)	251	5	39	15	16	120	138	990	5	20	385	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96			0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1618	1579			1638		1703	3403		1719	1810	1538
Flt Permitted	0.95	0.97			0.94		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1618	1579			1551		1703	3403		1719	1810	1538
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	270	5	42	16	17	129	148	1065	5	22	414	446
RTOR Reduction (vph)	0	18	0	0	115	0	0	1	0	0	0	296
Lane Group Flow (vph)	162	137	0	0	47	0	148	1069	0	22	414	150
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	6%	6%	6%	5%	5%	5%
Turn Type	Split	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	12.1	12.1			7.8		8.1	30.6		1.8	24.3	24.3
Effective Green, g (s)	12.1	12.1			7.8		8.1	30.6		1.8	24.3	24.3
Actuated g/C Ratio	0.17	0.17			0.11		0.11	0.42		0.02	0.34	0.34
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	270	264			167		190	1440		42	608	516
v/s Ratio Prot	c0.10	0.09					c0.09	c0.31		0.01	0.23	
v/s Ratio Perm					c0.03							0.10
v/c Ratio	0.60	0.52			0.28		0.78	0.74		0.52	0.68	0.29
Uniform Delay, d1	27.9	27.4			29.7		31.2	17.5		34.8	20.7	17.7
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	1.7			0.9		18.0	3.5		11.3	6.1	1.4
Delay (s)	31.4	29.2			30.6		49.3	21.0		46.1	26.7	19.1
Level of Service	C	C			C		D	C		D	C	B
Approach Delay (s)		30.3			30.6			24.5			23.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	294	503	2056	469	80
Future Volume (veh/h)	79	294	503	2056	469	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1870	1870	1811	1811
Adj Flow Rate, veh/h	83	309	529	2164	494	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	2	6	6
Cap, veh/h	291	767	576	2482	1055	
Arrive On Green	0.16	0.16	0.32	0.70	0.31	0.00
Sat Flow, veh/h	1767	1572	1781	3647	3532	1535
Grp Volume(v), veh/h	83	309	529	2164	494	0
Grp Sat Flow(s),veh/h/ln	1767	1572	1781	1777	1721	1535
Q Serve(g_s), s	3.0	9.1	20.9	34.3	8.5	0.0
Cycle Q Clear(g_c), s	3.0	9.1	20.9	34.3	8.5	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	291	767	576	2482	1055	
V/C Ratio(X)	0.29	0.40	0.92	0.87	0.47	
Avail Cap(c_a), veh/h	460	918	659	2482	1055	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.7	11.9	23.8	8.5	20.5	0.0
Incr Delay (d2), s/veh	0.5	0.3	16.7	4.6	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	10.3	8.7	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.3	12.3	40.5	13.1	22.0	0.0
LnGrp LOS	C	B	D	B	C	
Approach Vol, veh/h	392			2693	494	
Approach Delay, s/veh	15.4			18.4	22.0	
Approach LOS	B			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		56.0		17.0	28.6	27.4
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		51.0		19.0	27.0	19.0
Max Q Clear Time (g_c+I1), s		36.3		11.1	22.9	10.5
Green Ext Time (p_c), s		12.1		0.9	0.7	1.9

Intersection Summary			
HCM 6th Ctrl Delay			18.6
HCM 6th LOS			B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	855	746	57	1277	1148
Future Volume (veh/h)	79	855	746	57	1277	1148
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1826	1826	1841	1841	1841	1841
Adj Flow Rate, veh/h	82	0	777	0	1330	1196
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	4	4	4	4
Cap, veh/h	131		975		1447	2720
Arrive On Green	0.08	0.00	0.28	0.00	0.43	0.78
Sat Flow, veh/h	1739	2723	3589	1560	3401	3589
Grp Volume(v), veh/h	82	0	777	0	1330	1196
Grp Sat Flow(s),veh/h/ln	1739	1362	1749	1560	1700	1749
Q Serve(g_s), s	3.1	0.0	14.0	0.0	25.1	7.9
Cycle Q Clear(g_c), s	3.1	0.0	14.0	0.0	25.1	7.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	131		975		1447	2720
V/C Ratio(X)	0.62		0.80		0.92	0.44
Avail Cap(c_a), veh/h	179		975		1447	2720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	0.0	22.8	0.0	18.5	2.6
Incr Delay (d2), s/veh	4.8	0.0	6.7	0.0	10.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	6.3	0.0	10.7	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.4	0.0	29.5	0.0	29.3	3.1
LnGrp LOS	D		C		C	A
Approach Vol, veh/h	82		777			2526
Approach Delay, s/veh	35.4		29.5			16.9
Approach LOS	D		C			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	34.0	24.0				58.0	10.1
Change Period (Y+Rc), s	5.0	5.0				5.0	5.0
Max Green Setting (Gmax), s	29.0	19.0				53.0	7.0
Max Q Clear Time (g_c+I1), s	27.1	16.0				9.9	5.1
Green Ext Time (p_c), s	1.1	1.5				11.4	0.0

Intersection Summary			
HCM 6th Ctrl Delay			20.2
HCM 6th LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	103	37	210	63	114	34	530	139	213	735	31
Future Volume (veh/h)	19	103	37	210	63	114	34	530	139	213	735	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	20	106	38	216	65	0	35	546	0	220	758	32
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	3	3	3
Cap, veh/h	111	448	146	499	132		66	788		233	1107	47
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.00	0.04	0.23	0.00	0.13	0.32	0.32
Sat Flow, veh/h	96	1251	406	1057	369	1585	1739	3561	0	1767	3447	145
Grp Volume(v), veh/h	164	0	0	281	0	0	35	546	0	220	388	402
Grp Sat Flow(s),veh/h/ln	1754	0	0	1426	0	1585	1739	1735	0	1767	1763	1829
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	1.0	7.7	0.0	6.5	10.2	10.2
Cycle Q Clear(g_c), s	3.4	0.0	0.0	7.5	0.0	0.0	1.0	7.7	0.0	6.5	10.2	10.2
Prop In Lane	0.12		0.23	0.77		1.00	1.00		0.00	1.00		0.08
Lane Grp Cap(c), veh/h	704	0	0	631	0		66	788		233	566	588
V/C Ratio(X)	0.23	0.00	0.00	0.45	0.00		0.53	0.69		0.94	0.68	0.68
Avail Cap(c_a), veh/h	704	0	0	631	0		164	1242		233	698	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	0.0	13.1	0.0	0.0	25.1	18.8	0.0	22.8	15.7	15.7
Incr Delay (d2), s/veh	0.8	0.0	0.0	2.3	0.0	0.0	6.4	1.1	0.0	43.4	2.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	2.7	0.0	0.0	0.5	2.8	0.0	5.2	3.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.8	0.0	0.0	15.4	0.0	0.0	31.5	19.9	0.0	66.3	17.7	17.7
LnGrp LOS	B	A	A	B	A		C	B		E	B	B
Approach Vol, veh/h		164			281			581			1010	
Approach Delay, s/veh		12.8			15.4			20.6			28.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		24.0	12.0	17.1		24.0	7.0	22.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		19.0	7.0	19.0		19.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		9.5	8.5	9.7		5.4	3.0	12.2				
Green Ext Time (p_c), s		1.2	0.0	2.4		0.7	0.0	3.2				

Intersection Summary		
HCM 6th Ctrl Delay		23.1
HCM 6th LOS		C

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1	23	2	2	30	4	616	8	64	1066	30
Future Volume (vph)	125	1	23	2	2	30	4	616	8	64	1066	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.95			0.88		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1614			1667		1719	3431		1752	1845	1568
Flt Permitted	0.95	0.97			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1614			1627		1719	3431		1752	1845	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	134	1	25	2	2	32	4	662	9	69	1146	32
RTOR Reduction (vph)	0	12	0	0	31	0	0	0	0	0	0	9
Lane Group Flow (vph)	82	66	0	0	5	0	4	671	0	69	1146	23
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	5%	5%	5%	3%	3%	3%
Turn Type	Split	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	11.7	11.7			5.3		0.9	89.7		8.5	97.3	97.3
Effective Green, g (s)	11.7	11.7			5.3		0.9	89.7		8.5	97.3	97.3
Actuated g/C Ratio	0.09	0.09			0.04		0.01	0.66		0.06	0.72	0.72
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	144	139			63		11	2276		110	1327	1128
v/s Ratio Prot	c0.05	0.04					0.00	0.20		c0.04	c0.62	
v/s Ratio Perm					c0.00							0.01
v/c Ratio	0.57	0.48			0.08		0.36	0.29		0.63	0.86	0.02
Uniform Delay, d1	59.3	58.8			62.6		66.9	9.5		61.8	14.0	5.4
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	2.6			0.6		19.3	0.3		10.7	7.6	0.0
Delay (s)	64.4	61.4			63.2		86.1	9.8		72.5	21.7	5.4
Level of Service	E	E			E		F	A		E	C	A
Approach Delay (s)		62.9			63.2			10.3			24.1	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	513	226	837	1349	9
Future Volume (veh/h)	44	513	226	837	1349	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1841	1841
Adj Flow Rate, veh/h	46	540	238	881	1420	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	4	4	4	4
Cap, veh/h	423	614	263	2230	1486	
Arrive On Green	0.24	0.24	0.15	0.64	0.43	0.00
Sat Flow, veh/h	1781	1585	1753	3589	3589	1560
Grp Volume(v), veh/h	46	540	238	881	1420	0
Grp Sat Flow(s),veh/h/ln	1781	1585	1753	1749	1749	1560
Q Serve(g_s), s	1.6	19.0	10.7	9.8	31.4	0.0
Cycle Q Clear(g_c), s	1.6	19.0	10.7	9.8	31.4	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	423	614	263	2230	1486	
V/C Ratio(X)	0.11	0.88	0.91	0.40	0.96	
Avail Cap(c_a), veh/h	423	614	263	2230	1486	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.9	22.8	33.4	7.0	22.3	0.0
Incr Delay (d2), s/veh	0.1	13.8	31.8	0.5	14.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	21.7	6.5	2.8	14.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.0	36.5	65.3	7.6	37.1	0.0
LnGrp LOS	C	D	E	A	D	
Approach Vol, veh/h	586			1119	1420	
Approach Delay, s/veh	35.6			19.8	37.1	
Approach LOS	D			B	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		56.0		24.0	17.0	39.0
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		51.0		19.0	12.0	34.0
Max Q Clear Time (g_c+I1), s		11.8		21.0	12.7	33.4
Green Ext Time (p_c), s		6.6		0.0	0.0	0.4

Intersection Summary			
HCM 6th Ctrl Delay			30.6
HCM 6th LOS			C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX B
Early Consultation Comments

C. Kimo Alameda, PhD
Mayor

William V. Brilhante Jr.
Managing Director

Merrick Nishimoto
Deputy Managing Director

County of Hawaii
CIVIL DEFENSE AGENCY

920 Ululani Street • Hilo, Hawai'i 96720-3958
(808) 935-0031

Talmadge J. Magno
Civil Defense Administrator

August 6, 2025

Land Planning Hawai'i LLC
194 Wiwo'ole Street
Hilo, HI 96720
info@landplanninghawaii.com

Subject: Early Request for Comment – Kea'au Outpatient Center EA

Aloha,
Thank you for the opportunity to provide early comments on the proposed Environmental Assessment (EA) for the Kea'au Outpatient Center. After review, the Hawai'i County Civil Defense Agency offers the following initial concerns and recommendations:

1. Traffic Concerns
   The proposed location at the intersection of Kea'au-Pāhoa Road and Volcano Road is already prone to significant congestion. The additional traffic generated by staff, patients, and service vehicles will likely worsen this issue. A comprehensive Traffic Impact Analysis Report (TIAR) will be essential to assess whether the existing infrastructure can support the increased load, and if not, what mitigation measures will be implemented.

2. Alternate Site Consideration
   It was our understanding that earlier plans had considered a location near Kea'au High School, which appeared to be a more favorable site in terms of access and potential impacts. We would appreciate clarification on why that location is no longer being pursued and how this current site was selected.

3. Roadway Connectivity
   There was also previous discussion regarding improved roadway connectivity in this area, including the possibility of a major roadway connecting from Puna through Waiākea Uka to the Daniel K. Inouye Highway (Saddle Road/Steinbeck Highway). This type of connection would significantly improve emergency access and reduce regional traffic pressure. We would like to know whether this connection is still being considered and how the current project may impact or limit future roadway planning.

We look forward to reviewing the completed EA and continuing coordination to ensure that public safety and emergency access considerations are incorporated into this project.

Mahalo,

Talmadge Magno
Administrator, Hawai'i County Civil Defense Agency

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Benjamin T. Moszkowicz
Police Chief

Reed K. Mahuna
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT

349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
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August 11, 2025

John Pipan
Planning Administrator
Land Planning Hawaii, LLC
194 Wiwo'ole Street
Hilo, Hawaii 96720
Email: info@landplanninghawaii.com

Dear Mr. Pipan,

SUBJECT: EARLY REQUEST FOR COMMENT FOR A HAWAI'I ENVIORNMENTAL POLICY ACT (HEPA) ENVIRONMENTAL ASSESSMENT (EA)
RE: KEA'AU OUTPATIENT CENTER – HILO BENIOFF MEDICAL CENTER (HBMC) NEW LOCATION
APPLICANT: HILO BENIOFF MEDICAL CENTER (HBMC)
LOCATION: KEA'AU, PUNA HAWAI'I TMK (3) 1-6-003: 127 (POR.), TMK (3) 1-6-003: 007 (POR.)

This is in response to your letter dated July 24, 2025, in which you requested input for an Environmental Assessment (EA) in accordance with the Hawaii Environmental Policy Act (HEPA) on behalf of HBMC in order to determine possible impacts associated with the proposed development, in accordance with Chapter 343 of the Hawai'i Revised Statutes and Title 11, Chapter 200.1 of the Hawai'i Administrative Rules (HAR).

Staff, upon reviewing the provided documents, does not anticipate any significant impact on traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact our Puna District Commander, Captain Todd Pataray at (808) 965-2716 or email Todd.Pataray@hawaiicounty.gov.

Sincerely,

KENNETH A.K. QUIOCHO
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

STATE OF HAWAIʻI
DEPARTMENT OF EDUCATION
KA ʻOIHANA HOʻONAʻAUAO
P.O. BOX 2360
HONOLULU, HAWAIʻI 96804

OFFICE OF FACILITIES AND OPERATIONS

August 27, 2025

Mr. John Pipan
Planning Administrator
Land Planning Hawaii LLC
194 Wiwoole Street
Hilo, HI 96720

Re: Early Request for Comment for a Hawaii Environmental Policy Act Environmental Assessment, Keaau Outpatient Center

Dear Mr. Pipan:

Thank you for your letter dated July 24, 2025. Based on the information provided and proximity to the service area of Keaau Middle School, the Hawaii State Department of Education requests early consultation with school administrators to discuss potential vehicular and pedestrian traffic impacts construction might have on school operations.

Should you have any questions, please contact Cori China, School Lands and Facilities Specialist of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us.

We appreciate the opportunity to comment.

Sincerely,

Roy Ikeda
Acting Public Works Manager
Planning Section

RI:cc
c: Facilities Development Branch

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

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County of Hawai'i
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Director

Michelle S. Ahn
Deputy Director

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Fax (808) 961-8742

September 24, 2025

John Pipan, Planning Administrator
Land Planning Hawai'i LLC
194 Wiwo'ole Street
Hilo, HI 96720
Email: info@landplanninghawaii.com

Dear John Pipan:

SUBJECT: Early Request for Comment for a Hawai'i Environmental Policy Act (HEPA) Environmental Assessment (PL-ENV-2025-000046)
Project: Kea'au Outpatient Center – Hilo Benioff Medical Center (HBMC), New Location
TMK(s): (3) 1-6-003:127 (por.) and 1-6-003:007 (por.)
Location: Kea'au, Puna, Hawai'i Island

This is in response to your letter dated July 24, 2025, requesting early consultation comments for the preparation of a draft Environmental Assessment for the proposed construction of the Kea'au Outpatient Center – Hilo Benioff Medical Center new location.

The current extent of the proposed project area includes a 20-acre portion of parcel identified as TMK (3) 1-6-003:127. The proposed project includes the construction of a new single-story medical office building complex consisting of a clinical wing and behavioral health wing. The proposed facilities will provide urgent care services seven (7) days a week, including holidays, from 8:00 a.m. to 8:00 p.m. Primary care services, specialty clinic services (e.g. cardiology), imaging services (e.g. X-rays, CT scans, ultrasounds), laboratory services, and behavioral health and counseling services will be available Monday through Friday from 8:00 a.m. to 4:00 p.m.

A portion of an adjacent parcel, identified as TMK (3) 1-6-003:007, will be used for the construction of an approximately 0.5-mile-long access road. This access road will connect to the highway across from the intersection with Kea'au-Pāhoa Road.

Based on our review of the available project information, we offer the following early consultation comments for consideration in the preparation of the Draft Environmental Assessment, pursuant to HRS Chapter 343.

1. The subject parcel, identified as TMK (3) 1-6-003:127, is approximately 108.761 acres in size. It is primarily designated Urban, with a small portion designated Agricultural by the State Land Use Commission. The Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the parcel as Urban Expansion (ue). It is zoned Agricultural 20-acres (A-20a) and Industrial-Commercial Mixed Use (MCX-20) by the County of Hawai'i. It is not situated within the Special Management Area (SMA).

   Parcel identified as TMK (3) 1-6-003:007 is approximately 1,235.835 acres in size. It is designated Agriculture and Urban by the State Land Use Commission, and the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the parcel as Urban Expansion (ue) and Important Agricultural Lands (ial). It is zoned Agricultural 20-acres (A-20a) by the County of Hawai'i. This parcel is not situated within the Special Management Area (SMA).

2. According to the County of Hawai'i Real Property Tax records, these parcels are privately owned by W. H. Shipman, LTD. The proposed use of State or County funds triggers the Hawai'i Revised Statutes Chapter 343 environmental review process (HAR §11-200.1-13).

3. In Agricultural zoned areas, a Special Permit and a Use Permit are required for medical clinics in accordance with the Hawai'i County Zoning Code Section 25-5-72(d)(7) and 25-2-61(a)(9). In areas zoned MCX, the Hawai'i County Zoning Code Section 25-5-132(a)(31) identifies medical clinics as a permitted use. A medical clinic is defined as an office building or group of offices for persons engaged in the practice of a medical or dental profession or occupation.

4. Ordinance 2002-023, effective on February 28, 2002, allowed for rezoning a portion of parcel identified as TMK (3) 1-6-003:127 from A-20a to MCX-20, with conditions. Please adhere to the conditions set forth in the ordinance.

5. Include an analysis in the Draft Environmental Assessment addressing protective design measures in wastewater management; stormwater management; drainage, erosion, and sediment control; and spill prevention and response protocols. Please consult with the County of Hawai'i Department of Environmental Management and the DLNR Hawai'i Association of Conservation Districts and Soil & Water Conservation Districts.

6. Please consult with the County of Hawai'i's Department of Water Supply to discuss water availability and potential impacts to potable water resources, and the project's anticipated water demand. The Draft Environmental Assessment should summarize these consultations, including items discussed, recommendations provided, and commitments or design modifications resulting from these discussions.

7. Please provide an explanation about the considerations taken for alternative access to the development. Specifically, proposing to create a 0.5-mile-long access road to the Kea'au-Pāhoa Road instead of, or in addition to, connecting to the adjacent Shipman Industrial Area. Please provide an evaluation of reasonable access alternatives, and discuss the comparative environmental, cultural, and infrastructure impacts of each alternative.

8. Please consult with the Department of Land and Natural Resources Hawai'i Invasive Species Council and the USDA Forest Service for regulations and best practices to prevent and control the spread and/or introduction of invasive pest species during the construction of the project. Additional consultation may include the Big Island Invasive Species Committee. Summarize the discussions and recommendations provided and commitments resulting from these discussions.

9. Conduct an analysis of potential critical or native habitat areas or species and provide mitigating measures as necessary. Consider incorporating the use of native plants into the landscaping plan. Utilizing native plant species can help to reduce maintenance costs and support the preservation of Hawai'i's unique natural environment. We encourage consultations with experts such as the University of Hawai'i's College of Tropical Agriculture and Human Resources.

10. In addition to agency consultations, please engage in early and meaningful consultation with the Kea'au community, consistent with HAR 11-200.1. As part of this process, the Puna Community Development Action Committee may serve as a valuable resource for community engagement, helping to identify stakeholders and gathering input on cultural, environmental, or other concerns related to the project.

If you have any questions about this correspondence, please contact Kim Tanaka at (808) 961-8833 or via email at kim.tanaka@hawaiicounty.gov.

Sincerely,

Bethany Morrison
Bethany Morrison (Sep 24, 2025 10:50:42 HST)

for JEFFREY W. DARROW
Planning Director

KLT:ad
\\hawaiicounty.gov\Depts\PL\PL\planning\public\wpwin60\CH343\2025\PL-ENV-2025-000046 Keaau Outpatient Center\2023-09-24 PL-INT-2025-000046 Keaau Outpatient Center.doc

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF TRANSPORTATION | KA ʻOIHANA ALAKAU
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

DIR0002308
HWY-PL 25-2.35109

August 27, 2025

Mr. John Pipan
Planning Administrator
Land Planning Hawaii, LLC
194 Wiwoole Street
Hilo, Hawaii 96720

Dear Mr. Pipan:

Subject: Request for Early Consultation Comments
Draft Environmental Assessment (DEA)
Keaau Outpatient Center – Hilo Benioff Medical Center
Keaau, Puna, Hawaii
Tax Map Key No. (3) 1-6-003: 007 and 127 (por.)

Thank you for your letter requesting our comments for an upcoming DEA under the requirements of Hawaii Revised Statutes Chapter 343 involving the use of county or state funds. We apologize for the delay in response.

The applicant is proposing to develop a new medical facility within a 20-acre portion of agricultural land to meet the growing demands in the Puna area. The proposed project includes new construction of a medical building and a parking lot to serve primary care, specialty clinics and lab services seven days per week. We have reviewed the submitted application and provided our comments in the attachment.

If you have any questions, please contact Jeyan Thirugnanam, Land Use Planning Engineer, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PL 2025-039.

Sincerely,

EDWIN H. SNIFFEN
Director of Transportation

Attachment

<table>
<tr><th colspan="2">ATTACHMENT
The Hawaii Department of Transportation Comments
DIR0002308</th></tr>
<tr><th>No.</th><th>Comment</th></tr>
<tr><td>1.</td><td>The project site is adjacent to Volcano Road (State Route 11), with the proposed access roadway located off Old Keaau Pahoa Road.</td></tr>
<tr><td>2.</td><td>A Traffic Impact Analysis Report should be prepared by a licensed professional engineer.

1. Our Hawaii District Engineer recommends that specific intersections and traffic signal locations be included in the study as follows:

a. Kamehameha Schools Hawaii Keaau Campus
Paahana Street (State Route 11) at traffic signal

b. Herbert Shipman Park – Old Keaau Pahoa Road (State Route 139) at traffic signal

c. Keaau Bypass – Keaau Pahoa Road (State Route 130) at traffic signal

d. Shipman Industrial Park – Kipimana Street at temporary traffic signal

e. Old Volcano Road and Old Keaau Pahoa Road (State Route 139) at traffic signal

2. A discussion of multimodal conditions to include a description of the infrastructure for pedestrians, bicyclists, and transit riders at the site or the nearby intersection. Include qualitative assessment for the potential adverse impacts on safety for all users.</td></tr>
<tr><td></td><td>Describe strategies to reduce carbon emissions from the project, if any. Suggestions include:

1. Incorporate elements that encourage and enhance the use of multiple types of transportation to reduce carbon emissions.

2. Implement energy-efficient technologies and practices, such as light-emitting diode lighting.

3. Use sustainable, recycled, or low-emission materials in construction and manufacturing.</td></tr>
</table>

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

**STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL
RESOURCES DIVISION OF AQUATIC RESOURCES**
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

RYAN K.P. KANAKA'OLE
FIRST DEPUTY

CIARA W.K. KAHAHANE
DEPUTY DIRECTOR - WATER

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

Date: 8/29/25
DAR # AR6943

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Troy Sakihara TSS, Aquatic Biologist

SUBJECT: Early Request for Comments for a HEPA Environmental Assessment; Kea'au Outpatient Center- Hilo Benioff Medical Center New Location

Request Submitted by: John Pipan, Planning Administrator, Land Planning LLC

Location of Project: Kea'au, Puna, Hawai'i TMK (3) 1-6-003:127 (portion); (3) 1-6-003:007 (portion)

Brief Description of Project:

Land Planning LLC is preparing an Environmental Assessment in compliance with the Hawai'i Environmental Policy Act on behalf of Hilo Benioff Medical Center to determine potential impacts from a proposed development of a new single-story medical building complex located in Kea'au, District of Puna. The project and new facilities will be constructed over 20 acres of a 108.8 acre parcel zoned Agricultural 20-acres (A-20a), and nearby areas for the access road connecting to Highway 11. No natural aquatic habitats (e.g., streams, ponds) are known to be in the area, and no impacts to such are anticipated from the proposed project.

Comments:

☒ No Comments ☐ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: ______________________ Date: 08/29/2025
Brian J. Neilson
DAR Administrator

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

July 30, 2025

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
__Div. of Boating & Ocean Recreation richard.t.howard@hawaii.gov)
_X_Engineering Division (DLNR.ENGR@hawaii.gov)
_X_Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
__Div. of State Parks (curt.a.cottrell@hawaii.gov)
_X_Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
__Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_Land Division – Hawaii District (candace.m.martin@hawaii.gov)
_X_Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Ian C. Hirokawa, Acting Land Administrator

SUBJECT: Early Request for Comment for a HEPA Environmental Assessment (EA) for the proposed Kea'au Outpatient Center – Hilo Benioff Medical Center in Kea'au, Puna, Hawai'i

LOCATION: Kea'au, Puna, Hawai'i TMK: (3) 1-6-003:127 (por.) TMK (3) 1-6-003:007 (por.)

APPLICANT: John Pipan, Land Planning Hawai'i LLC Consultants for Hilo Benioff Medical Center, applicants

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **September 1, 2025.** If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Raymond Severn at raymond.severn@hawaii.gov. Thank you.

BRIEF COMMENTS:

(X) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
( ) Comments ~~are included/attached~~.

Signed:
Print Name: Candace Martin
Division: Land-HDLO
Date: August 18, 2025

Attachments
cc: Central Files

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

September 2, 2025

John Pipan, Planning Administrator
Land Planning Hawaii LLC
194 Wiwo'ole St.
Hilo, Hawai'i 96720

via email: info@landplanninghawaii.com

SUBJECT: Early Request for Comment for a Hawai'i Environmental Policy Act (HEPA) Environmental Assessment (EA) for the Kea'au Outpatient Center - Hilo Benioff Medical Center located in Kea'au, Puna, Hawai'i TMK (3) 1-6-003:127 (por.), TMK (3) 1-6-003:007 (por.)

Dear Mr. Pipan:

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request to the DLNR Divisions for their review and comments.

Currently, we have received two responses: 1) from the Hawai'i District Land Division office dated August 18, 2025 and 2) from the Engineering Division dated August 27, 2025.

If you have any questions, please contact Raymond Severn at (808) 587-0554 or email raymond.severn@hawaii.gov.

Sincerely,

Ian C. Hirokawa
Acting Land Administrator

Enclosures
cc: Central Files

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

July 30, 2025

MEMORANDUM

FROM: ~~TO~~: **DLNR Agencies:**
__Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
__Div. of Boating & Ocean Recreation richard.t.howard@hawaii.gov)
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
__Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
__Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Hawaii District (candace.m.martin@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO: ~~FROM~~: Ian C. Hirokawa, Acting Land Administrator

SUBJECT: Early Request for Comment for a HEPA Environmental Assessment (EA) for the proposed Kea'au Outpatient Center – Hilo Benioff Medical Center in Kea'au, Puna, Hawai'i

LOCATION: Kea'au, Puna, Hawai'i TMK: (3) 1-6-003:127 (por.) TMK (3) 1-6-003:007 (por.)

APPLICANT: John Pipan, Land Planning Hawai'i LLC Consultants for Hilo Benioff Medical Center, applicants

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **September 1, 2025.** If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Raymond Severn at raymond.severn@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are included/attached.

Signed:
Print Name: Dina U. Lau, Acting Chief Engineer
Division: Engineering Division
Date: Aug 27, 2025

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Ian C. Hirokawa
Ref: Early Request for Comment for a HEPA Environmental Assessment (EA) for the Kea‘au Outpatient Center – Hilo Benioff Medical Center in Kea‘au, Puna, Hawai‘i
Location: Kea‘au, Puna, Hawai‘i
TMK(s): (3) 1-6-003:127 (por.) and (3) 1-6-003:007 (por.)
Applicant: John Pipan, Land Planning Consultants for Hilo Benioff Medical Center, Applicants

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fhat.hawaii.gov) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.

- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.

- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.

- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: DLau
DINA U. LAU, ACTING CHIEF ENGINEER

Date: Aug 27, 2025

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES | KA ʻOIHANA KUMUWAIWAI ʻĀINA
COMMISSION ON WATER RESOURCE MANAGEMENT | KE KAHUWAI PONO
P.O. BOX 621
HONOLULU, HAWAII 96809

Sept 2, 2025

REF: RFD.6495.8

TO: Mr. Ian Hirokawa, Acting Administrator
Land Division

FROM: Ciara W.K. Kahahane, Deputy Director
Commission on Water Resource Management

SUBJECT: Kea'au Outpatient Center - Hilo Benioff Medical Center

FILE NO.: RFD.6495.8
TMK NO.: (3) 1-6-003:007, (3) 1-6-003:127

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

[ ] 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

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

[ ] 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

[X] 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

[X] 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

[ ] 6. We recommend the use of alternative water sources, wherever practicable.

[X] 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

[X] 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

☐ 11. The Hawaii Water Plan is directed toward the achievement of the utilization of reclaimed water for uses other than drinking and for potable water needs in one hundred per cent of State and County facilities by December 31, 2045 (§174C-31(g)(6), Hawaii Revised Statutes). We strongly recommend that this project consider using reclaimed water for its non-potable water needs, such as irrigation. Reclaimed water may include, but is not limited to, recycled wastewater, gray water, and captured rainwater/stormwater. Please contact the Hawaiʻi Department of Health, Wastewater Branch, for more information on their reuse guidelines and the availability of reclaimed water in the project area.

☐ 12. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.

☐ 13. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 14. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 15. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 16. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.

☐ 17. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☐ 18. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 19. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☒ OTHER: Planning -

The proposed water source(s) and projected water demands for the project, both potable and non-potable, should be identified and the calculations used to estimate demands should be provided. A discussion of the potential impacts on water resources and other public trust uses of water should be included, and any proposed mitigation measures described. Water conservation and efficiency measures to be implemented should also be discussed.

If you have any questions, please contact Ryan Imata of the Groundwater Regulation Branch at (808) 587-0225 or Katie Roth of the Planning Branch (808) 587-0216.

TABLE OF CONTENTS

TABLES

APPENDICES

LIST OF ACRONYMS

<	less than
%	percent
%R	percent recovery
bgs	below ground surface
C/I	commercial/industrial
C-EHMP	Construction-Environmental Hazard Management Plan
COPC	chemicals of potential concern
cy	cubic yards
DOH	State of Hawaii Department of Health
DU	decision unit
DQO	data quality objective
EAL	Environmental Action Level
EPA	Environmental Protection Agency
ft	feet
g	gram
HEER	Hazard Evaluation and Emergency Response
in	inch
LEI	Lehua Environmental Inc.
mg/kg	milligrams per kilogram
MI	multi-increment
NA	not applicable
ND	not detected
QA/QC	quality assurance/quality control
RCRA	Resource Conservation Recovery Act
SBRC	Solubility/Bioavailability Research Consortium
TGM	Technical Guidance Manual

1.0 CERTIFICATIONS AND LIMITATIONS

Lehua Environmental Inc. (LEI) has completed this Soil Screen for the Keaau Benioff Health Center Wellness and Behavioral Health Clinic (Project), located within a 10-acre portion of TMK: (3) 1-6-003-127 (Figure 2), in Keaau, Hawaii (Subject Site). LEI's findings and recommendations contained herein are based on research, site observations, government regulations and laboratory data, which were gathered at the time and location of the study. Opinions stated in this report do not apply to changes that may have occurred after the services were performed.

LEI has performed specified services for this project with the degree of care, skill and diligence ordinarily exercised by professional consultants performing the same or similar services. No other warranty, guarantee, or representation, expressed or implied, is included or intended; unless otherwise specifically agreed to in writing by both LEI and LEI's Client.

This report is intended for the sole use of LEI's client exclusively for the Subject Site. LEI's client may use and release this report, including making and retaining copies, provided such use is limited to the particular site and project for which this report is provided. However, the services performed may not be appropriate for satisfying the needs of other users. Release of this report to third-parties will be at the sole risk of LEI's Client and/or said user, and LEI shall not be liable for any claims or damages resulting from or connected with such release or any third party's use or reuse of this report.

Prepared By: ______________________________
Kamalana Kobayashi
Senior Environmental Scientist/President

Date: September 29, 2025

2.0 INTRODUCTION/SCOPE OF WORK

The objective of the Soil Screen was to identify the presence (if any) of Resource Conservation Recovery Act (RCRA) 8 metals- and organochlorine pesticide-contaminated soils within the areas of planned disturbance for the Project at the Subject Site, so that the information can be incorporated in the design of the Project.

Specifically, LEI completed the following tasks:

- Identified a total of twenty-four (24) decision units at the Subject Site;

- Collected a total of thirty (30) multi-increment (MI) soil samples from the 24 decision units of the Subject Site, which included duplicate and triplicate samples per the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Technical Guidance Manual (TGM) recommendations. Each MI soil sample included 50 increments collected utilizing DOH recommended hand tools and equipment. Samples were collected from surface soils (0-6" below ground surface (bgs)) and shallow subsurface soils (6"-12" bgs). Decision unit (DU) sizes ranged from 16,250 square feet to 20,000 square feet and the volumes ranged from 301 cubic yards (cy) to 370 cy.

- Submitted the thirty (30) MI soil samples to Advanced Analytical Laboratories in Honolulu, Hawaii for the following analysis:
  - MIS laboratory preparation non-volatile
  - RCRA 8 metals by EPA 6020B/EPA 3050B
  - Bioaccessible arsenic by EPA 1340
  - Organochlorine pesticides by EPA 8081B/3550C

- Prepared this report documenting the field activities and the results of the investigation including analytical results, photographs and recommendations.

3.0 BACKGROUND

Site Description
The project site is located on the eastern portion of the Island of Hawaii in the Puna district. Keaau lies at modest elevation of a few hundred feet above sea level. The project site includes an approximate 10-acre portion of the parcel identified by TMK: (3) 1-6-003-127. The project site is heavily vegetated with portions of the parcel used for agriculture. The parcel is zoned for agriculture use and the surrounding properties include commercial properties to the north, highway 11 to the east and vacant land to the west and south.

Climate
The climate in the Puna district (which includes Kea´au) has a mild tropical climate with abundant rainfall overall. The annual rainfall in Kea´au is approximately 30 inches with the wettest months being December through February. Kea´au experiences small seasonal variances in temperature, with an average mean temperature of 75 degrees Fahrenheit.

Soils/Geology
The Island of Hawaii is the youngest and most southeasterly of the emerged volcanic edifices of the Hawaiian chain. The island has an area of 4,038 square miles and consists of five large volcanoes including Mauna Kea, Kohala, Hualalai, Mauna Loa and Kilauea, to form the island. The island consists entirely of the slopes of these mountains and of the broad saddles between them.

Soil within the project area includes Keaukaha soil series. These are very shallow, well drained soils formed in organic material overlying pahoehoe lava with a depth to rock typically from 6 inches to 20 inches. The moisture regime is often perudic being moist the majority of the year with poor drainage (USDA, 2025).

Surface Water
Due to the poor drainage characteristics of the Keaukaha soil series, surface water (runoff, ponding) is more likely in areas with this soil type. This suggests retention of water near the surface, slower drainage, possibly surface saturation during/after rain events. There are no other significant water features within close proximity to the project site.

Groundwater
The aquifer that underlies the Subject Site is the Mauna Loa Aquifer System. The aquifer's main source is classified as basal (fresh water in contact with seawater). Although, other types of groundwater systems exist in the area due to complex volcanic geology (Mink and Lau, 1990).

Historical, Current and Planned Future Land Use
Public land records indicate the Subject Site was historically been used for agriculture. The site is owned by the W.H. Shipman Ltd. The future planned use of the Subject Site is a healthcare and medical facility with a parking lot.

Conceptual Site Model

The Conceptual Site Model (CSM) is provided in Table A below. The CSM outlines a general framework for evaluating exposure pathways, identified potential pathways for the transport of COPCs confirmed on-site; and assesses the likelihood of these pathways reaching human and ecological receptors.

Potential environmental hazards considered in the CSM include direct exposure to construction workers, leaching to groundwater resources and gross contamination.

Identified potential receptors for current and planned soil excavation work at the Subject Site include the construction workers for the project. The elements of the exposure pathways include the source and release of contaminants, transport of contaminants, exposure points of contact and the route of exposure (inhalation, ingestion, dermal contact, injection).

Potential exposure pathways at the Subject Site largely depend on the disturbance of soil containing COPCs. Construction workers may be exposed to contaminants in the soil during earthwork activities, either through direct contact with the soil or by the generation of fugitive dust, which could lead to dermal absorption, oral ingestion, or inhalation of COPCs.

Sediment from runoff may discharge into neighboring parcels due to runoff channels, or through leaching into groundwater.

Table A. Conceptual Site Model

Primary Sources	Primary Release Mechanism	Secondary Sources	Potential Environmental Hazards	Hazard Present Under Current Site Conditions						
Presence of arsenic in soil	Improper handling of contaminated soil during site remedial activities	Soil	Risk to Human Health	*Exposure Type*	*Secondary Release Mechanism*	*Exposure Route*	*Receptors*			
							Construction Workers		*Offsite Residents/General Public*	
							During Remediation	*Post-Remediation*	*During Remediation*	*Post-Remediation*
				Direct Exposure	Dust/Vapors	Ingestion	Yes	No	No	No
						Dermal	Yes	No	No	No
						Inhalation	Yes	No	No	No
				Vapor Intrusion into Buildings	Vapors	Inhalation	No	No	No	No
			Leaching	During Remediation - No expected				Post-Remediation – No		
			Gross Contamination	During Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded				Post-Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded		
		Groundwater	Risk to Human Health	*Exposure Type*	*Secondary Release Mechanism*	*Exposure Route*	*Receptors*			
							Onsite Workers		*Offsite Residents/General Public*	
							During Remediation	*Post-Remediation*	*During Remediation*	*Post-Remediation*
				Direct Exposure	Dust/Vapors	Ingestion	No	No	No	No
						Dermal	No	No	No	No
						Inhalation	No	No	No	No
				Vapor Intrusion into Buildings	Vapors	Inhalation	No	No	No	No
			Leaching	During Remediation - No				During Remediation - No		
			Gross Contamination	During Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded				Post-Remediation - No Tier 1 EAL for gross contamination of 1,000 mg/kg not exceeded		

4.0 METHODOLOGY/PURPOSE

This Soil Screen is limited to the Project boundaries and included a surface (0"-6" bgs) and shallow subsurface (6"-12" bgs) Soil Screen for contaminants of potential concern (COPC) with established Department of Health (DOH) Environmental Action Levels (EALs). The purpose of this Soil Screen is to provide a screen of COPCs in surface and shallow subsurface soils with planned disturbance during this project. This Soil Screen is not intended to characterize the horizontal and vertical extents of the COPC within the entire Subject Site. A Sampling and Analysis Plan (SAP) was not completed for this Soil Screen, however a SAP may be completed for the entire property and/or the soils with planned disturbance within the project boundaries, prior to further site characterization. The laboratory analytical results of this Soil Screen were used to determine if the surface and shallow subsurface soils with planned disturbance contain COPC that exceed applicable DOH commercial/industrial EALs at the Subject Site.

Selection of Decision Units

Twenty-four (24) decision units were designated for this project at the Subject Site. The areas included in the DUs ranged from 16,250 square feet to 20,000 square feet and the volumes ranged from 301 cubic yards (cy) to 370 cy. Based on the planned future use of the Subject Site as a commercial facility, the Tier 2 (commercial/industrial) land use maximum volume of 400 cy per DU was utilized. Soil re-use at the Subject Site is limited to commercial/industrial land use. For unrestricted land use and soil re-use, further evaluation of the soils is required to assess whether the soils are sufficient for unrestricted use. A description of each DU and sampling locations are presented in the table below:

Table B. Summary of Decision Units and Analysis

Sample ID	Decision Unit Area (ft^2)/Volume (cy)	Construction Plan and Rational	Depth (bgs)	Analytes (EPA Method)		
				Total RCRA 8 (EPA 6020B/ 3050B)	Bioassessible Arsenic (EPA 1340)	OrganoChlorine Pesticides (8081B/ 3550C)
DU-1	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-2	20,000/370		6"-12"	X	X	X
DU-3	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-4	20,000/370		6"-12"	X	X	X
DU-5	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-6	20,000/370		6"-12"	X	X	X
DU-7	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-8	20,000/370		6"-12"	X	X	X
DU-9	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-10A	20,000/370		6"-12"	X	X	X
DU-10B	20,000/370		6"-12"	X	X	X
DU-10C	20,000/370		6"-12"	X	X	X
DU-11	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-12	20,000/370		6"-12"	X	X	X
DU-13	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-14	20,000/370		6"-12"	X	X	X
DU-15	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-16	20,000/370		6"-12"	X	X	X
DU-17	20,000/370	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-18	20,000/370		6"-12"	X	X	X
DU-19	16,250/301	Planned soil disturbance associated with a planned construction of a parking lot and building	0"-6"	X	X	X
DU-20A	16,250/301		6"-12"	X	X	X
DU-20B	16,250/301		6"-12"	X	X	X
DU-20C	16,250/301		6"-12"	X	X	X

Table B. Summary of Decision Units and Analysis (Continued)

Sample ID	Decision Unit Area (ft^2)/Volume (cy)	Construction Plan and Rational	Depth (bgs)	Analytes (EPA Method)		
				(EPA 6020B/ 3050B)	Arsenic (EPA 1340)	Pesticides (8081B/ 3550C)
DU-21	20,000/370	Planned soil disturbance associated with a planned construction of an access road	0"-6"	X	X	X
DU-22	20,000/370		6"-12"	X	X	X
DU-23	19,667/364	Planned soil disturbance associated with a planned construction of an access road	0"-6"	X	X	X
DU-24A	19,667/364		6"-12"	X	X	X
DU-24B	19,667/364		6"-12"	X	X	X
DU-24C	19,667/364		6"-12"	X	X	X

Selection of Contaminants of Potential Concern (COPC)

The COPC were identified based on current and past land use of the Subject Site for limited agriculture. COPC for the Subject Site included pesticides and RCRA 8 metals.

Potential sources of contamination were identified as follows:

Pesticides

Pesticides have been widely used in Hawaii since the early 20th century for various purposes, particularly in agriculture (DOH, 2009). The DOH has designated the surrounding area as former sugarcane plantation land (DOH, 2019). Common pesticides historically used in Hawaii include:

- Chlordane, heptachlor, and heptachlor epoxide (a breakdown product of chlordane and heptachlor)
- DDT (dichlorodiphenyltrichloroethane), DDD (dichlorodiphenyldichloroethane) and DDE (dechlorodiphenyldiloroethylene)
- Aldrin, dieldrin and endrin

Pesticides tend to accumulate most heavily in the top 1-2 feet of soil, as they are stable compounds that attach to soil particles and are not easily washed away. Typically, the highest levels are found within the top 6 to 12 inches of soil, although this can vary based on the soil type and application history (DOH, 2011).

Heavy Metals

Heavy metals including arsenic and lead are commonly found in former agricultural areas where herbicides were applied for weed control between 1915 and 1950. The past use of heavy metal-based pesticides, especially arsenic, during the plantation era is a significant contributor to elevated heavy metal levels in soils. Lead, another frequently identified soil contaminant, was historically used in paints. Over time, lead-based paint can flake off building surfaces, accumulating in nearby soil.

Arsenic and lead are likely to remain in the upper layers of soil, as they typically do not leach downward due to their strong tendency to attach to soil particles and sediments.

Soil Screen Sampling Activities

LEI personnel collected fifty increments for the surface MI soil samples utilizing a 33-inch-long hand-held core sampler with a 7/8-inch diameter core. Shallow subsurface MI soil samples were collected by first utilizing a stainless-steel hand shovel to remove the top layer of soil. Once the desired depth of the sample was achieved, the 33-inch-long hand-held core sampler with a 7/8-inch diameter core was utilized to collect the MI soil sample. If rock or other underground anomalies which restricted access to deeper soil depths were encountered, a replacement MI soil sample was collected directly adjacent to the original MI soil sample location. This process was repeated until 50 increments were collected for each surface and shallow subsurface decision unit.

For all non-volatile soil samples collected, each increment was taken and then placed into a double-bagged Ziploc® bag. Soil samples were placed in a field cooler with ice packs and sent to the Advanced Analytical Laboratory in Honolulu, Hawaii.

MI soil sampling was chosen for the Subject Site so that reproducible data, representative of average background concentrations, can be obtained for use as reference control data. A total of twenty-four (24) DUs were identified at the Subject Site. DU boundaries were based on the location of the proposed site work and site characteristics (Figure 3, Appendix II). Each MI soil sample consisted of 50 increments. Based on sampling theory (Pitard, 1993), a minimum of 30 increments per sample is generally recommended in order to obtain a reliable estimate of the mean concentration. The DOH typically specifies the use of 30 to 100 increments per sample in their Technical Guidance Manual (DOH, 2009b). Each increment was taken from 0-6 inches below ground surface [bgs] for surface soils and from 6-12 inches bgs for subsurface soils.

The location of each increment was based on a systematic random grid that was developed during the site visit. The grid was drawn with a random starting point for even distribution across the sampling area. The systematic random sampling design provided coverage of the DUs along a horizontal plane, without the gaps associated with purely random designs.

Triplicate Sample Collection

A duplicate sample and triplicate sample were collected from decision units: DU-10, DU-20 and DU24 at predetermined independent locations. The distance between the primary, duplicate and triplicate samples were considered adequate to evaluate variability. The DOH HEER technical guidance manual following sampling protocol was used to collect the primary, duplicate and triplicate samples:

Per the recommendation provided in Section 4, Appendix L.1 of the DOH HEER technical guidance manual (DOH 2023), three separate increments were collected from each grid cell, one for each replicate sample. Samples were labeled "A", "B" and "C" as part of the DU identification (i.e. DU-10A, DU-10B and DU-10C). The primary, duplicate, and triplicate samples were collected from a spacing of roughly one-third the distance of the DU increment spacing, forming an equilateral triangle pattern. The triangle's corners were labeled "A", "B" and "C" and each point of the triangle represents the collection location for each of the replicate increments. Each increment was placed in a separate, properly labeled sampling container.

Equipment Decontamination and Investigation-Derived Waste

All sampling equipment used to collect MI soil samples were decontaminated prior to use between DUs. The decontamination procedure for sampling equipment is as follows:

1. Clean with distilled water and brush, if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with distilled water.
3. Rinse thoroughly with Liquinox™.
4. Rinse with distilled water.

Investigation-derived waste (IDW) consisted of items such as disposable personal protective equipment (PPE), decontamination water, and rags. Each sampling event produced approximately one-quarter of a 15-gallon trash bag filled with PPE, disposable wipes, rags and paper towels, which were discarded in a municipal waste dumpster. The decontamination water was poured on site to infiltrate into the ground after field sampling was completed.

Data Quality Control and Review

In accordance with DOH policy, LEI implemented a 10% QC program, meaning that a duplicate and triplicate sample were taken for a minimum of 10% of primary samples, and submitted for chemical analysis. The duplicate and triplicate samples were taken from locations directly adjacent to and at approximately the same depth of the primary sample. The duplicate and triplicate samples were collected, handled, and analyzed using the same methods as the primary samples.

QA of samples collected in the field was ensured through the use of trained sampling personnel, documented and standardized procedures, and collection of field QC samples.

Field QC samples were analyzed for the same parameters as the primary samples. Laboratory QC samples and surrogates were analyzed according to the laboratory's SOPs.

Precision is defined as the agreement between a set of replicate measurements without assumption and knowledge of the true value. Precision was evaluated using a sample group consisting of primary, duplicate, and triplicate samples for ISM soil samples. QC samples were collected at a rate of 10% of project samples.

For the ISM samples collected, the field QC sample groups consisted of a primary sample, duplicate sample, and a triplicate sample.

The mean and relative standard deviations were used to evaluate the precision of the QC sample groups. If the relative standard deviation of the sample group is less than 35%, then the reported concentrations are considered precise. For the field QC samples collected from the ISM sampling all analytes had a standard deviation less than 35% for every analyte. Additionally, laboratory QC tests were all within their acceptable ranges which points to the accuracy of the reported concentrations. Therefore, the results of all analytes are considered precise.

5.0 RESULTS

Arsenic
Bioaccessible arsenic was detected above the Tier 1 (unrestricted land use) EAL in decision units: DU-23 and DU-24 at the Subject Site.

Subsurface soils ≥12" below ground surface within decision units: DU-23, DU-24A, DU-24B and DU-24C boundaries are assumed to be arsenic-impacted soils until further testing determines otherwise.

Additionally, total arsenic was detected above the Tier 1 (unrestricted) and/or Tier 2 (commercial/industrial) EAL in decision units: DU-1, DU-2, DU-3, DU-4, DU-5, DU-6, DU-7, DU-8, DU-9, DU-10A, DU-10B, DU-10C, DU-11, DU-12, DU-13, DU-14, DU-15, DU-16, DU-17, DU-18, DU-19, DU-20A, DU-20B, DU-20C, DU-21, DU-22, DU-23, DU-24A, DU-24B and DU-24C. However, further analysis via bioaccessible arsenic did not detect concentrations of bioaccessible arsenic that exceed the Tier 1 EAL.

Table 1 located in Appendix I summarizes the soil screen results for the Subject Site. Figure 4 in Appendix II identifies the locations of the identified arsenic-impacted soils at the Subject Site. Laboratory results are included in Appendix III.

Remaining RCRA 8 Metals (Barium, Cadmium, Chromium, Lead, Selenium, silver and mercury)
The remaining RCRA 8 metals were not detected above the applicable HDOH Tier 1 EALs.

Organochlorine Pesticides
Organochlorine pesticides were not detected above the applicable HDOH Tier 1 EALs.

5.1 DU-1 Surface (0"-6" bgs)
Total arsenic was measured at 170 mg/kg, exceeding the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 13 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.2 DU-2 Subsurface (6"-12" bgs)
Total arsenic was measured at 180 mg/kg, exceeding the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 13 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.3 DU-3 Surface (0”-6” bgs)

Total arsenic was measured at 95 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 10 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.4 DU-4 Subsurface (6”-12” bgs)

Total arsenic was measured at 92 mg/kg, exceeding the HDOH EAL of 24 mg/kg for unrestricted land use. However, further analysis of bioaccessible arsenic was measured at 8.7 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.5 DU-5 Surface (0”-6” bgs)

Total arsenic was measured at 150 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 14 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.6 DU-6 Subsurface (6”-12” bgs)

Total arsenic was measured at 150 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 13 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.7 DU-7 Surface (0”-6” bgs)

Total arsenic was measured at 120 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 10 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.8 DU-8 Subsurface (6”-12” bgs)

Total arsenic was measured at 120 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 9.2 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.9 DU-9 Surface (0”-6” bgs)

Total arsenic was measured at 190 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 12 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.10 DU-10A Subsurface (6”-12” bgs)

Total arsenic was measured at 170 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 11 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.11 DU-10B Subsurface (6”-12” bgs)

Total arsenic was measured at 170 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 12 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.12 DU-10C Subsurface (6”-12” bgs)

Total arsenic was measured at 170 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 11 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.13 DU-11 Surface (0”-6” bgs)

Total arsenic was measured at 190 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 15 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.14 DU-12 Subsurface (6”-12” bgs)

Total arsenic was measured at 180 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 15 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.15 DU-13 Surface (0”-6” bgs)

Total arsenic was measured at 140 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 10 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.16 DU-14 Subsurface (6”-12” bgs)

Total arsenic was measured at 140 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 11 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.17 DU-15 Surface (0”-6” bgs)

Total arsenic was measured at 200 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 20 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.18 DU-16 Subsurface (6”-12” bgs)

Total arsenic was measured at 190 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 17 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.19 DU-17 Surface (0”-6” bgs)

Total arsenic was measured at 220 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 18 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.20 DU-18 Subsurface (6”-12” bgs)

Total arsenic was measured at 240 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 16 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.21 DU-19 Surface (0”-6” bgs)

Total arsenic was measured at 160 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 14 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.22 DU-20A Subsurface (6”-12” bgs)

Total arsenic was measured at 180 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 13 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.23 DU-20B Subsurface (6”-12” bgs)

Total arsenic was measured at 170 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 13 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.24 DU-20C Subsurface (6”-12” bgs)

Total arsenic was measured at 170 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 12 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.25 DU-21 Surface (0”-6” bgs)

Total arsenic was measured at 160 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 9.8 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.26 DU-22 Subsurface (6”-12” bgs)

Total arsenic was measured at 200 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 14 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.27 DU-23 Surface (0”-6” bgs)

Total arsenic was measured at 190 mg/kg, exceeding the HDOH EAL of 95 mg/kg for commercial/ industrial land use. Bioaccessible arsenic was measured at 26 mg/kg, exceeding the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.28 DU-24A Subsurface (6”-12” bgs)

arsenic was measured at 200 mg/kg, exceeding the HDOH EAL of 95 mg/kg for commercial/ industrial land use. Bioaccessible arsenic was measured at 25 mg/kg, exceeding the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, lead, and dieldrin were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and other organochlorine pesticides were not identified above laboratory reporting limits.

5.29 DU-24B Subsurface (6”-12” bgs)

Total arsenic was measured at 210 mg/kg, equal to the HDOH EAL of 95 mg/kg for commercial/ industrial land use. However, further analysis of bioaccessible arsenic was measured at 23 mg/kg, which is below the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, and lead were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and organochlorine pesticides were not identified above laboratory reporting limits.

5.30 DU-24C Subsurface (6”-12” bgs)

arsenic was measured at 200 mg/kg, exceeding the HDOH EAL of 95 mg/kg for commercial/ industrial land use. Bioaccessible arsenic was measured at 24 mg/kg, equal to the HDOH EAL of 24 mg/kg for unrestricted land use.

Measurable concentrations of barium, chromium, lead, and dieldrin were reported in the soil samples below the HDOH EALs. Cadmium, selenium, silver, mercury, and other organochlorine pesticides were not identified above laboratory reporting limits.

6.0 RECOMMENDATIONS

LEI recommends the following for the identified arsenic-impacted soils at the Subject Site:

- The discovery of soil contamination at concentrations that exceeds the arsenic Tier 1 EALs indicates a release, or potential threat of a release, that may pose a risk to human health or the environment and must be addressed in accordance with the Hawaii Environmental Response Law, Hawaii Revised Statute (HRS) 128D and the State Contingency Plan, Hawaii Administrative Rule (HAR) 11-451. To ensure an adequate response and to comply with reporting requirements all new releases must be reported to HEER Office Emergency Planning and Response (EP&R) personnel following the release reporting guidance at https://health.hawaii.gov/heer/reporting/how-to-report-a-release-spill/. Newly discovered contamination from historic releases or applications that exceeds the Tier 1 and/or Tier 2 EALs and therefore poses a potential risk to human health and the environment must also be reported to EP&R personnel following the above guidance. Therefore, detection of arsenic at concentrations that exceed the Tier 1 EAL at the Subject Site must be reported with an initial verbal notification and a follow-up written notification to the HEER Office emergency responders.

- Following discovery of contamination that may pose a threat to human health and/or the environment at the site, the process described in the State Contingency Plan (HAR 11-451) and in the HEER Office technical Guidance Manual (TGM) must be followed:
    a. First, a site characterization must be completed to delineate the nature and extent of the contamination at the site.

    b. Once the site is adequately characterized, an updated Conceptual Site Model (CSM) must be prepared, and an Environmental Hazard Evaluation (EHE) must be developed. The CSM and EHE may be incorporated into the soils report or may be a stand-alone document.

    c. Once the environmental hazards have been identified in an EHE, remedial alternative must be considered, and a determination must be made whether a Remedial Action or a Removal Action is appropriate for the site. Guidance for selecting the appropriate Response Action is in the State Contingency Plan and in the TGM. If a Remedial Action is selected, then a Remedial Alternatives Analysis, a Draft Remedial Action Memorandum (RAM), and a Final RAM must be prepared, followed by a Response Action Work Plan (RAWP).

       Following the completion of a Remedial Action Work Plan (WP) and the completion of the Remedial Action, A Remedial Action Completion Report (RACR) must be prepared describing the activities conducted during the Remedial Action.

    d. If a Removal Action is selected, then the EHE and the assessment of Removal Action alternatives may be combined together into a Removal Action Work Plan. Following the approval of the Removal Action Work Plan and the completion of the Removal Action, a Removal Action Report (RAR) must be prepared and describe the activities conducted during the Removal Action.

e. If contamination will remain on site and be managed in place as part of the Response Action, then a Long-term/Site-Specific Environmental Hazard Management Plan (EHMP) must be prepared.

f. If you are not prepared to complete the required site characterization and Response Action at this time, then it may be acceptable to implement temporary institutional controls (ICs) under an Interim EHMP, with approval from the HEER Office. If additional site investigations to delineate the nature and extent of contamination at the Subject Site and evaluate the environmental hazards in accordance with State regulations and guidance will not be conducted in the near future, then a Removal Action or Interim Remedial Action to implement interim engineering and/or ICs must be conducted to mitigate and manage known and suspected environmental hazards at the Subject Site until a final response action can be selected and implemented. This requires developing an Environmental Hazard Evaluation (EHE) which can be integrated into the Interim Remedial Action Work Plan (for Interim Remedial Action) or Removal Action Work Plan (for Removal Action). Once interim controls are documented in place an Interim RACR (for Remedial Action) or RAR (for Removal Action), and all known and potential environmental hazards are satisfactorily mitigated, an Interim Environmental Hazard Management Plan (EHMP) will be required to continue to manage and maintain the interim controls until a future final remedy is implemented.

- Assume subsurface soils ≥ 12” bgs within DU-23, DU-24A, DU-24B and DU-24C boundaries are arsenic-impacted soils until further testing determines otherwise.

- The following recommendations should be followed in areas with soils identified to exceed the Tier 1 EAL for arsenic in soils at the Subject Site.

  Important Note: A Response Action in accordance with the State Contingency Plan (HAR 11-451) and the HEER Office Technical Guidance Manual (TGM) should be completed prior to preparing a C-EHMP (or C-EHMP Addendum) for redevelopment. Following the completed Response Action and prior to the start of any construction activity that disturbs soils with arsenic concentrations above DOH EAL, a project specific C-EHMP must be approved by the DOH HEER office. 1) contaminated soil removed from the Subject Site must be disposed of in accordance with Federal and State rules and regulations, 2) dust control practices should include both wetting during soil disturbance activities and monitoring by a designated competent person, in addition to containing temporary soil stockpiles, 3) use of good general hygiene practices for tenants, public, employees and workers to avoid soil exposure, 4) long-term controls should be implemented on the site to minimize the potential for exposure to contaminated soil by tenants, public, employees and workers, 5) possible need to cover any bare soil, if subject to wind or water transport off-site, 6) limit exposure to the contaminated soils to properly trained personnel.

- Prepare and submit for approval to the DOH HEER office a C-EHMP which outlines the proper handling and management of soil and/or groundwater, sampling and analysis protocol for soil, the planned re-use/disposal locations for excavated soil, health and safety measures to be taken to protect workers, environment and the general public. The project specific C-EHMP must be approved by the DOH HEER office prior to the start of any construction activity that disturbs the identified contaminated soils at the Subject Site.

- Have air monitoring conducted for airborne arsenic-impacted dust by qualified personnel during any contaminated soil disturbance.

REFERENCES

- County of Hawaii. (2018, January 26). Hawaii County Real Property Tax Office Property Search. Retrieved September 7, 2025, from Hawaii County Real Property Tax Office: http://www.hawaiipropertytax.com

- Pitard, Francis F. (1993). Pierre Gy's Sampling Theory and Sampling Practice: Heterogeneity, Sampling Correctness, and Statistical Process Control. 2nd Ed. Boca Raton, FL: CRC Press.

- Department of Health (DOH). Hazard Evaluation and Emergency Response (HEER) website, http://www.hawaiidoh.org/tgm.aspx.

- DOH. (2018, May). Arsenic in Hawaiian Soils: Questions and Answers on Health Concerns. Hawaii Department of Health Hazard Evaluation and Emergency Response Office. Retrieved September 9, 2025, from http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/soi-arsenic-guidance-and-information

- DOH. (2011, September). Termiticides Fact Sheet.

- DOH. (Spring 2024). Environmental Action Levels Surfer. Retrieved from Environmental Hazard Evaluation and Environmental Action Levels: http://eha-web.doh.hawaii.gov/eha-cma/leaders/HEER/environmental-hazard-evaluation-and-environmental-action-levels

- DOH. (2009a). Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Office of Hazard Evaluation and Emergency Response. March.

- DOH. (2009b). Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan.

- DOH. (Fall 2017). *Environmental Action Levels Surfer*. Retrieved from Environmental Hazard Evaluation and Environmental Action Levels: http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/environmental-hazard-evaluation-and-environmental-action-levels

- DOH. (Fall 2017). *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater.* Retrieved from http://hawaii.gov/health/environmental/hazard/index.html

Appendix I

TABLE 1. SOIL SCREEN SUMMARY
TABLE C. SUMMARY OF SAMPLES WITH COPC THAT EXCEEDED THE LABORATORY DETECTION LIMIT

Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-1		DU-2		DU-3	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	170	2	180	2	95	2
Bioassessible Arsenic	EPA 1340	24	95	13	0.1	13	0.1	10	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	6.9	5	6.4	5	5.9	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	130	2	120	2	67	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	4.7	1	5.2	1	2.4	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	0.002	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

Notes:
ND = Not detected above the laboratory detection limit
DOH = State of Hawai'i Department of Health
EPA = Environmental Protection Agency
EAL = Environmental Action Level
mg/kg = Milligrams per kilogram
NA = Not available

Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-4		DU-5		DU-6	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	92	2	150	2	150	2
Bioassessible Arsenic	EPA 1340	24	95	8.7	0.1	14	0.1	13	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	6	5	6.3	5	4.5	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	68	2	79	2	91	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	2.4	1	4.1	1	3.2	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

Notes:
ND = Not detected above the laboratory detection limit
DOH = State of Hawai'i Department of Health
EPA = Environmental Protection Agency
EAL = Environmental Action Level
mg/kg = Milligrams per kilogram
NA = Not available

Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	**DU-7**		**DU-8**		**DU-9**	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	120	2	120	2	190	2
Bioassessible Arsenic	EPA 1340	24	95	10	0.1	9.2	0.1	12	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	7.3	5	7.7	5	7.8	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	60	2	71	2	91	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	2.3	1	2.3	1	4.6	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

Notes:
ND = Not detected above the laboratory detection limit
DOH = State of Hawai'i Department of Health
EPA = Environmental Protection Agency
EAL = Environmental Action Level
mg/kg = Milligrams per kilogram
NA = Not available

Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-10A		DU-10B		DU-10C	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	170	2	170	2	170	2
Bioassessible Arsenic	EPA 1340	24	95	11	0.1	12	0.1	11	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	7.1	5	8	5	7.1	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	110	2	96	2	87	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	4.2	1	4.7	1	4.4	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

Notes:
ND = Not detected above the laboratory detection limit
DOH = State of Hawai'i Department of Health
EPA = Environmental Protection Agency
EAL = Environmental Action Level
mg/kg = Milligrams per kilogram
NA = Not available

Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-11		DU-12		DU-13	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	190	2	180	2	140	2
Bioassessible Arsenic	EPA 1340	24	95	15	0.1	15	0.1	10	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	9.4	5	9.8	5	8.6	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	90	2	89	2	82	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	4.9	1	4.9	1	3.8	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

Notes:
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DOH = State of Hawai'i Department of Health
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mg/kg = Milligrams per kilogram
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Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-14		DU-15		DU-16	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	140	2	200	2	190	2
Bioassessible Arsenic	EPA 1340	24	95	11	0.1	20	0.1	17	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	9.7	5	11	5	9.7	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	85	2	97	2	84	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	4	1	6.1	1	5	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

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DOH = State of Hawai'i Department of Health
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EAL = Environmental Action Level
mg/kg = Milligrams per kilogram
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Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-17		DU-18		DU-19	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	220	2	240	2	160	2
Bioassessible Arsenic	EPA 1340	24	95	18	0.1	16	0.1	14	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	9.5	5	8.1	5	6.2	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	99	2	86	2	99	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	6.1	1	5.3	1	4.7	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

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EAL = Environmental Action Level
mg/kg = Milligrams per kilogram
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Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-20A		DU-20B		DU-20C	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	180	2	170	2	170	2
Bioassessible Arsenic	EPA 1340	24	95	13	0.1	13	0.1	12	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	6.2	5	5.6	5	5.3	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	100	2	100	2	100	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	5.2	1	5	1	6.3	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	0.0014	0.01	0.0027	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

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Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-21		DU-22		DU-23	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	160	2	200	2	**190**	2
Bioassessible Arsenic	EPA 1340	24	95	9.8	0.1	14	0.1	**26**	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	6.2	5	6	5	12	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	96	2	100	2	89	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	3.8	1	4.2	1	5.2	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	ND	0.01	ND	0.01	ND	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

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Table 1. Soil Screen Summary
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

			Descriptive Sample ID	DU-24A		DU-24B		DU-24C	
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**	**Result (mg/kg)**	**Laboratory Reporting Limit (mg/kg)**
RCRA 8 Metals									
Arsenic (Total)	EPA 3051m/7061Am	24	95	**200**	2	210	2	**200**	2
Bioassessible Arsenic	EPA 1340	24	95	**25**	0.1	23	0.1	**24**	0.1
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	10	5	11	5	10	5
Cadmium (Cd)	EPA 3051m/7000Bm	14	72	ND	1	ND	1	ND	1
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	88	2	92	2	86	2
Lead (Pb)	EPA 3051m/7000Bm	200	800	5.4	1	5.5	1	5.3	1
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	ND	2	ND	2
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	1	ND	1	ND	1
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	0.5	ND	0.5	ND	0.5
Organochlorine Pesticides									
4,4'-DDD	EPA 8081B/3550C	2.2	8.4	ND	0.05	ND	0.05	ND	0.05
4,4'-DDE	EPA 8081B/3550C	1.9	8.2	ND	0.05	ND	0.05	ND	0.05
4,4'-DDT	EPA 8081B/3550C	1.8	5.6	ND	0.05	ND	0.05	ND	0.05
Aldrin	EPA 8081B/3550C	3.9	8.4	ND	0.01	ND	0.01	ND	0.01
alpha-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
beta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Chlordane (Technical)	EPA 8081B/3550C	17	23	ND	0.1	ND	0.1	ND	0.1
delta-BHC	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Dieldrin	EPA 8081B/3550C	2.5	24	0.0055	0.01	0.0012	0.01	0.0018	0.01
Endosulfan I	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan II	EPA 8081B/3550C	13	13	ND	0.05	ND	0.05	ND	0.05
Endosulfan sulfate	EPA 8081B/3550C	13	13	ND	0.1	ND	0.1	ND	0.1
Endrin	EPA 8081B/3550C	3.8	30	ND	0.01	ND	0.01	ND	0.01
Endrin Aldehyde	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
Endrin ketone	EPA 8081B/3550C	NA	NA	ND	0.05	ND	0.05	ND	0.05
gamma-BHC (Lindane)	EPA 8081B/3550C	NA	NA	ND	0.01	ND	0.01	ND	0.01
Heptachlor	EPA 8081B/3550C	1.3	5.6	ND	0.01	ND	0.01	ND	0.01
Heptachlor epoxide	EPA 8081B/3550C	0.2	2.7	ND	0.01	ND	0.01	ND	0.01
Methoxychlor	EPA 8081B/3550C	16	16	ND	0.05	ND	0.05	ND	0.05

Notes:
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NA = Not available

Table C. Summary of Samples with COPC that Exceeded the Laboratory Detection Limit
Keaau Benioff Health Center - Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3) 1-6-003-127

Stockpile Sample ID	Sample Date	Stock Pile Volume (cubic yards)	As (mg/kg)	Bioassessible As (mg/kg	Ba (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Dieldrin (mg/kg)
DU-1	9/9/2025	370	170	13	6.9	130	4.7	ND
DU-2	9/9/2025	370	180	13	6.4	120	5.2	ND
DU-3	9/9/2025	370	95	10	5.9	67	2.4	0.002
DU-4	9/9/2025	370	92	8.7	6	68	2.4	ND
DU-5	9/9/2025	370	150	14	6.3	79	4.1	ND
DU-6	9/9/2025	370	160	13	4.5	91	3.2	ND
DU-7	9/9/2025	370	120	10	7.3	60	2.3	ND
DU-8	9/9/2025	370	120	9.2	7.7	71	2.3	ND
DU-9	9/9/2025	370	190	12	7.8	91	4.6	ND
DU-10A	9/9/2025	370	170	11	7.1	110	4.2	ND
DU-10B	9/9/2025	370	170	12	8	96	4.7	ND
DU-10C	9/9/2025	370	170	11	7.7	87	4.4	ND
DU-11	9/9/2025	370	190	15	9.4	90	4.9	ND
DU-12	9/9/2025	370	180	15	9.8	89	4.9	ND
DU-13	9/9/2025	370	140	10	8.6	82	3.8	ND
DU-14	9/9/2025	370	140	11	9.7	85	4	ND
DU-15	9/9/2025	370	200	20	11	97	6.1	ND
DU-16	9/9/2025	370	190	17	9.7	84	5	ND
DU-17	9/9/2025	370	220	18	9.5	99	6.1	ND
DU-18	9/9/2025	370	240	16	8.1	86	5.3	ND
DU-19	9/9/2025	301	160	14	6.2	99	4.7	ND
DU-20A	9/9/2025	301	180	13	6.2	100	5.2	ND
DU-20B	9/9/2025	301	170	13	5.6	100	5	0.0014
DU-20C	9/9/2025	301	170	13	5.3	100	6.3	0.0027
DU-21	9/9/2025	370	160	9.8	6.2	96	3.8	ND
DU-22	9/9/2025	370	200	14	6	100	4.2	ND
DU-23	9/9/2025	364	190	26	12	89	5.2	ND
DU-24A	9/9/2025	364	200	25	10	88	5.4	0.0055
DU-24B	9/9/2025	364	210	23	11	92	5.5	0.0012
DU-24C	9/9/2025	364	200	24	10	86	5.3	0.0018
Tier 1 EAL (mg/kg):			24	24	1000	1100	200	3.6
C/I EAL (mg/kg):			95	95	2500	1100	800	1.5

Appendix II

FIGURE 1: GENERAL SITE LOCATION
FIGURE 2: PROJECT LOCATION
FIGURE 3: DECISION UNIT (DU) BOUNDARY MAP
FIGURE 4: LOCATIONS OF IDENTIFIED ARSENIC-IMPACTED SOILS

Figure 1. General Site Location
Soil Screen
Kea´au Benioff Health Center – Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3)1-6-003-127

Figure 2. Project Area
Soil Screen
Kea´au Benioff Health Center – Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3)1-6-003-127

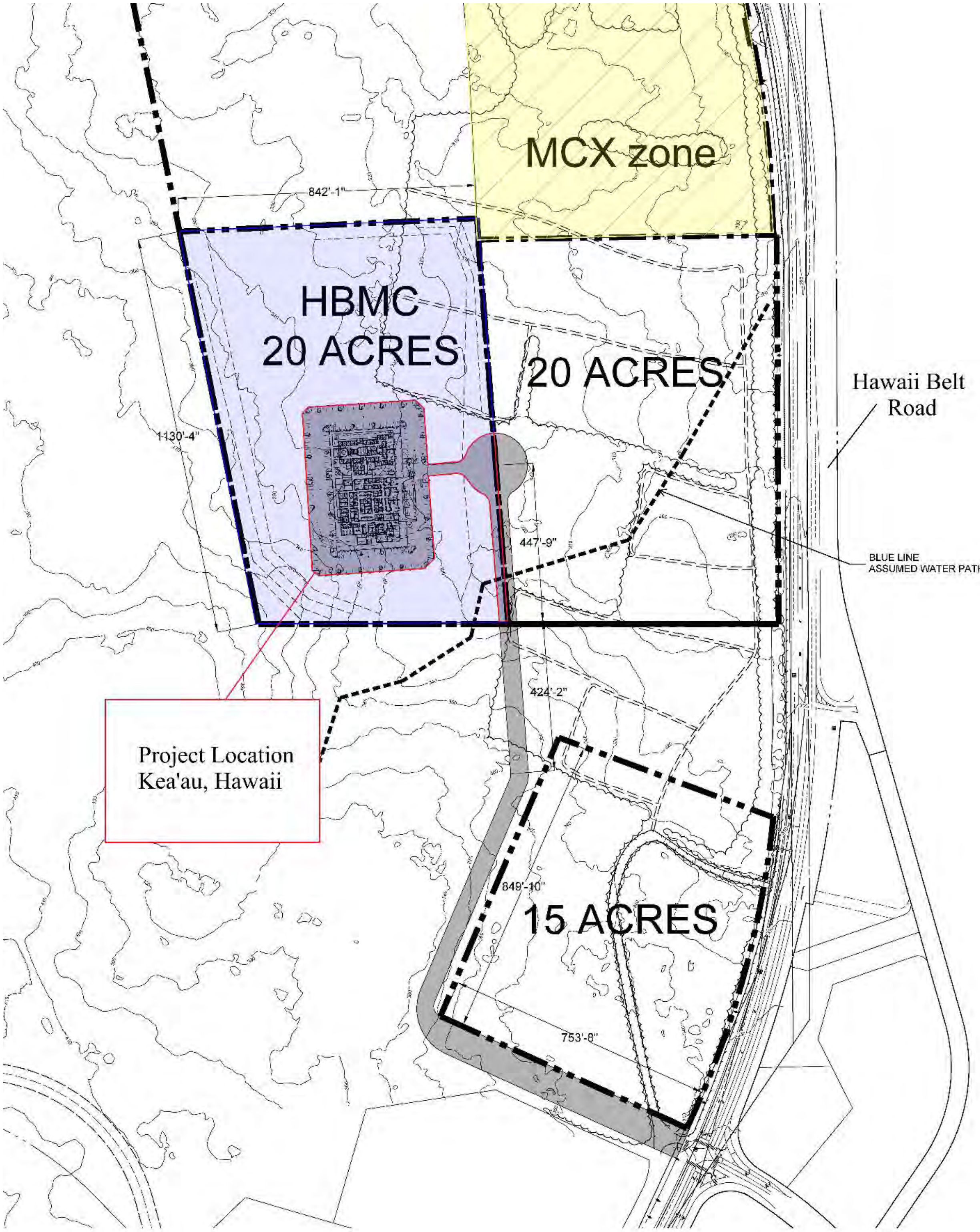

Figure 3. Decision Unit (DU) Boundaries
Soil Screen
Kea´au Benioff Health Center – Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3)1-6-003-127

Figure 4. Locations of Arsenic-Impacted Soils
Soil Screen
Kea´au Benioff Health Center – Wellness and Behavioral Health Clinic
10-Acre Portion of TMK: (3)1-6-003-127

Appendix III

SOIL LABORATORY ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS
LEVEL 2 LABORATORY REPORT INCLUDING BLANK, MS/MSD AND LCS/LCSD INFORMATION

ADVANCED ANALYTICAL LABORATORY INC

September 18, 2025

Lehua Environmental Inc
PO BOX 1018
Kamuela, HI
96743

Dear Kama Kobayashi:

Please find enclosed the analytical report for:

Project Name:	HBMC Soil
AAL Project #:	AA599 final report
Date Received:	09/10/2025
MIS Prep:	Yes

The results, applicable reporting limits, QA/QC data, invoice, and copy of COC are included.

Advanced Analytical Laboratory appreciates the opportunity to provide analytical services for this project. If you have any questions regarding this project, please don't hesitate to contact AAL.

Thank you for your business and continuing support.

Sincerely,

Uwe Baumgartner, Ph.D
Owner

Elisa M. Young
Owner

544 Ohohia Street #10 HONOLULU HAWAII 96819
tel (808) 836-2252

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-3

Client sample ID					**DU 1**	**DU 2**	**DU 3**	**DU 4**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	25-AL0915-1-1	25-AL0915-1-2	25-AL0915-1-3	25-AL0915-1-4
Matrix			Solid	Solid	Soil	Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
α-BHC	1.0	ug/kg	nd		nd	nd	nd	nd
Ȗ-BHC (Lindane)	1.0	ug/kg	nd	123%	nd	nd	nd	nd
ù-BHC	1.0	ug/kg	nd		nd	nd	nd	nd
Heptachlor	1.0	ug/kg	nd	101%	nd	nd	nd	nd
β-BHC	1.0	ug/kg	nd		nd	nd	nd	nd
Aldrin	1.0	ug/kg	nd	131%	nd	nd	nd	nd
Heptachlor Epoxide	1.0	ug/kg	nd		nd	nd	nd	nd
Ȗ-Chlordane	5.0	ug/kg	nd		nd	nd	nd	nd
α-Chlordane	5.0	ug/kg	nd		nd	nd	nd	nd
Endosulfan I	1.0	ug/kg	nd		nd	nd	nd	nd
4,4'-DDE	5.0	ug/kg	nd		nd	nd	nd	nd
Dieldrin	1.0	ug/kg	nd	123%	nd	nd	2.0	nd
Endrin	1.0	ug/kg	nd	118%	nd	nd	nd	nd
4,4'-DDD	5.0	ug/kg	nd		nd	nd	nd	nd
Endosulfan II	5.0	ug/kg	nd		nd	nd	nd	nd
4,4'-DDT	5.0	ug/kg	nd	115%	nd	nd	nd	nd
Endrin Aldehyde	5.0	ug/kg	nd		nd	nd	nd	nd
Methoxychlor	5.0	ug/kg	nd		nd	nd	nd	nd
Endrin Ketone	5.0	ug/kg	nd		nd	nd	nd	nd
Endosulfan Sulfate	10	ug/kg	nd		nd	nd	nd	nd
Technical Chlordane	0.10	**mg/kg**	nd		nd	nd	nd	nd
Toxaphene	0.20	**mg/kg**	nd		nd	nd	nd	nd
Surrogate Recoveries								
Tetrachloro-m-xylene			100%	94%	105%	100%	103%	94%
Decachlorobiphenyl			116%	112%	118%	119%	118%	109%

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-3

Client sample ID			**DU 5**	**DU 6**	**DU 7**	**DU 8**	**DU 9**	**DU 10A**
Lab ID	**MRL**	**Unit**	25-AL0915-1-5	25-AL0915-1-6	25-AL0915-1-7	25-AL0915-1-8	25-AL0915-1-9	25-AL0915-1-10
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
α-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Û-BHC (Lindane)	1.0	ug/kg	nd	nd	nd	nd	nd	nd
ù-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Heptachlor	1.0	ug/kg	nd	nd	nd	nd	nd	nd
β-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Aldrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Heptachlor Epoxide	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Û-Chlordane	5.0	ug/kg	nd	nd	nd	nd	nd	nd
α-Chlordane	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan I	1.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDE	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Dieldrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDD	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan II	5.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDT	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin Aldehyde	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Methoxychlor	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin Ketone	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan Sulfate	10	ug/kg	nd	nd	nd	nd	nd	nd
Technical Chlordane	0.10	**mg/kg**	nd	nd	nd	nd	nd	nd
Toxaphene	0.20	**mg/kg**	nd	nd	nd	nd	nd	nd
Surrogate Recoveries								
Tetrachloro-m-xylene			99%	105%	105%	99%	104%	103%
Decachlorobiphenyl			117%	125%	123%	121%	120%	121%

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
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Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-3

Client sample ID			**DU 10B**	**DU 10C**	**DU 11**	**DU 12**	**DU 13**	**DU 14**
Lab ID	**MRL**	**Unit**	25-AL0915-1-11	25-AL0915-1-12	25-AL0915-1-13	25-AL0915-1-14	25-AL0915-1-15	25-AL0915-1-16
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
α-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Û-BHC (Lindane)	1.0	ug/kg	nd	nd	nd	nd	nd	nd
ù-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Heptachlor	1.0	ug/kg	nd	nd	nd	nd	nd	nd
β-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Aldrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Heptachlor Epoxide	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Û-Chlordane	5.0	ug/kg	nd	nd	nd	nd	nd	nd
α-Chlordane	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan I	1.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDE	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Dieldrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDD	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan II	5.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDT	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin Aldehyde	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Methoxychlor	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin Ketone	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan Sulfate	10	ug/kg	nd	nd	nd	nd	nd	nd
Technical Chlordane	0.10	**mg/kg**	nd	nd	nd	nd	nd	nd
Toxaphene	0.20	**mg/kg**	nd	nd	nd	nd	nd	nd

Surrogate Recoveries

	DU 10B	DU 10C	DU 11	DU 12	DU 13	DU 14
Tetrachloro-m-xylene	106%	107%	100%	99%	103%	96%
Decachlorobiphenyl	124%	125%	117%	118%	122%	110%

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-3

Client sample ID			**DU 15**	**DU 16**	**DU 17**	**DU 18**
Lab ID	**MRL**	**Unit**	25-AL0915-1-17	25-AL0915-1-18	25-AL0915-1-19	25-AL0915-1-20
Matrix			Soil	Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/15/2025	9/15/2025	9/16/2025	9/16/2025
α-BHC	1.0	ug/kg	nd	nd	nd	nd
Û-BHC (Lindane)	1.0	ug/kg	nd	nd	nd	nd
ù-BHC	1.0	ug/kg	nd	nd	nd	nd
Heptachlor	1.0	ug/kg	nd	nd	nd	nd
β-BHC	1.0	ug/kg	nd	nd	nd	nd
Aldrin	1.0	ug/kg	nd	nd	nd	nd
Heptachlor Epoxide	1.0	ug/kg	nd	nd	nd	nd
Û-Chlordane	5.0	ug/kg	nd	nd	nd	nd
α-Chlordane	5.0	ug/kg	nd	nd	nd	nd
Endosulfan I	1.0	ug/kg	nd	nd	nd	nd
4,4'-DDE	5.0	ug/kg	nd	nd	nd	nd
Dieldrin	1.0	ug/kg	nd	nd	nd	nd
Endrin	1.0	ug/kg	nd	nd	nd	nd
4,4'-DDD	5.0	ug/kg	nd	nd	nd	nd
Endosulfan II	5.0	ug/kg	nd	nd	nd	nd
4,4'-DDT	5.0	ug/kg	nd	nd	nd	nd
Endrin Aldehyde	5.0	ug/kg	nd	nd	nd	nd
Methoxychlor	5.0	ug/kg	nd	nd	nd	nd
Endrin Ketone	5.0	ug/kg	nd	nd	nd	nd
Endosulfan Sulfate	10	ug/kg	nd	nd	nd	nd
Technical Chlordane	0.10	**mg/kg**	nd	nd	nd	nd
Toxaphene	0.20	**mg/kg**	nd	nd	nd	nd

Surrogate Recoveries

	DU 15	DU 16	DU 17	DU 18
Tetrachloro-m-xylene	98%	105%	103%	105%
Decachlorobiphenyl	113%	121%	118%	127%

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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ACCU LABORATORY

Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-3

Client sample ID			**MS**	**MSD**	**RPD**
Lab ID	**MRL**	**Unit**	25-AL0915-1-10	25-AL0915-1-10	25-AL0915-1-10
Matrix			Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/15/2025	9/15/2025	9/15/2025
α-BHC	1.0	ug/kg			
Û-BHC (Lindane)	1.0	ug/kg	115%	116%	1%
ù-BHC	1.0	ug/kg			
Heptachlor	1.0	ug/kg	107%	112%	5%
β-BHC	1.0	ug/kg			
Aldrin	1.0	ug/kg	125%	130%	4%
Heptachlor Epoxide	1.0	ug/kg			
Û-Chlordane	5.0	ug/kg			
α-Chlordane	5.0	ug/kg			
Endosulfan I	1.0	ug/kg			
4,4'-DDE	5.0	ug/kg			
Dieldrin	1.0	ug/kg	94%	114%	19%
Endrin	1.0	ug/kg	114%	116%	2%
4,4'-DDD	5.0	ug/kg			
Endosulfan II	5.0	ug/kg			
4,4'-DDT	5.0	ug/kg	58%	62%	7%
Endrin Aldehyde	5.0	ug/kg			
Methoxychlor	5.0	ug/kg			
Endrin Ketone	5.0	ug/kg			
Endosulfan Sulfate	10	ug/kg			
Technical Chlordane	0.10	**mg/kg**			
Toxaphene	0.20	**mg/kg**			
Surrogate Recoveries					
Tetrachloro-m-xylene			109%	109%	
Decachlorobiphenyl			121%	128%	

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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ACCU LABORATORY

Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-5

Client sample ID					**DU 19**	**DU 20A**	**DU 20B**	**DU 20C**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	25-AL0915-1-21	25-AL0915-1-22	25-AL0915-1-23	25-AL0915-1-24
Matrix			Solid	Solid	Soil	Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/15/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
α-BHC	1.0	ug/kg	nd		nd	nd	nd	nd
Û-BHC (Lindane)	1.0	ug/kg	nd	109%	nd	nd	nd	nd
ù-BHC	1.0	ug/kg	nd		nd	nd	nd	nd
Heptachlor	1.0	ug/kg	nd	91%	nd	nd	nd	nd
β-BHC	1.0	ug/kg	nd		nd	nd	nd	nd
Aldrin	1.0	ug/kg	nd	115%	nd	nd	nd	nd
Heptachlor Epoxide	1.0	ug/kg	nd		nd	nd	nd	nd
Û-Chlordane	5.0	ug/kg	nd		nd	nd	nd	nd
α-Chlordane	5.0	ug/kg	nd		nd	nd	nd	nd
Endosulfan I	1.0	ug/kg	nd		nd	nd	nd	nd
4,4'-DDE	5.0	ug/kg	nd		nd	nd	nd	nd
Dieldrin	1.0	ug/kg	nd	109%	nd	nd	1.4	2.7
Endrin	1.0	ug/kg	nd	121%	nd	nd	nd	nd
4,4'-DDD	5.0	ug/kg	nd		nd	nd	nd	nd
Endosulfan II	5.0	ug/kg	nd		nd	nd	nd	nd
4,4'-DDT	5.0	ug/kg	nd	110%	nd	nd	nd	nd
Endrin Aldehyde	5.0	ug/kg	nd		nd	nd	nd	nd
Methoxychlor	5.0	ug/kg	nd		nd	nd	nd	nd
Endrin Ketone	5.0	ug/kg	nd		nd	nd	nd	nd
Endosulfan Sulfate	10	ug/kg	nd		nd	nd	nd	nd
Technical Chlordane	0.10	**mg/kg**	nd		nd	nd	nd	nd
Toxaphene	0.20	**mg/kg**	nd		nd	nd	nd	nd
Surrogate Recoveries								
Tetrachloro-m-xylene			95%	105%	95%	98%	98%	100%
Decachlorobiphenyl			133%	121%	114%	115%	117%	119%

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-5

Client sample ID			**DU 21**	**DU 22**	**DU 23**	**DU 24A**	**DU 24B**	**DU 24C**
Lab ID	**MRL**	**Unit**	25-AL0915-1-25	25-AL0915-1-26	25-AL0915-1-27	25-AL0915-1-28	25-AL0915-1-29	25-AL0915-1-30
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
α-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Û-BHC (Lindane)	1.0	ug/kg	nd	nd	nd	nd	nd	nd
ù-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Heptachlor	1.0	ug/kg	nd	nd	nd	nd	nd	nd
β-BHC	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Aldrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Heptachlor Epoxide	1.0	ug/kg	nd	nd	nd	nd	nd	nd
Û-Chlordane	5.0	ug/kg	nd	nd	nd	nd	nd	nd
α-Chlordane	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan I	1.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDE	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Dieldrin	1.0	ug/kg	nd	nd	nd	5.5	1.2	1.8
Endrin	1.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDD	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan II	5.0	ug/kg	nd	nd	nd	nd	nd	nd
4,4'-DDT	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin Aldehyde	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Methoxychlor	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endrin Ketone	5.0	ug/kg	nd	nd	nd	nd	nd	nd
Endosulfan Sulfate	10	ug/kg	nd	nd	nd	nd	nd	nd
Technical Chlordane	0.10	**mg/kg**	nd	nd	nd	nd	nd	nd
Toxaphene	0.20	**mg/kg**	nd	nd	nd	nd	nd	nd
Surrogate Recoveries								
Tetrachloro-m-xylene			105%	105%	103%	102%	103%	103%
Decachlorobiphenyl			123%	119%	117%	115%	117%	119%

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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Analytical Report

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	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Organochlorine Pesticides in Soil by EPA 8081B/3550C

Accu Lab Batch# AL091525-5

Client sample ID			**MS**	**MSD**	**RPD**
Lab ID	**MRL**	**Unit**	25-AL0915-3-1	25-AL0915-3-1	25-AL0915-3-1
Matrix			Soil	Soil	Soil
Date Extracted			9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025
α-BHC	1.0	ug/kg			
Û-BHC (Lindane)	1.0	ug/kg	113%	116%	2%
ù-BHC	1.0	ug/kg			
Heptachlor	1.0	ug/kg	108%	114%	5%
β-BHC	1.0	ug/kg			
Aldrin	1.0	ug/kg	127%	130%	2%
Heptachlor Epoxide	1.0	ug/kg			
Û-Chlordane	5.0	ug/kg			
α-Chlordane	5.0	ug/kg			
Endosulfan I	1.0	ug/kg			
4,4'-DDE	5.0	ug/kg			
Dieldrin	1.0	ug/kg	110%	123%	11%
Endrin	1.0	ug/kg	107%	110%	3%
4,4'-DDD	5.0	ug/kg			
Endosulfan II	5.0	ug/kg			
4,4'-DDT	5.0	ug/kg	66%	50%	27%
Endrin Aldehyde	5.0	ug/kg			
Methoxychlor	5.0	ug/kg			
Endrin Ketone	5.0	ug/kg			
Endosulfan Sulfate	10	ug/kg			
Technical Chlordane	0.10	**mg/kg**			
Toxaphene	0.20	**mg/kg**			
Surrogate Recoveries					
Tetrachloro-m-xylene			108%	101%	
Decachlorobiphenyl			127%	130%	

Acceptable Recovery Limits:

Surrogates	*50-150%*
LCS/MS/MSD	*50-150%*
Acceptable RPD limit:	*30%*

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091525-13

Client sample ID					**DU 1**	**DU 2**	**DU 3**	**DU 4**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	25-AL0915-1-1	25-AL0915-1-2	25-AL0915-1-3	25-AL0915-1-4
Matrix			Solid	Solid	Soil	Soil	Soil	Soil
Date Digested			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	nd	114%	310	330	170	190

Acceptable Recovery Limits:
LCS *80-120%*
MS/MSD *75-125%*
Acceptable RPD limit: *20%*

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	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091525-13

Client sample ID			**DU 5**	**DU 6**	**DU 7**	**DU 8**	**DU 9**	**DU 10A**
Lab ID	**MRL**	**Unit**	25-AL0915-1-5	25-AL0915-1-6	25-AL0915-1-7	25-AL0915-1-8	25-AL0915-1-9	25-AL0915-1-10
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	200	130	160	220	280	230

Acceptable Recovery Limits:

LCS	*80-120%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091525-13

Client sample ID			**DU 10B**	**DU 10C**	**DU 11**	**DU 12**	**DU 13**	**DU 14**
Lab ID	**MRL**	**Unit**	25-AL0915-1-11	25-AL0915-1-12	25-AL0915-1-13	25-AL0915-1-14	25-AL0915-1-15	25-AL0915-1-16
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	270	280	300	290	220	240

Acceptable Recovery Limits:
LCS *80-120%*
MS/MSD *75-125%*
Acceptable RPD limit: *20%*

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091525-13

Client sample ID			**DU 15**	**DU 16**	**DU 17**	**DU 18**
Lab ID	**MRL**	**Unit**	25-AL0915-1-17	25-AL0915-1-18	25-AL0915-1-19	25-AL0915-1-20
Matrix			Soil	Soil	Soil	Soil
Date Digested			9/15/2025	9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	310	300	380	350

Acceptable Recovery Limits:

LCS	*80-120%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091525-13

Client sample ID			**MS**	**MSD**	**RPD**
Lab ID	**MRL**	**Unit**	25-AL0915-1-1	25-AL0915-1-1	25-AL0915-1-1
Matrix			Soil	Soil	Soil
Date Digested			9/15/2025	9/15/2025	9/15/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	81%	80%	1%

Acceptable Recovery Limits:
LCS *80-120%*
MS/MSD *75-125%*
Acceptable RPD limit: *20%*

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091625-11

Client sample ID					**DU 19**	**DU 20A**	**DU 20B**	**DU 20C**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	25-AL0915-1-21	25-AL0915-1-22	25-AL0915-1-23	25-AL0915-1-24
Matrix			Solid	Solid	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	nd	115%	350	290	280	220

Acceptable Recovery Limits:

LCS	*80-120%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091625-11

Client sample ID			**DU 21**	**DU 22**	**DU 23**	**DU 24A**	**DU 24B**	**DU 24C**
Lab ID	**MRL**	**Unit**	25-AL0915-1-25	25-AL0915-1-26	25-AL0915-1-27	25-AL0915-1-28	25-AL0915-1-29	25-AL0915-1-30
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	260	330	300	320	350	270

Acceptable Recovery Limits:

LCS	*80-120%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Metals in Soil by EPA 6020B/EPA3050B (<0.25mm Fraction)

Accu Lab Batch# AL091625-11

Client sample ID			**MS**	**MSD**	**RPD**
Lab ID	**MRL**	**Unit**	25-AL0729-1-21	25-AL0729-1-21	25-AL0729-1-21
Matrix			Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025
Arsenic (As)	2.0	mg/kg	M	M	

Acceptable Recovery Limits:

LCS	*80-120%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 1**	**DU 2**	**DU 3**	**DU 4**	**DU 5**
Lab ID	**MRL**	**Unit**	25-AL0915-1-1	25-AL0915-1-2	25-AL0915-1-3	25-AL0915-1-4	25-AL0915-1-5
Matrix			Soil	Soil	Soil	Soil	Soil
Date Extracted			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.10	mg/kg	13	13	10	8.7	14

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 6**	**DU 7**	**DU 8**	**DU 9**	**DU 10A**
Lab ID	**MRL**	**Unit**	25-AL0915-1-6	25-AL0915-1-7	25-AL0915-1-8	25-AL0915-1-9	25-AL0915-1-10
Matrix			Soil	Soil	Soil	Soil	Soil
Date Extracted			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.10	mg/kg	13	10	9.2	12	11

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 10B**	**DU 10C**	**DU 11**	**DU 12**	**DU 13**
Lab ID	**MRL**	**Unit**	25-AL0915-1-11	25-AL0915-1-12	25-AL0915-1-13	25-AL0915-1-14	25-AL0915-1-15
Matrix			Soil	Soil	Soil	Soil	Soil
Date Extracted			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.10	mg/kg	12	11	15	15	10

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 14**	**DU 15**	**DU 16**	**DU 17**	**DU 18**
Lab ID	**MRL**	**Unit**	25-AL0915-1-16	25-AL0915-1-17	25-AL0915-1-18	25-AL0915-1-19	25-AL0915-1-20
Matrix			Soil	Soil	Soil	Soil	Soil
Date Extracted			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.10	mg/kg	11	20	17	18	16

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Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID			**DU 19**	**DU 20A**	**DU 20B**	**DU 20C**	**DU 21**
Lab ID	**MRL**	**Unit**	25-AL0915-1-21	25-AL0915-1-22	25-AL0915-1-23	25-AL0915-1-24	25-AL0915-1-25
Matrix			Soil	Soil	Soil	Soil	Soil
Date Extracted			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.10	mg/kg	14	13	13	12	9.8

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID			**DU 22**	**DU 23**	**DU 24A**	**DU 24B**	**DU 24C**
Lab ID	**MRL**	**Unit**	25-AL0915-1-26	25-AL0915-1-27	25-AL0915-1-28	25-AL0915-1-29	25-AL0915-1-30
Matrix			Soil	Soil	Soil	Soil	Soil
Date Extracted			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.10	mg/kg	14	26	25	23	24

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Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID		**DU 1**	**DU 2**	**DU 3**	**DU 4**	**DU 5**
Lab ID	**Unit**	25-AL0915-1-1	25-AL0915-1-2	25-AL0915-1-3	25-AL0915-1-4	25-AL0915-1-5
Matrix		Soil	Soil	Soil	Soil	Soil
Date Extracted		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As) Bioaccessibility	%	4.1%	4.1%	5.9%	4.6%	7.2%

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Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID		**DU 6**	**DU 7**	**DU 8**	**DU 9**	**DU 10A**
Lab ID	**Unit**	25-AL0915-1-6	25-AL0915-1-7	25-AL0915-1-8	25-AL0915-1-9	25-AL0915-1-10
Matrix		Soil	Soil	Soil	Soil	Soil
Date Extracted		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As) Bioaccessibility	%	9.7%	6.3%	4.2%	4.4%	4.8%

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Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID		**DU 10B**	**DU 10C**	**DU 11**	**DU 12**	**DU 13**
Lab ID	**Unit**	25-AL0915-1-11	25-AL0915-1-12	25-AL0915-1-13	25-AL0915-1-14	25-AL0915-1-15
Matrix		Soil	Soil	Soil	Soil	Soil
Date Extracted		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As) Bioaccessibility	%	4.3%	4.0%	5.0%	5.2%	4.5%

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Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID		**DU 14**	**DU 15**	**DU 16**	**DU 17**	**DU 18**
Lab ID	**Unit**	25-AL0915-1-16	25-AL0915-1-17	25-AL0915-1-18	25-AL0915-1-19	25-AL0915-1-20
Matrix		Soil	Soil	Soil	Soil	Soil
Date Extracted		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As) Bioaccessibility	%	4.4%	6.5%	5.6%	4.8%	4.7%

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID		**DU 19**	**DU 20A**	**DU 20B**	**DU 20C**	**DU 21**
Lab ID	**Unit**	25-AL0915-1-21	25-AL0915-1-22	25-AL0915-1-23	25-AL0915-1-24	25-AL0915-1-25
Matrix		Soil	Soil	Soil	Soil	Soil
Date Extracted		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As) Bioaccessibility	%	4.1%	4.5%	4.5%	5.5%	3.8%

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	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID		**DU 22**	**DU 23**	**DU 24A**	**DU 24B**	**DU 24C**
Lab ID	**Unit**	25-AL0915-1-26	25-AL0915-1-27	25-AL0915-1-28	25-AL0915-1-29	25-AL0915-1-30
Matrix		Soil	Soil	Soil	Soil	Soil
Date Extracted		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed		9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Arsenic (As) Bioaccessibility	%	4.2%	8.8%	7.7%	6.7%	8.9%

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Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID					**DU 1**	**DU 2**	**DU 3**	**DU 4**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	25-AL0915-1-1	25-AL0915-1-2	25-AL0915-1-3	25-AL0915-1-4
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	nd	108%	0.13	0.13	0.10	0.087

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 5**	**DU 6**	**DU 7**	**DU 8**	**DU 9**	**DU 10A**
Lab ID	**MRL**	**Unit**	25-AL0915-1-5	25-AL0915-1-6	25-AL0915-1-7	25-AL0915-1-8	25-AL0915-1-9	25-AL0915-1-10
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	0.14	0.13	0.10	0.092	0.12	0.11

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 10B**	**DU 10C**	**DU 11**	**DU 12**	**DU 13**	**DU 14**
Lab ID	**MRL**	**Unit**	25-AL0915-1-11	25-AL0915-1-12	25-AL0915-1-13	25-AL0915-1-14	25-AL0915-1-15	25-AL0915-1-16
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	0.12	0.11	0.15	0.15	0.10	0.11

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**DU 15**	**DU 16**	**DU 17**	**DU 18**
Lab ID	**MRL**	**Unit**	25-AL0915-1-17	25-AL0915-1-18	25-AL0915-1-19	25-AL0915-1-20
Matrix			Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	0.20	0.17	0.18	0.16

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Analytical Report

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	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-10

Client sample ID			**MS**	**MSD**	**RPD**
Lab ID	**MRL**	**Unit**	25-AL0729-1-1	25-AL0729-1-1	25-AL0729-1-1
Matrix			Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	115%	117%	2%

Acceptable Recovery Limits:
LCS *85-115%*
MS/MSD *75-125%*
Acceptable RPD limit: *20%*

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Analytical Report

Client	**Advanced Analytical Laboratory** 544 Ohohia Street #10 Honolulu, HI, 96819	**Acculab WO#**	**25-AL0915-1**
		Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID					**DU 19**	**DU 20A**	**DU 20B**	**DU 20C**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	25-AL0915-1-21	25-AL0915-1-22	25-AL0915-1-23	25-AL0915-1-24
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	nd	105%	0.14	0.13	0.13	0.12

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**25-AL0915-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID			**DU 21**	**DU 22**	**DU 23**	**DU 24A**	**DU 24B**	**DU 24C**
Lab ID	**MRL**	**Unit**	25-AL0915-1-25	25-AL0915-1-26	25-AL0915-1-27	25-AL0915-1-28	25-AL0915-1-29	25-AL0915-1-30
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	0.098	0.14	0.26	0.25	0.23	0.24

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Analytical Report

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	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Project#	**AA599**		

Bioaccessible Arsenic in Soil (<0.25mm Fraction) by EPA1340

Accu Lab Batch# AL091625-12

Client sample ID			**MS**	**MSD**	**RPD**
Lab ID	**MRL**	**Unit**	25-AL0915-1-21	25-AL0915-1-21	25-AL0915-1-21
Matrix			Soil	Soil	Soil
Date Digested			9/16/2025	9/16/2025	9/16/2025
Date Analyzed			9/16/2025	9/16/2025	9/16/2025
Bioaccessible Arsenic (As)	0.0020	mg/l	117%	120%	3%

Acceptable Recovery Limits:

LCS	*85-115%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

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Analytical Report

Client	Advanced Analytical Laboratory 544 Ohohia Street #10 Honolulu, HI, 96819	**Acculab WO#**	**25-AL0915-1**
		Date Sampled	9/9/2025
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	9/15/2025
Project Name	**HBMC Soil**	Date Reported	9/18/2025
Client Project#			
Project#	**AA599**		

Data Qualifiers and Comments:

Results reported on dry-weight basis for soil samples.

MRL- Method Reporting Limit
nd- Indicates the analyte is not detected at the listing reporting limit.
C- Coelution with other compounds.
M- % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
B- Indicates the analyte is detected in the method blank associated with the sample.
J- The analyte is detected at below the reporting limit.
E- The result reported exceeds the calibration range, and is an estimate.
D- Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
H- Sample was received or analyzed past holding time
Q- Sample was received with head space, improper preserved or above recommended temperature.
I- Due to insufficient sample, LCS/LCS DUP were analyzed in place of MS/MSD.
R- The recovery of this analyte in QC sample failed high, but the analyte was not detected in all related samples. No action was taken.
R-1- The RPD value for the MS/MSD was outside of QC acceptance limits however both recoveries were acceptable. All related samples were "nd". No action was taken.
R-2- The recovery of the surrogate in sample failed high, but all related analytes were not detected in the sample. No action was taken.

ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836-2252 Fax:(808) 836-2250 Address: 544 Ohohia St., unit 10 Honolulu, HI 96819

TURNAROUND TIME: 1 Day TAT- Total RCRA 8
2 Day TAT-Bioaccessible Arsenic for Total Arsenic > 23
3 Day TAT- Organochlorine Pesticides

AAL PROJECT#: AA599

CLIENT:	Lehua Environmental Inc.	PROJECT NAME:	HBMC Soil
ADDRESS:	P.O. Box 1018, Kamuela, Hawaii 99743	COLLECTOR:	Calvin Arca, Taylor Burks
PHONE: (808)494-036!	lehuaenvironmental@gmail.com	DATE OF COLLECTION:	9/9/2025
CLIENT PROJECT#:		PROJECT MANAGER:	Kama Kobayashi

ANALYSES

Sample Number	Time	Sample type	Container Type	Multi-Incremental Volatile	Multi-Incremental Non Volatile	8015M TPH Fuel Scan	8015M TPH Gasoline	8015M TPH Diesel	8015M TPH Oil	8260B Volatiles	8260 BTEX	8270 PAH DOH 4	8270 PAH 17 analytes	8270 Semi Volatiles	8082 PCB	TCLP 8081 OrganoChlorind Pest	8081 Organochlorine Pesticides	Total Lead	Total Cadmium	TCLP RCRA 8 Metals	Total RCRA 8 Metals	*Bioaccessible Ar for total Ar >23mg/	Field Notes	Number of containers	Number containers received
DU 1		Soil	Zip-lock Bag		X												X				X	X			1
DU 2		Soil	Zip-lock Bag		X												X				X	X			1
DU 3		Soil	Zip-lock Bag		X												X				X	X			1
DU 4		Soil	Zip-lock Bag		X												X				X	X			1
DU 5		Soil	Zip-lock Bag		X												X				X	X			1
DU 6		Soil	Zip-lock Bag		X												X				X	X			1
DU 7		Soil	Zip-lock Bag		X												X				X	X			1
DU 8		Soil	Zip-lock Bag		X												X				X	X			1
DU 9		Soil	Zip-lock Bag		X												X				X	X			1
DU 10A		Soil	Zip-lock Bag		X												X				X	X			1
DU 10B		Soil	Zip-lock Bag		X												X				X	X			1
DU 10C		Soil	Zip-lock Bag		X												X				X	X			1
DU 11		Soil	Zip-lock Bag		X												X				X	X			1
DU 12		Soil	Zip-lock Bag		X												X				X	X			1

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	9/10/25 11:30AM		
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
		[signature]	9/11/25 10:15

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	14
CHAIN OF CUSTODY SEALS INTACT	N
RECEIVED IN GOOD CONDITION	Y
TEMPERATURE	4.1°C
PAGE 1 OF 3	

LABORATORY NOTES:

ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252 Fax:(808) 836 2250 Address: 544 Ohohia St., unit 10 Honolulu, HI 96819

TURNAROUND TIME: 1 Day TAT- Total RCRA 8
2 Day TAT-Bioaccessible Arsenic for Total Arsenic > 23
3 Day TAT- Organochlorine Pesticides

AAL PROJECT#: AA599

CLIENT:	Lehua Environmental Inc.	PROJECT NAME:	HBMC Soil
ADDRESS:	P.O. Box 1018, Kamuela, Hawaii 99743	COLLECTOR:	Calvin Arca, Taylor Burks
PHONE: (808)494-036!	lehuaenvironmental@gmail.com	DATE OF COLLECTION:	9/9/2025
CLIENT PROJECT#:		PROJECT MANAGER:	Kama Kobayashi

ANALYSES

Sample Number	Time	Sample type	Container Type	Multi-Incremental Volatile	Multi-Incremental Non Volatile	8015M TPH Fuel Scan	8015M TPH Gasoline	8015M TPH Diesel	8015M TPH Oil	8260B Volatiles	8260 BTEX	8270 PAH DOH 4	8270 PAH 17 analytes	8270 Semi Volatiles	8082 PCB	TCLP 8081 OrganoChlorind Pest	8081 Organochlorine Pesticides	Total Lead	Total Cadmium	TCLP RCRA 8 Metals	Total RCRA 8 Metals	*Bioaccessible Ar for total Ar >23mg/	Field Notes	Number of containers	Number containers received
DU 13		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 14		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 15		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 16		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 17		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 18		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 19		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 20A		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 20B		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 20C		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 21		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 22		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 23		Soil	Zip-lock Bag		X												X				X	X		1	1
DU 24A		Soil	Zip-lock Bag		X												X				X	X		1	1

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	9/10/25 1:30AM		
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
		[signature]	9/11/25 10:15

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	14
CHAIN OF CUSTODY SEALS INTACT	N
RECEIVED IN GOOD CONDITION	Yes
TEMPERATURE	4.1°C
PAGE 2 OF 3	

LABORATORY NOTES:

Flip for Page 3.

ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252 Fax:(808) 836 2250 Address: 544 Ohohia St., unit 10 Honolulu, HI 96819

TURNAROUND TIME: 1 Day TAT- Total RCRA 8
2 Day TAT-Bioaccessible Arsenic for Total Arsenic > 23
3 Day TAT- Organochlorine Pesticides

AAL PROJECT#: AA599

CLIENT:	Lehua Environmental Inc.	PROJECT NAME:	HBMC Soil
ADDRESS:	P.O. Box 1018, Kamuela, Hawaii 99743	COLLECTOR:	Calvin Arca, Taylor Burks
PHONE: (808)494-036!	lehuaenvironmental@gmail.com	DATE OF COLLECTION:	9/9/2025
CLIENT PROJECT#:		PROJECT MANAGER:	Kama Kobayashi

ANALYSES

Sample Number	Time	Sample type	Container Type	Multi-Incremental Volatile	Multi-Incremental Non Volatile	8015M TPH Fuel Scan	8015M TPH Gasoline	8015M TPH Diesel	8015M TPH Oil	8260B Volatiles	8260 BTEX		8270 PAH DOH 4	8270 PAH 17 analytes	8270 Semi Volatiles		8082 PCB	TCLP 8081 OrganoChlorind Pest	8081 Organochlorine Pesticides		Total Lead	Total Cadmium	TCLP RCRA 8 Metals	Total RCRA 8 Metals	*Bioaccessible Ar for total Ar >23mg/		Field Notes	Number of containers	Number containers received
DU 24B		Soil	Zip-lock Bag		X														X					X	X			1	1
DU 24C		Soil	Zip-lock Bag		X														X					X	X			1	1

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	9/10/25	11:30AM	
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
			9/11/25 10:15

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS INTACT	N
RECEIVED IN GOOD CONDITION	Yes
TEMPERATURE	3.9° C
PAGE 3 OF 3	

LABORATORY NOTES:

ENGINEERING PARTNERS

455 E. Lanikaula Street
Hilo, Hawaii 96720
www.epinc.pro

14043-24-13

April 17, 2025

County of Hawaii
Department of Water Supply
345 Kekūanāo'a Street
Hilo, HI 96720

Attention: Manager-Chief Engineer,

Subject: HBMC Keaau Medical Office Building and Behavioral Health Building
TMK: 1-6-003: 127

Submitted herein is a revised water demand calculation based on the final design and patient count for the HBMC Keaau Medical Office Building and Behavioral Health Building for your review and approval.

The HBMC Keaau Medical Office Building and Behavioral Health Building project will consist of two one-story medical clinic office buildings. There will be the North and South wing with associated parking lot. The North Wing will have 8 exam / therapy rooms, 16 Provider Offices, and associated lobbies, security, clinical, janitorial and staff support. The South Wing will have 29 exam / procedure / triage rooms, radiology / ultrasound / MRI / CT area, and associated lobbies, security, clinical, janitorial and staff support.

Water demand calculations are based on average daily water usage as provided by the owner and owner's representative for the proposed project.

Water Daily Demand

North Wing:

Staff: 35 @ 20gpd/c = 700 gpd
Patients: 160 patients x 5 gpd/c = 800 gpd
Patients' companion: 48 @ 3 gpd/c = 144 gpd

South Wing:

Staff: 45 @ 20gpd/c = 900 gpd
Patients: 240 patients x 5 gpd/c = 1200 gpd
Patients' companion: 72 @ 3 gpd/c = 216 gpd

Total Water Average Daily Demand = 700 + 800 + 144 + 900 + 1,200 + 216 = 3,960 gpd
= 3,960 / 400 gpd/WU = 9.9 WU or 10 Water Units

The proposed HBMC Keaau Medical Office Building and Behavioral Health Building has a water fixture unit count of 286.5, which is equal to 109 gpm of peak hour flow.

Conclusion:

The HBMC Keaau Medical Office Building and Behavioral Health Building project will increase the daily water usage by 3,960 gpd and peak hour flow by 109 gpm.

Sincerely,

ENGINEERING PARTNERS, INC.

Yen Wen Fang, P.E.
Principal

Cc: Hilo Medical Center, HHSC
3675 Kilauea Ave, Honolulu
HI 96816-2333

Fleming & Associates
557 Manono St.
Hilo, HI 96720

Engineering Partners, INC.

Job Name: HBMC Keaau Medical Office Building and Behavioral Health Building

PROPOSED DOMESTIC		ultra flow private	ultra flow public	private	public	
Water Closet - Flush Valve		3.4	5.6	6	10	
	Qty	0	0	21	0	126.00
Water Closet - Flush Tank		1.7	2.8	2.5	2.5	
	Qty	0	0	0	0	0.00
Urinal		0	2.8	3	4	
	Qty	0	0	3	0	9.00
Lavatory		0.8	1.2	1	1	
	Qty	0	0	23	0	23.00
Kitchen sink		1.6	3.2	1.5	1.5	
	Qty	0	0	75	0	112.50
Shower		1.8	3.2	2	2	
	Qty	0	0	0	0	0.00
Bathtub / Shower		1.6	4	4	4	
	Qty	0	0	0	0	0.00
Drinking Fountain / Water cooler		1	2	0.5	0.5	
	Qty	0	0	5	0	2.50
Laundry tray		2	4	2	4	
	Qty	0	0	0	0	0.00
Service sink / Mop sink		2	4	1.5	3	
	Qty	0	0	2	0	3.00
Dishwasher		1.6	4	1.5	1.5	
	Qty	0	0	0	0	0.00
Bar sink		1	*	1	2	
	Qty	0		0	0	0.00
First Hose Bibb		2.5	*	*	*	
	Qty	1				2.50
Additional Hose Bibbs		1				
	Qty	8				8.00
ice machine						
	Qty	0				0.00
EWC						
	Qty	0				0.00
make-up water		1.6				
	Qty	0				0.00
Washer Machine		1.8	4	4	4	
	Qty	0	0	0	0	0.00
coffee		1				
	Qty	0				0.00
water station		1				
	Qty	0				0.00
hot well		1				
	Qty	0				0.00
pitcher rinser		1				
	Qty	0				0.00
kettle		1				
	Qty	0				0.00
		1				
	Qty	0				0.00
					Total Fixture Units	286.50

WATER FLOW REQUIREMENTS

DATE: 4/14/25

PROJECT NAME: HBMC Keaau Medical Office Building and Behavioral Health Building

A.	**PROPOSED DOMESTIC:**	286.50	**F.U.'S**	109.0	**GPM'S**
B.	**PROPOSED OTHERS:**	0	**F.U.'S**	0.0	**GPM'S**
C.	**TOTAL PROPOSED:**	286.5	**F.U.'S**	109.0	**GPM'S**
	(DO NOT include irrigation gpm if less than domestic and done during off-peak hours.)				
D.	**DEMOLISHED: DOMESTIC** (All fixtures being removed) DEMO PERMIT # DATE:	0.00	**F.U.'S**	0.0	**GPM'S**
E.	**DEMOLISHED: OTHER** DEMO PERMIT # DATE:	0	**F.U.'S**	0.0	**GPM'S**
F.	**TOTAL DEMOLITION:** (Add D and E)	0	**F.U.'S**	0.0	**GPM'S**
G.	**NET CHANGE:** (Subtract F from C above)	286.5	**F.U.'S**	109.0	**GPM'S**
H.	**EXISTING DOMESTIC TO REMAIN:** (Other fixtures serviced by this meter but not effected by project including irrigation)	0	**F.U.'S**	0.0	**GPM'S**
L.	**GRAND TOTAL** (Add C and H)	**286.5**	**F.U.'S**	109.0	**GPM'S**

CALCULATION CRITERIA

USE (1) FOR FLUSH TANK:

OR FLUSH VALVE : (2) 2

WATER DEMAND SCHEDULE

FIXTURE UNITS	286.5	FU	
GALLONS PER MIN.	109.0	GPM	
GALLONS PER DAY	4905	GPD	45 MIN PER DAY

APPENDIX E
COMMENTS IN RESPONSE TO PUBLICATION OF DRAFT ENVIRONMENTAL ASSESSMENT

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

West Hawaiʻi Office
74-5044 Ane Keohokālole Hwy
Kailua-Kona, Haw iʻi 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawaiʻi
PLANNING DEPARTMENT

Jeffrey W. Darrow
Director

Michelle S. Ahn
Deputy Director

East Haw iʻi Office
101 Pauahi Street, Suite 3
ilo, Haw i i 96720
Phone (808) 961-8288
Fax (808) 961-8742

March 19, 2026

John Pipan
Pipan Consulting LLC
P. O. Box 421
Honokaa, Hawaiʻi   96727
VIA EMAIL

Dear John Pipan:

SUBJECT: Comment for a Hawaiʻi Environmental Policy Act (HEPA) Environmental Assessment (PL-ENV-2026-000060)
Project: Keaʻau Outpatient – Hilo Benioff Medical Center (HBMC), New Location
Tax Map Key: (3) 1-6-003:127 (por.) and 1-6-003:007 (por.), Keaʻau, Puna, Hawaiʻi

This letter is in response to your February 20, 2026 transmittal of the Draft Environmental Assessment (DEA) and Anticipated Finding of No Significant Impact (AFONSI) for the proposed Keaʻau Outpatient Center, which was published in the February 23, 2026 Environmental Review Bulletin (ERB). The following comments are provided based on the Planning Department's review of the DEA.

Hilo Benioff Medical Center (HBMC) proposes to construct a new medical facility in Keaʻau known as the Keaʻau Outpatient Center (KOC). The proposed project site is located west of Volcano Road, near its intersections with Keaʻau Bypass Road and Hawaiʻi Belt Road. The parent parcel, identified as TMK (3) 1-6-003:127, is approximately 108.8 acres and is owned by W.H. Shipman Ltd. The proposed project site consists of a 20-acre portion of the parent parcel currently zoned Agricultural 20-acres (A-20a), which would be subdivided from the larger parcel. The clinic is proposed to occupy approximately 13 acres within the 20-acre project area. A new access driveway would be constructed within a 4.4-acre roadway lot to be subdivided from TMK (3) 1-6-003:007. Plans include the construction of a single-story medical office building complex consisting of a clinical wing and a behavioral health wing totaling approximately 40,000 square feet, along with associated parking and loading areas.

Based on the Planning Department's review of the DEA, the following comments are provided:

1. TMK (3) 1-6-003:127 is approximately 108.761 acres in size. The property is zoned Agricultural 20-acres (A-20a) and Industrial-Commercial Mixed Use (MCX-20). The parcel is primarily designated Urban, with a small portion designated Agricultural by the State Land Use Commission. The Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the parcel as Urban Expansion (UE). The parcel is not located within the Special Management Area (SMA).

2. TMK (3) 1-6-003:007 is approximately 1,235.835 acres in size. The parcel is designated Agricultural and Urban by the State Land Use Commission. The General Plan LUPAG Map designates the parcel as Urban Expansion (UE) and Important Agricultural Lands (IAL). The property is zoned Agricultural 20-acres (A-20a) and is not located within the Special Management Area (SMA).

3. According to County Real Property Tax Records, the subject parcels are privately owned by W.H. Shipman Ltd.

4. The proposed development is subject to the requirements of the Hawai'i County Zoning Code. Based on the information provided in the DEA, a Use Permit is required for development within the portion of the property located in the State Land Use Urban District, and a Special Permit is required for development within the portion of the property located in the State Land Use Agricultural District. The DEA should clearly identify all required discretionary permits and approvals and confirm consistency with applicable zoning and State Land Use regulations.

5. State Land Use Boundary Amendment No. 884 (LUC Docket No. BR96-699) was approved on July 18, 1994, amending approximately 660 acres in Kea'au, Puna, Hawai'i Island from the Agricultural District to the Urban District. County Change of Zone Ordinance No. 02-23, approved on February 28, 2002, reclassified portions of the property to Industrial-Commercial Mixed Use (MCX-20). The DEA does not clearly provide comprehensive permitting and zoning history for the subject property. The DEA should be revised to include a complete summary of prior approvals, including State Land Use actions, County zoning ordinances, and any associated conditions of approval, and should clarify whether the proposed project and access improvements are consistent with those approvals.

6. According to the Land Study Bureau Productivity Rating, soils in the project area are classified as C (Fair Soils) and D (Poor Soils) and the Agricultural Lands of Importance to the State of Hawaiʻi (ALISH) classification identifies the project area as Other or Unclassified.

7. The DEA includes a general discussion of wastewater disposal, stormwater management, drainage, and erosion and sediment control; however, it does not clearly identify or depict these infrastructure components on the conceptual site plan. The DEA should be revised to include a complete list of required permits and approvals, and document any resulting requirements or mitigation measures. The document should also address spill prevention measures associated with both construction and operation of the project.

8. The DEA references consultation with the Hawaiʻi State Department of Transportation (HDOT) regarding traffic and access impacts; however, it does not provide sufficient detail regarding the substance and outcomes of that coordination. The DEA should be revised to include a clearer summary of consultation with HDOT, identify any required roadway or intersection improvements, and describe any traffic-related mitigation measures.

9. The DEA should include a summary of any concerns raised by surrounding community members and stakeholders and describe how those concerns have been addressed.

10. The DEA indicates that no Archaeological Inventory Survey (AIS) has been conducted. Given that the project involves ground-disturbing activities, the DEA does not adequately document consultation with the State Historic Preservation Division (SHPD) pursuant to HRS Chapter 6E. The DEA should be revised to include documentation of consultation with SHPD and clarify whether an AIS or other cultural resource study is required, along with any resulting recommendations or conditions.

The DEA should also clearly identify all agencies consulted during its preparation and confirm that the Department of Transportation (HDOT), County Department of Water Supply (DWS), State Historic Preservation Division (SHPD), and Department of Health (DOH) Wastewater Branch were provided a draft of the DEA for review, and summarize the outcomes of those consultations.

If you should have further questions, please contact Tracie Camero of this office at (808) 961-8166 or via email at Tracie-Lee.Camero@hawaiicounty.gov.

Sincerely,

Maija Jackson for

JEFFREY W DARROW
Planning Director

TLC:sm

\\hawaiicounty.gov\depts\PL\PL\planning\public\wpwin60\PC\letters\2026\PL-ENV-2026-000060 - Benioff Center Comments.doc

LAND PLANNING HAWAII LLC

194 Wiwoole St. Hilo, HI 96720
(808) 333-3393
info@landplanninghawaii.com

April 29, 2026

Mr. Jeffrey Darrow, Director
Planning Department
COUNTY OF HAWAII
101 Pauahi Street
Hilo, HI 96720

Dear Mr. Darrow:

Subject:	**Response to Comments for Hilo Benioff Medical Center Kea'au Outpatient Center Draft Environmental Assessment (EA)**
RE:	**Construction of a New Medical Clinic Facility**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Kea'au, Puna, Hawai'i TMK (3) 1-6-003: 127, TMK (3) 1-6-003: 007 (por.)**

Thank you for your comments dated March 19, 2026 regarding the subject Draft Environmental Assessment (DEA) for the Hilo Benioff Medical Center (HBMC) Kea'au Outpatient Center, located to the west of Highway 11, across from the intersection with Kea'au-Pāhoa Road.

HBMC is proposing to construct a new medical facility in Kea'au known as the Kea'au Outpatient Center (KOC). Plans include construction of a single-story medical office building complex consisting of a clinical wing and a behavioral health wing totaling approximately 40,000 square feet. The proposed facilities will provide urgent care services, primary care services, specialty clinic services, imaging services, laboratory services, and behavioral health and counseling services. The facilities will serve the general public but will be primarily focused on residents of Puna and South Hilo.

The Final Environmental Assessment has been revised to address the following comments received from the Planning Department:

1. *TMK (3) 1-6-003:127 is approximately 108.761 acres in size. The property is zoned Agricultural 20-acres (A-20a) and Industrial-Commercial Mixed Use (MCX-20). The parcel is primarily designated Urban, with a small portion designated Agricultural by the State Land Use Commission. The Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the parcel as Urban Expansion (UE). The parcel is not located within the Special Management Area (SMA).*

   The Final EA has been revised where necessary to reflect the preceding information.

2. *TMK (3) 1-6-003:007 is approximately 1,235.835 acres in size. The parcel is designated Agricultural and Urban by the State Land Use Commission. The General Plan LUPAG Map designates the parcel as Urban Expansion (UE) and Important Agricultural Lands*

(IAL). The property is zoned Agricultural 20-acres (A-20a) and is not located within the Special Management Area (SMA).

The Final Environmental Assessment has been revised to provide additional information regarding the LUPAG designation of the parcels in Section 4.1.1 2005, Hawaiʻi County General Plan, additional information on the zoning of the parcels in Section 4.3, County Zoning and Special Management Area and additional information on the State Land Use designation of the parcels in Section 4.4, Hawaiʻi State Land Use Law.

3. *According to County Real Property Tax Records, the subject parcels are privately owned by W.H. Shipman Ltd.*

   Page 6 of the Draft and Final Environmental Assessment concur with this comment.

4. *The proposed development is subject to the requirements of the Hawaii County Zoning Code. Based on the information provided in the DEA, a Use Permit is required for development within the portion of the property located in the State Land Use Urban District, and a Special Permit is required for development within the portion of the property located in the State Land Use Agricultural District. The DEA should clearly identify all required discretionary permits and approvals and confirm consistency with applicable zoning and State Land Use regulations.*

   This is correct and further elaborated on in the Summary of Project, Environmental Impacts, and Mitigation, Measures section of the report. The Final Environmental Assessment has been revised throughout to consistently identify the need for both a Use Permit and a Special Permit.

5. *State Land Use Boundary Amendment No. 884 (LUC Docket No. BR96-699) was approved on July 18, 1994, amending approximately 660 acres in Keaʻau, Puna, Hawaiʻi Island from the Agricultural District to the Urban District. County Change of Zone Ordinance No. 02-23, approved on February 28, 2002, reclassified portions of the property to Industrial-Commercial Mixed Use (MCX-20). The DEA does not clearly provide comprehensive permitting and zoning history for the subject property. The DEA should be revised to include a complete summary of prior approvals, including State Land Use actions, County zoning ordinances, and any associated conditions of approval, and should clarify whether the proposed project and access improvements are consistent with those approvals.*

   Section 4.4, Hawaiʻi State Land Use Law, of the final Environmental Assessment has been revised to provide this additional information.

6. *According to the Land Study Bureau Productivity Rating, soils in the project area are classified as C (Fair Soils) and D (Poor Soils) and the Agricultural Lands of Importance to the state of Hawaiʻi (ALISH) classification identiefies the project area as Other or Unclassified.*

Section 3.1: Environmental Setting, Impacts, and Mitigation, Topography and Soil, of the Final Environmental Assessment has been revised to include this information.

7. *The DEA includes a general discussion of wastewater disposal, stormwater management, drainage, and erosion and sediment control; however, it does not clearly identify or depict these infrastructure components on the conceptual site plan. The DEA Should be revised to include a complete list of required permits and approvals, and document any resulting requirements or mitigation measures. The document should also address spill prevention measures associated with both construction and operation of the project.*

   The site plan is conceptual at this point and cannot be finalized until potential conditions of the Use Permit and Special Permit are accounted for. The location of specific components or design of mitigation measures will come at later permitting phases. A complete list of required permits and approvals is provided in the Draft and Final EA in Section 4.5. Spill prevention measures are detailed in Section 3.1.9 of the Draft and Final EA.

8. *The DEA references consultation with the Hawai'i State Department of Transportation (HDOT) regarding traffic and access impacts; however, it does not provide sufficient detail regarding the substance and outcomes of that coordination. The DEA should be revised to include a clearer summary of consultation with HDOT, identify any required roadway or intersection improvements, and describe any traffic-related mitigation measures.*

   Section 3.3 Public Roads, Services, and Utilities of the Final Environmental Assessment has been revised to include additional information on the consultation with HDOT. Consultation with the HDOT was primarily conducted through SSFM International, the engineering firm that conducted the Traffic Impact Analysis Report (TIAR) for the project. The TIAR did not recommend any intersection improvements or traffic-related mitigation measures. A copy of the TIAR and the Draft Environmental Assessment has been provided to the HDOT and no comment has been received as of the date of the letter.

9. *The DEA should include a summary of any concerns raised by surrounding community members and stakeholders and describe how those concerns have been addressed.*

   Section 1.5 has been edited to include more information about the stakeholder and community consultation process, including topics raised as community member concerns and how HBMC has addressed the concerns.

10. *The DEA indicates that no Archaeological Inventory Survey (AIS) has been conducted. Given that the project involves ground-disturbing activities, the DEA does not adequately document consultation with the State Historic Preservation Division (SHPD) pursuant to HRS Chapter 6E. The DEA Should be revised to include documentation of consultation with SHPD and clarify whether an AIS or other cultural resource study is required, along with any resulting recommendations' or conditions.*

Section 3.2.4 Cultural and Historic Resources, Potential Environmental Impact from Proposed Action, of the Final Environmental Assessment has been revised to include information that was recently compiled relating to prior archaeological studies which were conducted on the subject properties and the larger area. This additional information includes an additional appendix containing a prior Archaeological Assessment of the area and a letter from SHPD concurring with the findings of that Assessment that no further archaeological work is necessary.

We trust that everything is in order for your acceptance of this Final Environmental Assessment. If not, or if there are questions relating to this matter, please feel free to direct them to me. Thank you very much.

Sincerely,

JOHN PIPAN
Planning Administrator

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health
July 3, 2024

All project activities shall comply with Hawaii Administrative Rules (HAR), Chapter 11-59 and 11-60.1.

If your proposed project:

Requires an Air Pollution Control Permit

- You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.
- Permit application forms can be found here: https://health.hawaii.gov/cab/permit-application- forms/

Has the potential to generate fugitive dust

- You must reasonably control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near existing residences, businesses, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.
- Construction activities must comply with the provisions of Hawaii Administrative Rules, §11- 60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, it is strongly recommended that buffer zones be established, wherever possible, in order to alleviate potential dust concerns.
- You must provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:
    - Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
    - Providing an adequate water source at the site prior to start-up of construction activities;
    - Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
    - Minimizing airborne, visible fugitive dust from shoulders and access roads;
    - Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
    - Controlling airborne, visible fugitive dust from debris being hauled away from the project site.
- If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch. Please also see fugitive dust fact sheet at: https://health.hawaii.gov/cab/files/2024/02/Hawaii-Fugitive-Dust-Fact-Sheet-February-2024.pdf.

Includes construction, demolition, or renovation activities that involve potential asbestos and lead containing materials

- Please contact the Indoor and Radiological Health Branch at (808) 586-4700 or visit: https://health.hawaii.gov/irhb/

Increases the population and potential number of vehicles in an area

- The creation of apartment buildings, complexes, and residential communities may increase the overall population in an area. Increasing the population in an area may inadvertently lead to more air pollution via vehicle exhaust. Vehicle exhaust releases pollutants in the air that can negatively impact human health and air quality, including lung irritants, carcinogens, and greenhouse gases.
- Ensure that drivers keep vehicle idling times to three (3) minutes or less.
- Consider and incorporate support for alternative transportation options such as bike racks and/or electric vehicle charging stations where possible.

If you have any questions, please contact the Clean Air Branch at (808) 586-4200 or at cab@doh.hawaii.gov.

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April 29, 2026

Clean Air Branch
Hawaii State Department of Health
919 Ala Moana Blvd, Room 203
Honolulu, HI 96814

Subject: **Response to Clean Air Branch Standard Comments on the Draft Environmental Assessment — Hilo Benioff Medical Center Keaʻau Outpatient Center**
RE: **Keaʻau Benioff Medical Center — Hilo Benioff Medical Center (HBMC) New Location**
Applicant: **Hilo Benioff Medical Center (HBMC)**
Location: **Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Clean Air Branch,

Mahalo for your review of the Draft Environmental Assessment (DEA) for the proposed Hilo Benioff Medical Center (HBMC) Keaʻau Outpatient Center. Land Planning Hawaiʻi LLC, on behalf of HBMC, has carefully reviewed the Clean Air Branch (CAB) standard comments for land use reviews and welcomes the opportunity to respond. The CAB comments address four topics: (1) air pollution control permits, (2) fugitive dust during construction, (3) asbestos and lead-containing materials, and (4) increased vehicle traffic. Each topic is addressed below and in the Final Environmental Assessment (FEA) at Section 3.1.6 (Air Quality).

1. Air Pollution Control Permit

The CAB advises that an air pollution control permit must be obtained if required for the proposed project and that applicable conditions and requirements must be met. The FEA acknowledges at Section 3.1.6 that all Hawaiʻi Island meets the standards set by the Clean Air Act (CAA) and HRS §342B, and that air quality in the Keaʻau area is currently very good.

The proposed project is the construction of a single-story outpatient medical office building totaling 40,000 square feet. The project does not involve combustion sources, industrial processes, or operations that are anticipated to require an air pollution control permit under HAR Chapter 11-60.1. During the engineering and permitting phase, the applicant will evaluate all applicable permit requirements and will obtain any required air pollution control permit from the CAB Permitting Section prior to construction or operation of any equipment subject to such requirements. The applicant acknowledges the CABʻs Permitting Section as the appropriate point of contact for permit applicability determinations.

2. Fugitive Dust During Construction

The CAB advises that construction activities must comply with HAR §11-60.1-33 on Fugitive Dust and that a dust control management plan is recommended. The FEA addresses this

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comment at Section 3.1.6 and incorporates the CABʿs recommended fugitive dust mitigation measures in full.

Air pollutants during construction will be limited and temporary. The main sources of short-term air pollutants are construction equipment exhaust and dust. HAR §11-60 on Fugitive Dust, which prohibits visible emissions of dust from construction activities, will be strictly followed to prevent dust impacts to Hawaiʻi Belt Road and surrounding areas. The FEA (Section 3.1.6) commits the project to the following measures to control airborne, visible fugitive dust, consistent with the CABʿs standard requirements:

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

These measures will be implemented during all phases of construction to prevent significant impacts to Hawaiʻi Belt Road, Highway 130, and surrounding areas. The project site is located within an agricultural area, and nearby residents and businesses will benefit from these proactive dust management measures. A site-specific dust control management plan will be developed as part of the contractorʿs Best Management Practices (BMPs) prior to the start of construction, consistent with the CABʿs recommendation.

3. Asbestos and Lead-Containing Materials

The CAB advises that construction, demolition, or renovation activities involving potential asbestos or lead-containing materials require contact with the Indoor and Radiological Health Branch (IRHB). The proposed project is a new construction on a previously agricultural (fallow sugarcane field) site. There are no existing structures on the 20-acre project footprint that would require demolition or renovation. Accordingly, the project does not anticipate construction or demolition activities involving asbestos or lead-containing building materials.

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The FEA at Section 3.1.9 (Hazardous Substances, Toxic Waste, and Hazardous Conditions) addresses site history and potential contamination concerns. The subject site has been used for agricultural purposes, primarily sugarcane production, for over a century. A Soil Screening Survey (Appendix C of the FEA) was conducted for the project area to assess the potential for residual agricultural chemicals in the soil. The project˓s Soil Management Plan, which is incorporated as a mitigating measure in the FEA, addresses management of any impacted soils encountered during grading and construction. Again, as a new construction project on a previously cleared agricultural site, asbestos and lead concerns associated with building demolition are not applicable. Should any previously unidentified structures or materials be encountered during site preparation, the applicant will contact the IRHB as directed.

4. Increased Vehicle Traffic and Emissions

The CAB advises that increased population and vehicle numbers can lead to greater air pollution via vehicle exhaust, and recommends that vehicle idling times be kept to three (3) minutes or less and that support for alternative transportation options — such as bike racks and/or electric vehicle charging stations — be considered. The FEA acknowledges at Section 3.1.6 that vehicle emissions from the proposed facility will represent the primary source of operational air quality impacts, which are anticipated to be minor given the context of Hawaiʻi Island.

Vehicle Idling

The proposed Kea˓au Outpatient Center will implement a policy requiring that drivers keep vehicle idling times to three (3) minutes or less in surface parking areas, consistent with the CAB˓s recommendation. This measure will be incorporated into the facility˓s operational management plan and posted signage will be provided in parking areas to inform patients, visitors, and employees.

Alternative Transportation Support

The project will incorporate support for alternative transportation options consistent with its role as a community healthcare facility serving the Puna District. Bicycle parking will be provided at the facility. The project site is located along Hawaiʻi Belt Road (Route 11), which is served by the Hele-On Bus public transit system, providing an existing transit option for patients and employees who choose not to drive. The feasibility of electric vehicle (EV) charging stations will be evaluated during the design phase; given the rapidly growing adoption of EVs on Hawaiʻi Island, the applicant anticipates providing EV charging infrastructure as part of the facility˓s parking facilities.

Overall Air Quality Impact

The Traffic Impact Analysis Report (TIAR) prepared by SSFM International and incorporated into the FEA as Appendix A evaluated traffic conditions at four study intersections in the Kea˓au area under existing (2025) and future (2028) with-project conditions. The TIAR concludes that the roadway network in the Kea˓au area can accommodate anticipated traffic volumes without significant adverse effects, even accounting for background area growth. With the outlined

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mitigation measures, potential impacts to air quality from vehicle emissions will not change appreciably under any alternative and will remain within standards set by the Clean Air Act and HRS §342B. Air quality in the Keaʿau area is currently very good and the proposed project is not expected to result in any meaningful degradation of regional air quality.

We trust that the above responses address the comments made by the Clean Air Branch and that the Final Environmental Assessment adequately evaluates and mitigates potential air quality impacts associated with the proposed Keaʿau Outpatient Center. The applicant is committed to complying with all applicable requirements under HAR Chapters 11-59 and 11-60.1, and to implementing the fugitive dust, idling, and transportation measures described above. Please do not hesitate to contact us directly with any additional questions.

Sincerely,

John Pipan

Planning Administrator

Land Planning Hawaiʻi LLC

PRP Comments on Draft Environmental Assessment: Hilo Benioff Medical Center Kea'au Outpatient Center

Pacific Resource Partnership (PRP) appreciates the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the proposed Hilo Benioff Medical Center Kea'au Outpatient Center project.

PRP represents construction industry stakeholders who regularly work on large public infrastructure and vertical construction projects throughout Hawai'i, including projects involving healthcare facilities and water infrastructure. Our contractors and affiliated trades are frequently responsible for implementing environmental mitigation measures associated with projects of this scale.

PRP supports the expansion of healthcare services in the Puna District and recognizes the need for additional medical facilities to serve the growing population. At the same time, PRP believes it is important that the environmental review process fully analyze potential impacts associated with the proposed development to ensure that all environmental issues are adequately addressed.

After reviewing the Draft EA, PRP respectfully submits the following comments.

1. **Wastewater Treatment and Groundwater Protection**

The Draft EA states that the project will utilize an on-site wastewater treatment system because no county sewer connection currently exists in the area.

The document also indicates that the property lies above the Underground Injection Control (UIC) line used by the State Department of Health to protect groundwater resources that may serve as drinking water supplies.

However, the Draft EA provides limited information regarding the design and operation of the proposed wastewater treatment system. Given that the proposed facility will provide clinical services and is expected to serve more than 100 patients per day, PRP requests that the Final EA provide additional information regarding:

- anticipated wastewater generation volumes
- the type of wastewater treatment technology proposed
- whether deep or shallow injection wells will be used
- potential impacts to groundwater resources
- long-term system maintenance and monitoring requirements

The Draft EA should also clarify whether medical wastewater or substances associated with clinical services could enter the wastewater treatment system and whether additional review by the Department of Health will be required.

Because the site lies above groundwater resources with potential drinking water value, additional analysis of groundwater protection measures would help ensure that environmental impacts are fully considered.

2. Alternatives Analysis

The Draft EA indicates that alternate locations were evaluated during early project planning but ultimately concludes that no alternative sites warrant further study.

However, the discussion of alternative locations in the Draft EA is limited. Given the scale of the proposed development and the use of public funding sources, PRP requests that the Final EA provide additional explanation regarding the alternatives considered during project planning.

Additional discussion could include:

- whether alternative locations within already developed areas were evaluated
- whether expansion of existing medical facilities was considered
- the criteria used to select the proposed site over other potential locations

A more detailed explanation of the alternatives considered would help clarify the basis for the selected site and ensure that the environmental review process adequately evaluates reasonable alternatives.

3. Cumulative and Secondary Impacts

The Draft EA acknowledges that the Puna District has experienced rapid population growth and is expected to continue growing significantly in the coming years.

The project site is also part of a larger property owned by W.H. Shipman Ltd., with the proposed development occupying a portion of a larger parcel.

Given these circumstances, PRP requests that the Final EA provide additional discussion regarding cumulative and secondary impacts associated with the proposed project. This could include consideration of:

- foreseeable development on adjacent portions of the property
- cumulative traffic impacts in the Kea'au area
- long-term infrastructure demands related to population growth
- potential expansion of medical facilities in the future

Additional discussion of cumulative impacts would help provide a clearer understanding of how the proposed project may interact with future development and infrastructure needs in the area.

In addition to the comments above, PRP respectfully requests that the proposing agency fully address the issues raised in these comments in the Final Environmental Assessment.

PRP reserves the right to raise additional issues related to the environmental review of this project should additional information become available or should the Final Environmental Assessment fail to adequately address the concerns identified during the public review process. PRP further reserves all rights available under Hawaiʻi Revised Statutes Chapter 343 and related laws and regulations.

Based on the issues identified above, PRP respectfully requests that the agency carefully consider whether additional environmental analysis may be warranted to fully evaluate potential impacts associated with the proposed project prior to issuing a Finding of No Significant Impact.

PRP

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April 29, 2026

Pacific Resource Partnership (PRP)
1100 Alakea Street, 4th Floor
Honolulu, HI 96813

Subject:	**Response to Public Comments on the Draft Environmental Assessment — Hilo Benioff Medical Center Keaʻau Outpatient Center**
RE:	**Keaʻau Outpatient Center — Hilo Benioff Medical Center (HBMC) New Location**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Pacific Resource Partnership,

Mahalo for your review of the Draft Environmental Assessment (DEA) for the proposed Hilo Benioff Medical Center (HBMC) Keaʻau Benioff Medical Center and for your comments submitted during the public comment period. Land Planning Hawaiʻi LLC, on behalf of HBMC, has carefully reviewed Pacific Resource Partnership's (PRP) comments and welcomes the opportunity to respond. PRP's three comment topics — wastewater treatment and groundwater protection, alternatives analysis, and cumulative and secondary impacts — have each been addressed in the Final Environmental Assessment (FEA), as summarized below.

1. Wastewater Treatment and Groundwater Protection

PRP requested additional information regarding anticipated wastewater generation volumes, the type of wastewater treatment technology proposed, whether injection wells will be used, potential impacts to groundwater resources, and long-term system maintenance and monitoring requirements. These are addressed in turn below and in the FEA at Section 3.3.3.2 (Wastewater).

Wastewater Generation

Detailed wastewater generation calculations will be developed at the time of engineering design and prepared as part of the permitting package submitted to the State Department of Health (DOH). Wastewater flow calculations will be based on DOH guidance for the type of use, number of employees, and anticipated patient volumes. Similar to the approach used for water calculations — which will be developed in consultation with the Department of Water Supply as noted in the FEA — wastewater calculations are a permitting-stage deliverable developed in coordination with the regulatory agency once detailed building programs and fixture counts are established.

The facility is anticipated to serve more than 100 patients per day across its clinical and behavioral health wings. Based on DOH guidance for outpatient medical facilities of this scale, the project is anticipated to generate wastewater at more than 1,000 gallons per day (gpd), mandating compliance with DOH regulations for a Wastewater Treatment Works (WWTW) providing secondary treatment under Hawaiʻi Administrative Rules (HAR) Chapter 11-62. Precise flow calculations will be developed and submitted to DOH as part of the WWTW permit application during the engineering and permitting phase, prior to construction.

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Proposed Package Wastewater Treatment Works

The project will utilize a package Wastewater Treatment Works (WWTW) providing secondary treatment of all wastewater generated on-site. A package WWTW is a self-contained, factory-built treatment unit that integrates all biological treatment processes in a compact system, making it well-suited for commercial and institutional facilities that exceed the capacity of conventional septic systems but are not connected to a municipal sewer. Acceptable secondary treatment technologies include Activated Sludge, Sequential Batch Reactor (SBR), Fixed Bed Biofilm Reactor (FBBR), Moving Bed Biofilm Reactor (MBBR), Membrane Bioreactor (MBR), or other advanced methods ensuring effluent quality meeting DOH's Chapter 11-62 standards. The specific package unit will be selected during the engineering design phase in coordination with DOH to ensure compliance with all applicable standards for a facility of this type and size.

No Injection Wells — Treated Effluent Infiltrated via Leach Fields

No deep or shallow injection wells will be used for wastewater disposal. Treated secondary effluent from the package WWTW will be disposed of underground via a properly sized absorption bed (leach field) or other type of drain field, designed and permitted in accordance with DOH Chapter 11-62 requirements. DOH requires a 100% backup absorption system to ensure redundancy. Because the soils in the Puna District can exhibit fast percolation rates, soil replacement below the absorption beds may be evaluated during engineering design; however, the soil replacement requirement may be waived by DOH when the disposal system receives WWTW secondary effluent rather than raw septic effluent.

The FEA notes (Section 3.1.4) that the subject property lies above the Underground Injection Control (UIC) line established by DOH to protect groundwater resources with drinking water potential — the zone where the Hilo Aquifer, which supplies most municipal water on the Island, is recharged. The UIC permit requirement referenced in the FEA applies to any stormwater drywells that may be used for drainage management. Because no injection wells are proposed for wastewater disposal, the wastewater system is not subject to UIC permitting requirements. The leach field system will be engineered and permitted by DOH to ensure that secondary-treated effluent meets all applicable standards before infiltrating the soil, providing a protective barrier for underlying groundwater resources.

Medical and Clinical Wastewater

Clinical operations at the Keaʻau Benioff Medical Center will generate wastewater typical of an outpatient medical facility, including sanitary waste, hand-washing drainage, imaging-related drainage, and laboratory sinks. The facility is an outpatient clinic — not a hospital or inpatient facility — and is not anticipated to generate high-strength or hazardous medical wastewater beyond what is typical of an outpatient setting. The proposed package WWTW is designed to handle the full wastewater stream from the facility. Hazardous waste and regulated medical waste generated by clinical operations (sharps, biohazardous materials) are managed through separate solid waste and hazardous materials handling protocols consistent with DOH and EPA regulations, and do not enter the wastewater treatment system. No additional DOH review beyond the standard WWTW permit process is anticipated for the wastewater stream from this outpatient facility.

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Maintenance and Monitoring
Package WWTW systems of the type proposed are subject to ongoing operation, maintenance, and monitoring requirements under DOH Chapter 11-62. These requirements include: regular inspection and servicing of all mechanical components (pumps, blowers, treatment media, instrumentation) by a licensed O&M contractor; periodic sampling and laboratory analysis of treated effluent to confirm compliance with secondary treatment standards for BOD, TSS, and other parameters specified in the DOH permit; recordkeeping and periodic reporting to DOH; and immediate notification to DOH in the event of system malfunction, effluent permit exceedance, or other abnormal conditions. A licensed individual wastewater system operator will be retained for the operational life of the facility, consistent with DOH licensing requirements. The leach field system will also be periodically inspected to ensure proper function and drainage. These maintenance and monitoring commitments are reflected in the FEA as mitigating measures for Section 3.3.3.2 (Wastewater) and will be incorporated as conditions of the DOH WWTW permit.

2. Alternatives Analysis
PRP requested that the FEA provide additional explanation regarding alternatives considered during project planning, including whether alternative locations within already-developed areas were evaluated, whether expansion of existing medical facilities was considered, and the criteria used to select the proposed site over other potential locations. The FEA addresses alternatives at Part 2 (Alternatives), and this response supplements that discussion.

The fundamental purpose of the Keaʻau Outpatient Center is to bring primary care, specialty care, urgent care, imaging, laboratory, and behavioral health services directly to the Puna District, substantially reducing the burden on HBMC in Hilo and the long travel distances currently faced by Puna's approximately 50,000 residents. Expansion of existing HBMC facilities at the Hilo campus was evaluated and determined not to address this objective, as doing so would not meaningfully improve healthcare access for Puna residents. A new facility located in Keaʻau — near the geographic center of the Puna District's population — is the appropriate means to achieve the project's community healthcare goals.

During early planning phases, HBMC evaluated alternative locations for the facility in the Keaʻau area, including commercially and agriculturally zoned parcels. The W.H. Shipman property was selected as the preferred site based on the following criteria: (1) central location within the Keaʻau commercial node, at the intersection of Route 11 (Hawaiʻi Belt Road) and the Keaʻau-Pāhoa Road corridor, providing convenient access from throughout Puna; (2) sufficient parcel size — 108.8 acres total, with the 20-acre project footprint accommodating the full facility buildout, required parking, the on-site WWTW, and associated infrastructure without requiring land assemblage or consolidation of multiple smaller parcels; (3) confirmed availability of county water supply (per Department of Water Supply consultation) and electrical service (HELCO), and the feasibility of an on-site WWTW given site size and soil conditions; and (4) the absence of significant environmental or other factors at the site that would render the proposed use unsuitable, as confirmed by the biotic survey, archaeological studies, and other technical analyses prepared for the FEA.

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Alternative sites examined during planning were constrained by smaller parcel sizes, more complex access configurations, proximity to existing residences, limited utility availability, or development costs and zoning conditions that would compromise the project's feasibility or introduce greater environmental impacts. The selected site is already in active agricultural use and previously cleared, contains no significant sensitive ecological resources, and does not pose the development challenges presented by other candidate locations. No alternative sites were identified that offered superior environmental outcomes while meeting the project's program requirements for size, access, utilities, and proximity to Puna residents. The FEA's Section 2.1 (Alternate Location) reflects this evaluation and the determination that no alternative sites warrant further comparative study within the EA process.

3. *Cumulative and Secondary Impacts*

PRP requested additional discussion regarding cumulative and secondary impacts, including foreseeable development on adjacent portions of the Shipman property, cumulative traffic impacts in the Keaʻau area, long-term infrastructure demands related to population growth, and potential future expansion of medical facilities. The FEA addresses secondary and cumulative impacts at Section 3.4 (Secondary and Cumulative Impacts), and this response provides additional context.

The Keaʻau Village Master Plan, which covers additional portions of the W.H. Shipman property adjacent to the project site, was projected to develop in three phases over approximately 2023–2038 and would ultimately include 590 single-family homes, 350 multi-family homes, 220,408 square feet of commercial space, 43,600 square feet of office space, and 100 hotel rooms. However, as noted in the FEA, construction of the master plan is currently on pause due to infrastructure costs, and the timing of any future phases remains uncertain. Because the master plan's phasing is speculative, the Traffic Impact Analysis Report (TIAR) prepared for this project incorporated a 2.12% annual background traffic growth rate that conservatively accounts for area-wide growth, including any foreseeable development on surrounding Shipman parcels. The TIAR concludes that even with projected background growth, the roadway network in the Keaʻau area can accommodate anticipated traffic volumes without significant adverse effects.

The Keaʻau Mountain View Public Library, proposed northeast of the Route 11/139 intersection, is anticipated to be completed by 2027 and was specifically incorporated into the TIAR traffic projections. The TIAR's analysis confirms that even accounting for the library and background growth, total traffic remains within the capacity of the roadway network without significant effects.

With respect to long-term infrastructure demands, the proposed Keaʻau Outpatient Center is itself a direct response to population growth — it is being developed specifically to address an existing and growing deficit in healthcare access for Puna's rapidly growing community. The facility's infrastructure, including the on-site package WWTW, water service lateral, parking, and access driveway, are sized for the proposed 20-acre medical facility. Infrastructure for the project is self-contained and does not rely on public wastewater or sewer systems. In this respect, the project's cumulative effect on public infrastructure is limited and largely beneficial: it absorbs healthcare demand that would otherwise be borne by HBMC in Hilo and reduces the cumulative impact of population growth on the existing Hilo medical campus.

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Regarding future expansion of the medical facility, no expansion beyond the current 20-acre project footprint is proposed or evaluated in the FEA. Any future expansion of the facility would be a separate action subject to its own environmental review and permitting under HEPA and applicable county and state regulations. As the FEA concludes, nearly all long-term impacts from the proposed project are negligible, with no meaningful effects on ecosystems or protected species, water quality, historic properties, noise, air quality, or other environmental measures.

We trust that the above responses address the concerns raised by PRP and that the Final Environmental Assessment adequately evaluates the potential environmental impacts associated with the proposed Keaʻau Outpatient Center. We remain committed to a thorough and transparent environmental review process and welcome further engagement. Please do not hesitate to contact us directly with any additional questions or to arrange a meeting at your convenience.

Sincerely,

John Pipan
Planning Administrator
Land Planning Hawaiʻi LLC

OHA Comment Re: DEA for Hilo Benioff Medical Center

Kamakana Ferreira < kamakanaf@oha.org >

Wed, 11 Mar 2026 10:27:17 AM -1000

To "john@landplanninghawaii.com" <john@landplanninghawaii.com>,"info@landplanninghawaii.com" <info@landplanninghawaii.com>

Cc "kwilson@hhsc.org"<kwilson@hhsc.org>

Aloha,

The Office of Hawaiian Affairs (OHA) is in receipt of your letter dated February 20, 2026, inviting comment on the draft environmental assessment (DEA) for the Hilo Benioff Medical Center project in Kea'au. Land Planning Hawaii LLC has prepared this DEA on behalf of Hilo Benioff Medical Center per Hawaii Revised Statutes (HRS) 343. The proposed property is 108.8 acres and the site will take up a 20-acre portion of the parcel zoned for ag (A-20a). The clinic (a single story medical office building with a clinical wing and behavioral health wing, totaling 40,000 sq ft) will be 13 acres of the 20 acre parcel. A new driveway will be built.

DEA claims that while an archaeological inventory survey (AIS) wasn't done, they believe its highly unlikely any resources exist as the site has already been cleared and previously used for sugarcane production. Minimally, we recommend completion of an archaeological literature review and field inspection (ALRFI) and consultation with the State Historic Preservation Division (SHPD) to see if there are any historic or archaeological resources around the project area.

For cultural resources, the DEA says that its unknown if the subject property or surrounding area was used for gathering practices. As such, the DEA concludes its unlikely that such practices would exist today. Currently, its unclear if any type of community outreach specific to cultural resources occurred. Guidelines for assessing cultural impacts are provided by the Office of Environmental Quality Control (OEQC) in the *Guide to Implementation and Practice of the Hawaii Environmental Policy Act*, Exhibit 1-1, 2012 Edition. The process should involve an attempt to consult with community and cultural practitioners to ascertain ethnographic information on cultural resources and practices that occur on the site or in the broader area. As the DEA fails to mention any type of outreach specific to cultural related consultation, it is unclear if the project will effect cultural practices occurring nearby. We thus encourage the applicant to complete some level of cultural outreach for this particular project and to document their findings on possible impacts to cultural resources or practices.

Mahalo for the opportunity to comment. We look forward to seeing our comments taken into consideration. Please let me know if you have any questions.

Mahalo,

Kamakana C. Ferreira
Compliance Archaeologist
Office of Hawaiian Affairs
560 N. Nimitz Hwy
Honolulu, Hi. 96817

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April 29, 2026

Kamakana C. Ferreira
Compliance Archaeologist
Office of Hawaiian Affairs
560 N. Nimitz Hwy
Honolulu, HI 96817

Subject:	**Response to OHA Comments on the Draft Environmental Assessment — Hilo Benioff Medical Center Keaʻau Outpatient Center**
RE:	**Keaʻau Benioff Medical Center — Hilo Benioff Medical Center (HBMC) New Location**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Mr. Ferreira,

Mahalo for your review of the Draft Environmental Assessment (DEA) for the proposed Hilo Benioff Medical Center (HBMC) Keaʻau Outpatient Center and for the comments submitted by the Office of Hawaiian Affairs (OHA) on March 11, 2026. Land Planning Hawaiʻi LLC, on behalf of HBMC, has carefully reviewed OHAʻs comments and welcomes the opportunity to respond. OHAʻs two comment topics — archaeological resources and cultural resources/community outreach — have each been addressed in the Final Environmental Assessment (FEA), as summarized below.

1. Archaeological Resources

OHA recommends completion of an Archaeological Literature Review and Field Inspection (ALRFI) and consultation with the State Historic Preservation Division (SHPD) to identify any historic or archaeological resources in and around the project area. The FEA addresses archaeological resources at Section 3.2.4 (Cultural and Historic Resources) and documents a substantial body of prior archaeological work completed for the subject property and the broader W.H. Shipman landholding, all accepted by SHPD.

Prior Archaeological Studies

Multiple archaeological studies have been completed for the subject property and surrounding lands. These studies collectively satisfy the concerns raised by OHA regarding the absence of an AIS in the DEA.

Rechtman Consulting, LLC conducted an Archaeological Assessment of an approximately 112-acre portion of TMKs (3) 1-6-003:007 and (3) 1-6-146:017 in September 2004 (FEA Appendix F). That assessment encompassed the entirety of the subject 20-acre project area and produced no evidence of early historic or traditional Hawaiian remains. The assessed area was confirmed to consist primarily of fallow sugarcane fields, and the small, seemingly uncultivated portion of

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the assessed area was intensively surveyed and contained no cultural remains. The assessment recommended that no further archaeological work need be conducted prior to development. SHPD accepted the findings of this report on February 16, 2005.

Scientific Consultant Services (SCS) subsequently conducted an Archaeological Inventory Survey (AIS) of approximately 254.1 acres of the broader W.H. Shipman property in Keaʿau, which encompasses and surrounds the project site. Fieldwork was conducted between January and December 2016, and the AIS was submitted to SHPD in May 2017. The survey was conducted in accordance with Hawaiʻi Administrative Rules 13-284 and the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports (HAR 13-276). SHPD accepted the findings and recommendations of the AIS in a letter dated February 12, 2018. An earlier SCS field investigation in July 2014 covering adjacent Shipman property was also accepted by SHPD on September 4, 2014, with SHPD concurring that no historic properties would be affected within that surveyed area.

Collectively, the AIS identified three surface historic properties within the broader Shipman Master Plan Area, all associated with historic-era plantation activities from the early 1900s to 1950s: Site TS-001 (plantation dwellings and garden features of Luna Row) and Site TS-002 (a rock wall enclosing the former plantation doctorʿs house lot). Thirteen historic-era sugarcane features were also documented. No pre-Contact archaeological sites were identified within any portion of the surveyed Shipman property, and SHPD concurred that no further work was necessary for the areas encompassing the subject project site. These sites are not within or adjacent to the project area.

The subject project areaʿs uninterrupted history of commercial sugarcane cultivation and repeated clearing renders it highly unlikely that pre-Contact or historic archaeological resources remain within the 20-acre project footprint. Aerial imagery from 1965 through the present, presented in Figures 9 and 10 of the FEA, confirms the extent and continuity of this agricultural disturbance. Based on the foregoing, and consistent with SHPDʿs prior concurrences, no additional ALRFI or AIS is required for the subject project area prior to development.

Inadvertent Discovery Provision

Notwithstanding the thorough prior archaeological coverage, the FEA includes a standard inadvertent discovery provision as a mitigating measure: should any undocumented archaeological or cultural resources — including artifacts, shells, bones, midden deposits, charcoal deposits, lava tubes, stone platforms, pavings, or rock walls — be encountered during grading or construction, all work in the immediate vicinity of the find will cease and SHPD will be contacted to determine the significance of the find and to approve an acceptable mitigation plan as needed. If human burials are encountered, they will be treated in accordance with the specific provisions of Chapter 6E, HRS.

2. Cultural Resources and Community Outreach

OHA notes that the DEA does not describe community outreach specific to cultural resources and encourages the applicant to conduct cultural outreach and document findings regarding

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possible impacts to cultural resources or practices, consistent with the OEQCʿs guidance in the Guide to Implementation and Practice of the Hawaii Environmental Policy Act and the Hawaiʻi Supreme Courtʿs PASH and Ka Paʿakai O Ka ʻAina decisions. The FEA addresses these concerns at Section 3.2.4 and documents both a Cultural Impact Assessment and additional outreach efforts undertaken in direct response to OHAʿs DEA comments.

Cultural Impact Assessment

PBR HAWAII prepared a Cultural Impact Assessment (CIA) for the Keaʿau Village Master Plan, which covers the W.H. Shipman property that encompasses the subject project site. As the project site is located within the same Keaʿau Ahupuaʿa and on the same landholding studied in the CIA, the findings and conclusions of the CIA are directly applicable. The CIA provides detailed information on the cultural and historical context of the Keaʿau Ahupuaʿa, prior archaeological work, and summaries of community consultations and ’talk storyʽ interviews with individuals knowledgeable about cultural resources and practices in the area. A review of these consultations did not reveal or identify cultural resources or practices that may be adversely affected by development within the project area. The subject project site, given its long history of commercial sugarcane cultivation and repeated clearing, does not appear to contain the native plant resources typically associated with traditional Hawaiian gathering practices.

Additional Cultural Outreach for the FEA

In direct response to OHAʿs DEA comments, Land Planning Hawaiʻi LLC mailed additional consultation letters to the following organizations, each provided a 30-day period to respond:

- Association of Hawaiian Civic Clubs
- Cultural Resources Division of the Bernice Pauahi Bishop Museum
- The Department of Hawaiian Home Lands
- Hui Mālama I Nā Kupuna O Hawaiʻi Nei
- Ka Haka ʿUla O Keʿelikōlani — College of Hawaiian Language, UH Hilo

To date, no responses have been received from any of the above organizations. This outreach is documented in Section 1.5 (Public Involvement and Agency Coordination) and Appendix E of the FEA.

Consistency with PASH and Ka Paʿakai O Ka ʻAina

The FEA addresses the Hawaiʻi Supreme Courtʿs requirements under PASH and Ka Paʿakai O Ka ʻAina, which require decision-makers to: (1) identify cultural, historical, and natural resources and associated traditional and customary practices of the subject site; (2) assess the impacts of the proposed project on those resources and practices; and (3) identify feasible mitigating measures to protect such resources and practices. Based on the CIA, the AIS, and the Archaeological Assessment collectively, no significant adverse impacts to cultural resources,

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traditional practices, or gathering rights are anticipated from the proposed project. Archaeological studies conducted throughout the Keaʿau area since the 1990s have not found evidence of pre-Contact habitation or traditional resource use within the sugarcane cultivation areas of the Shipman property, and no cultural informants or community consultees identified practices that would be adversely impacted by the proposed development. These conclusions are documented in FEA Section 3.2.4.

We trust that the above responses address the concerns raised by OHA and that the Final Environmental Assessment adequately evaluates potential impacts to archaeological and cultural resources associated with the proposed Keaʿau Outpatient Center. We remain committed to a thorough and transparent environmental review process and welcome further engagement. Mahalo for the opportunity to respond, and please do not hesitate to contact us directly with any additional questions.

Sincerely,

John Pipan

Planning Administrator

Land Planning Hawaiʻi LLC

LAND PLANNING HAWAII LLC

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info@landplanninghawaii.com

March 24, 2026

President
Association of Hawaiian Civic Clubs
Hawaiian Civic Club of Puna
P.O. Box 1135
Honolulu, Hawaiʻi 96808

Subject:	**Cultural Resource Consultation – HEPA Environmental Assessment**
RE:	**Keaʻau Benioff Health Center**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear President,

Hilo Benioff Medical Center (HBMC) is writing to invite your organization's participation in the cultural resource consultation process for the proposed HBMC Keaʻau Benioff Health Center. HBMC proposes to develop an outpatient medical facility on a 20-acre portion of a 108.8-acre parcel located in the Keaʻau Ahupuaʻa, Puna District, Island of Hawaiʻi. The project area consists largely of former Olāʻa / Puna Sugar Company sugarcane lands that have been in agricultural use for several decades. A Draft Environmental Assessment (DEA) has been prepared pursuant to the Hawaiʻi Environmental Policy Act (HEPA), HRS Chapter 343.

HBMC is writing to the Puna Hawaiian Civic Club as a community organization representing Hawaiian interests across the Puna District — the moku within which the Keaʻau Ahupuaʻa is located. The Club's members include kūpuna and community leaders with generational ties to the Keaʻau area and knowledge of its traditional resources, cultural history, and contemporary Hawaiian community values.

We respectfully invite your organization's participation in the cultural resources consultation process as part of the Environmental Assessment review under HEPA, HRS Chapter 343. This process is also intended to satisfy the requirements of HRS Chapter 6E (State Historic Preservation Law), the Environmental Council's Guidelines for Assessing Cultural Impacts (1997), and the standards established by the Hawaiʻi Supreme Court in PASH and Ka Paʻakai O Ka ʻĀina.

Request for Information

We respectfully request any information your organization can share regarding the following:

- Traditional and customary Native Hawaiian cultural practices, land use patterns, and gathering rights associated with the Keaʻau Ahupuaʻa and the surrounding Puna District;
- Oral traditions, moʻolelo, place names, or traditional ecological knowledge pertaining to the project area or its vicinity;
- Known or suspected archaeological sites, heiau, burial sites, traditional cultural properties (TCPs), or other cultural resources in or near the project area;
- Any concerns regarding ground-disturbing construction activities within the Keaʻau Ahupuaʻa;

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We invite the Club's members and officers to share any knowledge of traditional cultural resources, practices, oral histories, or cultural associations with the Keaʻau Ahupuaʻa and the former Olāʻa Sugar lands. We also welcome the Club's perspective on how HBMC can most respectfully and meaningfully engage the Puna Hawaiian community throughout the project planning and Environmental Assessment process.

Response Requested

We respectfully request a written response within thirty (30) calendar days from the date of this letter. If your organization would prefer to meet in person or by telephone, we welcome that opportunity. HBMC will ensure that information gathered through this consultation is respectfully documented and incorporated into the final Environmental Assessment.

HBMC is committed to being a respectful and responsible member of the Keaʻau community and looks forward to the Puna Hawaiian Civic Club's input.

Sincerely,

John Pipan
Planning Administrator

LAND PLANNING HAWAII LLC

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(808) 333-3393
info@landplanninghawaii.com

March 24, 2026

Cultural Resources Division
Bernice Pauahi Bishop Museum
1525 Bernice Street
Honolulu, Hawaiʻi 96817

Subject: **Cultural Resource Consultation – HEPA Environmental Assessment**
RE: **Keaʻau Benioff Health Center**
Applicant: **Hilo Benioff Medical Center (HBMC)**
Location: **Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Cultural Resources Division,

Hilo Benioff Medical Center (HBMC) is writing to invite your organization's participation in the cultural resource consultation process for the proposed HBMC Keaʻau Benioff Health Center. HBMC proposes to develop an outpatient medical facility on a 20-acre portion of a 108.8-acre parcel located in the Keaʻau Ahupuaʻa, Puna District, Island of Hawaiʻi. The project area consists largely of former Olāʻa / Puna Sugar Company sugarcane lands that have been in agricultural use for several decades. A Draft Environmental Assessment (DEA) has been prepared pursuant to the Hawaiʻi Environmental Policy Act (HEPA), HRS Chapter 343.

HBMC is writing to the Bernice Pauahi Bishop Museum in recognition of the Museum's unparalleled collections of archaeological, historical, and cultural materials relating to the Puna District and the Island of Hawaiʻi. The Museum's libraries, archives, and cultural collections — including records of the Olāʻa / Puna Sugar Company era and pre-contact land use in the Keaʻau Ahupuaʻa — represent a critical resource for the review of potential cultural impacts of the proposed project.

We respectfully invite your organization's participation in the cultural resources consultation process as part of the Environmental Assessment review under HEPA, HRS Chapter 343. This process is also intended to satisfy the requirements of HRS Chapter 6E (State Historic Preservation Law), the Environmental Council's Guidelines for Assessing Cultural Impacts (1997), and the standards established by the Hawaiʻi Supreme Court in PASH and Ka Paʻakai O Ka ʻĀina.

Request for Information

We respectfully request any information your organization can share regarding the following:

- Traditional and customary Native Hawaiian cultural practices, land use patterns, and gathering rights associated with the Keaʻau Ahupuaʻa and the surrounding Puna District;
- Oral traditions, moʻolelo, place names, or traditional ecological knowledge pertaining to the project area or its vicinity;
- Known or suspected archaeological sites, heiau, burial sites, traditional cultural properties (TCPs), or other cultural resources in or near the project area;
- Any concerns regarding ground-disturbing construction activities within the Keaʻau Ahupuaʻa;

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We respectfully request the Museum's assistance in identifying any archival materials, archaeological site records, historic maps, oral history collections, or published reports relating to the Keaʻau Ahupuaʻa and the former Olāʻa Sugar lands. We also welcome the Museum's comment on any aspects of the project's potential effects on cultural resources in the Puna District. Copies of relevant materials, to the extent they can be shared, would be greatly appreciated.

Response Requested

We respectfully request a written response within thirty (30) calendar days from the date of this letter. If your organization would prefer to meet in person or by telephone, we welcome that opportunity. HBMC will ensure that information gathered through this consultation is respectfully documented and incorporated into the final Environmental Assessment.

HBMC values the Bishop Museum's scholarly resources and looks forward to benefiting from the Museum's expertise in this consultation.

Sincerely,

John Pipan
Planning Administrator

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info@landplanninghawaii.com

March 24, 2026

Mr. Kali Watson
Chairman
Department of Hawaiian Home Lands
91-5420 Kapolei Parkway
Kapolei, Hawaiʻi 96707

Subject:	**Cultural Resource Consultation – HEPA Environmental Assessment**
RE:	**Keaʻau Benioff Health Center**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Mr. Watson,

Hilo Benioff Medical Center (HBMC) is writing to invite your organization's participation in the cultural resource consultation process for the proposed HBMC Keaʻau Benioff Health Center. HBMC proposes to develop an outpatient medical facility on a 20-acre portion of a 108.8-acre parcel located in the Keaʻau Ahupuaʻa, Puna District, Island of Hawaiʻi. The project area consists largely of former Olāʻa / Puna Sugar Company sugarcane lands that have been in agricultural use for several decades. A Draft Environmental Assessment (DEA) has been prepared pursuant to the Hawaiʻi Environmental Policy Act (HEPA), HRS Chapter 343.

HBMC is writing to the Department of Hawaiian Home Lands (DHHL) in recognition of the Department's significant landholdings in the Puna District and its mandate to benefit Native Hawaiian beneficiaries. DHHL's presence in the Keaʻau area and its knowledge of Native Hawaiian land tenure, community needs, and cultural resources in the Puna District make the Department an important consulting party for this project. HBMC is respectful of DHHL's kuleana and seeks to ensure that the proposed facility does not adversely affect DHHL beneficiaries or their cultural resources.

We respectfully invite your organization's participation in the cultural resources consultation process as part of the Environmental Assessment review under HEPA, HRS Chapter 343. This process is also intended to satisfy the requirements of HRS Chapter 6E (State Historic Preservation Law), the Environmental Council's Guidelines for Assessing Cultural Impacts (1997), and the standards established by the Hawaiʻi Supreme Court in PASH and Ka Paʻakai O Ka ʻĀina.

Request for Information

We respectfully request any information your organization can share regarding the following:

- Traditional and customary Native Hawaiian cultural practices, land use patterns, and gathering rights associated with the Keaʻau Ahupuaʻa and the surrounding Puna District;
- Oral traditions, moʻolelo, place names, or traditional ecological knowledge pertaining to the project area or its vicinity;
- Known or suspected archaeological sites, heiau, burial sites, traditional cultural properties (TCPs), or other cultural resources in or near the project area;

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- Any concerns regarding ground-disturbing construction activities within the Keaʻau Ahupuaʻa;

We respectfully request DHHL's review of the project description and site location and any information the Department can provide regarding: (a) cultural or archaeological resources on or adjacent to the project site within DHHL's planning records; (b) any DHHL beneficiary families or homestead communities in the Keaʻau area that should be directly consulted; and (c) DHHL's assessment of whether the proposed project may affect access to or the exercise of customary or traditional practices by DHHL beneficiaries.

Response Requested

We respectfully request a written response within thirty (30) calendar days from the date of this letter. If your organization would prefer to meet in person or by telephone, we welcome that opportunity. HBMC will ensure that information gathered through this consultation is respectfully documented and incorporated into the final Environmental Assessment.

HBMC values DHHL's role as a trustee for Native Hawaiian land and looks forward to a collaborative consultation.

Sincerely,

John Pipan
Planning Administrator

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March 24, 2026

Executive Director
Hui Mālama I Nā Kupuna O Hawaiʻi Nei
P.O. Box 896
Honolulu, Hawaiʻi 96808

Subject:	**Cultural Resource Consultation – HEPA Environmental Assessment**
RE:	**Keaʻau Benioff Health Center**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Executive Director,

Hilo Benioff Medical Center (HBMC) is writing to invite your organization's participation in the cultural resource consultation process for the proposed HBMC Keaʻau Benioff Health Center. HBMC proposes to develop an outpatient medical facility on a 20-acre portion of a 108.8-acre parcel located in the Keaʻau Ahupuaʻa, Puna District, Island of Hawaiʻi. The project area consists largely of former Olāʻa / Puna Sugar Company sugarcane lands that have been in agricultural use for several decades. A Draft Environmental Assessment (DEA) has been prepared pursuant to the Hawaiʻi Environmental Policy Act (HEPA), HRS Chapter 343.

HBMC is writing to Hui Mālama I Nā Kupuna O Hawaiʻi Nei in recognition of the organization's kuleana for the care and protection of iwi kūpuna and burial sites throughout the Hawaiian Islands. The Keaʻau Ahupuaʻa, as a historically inhabited area with documented land tenure records dating to the Māhele of 1848, may contain burial sites or ancestral remains associated with the generations of Native Hawaiians who lived and worked the land in this ahupuaʻa. The Archaeological Literature Review and Field Inspection to be conducted for this project will address burial-related concerns, but HBMC wishes to ensure that Hui Mālama's guidance informs the scope of that work.

We respectfully invite your organization's participation in the cultural resources consultation process as part of the Environmental Assessment review under HEPA, HRS Chapter 343. This process is also intended to satisfy the requirements of HRS Chapter 6E (State Historic Preservation Law), the Environmental Council's Guidelines for Assessing Cultural Impacts (1997), and the standards established by the Hawaiʻi Supreme Court in PASH and Ka Paʻakai O Ka ʻĀina.

<u>Request for Information</u>

We respectfully request any information your organization can share regarding the following:

- Traditional and customary Native Hawaiian cultural practices, land use patterns, and gathering rights associated with the Keaʻau Ahupuaʻa and the surrounding Puna District;
- Oral traditions, moʻolelo, place names, or traditional ecological knowledge pertaining to the project area or its vicinity;
- Known or suspected archaeological sites, heiau, burial sites, traditional cultural properties (TCPs), or other cultural resources in or near the project area;

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- Any concerns regarding ground-disturbing construction activities within the Keaʻau Ahupuaʻa;

We request Hui Mālama's guidance regarding appropriate protocols for unanticipated burial discoveries during construction in the Keaʻau area, consistent with HRS §6E-43.5. We also welcome any information the organization may have regarding known burial locations or traditional burial practices within the Keaʻau Ahupuaʻa.

Response Requested

We respectfully request a written response within thirty (30) calendar days from the date of this letter. If your organization would prefer to meet in person or by telephone, we welcome that opportunity. HBMC will ensure that information gathered through this consultation is respectfully documented and incorporated into the final Environmental Assessment.

HBMC is committed to the respectful treatment of any burial sites that may be encountered and to full compliance with HRS §6E-43.5 and Hui Mālama's guidance.

Sincerely,

John Pipan
Planning Administrator

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March 24, 2026

Dean / Director
Ka Haka ʻUla O Keʻelikōlani — College of Hawaiian Language, UH Hilo
University of Hawaiʻi at Hilo
200 W. Kāwili Street, Hilo, Hawaiʻi 96720

Subject:	**Cultural Resource Consultation – HEPA Environmental Assessment**
RE:	**Keaʻau Benioff Health Center**
Applicant:	**Hilo Benioff Medical Center (HBMC)**
Location:	**Keaʻau, Puna, Hawaiʻi TMK (3) 1-6-003: 127 (por.), TMK (3) 1-6-003: 007 (por.)**

Dear Dean / Director,

Hilo Benioff Medical Center (HBMC) is writing to invite your organization's participation in the cultural resource consultation process for the proposed HBMC Keaʻau Benioff Health Center. HBMC proposes to develop an outpatient medical facility on a 20-acre portion of a 108.8-acre parcel located in the Keaʻau Ahupuaʻa, Puna District, Island of Hawaiʻi. The project area consists largely of former Olāʻa / Puna Sugar Company sugarcane lands that have been in agricultural use for several decades. A Draft Environmental Assessment (DEA) has been prepared pursuant to the Hawaiʻi Environmental Policy Act (HEPA), HRS Chapter 343.

HBMC is writing to Ka Haka ʻUla O Keʻelikōlani, the College of Hawaiian Language at UH Hilo, in recognition of the College's expertise in documenting and preserving oral traditions, place names, and traditional ecological and cultural knowledge for East Hawaiʻi. The College's faculty and students work with Hawaiian-language sources that may contain information about the Keaʻau Ahupuaʻa and its traditional cultural resources that is not available in English-language archives.

We respectfully invite your organization's participation in the cultural resources consultation process as part of the Environmental Assessment review under HEPA, HRS Chapter 343. This process is also intended to satisfy the requirements of HRS Chapter 6E (State Historic Preservation Law), the Environmental Council's Guidelines for Assessing Cultural Impacts (1997), and the standards established by the Hawaiʻi Supreme Court in PASH and Ka Paʻakai O Ka ʻĀina.

Request for Information

We respectfully request any information your organization can share regarding the following:

- Traditional and customary Native Hawaiian cultural practices, land use patterns, and gathering rights associated with the Keaʻau Ahupuaʻa and the surrounding Puna District;
- Oral traditions, moʻolelo, place names, or traditional ecological knowledge pertaining to the project area or its vicinity;
- Known or suspected archaeological sites, heiau, burial sites, traditional cultural properties (TCPs), or other cultural resources in or near the project area;
- Any concerns regarding ground-disturbing construction activities within the Keaʻau Ahupuaʻa;

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We respectfully request the College's assistance in identifying any Hawaiian-language documents, oral tradition collections, place name studies, or traditional ecological knowledge records pertaining to the Keaʻau Ahupuaʻa and the former Olāʻa Sugar lands. We also welcome recommendations for Hawaiian cultural practitioners or kūpuna in the Puna area who should be directly consulted.

Response Requested

We respectfully request a written response within thirty (30) calendar days from the date of this letter. If your organization would prefer to meet in person or by telephone, we welcome that opportunity. HBMC will ensure that information gathered through this consultation is respectfully documented and incorporated into the final Environmental Assessment.

HBMC values the unique expertise and resources of Ka Haka ʻUla O Keʻelikōlani and looks forward to learning from your institution's knowledge.

Sincerely,

John Pipan
Planning Administrator

APPENDIX F
ARCHAEOLOGICAL ASSESSMENT AND SHPD ACCEPTANCE LETTER

RC-0260

Archaeological Assessment of a 112 Acre Property

(TMK: 3-1-6-03:por. 07 and 3-1-6-146:17)

Kea‘au Ahupua‘a
Puna District
Island of Hawai‘i

PREPARED BY:

Michael Desilets, M.A.
and
Robert B. Rechtman, Ph.D

PREPARED FOR:

Dean Hirabayashi
A & B Properties, Inc.
822 Bishop Street
Honolulu, Hawai‘i 96813

September 2004

RECHTMAN CONSULTING, LLC
HC 1 Box 4149 Kea‘au, Hawai‘i 96749
phone: (808) 966-7636 toll-free fax: (800)406-2665
e-mail: bob@rechtmanconsulting.com
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

Archaeological Assessment of a 112 Acre Property
(TMK: 3-1-6-03:por. 07 and 3-1-6-146:17)

Kea‘au Ahupua‘a
Puna District
Island of Hawai‘i

RECHTMAN CONSULTING

EXECUTIVE SUMMARY

At the request of Dean Hirabayashi of A & B Properties, Inc., Rechtman Consulting, LLC performed an archaeological assessment survey of two parcels (TMK:3-1-6-003:por. 07 and 3-1-6-146:17) in Kea‘au Ahupua‘a, Puna District, Island of Hawai‘i. The purpose of this study was to document the presence of any historic properties that might exist within the 112-acre project area, assess the significance of any such resources, and provide a statement of impact to any such resources resulting from future development.

Fieldwork for the project area was conducted between July 14–16, 2004 under the supervision of Robert B. Rechtman, Ph.D. The property was surveyed using pedestrian transects with 15 meter spacing. Parallel transects were walked on a north/south bearing across the length of the project area. Vegetation was very dense and ground visibility was poor. Evidence of modern cultivation was observed during the survey and consisted of ‘dozer-push’ piles and abandoned field roads. These were interpreted as remnants of late twentieth century sugarcane cultivation.

Archaeological survey of the project area produced no evidence of early historic or traditional Hawaiian remains. The survey confirmed that most of the area consisted of fallow sugarcane and papaya fields. A small seemingly uncultivated portion of the project area was intensively surveyed and contained no cultural remains. As there were no significant cultural sites or deposits encountered within the study parcels, it is recommended that no further archaeological work need be conducted prior to development. However, in the unlikely event that historic properties are inadvertently discovered during construction activities, such activities should be immediately suspended in the vicinity of the discovery, and DLNR-SHPD notified as outlined in the Hawai‘i Administrative Rules 13§13-284.

Contents

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INTRODUCTION

At the request of Dean Hirabayashi of A & B Properties, Inc., Rechtman Consulting, LLC performed an archaeological assessment of two parcels (TMK:3-1-6-003:por. 07 and 3-1-6-146:17) in Keaʻau Ahupuaʻa, Puna District, Island of Hawaiʻi (Figure 1). The purpose of this study was to document the presence of any historic properties that might exist within the 112-acre project area, assess the significance of any such resources, and provide a statement of impact to any such resources resulting from future development.

This report is intended to fulfill the requirements of the County of Hawaiʻi Planning Department and the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) with respect to permit approvals for land-altering and development activities. The current project was undertaken in compliance with the historic preservation review process requirements of the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) as specified in Hawaiʻi Administrative Rules.13§13–284.

This report details the current project objectives and scope of work, field methods and procedures, and survey findings. A brief archaeological and historical background is provided, which forms the basis for a set of project expectations. Recommendations addressing future historic preservation concerns are offered.

PROJECT AREA DESCRIPTION

The current project area consists of two parcels covering a combined area of 112 acres immediately *mauka* of Highway 11 (Figure 2). The area is generally level with a slight slope to the northeast. Elevation ranges from 280 to 320 feet above mean sea level.

The larger parcel, TMK:3-1-6-003:por. 07, covers 109 acres and borders Highway 11 for approximately 870 meters. The parcel begins at W.H. Shipman Business Park and extends to the south. Vegetation in this area is very dense with tall grass dominating large expanses (Figure 3). Much of the area is also semi-wooded with moderate to dense understory. Mature stands of Moluccan albizia (*Falcataria moluccana*) are present. Most of the vegetation consists of fast growing, invasive species. This suggests that the area is in the early stages of forest development and has likely undergone large-scale disturbance in the recent past.

Also included in the larger parcel is a narrow east/west trending drainage containing a variety of palms, ferns, and large banyon trees (Figure 4). Sediment in the base of the drainage is a rich, moist, silt loam. On the drainage slopes, however, broken *pāhoehoe* constitutes the dominant surface material (Figure 5). This small drainage appears unmodified by historic era processes.

The smaller parcel, 3-1-6-146:17, covers 2.8 acres within W. H. Shipman Business Park (Figure 6). This lot has been entirely landscaped, filled, and leveled to facilitate use as an industrial staging area. Vegetation consists of only a few intrusive weeds and grasses. The ground surface consists of gravel and crushed cobbles with minimal interstitial silt loam.

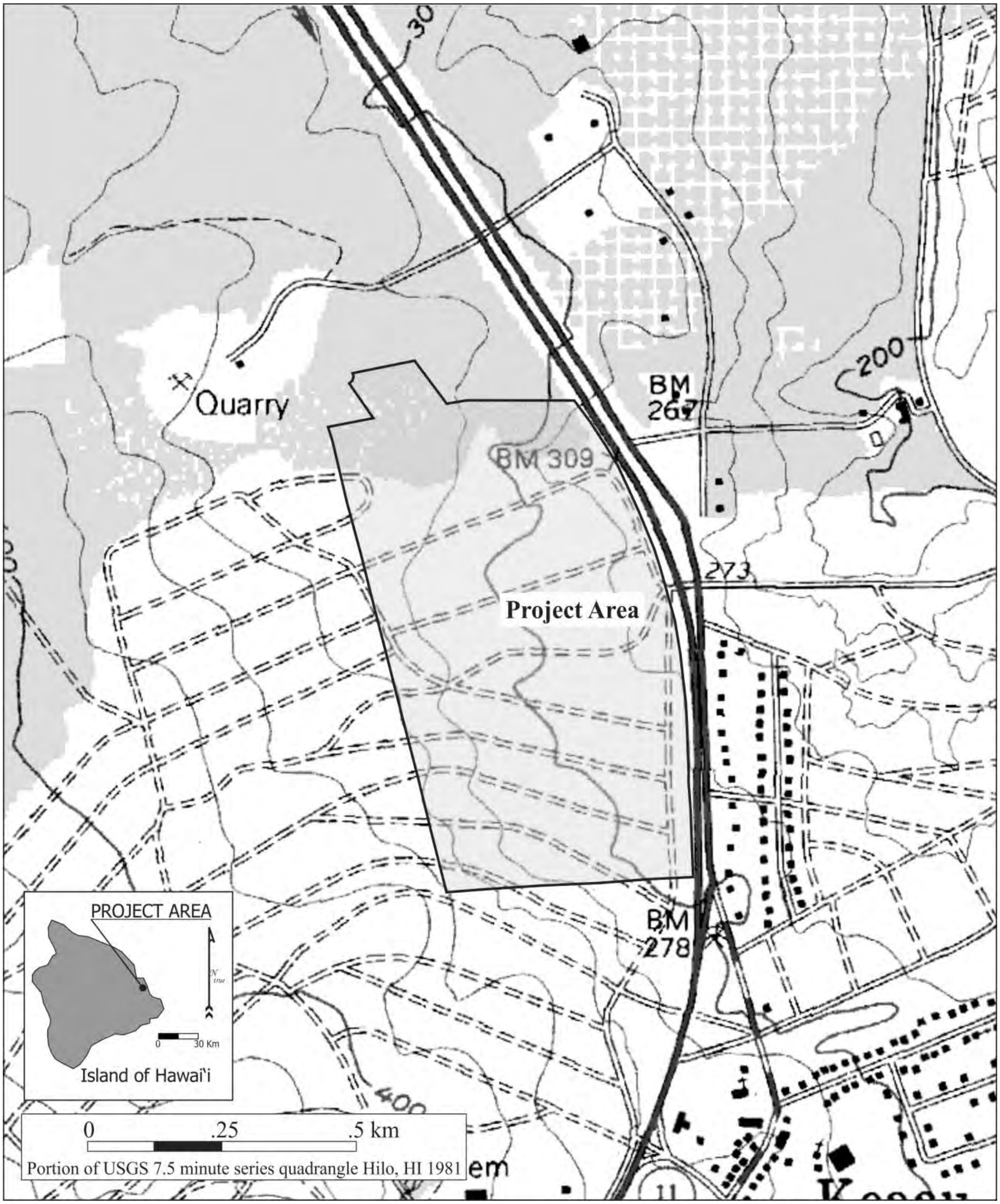

Figure 1. Project area location.

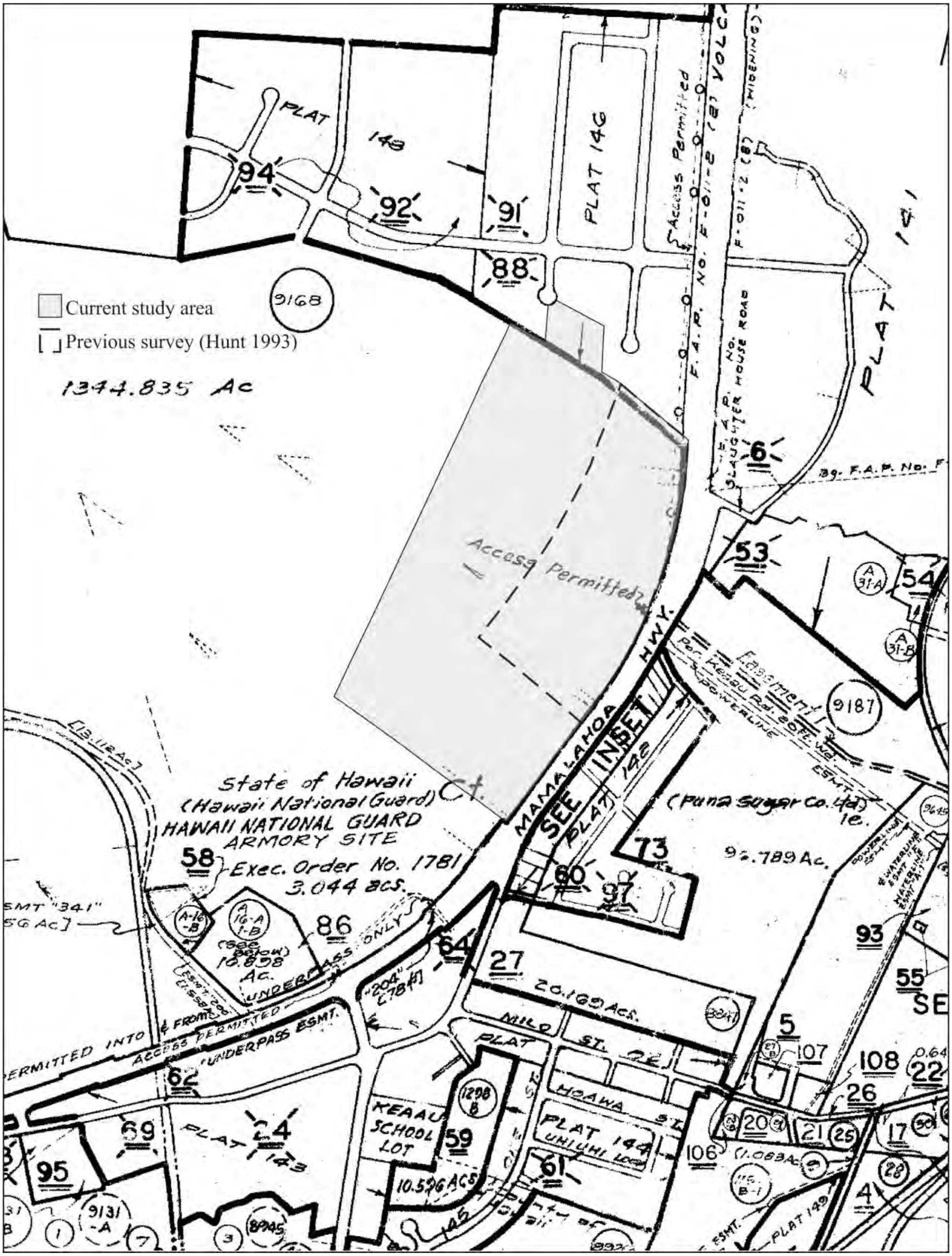

Figure 2. Portion of TMK: 3-1-6-03 showing project area within Parcel 7 and location of previous archaeological survey.

Figure 3. Large palms in base of drainage in the northern part of the project area.

Figure 4. Far northern portion of project area showing broken *pāhoehoe* and surrounding vegetation.

Figure 5. One of several large grassy expanses within the project area.

BACKGROUND STUDIES

This section of the report describes and synthesizes prior archaeological, cultural, and historical studies that are relevant to the current project area; and provides a brief culture-historical background of Puna District and Kea‘au Ahupua‘a specifically.

Puna District and Kea‘au Ahupua‘a

Kea‘au Ahupua‘a is a portion of the larger Puna District, one of six major districts on the island that remain intact today. This division of districts (and likely all of the smaller land divisions) extends back in time to at least A.D. 1475, in the time of the Chief Līloa; and were brought together under a single ruler when ‘Umi a Līloa (son of Līloa) came to power in about A.D. 1525 (Maly 1999). Barrère (1959) summarizes the Precontact geopolitics of the Puna District as follows:

> Puna, as a political unit, played an insignificant part in shaping the course of history of Hawaii Island. Unlike the other districts of Hawaii, no great family arose upon whose support one or another of the chiefs seeking power had to depend for his success. Puna lands were desirable, and were eagerly sought, but their control did not rest upon conquering Puna itself, but rather upon control of the adjacent districts, Kau and Hilo. (Barrère 1959:15)

The Puna District generally remained under the control of outside chiefs until the time of Kalani‘ōpu‘u’s reign. Shortly before his death in A.D. 1782, Kalani‘ōpu‘u’s dominion over Puna and portion of Ka‘ū was challenged by the Puna chief ‘Īmakakōloa. Kalani‘ōpu‘u resolved the unrest, but following his death the disposition of Puna once again became an issue until Kamehameha I successfully brought the entire island under his control in A.D 1793.

As a result of the *Māhele* of A.D 1848, most of Puna was retained as crown land. Research conducted by Kepā Maly shows that although Kea‘au *ahupua‘a* was well populated at the time, only two claims were awarded for these lands. Practically the entire *ahupua‘a* was awarded to prince William Lunalilo (Land Claim Award 8559-B, Parcel 16). A detailed description of subsequent land conveyances for Kea‘au can be found in Hurst’s background for the Kea‘au Bypass corridor (Hurst 1994). Essentially, most of the land were leased out for use as ranch land. By 1884 ownership had passed to William H. Shipman and ranching continued as the primary land use until at least 1895.

By the 1890s the government was investigating ways to improve access and resources in Puna. In A.D 1892 Loebenstein was directed to survey a new inland road (roughly in the location of the current Highway 130) through the district. In a newspaper interview, he describes the area as follows:

> The arable belt of Puna is from three to six miles from the sea coast, and is consequently unexplored. It is a wonderful country and I could talk of it by the hour. It only lies in the hands of the Government to develop it. Everything depends on an appropriation being made for the road, of which the preliminary survey has been made.
>
> . . . The road begins at the edge of the Ramie camp, one mile from the edge of the woods–nine miles from Hilo. It follows the old road for a mile and a half more, and is to extend to Kaimu on a new survey . . . I met with ancient trails showing traces of a dense population and cultivation in early times. The road, if opened, will afford beautiful scenery to tourists, as there are natural wonders all along, lava trees, pit craters and lava tunnels extending for miles which formed ancient burial places. There are natural benches formed by the lava, where the dead were placed, and on these are the bones, skulls and sometime complete skeletons. These tunnels are from 25 to 30 feet wide and about the same in height, and of course pitch dark . . . From the ninth to the nineteenth mile [the current study area is at about the ninth mile] the road is over *pahoehoe*, the arable land lying about a mile and a half above . . . There is considerable sandal wood growing on the *pahoehoe*, but the ranchers are too indolent to drive cattle, so they make fires and burn off the brush, which kills the sandal wood. It is a shame. There are no wild cattle in Puna . . . (Hawaiian Gazette, March 22, 1892)

In 1899 large tracts of land in Kea‘au were turned to new uses. Most of the richest land was leased by the Ola‘a Sugar Company. This land, including most of the current project area, remained in sugar cultivation until September of 1984.

Previous Archaeology

A number of archaeological studies have been performed in Kea‘au, five of which were conducted in inland areas comparable to the current study area (Table 1). The earliest of these (Rosendahl 1982) was for the 490 acre Shipman Industrial Park located immediately adjacent to the current study area. As a result of that study, Rosendahl reported that, “No archaeological sites or features of any kind were found wither within or immediately adjacent to the limits of the proposed industrial park.” (1982:3). In 1993, Hunt (1993) conducted a 600 acre survey of lands west of Kea‘au Town, which included a portion of the present project area (Figure 2). Hunt recorded a variety of features associated with sugarcane cultivation on property outside of the current study area. These included mounds, enclosures, alignments, walls, facings, and a terrace mound. No traditional Hawaiian sites were identified.

Hurst performed subsequent archaeological survey for the Kea‘au Bypass corridor (Hurst 1993). This survey produced only historic remains associated with former 81/2 Mile Camp. The corridor had apparently been heavily impacted by agricultural uses such as sugarcane, macadamia orchards, as well as recent residential development.

More recently, Walker et al. conducted archaeological and historical research at the 75-acre Kea‘au High School Site. About 50% of this area was surveyed. Survey was primarily conducted via automobile; however, an old railroad right of way was surveyed on foot. This right of way was identified as part of the former Hilo Railroad Company. Other than this historic find, no archaeological sites were recorded in the project area.

In 1999, a 30-acre parcel adjacent to the current project area was investigated (Rechtman 1999). This area was largely disturbed by sugarcane cultivation. A small, undisturbed area was intensively surveyed but also produced no cultural remains.

Recent archaeological investigation in and around the current project area demonstrates the highly impacted nature of the land surrounding Kea‘au Town. It appears that almost every available acre was under direct cultivation or was utilized for supporting infrastructure (worker’s housing, mills, etc.).

Table 1. Prior relevant archaeological and historical studies.

Author/Date	*Type of Study*	*Ahupua‘a*
Hunt/1993	Archaeological Survey	Kea‘au
Hurst/1994	Archaeological Survey	Kea‘au
Walker et al./1997	Archaeological Survey and Historical Research	Kea‘au
Rechtman/1999	Reconnaissance Survey	Kea‘au
Rosendahl/1992	Reconnaissance Survey	Kea‘au

Aerial Photographs

As part of the background research for this project, a series of aerial photographs of the project area were obtained (Figures 7, 8, and 9). The photos show the transition of the project area from fully cultivated land, to fallow land, to resumed limited cultivation as late as 1999. Figure 7 shows an outline of the project area superimposed on an aerial photograph taken in December 1975. The figure clearly shows the system of cane fields in operation at the time including the east-west trending field roads. The northern portion of the project area was still forested at the time and does not appear to have been impacted. By May of 1994 (Figure 8), the photo indicates: that the area was no longer under cultivation, that the W. H. Shipman Business Park was under construction, and that parcel TMK:3-1-6-146:17 was cleared. The area of darker vegetation at the northern end of parcel TMK:3-1-6-003:07 remained undeveloped between the old cane fields and the new industrial park. Four years later (Figure 9), large portions of the project area are again under cultivation, this time papaya was the chosen crop. In 2004, at the time of the current survey, the land was again fallow.

This series of photographs is very informational. Clearly a vast majority of the project area has been subject to repeated severe impact in the recent past through sugarcane and papaya cultivation and industrial development. The exception to this is a single narrow strip of land on the northern edge of the fields, bordering the W. H. Shipman Business Park (see Figure 7). This area does not appear to have sustained recent disturbance and likely has a higher chance of containing early historic or traditional Hawaiian cultural material.

Figure 7. Aerial photograph taken in 1975 showing project area outlined in white with undeveloped area (dashed line).

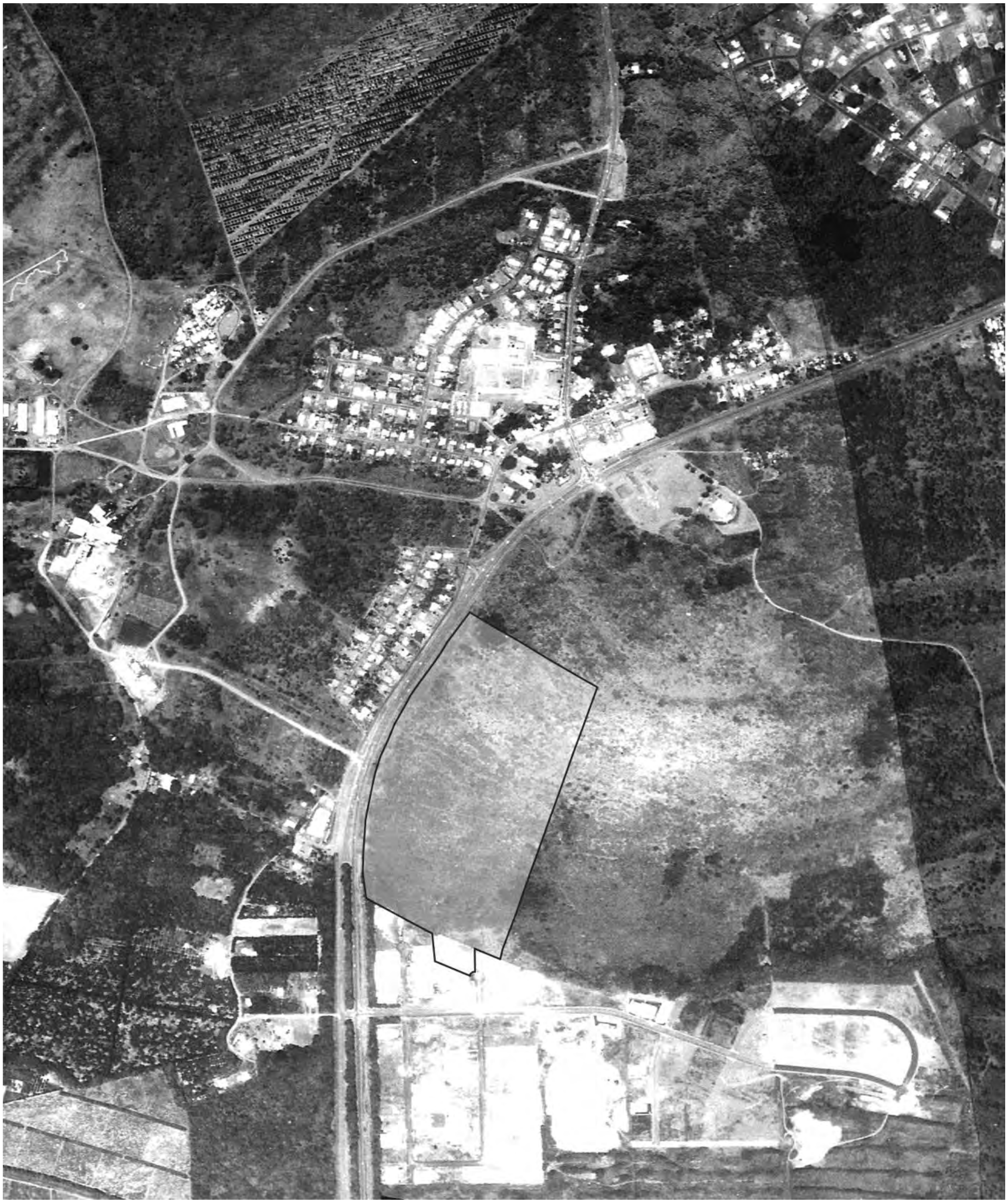

Figure 8. Aerial photograph taken in 1994 showing project area outlined in black.

Figure 9. Aerial photograph taken in 1999 showing project area outlined in white.

CURRENT PROJECT EXPECTATIONS

Based solely on elevation, the current project area falls within the Upland Agricultural Zone (Zone II) as defined by McEldowney (1979:49). This zone corresponds with the distribution of ash soils (Figure 10), which, although having an elevated theoretical probability of sites, were also commonly planted in sugarcane historically. The aerial photographs presented in the previous section clearly indicate that this was the case in the current project area. It is therefore expected that the majority of the project area will contain only features associated with late historic sugarcane cultivation. These features may include field roads, irrigation ditches, and stone piles. Given that the area was under almost complete cultivation as late as 1975 and under partial cultivation by 1994, most of the extant features are expected to be modern.

One small portion of the project area may not have been impacted by recent agricultural and industrial activities. This is the small strip of land between W. H. Shipman Business Park and the former cane fields shown in the aerial photographs (see Figure 7). This piece of land may possess qualities making it unsuitable for large-scale agricultural development. It is therefore expected that remnant historic or traditional Hawaiian cultural remains are most likely to be found in this region of the project area. According to the model developed by McEldowney, within this Upland Agricultural Zone,

> the possibilities of remnant agricultural complexes could be high on both ash and older aa or pahoehoe substrates that have not been disrupted by historic agricultural practices. (McEldowney 1979:19)

If present, remains may include agricultural features such as mounds, terracing, or walls as well as utilized lava tubes, trails, and trail markers. The 2.8 acre parcel in W. H. Shipman Business Park (TMK:3-1-6-146:17) was developed for industrial use by 1994 and was likely bulldozed, filled, and graded. No historic or traditional Hawaiian remains are expected on this parcel.

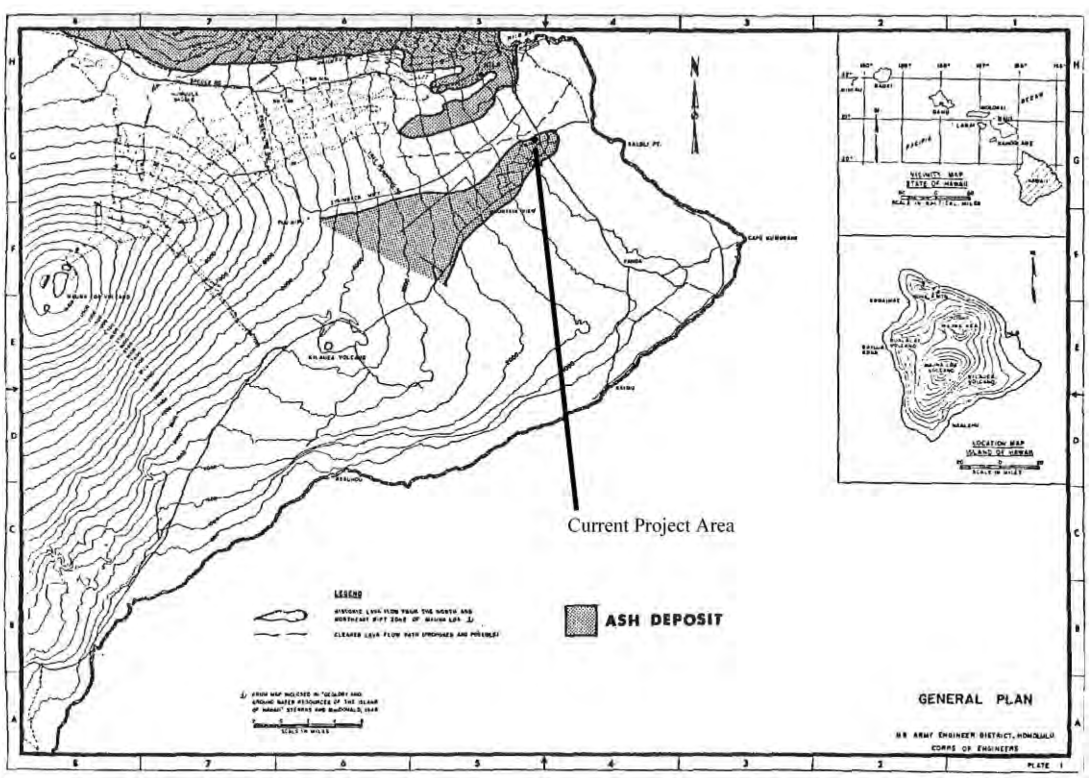

Figure 10. Map depicting locations of ash deposits corresponding to the Upland Agricultural Zone (adapted from McEldowney 1979:63).

FIELDWORK METHODS AND RESULTS

Archaeological survey of the project area was conducted on July 14, 15, and 16, 2004 by Christopher Hand, B.A., Thomas B. Jones, B.A., Michael Vitousek, and Michael Desilets, M.A., under the supervision of Robert B. Rechtman, Ph.D. The property was surveyed using pedestrian transects with 15 meter spacing. Parallel transects were walked on a north/south bearing across the length of the project area (TMK:3-1-6-003:por. 07). Vegetation in this area was very dense and ground visibility was poor. Evidence of cultivation was observed during much of the survey and consisted of ‘dozer-push’ piles and abandoned field roads. These were interpreted as remnants of late twentieth century sugarcane cultivation. No other cultural remains were observed.

Following completion of the north/south transects, an additional series of east/west (*mauka/makai*) transects were walked within the narrow drainage between W. H. Shipman Business Park and the former sugarcane fields (Figure 7). Based on the background information presented above, as well as field observation during initial transecting, this area was considered to have a relatively high probability for containing cultural remains. Intensive survey within this area confirmed that it had not been impacted by industrial and agricultural activities to the north and south. The additional survey effort, however, did not result in the identification of any early historic or traditional Hawaiian remains.

On the small parcel within Shipman Industrial Park (TMK:3-1-6-146:17), a systematic investigation was also conducted consisting of pedestrian transects with 15 meter spacing. There was almost no vegetation in this area and ground visibility was excellent. The parcel is currently used as a staging area for drilling equipment, and had been filled, leveled, and graded. No early historic or traditional Hawaiian remains were observed on this parcel.

CONCLUSIONS AND RECOMMENDATIONS

Archaeological survey of the 112 acre project area produced no evidence of early historic or traditional Hawaiian remains. The survey confirmed that most of the area consisted of fallow sugarcane fields. The small seemingly uncultivated portion of the project area was intensively surveyed and contained no cultural remains. As there were no significant cultural sites or deposits encountered within the study parcels, it is recommended that no further archaeological work need be conducted prior to development. However, in the unlikely event that historic properties are inadvertently discovered during construction activities, such activities should be immediately suspended in the vicinity of the discovery, and DLNR-SHPD notified as outlined in the Hawai‘i Administrative Rules 13§13-284.

REFERENCES CITED

Barrère, D.

1959 Political History of Puna. IN: Natural and Cultural History Report on the Kalapana Extension of the Hawai‘i Volcanoes National Park: Vol. I, pp. 15-65. Compiled by Emory, K.P., W.J. Bonk, Y.H. Sinoto, D.B. Barrere, Department of Anthropology, B.P. Bishop Museum, Honolulu.

Hunt, T.L.

1993 Archaeological Assessment of Shipman Lands in Kea‘au, Puna, Island of Hawai‘i. Prepared for W.H. Shipman Corporation.

Hurst, G., and A. Schilz

1994 Archaeological Survey of the Kea‘au-Pahoa Road, Keaau Town Section, Project No. 130B-01-92, Puna Hawai‘i (TMK:1-6-03). Ogden Environmental and Energy Services Co., Inc. Prepared for GK & Associates.

Maly, K.

1999 The Historic Puna Trail-old Government Road (Kea‘au Section): Archaival-Historical Documentary Research, Oral History and Consultation Study, and Limited Site Preservation Plan. Kumu Pono Associates report, prepared for Na Ala Hele Program, DOFAW, Hilo.

McEldowney, H.
1979 Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo, Hawaii. Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for U.S. Army Engineer Division, Pacific Ocean.

Rechtman, R
1999 Archaeological Field Inspection, 30 Acre Development Parcel (TMK: 3-1-6-03:por. 12). PHRI Letter Report 1942-032499. Prepared for W. H. Shipman, Ltd.

Rosendahl, M.
1982 Archaeological Reconnaissance Survey Proposed W. H. Shipman Industrial Park TMK: 3-1-6-03: por. 12. PHRI Report Ms. 75-112282. Prepared for Okahara, Shigeoka & Associates.

Spencer, C., N. Ishihara, and H. Hammatt
2017 [Draft] Cultural Impact Assessment for the Kea‘au Zero Waste Facility, Kea‘au Ahupua‘a, Puna District, Hawai‘i Island, TMKs: [3] 1-6-151:002 and portions of 003, 006, and 999. Cultural Surveys Hawai‘i, Inc. Job Code KEAAU 12. Prepared for The Limtiaco Consulting Group.

Walker, A.T., K. Maly, and P.H. Rosendahl
1997 Historical and Archaeological Research Proposed Kea‘au High School Site, Puna District, Island of Hawai‘i (TMK:1-6-03:Por.3,15,84). PHRI Report 1694-071697. Prepared for Group 70 International, Inc.

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

February 16, 2005

Robert Rechtman, Ph.D.
Rechtman Consulting Inc.
HC 1 Box 4149
Kea`au, Hawaii 96749

LOG NO: 2005.0061
DOC NO: 0501MM19

Dear Dr. Rechtman:

SUBJECT: Chapter 6E-42 Historic Preservation Review, "Archaeological Assessment Of a 112-Acre Property" (Desilits and Rechtman, September 2004)
Ahupua`a of Kea`au, Puna District, Hawaii Island
TMK: (3) 1-6-003: 007 (por) and 1-6-146:017

Thank you for your cover letter dated September 16, 2004 and a copy of the subject Archaeological Assessment Report for our review comments. The report, which was prepared for Dean Hirabayashi of A&B Properties, Inc., was received by our division on September 20, 2004.

The historical background information for the Puna district and Keaau *ahupua`a*, in which the 112-acre project area is located, is adequate to predict the types of historic properties that might be present and to evaluate their significance. Most of the project area is described as having been leased by the Ola`a Sugar Company after 1899, after a period in which cattle ranching dominated. Sugarcane cultivation continued until the end of the twentieth century.

Your review of five previous archaeological studies in the area indicates that only the remains of sugarcane cultivation activities and a railroad bed have been documented. Aerial photography in 1975, 1994, and 1999 further documents extensive disturbance due to intensive agriculture and industrial development. Although pre-Contact agricultural complexes are possible on undisturbed surfaces at this elevation in ash soils, no historic or traditional Hawaiian remains were expected.

We believe with the survey methodology described, the field survey was more than adequate to locate any surviving surface features. No historic properties were identified in the survey.

We agree with your recommendation that no further archaeological work is necessary and consider the report adequate to fulfill the requirements of HAR 13 §13-276.

If you have any questions about this review, please contact MaryAnne Maigret in our Hawaii Island office at (808) 327-3690.

Aloha,

Melanie A. Chinen, Administrator
State Historic Preservation Division

MM:jen

c: Dean Hirabayashi, A&B Properties, Inc., 822 Bishop Street, Honolulu Hawaii, 96813
Christopher Yuen, Hawaii County Planning Department

FEB 23 2005

APPENDIX G
STATUS REPORT ON COMPLIANCE WITH THE CONDITIONS OF STATE LAND USE BOUNDARY AMENDMENT 884

RECEIVED
07/01/2025
2:35 pm
STATE OF HAWAII
LAND USE COMMISSION

2025
STATUS OF THE PROJECT

PROGRESS IN COMPLYING WITH LUC CONDITIONS OF THE DECISION AND ORDER

1. "The developer and/or landowner of the Property shall fund and construct adequate civil defense measures as determined by the County and State Civil Defense agencies."

   W.H. Shipman, Limited (WHS) Response: In a letter dated September 24, 2004, the County Civil Defense Agency confirmed to WHS that approved shelter facilities have been established at Kea`au Elementary School and Kea`au High School. To the extent that additional civil defense measures may be required in the future, WHS will continue to work with Civil Defense agencies.

2. "The developer and/or landowner of the Property shall contribute to the development, funding and/or construction of school facilities, on a pro-rata basis, as determined by and to the satisfaction of the Department of Education (DOE). Agreement by DOE on the level of funding and participation shall be obtained prior to the developer and/or landowner applying for County zoning or prior to the developer and/or landowner applying for County building permits if County rezoning is not required."

   WHS Response: This condition has been satisfied. On September 27, 2004, the Department of Education confirmed to the LUC that this condition had been satisfied by the donation of 15.399 acres for the construction of the Kea`au Elementary School, which has been completed.

3. "The developer and/or landowner of the Property shall participate in the funding and construction of adequate wastewater transmission and disposal facilities, on a pro-rata basis, as determined by the State Department of Health and the County Department of Public Works."

   WHS Response: The developer and/or landowner of the Property will abide by this condition.

4. "The developer and/or landowner of the Property shall provide affordable housing opportunities for low, low-moderate, and gap group income residents of the State of Hawaii to the satisfaction of the State Housing and Finance Development Corporation (HFDC) in accordance with the Affordable Housing Guidelines, adopted by the Housing and Finance Development Corporation, effective July 1, 1992, as periodically amended. The location and distribution of the affordable housing or other provisions for affordable housing shall be under such terms as may be mutually agreeable between the developer and/or landowner of the subject Property and the State Housing and Finance Development Corporation and the County of Hawaii. Agreement by the HFDC on the provision of affordable housing shall be obtained prior to the developer and/or landowner applying for County zoning or prior to the developer and/or landowner applying for County building permits if County rezoning is not required."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

5. "The developer and/or landowner of the Property shall have an archaeological inventory survey conducted by a professional archaeologist prior to submitting an application to the County of Hawaii for rezoning or prior to applying for a building permit if county rezoning is not required. The findings shall be submitted to the State Historic Preservation Division, Department of Land and Natural Resources ("HPD-DLNR") in report format for adequacy review. The HPD-DLNR must verify that the survey report is acceptable, must approve significance evaluations, and must approve mitigation commitments for significant historic sites prior to the landowner and/or developer submitting an application to the county for rezoning or prior to applying for a building permit if county rezoning is not required."

WHS Response: Paul H. Rosendahl, Inc. prepared an historical and archeological report for the 32 acres in Parcel D. No significant findings were discovered as the land had been in sugar cane for decades and is currently in papaya on an interim basis. The State Department of Land and Natural Resources- Historic Preservation District concurred with the report's finding in a letter dated June 16, 1999. Paul H. Rosendahl, Inc., conducted historical and archaeological research and a field inspection for the Keaau High School site, with a report submitted to the Historic Preservation Division, DLNR. Copies of DLNR's approval letter, dated August 12, 1997, were sent to DAGS and the Planning Department, County of Hawaii. Most recently, in April 2017, Scientific Consultant Services, Inc. prepared and submitted for State Historic Preservation Review a draft archaeological inventory survey (2017 AIS) for much of the petition areas east of the Belt Highway and which similarly concluded that no sites of significance requiring preservation remain due to the history of extensive sugar cane farming. Older structures in the vicinity have been documented for their past historic architectural styles. On February 12, 2018, SHPD approved the AIS and asked to be consulted prior to the issuance of permit applications for projects which may impact the historic integrity of architectural properties within the project area. WHS will comply with this request as project development occurs.

6. "If significant historic sites are present, then the developer and/or landowner of the Property shall agree to develop and execute a detailed historic preservation mitigation plan prior to any ground altering construction in the area. The HPD-DLNR must approve this plan, and must verify in writing to the Land Use Commission that the plan has been successfully executed."

WHS Response: The developer and/or landowner of the Property will abide by this condition. To date, no significant historic sites have been determined to exist which have required preservation plans or mitigation plans. As to structures which may have historic architectural styles, WHS will consult with SHPD on whether or not mitigation as to the historic integrity of those styles will be required.

7. "Should any human burials or any historic sites such as artifacts, charcoal deposits, or stone platforms, pavings or walls be found, the developer and/or landowner of the Property shall stop work in the immediate vicinity and contact the HPD-DLNR. The significance of these finds shall then be determined and approved by the HPD-DLNR, and an acceptable mitigation plan shall be approved by the HPD-DLNR (if needed). The HPD-DLNR must verify that the fieldwork portion of the mitigation plans has been successfully executed prior to work proceeding in the immediate vicinity of the find. Burials must be treated under the specific provisions of Chapter 6E, HRS."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

8. "The developer and/or landowner of the Property shall conduct a flora and fauna survey and prepare and agree to execute a mitigation plan which meets the requirements of the Department of Land and Natural Resources. The Department of Land and Natural Resources must approve the plan and a copy of the approved plan must be submitted to the Land Use Commission prior to the developer and/or landowner applying for county zoning or prior to the developer and/or landowner applying for county building permits if county rezoning is not required."

WHS Response: DLNR Division of Forestry (DOFAW) has previously commented that the entire 660 acres comprising the subject LUC reclassification thereby including the zoning application land concludes that "…vegetation at the project site (660 acres including the Gateway project area) does not require protection other than standard procedures consistent with good soil and water conservation practices. Accordingly, no mitigation measures are needed for these resources."

With regard to fauna, DOFAW stated that "…the Hawaiian hawk is the only endangered species likely to be encountered at the project site (660 acres). In the event nesting hawks are encountered during clearing or construction phases of the project DOFAW proposes standard mitigation procedures are."

In a more recent draft flora and fauna survey conducted for much of the petition areas south of the Belt Highway conducted in 2106, Ron Terry of Geometrician Associates, LLC reported that no threatened or endangered plant species as listed by the U. S. Fish and Wildlife Service (USFWS) appear to be present on the Project Area, nor are there uniquely valuable habitats. No existing or proposed federally designated critical habitat is present on or near the Project Area.

As to fauna, only common non-native species of birds were observed during the site survey. However, it was noted that the migratory resident Golden Plover (*Pluvialis fulva*) may be expected to be at least occasionally present, as it frequently rests and forages on pastures and open fields throughout the State of Hawai'i during its migratory residence from August to April. Geometrician Associates, LLC, also reported that the area is can be expected to be utilized by the endemic Hawaiian

Hawk (*Buteo solitarius*). The endangered Hawaiian Hawk is widespread, hunting throughout forested, agricultural and even residential areas of the island of Hawai‘i. It nests in large trees and can be vulnerable during the summer nesting season. Aside from the hawk, it is considered unlikely that native forest birds would make much use of the Project Area because of its relatively low elevation and lack of native plants. It is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*) and the threatened Newell's Shearwater (*Puffinus auricularis newelli*) over-fly the Project Area between the months of May and November. The Hawaiian Petrel was formerly common on the Island of Hawai‘i. This pelagic seabird reportedly nested in large numbers on the slopes of Mauna Loa and in the saddle area between Mauna Loa and Mauna Kea, as well as at the mid-to-high elevations of Hualālai. Hawaiian Petrels were first listed as an endangered species by the USFWS in 1967 and by the State of Hawai‘i in 1973. Newell's Shearwaters were also once common on the Island of Hawai‘i. Geometrician Associates also considered it likely that Hawaiian Hoary Bats (*Lasiurus cinereus semotus*), the only native Hawaiian land mammals, are sometimes present on the Project Area. They have been found throughout Puna and in most areas on the island of Hawai‘i. Bats may forage for flying insects on the Project Area on a seasonal basis and may also roost in trees and large shrubs. Geometrician Associates, LLC offered the following recommendations in order to avoid impacts to endangered but widespread native birds and the Hawaiian hoary bat that maybe found on site:

- **To minimize impacts to the endangered Hawaiian hoary bat, trees taller than 15 feet should not be removed or trimmed during the bat birthing and pup rearing season (June 1 through September 15), to the extent practical.**

- **To minimize impacts to Hawaiian Hawks, avoid earthmoving within 100 meters of tall trees or tree cutting during the breeding season for Hawaiian Hawks (March through the end of September). If this time period cannot be avoided, arrange for a hawk nest search to be conducted by a University of Hawai‘i at Hilo biologist or other qualified biologist. If hawk nests are present in or near the Project Area, all land clearing activity should cease until the expiration of the breeding season.**

- **If development activities incorporate outdoor lighting, they may attract endangered Hawaiian Petrels and Newell's Shearwaters, which may become disoriented by the lighting. To avoid the potential downing of Hawaiian Petrels and Newell's Shearwaters by their interaction with outdoor lighting, there should be no construction or unshielded equipment maintenance lighting after dark between the months of April and October. All permanent lighting should be shielded in strict conformance with the Hawai‘i County Outdoor Lighting Ordinance (Hawai‘i County Code Chapter 9, Article 14), which requires shielding of exterior lights so as to lower the ambient glare caused by unshielded lighting.**

The landowner or developer will submit the recommended mitigation measures to the Department of Land and Natural Resources (DLNR) for review of recommended mitigation measures and submit the approved plan to the LUC prior to applying for County zoning amendments or building permits, if such zoning is not required.

9. "The developer and/or landowner of the Property shall prepare a Traffic Impact Analysis Report prior to applying for County zoning or prior to the developer and/or landowner applying for County building permits if County rezoning is not required. The landowner and/or developer shall also participate in the funding and construction of local and regional transportation improvements and programs including dedication of rights-of-way as determined by the State Department of Transportation and the County Department of Public Works. Agreement by the State Department of Transportation on the level of funding and participation shall be obtained prior to the developer and/or landowner applying for County zoning or prior to the developer and/or landowner applying for County building permits if County rezoning is not required."

   WHS Response: This condition has been partially satisfied. By letter dated November 26, 1997, the State Department of Transportation considered the donation by WHS property needed for the Kea`au Bypass Road as fulfilling the requirement for participation on regional transportation improvements. The now completed Bypass Road has substantially improved regional traffic conditions. The developer and/or landowner of future rezoning of the Property will abide by this condition. The Traffic Impact Analysis Report was updated on June 15, 2022 for Area "A" and "B".

10. "The developer and/or landowner of the Property shall monitor the traffic attributable to the proposed project at on-site and off-site locations and shall undertake subsequent mitigative measures that may be reasonably required. These activities shall be coordinated with and approved by the State Department of Transportation."

   WHS Response: The developer and/or landowner of the Property will abide by this condition.

11. "The developer and/or landowner of the Property shall fund the design and construction of drainage improvements required as a result of the development of the property to the satisfaction of the appropriate State and County agencies."

   WHS Response: The developer and/or landowner of the Property will abide by this condition.

12. "The developer and/or landowner shall coordinate with the County of Hawaii and the State Department of Health regarding the establishment of appropriate systems to contain spills and prevent materials associated with industrial and commercial uses such as

petroleum products, chemical or other pollutants, from adversely affecting the groundwater resources of the area."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

13. "The developer and/or landowner of the Property shall participate in an air quality monitoring program as specified by the State Department of Health."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

14. "The developer and/or landowner of the Property shall cooperate with the State Department of Health and the County of Hawaii Department of Public Works to conform to the program goals and objectives of the Integrated Solid Waste Management Act, Chapter 342G, Hawaii Revised Statutes, and the County's approved integrated solid waste management plans in accordance with a schedule and time frame satisfactory to the State Department of Health."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

15. "The developer and/or landowner of the Property shall be responsible for implementing sound attenuation measures to bring noise levels from vehicular traffic in the Property down to levels acceptable to the State Department of Health and the State Department of Transportation."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

16. "The developer and/or landowner of the Property shall notify all prospective buyers of Property of the potential odor, noise, and dust pollution resulting from surrounding Agricultural District land."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

17. "The developer and/or landowner of the Property shall notify all prospective buyers of property that the Hawaii Right-to-Farm Act, Chapter 165, Hawaii Revised Statues, limits the circumstances under which preexisting farming activities may be deemed a nuisance."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

18. "The Petitioner has represented that no golf courses will be developed within the Property by the developer and/or landowner. Any plans by the developer and/or landowner to include a golf course within the Property shall be subject to review and approval by the

Land Use Commission. The developer and/or landowner shall: (a) file an appropriate motion or petition, whichever is appropriate; (b) provide the necessary evidence to justify its proposed use; and (c) seek prior approval from the Commission for golf course use on the Property."

WHS Response: The developer and/or landowner of the Property will abide by this condition.

19. "The developer and/or landowner of the Property shall develop the Property in substantial compliance with the representations made to the Land Use Commission. Failure to so develop the Property may result in reclassification of the Property to its former land use classification, or change to a more appropriate classification."

    WHS Response: The developer and/or landowner of the Property will abide by this condition. The landowner and/or the developer of the Property will include plans which are in compliance with the representations made to the Land Use Commission.

20. "The developer and/or landowner of the Property shall promptly provide without any prior notice, annual reports to the Land Use Commission, the Office of State Planning, and the County of Hawaii Planning Department in connection with the status of the subject project and the developer's and/or landowner's progress in complying with the conditions imposed."

    WHS Response: The developer and/or landowner of the Property will abide by this condition.

21. "The developer and/or landowner of the Property shall give notice to the Commission of any intent to sell, lease, assign, place in trust, or otherwise voluntarily alter the ownership interests in the Property, prior to the completion of the development of the Property."

    WHS Response: The developer and/or landowner of the Property will continue to abide by this condition.

22. "The Land Use Commission may fully or partially release these conditions as to all or any portion of the Property upon timely motion and upon the provision of adequate assurance of satisfaction of these conditions by the developer and/or landowner of the Property."

23. "Within 7 days of the issuance of the Land Use Commission's Decision and Order for the subject reclassification, the Petitioner shall:

    (a) record with the Bureau of Conveyances a Statement to the effect that the Property is subject to conditions imposed by the Land Use Commission in the reclassification of the Property, and

(b) file a copy of such recorded statement with the Commission."

WHS Response: The statement of Imposition of Conditions imposed by the Land Use Commission for the real property at Keaau, Hawaii, was filed with the Bureau of Conveyances Land Court System on July 22, 1994.

24. "The Petitioner shall record the conditions imposed by the Land Use Commission with the Bureau of Conveyances pursuant to section 15-15-92, HAR."

WHS Response: The Declaration of Conditions imposed by the Land Use Commission for the real property at Keaau, Hawaii, was recorded with the Bureau of Conveyances on August 11, 1994 as Document No. 94-133996, and filed on the same date with the Land Court as Document no. 2171696.