



Hanapēpē Homestead Community **Final Environmental Assessment**

Prepared for: Department of Hawaiian Home Lands

Prepared by: SSFM International



October 2020

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Final Environmental Assessment
and
Finding of No Significant Impact for the
Hanapēpē Homestead Community
Hanapēpē Ahupua‘a, Kona Moku, Island of Kaua‘i

Prepared For:



HAWAIIAN HOME LANDS
HAWAIIAN HOMES COMMISSION · DEPARTMENT OF HAWAIIAN HOME LANDS

Prepared by:



October 2020

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PROJECT SUMMARY TABLE

This Final Environmental Assessment (EA) has been prepared in accordance with the requirements of Chapter 343, Hawai‘i Revised Statutes (HRS) and Hawai‘i Administrative Rules (HAR) Title 11-200 *Environmental Impact Statement Rules*.

Project Name:	Hanapēpē Homestead Community
Proposing Agency:	Department of Hawaiian Home Lands (DHHL) Hale Kalaniana‘ole 91-5420 Kapolei Parkway Kapolei, HI 96707 Contact: Nancy McPherson nancy.m.mcpherson@hawaii.gov
Accepting Authority:	Hawaiian Homes Commission (HHC) Department of Hawaiian Home Lands Hale Kalaniana‘ole 91-5420 Kapolei Parkway Kapolei, HI 96707
EA Preparer:	SSFm International, Inc. 501 Sumner Street, Suite 620 Honolulu, Hawai‘i 96817 Contact: Jared Chang, AICP jchang@ssfm.com
Project Location:	Hanapēpē Ahupua‘a, Kona Moku, Island of Kaua‘i
Project Size:	363 acres
Tax Map Keys:	(4) 1-8-007:003 (4) 1-8-008:035, 081, 086, and 087
Landowner:	State of Hawai‘i, Department of Hawaiian Home Lands
Project Site Existing Uses:	Agriculture and Commercial
State Land Use:	Agricultural and Urban
Kaua‘i County Zoning:	Agriculture (A) and Open (O)
Chapter 343, HRS Trigger:	Use of State lands and funds
Special Management Area:	Outside SMA
Flood Zone:	Flood Zone X and AE
Determination:	Finding of No Significant Impact (FONSI)
Permits/ Approvals:	See Section 1.5 of this document for Approvals and Permits
Consultations:	See Chapter 6: Agencies and Organizations Consulted

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LIST OF ACRONYMS

AIS Archaeological Inventory Survey
ASYA Aquifer System Area
BMP Best Management Practice
CFS Cubic Feet per Second
CIA Cultural Impact Assessment
CTAHR College of Tropical Agriculture and Human Resources, University of Hawai‘i
CZM Coastal Zone Management
DHHL Department of Hawaiian Home Lands, State of Hawai‘i
DLNR Department of Land and Natural Resources, State of Hawai‘i
DOH Department of Health, State of Hawai‘i
DPW Department of Public Works, County of Kaua‘i
DOW Department of Water, County of Kaua‘i
EA Environmental Assessment
GPD Gallons Per Day
GPM Gallons Per Minute
HAR Hawai‘i Administrative Rules
HDOT Department of Transportation, State of Hawaii
HHCA Hawaiian Homes Commission Act
HHL Hawaiian Home Lands
HDOT State of Hawai‘i Department of Transportation
HHCA Hawaiian Homes Commission Act
HRS Hawai‘i Revised Statutes
IAL Important Agricultural Lands
IWS Individual Wastewater System
KIUC Kaua‘i Island Utility Cooperative
LiDAR Light Detection and Ranging
LCA Land Commission Award
LOS Level of Service
LUPAG Land Use Pattern Allocation Guide
MG Million Gallons
MGD Million Gallons per Day
MSL Mean Sea Level
NPDES National Pollutant Discharge Elimination System
REC Recognized Environmental Concern
SHPD State Historic Preservation Division
SLH Session Laws of Hawai‘i
SOS Save our Shearwaters
TIAR Traffic Impact Analysis Report
TMK Tax Map Key
USGS United States Geological Survey
USFWS United States Fish and Wildlife Service
v/c volume-to-capacity ratio
VPH Vehicles Per Hour
WWTP Wastewater Treatment Plant

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1.0 PROJECT DESCRIPTION

The purpose of the Hawaiian Homes Commission Act (HHCA) of 1920 is “to enable native Hawaiians to return to their lands in order to fully support self-sufficiency for native Hawaiians and the self-determination of native Hawaiians in the administration of this Act, and the preservation of the values, traditions, and culture of native Hawaiians.” The Hanapēpē Homestead Community Project seeks to provide Department of Hawaiian Home Lands (DHHL) waitlist beneficiaries with residential and subsistence agriculture homesteading opportunities. This is in support of DHHL’s mission to manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians.

1.1 BACKGROUND

The Hanapēpē Homestead Community (“Project”) was identified in DHHL’s Kaua‘i Island Plan (“Island Plan”) (DHHL, 2004) as one of three priority areas for new residential and agricultural homestead development, based on waitlist preference and estimated development cost. The majority of DHHL’s Hanapēpē lands are designated for subsistence agriculture and residential homesteading. Other complementary land uses are designated for commercial and community use. This homestead community is envisioned as DHHL’s largest residential and agricultural community on the west side of Kaua‘i. It is situated adjacent to the Hanapēpē town center and within commuting distance of local employment centers.

In February 2017, the Hawaiian Homes Commission approved amendments to the Hawai‘i Administrative Rules, Title 10, to allow small-lot agricultural homestead leases that are being administered programmatically as “Subsistence Agricultural” homestead leases. The 2018 State Legislature, with support from Senate President Ron Kouchi, allocated funding to DHHL specifically for planning of the Hanapēpē homestead community & engineering design work for what is identified as the next phase of development (“Phase 2”) for DHHL’s Hanapēpē lands, which will consist of up to 75 Residential homestead lots.

The Project is proposed on DHHL lands and involves the use of state funds, which triggers the preparation of an Environmental Assessment (EA) as prescribed by Hawai‘i Revised Statutes, Chapter 343.

1.2 PROJECT NEED AND OBJECTIVES

The purpose of the Project is to award residential and subsistence agriculture lots to beneficiaries on the DHHL waitlist, update the land use plan and infrastructure needs identified in the Island Plan, confirm waitlist beneficiary preferences, and designate the location for the next phase of residential homestead development (Phase 2). It also identifies desired elements and uses for Community Use and Commercial areas, and desired density of future subsistence agriculture homestead lots.

There are approximately 1,625 beneficiaries on the Kaua‘i Island Residential waitlist and 2,225 on the Agricultural waitlist. Based on 2019 survey responses from 333 waitlist beneficiaries, 37% of respondents are on both Residential and Agricultural Waitlists with 59% of all respondents indicating they would be “very likely” to accept an award in Hanapēpē.

1.3 PROJECT LOCATION

DHHL's Hanapēpē Lands consist of the existing 47-lot Phase 1 Residential homestead area; adjacent undeveloped lands including Tax Map Keys (TMKs) (4) 1-8-007:003, 021, 018, collectively hereinafter described as the "Mauka Site"; and TMKs (4) 1-8-008:035, 081, 086, and 087, collectively hereinafter described as the "Makai Site." These areas are located just west of historic Hanapēpē town and the Hanapēpē River and along both sides of Kaumuali'i Highway. The Mauka Site is 357 acres, exclusive of the existing Phase 1 residential subdivision; and the Makai Site is 6 acres. See Figure 1, Location Map, and Figure 2, Tax Map Keys.

The 357-acre Mauka Site includes some of the most fertile agricultural lands within DHHL's holdings, and its location near Hanapēpē town and within commuting distance of regional job centers make it an attractive location for homestead development. The entire Mauka Site was formerly used for the commercial cultivation of sugarcane for more than 70 years and reportedly pineapple prior to the 1950's. The site was leased and managed by Olokele Sugar (C. Brewer) until 1994. In 1994, Gay and Robinson Sugar Plantation bought out C. Brewer and farmed sugarcane on the site until 2009. There are no building permits or other improvements listed for the Mauka Site. The site is currently vacant, undeveloped and overgrown with wild cane and brush.

The 6-acre Makai Site is bounded by the Kaumuali'i highway on the north, Lele Road on the west and a drainage channel on the east. The Makai Site has been in warehouse industrial use for at least 60 years and houses multiple existing business operations. The Makai Site consists of four TMK parcels, all owned by DHHL. Each of the four parcels has business operations/tenants as follows:

- Parcel 035 – Habitat for Humanity carpentry shop and secondhand store. Parcel 035 also contains a parking and equipment storage yard in use by another business.
- Parcel 081 – Parking/storage area for Wally Rita Trucking.
- Parcel 086 – School bus parking lot operated by Akita Enterprises.
- Parcel 087 – Truck repair service shop, operated by R. W. Palama and Sons Trucking.

The County of Kaua'i website listed no building permits on file for the Makai Site. Aerial photos indicate that warehouse-type buildings have existed on the site since the early 1950's. Prior to that, the site appears to have been undeveloped.

Figure 1: HANAPĒPĒ HOMESTEAD PROJECT LOCATION

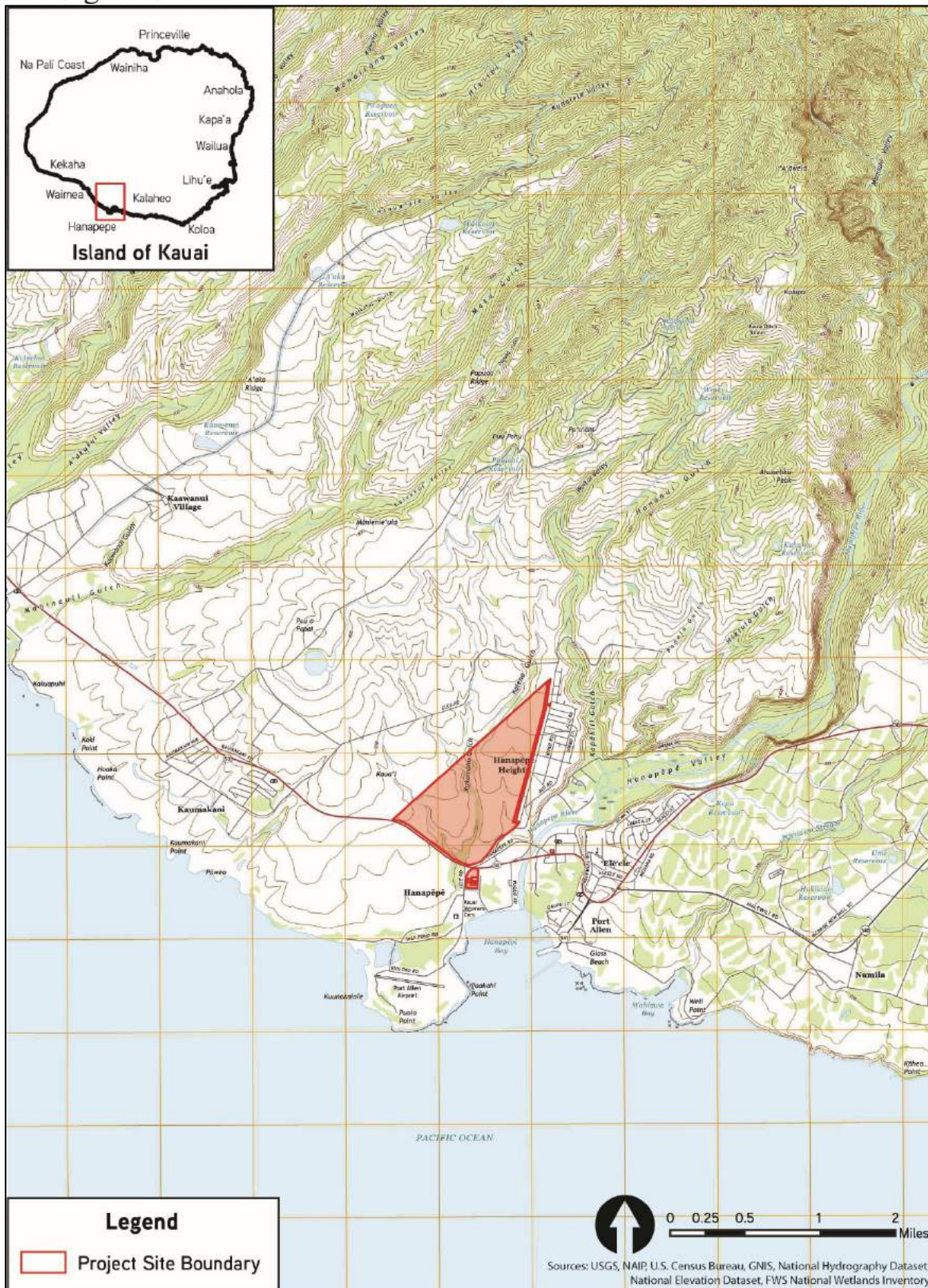
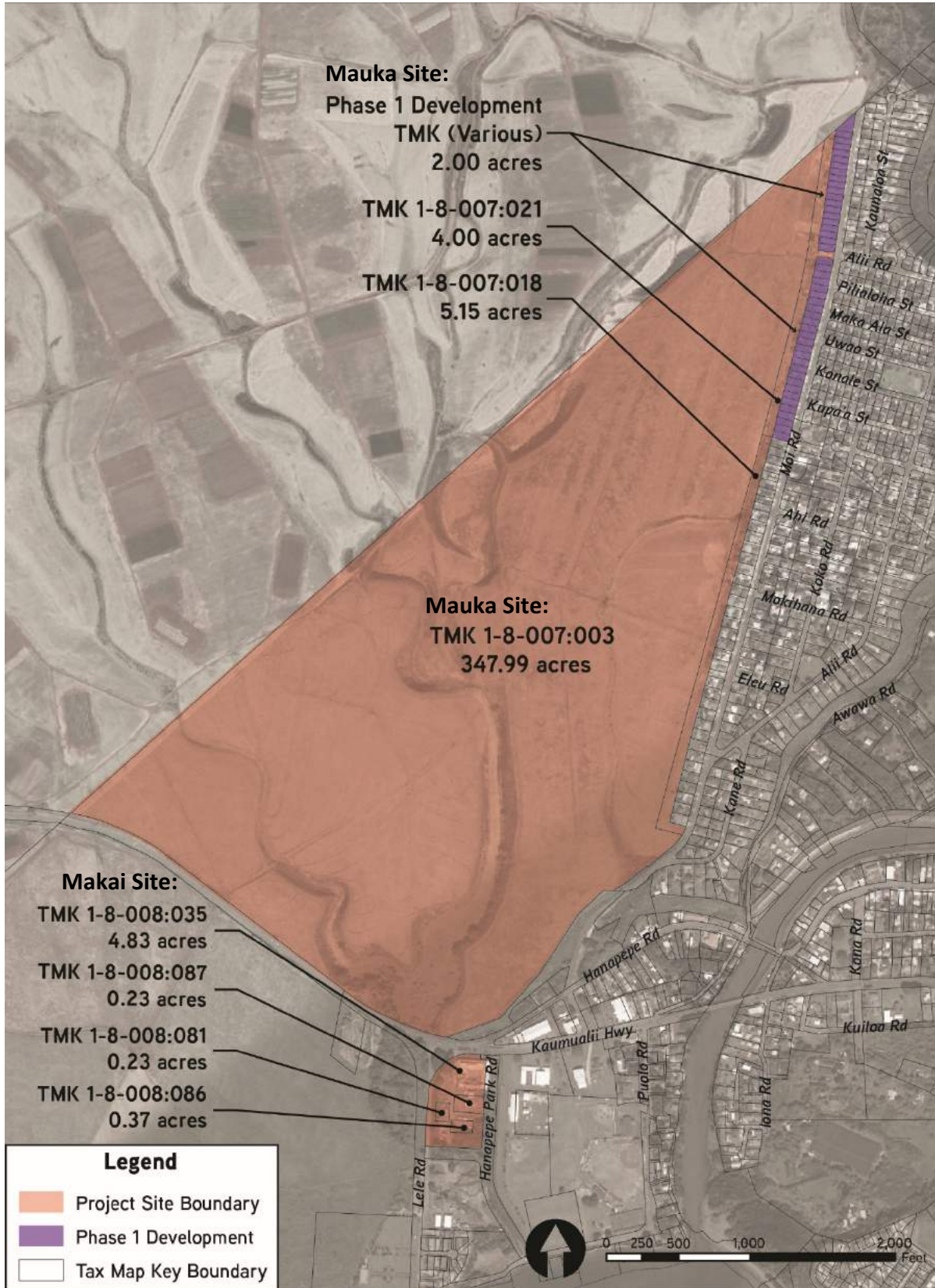


Figure 2: TAX MAP KEY BOUNDARIES



1.4 DESCRIPTION OF THE PROPOSED PROJECT

Hanapēpē is envisioned to be DHHL’s largest residential and agricultural community on the west side of Kaua‘i. The DHHL is proposing the Hanapēpē Homestead Community (“Project”) to offer up to 449 new Residential homestead lots on 126 acres and up to 111 new Subsistence Agricultural homestead lots on 157 acres, based on waitlist preference and estimated development cost. Other complementary land uses are proposed to include 13 acres for Commercial use; 26 acres for Community Use; 33 acres for Special District; and 8 acres of Conservation. The preferred land use plan depicting the spatial layout of proposed land uses is provided as Figure 3. Table 1 provides a summary of proposed land uses and acreages.

Full build-out of the Project is anticipated to be developed over multiple phases and years. The next phase under the proposed Project (Phase 2) includes up to 75 new Residential homestead lots near existing homes along Moi Road and expansion of the existing homestead lots along Moi Road from approximately 5,000 SF to 7,500 SF. Full build-out (Phase 3) is anticipated to include additional residential homesteads, development of Subsistence Agriculture homestead lots ranging in size from less than 1 acre up to 3 acres, development of Commercial and Community Use areas, and infrastructure improvements to serve the homestead community. Infrastructure for this Project will be designed to provide for the health and safety of residents but be appropriate for a rural area.

The preferred land use plan (identified as Alternative 2 in this EA) concentrates Residential land use areas east of Kukamahu Gulch, adjacent to existing residential development and infrastructure. Concentrating Residential homesteads to the east of the gulch is consistent with the County’s West Kaua‘i Community Plan update, which calls for focusing development in and adjacent to existing neighborhoods and town centers in accordance with smart growth principles. It also enables the subdivision to be more easily and cost-effectively serviced by existing water and sewer infrastructure along Moi Road.

Subsistence Agriculture areas are concentrated to the west of the gulch to provide a more gradual transition between the residential areas and open space and agricultural lands to the west of the site. This will also help to preserve viewplanes across the southwest of the site.

Commercial and Community Use Areas are provided in the southwest corner of the Makai Site with the intent of providing a destination for the west side community that may include a park, ball fields, and community center, as well as agriculture-supportive uses such as a farmers market, community garden, and shared equipment/ facilities. A future mauka extension of Lele Road as a gateway to the community and a second access to Hanapēpē Heights is included, as is a new small Commercial area at this location to allow for small commercial uses to serve the existing Hanapēpē Heights community as well as the new homesteads. The gulch areas will be designated as Conservation and Special District to indicate their intended uses as open space or limited use areas.

Figure 3: PREFERRED LAND USE PLAN

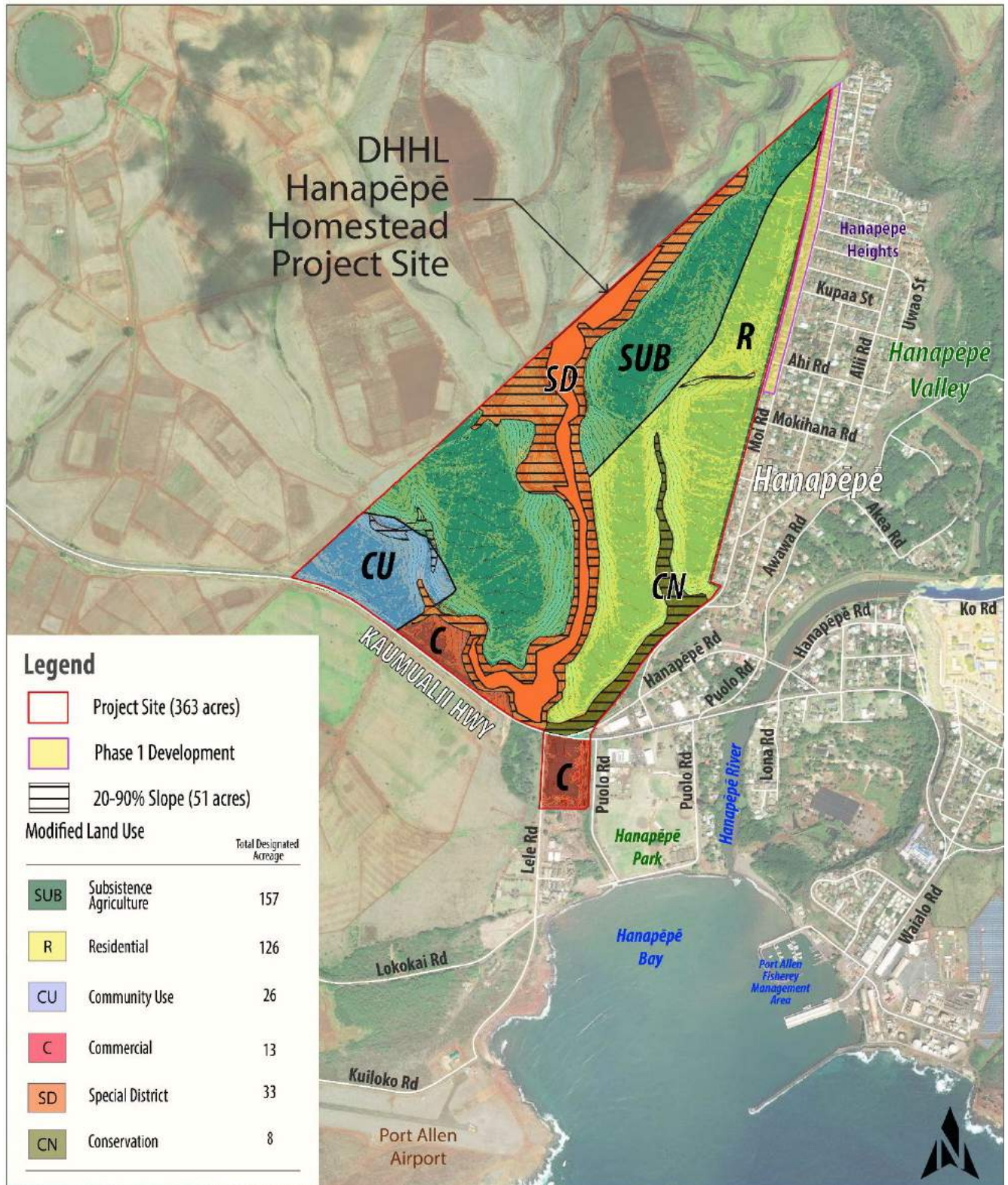


TABLE 1: PROPOSED LAND USES AND ACRES

Subsistence Agriculture <ul style="list-style-type: none"> • Small lot agriculture. Lots no larger than three (3) acres in size. • Up to 111 new Subsistence Agricultural homestead development lots. • Lessees are required to actively cultivate subsistence agriculture OR reside and cultivate subsistence agriculture on their lots. • Crops are expected to provide food for home consumption or small-scale commercial production. 	157 acres (43%)
Residential <ol style="list-style-type: none"> 1. Lots approximately 7,500 sf or less in size. 2. Up to 449 new Residential homestead lots. 3. Residential subdivisions are built to County standards in areas close to existing infrastructure and in conjunction with community use areas. 4. Expansion of the existing 47 homestead lots along Moi Road from 5,000 sf (approx.) to 7,500 sf (approx.) 	126 acres (35%)
Commercial <ul style="list-style-type: none"> • Commercial areas that could include retail, office, public space, public services and health care services. 	13 acres (4%)
Community Use <ul style="list-style-type: none"> • Common areas for community use. • Possible uses include parks and recreation, cultural activities, community-based economic development, utilities, other facilities and amenities. 	26 acres (7%)
Special District <ul style="list-style-type: none"> • Areas requiring special attention because of unusual opportunities and/or constraints, e.g. natural hazard areas. Possible uses include cultural uses, agricultural uses, open space or stormwater management. 	33 acres (9%)
Conservation <ul style="list-style-type: none"> • Areas that include steep slopes (>20% slopes) • Possible uses include preservation and open space. 	8 acres (2%)
TOTAL	363 acres

1.4.1 RESIDENTIAL HOMESTEADS

The development of Residential homesteads is a priority for DHHL waitlist beneficiaries. The next phase of development (Phase 2) will consist of up to 75 Residential homestead lots and will be located behind existing residences along Moi Road near the north end of the Mauka Site. This will allow the development to take advantage of existing infrastructure connections and roadway stub-outs along Moi Road.

At full build-out, the homestead community will include up to 449 Residential homestead lots. Residential homestead lots are sized at approximately 7,500 square feet (sf). A site plan showing the next phase of Residential homestead lots is provided in Figure 4.

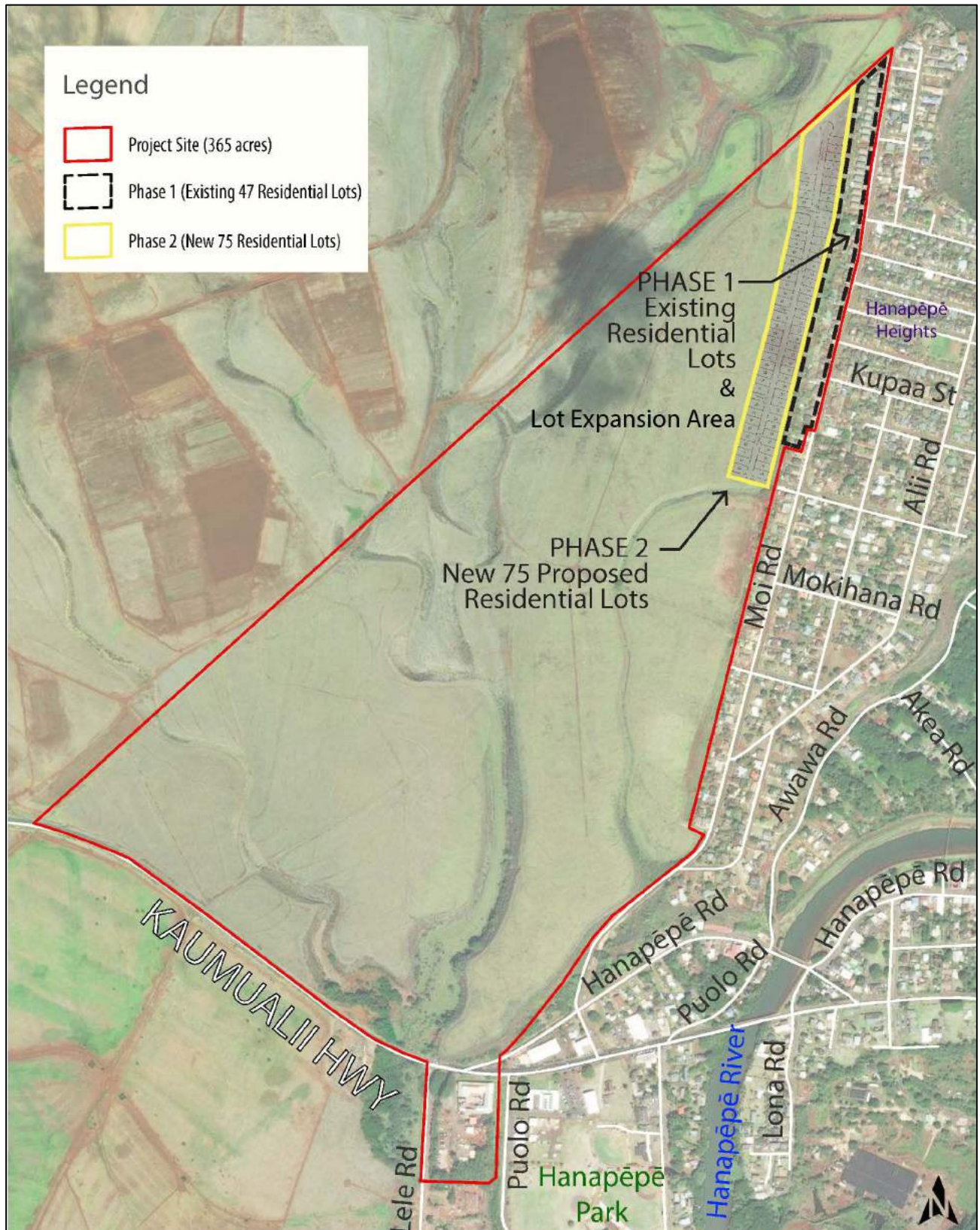
1.4.2 SUBSISTENCE AGRICULTURE HOMESTEADS

The proposed Subsistence Agriculture homestead lots are sized to range from less than one (1) acre to no more than three (3) acres that would enable growing crops, a garden, or raising animals for subsistence living. The DHHL Subsistence Agricultural homestead designation was created to provide agricultural lands that are more manageable than the larger agricultural homestead lots that were previously offered by DHHL. In a lot of instances, the larger agricultural lots were underutilized by some lessees. Smaller sized Subsistence Agricultural lots also allow DHHL to provide more homesteading opportunities to those on the waitlist.

The Subsistence Agriculture lots allow for, but do not require, a residence. The crops grown on Subsistence Agricultural lots are expected to provide food for home consumption or to allow for small-scale commercial production. Subsistence Agriculture lessees are required to either actively cultivate their land or reside and actively cultivate their land within three years of receiving their leases. Infrastructure in the Subsistence Agriculture areas will be rural in nature in order to maintain the character of the Project area.

As part of the beneficiary consultation process for this Project, DHHL Kaua‘i waitlist applicants were surveyed in 2019. Of the surveyed beneficiaries on the agricultural waiting list, the majority of applicants (80%) intend to both farm and/or raise livestock and build a house on their Subsistence Agricultural lot if awarded. Based on other DHHL agricultural homesteads, an average of 50% of lessees tend to reside on the lots, which would result in about 55 homes expected in the Subsistence Agriculture land use areas. Ninety-two percent of waitlist beneficiaries specifically interested in the Hanapēpē agricultural award said they would be willing to accept lots of one-half to one acre in size.

Figure 4: PHASE 2 RESIDENTIAL SUBDIVISION



1.4.3 COMMERCIAL AND COMMUNITY USE AREAS

DHHL designates Commercial lands as those that are suitable for business, retail, and commercial activities. Specific commercial uses will be determined as opportunities arise but will be complementary to the uses in the area. The existing commercial industrial area on the Makai Site is being leased by several businesses that for the purposes of this environmental assessment are assumed to remain in place.

Community Use areas are common areas for shared homestead uses and facilities. They may include space for parks, recreation, cultural activities, community-based economic development, utilities and other facilities and amenities. The specific community uses will be determined by the homestead community, which may choose to form a Homestead Association. Comments received on the Draft EA suggested that examples might consider a commercial kitchen, cultural spaces for family gatherings, community workshops and meetings and plants considered for these spaces should include plants that can be gathered and used as food or for lei making for the community. Based on the 2019 survey of waitlist beneficiaries, the Community Uses most important to have in a homestead community were: playground (51%), government services (49%), medical/dental clinic (47%), farmers market (46%), and community center (46%). Outreach to existing lessees and waitlist beneficiaries on Kaua‘i confirmed support for these uses, as well as interest in sports fields, preschools/childcare, kupuna housing and services, and cultural activities.

The development of Commercial and Community Use areas is slated to occur in Phase 3 of this plan, with anticipated completion by 2040 as availability of funding permits.

1.4.4 SPECIAL DISTRICT

Areas within the Project site requiring special attention because of topographical constraints or other factors are designated as Special District. The Special District within the Project area primarily consists of Kukamahu Gulch, drainageway buffers, and unbuildable areas. Possible uses for these areas include cultural uses, agricultural uses, open space or stormwater management.

1.4.5 CONSERVATION

Approximately 2 percent of the Project site will be designated as Conservation in order to protect natural drainageways and environmentally sensitive areas. The possible uses for the Conservation areas include preservation and open space.

1.4.6 ROADS AND ACCESS

A traffic impact study (see Appendix E) was prepared to identify access needs for Phase 2 and Phase 3 of the Project. For Phase 2, Moi Road would continue to serve as the sole ingress/egress to the Project site. For Phase 3 (full build-out), two additional access points are proposed including a round-a-bout intersection at Kaumuali‘i Highway and Lele Road (supported by County, pending HDOT approval) and new access off Kaumuali‘i Highway near the southwest corner of the Mauka site (pending HDOT approval. Full build out (Phase 3) may require additional regional roadway network improvements to include a two-way left turn lane between

Lele Road and Puolo Road, removal of the Hanapēpē Road and Kaumuali‘i Road intersection, and a new round-a-bout at Kona Road and Kaumuali‘i Highway. DHHL may be responsible to provide fair share mitigation of regional impacts and per HDOT recommendations, a 60-foot design setback is needed from Kaumuali‘i Highway to accommodate future roadway improvements.

Residential subdivision roads for Phase 2 will connect to Moi Road via existing stub-outs that were constructed when the Phase 1 homesteads were developed. New roads within the subdivision will follow the standards outlined in the County of Kaua‘i Street Design Manual for residential uses. Roads would have a right-of-way of 48 feet with 20-foot to 26-foot travelways, and dedication to the County of Kaua‘i will be pursued. DHHL will coordinate with HDOT to provide access to the Project off of Kaumuali‘i Highway, and with Kaua‘i County Department of Public Works (DPW) for access from Moi Road.

Street lighting will be designed to meet Kaua‘i County street light standards, and underground lighting circuits will be provided for new roadways within the development. Pole mounted luminaires and underground lighting circuits can be provided along bike and pedestrian paths within the development.

It is likely that at least one roadway crossing of Kukamahu Gulch will be included in full build-out of the Mauka Site. This will require further study to determine the best and most feasible location.

1.4.7 GRADING AND RUNOFF, DRAINAGE, AND EROSION CONTROL

A Drainage Master Plan (see Appendix F) was prepared by SSFM International, Inc. to model stormwater flows from the proposed development and determine the preliminary locations and sizes of the various stormwater management facilities needed to ensure minimal impacts on the downstream receiving waters.

An analysis of the existing drainage patterns and flow rates was carried out to determine the existing flow rates for the 10-year and 50-year recurrence intervals. The Mauka Site includes approximately 357 acres, and the upstream watershed consists of approximately 1,600 acres of agricultural lands and 84 acres of single-family residential lands. There are two major discharge points in which runoff exits the site, including Kukamahu Gulch, which discharges through an existing culvert beneath Kaumuali‘i Highway, and also a drainage inlet on Moi Road near Kane Road.

The runoff rates for the Project were modeled based on the proposed single-family Residential, Subsistence Agriculture and Commercial/Community Use land uses. Eleven (11) stormwater detention basins are proposed at various locations of the development site, including ten (10) within the Mauka Site and one (1) on the Makai Site. An existing drainage channel easement behind the current homestead lots along Moi Road will be eliminated and incorporated into the drainage master plan.

With the proposed stormwater detention basins and controlled release rates to the downstream systems, the post-development peak flow rate at Kukamahu Gulch (Outlet 1) is estimated to be 45 cubic feet per second (cfs), which is an increase of approximately 28% compared to existing conditions, but is within the hydraulic capacity of the existing culvert.

Similarly, with the proposed stormwater detention basins and controlled release rates to the downstream systems, the post-development peak flow rate at Moi Road (Outlet 2) is estimated to be 185 cfs, which represents an increase of only 15% compared to existing conditions.

The various detention basins can also be incorporated into a Low Impact Development strategy to further reduce the environmental impact and provide additional water quality improvement opportunities.

1.4.8 WATER SYSTEM

A Water Master Plan (see Appendix G) was prepared by SSFM International, Inc. to assess the existing water supply capacity, identify the ultimate demands for the Project, and determine how the existing water system may be affected by the addition of Project. The existing Hanapēpē-‘Ele‘ele water supply network was analyzed to assess the performance of the existing water supply system with the increased demands resulting from the Project.

The increased water demands for the Project’s initial phase of development (Phase 2) will increase the maximum day demand by 56,250 gallons with a peak flow of approximately 90 gpm and under full build-out conditions will increase the maximum day demand by 644,270 gallons with a peak demand rate in the range of 1,000 gpm.

The water master plan prepared for the Project shows that the existing water supply system is able to meet the increased demands associated with Phase 2 of the Project plus demands from Phase 1 of the Lima Ola Development. With the facility improvements planned for the ‘Ele‘ele system to support the Lima Ola build-out conditions (expansion of the ‘Ele‘ele storage tanks), the existing supply and distribution network are able to meet the increased demands to support the Project full build-out (Phase 3). No additional source wells are anticipated to be required and no additional storage is anticipated to be required.

The proposed distribution system will include a connection to the existing 12-inch water main on Moi Road, plus a network of new onsite water mains ranging in size from 12-inch to 6-inch pipelines. On-site pressure reducing valves will be required to control system pressure and maintain compatibility with the existing DOW pressure zones. The water system will provide domestic water and fire protection for the entire homestead community, all in accordance with DOW Standards. The DOW system could also supply irrigation water for the Subsistence Agriculture lots if DHHL is unable to locate alternative sources of non-potable water.

1.4.9 WASTEWATER SYSTEM

A Wastewater Master Plan (see Appendix H) was prepared by SSFM International, Inc. to identify wastewater generation and infrastructure requirements for the project. This plan consisted of two phased scenarios; Phase 2 (75 residential lots) and Phase 3 (full build-out).

For Phase 2, an 8-inch gravity sewer would be installed running along a new residential road, parallel to Moi Road, at roughly 3 percent grade and will connect downstream to existing sewer manholes at the upper Moi Road / Ahi Road intersection and further downslope at the lower Moi Road / Ahi Road intersection. Preliminary discussion with the County of Kaua‘i Department of Public Works, Division of Wastewater Management (DWWM) indicated that the ‘Ele‘ele Wastewater Treatment Plant (WWTP) has enough capacity to accommodate the additional 75

houses proposed in Phase 2, however capacity is based on a first-come, first-served basis. Phase 2 would have an average daily flow of 0.030 MGD and peak flow of 0.166 MGD.

Phase 3 (full build-out) of the homestead community is proposed to be served by a combination of municipal sewer systems for the Residential homesteads, and individual wastewater systems (IWS) for the Subsistence Agricultural lots. The potential additional future flows to the 'Ele'ele WWTP from the Project's full build-out of Residential, Commercial and Community Uses would have an average daily flow of 0.199 MGD and peak flows of 1.030 MGD. The Subsistence Agricultural lots are proposed to be serviced by IWS consisting of septic tanks and leach fields that accommodate up to 1,000 gallons per day (GPD) of domestic wastewater.

The ability of Phase 3 to connect to the County sewer system will be dependent upon timing, refinement of sewer generation flows and availability of capacity. The West Kaua'i Community Plan (Departmental Draft, 2020) estimates that the 'Ele'ele WWTP has adequate wastewater capacity through 2040. However, it is not currently known if the 'Ele'ele WWTP has enough capacity to include full build-out of the Hanapēpē Homestead Community as it remains subject to the first-come, first-served policy. DHHL plans to work with DWWM to identify possible upgrades to the wastewater collection and treatment works, as needed in the future.

Solid waste disposal will be provided through the County DPW, Division of Solid Waste automated refuse collection system for residential lots. Solid waste disposal for subsistence agricultural lots and commercial lots will be the responsibility of the lessee.

1.4.10 ELECTRICAL POWER AND COMMUNICATIONS

Electrical utility planning for the development includes primary electrical (power) and telecommunication (telephone, internet and CATV) utility infrastructure and street lighting systems along existing and new roadways (see Electrical Report in Appendix I). The utility companies are typically responsible for the construction of overhead utility pole lines (pole, overhead conductors, pole-mounted transformers, etc.), underground distribution cables and pad-mounted primary transformers.

There are existing Kaua'i Island Utility Cooperative (KIUC) owned electrical distribution systems in the area. These consist of overhead lines on wooden utility poles along Kaumuali'i Highway and Moi Road, as well as underground distribution systems along portions of Moi Road. These 12kV overhead power lines are stepped down via three-phase and single-phase transformers to service the customers in the area. Electrical power will be provided by KIUC via the existing overhead electrical distribution system running along Moi Road. Preliminary discussions with KIUC indicate there is existing capacity to support the Project. New KIUC underground infrastructure is anticipated and will likely follow the alignment of the new roadways within road right-of-way.

There are existing telecommunication and CATV distribution systems in the area. These run overhead along Kaumuali'i Highway and Moi Road, as well as underground distribution systems along Moi Road. Telecom services for DHHL properties are currently provided to customers in the area by Sandwich Isles Communications (SIC). CATV services for DHHL properties are provided to customers in the area by Hawaiian Telcom.

According to preliminary discussions with the utility companies, the existing electrical, telecommunication, and CATV distribution systems in the area are sufficient to support the

proposed development. These distribution systems can be extended and provide new services into the Mauka Site via underground distribution systems. Further coordination and discussion with the utility companies will be necessary to confirm and identify any necessary improvements, upgrades, or modifications to the respective utility distribution systems.

1.5 ESTIMATED PROJECT COSTS

The next phase under the proposed Project (Phase 2) including up to 75 new Residential homestead lots near existing homes along Moi Road is estimated to cost approximately \$13 million inclusive of a 15% construction contingency. Projected costs include site earthwork, roads, water, sewer, drainage, electrical and telecommunications.

Full build-out (Phase 3) of the Project is anticipated to be developed over multiple phases and years and is estimated to cost approximately \$120 million inclusive of a 15% construction contingency. Full build-out is anticipated to include infrastructure to support additional residential homesteads, development of Subsistence Agriculture homestead lots, and development of Commercial and Community Use areas. Estimated costs were developed in 2020.

1.6 APPROVALS AND PERMITS

The following approvals and permits are anticipated to be needed for the Project:

Federal Aviation Administration

- FAA Form 7 460-1 Notice of Proposed Construction or alteration
- Glint and glare analysis for Photovoltaic Systems (if necessary)

State Historic Preservation Division

- HRS §6E, Historic Preservation Review Clearance

Office of Environmental Quality Control

- HRS Chapter 343 Compliance

State Department of Health

- National Pollutant Discharge Elimination System (NPDES) General Permit
- Individual Wastewater System Approval

State Department of Transportation

- Application for Use and Occupancy Agreement and Grant of Access and Permit to Perform Work Within a State Highway Right-of-Way
- Compliance documentation of line of sight adequacy requirements

Kaua'i County of Public Works

- Grading and Grubbing Permit
- Building Permit

Kaua'i County Planning Department

- Subdivision Application

Kaua'i County Department of Water Supply

- Application for Water Services

Kaua'i County Wastewater Management Division

- Sewer Connection Permit

2.0 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This chapter describes the natural, man-made, and social environment; the potential impacts that may result from implementation of the Project; and measures proposed to mitigate those impacts.

2.1 CLIMATE

Hanapēpē has a tropical savannah climate with light rainfall most months of the year. The mean annual temperature is 74 degrees Fahrenheit with mean annual precipitation averaging 27 inches (UHM 2014). The dominant winds are northeast trade winds like much of Hawai‘i.

Potential Impacts and Mitigation Measures

The Project is not anticipated to have any effect on the region’s climate.

2.2 GEOLOGY, TOPOGRAPHY AND SOILS

A slope analysis of the Project site was conducted using topographic LiDAR (light detection and ranging) data to determine slopes and calculate acreages of the developable areas of the site. The Hanapēpē Homestead area is generally moderately sloped, however there are areas of steeper slopes in and around the gulches.

Moderate slopes are good for aesthetics and site drainage, but steeply sloped areas can substantially raise development costs. Moderate slopes with grades of less than 10% are the easiest to build on. Between 15% and 20%, more complex grading and foundation work is required. Steep slopes above 20% require more extensive earth moving and soil stabilization to create workable grades and to prevent erosion. Figure 5 shows the amount of acreage for the various levels of slope in the Project area. Slopes over 20% are the main constraint to development of the proposed homesteads.

Mauka Site: The 2013 USGS Topographic Map of the area show the site located on the northwestern side of the Hanapēpē River drainage basin and to the west-northwest of Hanapēpē town. The southeastern side of the site is approximately 250 yards from the western bank of the Hanapēpē River and about 0.3 miles north of Hanapēpē Bay where the Hanapēpē River meets the Pacific Ocean. The site sits approximately 30 feet above msl at the lowest, southern end and slopes gently up to approximately 250 feet msl at the extreme northeastern corner of the site (KSK, 2019).

The Mauka site includes Agricultural Lands of Importance to the State of Hawaii (ALISH) that are classified as “Prime,” “Unique,” and “Other.” See Figure 6, ALISH Map. The portions of the Project area designated as prime generally have the flattest land with the least amount of slope. “Other” designated lands are found mostly along the gulches.

Prime agricultural land is best suited for the production of food, feed, forage and fiber crops. The land has the soil quality, growing season, and moisture needed to produce sustained high yields of crops. Other important agricultural land is land other than Prime, or Unique, Agricultural land. The lands in this classification are important to agriculture, yet exhibit

properties like slopes, flooding, or seasonal wetness that exclude them from the Prime ALISH classification.

The predominant soil type present at the Mauka Site is Makaweli silty clay loam at close to 80% coverage. Other soil types have been identified on the site in lower percentages. See Figure 7, Soils Map.

Makai Site: The 2013 USGS Topographic Map of the area and the Google Earth satellite images show the site located on the western side of the Hanapēpē River drainage basin and at the base of the western slope of the volcano. The site is approximately 30 feet above mean sea level (msl), and about ¼ mile from the mouth of Hanapēpē River where it enters Hanapēpē Bay. The surrounding area to the south slopes gently down to sea level and the topography to the north of the site rises gently up the slopes of the volcano.

The Makai Site is comprised of one type of soil identified as “Pakala” soil, which is classified as a Class B “clay loam.” This soil is “deep and moderately deep, moderately well and well-drained soil with moderately coarse textures.” Soil layers for this type of soil are generally segregated at the Site as follows: 0 – 16 inches - Clay Loam. Silt-clay materials, clayey soils; and 16 – 59 inches – Silty Clay Loam. Silt-clay materials, clayey soil.

Figure 5: SLOPE ANALYSIS MAP AND TABLE

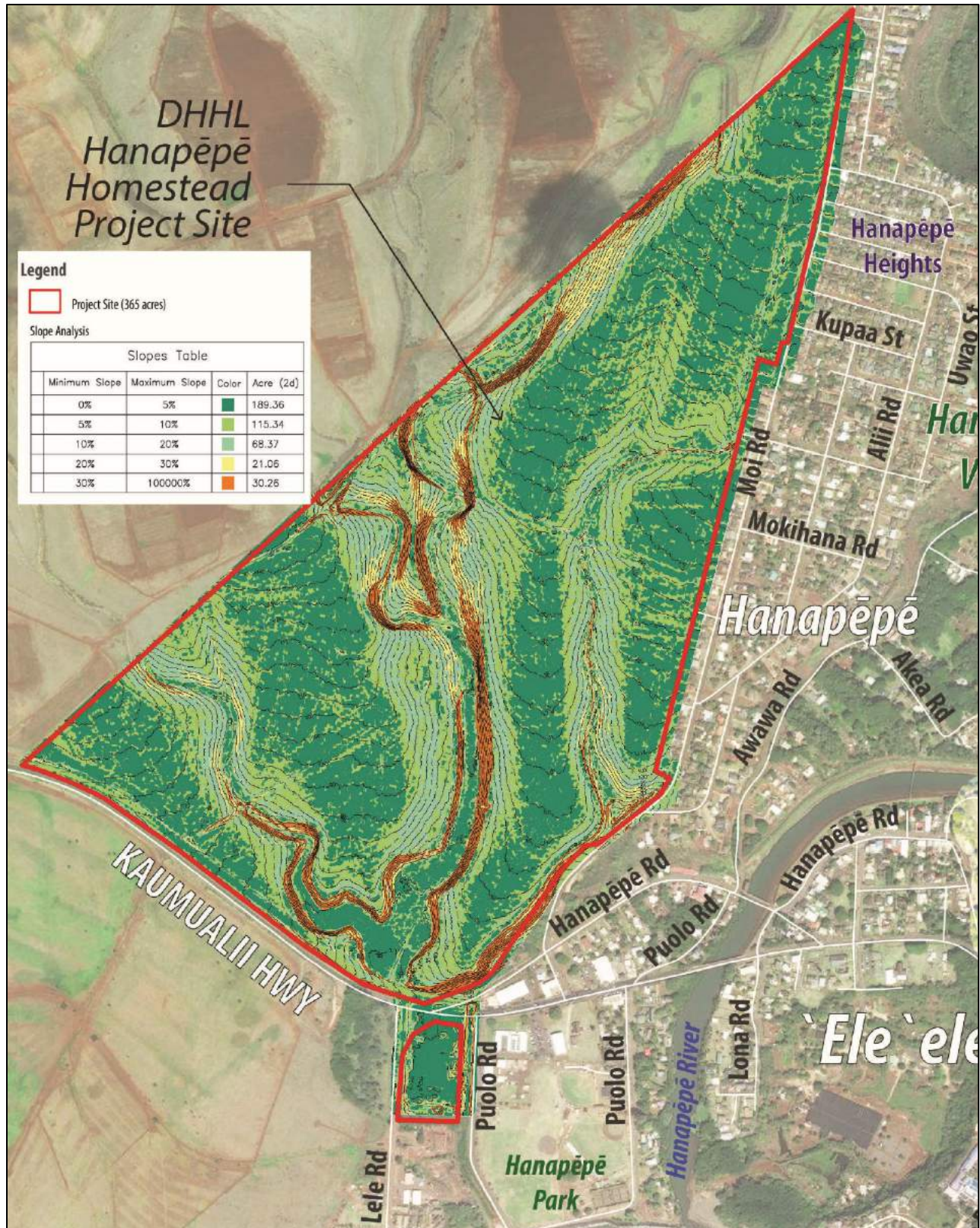


Figure 6: AGRICULTURAL LANDS OF IMPORTANCE TO THE STATE OF HAWAII MAP

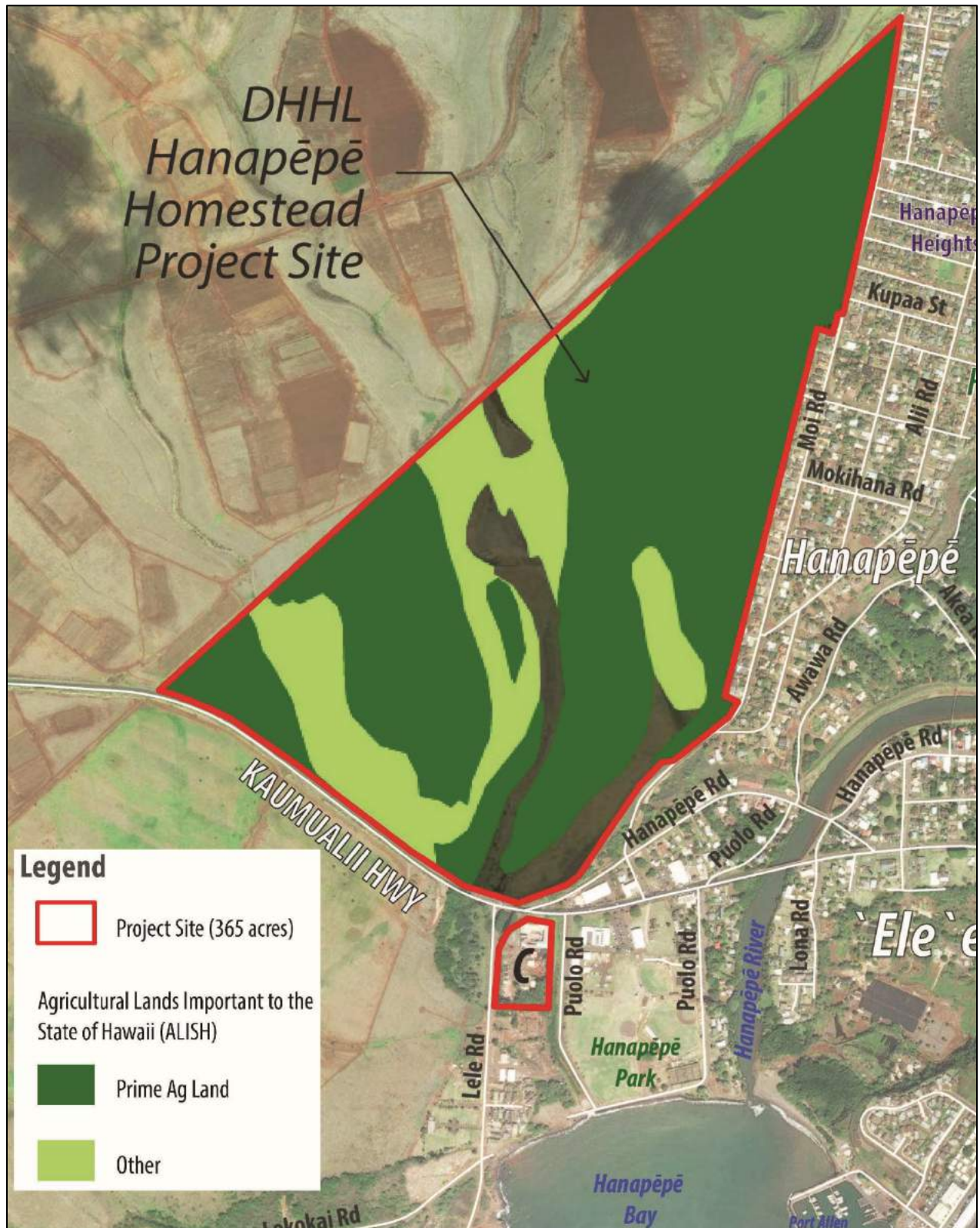
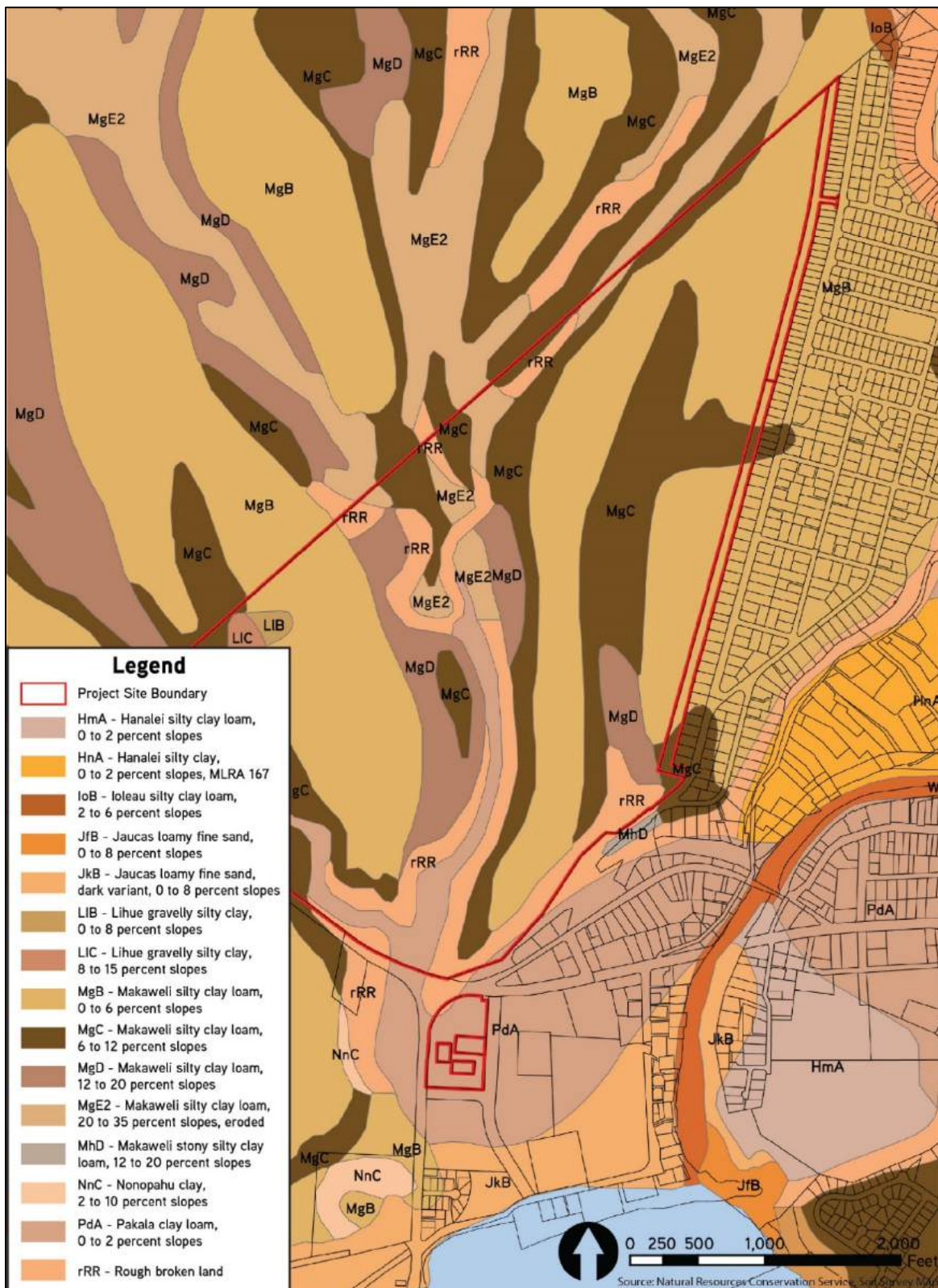


Figure 7: NATURAL RESOURCES CONSERVATION SERVICE HANAPĒPĒ SOILS MAP



Potential Impacts and Mitigation Measures

The primary constraints to development for the Mauka Site are related to the topography of several gulches of varying widths and steepness crossing the site. In general, the slopes and soils in these areas are less suited to development and are more likely to include sensitive resources such as flora, fauna, and cultural resources. Accordingly, the preferred land use plan designates the majority of the gulch areas and portions of the site with greater than 20% slope as Conservation or Special District. The proposed Project will have mitigable impacts upon the environment. The impact on the soil is anticipated to be less intensive than the commercial agricultural operations that previously dominated the area, nonetheless, it is important to mitigate any possible flooding to the makai areas that could potentially impact any and all cultural resources in the area.

The site shall be graded for accessibility in accordance with the Americans with Disabilities Act. Requirements include, in part, providing at least one accessible route from public transportation stops.

No significant impact to topographic landforms or soils at the subject property is anticipated. It is anticipated that the new underground water, sewer, and drainage systems will not be impacted by sea level rise, due to the elevated topography and the inland location of the site. All grading operations will be conducted in full compliance with dust, erosion control, and other requirements of the County of Kaua‘i and HAR, Section 11-60, 1-33 applicable to fugitive dust. A construction grading permit will be required. Best management practices will be included in construction plans to mitigate dust and/or silt emissions.

A Phase 1 Environmental Site Assessment Report was prepared for the Project by Kevin S. Kennedy LLC in 2019 (KSK 2019). The Mauka Site revealed no evidence of Recognized Environmental Concerns (RECs). However, the entire site was formerly used for commercial cultivation of sugarcane and pineapple. The normal application of pesticides and herbicides does not constitute an environmental “release” or “spill” under Hawaii environmental laws. Any future residential or commercial development of former agricultural lands will require environmental sampling and analysis of the soil to assess the presence and concentrations of various agrichemicals, their constituents and byproducts. The Makai Site is comprised of four adjoining tax parcels that contain 1) a Habitat for Humanity carpentry shop 2) two trucking companies with diesel truck repair operations and 3) a school bus parking lot with bus maintenance and repair operations. The Environmental Site Assessment has revealed evidence of REC’s at the site. These REC’s include the truck repair and maintenance operations, storage of bulk fuel and oil in the unsecured containers, stockpiled soil/asphalts, abandoned vehicles and truck parts, old battery storage and oil stained soil. Any future change in use or tenants should involve further study and remediation efforts as are determined necessary.

2.3 HYDROLOGY

Surface Water

There are no perennial streams located within or near the Project area. Both sites fall within the Waimea Aquifer Sector of Kaua‘i, which encompasses nearly the entire western side of the island, with the exception of the Nāpali Coast area. The Waimea Aquifer Sector is comprised of four aquifer systems: Kekaha, Waimea, Makaweli and Hanapēpē.

Groundwater

Mauka Site: According to Mink and Lau (1992), the Mauka Site overlies portions of two separate Aquifer Systems: the Makaweli Aquifer System, which generally underlies the western half of the Mauka Site and the Hanapēpē Aquifer System, which underlies the eastern half.

Six separate aquifers underlie various areas of the Mauka Site, three upper and three lower aquifers. For the eastern half of the Site, Mink and Lau assigned aquifer code 20304111 (21111) to the upper aquifer. The first part of the upper aquifer code number, 20304111, indicates that it is part of the Hanapēpē Aquifer System and contains a basal-type unconfined aquifer present in horizontally extensive lavas. The aquifer contains fresh water in contact with seawater and is unconfined (the water table is the upper surface of the saturated aquifer). The second part of the aquifer code number, 21111, is the aquifer Status Code, which in this case indicates that the aquifer has potential use as a drinking water aquifer. The aquifer contains fresh water with no salinity (chloride concentration < 250 mg/l), is irreplaceable and has a high vulnerability to contamination (Mink and Lau, 1992). The Mauka Site also falls within the Commission on Water Resource Management’s (CWRM) Makaweli Aquifer, assigned aquifer code 20303. The CWRM Water Resource Protection Plan’s aquifer system boundary area places the Project site within the Makaweli Aquifer. The Makaweli aquifer system is identified as having a sustainable yield of 26 MGD.

Makai Site: The Makai Site overlies portions of the Makaweli Aquifer System. Two aquifers underlie the site, an upper and lower aquifer. Mink and Lau assigned aquifer code 20303111(21111) to the upper aquifer. The first part of the upper aquifer code number, 20303111, indicates that it is a basal-type unconfined aquifer present in horizontally extensive lavas. The aquifer contains fresh water in contact with seawater and is unconfined (the water table is the upper surface of the saturated aquifer). The second part of the aquifer code number, 21111, indicates that the aquifer has potential use as a drinking water aquifer. The aquifer contains water with a “low” salinity (chloride concentration 250 – 1,000 mg/l), is irreplaceable and has a high vulnerability to contamination (Mink and Lau, 1992).

The lower aquifer, aquifer code 20303122(21113), is a basal-type, confined aquifer contained in dike compartments. The aquifer status code for this lower aquifer (21113) indicates that the aquifer has potential use as a drinking water aquifer, containing fresh water (chloride content < 250 mg/l). The aquifer is considered irreplaceable and has a “low” vulnerability to contamination.

Potential Impacts and Mitigation Measures

There are no perennial streams located within or immediately adjacent to the Project area, however there is a high probability that portions of the land being used would have waters of the

U.S. present on the site and a delineation of waters of the U.S. may be necessary as future phases are developed. Consultation with the U.S. Army Corps' of Engineers Regulatory Program will be necessary to determine if a Department of Army permit is required (file number POH-2019-00231).

The Project will meet or exceed County drainage requirements by preparing a drainage master plan in accordance with Federal, State and County regulations. Eleven (11) stormwater detention basins have been proposed at various locations on the development site, including ten (10) within the Mauka Site and one (1) on the Makai Site. In addition, Low Impact Development strategies can be incorporated to further reduce the environmental impact and provide additional water quality improvement opportunities.

No long-term impacts to groundwater aquifers or surface waters are expected to result from the property's development. Best management practices will be implemented during construction to minimize risk of siltation and pollution due to construction related stormwater runoff. The Project will comply with HAR, Sections 11-54-1.1, and 4 through 8. A National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including stormwater runoff, into State surface waters (HAR, Chapter 11-55) will be secured from the State Department of Health. The initial Phase 2 (75 new residential lots) is not anticipated to involve work in, over, or under waters of the U.S. All discharges related to the Project construction and operation activities will comply with the State of Hawai'i's Water Quality Standards.

Any subsequent unforeseen negative impacts may be mitigated through management protocols developed with the lessees, continued coordination with the State Historic Preservation Division (SHPD), and designation of streams, gulches, and biologically promising areas as Conservation or Special District.

2.4 AIR QUALITY AND NOISE

Air quality in the Hanapēpē area is not rated on the Air Quality Index provided by the Hawai'i Department of Health, Environmental Health Division. However, the air quality in Hanapēpē is considered satisfactory and air pollution poses little to no risk. The Project area is surrounded by non-active agricultural areas and residential uses. Air quality in the vicinity of the Project is mostly affected by emissions from vehicular sources which emit carbon monoxide, nitrogen oxides, hydrocarbons and other air pollutants.

There are two potential types of air pollution emissions that could directly result in short-term air quality impacts during Project construction phases: (1) fugitive dust from soil excavation, aggregate processing and vehicle movement, and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term air quality impacts from addition of construction vehicular traffic on Moi Road, from slow-moving construction equipment traveling to and from the Project site, and from a temporary increase in local traffic caused by commuting construction workers.

Fugitive dust emissions from construction activities are difficult to estimate accurately because of their elusive nature of emission and because the potential for dust generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxide emissions from diesel engines can be relatively high compared to gasoline powered equipment, but the standards for nitrogen dioxide are set on an annual basis and are not likely to be violated by short-term construction equipment emissions. Indirectly, slow-moving construction vehicles on roadways leading to and from the Project site could obstruct the normal flow of traffic to such an extent that overall vehicular emissions increase.

Noise levels in the area are fairly low and are primarily associated with vehicles traveling along the highway and Moi Road.

Potential Impacts and Mitigation Measures

The proposed Project will have short-term construction related impacts on noise and air quality, but impacts will be mitigated through best management practices, including applicable measures to control fugitive dust found in Hawai‘i State Department of Health, Clean Air Branch’s Standard Comments for Land Use Reviews.

Mitigating construction noise at the source is the most effective form of noise control and most construction equipment will follow appropriate noise control. Construction will be mitigated by best management practices in accordance with State Department of Health and County of Kaua‘i construction permit conditions. During Project construction, the dominant noise sources will likely be earth moving equipment, such as bulldozers and diesel-powered trucks.

Short-term impacts on air quality are anticipated to result from fugitive dust during Project construction phases. Because of this, an effective dust control plan for the period of construction should be prepared and implemented. After construction, any long-term impacts on air quality from motor vehicle traffic related to this Project will likely be negligible.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in active construction areas from becoming significant sources of dust. Control regulations will further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials likely to give rise to airborne dust. Haul trucks tracking dirt onto paved streets from unpaved areas are oftentimes a significant source of dust in construction areas. Some means to alleviate this problem, such as tire washing or road cleaning, may be appropriate. Dust monitoring will be considered as a means to quantitatively evaluate the effectiveness of dust control measures.

On-site mobile and stationary construction equipment air pollutant impacts will be mitigated by moving heavy construction equipment during periods of lower traffic volume. Likewise, the schedules of commuting construction workers may be adjusted as needed to avoid peak hours in the Project vicinity.

After the period of construction, long-term impacts on air quality from motor vehicle exhausts can potentially occur at or near any location that attracts large volumes of motor vehicle traffic. Carbon monoxide emissions are usually the primary issue, and public areas near traffic-congested intersections are the main concern. The Project’s traffic impact analysis indicates that the existing traffic level of service at these intersections is reasonably good, and in the future condition, it was found that with construction of the Project this would continue to be the case.

Considering the small Project-related traffic volumes that are expected and the reasonably good traffic level of service that is forecast, traffic from the proposed Project should have no measurable long-term impacts on air pollution levels in the Project area.

2.5 FLORA AND FAUNA

A team of biologists from H.T. Harvey and Associates conducted a flora and fauna survey of the Project area on March 4, 2019. A copy of the biological survey report is provided in Appendix B.

Most of the inaccessible interior of the Project area can be described as grassland habitat. Because this area has a long history of intensive cultivation, there are almost no traces of original vegetation at the site today. It is covered with dense, monotypic stands of dead guinea grass (*Megathyrsus maximus*) with scattered haole koa trees (*Leucaena leucocephala*). Unlike in the aerial photographs of the Project area, the Kukamahu Gulch habitat could not be distinguished when scanning the interior of the Project area from the eastern and southern borders. However, limited access to the southernmost portion of the gulch which runs parallel to the Highway revealed that the gulch was dry. The gulch constitutes a sharp drop of about 30 ft. from the edge of the Highway right-of-way. The western end of the gulch is comprised of large ‘opiuma trees (*Pithecellobium dulce*) with hardly any understory vegetation.

A total of 53 plant species were observed in the surveyed parts of the Project area. Fifty-one (96%) of these are either cultivated or naturalized and two species (4%): hoary abutilon (*Abutilon incanum*) and ‘uhaloa (*Waltheria indica*) are believed to be indigenous to the Hawaiian Islands (Wagner et al., 1999). No plant species state- or federally-listed as threatened or endangered, or candidates for listing, and no rare native Hawaiian plant species were observed in the accessible parts of the Project area. The Project area does not contain proposed or designated critical habitat for threatened or endangered plant species. The main vegetation types observed are provided in Table 2.

Fourteen (14) bird species, all nonnative introduced species were seen during the survey of the Project area. Seven (7) of these species are designated as injurious species on the state list of injurious wildlife (DLNR, 2015) and are known to be harmful to agriculture, aquaculture, or indigenous wildlife or plants or to constitute a nuisance or health hazard: cattle egret (*Bubulcus ibis*), zebra dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), Japanese white-eye (*Zosterops japonicus*), chestnut munia (*Lonchura atricapilla*), white-rumped shama (*Copsychus malabaricus*), and rose-ringed parakeet (*Psittacula krameri*). The first four of these species were either abundant or commonly found on the Project site, while the latter three were uncommon and rare, respectively, on the site. The other common and abundant urban bird species observed during the course of the survey were all nonnative introduced species typically seen in lowland areas. These included the common myna (*Acridotheres tristis*), northern cardinal (*Cardinalis cardinalis*), house finch (*Carpodacus mexicanus*), domestic pigeon or rock dove (*Paroaria coronata*), red-crested cardinal (*Paroaria coronata*), and domestic chicken (*Gallus domesticus*). Hawaii’s only native land mammal is the ‘Ōpe‘ape‘a, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), which can be found throughout Kaua‘i, Maui, Oahu, and Hawai‘i islands. They roost in native and non-native trees alike, and often forage in area like the borders between forest and pasture lands, forest road corridors, streams, bays and inlets.

Although no Hawaiian seabirds were observed, there was evidence of the presence of seabirds in the area. The electrical transmission lines along Kaumuali‘i Highway near the southwest corner of the property have bird diverters attached, which function to visually warn seabirds transiting the area of the presence of power lines. A check of the Kaua‘i Humane Society’s Save Our Shearwaters (SOS) Program seabird fallout records indicate that Hanapēpē and ‘Ele‘ele areas experience fallout of the threatened Newell’s shearwater (*Puffinus newelli*), Hawaiian petrel (*Pterodroma sandwichensis*), and wedge-tailed shearwater (*Puffinus pacificus*) on an annual basis. The fallout records in close proximity to the Project site indicate that these species fly near or over the Project site on an annual basis. The main faunal types observed are provided in Table 3.

TABLE 2: MAIN VEGETATION TYPES OBSERVED IN HANAPĒPĒ

AREA	DOMINANT VEGETATION
6-acre industrial parcel	Mixed-scrub vegetation, ornamental plants, variety of trees and shrubs (haole koa, monkeypod, ‘opiuma), ‘uhaloa
Hanapēpē Road	Haole koa shrubland, guinea grass, buffel grass, creeping indigo
Project Area interior	Grassland habits, dead guinea grass, scattered haole koa trees
Kukamahu Gulch	‘Opiuma trees, castor bean shrubs, haole koa, guinea grass

TABLE 3: MAIN FAUNAL TYPES OBSERVED IN HANAPĒPĒ

TYPE OF FAUNA	OBSERVATION/DESCRIPTION
Non-native birds	Cattle egret, zebra dove, spotted dove, Japanese white eye, chestnut Munia, rose-ringed parakeet, common myna, domestic pigeon, domestic chicken
Native birds/ mammals	None
Non-native mammals	domestic and feral cats, domestic horses

Potential impacts and mitigation measures

It is unlikely that the proposed Project will have a significant adverse impact on any plant species state or federally listed as threatened or endangered, candidate species for listing as endangered, species of concern, or rare native Hawaiian plant species. The Project area is highly disturbed, comprising of abandoned agricultural land now dominated by guinea grass grassland, residences, and an industrial lot, and with 96% of the flora being nonnative. The two indigenous plant species found in the Project area commonly occur on Kaua‘i and the other Main Hawaiian

Islands. However, it should be noted that the vast majority of the Mauka Site could not be surveyed on foot and was only able to be scanned using binoculars. It is possible that since agricultural practices were abandoned, some native plant species recruited and found refuge in suitable pockets of the Project area not invaded by the surrounding weedy vegetation (e.g. near the gulch habitat). Therefore, it is recommended that, before any major vegetation clearing is conducted, the interior of the 357-acre parcel should be surveyed on foot to confirm the presence or absence of any native plant species.

No native wildlife species were observed in the Project area at the time of the survey. However, the vast open grasslands of the Mauka Site appear to provide suitable habitat for Hawaiian short-eared owl (*Asio flammeus sandwichensis*) or pueo. This area also likely provides habitat for non-native barn owl (*Tyto alba*) and introduced game birds such as ring-necked pheasant (*Phasianus colchicus*), gray francolin (*Francolinus pondicerianus*); black francolin (*Francolinus francolinus*); and Erckel's francolin (*Francolinus erckelii*) (DLNR, 2019). These species are relatively common and distributed throughout the State and have open grassland habitat available in adjacent fallow agricultural land and pasture areas. On-foot surveys for seabirds were not conducted. However, the endangered Hawaiian petrel, threatened Newell's shearwater, and wedge-tailed shearwater are seabird species known to occur on Kaua'i and transit through the Project area (SOS 2018, USFWS 2019). Furthermore, seabird diverters were observed on the utility wires along Kaunuaui Highway near the southwestern end of the Project area suggests that seabirds frequent the Project area during the February-December seabird breeding season and tall overhead powerlines present a collision hazard to these birds in this area. Similarly, recent Save Our Shearwaters fallout records (SOS 2018) also indicate that fledgling seabirds are attracted to external lights in adjacent urban areas and external lights pose a light attraction hazard during the seabird fallout season from September 15 to December 15 in this area.

The further development of powerlines and external artificial lighting present an additional risk to seabirds, if not minimized or avoided (KIUC 2011). It is recommended that the Project incorporate measures to avoid or minimize potential impacts, such as limiting the quantity of, and shielding street lights, community park lighting, and external lights on buildings. Nighttime work that requires outdoor lighting would need to be avoided during the seabird fledging season from September 15 through December 15.

Hawaiian hoary bats are known to occur on Kaua'i (Tomich 1986) and their presence in the Project area cannot be ruled out. No trees greater than 15 feet tall should be trimmed or removed during the bat pupping season from June 1 to September 15.

State listed waterbirds have the potential to occur in the vicinity of the Project. If any of the waterbird species are present during construction, then all activities within 100 feet should cease and the bird(s) should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, the Kaua'i Division of Forestry and Wildlife (DOFAW) office should be contacted.

In their comments submitted on the Draft EA, DOFAW noted concerns about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongoose, and recommended actions to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles. DOFAW recommended minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid 'Ohi 'a Death), vertebrate and

invertebrate pests, or invasive plant parts that could harm our native species and ecosystems and consulting the Kaua'i Invasive Species Committee in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. In addition, the following minimization measures would be followed:

1. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Gear that may contain soil, such as work boots and vehicles, should be thoroughly cleaned with water and sprayed with 70% alcohol solution to prevent the spread of Rapid 'Ohi'a Death and other harmful fungal pathogens; and
2. Use of native plant species for landscaping if appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.).

2.6 NATURAL HAZARDS

Kaua'i island is subject to various natural hazards. Flooding, wildfires, and tsunami are the main risks. The vulnerability of the Project site to these hazards is described below.

Flood Hazard Risk

The Project area is designated as an area of minimal flood hazard, Flood Zone X, on the Federal Emergency Management Agency Flood Insurance Rate Maps. Zone X is determined to be outside the 500-year flood zone, with minimal risk of flooding.

Wildfire Hazard Risk

The State Department of Land and Natural Resources Division of Forestry and Wildlife identified the Mauka Site as in the "N/A" zone for risk to wildfire hazards. However, due to drier weather, hotter temperatures and stoppage of agricultural uses on the Project site, the risk of wildfire is high, and development of the site would help to mitigate the risk of wildfire substantially, with appropriate firebreaks provided between developed and open areas. Based on community concerns, DHHL Land Management Division recently (in 2019) cleared the area behind the existing residential homestead lots to create a fire break as a safety measure in the event of wild fire.

Tsunami Risk

The Pacific Disaster Center has identified the Makai Site as being within the Tsunami Evacuation Zone. The larger Mauka Site is determined to be outside the Tsunami Evacuation Zone.

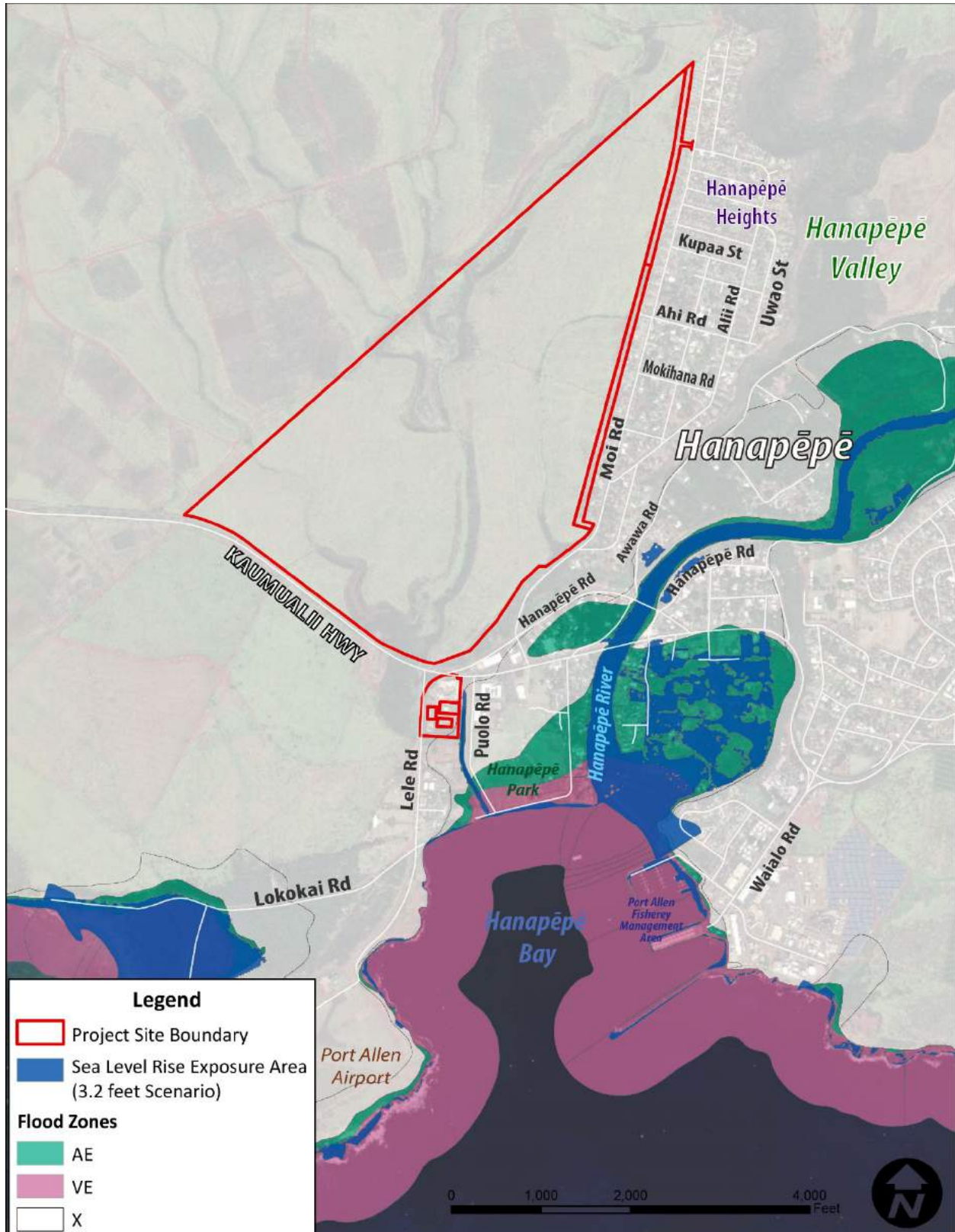
Flooding & Sea Level Rise

Both the Makai and Mauka Sites are designated as Flood Zone X on the Federal Emergency Management Agency Flood Insurance Rate Maps. Flood Zone X is determined to be outside the 500-year flood zone, with minimal risk of flooding. Both sites are located outside of the 3.2-foot Sea Level Rise Exposure Area (SLR-XA) from the Hawai'i Sea Level Rise Vulnerability and Adaptation Report. The Makai Site is located adjacent to but outside of the 3.2-foot Sea Level Rise Exposure Area SLR-XA. See Figure 8.

Potential Impacts and Mitigation Measures

The chance of flooding is minimal. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X of the Flood Insurance Rate Maps and the entirety of the Project is located within Zone X. In the event of an extreme tsunami, residents, employees and visitors will be able to take shelter in portions of Hanapēpē or community use facilities in the future. Wildfires were noted as a concern in consultation with current lessees and neighboring landowners. It was noted that firebreaks should be maintained between residential areas and open areas including gulches and grasslands to minimize wildfire risk. The Project area is located outside the 3.2-foot Sea Level Rise Exposure Area (SLR-XA) identified in the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report (2017).

Figure 8: FEMA FLOOD ZONE AND SLR-XA MAP



2.7 HISTORIC AND ARCHAEOLOGICAL RESOURCES

An archaeological assessment was conducted by DUDEK dated April 2019 to assess potential impacts of the proposed land use plan in accordance with the requirements set forth in HRS Chapter 343. A copy of this report is provided in Appendix C.

No known archaeological features or deposits within the Project areas were noted during background research of the Mauka Site. No archaeological features or deposits were observed during the preliminary site visit, however the dense and tall vegetation obscures the majority of the larger land parcel. Ranching and extensive mechanized agricultural activities have taken place on the Mauka Site for over 150 years, and the Makai Site has undergone at least one century of development.

Early Historic Period

Kaua‘i Kuapapa (ancient Kaua‘i) and Hanapēpē Ahupua‘a (traditional land division) were likely settled sometime after the 11th century C.E. by waves of Polynesia seafarers from the Marquesas and Tahiti. Hanapēpē Ahupua‘a hosted initial human settlement and uses unique throughout the Hawaiian Islands. Hanapēpē is translated as “crushed bay” and may be derived from Hanapepehi “killing bay”.

It encompasses the Hanapēpē River system that winds through numerous canyons and valleys before terminating at Hanapēpē Bay. Freshwater flowed through an array of terrains and elevations and ensured that Hanapēpē’s resources were plentiful and varied. Salt was harvested from ancient salt pans situated along the coast.

Handy and Handy (1972) suggest that Hanapēpē, as well as canyonlands throughout Kaua‘i hosted rare inland populations and settlements. They argue people within them subsisted primarily on kalo yields from dryland lo‘i flanking rivers and streams, and interacted rarely with the sea.

In 1778, Captain James Cook and the crew of *The Discovery* arrived at the mouth of the Waimea River, roughly 6 miles northwest of the Project areas. James Ellis, the surgeon’s mate on board, sketched Kaua‘i island’s south shore. Cooks arrival opened Kaua‘i and the islands to successive eras of foreign incursion, invited settlement and colonization.

Mid to Late 1800s

Mid-19th century accounts describe the fertile kalo fields, inland settlements and population of Hanapēpē. In 1847, Reverend Bingham recorded an inland settlement of 140 cottages and seven hundred inhabitants farming kalo in Hanapēpē Valley. An 1853 map of Kaua‘i population estimates counts roughly 1,400 people in the Hanapēpē Ahupua‘a. A description of Hanapēpē Valley from the same year describes its plantations, dwellings and coconut and taro patches. In an 1864 letter, Norwegian settler and ally of King Kamehameha III Valdemar Knudsen describes Hanapēpē as replete with fallow kalo and rice fields, and states that hula is still being practiced despite missionary bans.

Whaling, trade and commerce flourished between 1830-1861 in cities and settlements along Kaua‘i’s southwest coast (Joesting, 1984). Rice farming became established on Kaua‘i between the 1850’s and 1860’s.

The expansive growth of the sugar cane and pineapple industries throughout the archipelago transformed settlement and land use in Hanapēpē. The sugar industry in the Hawaiian Islands began on Kaua‘i and lasted from 1835 through 2009, drastically altering the landscape, economy and settlement patterns across the island and in the Project area.

In 1865, Elizabeth McHutcheson Sinclair, a wealthy Scottish emigrant who arrived via numerous booming economic frontiers around the Pacific rim, purchased the land between the Hanapēpē and Waimea rivers. Sinclair’s purchase is referenced as the Makaweli Ahupua‘a, but by description and in maps through the early 20th century, appears to have included the Project area in adjacent Hanapēpē Ahupua‘a. Sinclair partnered with her sons-in-law Francis Gay and Aubrey Robinson to form the Gay and Robinson partnership, purchased the lands adjoining theirs in Hanapēpē, and owned the entirety of the Kona District by 1873. Gay and Robinson and the Hawaiian Sugar Company plantations, as well as a ranch, resulted on Makaweli and Hanapēpē lands.

1900’s

A 1901 map of Kaua‘i classifies Hanapēpē and the Project areas as former Crown Lands initially reserved exclusively for use by Kamehameha III that transitioned into public domain before being classed as “Public Lands.” A 1903 map of Kaua‘i depicts Hanapēpē and the Project areas as “public lands”. The Project area also appears as part of the Gay and Robinson Makaweli Plantation. In the 1930’s, Hanapēpē Valley was under heavy agricultural cultivation. In 1941, C. Brewer Co. leased land from Gay and Robinson and established the Olokele Sugar Company, which operated until 1994 before being reabsorbed into the Gay and Robinson family holdings. Gay and Robinson is the last of three sugar plantations in the Hawaiian Islands and the last family-owned plantation.

Contemporary Land Use

The Mauka Site was formerly in sugar cane cultivation by Olokele Sugar Company, Ltd. The Project site is currently vacant and lays fallow, with no agricultural activity or production. DHHL previously established approximately 47 Residential homestead lots along Moi Road, on the eastern edge of the Project area.

Potential Impacts and Mitigation Measures

No archaeological features or deposits within the Project areas were noted during background research of the subject parcel. Neither were archaeological features or deposits observed during the preliminary site visit, although extremely dense, tall vegetation obscures the majority of the Mauka Site. Ranching and extensive mechanized agricultural activities have taken place on the Mauka Site for over 150 years, and the Makai Site has undergone at least one century of development.

Based on the fact that one archaeological study has partially, definitively occurred in the Project areas, an Archaeological Inventory Survey (AIS) of the subject properties is likely necessary for future development. The AIS should be developed in coordination with the SHPD and undertaken in full compliance with HAR 13-275, 13-276 and all additional applicable heritage legislation. Special attention should be given to any sinkholes and caves present on the larger subject property that may contain cultural materials/heritage destroyed or cleared from the rest of the landscape by extensive, sustained, ranching and sugar cane cultivation activities. The Project

designates the gulches as Conservation areas not to be developed, which constitutes a preliminary effort to preserve possible features that may exist in the gulch areas. DHHL will continue to consult with the SHPD to determine what additional historic preservation work might be required, if any, including additional documentation of specific known features.

2.8 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) was conducted by Nohopapa Hawai‘i, dated December 2019 to identify cultural resources within the Project area, potential impacts to those resources as a result of the proposed Project, and recommended measures to mitigate impacts. A draft of the CIA is provided in Appendix D.

Background on the Hanapēpē Area

The Project area is located in the Ahupua‘a of Hanapēpē (crushed bay) in the Kona Moku. The study area consists of two discontinuous ‘Apana (portions or segments), made up of five TMK parcels. Hanapēpē Ahupua‘a is replete with wahi pana (legendary places) and oral history. In a rare occurrence, maka‘āinana (common people) purportedly disposed of an unreasonable, obsessive high chief by throwing him off Holoīwi (traveling bones) Cliff. Hanapēpē Ahupua‘a hosts several leina a ka ‘uhane - leaping places associated with the transit of the dead into Pō, the “place of the dead”, or afterlife.

Early accounts depict Hanapēpē Ahupua‘a as hosting a rich trajectory of initial human settlement and uses unique throughout the Hawaiian Islands. Legends and oral histories state Kaua‘i experienced famine and drought less frequently than the other islands. During the Māhele, Crown lands in the Ahupua‘a of Hanapēpē, once inalienable and in trust for the people, were sold off to large land owners.

During the Hawaiian Kingdom Era (pre- Jan.17, 1893) portions of Hanapēpē were already in sugar. The 1865 land purchase of Elizabeth McHutcheson Sinclair established two sugar plantations and a cattle ranch between Hanapēpē River and Waimea River. In the 1950’s, the Hanapēpē Heights neighborhood was established adjacent to the Project area.

No archaeological features or deposits within the Project area were noted during background research or found during the fieldwork.

Community Consultations

Nohopapa Hawai‘i consulted with individuals knowledgeable with the Project area who participated in community ethnographic interviews for contributions to the cultural impact assessment. Ethnographic research involves gathering oral histories and conducting interviews with living communities to record historical connections to a place. Six individuals were contacted for the study. Three individuals participated in ethnographic interviews, one provided discussions off the record, and the fifth declined to participate. All community members interviewed commented on the lack of archival history about Hanapēpē, in both Hawaiian and English, citing that little remains of the mo‘olelo, ‘oli, mele, hula, and place names of Hanapēpē from historic times.

Hanapēpē, even at the time of the Mahele (1850s) had a large population, supported by agriculture extending deep into the valley. At this time, pa‘akai was being actively harvested at ‘Ukulā to support mauka and makai food preparation and preservation.

Hanapēpē was a place renowned for hula. The hālau Palaihiwa o Kaipuwai, established in 1945 by the late Kumu Hula Helen Kaipuwai Kekua Waiāu taught hālau in Hanapēpē for a time. Her granddaughter and current Kumu Hula Kēhaulani Kekua spent time learning mo‘olelo from area kūpuna in her grandmother’s tradition.

Today there are twenty-two Hanapēpē ‘ohana who make salt. Their families have roots in the area and have been passing down mo‘olelo of the area as well as the traditional cultural practice of cultivating lo‘i pa‘akai. It is these families, grounded by practice, that are most likely to have kept the old stories of the area alive. One well known kūpuna and salt maker, the late Auntie Wilma Holi, shared several mo‘olelo of the area, passed down to her through her family, with ‘ohana and friends of her time. The interviewees’ main concerns about the Project were that the process, design, and build-out be thoughtful, and that Hawaiian cultural resources be protected and even restored as a result of the development of a new Hawaiian homestead area.

Access throughout Hanapēpē lands remains an important cultural issue. Interviewees also expressed concerns over safety and worries were expressed over the speed at which vehicles travel on Kaumuali‘i Highway along the stretch bordering Hanapēpē Hawaiian Home Lands and the intersection of Kaumuali‘i Highway with Lele Road and Hanapēpē Road. A general concern involves limiting access to dunes and the education needed to reduce the negative effects of compacting the clay substrate beneath the sand due to vehicle access. This can result in impacts to the wells used for salt making, and prevents native plant species that grow on the dunes from flourishing. The increasing dune erosion, dust and debris along the windy shoreline are detrimental to the local ecosystem and salt production.

The salt makers would like to see new homesteaders informed about ways to take care of the makai area and encourage community and visitor support in adhering to protective measures. Creating cultural connections with new homesteaders coming to Hanapēpē is an important step towards growing a healthier Hawaiian community. Through active engagement and restoration, new Hawaiian Homesteads in Hanapēpē could positively impact cultural resources and grow traditional cultural practices.

2.9 VIEWPLANES

The Project is located on agricultural open space land on the mauka side of Kaumuali‘i Highway. The Mauka Site is located on a gentle slope within two miles of the coast. The Makai Site is located within approximately a half mile of the coast. Much of the region was previously under sugar cultivation and remains in agricultural open space from Hanapēpē town to Waimea town.

Views from the Project’s Mauka Site are generally of agricultural open space when looking west, open space and coastline when looking south, Residential areas and Hanapēpē town when looking east, open space and mountainous areas when looking north. Figure 9 provides a map key for viewplane vantage points of photos provided in Figure 10.

Public views of the property are generally from Kaumuali‘i Highway, which runs east to west along the Project area. Views are mainly of pasture lands, tall grasses, shrubs, and some trees. Figure 8 provides views of the Project site from Kaumuali‘i Highway.

Potential Impacts and Mitigation Measures

The proposed Project will have mitigable impacts upon the environment. The Project will alter the existing views of agricultural lands as they are converted to homesteads, but the Subsistence Agriculture land use will be consistent with previous and current agricultural land uses. Single-family homes may be built by lessees and no mid- or high-rise buildings will be allowed. The Subsistence Agricultural lots will be larger than the Residential lots, maintaining open space views from Kaumuali'i Highway.

Future Commercial and Community Use development will occur adjacent to Kaumuali'i Highway at the lowest elevations in the Mauka Site, thereby resulting in less impacts to mauka to makai viewplanes in the area. Where appropriate for design, adequate setbacks and screening landscaping will be considered to mitigate possible visual impacts along Kaumuali'i Highway.

Figure 9: LOCATION OF VIEWPLANE PHOTOS



Figure 10: **VIEWS FROM THE PROJECT SITE**



Photo Location 1 – Looking North (Mauka)



Photo Location 2 – Looking South (Makai)



Photo Location 3 – Looking South (Makai)



Photo Location 4 – Looking Southwest (over gulch)



Photo Location 5 -- Looking North from Kaunuali'i Hwy



Photo Location 6 – Looking North (Mauka)

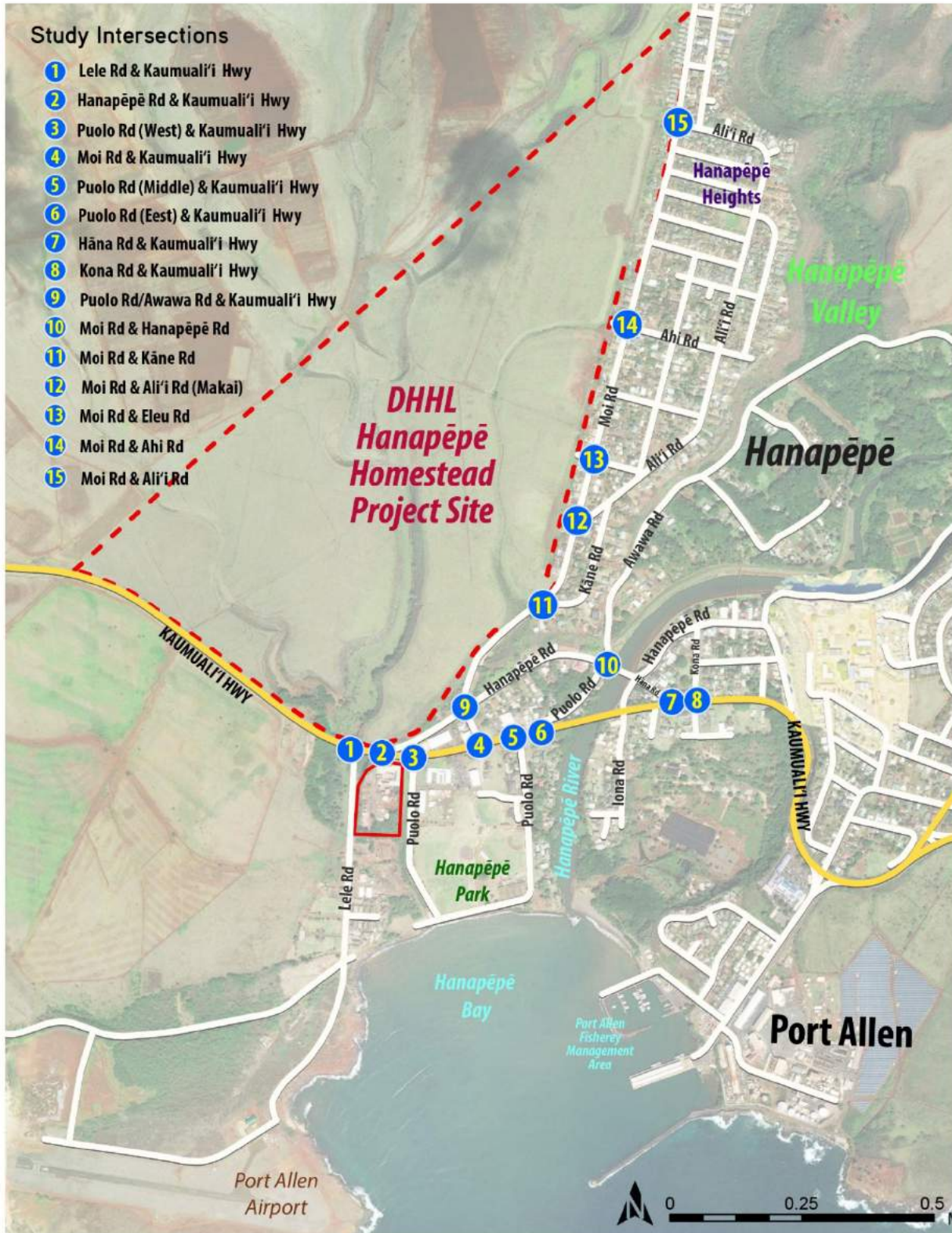
2.10 ROADS AND TRAFFIC

SSFMI International prepared a Traffic Impact Analysis Report (TIAR) for the Project dated October 12 2020. A copy of this TIAR is provided in Appendix E. The TIAR was prepared to assess traffic impacts as a result of the Project. Multimodal turning movement traffic counts were taken at 15 study intersections in the vicinity of Project area and analyzed for Existing (2019), Future (2025, 2040) Without Project, and Future (2025, 2040) With Project conditions. The Project location and study intersections are shown in Figure 11.

The TIAR assessed the impacts of the two Project phases:

- Phase 2 is assumed to include 75 new residential lots with an expected build-out and occupancy by 2025.
- Phase 3 full build-out includes 449 Residential lots, 111 Subsistence Agricultural lots, and development of new Commercial/Community Use areas. It also assumes the ongoing commercial /industrial use of the Makai Site. Full build-out is assumed to occur by 2040. The southwest corner portion of the Mauka Site is assumed to have Community Use areas for shared homestead uses and facilities that may include spaces for parks, recreation, cultural activities utilities and other amenities.

Figure 11: TIAR STUDY INTERSECTIONS



2.10.1 EXISTING ROADS AND FACILITIES

Surrounding Roadways

Kaumuali‘i Highway (State Route 50) is an undivided, two lane, two-way thoroughfare, classified as minor arterial. It traverses in the east-west direction in the Project area. It connects Hanapēpē to Kaumakani Village in the west and ‘Ele‘ele town in the east. The posted speed limit is 35-mph in the study area. Six-foot-wide shoulders are present on both sides of the road. No sidewalks, bikeways, or bike facilities exist along Kaumuali‘i Highway in the study area.

Moi Road starts from the signalized intersection with Kaumuali‘i Highway and ends mauka of its intersection with Ali‘i Road. It is a two-lane, two-way mauka-makai thoroughfare with a 25-mph posted speed limit. It connects Kaumuali‘i Highway to the existing DHHL and Hanapēpē Heights residential neighborhoods. Dedicated left turn lanes are present for both east and westbound movements at the intersection of Moi Road and Kaumuali‘i Highway. No shoulders, sidewalks, bikeways, or bike facilities exist along Moi Road. There are four (4) existing access roads to the Mauka Site that are oriented in east-west direction along Moi Road, at its intersections with Ali‘i Road, Ahi Road, Eleu Road and 300’ north of the intersection with Kane Road.

Hanapēpē Road starts from the stop-controlled intersection with Kaumuali‘i Highway, east of Puna road and ends at another stop-controlled with Kaumuali‘i Highway west of Puolo Road. It is a two-lane, two-way, east-west thoroughfare with a 25-mph posted speed limit. No shoulders, sidewalks, bikeways, or bike facilities exist along Hanapēpē Road.

Lele Road starts from the stop-controlled intersection with Kaumuali‘i Highway, west of Puolo Road, and ends makai of its intersection with Salt Pond Road. It is a two-lane, two-way, mauka-makai thoroughfare with a 25-mph posted speed limit. It connects Kaumuali‘i Highway to the Salt Pond Park and Port Allen Airport. No shoulders, sidewalks, bikeways, or bike facilities exist along Lele Road.

Pedestrian and Bicycle Facilities

Minimal dedicated pedestrian or bicycle facilities exist in the Project area. Six-foot-wide shoulders are present on both sides of Kaumuali‘i Highway, however no other roads in the Project area have dedicated space for pedestrians or bicycles, limiting the ability for people to get around the community by means other than passenger vehicle.

Bus Transit System

Kaua‘i Bus provides service to the island of Kaua‘i from Kekaha to Hānalei. Route 100, Kekaha-Līhu‘e mainline passes through Hanapēpē once per hour from 5:40am to 8:40pm. Bus stops are located at Hanapēpē Multipurpose Building on Puolo Road, Hanapēpē Armory and Hanapēpē First United Church on Kaumuali‘i Highway. Route 200, Līhu‘e-Kekaha mainline passes through Hanapēpē once per hour from 6:30am to 10:30pm. Bus stops are located at Westside Pharmacy, Mariko Store on Kaumuali‘i Highway and Hanapēpē Multipurpose Building on Puolo Road.

2.10.2 EXISTING TRAFFIC CONDITIONS

Moi Road and Kaumuali‘i Highway are two major roads which provide access to the existing and proposed developments. Considering existing traffic movements in the Project area and the anticipated impact of the Project, 15 intersections were selected for study. Out of these, 15 intersections 6 are along Moi Road and 8 are along Kaumuali‘i Highway. Both Moi Road and Kaumuali‘i Highway intersect each other at signalized intersections, and all other study intersections are stop-controlled. The study area did not include the intersections of Kaumuali‘i Highway-Iona Road –Hanapepe Road and Kaumuali‘i Highway – Pepe Road since these intersections are in the immediate vicinity of the Project and were assumed to have a relatively minor impact on operations or traffic flow due to their limited access to a low number of residential houses. Intersections further from the project that provide secondary access to Hanapepe town were selected for study to better understand regional traffic flow.

The most recent historical average daily traffic (ADT) along the roadways in the Project area in the year 2016 is shown in Table 4. The data comes from annual traffic counts completed by the HDOT and provided in *Historical Traffic Station Maps*.

TABLE 4: ROADWAY ANNUAL AVERAGE DAILY TRAFFIC (2016)

Roadway	Station	Location	ADT
Kaumuali‘i Hwy	B730 050 01702	Between Lele Road and Kaumakani Village Road	11,200
Moi Road	B730 543 00006	Between Hanapēpē Road and Kāne Road	4,600

Intersection peak period turning movement traffic counts for 14 study intersections were taken on Tuesday, May 14, 2019 and Wednesday, May 22, 2019 during the peak periods of traffic from 6:00am to 9:00am in the morning and 3:00pm to 6:00pm in the afternoon. Peak hours in the study area are identified as 7:00am to 8:00am in the morning and 3:30pm to 4:30pm in the evening. For the intersection of Eleu Road and Moi Road, traffic counts were estimated through balancing that with referenced adjacent intersections. The traffic count data may be found in Appendix E.

During the existing AM and PM peak hours, the signalized intersection of Kaumuali‘i Highway and Moi Road resulted in acceptable level of service (LOS) C or better for the intersection and movements. All the stop-controlled intersections along Moi Road resulted in LOS D or better. The side street approaches of the stop-controlled intersections along Kaumuali‘i Highway, east of Moi Road resulted in LOS E or F due to the lack of gaps in heavy traffic volumes highway. (See Table 5 for description of LOS). No significant pedestrian activity was observed in the study area. During the morning peak hour, a total of eight pedestrians were observed crossing the intersection of Kaumuali‘i Highway and Kona Road. During the afternoon peak hour, a total of 13 pedestrians were observed crossing the intersection of Moi Road and Ali‘i Road.

TABLE 5: LEVEL OF SERVICE DESCRIPTIONS

LOS	Description	Acceptability
A	Control delay is minimal	Satisfactory
B	Control delay is not significant	Satisfactory
C	Stable operation. Queuing begins to occur.	Satisfactory
D	Less stable condition. Increase in delays, decrease in travel speeds.	Acceptable*
E	Unstable operation, significant delays	Worse than acceptable
F	High delays, extensive queuing.	Worse than acceptable

2.10.3 FUTURE TRAFFIC CONDITIONS

DHHL is planning on building out the Project in multiple phases, with projected buildout years of 2025 (Phase 2) and 2040 (Phase 3).

Future (2025) Traffic Conditions Without Project (Phase 2)

The Kaua‘i County General Plan forecasts a growth rate of 1.10% for population, 1.06% for jobs, and 1.07% for housing per annum between 2010 and 2035 for the County of Kaua‘i. Out of the Projected growth, 47 % of the future population growth is allocated to the Līhu‘e District, 26% to South Kaua‘i, 13% to East Kaua‘i and 14 % to the remaining three districts – North Shore, Waimea-Kekaha, and Hanapēpē- Ele‘ele.

Traffic forecasting for the study area for Future Without Project conditions were based on known surrounding developments as well as background growth anticipated in the area. No other developments or construction projects which effect the travel patterns, in close proximity to the project area were identified, based on the best available information from research completed on January 2020 at the State of Hawai‘i Office of Environmental Quality Control (OEQC) website and the Statewide Transportation Improvements Program (STIP). Therefore, a 0.25% growth rate per annum was applied to all intersection movements in the study area. The resulting LOS for the Future Without Project (Phase 2) conditions are similar to existing conditions LOS.

Future (2025) Without Project intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. At the signalized intersection of Kaumuali‘i Highway and Moi Road all intersection movements resulted in acceptable LOS C or better. All stop-controlled intersection turning movements resulted in acceptable LOS D or better except for following turning movements:

- Puolo Road (Middle) and Kaumuali‘i Highway (Intersection #5): southbound movements resulted in LOS E for both AM and PM peak hours.
- Puolo Road (East) and Kaumuali‘i Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour.
- Hāna Road and Kaumuali‘i Highway (Intersection #7): southbound movements resulted in LOS E for both AM and PM peak hours.
- Kona Road (East) and Kaumuali‘i Highway (Intersection #8): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaumuali‘i Highway during the peak hours.

Future (2025) Traffic Conditions With Project (Phase 2)

The trip generated volumes from the Project were distributed along the new access roads and the existing transportation network. These volumes were added to the Future Without Project volumes for Future With Project volumes. The signalized intersection of Kaumuali‘i Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All the two-way stop- controlled intersection turning movements resulted in acceptable LOS of D or better except for following turning movements:

- Puolo Road (Middle) and Kaumuali‘i Highway (Intersection #5): southbound movements resulted in LOS E for both AM and PM peak hours.
- Puolo Road (East) and Kaumuali‘i Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour.
- Hāna Road and Kaumuali‘i Highway (Intersection #7): southbound movements resulted in LOS E for both AM and PM peak hours.
- Kona Road (East) and Kaumuali‘i Highway (Intersection #8): southbound movements resulted in LOS F with v/c ratio less than 1 for PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaumuali‘i Highway during the peak hours.

Future (2040) Traffic Conditions Without Project

The ‘Ele‘ele Residential and Commercial Project is a 30-acre development with access via a new driveway off-of Waialo Road. This development proposes the construction of 120 single-family residential units with approximately 35,000 square feet for commercial uses by the Year 2029. The development is estimated to generate 164 and 204 vehicle trips during the AM and PM peak hours respectively. Twenty-one (21) vehicle trips are projected to travel west towards Hanapēpē and 16 vehicles trips are projected to travel to the development from Hanapēpē during the AM peak hour. Similarly, 31 vehicle trips are projected to travel west towards Hanapēpē and 36 vehicles trips are projected to travel to the development from Hanapēpē during the PM peak hour.

Lima Ola Workforce Development is proposed to the east of Kaumuali‘i Highway in ‘Ele‘ele, on the island of Kaua‘i. The proposed project would construct approximately 550 affordable residential units of various densities by the year 2040. Project access would be through the easterly extensions of Mahea Road and Laulea Street. This development is estimated to generate 276 and 347 vehicle trips during AM and PM peak hours respectively. Fifty-four (54) vehicle trips are projected to travel west towards Hanapēpē and 15 vehicles trips are projected to travel to the development from Hanapēpē during AM peak hour. Similarly, 31 vehicle trips are projected to travel west towards Hanapēpē and 56 vehicles trips are projected to travel to the development from Hanapēpē during PM peak hour.

Traffic forecasting for the study area for future year 2040 without project conditions was based on the two (2) developments above as well as background growth anticipated in the area. This includes the Waimea sports complex and internal developments that will likely impact travel.

Therefore, a 0.25% growth rate per annum was applied to all roadways in the study area from 2019 till 2040.

Future (2040) without Project intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. The signalized intersection of Kaumuali‘i Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All the two-way stop-controlled intersection turning movements resulted in acceptable LOS D or better except for following turning movements:

- Hanapēpē Road and Kaumuali‘i Highway (Intersection #2): northbound movements resulted in LOS E for PM peak hour.
- Puolo Road (Middle) and Kaumuali‘i Highway (Intersection #5): northbound movements resulted in LOS E for PM peak hour, southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for AM and LOS E for PM peak hours.
- Puolo Road (East) and Kaumuali‘i Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour and southbound movements resulted in LOS E for PM peak hour.
- Hāna Road and Kaumuali‘i Highway (Intersection #7): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.
- Kona Road (East) and Kaumuali‘i Highway (Intersection #8): northbound movements resulted in LOS E for PM peak hour, southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaumuali‘i Highway during the peak hours.

Future (2040) Traffic Conditions with the Project (Phase 3)

Future (2040) with Project intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. The signalized intersection of Kaumuali‘i Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All the two-way stop-controlled intersection turning movements resulted in acceptable LOS D or better except for following turning movements:

- Lele Road and Kaumuali‘i Highway (Intersection #1): northbound movements resulted in LOS E for AM peak hour and LOS F with v/c ratio greater than 1 for PM peak hours; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio greater than 1 for both AM and PM peak hours.
- Hanapēpē Road and Kaumuali‘i Highway (Intersection #2): northbound movements resulted in LOS F with v/c ratio less than 1 for the PM peak hour.
- Puolo Road (West) and Kaumuali‘i Highway (Intersection #3): northbound movements resulted in LOS E for the PM peak hour.
- Puolo Road (Middle) and Kaumuali‘i Highway (Intersection #5): northbound movements resulted in LOS E for the PM peak hour; southbound movements resulted in LOS F with v/c ratio less than 1 for both AM and PM peak hours.

- Puolo Road (East) and Kaumuali‘i Highway (Intersection #6): northbound movements resulted in LOS F with v/c ratio less than 1 for the AM peak hour; southbound movements resulted in LOS F with v/c ratio less than 1 for the PM peak hour.
- Hāna Road and Kaumuali‘i Highway (Intersection #7): southbound movements resulted in LOS F with v/c ratio less than 1 for both AM and PM peak hours.
- Kona Road (East) and Kaumuali‘i Highway (Intersection #8): northbound movements resulted in LOS E for PM peak hour; southbound movements resulted in LOS E for the AM peak hour and LOS F with v/c ratio greater than 1 for PM peak hour.
- Sixth Access Road and Kaumuali‘i Highway (Intersection #16): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for AM peak hour and volume-to-capacity (v/c) ratio equal to 1 for PM peak hours.

Potential Impacts and Mitigation Measures

In the short-term scenario (Phase 2), Moi Road would continue to serve as the only ingress/egress to the project site and road operations would remain relatively consistent with current operations. All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaumuali‘i Highway during the peak hours.

In the long term (Phase 3), full build out will require additional regional roadway network improvements and mitigation treatments. Per HDOT recommendations, a 60-foot design setback is needed from Kaumuali‘i Highway to accommodate future roadways improvements. DHHL may be responsible to provide fair share mitigation of regional impacts.

The following changes in geometric configurations or change in control-type at the intersection were applied as mitigation measures.

- **Lele Road and Kaumuali‘i Highway (Intersection #1):** The intersection resulted in LOS F with volume-to-capacity (v/c) ratio 1.18 (> 1) and 1.79 (> 1) for the AM and PM peak hours respectively. Signal Warrant from MUTCD were analyzed with 70% factor as Hanapēpē is an isolated community with population less than 10,000. County of Kaua‘i General Plan forecasts the population Hanapēpē-‘Ele‘ele district will grow to 7,094 by 2035 (Table 1-1 Kaua‘i County Population, Island-Wide and By District (1990-2035). Four Hour Signal Warrants passed by using the existing volumes and Peak Hour Signal Warrants passed for Future (2040) With Project Conditions. A roundabout was analyzed at this location Per the County of Kaua‘i’s Street Design Manual, “a roundabout shall be used at any location where MUTCD signal warrants or all-way stop control warrants are met”. The resulting roundabout had appropriate LOS D or better for all approaches.
- **Two-way Left Turn Lane (TWLTL):** As a result of the poor LOS for side-street movements along Kaumuali‘i Highway, we have proposed widening the two-lane highway to include a dedicated TWLTL between Lele Road to Puolo Road (East). This will allow for side street movements to turn into the center lane, requiring drivers to find gaps in only one direction of traffic at a time. Hence all the side street movements along the Kaumuali‘i Highway between Lele Road and Puolo Road (East) are expected to result in acceptable LOS D or better.

- **Hanapēpē Road and Kaumuali‘i Highway (Intersection #2):** The Future Transportation Network proposes the removal of the misaligned (< 90-degrees) north leg at the intersection Hanapēpē Road and Kaumuali‘i Road. As a result, Hanapēpē Road is turned into a dead-end street north of the intersection. The right turning vehicles from Hanapēpē Road to Kaumuali‘i Highway were redistributed to make a right turn at the signalized intersection of Moi Road and Kaumuali‘i Highway (Intersection #4).
- **Kona Road and Kaumuali‘i Highway (Intersection #8):** Due to volumes on the Kaumuali‘i Highway side street volumes trying to make turn onto the highway from the Kona Road are experiencing higher delays and poor LOS, even though the volumes from the side streets are low. With the roundabout the LOS for all movements resulted in acceptable LOS of D or better.
- **Sixth access Road and Kaumuali‘i Highway (Intersection #16):** Delay can be reduced for southbound vehicles turning right from Sixth access Road onto Kaumuali‘i Highway by providing a dedicated right-turn lane. However, the southbound shared left movement resulted in LOS F with $v/c < 1.0$ for both AM and PM peak hours. Widening the Kaumuali‘i Highway in the vicinity of intersection to provide a refuge lane for the left-turning vehicles from Sixth access Road, allows drivers to find gaps in only one direction of traffic at a time. Hence all the turning movements are expected to result in acceptable LOS D or better.

With the development of the Residential lots, it is recommended to include dedicated space for bicycles and pedestrians as a part of new roadway build-out. This may look like one of the Residential Street cross-sections provided in the County of Kaua‘i Street Design Manual, with minimum five-foot-wide sidewalks included on either side and travel speeds low enough for people on bicycles to share the road. A continuous off-street path may be an appropriate solution to connect the residential neighborhood mauka of the highway to the commercial center and beach makai of the highway. Enhanced crosswalks should be included where appropriate. It is also recommended that Kaumuali‘i Highway be widened in the vicinity of the project to allow for safe and comfortable travel by pedestrians and bicyclists along the shoulders between Lele Road and Puolo Road. A proposed pedestrian plan is included as Figure 15 within the TIAR (Appendix E of this document).

The proposed transportation network improvements are shown in Figure 12.

2.11 PUBLIC AND PRIVATE UTILITIES

2.11.1 SEWER SERVICES

The segment of existing sewer collection system serving DHHL's existing 47 residential lots is located under Moi Road and was included as part of the DHHL Hanapēpē Residence Lots, Phase 1. The Phase 1 sewer pipe is an existing 8-inch diameter vitrified clay pipe, sloping at about 1 to 9 percent. The existing design flow of this facility is about 0.055 million gallons per day (MGD) and at a 3 percent pipe slope, the available capacity is about 1.18 MGD. The downstream sewer connection occurs makai of the Moi Road and Kupa'a Street intersection to an 8-inch sewer collection system. According to County DWWM, the gravity sewer discharges raw sewage into Sewer Pump Station (SPS) #1 located west of Hanapēpē River which is then conveyed about 1,100 ft downstream to a larger SPS #2, nestled between Hanapēpē Road and Kona Road, east of Hanapēpē River. Wastewater from SPS #2 is then conveyed to the 'Ele'ele WWTP, located further east and going makai along Waialo Road, approximately 2,700 ft away measured in radial distance.

Potential Impacts and Mitigation Measures

An analysis of wastewater requirements was conducted for two scenarios; Phase 2 (75 residential lots) and Phase 3 (full build-out).

For Phase 2, an 8-inch gravity sewer would be installed running along a new residential road, parallel to Moi Road, at roughly 3 percent grade and will connect downstream to existing sewer manholes at the upper Moi Road / Ahi Road intersection and further downslope at the lower Moi Road / Ahi Road intersection. Preliminary discussion with the County of Kaua'i Department of Public Works, Division of Wastewater Management (DWWM) indicated that the 'Ele'ele Wastewater Treatment Plant (WWTP) has enough capacity to accommodate the additional 75 houses proposed in Phase 2, however capacity is based on a first-come, first-served basis. Phase 2 would have an average daily flow of 0.030 MGD and peak flow of 0.166 MGD.

Phase 3 (full build-out) of the homestead community is proposed to be served by a combination of municipal sewer systems for the Residential homesteads, and individual wastewater systems (IWS) for the Subsistence Agricultural lots. The potential additional future flows to the 'Ele'ele WWTP from the Project's full build-out of Residential, Commercial and Community se areas would have an average daily flow of 0.199 MGD and peak flows of 1.030 MGD. The Subsistence Agricultural lots are proposed to be serviced by IWS consisting of septic tanks and leach fields that accommodate up to 1,000 gallons per day (GPD) of domestic wastewater.

The ability of the Phase 3 to connect to the County sewer system will be dependent upon timing, refinement of sewer generation flows and availability of capacity. The West Kaua'i Community Plan (Departmental Draft, 2020) estimates that the 'Ele'ele WWTP has adequate wastewater capacity through 2040. However, it is not currently known if the 'Ele'ele WWTP has enough capacity to include the full build-out of the Hanapēpē Homestead Community as it remains subject to the first-come, first-served policy. In addition, is unknown currently if the downstream existing sewer pump stations have adequate pumping capacity to accommodate Phase 3 of this Project. DHHL's design team has provided Phase 2 and Phase 3 design flows to the County DWWM for hydraulic capacity analysis and to determine if the pump station will require

improvements to increase flow capacity. If needed, DHHL plans to work with DWWM to identify possible upgrades to the wastewater collection and treatment works.

Since the proposed Project area is generally in a down slope direction, any new lift stations and pump stations would be located at the low spots along the proposed roadway network. The assumed gravity sewer pipe size is 8-inch diameter with more than adequate flow capacity along the main sewers following the roadway profiles (generally at 3 percent). The sewer collection system hydraulics will be refined and optimized in subsequent design phases. If a segment of the force main needs to be located along the State highway, then sewer easements will be required.

For lots which slope away from Moi Road, depending upon the severity of the falling slope, it is possible to sewer split level lots either by gravity and/or by sewage sump pumps. For lots with steeper topography where it is not feasible to raise building pads to sufficient height, a septic tank effluent pump (STEP) setup is proposed. These STEP sewers feature a septic holding tank installed with a low-profile sump pump, typically two pumps, one of which is on standby.

Depending upon the type of commercial uses within the Project area, wastewater pretreatment may be required by the County and State. This may apply to uses such as restaurants requiring grease traps, grease interceptor tanks, and oil-water separator chambers.

According to the State Department of Health Wastewater Branch, domestic wastewater must be collected from lots less than one acre in size. The Subsistence Agriculture lots, which are equal or greater to one acre, will be served by individual wastewater systems (IWS) for up to 1,000 GPD of domestic wastewater as per allowed. Septic tanks and leach fields are recommended. No sewer connection and treatment by WWTP is required when the IWS are properly maintained.

2.11.2 WATER SERVICES

The water system will provide domestic water, irrigation supply, and fire protection for the homestead community, in accordance with County DOW Standards.

Existing Hanapēpē-‘Ele‘ele Water System

The Kauai County Department of Water (DOW) has four (4) well sources in the Hanapēpē-‘Ele‘ele water system. Two (Hanapēpē A and Hanapēpē B) of the four wells are situated in the Hanapēpē Valley. Hanapēpē A was drilled in 1974 and has a pumping capacity of 500 gpm. The existing ground elevation at Hanapēpē A is 98 feet above mean sea level (MSL). Hanapēpē B was drilled in 1980 and has a pumping capacity of 900 gpm. The existing ground elevation at Hanapēpē B is 99 feet MSL.

The two other wells (Hanapēpē 25-1 and Hanapēpē 4) that are part of the Hanapēpē-‘Ele‘ele system are located on the west side of the Hanapēpē Valley. Hanapēpē 25-1 was drilled in 1966 and has a pumping capacity of 150 gpm. Hanapēpē 25-1 has been abandoned in place and is no longer being used by the DOW due to a pump/motor problem. The existing ground elevation at Hanapēpē 25-1 is 78 feet MSL. Hanapēpē 4 was drilled in 1993 and has a pumping capacity of 700 gpm. The existing ground elevation at Hanapēpē 4 is 463 feet MSL.

The DOW has three (3) water storage tanks located along Kaumuali‘i Highway, two (2) 0.4 MG steel tanks with 340-foot spillway elevations and one (1) 0.2-MG concrete tank with a 402-foot spillway elevation. Delivery of water from any of the wells into the storage tanks is accomplished by two 750 gpm ‘Ele‘ele booster pumps in Hanapēpē Valley and a 27-inch pipe up

the valley wall to the steel tanks at the 340-foot elevation. A smaller 120 gpm booster pump delivers water from the 340-foot tanks to the 402-foot tanks.

Hanapēpē-‘Ele‘ele Water System Analysis

The existing Hanapēpē-‘Ele‘ele water supply network was analyzed to assess the performance of the existing water supply system with the increased demands resulting from the Project. The water supply system was modelled using the Innovyze *InfoWater* model, based on the available DOW mapping information. The *InfoWater* model uses the EPANET engine to perform the hydraulic analysis and is also capable of completing extended period simulation modeling. The various junction elevations, pipe sizes and demands were based on the available contour mapping and aerial photos to estimate the water demands throughout the system.

Three separate modeling scenarios were conducted as part of the system analysis. The initial analysis included the existing conditions in order to establish the baseline of the water system performance. The second scenario included the Project Phase 2 including the 75 single family homes plus Phase 1 of the Lima Ola Development, which is understood to include 38 single family homes, 111 multi-family homes plus 3 acres for the community center and 2.5 acres of irrigation. The third scenario included the Project full build-out (Phase 3) including all residential areas, commercial sites and the subsistence agricultural areas plus full buildout of the Lima Ola Development, including Phase 2, Phase 3 and Phase 4. Facility improvements associated with the Lima Ola build out include a proposed storage tank at the 402 feet elevation plus upgrades to the ‘Ele‘ele Nani pump station to a capacity of 350 gpm.

The increased water demands for the Project’s initial phase of development (Phase 2) will increase the maximum day demand by 56,250 gallons with a peak flow of approximately 90 gpm and under full build-out conditions will increase the maximum day demand by 644,270 gallons with a peak demand rate in the range of 1,000 gpm.

An analysis of the existing storage reservoirs was also carried out based on the consumption data provided by DOW and the Projected demand from full build-out. The analysis finds that current storage capacity is adequate to meet the requirements for the existing system plus the increased demands from the proposed Project. The existing Hanapēpē-‘Ele‘ele water system has 2.0 million gallons (MG) of available storage.

Potential Impacts and Mitigation Measures

The water master plan prepared for the Project shows that the existing water supply system is able to meet the increased demands associated with Phase 2 of the Project plus demands from Phase 1 of the Lima Ola Development. With the facility improvements planned for the ‘Ele‘ele system to support the Lima Ola build-out conditions (expansion of the ‘Ele‘ele storage tanks), the existing supply and distribution network are able to meet the increased demands to support the Project full build-out (Phase 3). No additional source wells are anticipated to be required and no additional storage is anticipated to be required. DHHL intends to coordinate potable and non-potable water demands and calculations with 1) the County of Kaua‘i for inclusion in the next update of the County’s Water Use and Development Plan; and the State of Hawai‘i Department of Land and Natural Resources, Engineering Division for inclusion in the State Water Projects Plan update.

The proposed distribution system will include a connection to the existing 12-inch water main on Moi Road, plus a network of new onsite water mains ranging in size from 12-inch to 6-inch pipelines. On-site pressure reducing valves will be required to control system pressure and maintain compatibility with the existing DOW pressure zones. The water system will provide domestic water and fire protection for the entire homestead community, all in accordance with DOW Standards. The DOW system could also supply irrigation water for the Subsistence Agriculture lots if DHHL is unable to locate alternative sources of non-potable water.

The water master plan will be submitted to DOW at the time of development to provide a determination of availability. If DOW's water system is determined to be unable to serve part or all of the proposed homesteads, a private water system will be designed to provide domestic water, irrigation supply for the subsistence lots and fire protection for the entire community, in accordance with DOW Standards. Further, since this Project is occurring within State lands and proposes to secure water service from the County's municipal water system DHHL may be required to pay a resource development charge, in addition to water facilities charges for transmission and daily storage.

DHHL is also considering the possibility of connecting to the existing Gay and Robinson (G&R) irrigation water system on the neighboring parcel as an alternative source of irrigation water to serve the homestead community. This would involve extending irrigation water lines from the G&R owned parcel to the west of the site, and constructing a storage and distribution system on the DHHL Mauka Site to provide irrigation water to lessees. Further discussion and coordination with G&R will be required to determine the feasibility of this option.

The Commission on Water Resource Management, in their comments for the Draft EA, recommended the following water conservation and environmentally friendly practices:

1. Water efficient fixtures should 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.
2. Utilization 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.
3. Utilization of alternative water sources, wherever practicable.
4. Participation in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner.
5. Adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawai'i.

2.11.3 POWER AND COMMUNICATIONS

Electrical power will be provided by Kaua‘i Island Utility Cooperative (KIUC) via the existing overhead electrical distribution system running along Moi Road. Preliminary discussions with KIUC indicate there is existing capacity to support the Project. New KIUC underground infrastructure is anticipated and will likely follow the alignment of the new roadways within road right-of-way.

2.12 PUBLIC SERVICES

2.12.1 POLICE PROTECTION

Police service in the Hanapēpē area is provided by the Waimea Sub-station. The Waimea Sub-station is located at 4590 Ola Road, approximately 7 miles from the proposed Project site.

2.12.2 FIRE PROTECTION

Fire protection service for the Hanapēpē area is currently provided by the Hanapēpē Fire Station. The Hanapēpē Fire Station is located at 1-3787 Kaumuali‘i Hwy. Response time to the proposed development from the station, a distance of about 1.5 miles, is estimated at 2-3 minutes.

2.12.3 MEDICAL SERVICES

The closest health care facility nearest the Project site is the Kaua‘i Veterans Memorial Hospital, located at 4643 Waimea Canyon Dr, Waimea, Hawai‘i. The facility is located about 7 miles west of the Project site.

Project Impacts and Mitigation Measures

The Project is not expected to have significant adverse impacts on public services and community facilities.

2.12.4 AIRPORTS

The Project area is approximately 0.66 miles from Port Allen Airport (PAK) and approximately 3,463.25 feet from the end of Runway 27 at PAK. All projects within 5 miles from Hawai‘i State airports are advised by the State Department of Transportation, Airports Division to review the State Office of Planning’s Technical Assistance Memorandum (TAM) for guidance with development and activities pursuant to Federal Aviation Administration Order 5190.6B. The purpose of this order is to ensure compatible land use near federally obligated airports that do not conflict with normal airport operations, including landing and takeoff of aircraft.

Project Impacts and Mitigation Measures

Due to the Project’s proximity to PAK, Federal Aviation Administration regulation requires the submittal of FAA Form 7 460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9. Construction equipment and staging area heights, including heights of temporary construction cranes need to be included in the submittal.

The Airport Zoning Act, Hawai‘i Revised Statutes, Chapter 262, requires the State Airports Division to prevent hazards and non-conforming uses that conflict with the FAA Hazardous Wildlife Attractants requirements. Consequently, design of the homestead landscaping should not, nor is expected to create a wildlife attractant.

Due to the proximity of the project to the airport, there is a potential for noise, fumes, smoke, vibrations, odors, etc., that may result from aircraft flight operations over existing uses and the proposed future developments of the DHHL Hanapepe Homestead Community.

The Draft EA did not discuss the use of a Photovoltaic (PV) solar energy system in the Project, but if a PV system is later included, then the PV system(s) located in or near the approach and departure path of aircrafts may create a hazardous condition for pilots due to possible glint and glare reflected from the array. If DHHL decides to install PV solar panels in the future, a glint and glare analysis must be submitted for Federal Aviation Administration review. The Airports Division recommends using the highest rated non-glare solar panels in order to mitigate potential hazard to the greatest degree possible. Finally, PV systems have been known to emit radio frequency interference (RFI) to aviation-dedicated radio signals, disrupting the reliability of air-to-ground communications and DHHL should be prepared to mitigate this impact immediately if applicable.

2.13 SOCIO-ECONOMIC CONDITIONS

The County of Kaua‘i resident population was estimated to be 71,377 in the 2018 American Community Survey. The Hanapēpē Census Designated Place (CDP) population estimate from the 2018 American Community Survey was 2,870 people and 948 total housing units.

The Project will increase the population of Hanapēpē through new permanent residences in the short term of up to 75 residential lots and in the long term with the addition of up to 449 Residential lots and 111 Subsistence Agriculture lots. Based on the experience of previous DHHL agricultural homesteads, only 50% of the Subsistence Agricultural lots are expected to result in residences. However, all of the lessees, regardless of whether or not they ultimately reside in Hanapēpē, will be required to pay property taxes on their lot, which will contribute toward public facilities and services.

Project Impacts and Mitigation Measures

Development of the Project will provide additional construction jobs over the phased construction period. In addition to construction expenditures, construction activity will generate indirect sales associated with supplying goods and services to construction companies and to the families of construction workers. In turn, the companies supplying goods and services, and the families of their employees will purchase goods and services from other companies, and so on. These indirect sales will include sales by companies that supply building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hard-ware supplies, lighting, flooring, etc.); rent out construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Indirect sales also include sales by grocery stores, drugstores, restaurants, service stations, beauty salons, medical providers, accountants, attorneys, insurance agents, etc.

Most of the tax revenues generated by the Project will be paid to the State, not the County. In total, the State will receive money from excise taxes, corporate income taxes, and personal income taxes. The County will receive money from the excise tax surcharge. Due to the exemption for qualifying low-income rental Projects, this amount does not include any excise tax or surcharge on the construction costs of the residential portion of the Project.

2.14 POTENTIAL CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are impacts which result from the incremental effects of an activity when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertake such other actions. The proposed Project is not anticipated to generate substantial cumulative impacts. Short-term impacts to adjacent homes and roads rights of way may occur during construction. These will be mitigated to the extent possible, as previously described. In the long-term, there will be no adverse cumulative impacts on traffic, noise, air quality, flora or fauna with implementation of recommended mitigation measures. Wastewater capacity for Phase 2 has been confirmed by the County, however full build-out has the potential to require a new WWTP which will occupy buildable land and require additional funding and environmental protection considerations. Depending upon the category of commercial activities within the Project, wastewater pre-treatment could be required by the County and State.

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3.0 RELATIONSHIP TO PLANS AND POLICIES

3.1 FEDERAL PLANS AND POLICIES

3.1.1 ARCHAEOLOGICAL AND HISTORIC PRESERVATION ACT (16 U.S.C. § 470(F)) AND NATIONAL HISTORIC PRESERVATION ACT (16 U.S.C. § 470(F))

The Archaeological and Historic Preservation Act is a federal policy that is meant to provide for the preservation of significant historic American sites, buildings, and objects. The National Historic Preservation Act is a federal policy that is meant to preserve historic federal sites, and established the National Register of Historic Places, National Historic Landmarks list, and the State Historic Preservation Offices.

Discussion: The Project area was used extensively for agricultural operations and there are currently no known archaeological or cultural features within the Project area today. DHHL will continue to consult with the SHPD through HRS Chapter 6E consultation to determine if any additional historic preservation work might be required, including additional documentation of specific known features.

3.1.2 COASTAL ZONE MANAGEMENT ACT (16 U.S.C. § 1456(C)(1))

The Coastal Zone Management Act is a federal policy meant to preserve, protect, develop and restore and enhance the resources of America's coastal zone. This act encourages coastal states to create a Coastal Zone Management Program to protect and preserve their coastal resources.

Discussion: The Project will adhere to the regulations established by the Federal Coastal Zone Management Act and the State Coastal Zone Management Program for the protection of coastal resources.

3.1.3 ENDANGERED SPECIES ACT 16 U.S.C. §1536(A)(2) AND (4)

The Endangered Species Act is a national policy that is designed to protect critically imperiled species from extinction as a consequence of economic growth and development. The Act is administered by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Discussion: The Project will adhere to the regulations established by the Federal Endangered Species Act, and State and County regulations for the protection of endangered species. It is unlikely that the proposed Project will have a significant adverse impact on any plant species state or federally listed as threatened or endangered, candidate species for listing as endangered, species of concern, or rare native Hawaiian plant species. The Project area is highly disturbed, comprising of abandoned agricultural land now dominated by guinea grass grassland, residences, and an industrial lot, and with 96% of the flora being nonnative. It is recommended that, before any major vegetation clearing is conducted, the interior of the 357-acre parcel should be surveyed on foot during to confirm the presence or absence of any native plant species.

No native wildlife species were observed in the Project area at the time of the survey. However, the vast open grasslands in Mauka Site appear to provide suitable habitat for various species. The endangered Hawaiian petrel, threatened Newell's shearwater, and wedge-tailed shearwater are

seabird species known to occur on Kaua‘i and transit through the Project area (SOS 2018, USFWS 2019). Furthermore, seabird diverters were observed on the utility wires along Kaumuali‘i Highway near the southwestern end of the Project area suggests that seabirds frequent the Project area during the February-December seabird breeding season and tall overhead powerlines present a collision hazard to these birds in this area. Similarly, recent Save Our Shearwaters fallout records (SOS 2018) also indicate that fledgling seabirds are attracted to external lights in adjacent urban areas and external lights pose a light attraction hazard during the seabird fallout season from September 15 to December 15 in this area.

The Project will incorporate measures to avoid or minimize potential impacts, such as limiting the quantity, and shielding street lights, community park lighting, and external lights on buildings. Hawaiian hoary bats are known to occur on Kaua‘i (Tomich 1986) and their presence in the Project area cannot be ruled out. Consequently, no trees greater than 15 feet tall should be trimmed or removed during the bat pupping season from June 1 to September 15.

3.2 STATE OF HAWAI‘I PLANS AND POLICIES

3.2.1 STATE LAND USE LAW, CHAPTER 205, HRS

The State Land Use Law, Chapter 205 HRS, established the State Land Use Commission, which classifies all lands in Hawai‘i into four land use districts: Rural, Agricultural, Conservation, and Urban. The 359-acre Mauka Site is in the State Land Use Agricultural District. The 6-acre Makai Site is designated as Urban. According to Chapter 205 Land Use Commission, Article 5 Zoning, the minimum lot size for Agricultural district lands is no less than one acre. However, it should be noted that under the Hawaiian Homes Commission Act, which has been incorporated into Article XII Sections 1 and 3 of the State Constitution, laws such as HRS Chapter 205, that would significantly affect DHHL’s use of its lands do not apply to Hawaiian Home Lands. The Hawaiian Homes Commission has exclusive land use authority over Hawaiian Home Lands.

3.2.2 STATE COASTAL ZONE MANAGEMENT PROGRAM, CHAPTER 205A, HRS

The Hawai‘i Coastal Zone Management (CZM) Program was created in 1977 through the enactment of Chapter 205A, HRS to coordinate Federal, State, and County agency efforts in the comprehensive management of Hawai‘i’s coastal resources. The Hawai‘i CZM Program is administered by the State Office of Planning, but each of the four counties are responsible for administering the program locally through Special Management Area permits and shoreline setback provisions in their respective counties. The coastal zone encompasses the entire state, as there is no point of land more than 30 miles from the ocean.

The Coastal Zone Management Act (CZMA) of 1972 (16 USC 1451 et seq.) encourages coastal states to protect coastal resources consistent with the state’s coastal zone management program. The objectives of the Coastal Zone Management (CZM) Program are to provide the public with recreational opportunities, protect historic resources, protect scenic and open space resources, protect coastal ecosystems, provide facilities for economic development, reduce hazards and manage development. As discussed throughout this document, the proposed project is not anticipated to have adverse impacts on the area’s recreational opportunities, historic resources,

scenic and open space resources, or coastal ecosystems. A discussion of the Project's consistency with the CZM objectives and policies are provide in this section.

1) Recreational Resources

Objective:

Provide coastal recreational opportunities accessible to the public.

Policies:

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

Discussion: The Project does not conflict with this objective or these policies. Since no coastal development or improvements are associated with this Project, there are no anticipated impacts to coastal recreational opportunities and accessibility to the coastline.

2) Historic Resources

Objective:

Protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

- A) Identify and analyze significant archaeological resources;*
- B) Maximize information retention through preservation of remains and artifacts or salvage operations; and*
- C) Support state goals for protection, restoration, interpretation, and display of historic resources.*

Discussion: The proposed project will be constructed in keeping with the guidelines and objectives of the aforementioned objective and policies. No archaeological features or deposits within the Project areas were noted during background research of the subject parcel. Neither were archaeological features or deposits observed during the preliminary site visit, although extremely dense, tall vegetation obscures the majority of the Mauka Site. Ranching and extensive mechanized agricultural activities have taken place on the Mauka Site for over 150 years, and the Makai Site has undergone at least one century of development. The Project designates the gulches as Conservation areas not to be developed, which constitutes a preliminary effort to preserve possible features that may exist in the gulch areas. DHHL will continue to consult with the SHPD to determine what additional historic preservation work might be required, if any, including additional documentation of specific known features.

3) Scenic and Open Space Resources

Objective:

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

Policies:

- A) Identify valued scenic resources in the coastal zone management area;*
- B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;*
- C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and*
- D) Encourage those developments that are not coastal dependent to locate in inland areas.*

Discussion: The project is not anticipated to have a significant negative impact on scenic viewplanes or scenic resources. The Project will alter the existing views of agricultural lands as they are converted to homesteads, but the Subsistence Agriculture land use will be consistent with previous and current agricultural land uses. Single-family homes may be built by lessees and no mid- or high-rise buildings will be allowed. The Subsistence Agricultural lots will be larger than the Residential lots, maintaining open space views from Kaumuali'i Highway.

4) Coastal Ecosystems

Objective:

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

Policies:

- A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources*
- B) Improve the technical basis for natural resource management;*
- C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance*
- D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and*
- E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine water ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.*

Discussion: The Project will be consistent with these policies. To minimize degradation to the water quality of near-shore waters, best management practices will be implemented during the construction phases of the Project. Such measures would be developed during the design of this project, and would comply with the County's Erosion and Sedimentation Control regulations. Drainage will be designed to maintain acceptable drainage patterns.

5) Economic Uses

Objective:

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

Policies:

- A) Concentrate in appropriate areas the location of coastal dependent development necessary to the State's economy;*
- B) Insure that coastal dependent development such as harbors and ports, visitor industry facilities, and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and*
- C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such development and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
 - i) Utilization of presently designated locations is not feasible;*
 - ii) Adverse environmental effects are minimized; and**

iii) *Important to the State's economy.*

Discussion: The Project does not conflict with this objective or these policies. The Project does not involve coastal development or improvements along the coastline.

6) Coastal Hazards

Objective:

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

Policies:

- A) Develop and communicate adequate information on storm wave, tsunami, flood erosion, and subsidence hazard;*
- B) Control development in areas subject to storm wave, tsunami, flood, erosion, and subsidence hazard;*
- C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and*
- D) Prevent coastal flooding from inland projects.*

Discussion: The design of the Project will conform to all regulatory requirements to ensure adequate and proper storm drainage and erosion control to the surrounding properties.

According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency, the entirety of the Project is located in Zone X which is an area that has been determined to be outside the 0.2% annual chance floodplain and outside of the 500-year floodplain. The chance of flooding is minimal, and the Project area is located outside the 3.2-foot Sea Level Rise Exposure Area (SLR-XA) identified in the Hawai'i Sea Level Rise Vulnerability and Adaptation Report (2017). As a future benefit, in the event of an extreme tsunami, residents, employees and visitors will be able to take shelter in portions of Hanapēpē or community use facilities in the future.

7) Managing Development

Objective:

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

Policies:

- A) Effectively utilize and implement existing law to the maximum extent possible in managing present and future coastal zone development;*
- B) Facilitate timely processing of application for development permits and resolve overlapping or conflicting permit requirements; and*
- C) Communicate the potential short- and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the general public to facilitate public participation in the planning and review process*

Discussion: The Project does not conflict with this objective or these policies. The Environmental Assessment process requires public notification and allowance for public and agency comment and a comprehensive outreach program was followed for this Project (see Section 6.0).

8) Public Participation

Objective:

Stimulate public awareness, education, and participation in coastal management.

Policies:

- A) Promote public involvement in coastal zone management processes;*
- B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and*
- C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Discussion: The Project is consistent with this objective and policies. A comprehensive stakeholder engagement plan was developed for the Project and is being implemented to gather input from existing DHHL lessees and beneficiaries, as well as the greater Hanapēpē community and relevant agencies. See Section 6.0 of this document.

9) Beach Protection

Objective:

Protect beaches for public use and recreation.

Policies:

- A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;*
- B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities;*
- C) Minimize the construction of public erosion-protection structures seaward of the shoreline;*
- D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and*
- E) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor;*

Discussion: The Project does not conflict with the beach protection objective or policies. Beaches will not be impacted by this proposed project. The project is inland from the shoreline setback and does not involve any construction seaward of the shoreline.

10) Marine Resources

Objective:

Implement the State's ocean resources management plan.

Policies:

- A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- B) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;*
- C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*
- E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Discussion: The Project does not conflict with the marine resources objective or policies. The Project will include appropriate design and permit compliance aimed to avoid any negative effects to marine and coastal resources, and will incorporate appropriate low-impact development measures where appropriate, to minimize impacts to affected streams and near-shore waters. A drainage master plan will be prepared in design phase and will be in accordance with Federal, State and County regulations. A National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including stormwater runoff, into State surface waters (HAR, Chapter 11-55) will be secured.

3.2.3 HAWAI‘I STATE PLAN, CHAPTER 226, HRS

The Hawai‘i State Plan, codified as HRS Chapter 226, serves as a guide for the future long-range development of the State; identifies goals, objectives, policies and priorities for the State; provides a basis for determining priorities and allocating resources; improves coordination of federal, state and county activities, and establishes a system to integrate major state and county activities.

The use of the subject property would be consistent with Chapter 226, Hawai‘i Revised Statutes.

§226-5 Objective and policies for population.

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

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

- (1) Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.*
- (2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.*
- (3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.*
- (4) Encourage research activities and public awareness programs to foster an understanding of Hawaii's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawaii's population.*
- (5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.*
- (6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.*
- (7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (2), (3), and (7) through the master planning efforts provided by DHHL and new residential and commercial opportunities for native Hawaiian beneficiaries. The southeast portion of the Mauka Site is located within walking distance of Hanapēpē Town and is designated as Neighborhood General in the Kaua'i General Plan. This designation is considered appropriate for medium-density mixed-use commercial and residential development. Adding a new Commercial area at this location where a new road and gateway is envisioned is consistent with the County's policy of encouraging mixed use in the core of Hanapēpē town.

The land use plan provides Commercial and Community Use areas along the highway on the southwestern side of the Makai Site with the intent of providing a destination for the west side community that may include a park, ball fields, and community center, as well as agriculture-supportive uses such as a farmers market, community garden, and shared equipment/facilities.

§226-6 Objectives and policies for the economy--in general.

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

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

- (2) *A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.*
- (b) *To achieve the general economic objectives, it shall be the policy of this State to:*
- (1) *Promote and encourage entrepreneurship within Hawaii by residents and non-residents of the State.*
 - (2) *Expand Hawaii's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.*
 - (3) *Promote Hawaii as an attractive market for environmentally and socially sound investment activities that benefit Hawaii's people.*
 - (4) *Transform and maintain Hawaii as a place that welcomes and facilitates innovative activity that may lead to commercial opportunities.*
 - (5) *Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawaii.*
 - (6) *Seek broader outlets for new or expanded Hawaii business investments.*
 - (7) *Expand existing markets and penetrate new markets for Hawaii's products and services.*
 - (8) *Assure that the basic economic needs of Hawaii's people are maintained in the event of disruptions in overseas transportation.*
 - (9) *Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.*
 - (10) *Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaii's small-scale producers, manufacturers, and distributors.*
 - (11) *Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.*
 - (12) *Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawaii.*
 - (13) *Foster greater cooperation and coordination between the government and private sectors in developing Hawaii's employment and economic growth opportunities.*
 - (14) *Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.*
 - (15) *Maintain acceptable working conditions and standards for Hawaii's workers.*
 - (16) *Provide equal employment opportunities for all segments of Hawaii's population through affirmative action and nondiscrimination measures.*

(17) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.

(18) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy, particularly with respect to emerging industries in science and technology.

(19) Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.

(20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new or innovative potential growth industries in particular.

(21) Foster a business climate in Hawaii--including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (8), (9), (10) and (14) through new agricultural and commercial opportunities for native Hawaiian beneficiaries.

§226-7 Objectives and policies for the economy--agriculture.

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

- (1) Viability of Hawaii's sugar and pineapple industries.*
- (2) Growth and development of diversified agriculture throughout the State.*
- (3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.*

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

- (1) Establish a clear direction for Hawaii's agriculture through stakeholder commitment and advocacy.*
- (2) Encourage agriculture by making the best use of natural resources.*
- (3) Provide the governor and the legislature with information and options needed for prudent decision-making for the development of agriculture.*
- (4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.*
- (5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaii's economy.*

- (6) Seek the enactment and retention of federal and state legislation that benefits Hawaii's agricultural industries.*
- (7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaii's food producers and consumers in the State, nation, and world.*
- (8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.*
- (9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.*
- (10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.*
- (11) Increase the attractiveness and opportunities for an agricultural education and livelihood.*
- (12) In addition to the State's priority on food, expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.*
- (13) Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency, including the increased purchase and use of Hawaii-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.*
- (14) Promote and assist in the establishment of sound financial programs for diversified agriculture.*
- (15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.*
- (16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.*
- (17) Perpetuate, promote, and increase use of traditional Hawaiian farming systems, such as the use of loko i 'a, māla, and irrigated lo 'i, and growth of traditional Hawaiian crops, such as kalo, 'uala, and 'ulu.*
- (18) Increase and develop small-scale farms.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(2), (10),(11), (14), (16), (17) and (18) through new agricultural and commercial opportunities for native Hawaiian beneficiaries.

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

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

- (1) Prudent use of Hawaii's land-based, shoreline, and marine resources.*
- (2) Effective protection of Hawaii's unique and fragile environmental resources.*

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

- (1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.*
- (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.*
- (3) Take into account the physical attributes of areas when planning and designing activities and facilities.*
- (4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.*
- (5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.*
- (6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.*
- (7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.*
- (8) Pursue compatible relationships among activities, facilities, and natural resources.*
- (9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (2), (3), (4), (5), (6), and (8) through new agricultural and commercial opportunities for native Hawaiian beneficiaries.

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

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

(b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:

- (1) Promote the preservation and restoration of significant natural and historic resources.*
- (2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.*
- (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.*

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

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

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (3) and (5) through the preferred land use plan's spatial layout of the proposed land uses. The gulch areas would transition into Conservation and Special District which is consistent with preservation of natural and historic resources. In addition, maintaining the western side of the parcel in Subsistence Agriculture will help to preserve view planes and green space to the southwest, which is consistent with desires expressed by existing homestead lessees.

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

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

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

(2) Greater public awareness and appreciation of Hawaii's environmental resources.

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

(1) Foster educational activities that promote a better understanding of Hawaii's limited environmental resources.

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

(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.

(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.

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

(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.

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

(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures and visitors.

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(2), (3), (5), (7) and (8). The land use plan concentrates residential land use areas east of Kukamahu Gulch is consistent with smart growth principles, which calls for focusing development in and adjacent to existing neighborhoods and town centers. From an infrastructure standpoint, concentrating residential development on the east side of the gulch is advantageous, as sewer and water lines can be extended from existing facilities. Best management practices will

be implemented to protect land and water resources. The physical environment will be improved with complete streets design to accommodate people walking, biking, and taking transit in addition to vehicles.

The Project has identified opportunities to for homesteaders to be informed about ways to take care of the surrounding lands and encourage community and visitor support in adhering to protective measures. Creating cultural connections with new homesteaders to Hanapēpē is an important step towards growing a healthier Hawaiian community. Through active engagement and restoration, new Hawaiian Homesteads in Hanapēpē could positively impact cultural resources and grow traditional cultural practice.

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

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

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

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

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

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

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

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (2), and (3). Consultations with public utility service providers are occurring as part of this EA and in preliminary design actions.

§226-15 Objectives and policies for facility systems--solid and liquid wastes.

(a) Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:

(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.

(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.

(b) To achieve solid and liquid waste objectives, it shall be the policy of this State to:

(1) Encourage the adequate development of sewerage facilities that complement planned growth.

(2) *Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.*

(3) *Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (2), and (3). Consultations with public utility service providers are occurring as part of this EA and in preliminary design actions.

§226-16 Objective and policies for facility systems--water.

(a) *Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.*

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

(1) *Coordinate development of land use activities with existing and potential water supply.*

(2) *Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.*

(3) *Reclaim and encourage the productive use of runoff water and wastewater discharges.*

(4) *Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.*

(5) *Support water supply services to areas experiencing critical water problems.*

(6) *Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (2), (3) and (4). Consultations with public utility service providers are occurring as part of this EA and in preliminary design actions. DHHL is also considering the possibility of connecting to the existing Gay and Robinson irrigation water system on the neighboring parcel as an alternative source of irrigation water to serve the homestead community.

§226-17 Objectives and policies for facility systems--transportation.

(a) *Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:*

(1) *An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.*

(2) *A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.*

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

- (1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;*
- (2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;*
- (3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;*
- (4) Provide for improved accessibility to shipping, docking, and storage facilities;*
- (5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;*
- (6) Encourage transportation systems that serve to accommodate present and future development needs of communities;*
- (7) Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;*
- (8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;*
- (9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;*
- (10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment;*
- (11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;*
- (12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and*
- (13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), (2), (6), (9), (10), and (12). The Project will provide residents with multi-modal opportunities through complete streets design and expanded transportation networks. Consultations with the State Department of Transportation and County Department of Public Works are occurring as part of this EA and in preliminary design actions.

§226-19 Objectives and policies for socio-cultural advancement--housing.

- (a) Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:*
 - (1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure*

that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.

(2) The orderly development of residential areas sensitive to community needs and other land uses.

(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people.

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

(1) Effectively accommodate the housing needs of Hawaii's people.

(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.

(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.

(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.

(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.

(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.

(8) Promote research and development of methods to reduce the cost of housing construction in Hawaii.

Discussion: The proposed Project is consistent with all of these objectives and policies by providing much needed housing opportunities to DHHL's native Hawaiian beneficiaries, some of whom have been on the waiting list for decades.

§226-20 Objectives and policies for socio-cultural advancement--health.

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

(1) Fulfillment of basic individual health needs of the general public.

(2) Maintenance of sanitary and environmentally healthful conditions in Hawaii's communities.

(3) Elimination of health disparities by identifying and addressing social determinants of health.

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

- (1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.*
- (2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.*
- (3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.*
- (4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.*
- (5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.*
- (6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.*
- (7) Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (b)(1), and (7). The Project will provide the Hanapēpē community with opportunities for expanded health services and community spaces to encourage personal health, particularly for those uses best suited to help native Hawaiians.

§226-22 *Objective and policies for socio-cultural advancement--social services.*

- (a) Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.*
- (b) To achieve the social service objective, it shall be the policy of the State to:*
 - (1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.*
 - (2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.*

- (3) *Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaii's communities.*
- (4) *Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.*
- (5) *Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.*
- (6) *Promote programs which assist people in need of family planning services to enable them to meet their needs.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (a) and (b)(1). The preferred land use plan will provide a common area for community-building which includes possible uses such as parks, cultural activities, and community-based economic development, other facilities and amenities.

§226-23 Objective and policies for socio-cultural advancement--leisure.

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

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

- (1) Foster and preserve Hawaii's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.*
- (2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.*
- (3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.*
- (4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.*
- (5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.*
- (6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.*
- (7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawaii's people.*
- (8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.*
- (9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawaii's population to participate in the creative arts.*
- (10) Assure adequate access to significant natural and cultural resources in public ownership.*

Discussion: The proposed Project is consistent with these policies. It advances, in particular, items (a) and (b)(1), (4) and (10). The preferred land use plan will provide a common area for community-building which includes possible uses such as parks, cultural activities, and community-based economic development, other facilities and amenities.

3.2.4 HAWAI‘I REVISED STATUTES CHAPTER 343

The proposed action involves the use of State lands. Therefore, the Draft and Final EA documents were prepared in accordance with Chapter 343 HRS, and HAR Title 11, Chapter 200.

3.2.5 DHHL KAUA‘I ISLAND PLAN

The Kaua‘i Island Plan provides recommendations for the future use of the Department of Hawaiian Home Lands’ 20,565 acres on Kaua‘i. The plan designates appropriate land uses which ensure DHHL land will be developed to its highest potential. The plan is intended to guide overall land use patterns and development on Kaua‘i for the next 20 years. The plan identifies land designations for all DHHL land and as prioritizes areas for new residential development. The plan also identifies areas for agricultural lease and limited but adequate areas for income-generating commercial and industrial uses.

Discussion: The Project will support the Kaua‘i Island Plan goal of 840 residential homesteads by providing Residential and Subsistence Agriculture homesteading opportunities for beneficiaries.

3.2.6 STATE WATER PROJECTS PLAN

The State Water Projects Plan (SWPP) provides a framework for planning and implementation of water development programs to meet projected water demands for State Projects over a 20-year planning horizon. This plan includes current and future state water projects to ensure orderly authorization and development of the state’s water resources in accordance with the SWPP’s water development strategy and recommendations. The SWPP is prepared by the Engineering Division of the Department of Land and Natural Resources (DLNR) in conjunction with the Commission on Water Resource Management and other State agencies, including DHHL. State project demands are subsequently incorporated within respective County Water Use Development Plans as part of the statewide comprehensive water planning system.

The first SWPP report was completed in 2000, and was mostly recently updated in May 2017 for only DHHL projects due to budgetary constraints and because DHHL possesses one of the largest areas of land of all State agencies and thus potentially has a substantial impact on water resource needs. Furthermore, water needs of DHHL are Public Trust uses of water and have a special protection and priority in the State water code.

The 2017 update of the SWPP includes water development strategies for each DHHL tract and Section 4.5.1.2 of the SWPP covers the Hanapēpē tract which is identified as the Hanapēpē Homestead Community project. According to the SWPP, the Hanapēpē tract is proposed to be primarily a Residential and Sub Ag community and is currently outside the service area of the County’s Hanapēpē Water System. The SWPP assumes that the Hanapēpē tract would require additional sources (new source well), a booster pumping station, and extensive infrastructure.

The need for non-potable agricultural water is also identified and the SWPP strategy includes consideration of several sources, Hanapēpē Stream to the east and Gay and Robinson’s land spanning the Mahinauli and Hanapēpē Surface Water Hydrologic Units, the latter of which includes parts of the Hanapēpē Stream. If this latter option is to be pursued, DHHL and Gay and Robinson should enter into discussions as soon as possible; however, DHHL could plan to supply the Mauka subsistence agricultural irrigation water from the new potable DHHL system in the interim until a permanent non-potable water supply can be developed (DLNR, 2017).

Discussion: As discussed in Section 2.11.2, Water Services of this Final EA, a water master plan was developed for the project which indicates that the existing County Hanapēpē Water System is conceptually able to meet the increased demands associated with Phase 2 of the Project. Furthermore, with the current facility improvements planned for the ‘Ele‘ele system to support the County’s Lima Ola development build-out conditions (expansion of the ‘Ele‘ele storage tanks), the planned supply and distribution network are able to meet the increased demands to support the Project full build-out (Phase 3). Beyond these planned improvements, no additional source wells are anticipated to be required and no additional storage is anticipated to be required. DHHL intends to coordinate potable and non-potable water needs with 1) the County of Kaua‘i for inclusion in the next update of the County’s Water Use and Development Plan; and the State of Hawai‘i Department of Land and Natural Resources, Engineering Division for inclusion in the State Water Project Plan.

In accordance with the SWPP’s strategy for Hanapēpē tract, DHHL is also considering the possibility of connecting to the existing Gay and Robinson irrigation water system on the neighboring parcel as an alternative source of irrigation water to serve the homestead community. Further discussion and coordination with G&R will be required to determine the feasibility of this option.

3.3 COUNTY OF KAUA‘I PLANS AND POLICIES

3.3.1 COUNTY GENERAL PLAN

The Kaua‘i County General Plan establishes priorities for managing growth and community development over a 20-year planning timeframe. In addition to being required by State law, the County Charter instructs that the General Plan guide future action concerning land use and development regulations, urban renewal programs, and expenditures for capital improvements. The current General Plan was adopted in 2018.

The Kaua‘i County Future Land Use Maps describe the desired types of land use in broad terms. The boundaries are generalized and do not carry the legal weight of metes and bounds. The General Plan states that the County of Kaua‘i’s objective regarding the Department of Hawaiian Home Lands is to support the DHHL in its mission to provide housing to beneficiaries. The General Plan recognizes Hanapēpē as an appropriate location for incremental change. The Mauka Site is designated as Agriculture (196 acres), Residential Community (152 acres), and Neighborhood General (11 acres) on the Future Land Use Map. The 6-acre Makai Site is designated Neighborhood General (Figure 4). The General Plan designations partially correspond with those in DHHL’s Kaua‘i Island Plan. DHHL is not required to match General Plan Land Use Designations, and meetings with the County Planning Department indicated that they are flexible as to how land use designations are applied.

The following actions in the General Plan relate to DHHL lands:

- Integrate the recommendations of DHHL plans into community planning.
- Partner with DHHL on infrastructure Projects that will support development of both County and DHHL priority growth areas.
- Respect and support the mission of DHHL to prioritize planning for their beneficiaries.

The Project is supportive and aligned with the envisioned land uses and policies outlined in the General Plan. General Plan policies supported by the Project include:

Policy #2: Provide Affordable Housing While Facilitating a Diversity of Privately Developed Housing for Local Families

Discussion: The Project will establish a Residential and Subsistence Agricultural homestead community in the Hanapēpē area. The lands will be available for the native Hawaiian population they are designated to be used for the fulfillment of the Hawaiian Homes Commission Act.

Policy #8: Design Healthy and Complete Neighborhoods

Discussion: The proposed Project will establish a neighborhood where it is safe and convenient to walk and bike to allow residents to increase physical activity on a daily basis.

Sector: II. Housing

Objective: To increase housing opportunities for low- and moderate-income households

Objective: To develop compact, walkable communities consistent with the Future Land Use Map

Objective: To support the Department of Hawaiian Home Lands in their mission to provide housing to their beneficiaries.

Discussion: The proposed Project is consistent with the Kaua‘i County General Plan objectives of providing housing opportunities, developing compact, walkable communities, and supporting the DHHL in its mission to provide housing for beneficiaries.

3.3.2 COUNTY OF KAUA‘I COMPREHENSIVE ZONING ORDINANCE

Chapter 8 of the Kaua‘i County Code is known as the Comprehensive Zoning Ordinance (CZO). The Project site is zoned Agriculture (A) and Open (O). The DHHL is not subject to the requirements of the CZO. Attorney General opinion 72-21 states “Hawaiian home lands needed for purposes of the Hawaiian Homes Commission Act (HHCA) are to be used and disposed of in accordance with the act and are not subject to County zoning requirements.” Since the lands are to be used to fulfill the purposes of the HHCA, DHHL is not subject to County zoning. DHHL will declare the zoning designations for the Project site when it proceeds with subdivision of the next phase of homesteads.

Project team members and the County of Kaua‘i Planning Department met with the Planning Director and long-range planning staff on December 14, 2018 and April 5, 2019. The purpose of the meetings were to brief County staff on the project, discuss County standards for rural development, compare DHHL land uses with COK zoning designations, and discuss relevant input from the West Kaua‘i Community Plan (CP) process.

The COK Planning Department acknowledged that DHHL is not required to meet COK planning and zoning standards pursuant to the Hawaiian Homelands Commission Act (HHCA §206), and the County does not have a “Rural” zoning designation standard. Agricultural zoning has only one designation. The CZO allows one house on one acre in an Agriculture zone, then one house every two acres thereafter, up to a maximum of five houses. Currently, Accessory Dwelling Units (ADU’s) are not allowed on Ag land. Cluster Agriculture Development is encouraged in the Kaua‘i General Plan, but is currently not required.

3.3.3 WEST KAUA‘I COMMUNITY PLAN

The County of Kaua‘i is currently updating the West Kaua‘i Community Plan to manage future growth and change in the Hanapēpē-‘Ele‘ele and Waimea-Kekaha planning districts, while also coordinating land use and transportation planning. The Waimea-Kekaha Development Plan has not been updated in several decades. However, the draft West Kaua‘i Community Plan is under review at the Kaua‘i County Council. First reading occurred on August 5, 2020.

The purpose is to implement a general land use map, zoning maps, and design criteria to guide and regulate future development and protect valued physical and social characteristics. A shared vision will be developed along with guidance for the improvement of Hanapēpē-‘Ele‘ele. The plan will amend and update the Waimea-Kekaha Development Plan (1977) and the Hanapēpē-‘Ele‘ele Development Plan (1974). The public process for the West Kaua‘i Community Plan launched in August 2018. The Plan has been approved by the Kaua‘i Planning Commission and is being transmitted to the County Council for adoption later this year. The new plan will supplement the Kaua‘i General Plan and the Comprehensive Zoning Ordinance by regulating use and development practices (COK, 2020).

DHHL has consulted with the COK Planning Department throughout the development of the EA to ensure coordination between the West Kaua‘i Community Plan and the Project. Community input from the Community Plan process has been factored into the development of the preferred land use plan, including the provision of an additional access road for the Hanapēpē Heights community and allowance for Community Use area that can provide additional park capacity to serve the west side community. Further, the preferred land use plan is consistent with the CP policies of promoting smart growth and form-based zoning. In their comments submitted to DHHL on the Draft EA, the Kaua‘i Planning Department noted that the proposed Hanapepe Homestead Community Project is consistent with the policies, goals, and objectives set forth in the current draft of the West Kauai Community Plan. The Planning Department is working with the County Council to amend the draft Hanapepe Town Plan Map to better align with the preferred land use plan in the DEA.

4.0 PROJECT ALTERNATIVES

The No Action alternative, existing land use plan and a modified land use plan alternative were considered as Project alternatives. The alternatives identified are:

- No Action Alternative;
- Alternative 1 maintains the existing DHHL Land Use Plan as presented in the Kaua‘i Island Plan, and refines it to reflect developable and undevelopable areas; and
- Alternative 2 presents a modified land use configuration that the Project team believes is preferred from a land suitability and environmental standpoint and is compatible with planning best practices. The acreages of land designated for homesteads, Community Uses, and Commercial areas are roughly the same proportions as in Alternative 1.

Based on the findings of a land suitability analysis, the following criteria was used for the land use plan alternatives:

- Avoid development in areas with steep slopes (20% or greater).
- Avoid development in the bottom of gulches, except as needed for road/infrastructure crossings and drainage/flood control.
- Maintain similar ratio of DHHL land uses/acreages as presented in the Kaua‘i Island Plan.
- Minimize the need for gulch crossings.
- Provide buffers between residential and agricultural areas.
- Provide alternate roadway access from Kaumuali‘i Highway to Hanapēpē Heights.
- Where possible, align land uses, roadways, and infrastructure with County of Kaua‘i policies, plans, and standards.

Alternatives were refined through an infrastructure assessment, beneficiary survey, and community engagement activities described in Chapter 6.0.

4.1 NO ACTION ALTERNATIVE

Under the “No Action” alternative, there will not be a change from the current situation where the land is sitting vacant as agricultural open space. There will continue to be over 1,600 applications on the waitlist for residential homesteads and over 2,225 applications for the agricultural waitlist. DHHL beneficiaries will continue to wait on agricultural and residential homestead wait lists, and the land will have to be actively managed to reduce fire hazard and prevent dumping.

4.2 ALTERNATIVE 1: MAINTAIN EXISTING DHHL LAND USE PLAN

Alternative 1 retains the existing land use designations in the DHHL Kaua‘i Island Plan for the Hanapēpē Homestead site (Figure 13) Based on identified constraints for topography and soil types, the Project team calculated the acreages of developable versus non-developable areas. Based on the criteria, the developable area is reduced by approximately 84 acres. This includes 51 acres with 20% slope or greater, and 33 acres within the gulch.

Based on the results of the land suitability analysis, the existing land use plan is feasible from a land suitability standpoint. As stated in the Kaua‘i Island Plan, the terrain and soils on the Mauka

Site are well suited for dwellings. The flat conditions and scenic views make the land designated as Residential a good choice for residential development. The Commercial and Community Use areas along the highway are large enough to accommodate uses such as a community center, park, and farmers market. With the appropriate mix of community serving uses, these areas could provide a significant benefit to the west side beneficiary community and the greater community of Hanapēpē.

Drawbacks to the Existing Land Use Plan alternative are that it spreads residential and commercial development across Kukamahu Gulch, with those uses reaching to the western border of the site. This may require longer extensions of roads and utilities, as well as additional gulch crossings, with associated environmental and cost impacts. From a planning best practices standpoint, it is preferable to encourage compact development patterns that concentrate residential and commercial development within walking and biking distance of existing town centers.

In addition, placing residential and commercial uses adjacent to agricultural lands, which exist to the west of the site, can result in unwanted impacts from agricultural activities (noise, dust, pesticides, etc.) and in complaints from residents and businesses. In general, it is preferable to provide a buffer and allow for a gradual transition of decreasing density between residential and agricultural areas.

Finally, the residential areas to the west of the gulch are directly mauka of the area leading down to Salt Pond Park. This may add to existing concerns about runoff impacting the salt ponds.

4.3 ALTERNATIVE 2: MODIFIED LAND USE PLAN (PREFERRED)

Alternative 2 concentrates Residential land uses to the east of Kukamahu Gulch, adjacent to existing residential development (Figure 14). Subsistence agriculture areas are concentrated to the west of the gulch. The Commercial and Community Use areas in the southwest corner of the Makai Site are adjusted to reflect beneficiary preferences, and a new small area of Commercial is proposed just mauka of the Makai Site, in anticipation of a future mauka extension of Lele Road as a gateway to the community. Based on identified constraints for topography and soil types, the total developable area is 281 acres.

Concentrating residential development to the east of the gulch is consistent with smart growth principles, which calls for focusing development in and adjacent to existing neighborhoods and town centers. It is also compatible with form-based code, which the County plans to adopt via the West Kaua'i Community Plan. Form-based code replaces conventional use-based zoning with standards based on development form and type rather than use. The desired effect is a gradient, or transect, of uses transitioning from high density mixed use in town centers to lower density types. The gulch crossing the Mauka Site provides a natural division to separate denser Residential lots from larger lot Subsistence Agriculture homesteads, which would then transition into open space and adjacent agricultural lands. In addition, maintaining the western side of the parcel in agricultural use will help to preserve view planes and green space to the southwest, which is consistent with desires expressed by existing lessees.

The southeast portion of the Mauka Site is located within walking distance of Hanapēpē Town and is designated as Neighborhood General in the Kaua'i General Plan. This designation is considered appropriate for medium-density mixed-use commercial and residential development.

Adding a new Commercial area at this location where a new road and gateway is envisioned is consistent with the County's policy of encouraging mixed use in the core of Hanapēpē town.

Alternative 2 adjusts the Commercial and Community Use areas along the highway on the southwestern side of the Makai Site to reflect beneficiary input indicating the desire for a larger Community Use area and smaller Commercial area closer to Hanapēpē Town. The acreage for Community Use is increased with the intent of providing a destination for the west side community that may include a park, ball fields, and community center, as well as agriculture-supportive uses such as a farmer's market, community garden, and shared equipment/facilities. The Commercial area is decreased and moved closer to Hanapēpē Town.

Concentrating residential development on the east side of the gulch is advantageous from an infrastructure standpoint, as sewer and water lines can be extended from the existing subdivision without crossing the gulch.

Figure 13: ALT 1: MAINTAIN EXISTING DHHL LAND USE PLAN

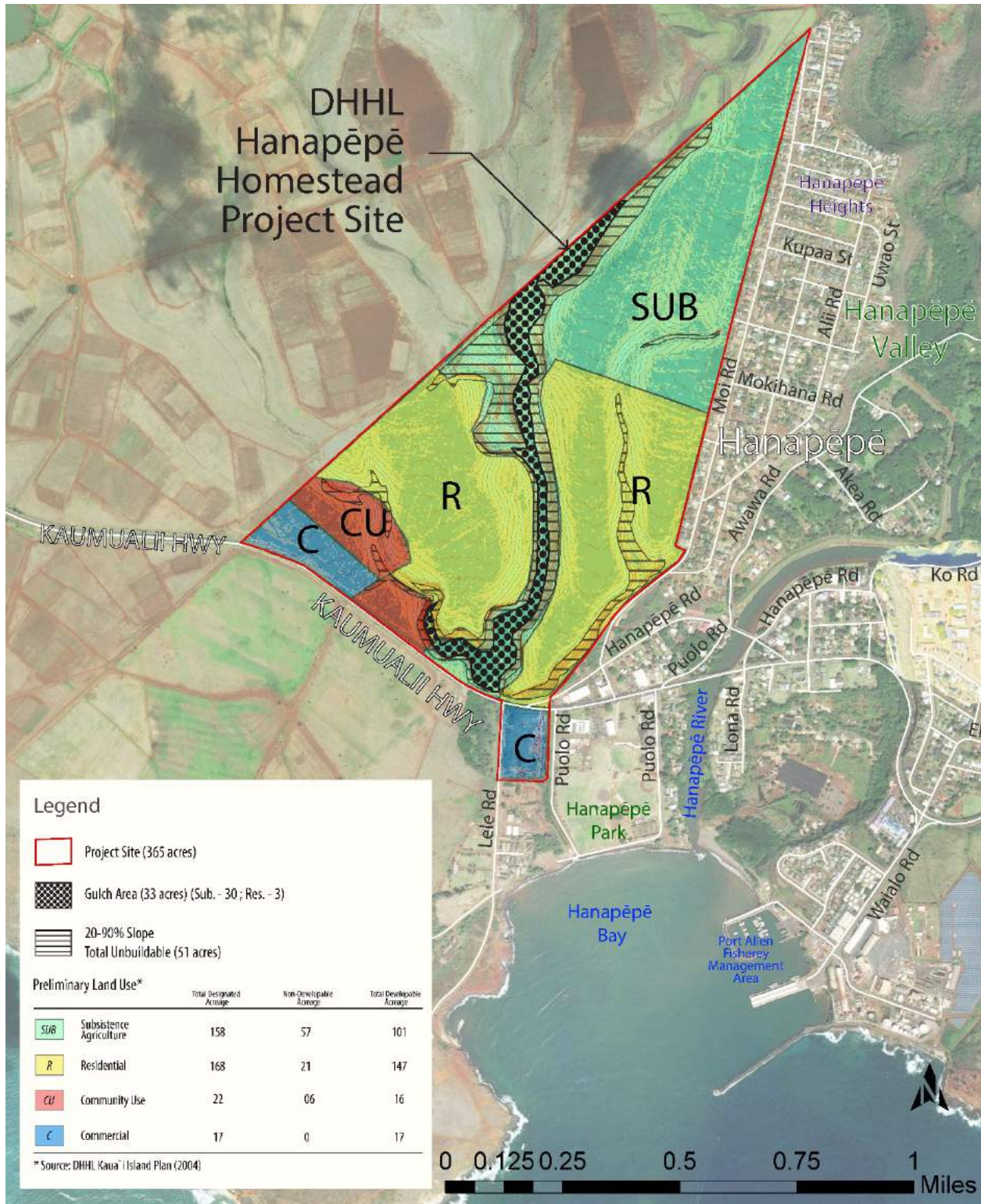
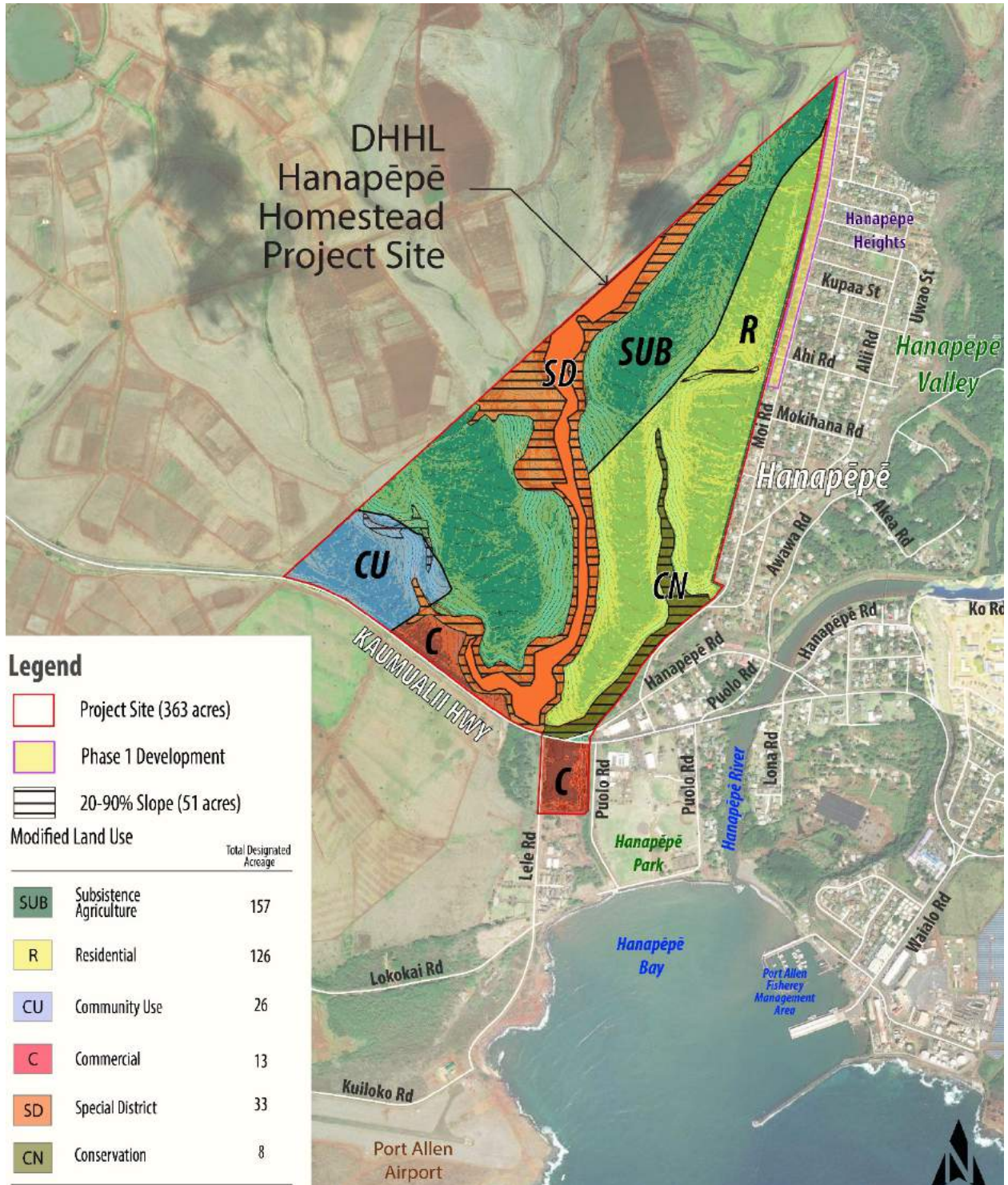


Figure 14: ALT 2: MODIFIED LAND USE PLAN (PREFERRED)



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5.0 FINDINGS AND DETERMINATION

5.1 DETERMINATION

The proposed Hanapēpē Homestead Community Project is not anticipated to have a significant impact based on the criteria set forth in HAR, Chapter 200, Title 11, Section 12. The objective of this Final EA is to identify and consider the “significance” of potential environmental effects which includes the sum of effects on the quality of the environment along with cumulative long-term effects.

As set forth in HAR, Chapter 200, Title 11, a prescribed set of 13 Significance Criteria is used to determine the Project’s impact on the environment. The Project’s relationship to each criterion is discussed in this chapter.

5.2 SIGNIFICANCE CRITERIA FINDINGS

To determine whether a proposed action may have a significant effect on the environment under HAR Title 11, Chapter 200.1 (2019), the Proposing Agency needs to consider every phase of the action, the expected primary and secondary consequences, cumulative effect, and the short- and long-term effects. The Proposing Agency’s review and evaluation of the proposed action’s effect on the environment would result in a determination whether: 1) the action would have a significant effect on the environment, and an Environmental Impact Statement Preparation Notice should be issued, or 2) the action would not have a significant effect warranting a Finding of No Significant Impact (FONSI).

1. Irrevocably commits a natural, cultural, or historic resource.

The Project is not expected to adversely impact natural or cultural resources in Hanapēpē. Technical studies have been conducted to assess the potential impact of the Project on fauna and flora, as well as cultural and archaeological resources on DHHL’s Hanapēpē lands and downstream lands.

Studies have found that the prime agricultural portions of the Mauka Site property were previously under long-term, intensive sugar cultivation and have since been used for farming and pasture, limiting the expectation of finding pre-contact archaeological or cultural features, or significant native habitats. The primary constraints to development of the Mauka Site are related to the topography of several gulches of varying widths and steepness cross the site. In general, the slopes and soils in these areas are less suited to development, and are more likely to include sensitive resources such as flora, fauna, and cultural resources. Accordingly, the Land Use Plan designates the majority of the gulch areas and portions of the site with greater than 20% slope as Conservation land or Special District.

Minimizing any potential impacts to the Hanapēpē salt ponds is critically important for protection of cultural practices in Hanapēpē. While the Project site is not believed to drain into the salt ponds area presently, reports of periodic flooding through the gulches and across the highway require careful attention to drainage system design and runoff retention. The Project

will meet or exceed County drainage requirements by providing stormwater detention basins and applying Low Impact Development strategies to reduce the environmental impact of runoff and improve water quality.

Any subsequent unforeseen negative impacts may be mitigated through management protocols developed with the lessees; continued coordination with SHPD; and designation of streams, gulches, and biologically promising areas as Conservation or Special District.

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

The proposed Project is not expected to curtail the range of beneficial use of the environment by placing native Hawaiians on the land and by designating streams, gulches, and areas with the potential for native habitat restoration as Conservation or Special District.

Given the presence of high-quality agricultural lands on the Mauka Site, the site is well suited for agricultural use, and the preferred location of Subsistence Agriculture lots will provides a buffer between Residential and agricultural uses to the west of the gulch. Proposed Residential uses are located to take advantage of natural buffers and trade winds, as well as proximity to existing infrastructure facilities along Moi Road.

Results of environmental studies and research suggest that the Makai Site should remain in industrial and/or commercial use. Of concern is the existence of soils that are prone to ponding and flooding, as well as the presence of Recognized Environmental Concerns on the site as identified in the Phase 1 Environmental Site Assessment. These warrant further study and will likely require additional drainage mitigation measures with any changes in use.

3. Conflicts with the State's environmental policies or long-term environmental goals and guidelines established by law.

This Project does not conflict with the State's long-term environmental policies or goals and guidelines. Potential adverse impacts are associated with short-term construction activities that will be mitigated through compliance with regulatory guidelines and use of best management practices. In the short-term, the Project provides up to 75 additional Residential lots for beneficiary lessees. In the long term, the Project provides up to 374 additional Residential lots, 111 Subsistence Agricultural and community and economic opportunities for native Hawaiians to improve their quality of life.

4. Has a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State.

The Project will be beneficial to the economy and social welfare of the State by providing opportunities for native Hawaiian beneficiaries to obtain homestead leases at \$1.00/year for 99 years, and to receive other programmatic supports that increase crop production and build capacity for homesteaders to engage in subsistence agricultural activities and to possibly reside on the lot. The lessees provide an additional customer base for the existing commercial businesses within Hanapēpē Town.

Current lessees and beneficiaries have identified a number of potential commercial uses that would contribute positively to the economic and social welfare of the surrounding community. These new commercial uses on the Project site would likely result in additional jobs and services offered to the Hanapēpē community.

Nohopapa Hawai‘i consulted with individuals knowledgeable with the Project area who participated in community ethnographic interviews for contributions to the cultural impact assessment. Ethnographic research involves gathering oral histories and conducting interviews with living communities to record historical connections to a place. Six individuals were contacted for the study. No significant adverse impacts from the project were identified.

5. Has a substantial adverse effect on public health.

The Project will have short-term construction- related impacts on noise and air quality, but they will be mitigated by compliance with Department of Health regulations. Potential long-term impacts on public health will be mitigated through wastewater disposal accommodated by connection to the ‘Ele‘ele WWTP or thru individual wastewater disposal systems that are approved by the DOH; surface water runoff managed by a Drainage Master Plan, and streams and gulches protected as Conservation or Special District-designated areas. Walking and biking paths as well as community use areas in the new homestead community will provide opportunities for active transportation and recreation to promote health.

6. Involves adverse secondary impacts, such as population changes or effects on public facilities.

The Project will increase the population of Hanapēpē through new permanent residences in the short term of up to 75 Residential lots and in the long term with the addition of up to 449 Residential lots and 111 Subsistence Agriculture lots. Based on the experience of previous DHHL agricultural homesteads, only 50% of the Subsistence Agricultural lots are expected to result in residences. However, all of the lessees, regardless of whether or not they ultimately reside in Hanapēpē, will be required to pay property taxes on their lot, which will contribute toward public facilities and services.

In the short term, public utility services are anticipated to be able to accommodate the Phase 2 residential subdivision for potable water and irrigation, wastewater connection, solid waste pick up, electricity and communications.

In the long-term, should public utilities not be available due to capacity issues, additional options will be necessary to provide water and wastewater services. The water master plan that was prepared to assess the existing water supply capacity and propose infrastructure improvements includes the possibility of a new well, storage tank and distribution system should the existing County system prove unable to accommodate the development. DHHL will mitigate the potential impacts to public utilities and services by working with the County DOW and DWWM to ensure the Project can be accommodated appropriately through County-owned systems.

There is only one public road to enter and exit the Project site and Hanapēpē Heights community at this time, which is Moi Road. Access road stub-outs exist along Moi Road across from Ali‘i Road, Ahi Road, and Eleu Road to provide future connection in DHHL’s Hanapēpē lands. Moi

Road is the collector for entire residential community. Lessees and residents have expressed a desire for alternate access, and the traffic analysis for the Project indicates a second access will be needed to mitigate traffic. The land use plan identifies a proposed location for the second access road, which is anticipated to be developed as part of the long-term site build-out.

7. Involves a substantial degradation of environmental quality.

Construction activities will cause some impacts to air quality, noise, and traffic in the area of the Project, but these are temporary in nature and will be mitigated by best management practices in accordance with State and County permit regulations. Potential impacts to surface water and drainage will be mitigated by a drainage master plan that is being developed to minimize erosion and manage runoff. Furthermore, roughly 10 percent of the Project site will be dedicated to Conservation and Special District uses in order to protect natural drainageways.

8. Is individually limited but cumulatively has substantial adverse effect upon the environment or involves a commitment for larger actions.

The proposed Project is not expected to have a significant negative cumulative effect upon the environment. DHHL does not have any other Projects in the vicinity and this Project does not commit DHHL or others to additional actions. The preferred land use plan is consistent with the policies, goals, and objectives set forth in the current draft of the West Kauai Community Plan and the County General Plan.

9. Has a substantial adverse effect on a rare, threatened or endangered species, or its habitat.

There are no known threatened or endangered species or associated habitats on or near the property. The areas most likely to contain any sensitive habitat, such as the gulches and steep slopes, are proposed for Conservation or Special District. Additionally, best practices will be carried out to protect against potential impacts to the Hawaiian hoary bat, Hawaiian hawk, and seabirds that may fly over the property. The Project will include measures to avoid or minimize potential impacts, such as limiting the quantity of, and shielding street lights, community park lighting, and external lights on buildings. Nighttime work that requires outdoor lighting would need to be avoided during the seabird fledging season from September 15 through December 15. No trees greater than 15 feet tall should be trimmed or removed during the bat pupping season from June 1 to September 15. If any of the waterbird species are present during construction, then all activities within 100 feet should cease and the bird(s) should not be approached.

10. Has a substantial adverse effect on air or water quality or ambient noise levels.

Construction activities will cause some impacts to air quality, noise, and surface water in the area of the Project, but these are temporary in nature, will follow appropriate regulations, and will be mitigated by best management practices in accordance with State Department of Health and County of Kaua‘i construction permit conditions.

Potential long-term impacts to surface water quality will be mitigated by a drainage master plan that is being developed to minimize erosion and manage runoff. After construction, the Project is

not expected to have a detrimental impact on air quality or noise levels. There may be a slight increase in impervious surfaces due to the construction of roads, houses, and community facilities, but any additional runoff will be contained on-site through drainage features identified during the development of a master drainage plan. The drainage master plan will identify features and practices to minimize erosion.

11. Has 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 Mauka Site is not located in an environmentally sensitive area. It is located outside of the flood plain, tsunami zone, beach area, geologically hazardous land, estuary, and 3.2-foot Sea Level Rise Exposure Area (SLR-XA) from the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report. It should be noted that for the islands of Lāna‘i, Moloka‘i, and Hawai‘i, the SLR-XA represents only the passive flooding hazard due to the lack of historical data needed to model the other two hazards.

The Makai Site is designated as an area of minimal flood hazard, Flood Zone X, on the Federal Emergency Management Agency Flood Insurance Rate Maps. Zone X is determined to be outside the 500-year flood zone, with minimal risk of flooding. The Pacific Disaster Center has identified the Makai Site as being within the Tsunami Evacuation Zone. The Makai Site is located adjacent to but outside of the 3.2-foot Sea Level Rise Exposure Area SLR-XA.

The State Department of Land and Natural Resources Division of Forestry and Wildlife identified the Mauka Site as in the “N/A” zone for risk to wildfire hazards. However, due to drier weather, hotter temperatures and stoppage of agricultural uses on the Project site, the risk of wildfire is high, and development of the site would help to mitigate the risk of wildfire substantially, with appropriate firebreaks provided between developed and open areas.

12. Has a substantial adverse effect on scenic vistas and view-planes, during day or night, identified in county or state plans or studies.

The Project site is not located in an area that has been identified as a scenic view plane or area of natural beauty by the County or State and it contains no significant geographical points, such as pu‘u. The proposed Project will not result in significant impacts to scenic vistas and view planes during day or night. The Project will alter the existing views of agricultural lands as they are converted to homesteads, but the Subsistence Agriculture land use will be generally consistent with previous and current agricultural land uses. The new Residential lots will be located adjacent to the existing homes and subdivision.

13. Require substantial energy consumption or emit substantial greenhouse gases.

The new agricultural activities, commercial and community use areas, and homes will increase energy consumption but are not anticipated to require substantial energy requirements or emit substantial greenhouse gases when compared with other similar Projects.

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6.0 AGENCIES AND ORGANIZATIONS CONSULTED

A comprehensive stakeholder engagement plan was developed for the Project and is being implemented to gather input from existing DHHL lessees and beneficiaries, as well as the greater Hanapēpē community and relevant agencies. Summaries of outreach activities are included in Appendix J. Activities to date have included:

- A meeting with existing Hanapēpē lessees and applicants to provide insights into current conditions on and around the Project site, and to identify important elements of culture, identity, and place.
- Three (3) beneficiary consultation meetings to inform beneficiaries about the Project and invite their participation in envisioning the future homestead community.
- Two (2) community meetings open to the public and beneficiaries, to introduce the Project, gather input for consideration in the EA, and envision the relationship of the lessees, homesteads, and Project site to the greater Hanapēpē community.
- A beneficiary survey to obtain current information on demand for homestead types in the Hanapēpē area, and to identify desired types of development, including communal use areas and facilities.
- A Cultural Impact Assessment and Phase I Environmental Site Assessment involving interviews and consultation with Hanapēpē residents, kupuna, landowners, and businesses.
- Consultations with adjacent landowner and former lessee of the site Gay and Robinson to gather information on the site history and discuss the relationship of the homestead community to adjacent agricultural lands and facilities.
- Consultations with relevant State and County agencies to address the relationship of the homestead community to existing plans, policies, and infrastructure.
- EA Pre-Consultation letters sent to relevant agencies and organizations requesting initial input on the Project and topics to address in the Draft EA.
- Draft EA publication and distribution for agency and public comment
- Presentation to the Hawaiian Homes Commission.

6.1 EXISTING LESSEES MEETING

A meeting with existing Hanapēpē Lessees was held on December 13, 2018 at the Hanapēpē Library. The purpose of the meeting was to introduce the Project team and meet the existing lessees, share information regarding the process and timeline for the Project, hear and collect lessee manaʻo on existing homesteads, the Project site, and the relationship of the homesteads to the greater community and island. A copy of the meeting summary is provided in Appendix J.

Twenty-two people attended, approximately half of whom were existing lessees, and the other half were applicants on the DHHL waiting list. The Project team shared a presentation and

distributed fact sheets with the plans and timeline for the Project. Valuable information about the Project site was gleaned from the meeting, as summarized below:

- **Vehicular Access:** There is only one road to enter and exit the community. Traffic backs up during emergencies, as people go up Moi Road for evacuation.
- **Fire Management:** The community is concerned with fire because the parcel behind their homes is overgrown and dry, and there are no firebreaks to prevent a fire from spreading.
- **Natural Disasters & Hazards:** Heavy rains cause flooding across homestead lots and the highway below the site. Drainage should be a priority to address.
- **Housing Product Types:** Applicants expressed a preference for turnkey homes over self-help or rent to own. There was interest in how land uses/product types would be selected. Lessees expressed a desire for a community center with playground, emergency shelter, and other uses.
- **Homestead Lot Size:** The existing homesteads are close together, and many lessees have extended their backyards to provide more space. Lessees would like areas behind homesteads lots extended to allow the lessees more space. Future homesteads should be built with bigger lots.
- **Timing of Project:** Applicants are hopeful that the development process can be completed in less than 10 years.
- **Uses behind Existing Homestead Lots:** The land behind the existing Homestead lots were previously used as gardens to grow food. Lessees would also like a firebreak behind existing lots.
- **Water Supply:** Lessees noted that there is only one well and one pump for Hanapēpē . The Homestead development may need a new well.

6.2 BENEFICIARY CONSULTATION MEETINGS

Three (3) beneficiary consultation meetings were held on July 24, 2019, December 5, 2019 and September 3, 2020. The first two meetings we held at the ‘Ele‘ele Elementary School and the third was held virtually due to COVID-19 social distance rules. Copies of meeting summaries are included in Appendix J. Presentations were provided in English, and it was also translated into ‘Ōlelo Ni‘ihau by an interpreter. Attendees received copies of the agenda in English and ‘Ōlelo Ni‘ihau, as well as copies of the presentation and Project distributed fact sheets with the plans and timeline for the Project.

The purpose of the July 24, 2019 meeting was to introduce the Project team and meet DHHL beneficiaries and applicants, share information regarding the findings from work done to date, share preliminary findings from the beneficiary survey, gather input on preliminary land use plan alternatives, and gather input on desired qualities and land uses for a Hanapēpē Homestead community.

The purpose of the December 5, 2019 meeting was to present and gather input on two proposed land use plan scenarios for full buildout, as well as preferred uses within Community Use and Commercial areas. Additionally, input was gathered on what should be addressed in the EA. The Project team provided a brief overview of the Project and a recap of beneficiary input and findings from early consultations, technical studies, and the beneficiary survey and meetings.

The Project team also presented preliminary land use plan alternatives for the Environmental Assessment. Map stations were set up to allow attendees to review and mark up the proposed site layout, as well as provide input on preferred uses within Community Use and Commercial Areas. Informational and interactive boards were on display in an open house format.

The third beneficiary consultation meeting on September 3, 2020 provided a recap of the Draft Environmental Assessment process.

6.3 STAKEHOLDER CONSULTATION MEETINGS

Initial stakeholder consultation meetings were held between December 2018 and April 2019. The SSFM Project team and DHHL staff met with and/or initiated e-mail correspondence with the following agencies and organizations:

- COK Planning Department
- COK Department of Public Works
- COK DPW Division of Wastewater Management
- COK Department of Water
- State of Hawai‘i Department of Transportation
- Gay and Robinson

6.4 COMMUNITY MEETINGS

Two (2) community meetings were held on October 26, 2019 at the ‘Ele‘ele Elementary School and virtually on July 9, 2020. A copy of the meeting summaries are included in Appendix J. The purpose of the first meeting was to introduce the Project, share findings from work done to date, share preliminary findings from the beneficiary survey, present land use plan alternatives for EA, gather input on what’s important to residents of Hanapēpē and how they view their community, and gather input on what should be addressed in the EA.

The Project team shared a presentation and developed informative and interactive boards on display in an open house format. Attendees received copies of the agenda, as well as copies of the presentation and Project fact sheet.

The second community meeting occurred during the EA public comment period to obtain input on the Draft EA (meeting coincided with the Draft EA publication by OEQC).

6.5 ENVIRONMENTAL ASSESSMENT CONSULTATIONS

The following agencies and organizations were consulted during the preparation of the Draft EA and on the Draft EA. All written comments received during the early consultation period of the Draft EA and on the Draft EA are included in Appendix A.

TABLE 6: EA CONSULTATIONS

Distribution	Pre-Assessment Consultation Comments	Draft EA Comments
FEDERAL AGENCIES		
U.S. Fish and Wildlife Service		
U.S. Army Corps of Engineers, Honolulu District Regulatory Office	X	
STATE OF HAWAI‘I AGENCY		
State of Hawai‘i Department of Agriculture		
State of Hawai‘i Department of Business, Economic Development & Tourism		
State of Hawai‘i Department of Accounting and General Services	X	X
State of Hawai‘i Department of Land and Natural Resources, Division of Aquatic Resources		
State of Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife		X
State of Hawai‘i Department of Land and Natural Resources, Division of State Parks		
State of Hawai‘i Department of Land and Natural Resources, Commission on Water Resource Management		X
State of Hawai‘i Department of Land and Natural Resources, Engineering Division		X
State of Hawai‘i Department of Land and Natural Resources, Office of Coastal and Conservation Lands		
State of Hawai‘i Department of Transportation, Highways Division	X	
State of Hawai‘i Department of Transportation, Airports Division		X
State of Hawai‘i Department of Health, Clean Air Branch		X
State of Hawai‘i Department of Health, Clean Water Branch		
Office of Hawaiian Affairs		
COUNTY OF KAUA‘I		
County of Kaua‘i Housing Agency		
County of Kaua‘i Planning Department		X

County of Kauaʻi Water Department		X
County of Kauaʻi Department of Public Works		
County of Kauaʻi Department of Public Works, Engineering Division	X	
County of Kauaʻi Department of Public Works, Roads Division		
County of Kauaʻi Department of Public Works, Waste Water Management Division		
County of Kauaʻi Department of Public Works, Solid Waste Division		
County of Kauaʻi Emergency Management Agency		
County of Kauaʻi Fire Department		
ELECTED OFFICIALS		
State Representative, House District 16		
State Senator, Senate District 8		
Kauaʻi County Council Chair		
Kauaʻi County Council, Felicia Cowden, Councilmember		X
OTHER		
Malia Nobrega-Olivera, Moku o Manakalanipo		X

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7.0 REFERENCES

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Appendix A – Pre-Assessment Consultation and Draft EA Comments



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

STATE OF HAWAII DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

DEC 9 2019


Mr. Jared Chang, AICP
SSFM International
501 Summer Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: **DHHL Hanapepe Kauai Homestead**
Pre- Assessment Consultation for Environmental Assessment
Hanapepe, Kauai, Hawaii
Tax Map Key (TMK): (4) 1-8-007-003; (4) 1-8-008: 035, 081, 087, 087

Thank you for the opportunity to provide comments on the subject project. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, your staff may call Mr. Dennis Chen of the Public Works Division at 586-0491.

Sincerely,

CURT T. OTAGURO
Comptroller

DYKC:jl



CURT T. OTAGURO
AICP
COMPTROLLER



June 30, 2020

SSFM 2018_021.000

Mr. Curt T. Otaguro
Comptroller
State of Hawaii
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawaii 96810

SUBJECT: **DHHL Hanapepe Kauai Homestead**
Response to Comments on Pre-Assessment Consultation for Environmental Assessment
Hanapepe, Kauai, Hawaii
Tax Map Key (TMK): (4) 1-8-007:003; (4) 1-8-008: 035, 081, 087, 087

Dear Mr. Moulte:

Thank you for your letter dated December 9, 2019 regarding the subject project.


We note that the project does not impact any of the Department of Accounting and General Services' projects or existing facilities.

Your December 9th letter, along with this response, will be included in the Draft Environmental Assessment. We appreciate your participation in the pre-assessment consultation review process.

If you have any questions on this matter or the proposed project, please feel free to contact me at (808) 356-1242 or by email at Jehang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.


Jared Chang, AICP
Manager, Strategic Services Group

DAVID Y. IGE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

November 26, 2019

Mr. Jared Chang
Manager, Strategic Services Group
SSFM International, Inc.
501 Summer Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Pre-Assessment Consultation
Hanapepe Kauai Homestead
State Department of Hawaiian Home Lands
Hanapepe, Kauai, Hawaii
Tax Map Key: (4) 1-8-007:003, (4) 1-8-008:035, 081, 086, and 087

The State Department of Hawaiian Home Lands (DHHL) proposes to develop Hanapepe Kauai Homestead on approximately 365 acres in Hanapepe to provide residential and subsistence agriculture homesteading opportunities for DHHL beneficiaries.

The majority (359 acres) of the project site is north of Kaunuaʻali Highway (State Route 510) on Tax Map Key (TMK) parcel (4) 1-8-007:003. The remaining 6 acres of the project site are located adjacent and south of Kaunuaʻali Highway on TMK parcels (4) 1-8-008:035, 081, 086, and 087.

Based on the Pre-Assessment Consultation materials provided, the Hawaii Department of Transportation (HDOT) has the following comments relevant to State roads:

1. A Traffic Impact Analysis Report (TIAR) should be prepared by a licensed professional engineer and included in the Draft Environmental Assessment (EA). The TIAR should identify potential direct, indirect and cumulative effects to Kaunuaʻali Highway traffic conditions and intersections (e.g., Moʻi Road, Lele Road, Hanapepe Road) in the study area.
2. Describe the phasing of the project and anticipated trip generation associated with each phase leading to full built-out.
3. Include mitigation measures for potential significant adverse impacts to traffic conditions.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
NOV 26 2019

NOV 26 2019
JARED CHANG
MANAGER, STRATEGIC SERVICES GROUP
SSFM INTERNATIONAL, INC.
501 SUMMER STREET, SUITE 620
HONOLULU, HAWAII 96817

HWY-PS 2, 1676

FILE COPY

Mr. Jared Chang
November 26, 2019
Page 2

HWY-PS 2, 1676

4. HDOT prefers no new access roads to Kaunuaʻali Highway and recommends alternatives be considered in the EA for the proposed Lele Road extension across Kaunuaʻali Highway.
5. Describe any ancillary uses (special events) such as a farmer's market or agricultural programs open to the public. These should be reflected in the TIAR's trip generation.
6. A permit to perform work upon State highways shall be required for any work within the highway right-of-way (ROW). Construction plans prepared by a Hawaii licensed engineer shall be submitted for review and approval prior to applying for a permit to perform work.
7. Describe the existing and proposed storm water drainage at the project site. No additional stormwater runoff will be permitted in the State highway ROW, including culverts. All additional stormwater runoff from the project site shall be managed and mitigated onsite.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PS 2019-149.

Sincerely,

JADE T. RUTAY
Director of Transportation



June 30, 2020

Mr. Jade T. Butay
Director
State of Hawai'i
Department of Transportation
Highways Division, Planning Branch
869 Punchbowl Street
Honolulu, Hawai'i 96813

**SUBJECT: DHHL Hanapepe Kaula'i Homestead
Response to Comments on Pre-Assessment Consultation for Environmental
Assessment
Hanapepe, Kaula'i, Hawai'i
Tax Map Key (TMK): (4)1-8-007:003; (4) 1-8-008: 035, 081, 087, 087**

Dear Mr. Butay:

Thank you for your letter dated November 26, 2019 (HWY-PS 2.1676) regarding the subject project. We offer the following response to your comments.
A Traffic Impact Analysis Report (TIAR) has been prepared for the project and included in the Draft EA. The TIAR includes discussion on the comments provided in your letter for the subject project.

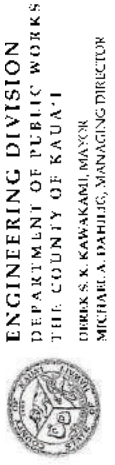
Your November 26th letter, along with this response, will be included in the Draft Environmental Assessment. We appreciate your participation in the pre-assessment consultation review process. If you have any questions on this matter or the proposed project, please feel free to contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared Chang
Jared Chang, AICP
Manager, Strategic Services Group

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ENGINEERING DIVISION
DEPARTMENT OF PUBLIC WORKS
THE COUNTY OF KAUA'I
DERRICK S. KAWAKAMI, MAYOR
MICHAEL A. DAHLIG, MANAGING DIRECTOR



LYLE M.
DEPUTY COM.

December 3, 2019

SSFM International
501 Summer Suite 620
Honolulu, HI 96817
Attention: Mr. Jared Chang, AICP

**SUBJECT: DHHL Hanapepe Kaula'i Homestead
Pre Assessment Consultation for Environmental Assessment
Hanapepe, Kaula'i, Hawai'i
TMK (4) 1-8-007: 003; (4)1-8-008: 035, 081, & 087**

PW 11,19,021

Dear Mr. Chang,

Your letter dated November 4, 2019 requested that the Engineering Division of the Department of Public Works (DPW) provide any comments, concerns, or regulatory requirements that the Division may have on the subject project. DHHL is proposing to develop a homestead community on about 365 acres of land in Hanapepe.

We recommend that the following items be included for discussion in the Environmental Assessment (EA)

1. Short term (construction) impacts of the project on air quality and water quality.
2. Identification of downstream drainage areas and the impact of drainage from the project on these properties.
3. Evaluation and discussion on the use of Moi Road between the project site and Kaunualii Highway
4. Traffic impacts both in the Hanapepe Heights area and on Kaunualii Highway.

Thank you for providing this opportunity for consultation on this pending project. We look forward to receipt of the EA. If you have any questions or need additional information, please contact Stanford Iwamoto, Engineering Division at (808) 241-4896 or siwamoto@kauai.gov.

Sincerely,
Michael Moule
Michael Moule, P.E.
Chief, Engineering Division

Lyle Tabata
Lyle Tabata
Deputy County Engineer

MM/Sl
cc. Design and Permitting Section



June 30, 2020

SSFM 2018_021.000

Mr. Michael Moule
Chief, Engineering Division
Department of Public Works
County of Kauai
444 Rice Street, Suite 175
Lihue, Hawaii 96766

**SUBJECT: DHHL Hanapepe Kaaui Homestead
Response to Comments on Pre-Assessment Consultation for Environmental
Assessment
Hanapepe, Kaaui, Hawaii
Tax Map Key (TMK): (4)1-8-007:003; (4) 1-8-008: 035, 081, 087, 087**

Dear Mr. Moule:

Thank you for your letter dated December 3, 2019 (PW 11.19.021) regarding the subject project. We offer the following response to your comments.

The Draft Environmental Assessment includes discussion on:

- Short term construction impacts of the project on air quality and water quality areas
- Identification of downstream drainage areas and the impact of drainage on these project areas
- Evaluation and discussion on the use of Moi Road between the project site and Kaunualii highway
- Traffic Impacts

Your December 3rd letter, along with this response, will be included in the Draft Environmental Assessment. We appreciate your participation in the pre-assessment consultation review process. If you have any questions on this matter or the proposed project, please feel free to contact me at (808) 356-1242, or by email at Jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared Chang, AICP
Manager, Strategic Services Group

Carlos Kelton

From: Speerstra, Linda CIV USARMY CEPOH (US) <Linda.Speestra@usace.army.mil>
Sent: Tuesday, November 26, 2019 12:36 PM
To: Jared Chang
Cc: Speerstra, Linda CIV USARMY CEPOH (US)
Subject: POH-2019-0231 Hawaiian Home Lands - Kaaui Hanapepe

Aloha Mr. Chang, thank you for reaching out to the Corps in regards to the Hanapepe Kaaui Homestead EA. The Honolulu District, U.S. Army Corps of Engineers (Corps), Regulatory Branch has received your request for comments on November 22, 2019 for a Department of the Army (DA) scoping comments. Your request has been assigned DA file number POH-2019-00231. Please reference this number in all future correspondence with our office relating to this action.

To determine if a DA permit is required for a proposed action, the Corps must first determine whether the proposed project is located within the Corps' geographic jurisdiction (i.e., whether the activity is located within a water of the U.S.). If the activity is within a water of the U.S., the Corps must then determine whether the proposed project is a regulated activity under Section 10 and/or Section 404 or if the activity is exempt. The determination provided in this letter pertains only to the question of geographic jurisdiction.

Based on our review of the information you provided we are not able to determine if the project area contains waters of the U.S., and/or wetlands, under the Corps' regulatory jurisdiction. The information submitted indicates that technical reports will be available in the forthcoming DEA. I'm providing the following information in regards to the Regulatory program.

DA authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Honolulu District.

Based on the information provided, it would appear that there is a high probability that portions of the land being used would have waters of the US present on the site. As you are preparing the EA, it would be prudent to include a delineation of waters of the US for the Corps review. If you have any questions or would like to discuss further please contact me via email at linda.speestra@usace.army.mil, by mail at the address above, by phone at (808) 835-4300 if you have questions. I appreciate your cooperation with the Corps' Regulatory Program.

Linda Speerstra
Chief, Regulatory Branch
U.S. Army Corps of Engineers
Honolulu District
808-835-4300

Linda Speerstra
Chief, Regulatory Branch
U.S. Army Corps of Engineers
Honolulu District
808-835-4300

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June 30, 2020

SSFM 2018_021.000

Ms. Linda Speerstra
Chief, Regulatory Branch
U.S. Army Corps of Engineers-Honolulu District
Building 252
Fort Shafter, HI 96858-5440
Linda.Speerstra@usace.army.mil

**SUBJECT: DHHL Hanapepe Kaa'i Homestead
Response to Comments on Pre-Assessment Consultation for Environmental
Assessment
Hanapepe, Kaa'i, Hawai'i
Tax Map Key (TMK): (4)1-8-007:003; (4) 1-8-008: 035, 081, 087, 087**

Dear Ms. Speerstra:

Thank you for your email received on November 26, 2019 (POH-2019-00231) regarding the subject project. We offer the following response to your comments.

We will work with USACE in the future to determine the Department of Army permit applicability.

Your November 26th email, along with this response, will be included in the Draft Environmental Assessment. We appreciate your participation in the pre-assessment consultation review process.

If you have any questions on this matter or the proposed project, please feel free to contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared Chang, AICP
Manager, Strategic Services Group



DANIEL BE
COMMISSIONER OF LAND AND NATURAL RESOURCES

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 2021
HONOLULU, HAWAII 96809

SUZANNE CASE
COMMISSIONER
BRUCE S. ANDERSON, PH.D.
KAMANA BEANER, PH.D.
MICHAEL O. BUCK
KIMBERLY A. HARRIS
WAYNE K. KOTAYAMA
PAUL J. MEYER
M. KALEO MANUEL
DEPUTY COMMISSIONER

August 4, 2020

REF: RFD-5410.2

TO: Mr. Jared Chang, AICP, Planner
SSFM International, Inc.

FROM: M. Kaleo Manuel, Deputy Director
Kaleo Manuel
Commission on Water Resource Management

SUBJECT: Draft Environmental Assessment, DHHL Hanapepe Homestead Community, Hanapepe Ahupuaa,
Waimea Moku, Island of Kauai

FILE NO.: RFD-5410.2
TRK NO.: (4) 1-8-007,003; (4) 1-8-008,035, 081, 086, and 087

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 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/cwrmm>.

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.
- 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>.
- 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.
- 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>.
- 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

Mr. Jared Chang
Page 2
August 4, 2020

- 9. http://www.hawailscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf. 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. A Well Construction Permit(s) is (are) required before the commencement of any well construction work.
- 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- 13. 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.
- 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a stream channel.
- 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- 18. 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 relationship of this project to the State Water Projects Plan (SWPP) should also be discussed in Section 3. The SWPP was updated in 2017, focusing exclusively on DHHL land tracts, including Hanapepe lands. The SWPP is a component of the Hawaii Water Plan and has been formally adopted by the Commission.

If you have any questions, please contact Lenore Ohye of the Commission staff at 587-0216.



October 08, 2020

Mr. Kaleo Manuel, Deputy Director
State of Hawai'i
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawai'i 96809

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs); (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Deputy Director Manuel:

Thank you for your letter dated August 4, 2020 regarding the proposed project. We offer the following response to your comments:

A review and discussion of the Project's water needs in relation to the State Water Projects Plan Update dated 2017, has been included in the Final EA as a new section in Chapter 3. We noted that Section 4.5.1.2 of the SWPP covers the Hanapēpē tract which is identified as the Hanapēpē Homestead Community project. The SWPP assumes that the Hanapēpē tract would require additional sources (new source well), a booster pumping station, and extensive infrastructure, in addition to several options for non-potable water sources to serve the subsistence agriculture land uses.

As discussed in Section 2.11.2, Water Services, a water master plan was developed for the project which indicates that the existing County Hanapēpē Water System is conceptually able to meet the increased demands associated with Phase 2 of the Project. Furthermore, with the current facility improvements planned for the 'Eie'ele system to support the County's Lima Ola development build-out conditions (expansion of the 'Eie'ele storage tanks), the planned supply and distribution network are likely able to meet the increased demands to support the Hanapēpē Project's full build-out scenario (Phase 3). Beyond these planned improvements, no additional source wells are anticipated to be required and no additional storage is anticipated to be required. DHHL intends to coordinate potable and non-potable water needs with 1) the County of Kaua'i for inclusion in the next update of the County's Water Use and Development Plan; and the State of Hawai'i Department of Land and Natural Resources, Engineering Division for inclusion in the State Water Project Plan.

In accordance with the SWPP's strategy for Hanapēpē tract, DHHL is also considering the possibility of connecting to the existing Gay and Robinson irrigation water system on the neighboring parcel as an alternative source of irrigation water to serve the homestead community. Further discussion and coordination with G&R will be required to determine the feasibility of this option.

501 Summer Street | Suite 620 | Honolulu, Hawaii 96817 | Tel 808.531.1308 | Fax 855.329.7736 | www.ssfm.com
Planning | Project & Construction Management | Structural, Civil & Traffic Engineering



DHHL Hanapepe Homestead Community
Page 2
October 8, 2020

Additional recommendations provided in your letter have also been included in the Final EA.

A copy of your August 4th letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared K. Chang, AICP
Manager, Strategic Services Group

DAVID Y. IBE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

August 4, 2020

Mr. Jared Chang, AICP

Planner
SSFMI International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Draft Environmental Assessment (EA)
Department of Hawaiian Home Lands (DHHL) Hanapepe Homestead Community
Hanapepe, Kauai, Hawaii
Tax Map Key: (4) 1-8-007-003, 018, and 021; 1-8-008-035, 081, 086, and 087

The State of Hawaii, Department of Transportation (HDOT) understands that DHHL is proposing to construct Phases 2 and 3 of the Hanapepe Homestead Community project. Phase 2 is proposed to consist of 75 residential lots in 2025, and Phase 3 will consist of an additional 374 residential units, 11 agricultural subsistence lots and 13.17 acres of commercial use. Full build-out is anticipated to be in 2040. The project will border Kaunualii Highway (State Route 50).

HDOT has the following comments:

Airports Division (HDOT-A)

1. The project area is approximately 0.66 miles from Port Allen Airport (PAK). All projects within 5 miles from Hawaii State airports are advised to read the Technical Assistance Memorandum (TAM) for guidance with development and activities that may require further review and permits. The TAM can be viewed at this link: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf.
2. The project area is approximately 3,463.25 feet from the end of Runway 27 at PAK. Federal Aviation Administration (FAA) regulation requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or Alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9, if the construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. Construction equipment and staging area heights, including heights of temporary construction cranes need to be included in the submittal. The form and criteria for submittal can be found at the following website: <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>.

Mr. Jared Chang, AICP
August 4, 2020
Page 2

STP 8.2980

3. The Airport Zoning Act, Hawaii Revised Statutes, Chapter 262, requires HDOT-A to prevent hazards and non-conforming uses that conflict with the FAA Hazardous Wildlife Attractants requirements. HDOT-A recommends that the design of the homestead landscaping does not create a wildlife attractant. Please review the FAA Advisory Circular 150/5200-33C, *Hazardous Wildlife Attractants On Or Near Airports* for guidance. If the project results in a wildlife attractant, DHHL shall immediately mitigate the impacts upon notification by the HDOT-A and/or FAA.

4. The applicant should be aware of the proximity of the airport and potential single event noise from aircraft operations.

5. Due to the proximity of the airport, there is a potential for fumes, smoke, vibrations, odors, etc., that may result from aircraft flight operations over existing uses and the proposed future developments of the DHHL Hanapepe Homestead Community.

6. The Draft EA does not discuss the use of a Photovoltaic (PV) solar energy system. However, the early consultation has recommendations for PV energy at the homestead. PV systems located in or near the approach and departure path of aircrafts can create a hazardous condition for pilots due to possible glint and glare reflected from the PV array. If DHHL decides to install PV solar panels in the future, a glint and glare analysis must be submitted for FAA review. The following website helps with the preparation of a glint and glare analysis: <https://share-ng.sandia.gov/glare-tools/>.

HDOT-A also recommends use of the highest rated non-glare solar panels in order to mitigate potential hazard to the greatest degree possible. If glint or glare from the PV array creates a hazardous condition for pilots, the owner of the PV system shall be prepared to immediately mitigate the hazard upon notification by the HDOT-A and/or FAA.

Finally, PV systems have been known to emit radio frequency interference (RFI) to aviation-dedicated radio signals, disrupting the reliability of air-to-ground communications. Again, the owner of the PV system shall be prepared to immediately mitigate the RFI hazard upon notification by the HDOT-A and/or FAA.

Highways Division (HDOT-HWY)

In reviewing both the Draft EA and the appended draft Traffic Impact Analysis Report (TIAR) dated March 25, 2020, HDOT-HWY has the following comments relevant to State highways:

1. The TIAR included 15 intersections in the study area for two horizon years: 2025 (Phase 2 buildout) and 2040 (Phase 3 buildout). The two proposed access driveways on Kaunualii Highway are included in Phase 3. The key findings are as follows:
 - a. The 2025 Phase 2 was found to have a negligible impact on traffic conditions; however, there were four intersections with Kaunualii Highway having unacceptable Levels of Service (LOS) (E or F) for one turning movement during a.m. and/or p.m. peak traffic hours. The same conditions were observed in 2019. All poorly operating approaches are for the side streets and are due to the lack of

- gaps in heavy traffic volumes on Kaunualii Highway during the peak hours. No mitigation is proposed.
- b. The 2040 with Phase 3 (buildout) development would have an adverse impact on traffic conditions relative to 2040 without the Phase 3 project development. Eight intersections with Kaunualii Highway would be operating at an unacceptable LOS, including a new direct access road to Kaunualii Highway. The TIAR proposed mitigation measures and assessed their effect.
 2. Explain why the study area did not include the intersections of Kaunualii Highway-Iona Road - Iianapepe Road and Kaunualii Highway-Pepe Road when other intersections further east and west were included.
 3. In addition to Lima Oia (TIAR Page 17) there is a second Ekele residential and commercial development proposed. The TIAR should include the traffic associated with both projects and the EA should consider the potential for cumulative effects on traffic.
 4. The TIAR (Page 49) should identify mitigation measures for the following intersections:
 - a. Puolo Road (West) and Kaunualii Highway (Intersection #3)
 - b. Puolo Road (Middle) and Kaunualii Highway (Intersection #5)
 - c. Kona Road and Kaunualii Highway (Intersection #8)
 - d. Sixth Access Road and Kaunualii Highway (Intersection #16)
 5. With respect to the proposed Lele Road and Kaunualii Highway roundabout (TIAR Page 49), HDOT requires that a roundabout only be considered. It is not a mandate. County design manuals do not apply to State roadways. The constructibility of a traffic signal or roundabout requires further study.
 6. HDOT recommends a 60-foot design setback from Kaunualii Highway to accommodate future roadway improvements. Both the EA project description and the TIAR Page 56 should reflect this setback.
 7. As described in the TIAR, there is minimal multimodal infrastructure in the vicinity. We appreciate the intent to incorporate complete streets principles into the design. The EA and the TIAR should include a pedestrian plan for Kaunualii Highway.
 8. When the LOS without the project is lower than the desirable HDOT-HWY threshold of LOS "D", mitigation measures should be identified to improve the State facilities to LOS "D" or better with the project condition. DHHI will be responsible to mitigate direct impacts and should provide fair share contribution towards mitigation of regional impacts.
 9. With respect to the new access driveways on Kaunualii Highway proposed under Phase 3, we have the following comments:

- a. As mentioned in our pre-assessment consultation letter HWY-PS 2.1676 dated November 26, 2019, HDOT-HWY prefers no new access driveways on Kaunualii Highway, which is already congested during peak hours of traffic. The EA should address this concern and clarify why reducing or eliminating the access driveways on the Highway is not feasible.
- b. New access driveways require an Application for Use and Occupancy Agreement and Grant of Access and construction plans prepared by a Hawaii licensed professional engineer be submitted to the HDOT-HWY Kauai District Engineer for review and approval prior to applying for a permit to perform work in State highways.
- c. Each driveway represents a new site for potential accidents and the closer driveways are to each other, the greater the risk to roadway safety. Consult with the HDOT-HWY Kauai District Engineer regarding the need for these access driveways and the safety risks. HDOT-HWY may require a report prepared and stamped by a Hawaii licensed professional engineer that documents compliance with line of sight adequacy requirements at the proposed access driveways.

If there are any questions, please contact Mr. Blayne Nikaido of the HDOT Statewide Transportation Planning Office at (808) 831-7979 or via email at blayne.nikaido@hawaii.gov.

Sincerely,



JADE T. BUTAY
Director of Transportation



October 13, 2020

SSFM 2018_021

Mr. Jade T. Butay, Director of Transportation
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs); (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Director Butay:

Thank you for your letter dated August 04, 2020 regarding the proposed project. We offer the following response to your comment:

Airports Division (HDOT-A)

A new discussion of potential impacts to Port Allen Airport (PAK) has been included in the Final EA and potential mitigations were noted, as applicable. The Draft EA did not discuss the use of a Photovoltaic (PV) solar energy system in the Project, but if DHHL decides to install PV solar panels in the future, a glint and glare analysis will be submitted for Federal Aviation Administration (FAA) review. In addition, FAA Form 7 460-1 Notice of Proposed Construction or alteration and possible Glint and Glare Analysis approvals have been added to the list of permits/approvals in the Final EA.

Highways Division (HDOT-HWY)

We acknowledged and incorporated Highways Division comments and recommended revisions into a revised Traffic Impact Analysis Report (TIAR), included with the Final EA appendix. The revised TIAR includes updated mitigations proposed to address roadway impacts from the Project and with the addition of the 'Ele'ele Residential and Commercial Project, which is a 30-acre development with access via a new driveway off-of Waialo Road.



DHHL Hanapepe Homestead Community
Page 2
October 13, 2020

A copy of your August 4th letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process. Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared K. Chang, AICP
Manager, Strategic Services Group

From: [Cab General](#)
To: [McPherson, Nancy M](#); [Jared Chang](#)
Subject: DOH Clean Air Branch Comments on Draft EA for DHHL Hanalei Community
Date: Thursday, August 6, 2020 4:05:41 PM

Email received from **EXTERNAL** sender. Confirm the content is safe prior to opening attachments or links.

Aloha

Thank you for the opportunity to provide comments on the subject project.
Please see our standard comments at:

<https://health.hawaii.gov/cab/files/2019/04/Standard-Comments-Clean-Air-Branch-2019.pdf>

Please let me know if you have any questions.

Barry Ching
Clean Air Branch
Hawaii Department of Health
(808) 586-4200

This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.

Standard Comments for Land Use Reviews Clean Air Branch Hawaii State Department of Health

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.

s

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, 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, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should 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:

- a) 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;
- b) Providing an adequate water source at the site prior to start-up of construction activities;
- c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
- d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
- e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
- f) 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

Clean Air Branch
(808) 586-4200
cab@doh.hawaii.gov

Indoor Radiological Health Branch
(808) 586-4700

April 1, 2019



October 08, 2020

Mr. Barry Ching
State of Hawaii
Department of Health
Clean Air Branch
2827 Waimano Home Road #130
Pearl City, HI 96782

SSFM 2018_021

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHHL Hanapepe Homestead Community
Tax Map Keys (TMKs); (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Mr. Ching,

Thank you for your email dated August 06, 2020 regarding the proposed project. We offer the following response to your comments:

The project will not require an air pollution control permit, nor does it include construction or demolition activities that involve asbestos. We have incorporated applicable mitigation measures into the Final EA for potential fugitive dust impacts on the surrounding areas, which include Best Management Practices for construction activities.

A copy of your August 6th email, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared K. Chang, AICP
Manager, Strategic Services Group



DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

JUL 24 2020

Mr. Jared Chang, AICP
SSFM International
501 Summer Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

**Subject: Draft Environmental Assessment
DHHHL Hanapepe Homestead Community
Hanapepe Ahupuaa, Waimaea Moku, Island of Kauai
Tax Map Keys (TMKs): (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Thank you for the opportunity to provide comments on the subject project. As we noted in our letter of reply to the solicitation for comments at the earlier pre-assessment consultation stage, the project does not impact any of the Department of Accounting and General Services' projects or existing facilities. We therefore once again have no comments to offer at this time.

If you have any questions, your staff may call Mr. Dennis Chen of the Public Works Division at 586-0491.

Sincerely,

CURT T. OTAGURO
Comptroller



October 08, 2020

SSEFM 2018_021

Mr. Curt T. Otaguro, Comptroller
State of Hawaii
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawaii 96810

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs); (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Mr. Otaguro:

Thank you for your letter dated July 24, 2020 regarding the proposed project. We offer the following response to your comment:

We note that the proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities.

A copy of your July 24th letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.


Jared K. Chang, AICP
Manager, Strategic Services Group

COUNTY COUNCIL
Aryl Kaneshiro, Chair
Ross Kagawa, Vice Chair
Arthur Brun
Mason K. Chock
Felicia Cowden
Luke A. Eyslin
Kipuka Kua'i'i



OFFICE OF THE COUNTY CLERK
Jade K. Fountain-Tanigawa, County Clerk
Scott K. Sato, Deputy County Clerk

Telephone: (808) 241-4188
Facsimile: (808) 241-6349
E-mail: cocouncil@kauai.gov

Council Services Division
4396 Rice Street, Suite 209
Lihue, Kauai, Hawaii 96766

August 7, 2020

Jared Chang, AICP
Planner
SSFM International
501 Summer Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

**RE: DRAFT ENVIRONMENTAL ASSESSMENT – DHHL HANAPEPE
HOMESTEAD COMMUNITY – HANAPEPE AHUPUA'A, WAIMEA
MOKU, ISLAND OF KAUAI – TAX MAP KEYS (TMKs):
(4) 1-8-007:003; (4) 1-8-008:035, 081, 086, AND 087**

I am writing in my capacity as an individual member of the Kauai County Council to express my support for the subject-referenced environmental assessment.

This DHHL development is deeply needed—particularly on the immediate edge of Mo'i Road—and the housing that this plan would create would support Kauai's intensive housing needs. For your reference, I have also expressed my support for amendment of the County's in-progress West Kauai Community Plan (WKCP) to ensure the WKCP makes appropriate reference to DHHL's Hanapepe Homestead.

Mahalo for the opportunity to comment on this matter and for your assistance in providing housing for Kauai's Native Hawaiian beneficiaries.

Should you have any questions, please feel free to contact me or Council Services Staff at (808) 241-4188.

Sincerely,



FELICIA COWDEN
Councilmember, Kauai County Council

JA:ic
cc: Senate President Ronald D. Kouchi (Via E-mail Only)
Representative Daynette "Dee" Morikawa (Via E-mail Only)
Michael A. Dahlig, Managing Director
Ka'aina S. Hull, Planning Director



October 08, 2020

Ms. Felicia Cowden, Councilmember
County of Kaua'i
Council Services Division
4396 Rice Street Suite 209
Lihue, Hawai'i 96766

SSFM 2018_021

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs); (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Councilmember Cowden,

Thank you for your letter dated August 07, 2020 regarding the proposed project. We want to express our MAHALO for your support for this important Project. We also appreciate your support for an update to the West Kaua'i Community Plan to include the Hanapepe Homestead Community Plan.

A copy of your August 7th letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchangs@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared K. Chang, AICP
Manager, Strategic Services Group



**DEPARTMENT OF PLANNING
THE COUNTY OF KAUAI**

DEREK S. KAWAKAMI, MAYOR
MICHAEL A. DAHLIG, MANAGING DIRECTOR

KA'AINA S. HULL
DIRECTOR

JODI A. HIGUCHI-SAYEGUSA
DEPUTY DIRECTOR

Jared Chang
SSFM
501 Summer Street
Suite 620 Honolulu
Hawaii 96817
United States

RE: Hanapepe Homestead Community Project Draft Environmental Assessment
Hanapepe Ahupua'a, Waimea Moku, Island of Kaua'i

Dear Mr. Chang:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for the Hanapepe Homestead Community Project Plan. According to the DEA, the plan aims to establish a Hanapepe Homestead Community Project to provide Department of Hawaiian Home Lands (DHHL) waitlist beneficiaries with residential and subsistence agriculture homesteading opportunities. The document describes the preferred master plan for vacant land owned by DHHL in the Hanapepe area. The majority of DHHL's Hanapepe lands are designated for subsistence agriculture and residential homesteading. Other complementary activities include commercial and community uses.

Pursuant to the HHCA §206, Hawaiian Home Lands are not subject to County zoning or other land use controls. However, the County encourages the Department of Hawaiian Home Lands to review the County's General Plan and use it as an aid during project development. The General Plan was updated in 2018 and is the County's guiding land use policy.

The Planning Department appreciates the DEA's assessment of consistency with the General Plan, Special Management Area, and Comprehensive Zoning Ordinance. We offer the following comments regarding the status of the West Kauai Community Plan:

Section 3.3.3. West Kauai Community Plan

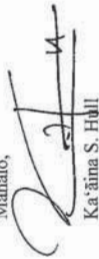
The Waimea-Kekaha Development Plan has not been updated in several decades. However, the draft West Kauai Community Plan is under review at the Kauai County Council. First reading occurred on August 5, 2020.

The Hanapepe Homestead Community Project Plan is consistent with the policies, goals, and objectives set forth in the current draft of the West Kauai Community Plan. The Planning Department is working with the County Council to amend the draft Hanapepe Town Plan Map to better align with the preferred land use plan in the DEA.



We hope these comments are useful as you finalize the environmental assessment. Should you have any questions, please contact the Planning Department at (808) 241-4050.

Mahalo,



Ka'āina S. Hull

Planning Director



October 08, 2020

SSFM2018_021

Mr. Ka'āina S. Hull, Director
County of Kaua'i
Department of Planning
4444 Rice Street Suite A473
Lihue, Hawai'i 96766

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHHL Hanapepe Homestead Community
Tax Map Keys (TMKS): (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Director Hull,

Thank you for your letter dated August 07, 2020 regarding the proposed project. We offer the following response to your comments:

Mahalo for the support of this project and the coordination throughout the master planning and environmental assessment process. We look forward to continuing our coordination with the Planning Department in support your to amend the draft Hanapepe Town Plan Map to better align with the preferred Hanapepe Homestead Community land use plan.

A copy of your August 7th letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.



Jared K. Chang, AICP
Manager, Strategic Services Group

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 631
HONOLULU, HAWAII 96809

July 23, 2020

LD 721

MEMORANDUM

FROM: ~~TO:~~

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division** (via email: DLNR.Engr@hawaii.gov)
- Div. of Forestry & Wildlife (via email: Rubyrosa.T.Terrago@hawaii.gov)
- Div. of State Parks
- Commission on Water Resource Management (via email: DLNR.CWRM@hawaii.gov)
- Office of Conservation & Coastal Lands
- Land Division – Kauai District (via email: DLNR.Land@hawaii.gov)
- Historic Preservation (via email: DLNR.Intake.SHPD@hawaii.gov)

TO:

Russell Y. Tsuji, Land Administrator

DHHL Hanapepe Homestead Community Draft Environmental Assessment (DEA)

LOCATION:

Hanapepe Ahupua'a, Waimea Moku, Island of Kauai
TMK: (4) 1-8-007:003, 1-8-008:035, 081, 086, and 087

APPLICANT:

SSFIM International on behalf of the Department of Hawaiian Home Lands

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published in the July 08, 2020 issue of The Environmental Notice. Please submit any comments via email to the Land Division at DLNR.Land@hawaii.gov, copied to barbara.j.lee@hawaii.gov and darlene.k.nakamura@hawaii.gov, by **August 05, 2020**.

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 Barbara Lee directly at barbara.j.lee@hawaii.gov. Thank you.

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: _____
 Print Name: Cathy S. Chang, Chief Engineer
 Division: Engineering Division
 Date: Jul 29, 2020

Attachments
Cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 631
HONOLULU, HAWAII 96809

August 07, 2020

LD 721

Jared Chang, AICP, Planner
SSFIM International
501 Summer Street, Suite 620
Honolulu, HI 96817

via email: jchang@ssfim.com

Dear Sirs:

SUBJECT: Draft Environmental Assessment
DHHL Hanapepe Homestead Community
Hanapepe Ahupua'a, Waimea Moku, Island of Kauai
TAX MAP KEYS: (4) 1-8-007:003; 1-8-008:035, 081, 086, and 087

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various divisions for their review and comment.

Enclosed are comments received from our (a) Engineering Division and (b) Division of Forestry and Wildlife. Should you have any questions, please feel free to contact Barbara Lee via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,
Russell Y. Tsuji
Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji

Ref: DHHL Hanapepe Homestead Community Draft Environmental Assessment (DEA)

TMK(s): (4) 1-8-007-003, 1-8-008-035, 081, 086, and 087

Location: Hanapepe Ahupua'a, Waimea Moku, Island of Kauai

Applicant: SSFM International on behalf of the Department of Hawaiian Home Lands

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). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR 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 to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (<http://gis.hawaii.nfip.org/FHAT>).

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

- o Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- o Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- o Maui/Molokai/Lanai: County of Maui, Department of Planning (808) 270-7253.
- o Kauai: County of Kauai, Department of Public Works (808) 241-4896.

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed:  CARY S. CHANG, CHIEF ENGINEER

Date: Jul 29, 2020



October 08, 2020

SSEFM 2018_021

Mr. Cary Chang, Chief Engineer
State of Hawaii's
Department of Land and Natural Resources
Engineering Division
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: **Draft Environmental Assessment Comment Response Letter**
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs): (4) 1-8-007-003; (4) 1-8-008-035, 081, 086, 087

Dear Mr. Chang:

Thank you for your letter dated July 23, 2020 regarding the proposed project. We offer the following response to your comments:

The Project site is located in Flood Zone X which is outside of Flood Hazard Zone designations and water demand calculations have been included in the Final EA. Furthermore, DHHL intends to coordinate potable and non-potable water needs with 1) the County of Kauai for inclusion in the next update of the County's Water Use and Development Plan; and your division for inclusion in the State Water Projects Plan.

A copy of your July 23rd letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

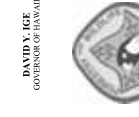
Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at ichang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.



Jared K. Chang, AICP
Manager, Strategic Services Group



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

July 23, 2020
Log no. 2730

MEMORANDUM

TO: RUSSELL Y. TSUIJI, Administrator
Land Division

FROM: DAVID G. SMITH, Administrator
Division of Forestry and Wildlife

SUBJECT: **Division of Forestry and Wildlife Comments for the DHHL Hanapepe Homestead Community Draft Environmental Assessment**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding review of the DHHL Hanapepe Homestead Community Draft Environmental Assessment in Hanapepe on the island of Kauai, Hawaii, TMKs: (4) 1-8-007:003, and 1-8-008:035, 081, 086, and 087. The proposed project consists of constructing up to 449 residential homestead lots on 126 acres and up to 111 new subsistence agricultural homes lots on an additional 157 acres.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawaii please visit: <https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf>.

The State listed Hawaiian Hoary Bat or 'Ope'ape'a (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*), Hawaiian Goose or Nene (*Bramble sandwicensis*), and Hawaiian Common Gallinule (*Gallinula chloropus sandwicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 23, 2020
LD 721

MEMORANDUM

TO: DLNR Agencies:
___ Div. of Aquatic Resources
___ Div. of Boating & Ocean Recreation
X Engineering Division (via email: DLNR.Engr@hawaii.gov)
___ Div. of Forestry & Wildlife (via email: Rubyrosa.T.Terrago@hawaii.gov)
___ Div. of State Parks
X Commission on Water Resource Management (via email: DLNR.CWRM@hawaii.gov)
___ Office of Conservation & Coastal Lands
X Land Division - Kauai District (via email: DLNR.Land@hawaii.gov)
X Historic Preservation (via email: DLNR.Intake.SHPD@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator
DHHL Hanapepe Homestead Community Draft Environmental Assessment (DEA)

SUBJECT: Hanapepe Ahupua'a, Waimea Moku, Island of Kauai
TMK: (4) 1-8-007:003, 1-8-008:035, 081, 086, and 087

LOCATION: SSFM International on behalf of the Department of Hawaiian Home Lands

APPLICANT:

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published in the July 08, 2020 issue of The Environmental Notice. Please submit any comments via email to the Land Division at DLNR.Land@hawaii.gov, copied to barbara.j.lee@hawaii.gov and darlene.k.nakamura@hawaii.gov, by August 05, 2020.

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 Barbara Lee directly at barbara.j.lee@hawaii.gov. Thank you.

() We have no objections.
() We have no comments.
 Comments are attached. **4/4**

Signed: _____
Print Name: DAVID G. SMITH, Administrator
Division: Division of Forestry and Wildlife
Date: Aug 6, 2020

Attachments
Cc: Central Files



October 08, 2020

SSEFM2018_021

Mr. Russell Y. Tsuji, Land Administrator
State of Hawai'i
Department of Land and Natural Resources
Division of Forestry and Wildlife
P.O. Box 621
Honolulu, Hawai'i 96809

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs): (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Administrator Tsuji,

Thank you for your letter dated August 07, 2020 regarding the proposed project. We offer the following response to Division of Forestry and Wildlife's (DOFAW) comments:

The minimization measures provided by DOFAW have been incorporated into the Final EA as applicable. We have noted applicable measures to include the following:

Where possible, to limit the quantity of street lighting and to ensure that proper shielding of street lights, community park lighting, and external lights on building occur.

Acknowledging that should nighttime work be required; outdoor lighting would need to be avoided during the seabird fledging season from September 15 through December 15.

Acknowledging that no trees greater than 15 feet tall should be trimmed or removed during the bat pupping season from June 1 to September 15.

Acknowledging that if any waterbird species are present during construction, then all activities within 100 feet should cease and the bird(s) should not be approached and work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, the Kauai Division of Forestry and Wildlife (DOFAW) office should be contacted.

Acknowledging efforts to minimize the movement of plant or soil material between worksites, such as in fill.

We also included best management practices to minimize the spread of invasive species and recommendations to utilize native species for landscaping as appropriate for the area.

may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the Kauai DOFAW office at (808) 274-3433.

DOFAW is concerned about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongooses. Additionally, improvements to the land parcels are likely to increase human activity and may generate more mammalian predator attractants. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid 'Ohia' Death), vertebrate and invertebrate pests, or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the Kauai Invasive Species Committee at (808) 821-1490 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Gear that may contain soil, such as work boots and vehicles, should be thoroughly cleaned with water and sprayed with 70% alcohol solution to prevent the spread of Rapid 'Ohia' Death and other harmful fungal pathogens.

DOFAW recommends using native plant species for landscaping that are appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Please do not plant invasive species. DOFAW recommends consulting the Hawai'i-Pacific Weed Risk Assessment website to determine the potential invasiveness of plants proposed for use in the project (<https://sites.google.com/site/weedriskassessment/home>). We recommend that you refer to www.plantpomo.org for guidance on selection and evaluation for landscaping plants.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Lauren Taylor, Protected Species Habitat Conservation Planning Coordinator at (808) 587-0010 or lauren.taylor@hawaii.gov.



DHHL Hanapepe Homestead Community
Page 2
October 8, 2020

A copy of your August 7th letter, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared K. Chang, AICP
Manager, Strategic Services Group

Jared Chang

Subject: RE: Form submission from: EA Comments

Submitted on Saturday, August 8, 2020 - 9:05pm
Submitted by anonymous user: 50.113.52.179
Submitted values are:

Name: Malia Nobrega-Olivera, Pelekikena
Organization: Moku o Manokalanipō
Email Address: malianob@gmail.com
Mailing Address: PO Box 24 Hanapepe HI 96716
Applicable Page(s) /Section(s) of EA:
Comment:
P.10 Sec 1.3.3 Commercial and Community Use Areas

Very important to have spaces for cultural activities and community-based economic development. This includes spaces like a commercial kitchen, cultural spaces for family gatherings, community workshops, community meetings. All plants in these spaces should be plants that can be gathered and used as food or for lei making for the community.

P.20 Sec.2.2 Geology Topography and Soils

Creative ways to mitigate flooding from the gulches and mauka areas should be prioritized to mitigate any possible flooding to the makai areas that could potentially impact any and all cultural resources that are very vulnerable.

Very concerning to read that there is evidence of REC's at the site. We strongly support that further study and remediation efforts be required currently and especially with future change in use or tenants.

P. 29 Sec. 2.7

Hanapēpē Ahupua'a was initially part of Kona Moku, then Waimea- No citation for the Waimea part of this statement. We are a part of the Kona Moku and not the Waimea moku.

P. 30 Sec. 2.7

Re: Potential impacts and mitigation measures

We support an AIS for any future development especially regarding the sink holes and caves that may contain cultural materials/heritage. This was seen in many areas in the ahupua'a and is very likely to be seen in the project area too.

P. 31 Sec.2.8 Cultural Resources



October 08, 2020

SSFM2018_021

Ms. Malia Nobrega-Olivera, Pelekikena
Moku o Manokalanipō
P.O. Box 24
Hanapepe, Hawai'i 96716

**SUBJECT: Draft Environmental Assessment Comment Response Letter
DHHL Hanapepe Homestead Community
Tax Map Keys (TMKs): (4) 1-8-007:003; (4) 1-8-008: 035, 081, 086, 087**

Dear Ms. Nobrega-Olivera,

Thank you for your email dated August 08, 2020 regarding the proposed project. We offer the following response to your comment:

We have incorporated your comments into the Final EA. Please note that additional soil remediation studies will be conducted for the makai parcel at the appropriate time and an archaeological survey will be conducted prior to construction of new homes on the mauka parcel.

A copy of your August 8th email, as well as this response letter, will be included in the Final EA. We appreciate your participation in the EA process.

Should you have any additional comments or questions regarding the proposed project, please contact me at (808) 356-1242 or by email at jchang@ssfm.com.

Mahalo,

SSFM INTERNATIONAL, INC.

Jared K. Chang, AICP
Manager, Strategic Services Group

Leina a ka 'uhane instead of leina 'o ka 'uhane
This is how many of the kupuna refer to the leina of the area.

P. 32 Sec 2.8

Paragraph 3- line 7

Add an s to the word well to make it refer to multiple wells in the area

P. 80 Sec 5.2.1 Irrevocably commits a natural, cultural or historic resource

We fully support the last paragraph on this page regarding minimizing any and ALL potential impacts to the Hanapepe salt ponds. We are already seeing the degradation of the area and the disappearing of the practice for this generation. If we don't do EVERYTHING we can to protect this vulnerable resource it will not be here for the next 7 generations.

Appendix B – Biological Survey Report

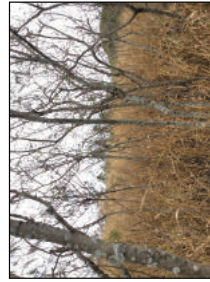


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List of Preparers

Scott Terrill, Principal
Paul Conry, Senior Associate Wildlife Ecologist
Shahin Ansari, Senior Plant Ecologist

Section 1.0 Project Background

The Department of Hawaiian Homelands (DHHL) owns approximately 365 acres of land in the western part of Kaua'i, just west of Hanalepé town (Figure 1). The Kaunuauli'i Highway divides this DHHL property into a larger 359-acre *makua* parcel to the north and a smaller 6-acre *makua* parcel to the south. The norther parcel is bound by Moi Road and the Hanalepé Heights residential neighborhood to the east, and agricultural lands to the west (Figure 1). It ranges from 20 to 200 ft. in elevation and is bisected by the Kulamann Gulch (Group 70 2004). This *makua* parcel is designated as Agriculture by the State Land Use System and the existing land use includes residential—36 homesteads and agriculture—fallow sugarcane land. The smaller southern parcel is bound by Lele Road to the west, a drainage channel to the east, and the Hanalepé transfer refuse station to the south (Figure 1). It is designated Urban by the State Land Use System and the existing use is industrial—comprising of a warehouse and parking lot (Group 70 2004).

DHHL is planning to develop this 365-acre property in Hanalepé to provide residential and agricultural homesteading opportunities to their beneficiaries. This 365-acre property (henceforth also referred to as the project area) is envisioned to be DHHL's largest community on the west side of Kaua'i with a mix of land uses including subsistence agriculture, residential, commercial, and community use (Figure 1). SSFM International (SSFM) is providing DHHL with planning and permitting services for this rural homestead community project. For this project, SSFM's work plan is to build on the conceptual land use plan and infrastructure requirements identified in DHHL's Kaua'i Island Plan (Group 70 2004) which includes, land suitability analysis, infrastructure assessment, environmental assessment, and a community engagement program. To support their initial land suitability analysis, SSFM contracted H. T. Harvey & Associates to conduct a flora and fauna survey of the project area. The objectives of the biological survey were to:

- Conduct a reconnaissance level wildlife survey to identify and document the presence of wildlife (birds and mammals) species.
- Conduct a reconnaissance level botanical survey to identify and document the vegetation communities and the plant species observed in the project area.
- Identify and document the presence of biological issues of concern including the presence of any taxa state or federally listed as threatened or endangered and candidate species for listing or sensitive habitats such as wetlands.
- Identify potential impacts and a range of potential conservation measures that may be considered for inclusion into the planning stage of the project if any taxa state or federally listed as threatened or endangered and candidate species for listing are found in the project area.

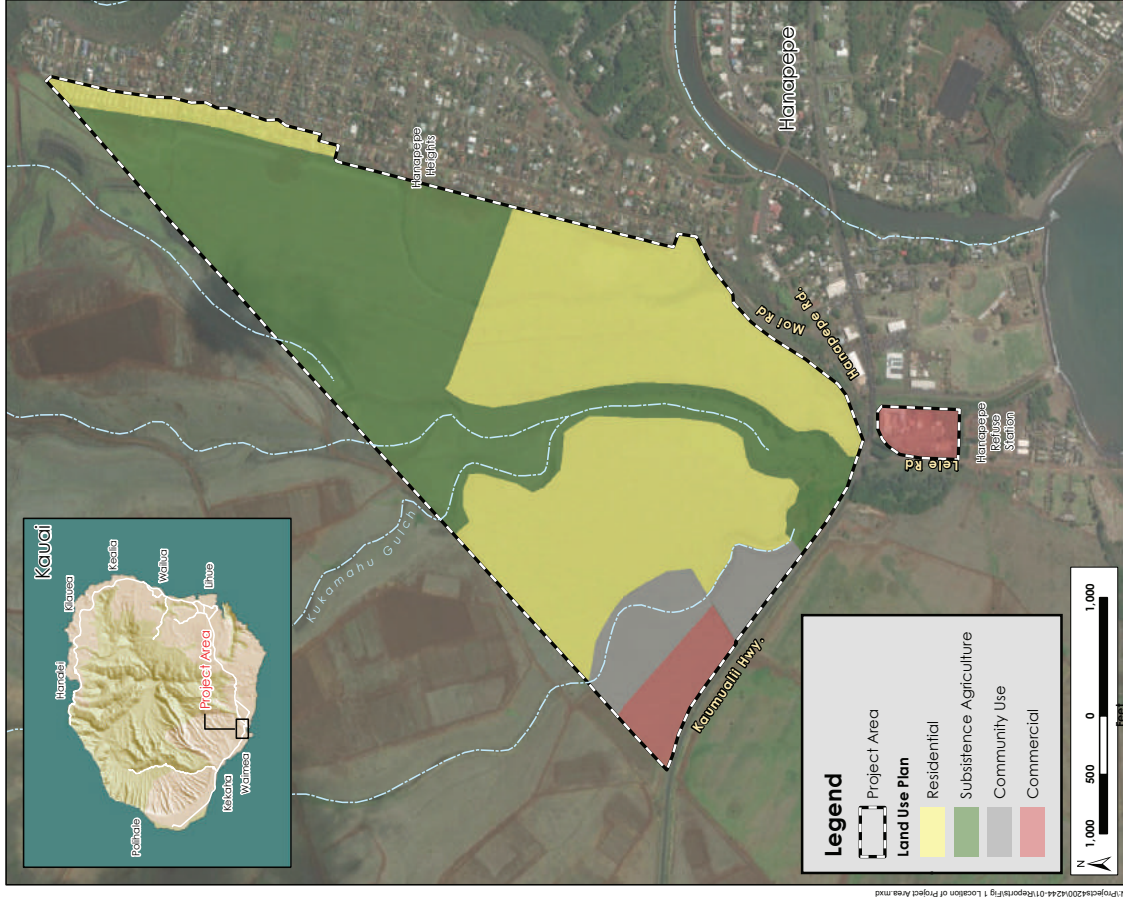


Figure 1. Location of Project Area
(4244-01)
May 2019

Section 2.0 Methods

A reconnaissance level biological survey of the project area was conducted on March 4, 2019 from 8:30 am to 5 pm. Sunny to partially cloudy skies and moderate trade winds prevailed during the survey period. One botanist and one wildlife biologist (together referred to as biologists) conducted the survey together. A handheld Global Positioning System (GPS) device loaded with spatial details was used to navigate during the survey and to record field observations. The biologists walked the accessible parts (see discussion below) of the project area documenting the vegetation type, plants, birds and mammals. In general, rocky outcrops, shaded areas, and depressions which are more likely to support native plant species were intensively surveyed. Visual and auditory detection together with observations of scats, tracks, nests, and other animal signs were used to record observations of birds and mammals. In addition to general observation, nine 10-minute point counts were also conducted, tallying all birds seen or heard by a single observer from a fixed point over a period of 10-minutes.

The biologists first surveyed the smaller 6-acre parcel to the south of the Highway on foot, recording vegetation and plant and animal species observed. The vast majority of the larger 359-acre parcel to the north of the Highway could not be surveyed by foot. The eastern border of the project area, from the Highway along Hanapepe Road and Moi Road, up until the first homestead was lined with a wall of thick impenetrable vegetation on a high berm that ran parallel to the road and prevented access to the interior of the project area. The remaining northern part of the eastern border along Moi Road was lined with residences of Hanapepe Heights (Figure 2). Eleu Road and Ali'i Road, which ran in the east-west direction, intersected this residential development and provided access at two points between the houses up to the eastern edge of the project area but, again access to the interior of the project area from here was blocked due to boundary fences, locked gates on previously used jeep trails, and impenetrable thickets of tall dead grass. The biologists drove Moi Road making several stops to document flora and fauna observations; particularly stopping at vantage points from where they could scan the habitat in the interior of the project area using binoculars (Figure 2).

The biologists also drove the southern border of the project area along Kaunualii Highway stopping at several places to document the vegetation and plant and animal species observed. Surveying on foot was limited to a narrow strip of vegetation along the Highway as the dense vegetation, sometimes on high earthen berm, made it difficult to access the interior part of the project area. But, the biologists stopped at some vantage points to scan the interior habitat of the project area using binoculars.

At four locations the biologists encountered locked gates—at the end of Moi Road at the norther tip of the project area, Eleu Road and Ali'i Road in the central part of the project area, and from the Highway at the southwestern tip of the project area. If additional surveys are needed later in the planning stages, it is possible that the jeep roads leading from these gates would provide access into the interior parts of the project interior.

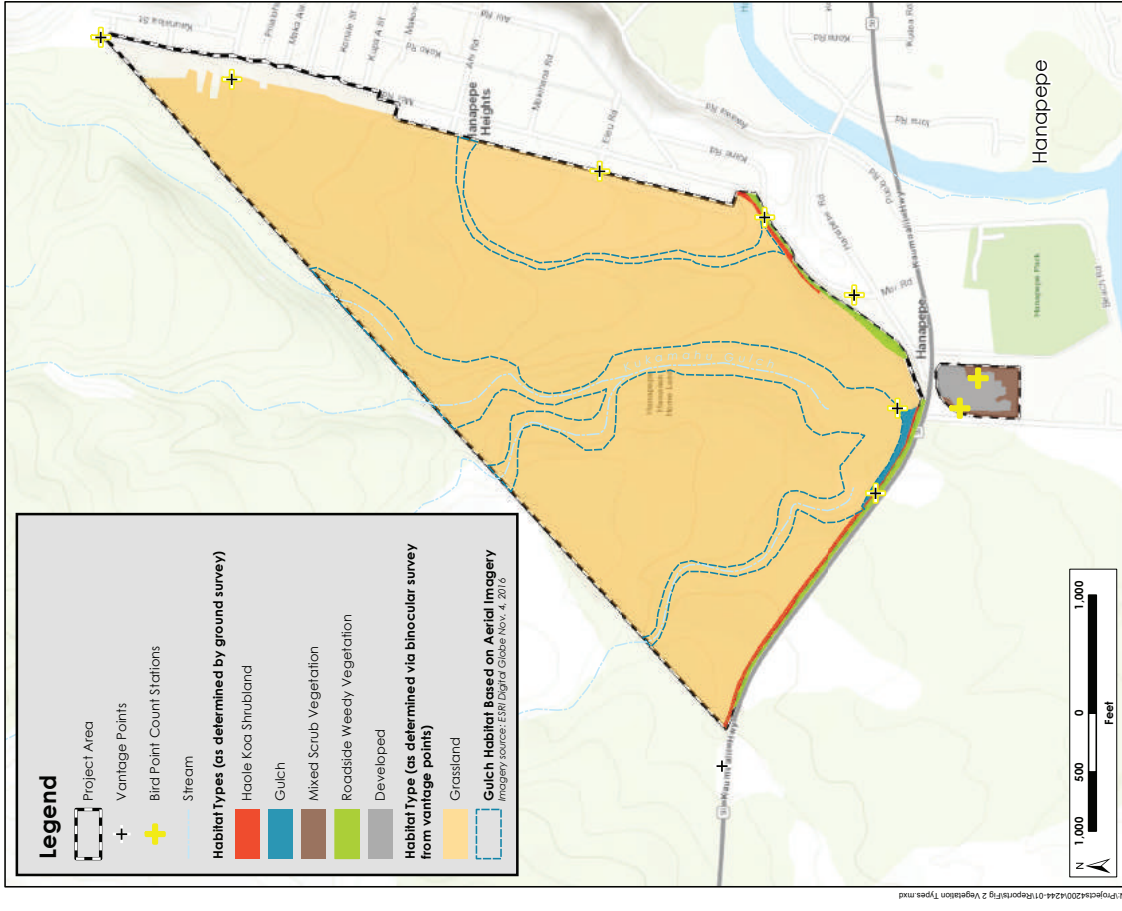


Figure 2. Habitat Types
(4244-01)
May 2019

Section 3.0 Results

3.1 Flora

No plant species state or federally listed as threatened, endangered, or candidates for listing, and no rare native Hawaiian plant species were observed in the accessible parts of the project area. The project area did not contain proposed or designated critical habitat for threatened or endangered plant species (USFWS 2019).

A total of 53 plant species were observed in the surveyed parts of the project area. Fifty-one (96%) of these are either cultivated or naturalized and two species (4%): hoary abutilon (*Abutilon incanum*) and 'uhaloa (*Waltheria indica*) are believed to be indigenous to the Hawaiian Islands (Wagner et al. 1999). Table 1 below provides a list of the plant species observed in the accessible parts of the project area.

Table 1. Plant Species Observed at the DHHL Hanalei Project Area, Kaua'i

Family	Scientific Name	Common name	Status ¹	Qualitative Relative Abundance in Project Area
Angiosperms – Monocots				
Agavaceae	<i>Cordyline fruticosa</i> (L.) A.Chev.	Ti, ki	pal	R
	<i>Dracaena marginata</i> Lam.	Dragon tree	cul	R
	<i>Dracaena reflexa</i> Lamarck	Song of India	cul	R
Liliaceae	<i>Cirium asiaticum</i> L.	Giant lily	cul	R
Musaceae	<i>Musa</i> sp.	Banana	cul	R
Poaceae	<i>Cenchrus ciliaris</i> L.	Buffel grass	nat	C
	<i>Chloris barbata</i> Sw.	Swollen finger grass	nat	C
	<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	nat	C
	<i>Eragrostis</i> sp.	love grass	nat	C
	<i>Eleusine indica</i> (L.) Gaertn.	Wire grass	nat	C
	<i>Urochloa maxima</i> (Jacq.) R. Webster	Guinea grass	nat	A
Angiosperms – Dicots				
Acanthaceae	<i>Asystasia gangetica</i> (L.) T.Anderson	Chinese violet	nat	U
	<i>Ruellia brittoniana</i> Leonard	Purple ruella	nat	U
	<i>Thunbergia fragrans</i> Roxb.	White thunbergia	nat	U
Amaranthaceae	<i>Amaranthus pungens</i> Kunth	Khaki weed	nat	U

Family	Scientific Name	Common name	Status ¹	Qualitative Relative Abundance in Project Area
	<i>Amaranthus spinosus</i> L.	Amaranthus	nat	U
Anacardiaceae	<i>Mangifera indica</i> L.	Mango	nat	R
Apocynaceae	<i>Catharanthus roseus</i> (L.) G.Don	Madagascar periwinkle	nat	R
Asteraceae	<i>Ageratum conyzoides</i> L.	Billy goat weed	nat	C
	<i>Emilia fosbergii</i> Nicolson	Pualele	nat	U
	<i>Parthenium hysterophorus</i> L.	False ragweed	nat	U
	<i>Pluchea carolinensis</i> (Jacq.) G.Don	Sourbush	nat	U
	<i>Triox procumbens</i> L.	Coatbuttons	nat	C
	<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.	Golden crown-beard	nat	C
Bignoniaceae	<i>Spathodea campanulata</i> P.Beauv.	African tulip tree	nat	R
Baraginaceae	<i>Heliotropium procumbens</i> Mill. var. <i>depressum</i> (Cham.) Fosberg	Fourspike heliotrope	nat	U
Brassicaceae	<i>Lepidium oblongum</i> Small	Peppergrass	nat	C
Cactaceae	<i>Opuntia ficus-indica</i> (L.) Mill.	Prickly pear cactus	nat	R
Capparidaceae	<i>Cleome gynandra</i> L.	Wild spider flower	nat	C
Clusiaceae	<i>Clusia rosea</i> Jacq.	Autograph tree	nat	R
Convolvulaceae	<i>Ipomoea obscura</i> (L.) Ker Gawl.	Ipomoea	nat	C
Euphorbiaceae	<i>Euphorbia candelabrum</i> Tre mair & Kotschy	African candelabra	cul	R
	<i>Euphorbia hirta</i> L.	Hairy spurge	nat	C
	<i>Euphorbia hypericifolia</i> L.	Graceful spurge	nat	C
	<i>Ricinus communis</i> L.	Castor	nat	C
Fabaceae	<i>Chamaecrista nictitans</i> (L.) Moench ssp. <i>patellaria</i> (DC. ex Collad.) H.S.Irwin & Barneby var. <i>glabrata</i> (Vogel) H.S.Irwin & Barneby	Partridge pea	nat	U
	<i>Desmodium incanum</i> DC.	Spanish clover	nat	C
	<i>Indigofera spicata</i> Forsk.	Creeping indigo	nat	C
	<i>Leucaena leucocephala</i> (Lam.) de Wit	Haole koa	nat	A
	<i>Macropitillum latyroides</i> (L.) Urb.	Cow pea	nat	C

Family	Scientific Name	Common name	Status ¹	Qualitative Relative Abundance in Project Area
	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Manila tamarind, Opiuma	nat	C
	<i>Samanea saman</i> (Jacq.) Merr.	Monkeypod	nat	U
Lamiaceae	<i>Leonotis nepetifolia</i> (L.) R.Br.	Lion's ear	nat	U
Malvaceae	<i>Abutilon incanum</i> (Link) Sweet	Hoary abutilon	ind?	R
	<i>Sida ciliaris</i> L.	Red lima	nat	C
	<i>Sida rhombifolia</i> L.	Cuban jute	nat?	C
Moraceae	<i>Ficus</i> sp.	Ficus	nat	R
Myrtaceae	<i>Syzygium cumini</i> (L.) Skeels	Java plum	nat	R
Nyctaginaceae	<i>Bougainvillea</i> sp.	Bougainvillea	nat	R
Rubiaceae	<i>Spermacoce assurgens</i> Ruiz & Pav.	Buttonweed	nat	C
Sterculiaceae	<i>Waltheria indica</i> L.	'Uhaloa	ind?	U
Verbenaceae	<i>Clerodendrum xspeciosum</i> D'Ombrai	Java glory vine	cul	R
Zingiberaceae	<i>Alpinia purpurata</i> (Vieill.) K.Schum.	Red ginger	nat	R

¹Status: nat = Polynesian introduction, ind? = Questionably a Polynesian introduction. Species that may have been Polynesian introductions or that possibly were introduced in historical times (after 1778), nat = naturalized = introduced or alien (all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact [i.e., Cook's arrival in the islands in 1778]), ind = indigenous = species that occur naturally in the archipelago but that also have a wider distribution outside of Hawaii, ind? = questionably indigenous (species for which dates of introduction or other information do not make a clear argument for their dispersal here by natural or human-related mechanism but for which the weight of the evidence suggests that they are probably indigenous), end = endemic = species that occur naturally only in the Hawaiian Islands, cul = cultivated = species that are known to be cultivated but, not naturalized in the Hawaiian Islands.

Qualitative Relative Abundance of Observed Species on Site: A = abundant—forming a major part of the vegetation in the survey on the project site, C = common—widely scattered throughout the area or locally abundant in a portion of it, U = uncommon—scattered sparsely throughout the area or occurring in a few small patches, R = rare—only a few isolated individuals on the project site.

Additional Notes: This checklist is an inventory of plant species observed on March 4, 2019 in parts of the project area accessible on foot. The plant names are arranged alphabetically by family, then by species, into each of two groups: monocots and dicots within the subdivision of angiosperm (flowering plants). The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999); recent name changes are those recorded in Wagner and Herbst (1999) and Wagner et al. (2012).

The vegetation in the smaller 6-acre industrial parcel can be described as mixed-scrub vegetation representative of a highly disturbed lowland habitat. The entrance to this parcel was landscaped with ornamental plants such as song of India (*Dracaena reflexa*), dragon tree (*Dracaena marginata*), Java glory vine (*Clerodendrum xspeciosum*), and

grant lily (*Crinum asiaticum*). Most of the center of this parcel was bare ground. Trees and shrubs along the western and southern portion of the parcel comprised of species such as 'opiuma (*Pithecellobium dulce*), monkeypod (*Samanea saman*), and haole koa (*Leucaena leucocephala*) (Figure 3). The ground cover primarily comprised of weedy vegetation such as golden crown-beard (*Veronica enceladoides*), spiny amaranthus (*Amaranthus spinosa*), guinea grass (*Urochloa maxima*), and swollen fingergrass (*Chloris barbata*) growing in between the existing buildings and structures. Scattered individuals of the indigenous species of 'uhaloa were also found in this parcel.

Vegetation along the eastern border along Hanapepe Road can be described as haole koa shrubland, mostly comprised of haole koa thickets mixed in with guinea grass (Figure 4). Vegetation along the remaining eastern and southern borders of the project area was that of haole koa shrubland and mixed roadside vegetation. Low growing weedy plants such as buffel grass (*Cenchrus ciliatus*), coatbuttons (*Tidax praevenens*), hairy spurge (*Euphorbia hirta*), and creeping indigo (*Indigofera spicata*) were characteristic of the roadside in the eastern and southern borders of the project area. A narrow band of haole koa shrubland generally occurred behind the strip of roadside vegetation toward the project area (Figure 5).

The vast majority of the inaccessible interior of the project area which was scanned using binoculars can be described as grassland habitat (Figure 6). It was covered with dense, monotypic stand of dead guinea grass with a scattered haole koa trees. Unlike in the aerial photographs of the project area, the Kalamanu Gulch habitat could not be distinguished when scanning the interior of the project area from the eastern and southern borders. However, limited access to the southernmost portion of the gulch which runs parallel to the Highway revealed that the gulch was dry. The gulch constituted a sharp drop of about 30 ft. from the edge of the Highway right-of-way. The western end of the gulch comprised of large 'opiuma trees with hardly any understory vegetation. Castor bean shrubs, 'opiuma trees, haole koa, and guinea grass were abundant in the eastern end of the gulch (Figure 7).



Figure 3. Mixed Scrub Vegetation in the Southern 6-Acre Parcel of the Project Area. Monkey Pod (*Samanea Saman*) tree in the Foreground and Haole Koa (*Leucaena leucocephala*) Trees in the Background.



Figure 4. Eastern Border of the Project Area Along Hanapēpē Road with Haole Koa (*Leucaena leucocephala*) Thickets.



Figure 5. Roadside Weedy Vegetation Representative of the Majority of the Eastern and Southern Border of the Project Area.

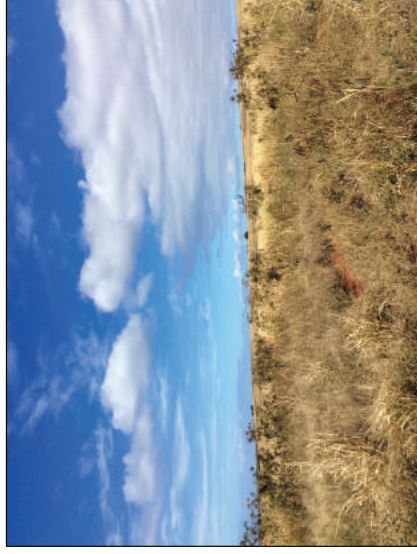


Figure 6. Grassland Habitat in the 359-Acre Northern Parcel of Project Area Comprised of Dead Guinea Grass (*Urochloa maxima*) and Scattered Haole Koa (*Leucaena leucocephala*).



Figure 7. Gulch Habitat at the Southeastern Corner of the Project Area with Castor Bean Shrubs (*Nicotiana glauca*) and Opiuma (*Pithecellobium dulce*) trees.

3.2. Fauna

Fourteen bird species—all nonnative, introduced species were seen during the survey of the project area (Table 2). Seven of these species are designated as injurious species on the state list of injurious wildlife (DLNR 2015) and are known to be harmful to agriculture, aquaculture, or indigenous wildlife or plants or to constitute a nuisance or health hazard: cattle egret (*Bubulcus ibis*), zebra dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), Japanese white-eye (*Zosterops japonicus*), chestnut muntia (*Lonchura atricapilla*), white-rumped shama (*Copsychus sahyalensis*), and rose-ringed parakeet (*Ptilinopus*). The first four of these species were either abundant or commonly found on the project site, while the latter three were uncommon and rare, respectively, on the site. The other common and abundant urban bird species observed during the course of the survey were all nonnative introduced species typically seen in lowland areas. These included the common myna (*Acridotheres tristis*), northern cardinal (*Cardinalis cardinalis*), house finch (*Carpodacus mexicanus*), domestic pigeon or rock dove (*Columba livia*), red-crested cardinal (*Paroaria coronata*), and domestic chicken (*Gallus domesticus*).

Although no Hawaiian seabirds were observed in our survey, there was evidence of the presence of seabirds in the area. The electrical transmission lines along Kaunualii Highway near the southwest corner of the property had bird diverters attached, which function to visually warn seabirds transiting the area of the power lines presence (Figure 8). A check of the Kauai Humane Society's Save our Shearwaters (SOS) Program seabird fallout records indicate that Hanapepe and 'Ele'ele areas experience fallout of the threatened Newell's shearwater (*Puffinus newelli*), Hawaiian petrel (*Pterodroma sandwichensis*), and wedge-tailed shearwater (*Puffinus pacificus*) on an annual basis. The fallout records in close proximity to the project site indicate that these species fly near or over the project site on an annual basis.

The mammals observed during the survey were three domestic cats (*Felis catus*) and three domestic horses (*Equus ferus caballus*). The cats were observed in and around the vicinity of residential areas, and likely were pet cats or semi-wild feral cats cared for by residents. Although rats (*Rattus* spp.) were not observed during the survey, they also are expected to be present in the project area because of the proximity to residential units. The horses were observed adjacent to residential areas, and likely kept by residents.

No nonnative reptiles or amphibians were seen or heard during the survey. Hawai'i does not have any native terrestrial reptiles or amphibians.

Table 2. Bird Species Observed in the Project Area

Scientific Name	Common Name	Status	Number Observed on Point Count Stations (n=9)	Number of Stations Occupied	Qualitative Relative Abundance
<i>Acridotheres tristis</i>	Common myna	X	36	7	Abundant
<i>Bubulcus ibis</i>	Cattle egret	X, IW	6	5	Common
<i>Cardinalis cardinalis</i>	Northern cardinal	X	9	4	Common
<i>Carpodacus mexicanus</i>	House finch	X	20	7	Abundant
<i>Columba livia</i>	Rock dove (pigeon)	X	16	4	Common
<i>Copsychus sahyalensis</i>	White-rumped shama	X, IW	2	2	Uncommon
<i>Geopelia striata</i>	Zebra dove	X, IW	11	5	Abundant
<i>Lonchura atricapilla</i>	Chestnut muntia	X, IW	7	1	Uncommon
<i>Lonchura punctulata</i>	Nutmeg manakin	X	1	1	Uncommon
<i>Paroaria coronata</i>	Red-crested cardinal	X	5	2	Common
<i>Ptilinopus krameri</i>	Rose-ringed parakeet	X, IW	1	1	Rare
<i>Streptopelia chinensis</i>	Spotted dove	X, IW	13	6	Abundant
<i>Zosterops japonicus</i>	Japanese white-eye	X, IW	23	6	Abundant
<i>Gallus domesticus</i>	Domestic chicken	X	33	8	Abundant
Totals					183

Section 4.0 Conclusions and Recommendations

It is unlikely that the proposed development of a rural homestead community by DHHIL on their 365-acre property in Hanapepé will have a significant adverse impact on any plant species state or federally listed as threatened or endangered, candidate species for listing as endangered, species of concern, or rare native Hawaiian plant species. The project area is highly disturbed, comprising of abandoned agricultural land now dominated by guinea grass grassland, residences, and an industrial lot, and with 96% of the flora being nonnative. The two indigenous plant species found in the project area commonly occur on Kaua'i and the other main Hawaiian Islands. However, it should be noted that the vast majority of the larger 359-acre parcel could not be surveyed on foot and was only scanned using binoculars. It is possible that since agricultural practice was abandoned, some native plant species recruited and found refuge in suitable pockets (e.g. near the gulch habitat) of the project area not invaded by the surrounding weedy vegetation. While the results of this survey, conducted in support of a land suitability analysis, do not reveal any botanical resources of concern at the project site, H. T. Harvey & Associates recommends that, before any major vegetation clearing is conducted, the interior of the 359-acre parcel should be surveyed on foot to confirm the presence or absence of any native plant species. Also, at the time of the survey, dry conditions prevailed and the vast majority of the vegetation was either dead or dry. We recommend that this future follow-up survey be conducted during the wet season to capture possible native plant species that might die back during the dry season.



Figure 8. Seabird Diverters on Utility Wires Along Kaunuaui Highway Near the Southwestern Border of the Project Area.

No native wildlife species were observed in the project area at the time of the survey. However the vast open grasslands in the larger 359-acre parcel appear to provide suitable habitat for Hawaiian short-eared owl (*Lasiurus leucurus*) or pueo. This area also likely provides habitat for non-native barn owl (*Tyto alba*), and introduced game birds such as ring-necked pheasant (*Phasianus colchicus*), gray francolin (*Francolinus pondicerius*); black francolin (*Francolinus francolinus*); and Erckel's francolin (*Francolinus erckelii*) (DLNR 2019). These species are relatively common, and distributed throughout the state, and have open grassland habitat available in adjacent fallow agricultural land and pasture areas.

Surveys for seabirds were not conducted however, the endangered Hawaiian petrel, threatened Newell's shearwater, and wedge-tailed shearwater are seabird species known to occur on Kaua'i and transit through the project area (SOS 2018, USFWS 2019). Furthermore, seabird diverters were observed on the utility wires along Kaunuaui Highway near the southwestern end of the project area (Figure 8) suggests that seabirds frequent the project area during the February-December seabird breeding season and tall overhead powerlines present a collision hazard to these birds in this area. Similarly, recent Save Our Shearwaters fallout records (SOS 2018) also indicate that fledgling seabirds are attracted to external lights in adjacent urban areas and external lights pose a light attraction hazard during the seabird fallout season from September 15-December 15 in this area. The further development of powerlines and external lighting present an additional risk to the birds, if not minimized or avoided (KIUC 2011).

H. T. Harvey & Associates recommends that further planning for the homestead community project should include an assessment of the risk from these features and incorporate measures to avoid or minimize potential impacts. Seabird light attraction risk can be reduced by limiting the quantity, and shielding street lights, community park lighting, and external lights on buildings. Planners should also investigate and consider options to avoid or minimize seabird collision risks by undergrounding powerlines, using lower-risk horizontal line configurations, attaching bird diverters to lines, or planting fast growing shielding vegetation so that seabirds will fly over and avoid powerlines (KIUC 2011). We also recommend that the planners seek early advice from U.S. Fish and Wildlife Service and State Department of Land and Natural Resources' Division of Forestry and Wildlife on potential risks of project features to listed seabirds and appropriate measures that can be taken to avoid or minimize impacts.

Surveys to detect Hawaiian hoary bats were not conducted in support of the planning phase of this project. However, Hawaiian hoary bats are known to occur on Kaua'i (Tomich 1986) and their presence in the project area cannot be ruled out. If DHHIL plans to remove any large trees from the project area then DHHIL should follow the U. S. Fish and Wildlife guidelines which recommends that no trees greater than 15 feet tall be trimmed or removed during the bat pupping season from June 1 to September 15.

Section 5.0 References

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Appendix C – Archaeological Assessment

HANAPEPE ARCHAEOLOGICAL ASSESSMENT
Hanapēpē Ahupua'a, Waimea Moku, Island of Kaua'i
359 Acres in TMK (4) 1-8-007:003 and 6 Acres in TMKs (4) 1-8-
008:035, 081, 086, and 087

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APRIL 2019

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HANAPEPE ARCHAEOLOGICAL ASSESSMENT
359 ACRES IN TMK (4) 1-8-007:003 AND 6 ACRES IN TMKS (4) 1-8-009:035, 081, 086, AND 087

MANAGEMENT SUMMARY

DUDEK PROJECT NAME: Hanapēpē Archaeological Assessment

COUNTY/BOROUGH: Hanapēpē, Kauai, Hawaii, 96716

AHUPUA'A/MOKU: Hanapēpē Ahupua'a, Waimea Moku

TMKS: 359 acres in TMK (4) 1-8-007:003 and 6 acres in TMKS (4) 1-8-009:035, 081, 086, and 087

COORDINATES: 21°55'18.6"N, 159°35'54.7"W

USGS QUAD MAP: Hanapepe, HI, USGS 7.5-minute topographic quadrangle

DIRECT APE: 365 acres (Parcel Nos. 180070030000, 180080810000; 180080350000; 180080860000; 180080870000)

INDIRECT APE: One-half-(0.5)-mile radius around the subject properties

PURPOSE: Archaeological assessment

INVESTIGATION PERMIT NUMBER: Archaeological Permit Number 19-04, issued by the State of Hawai'i Department of Land and Natural Resources-State Historic Preservation Division

PROJECT DESCRIPTION: The purpose of this archaeological assessment is to assess impacts of SSFM's proposed land use plan in accordance with the requirements set forth in Hawai'i Revised Statutes (HRS) Chapter 343. SSFM International is coordinating Phase I planning and permitting for a rural homestead community development project on approximately 365 acres of lands owned by the Department of Hawaiian Homelands (DHHL) adjacent to the Hanapēpē town center. Proposed is a development that will provide residential and agricultural homesteading opportunities to DHHL's waitlist beneficiaries, and support DHHL's mission to manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians.

HISTORIC PROPERTIES: There are no historic properties within the direct APE. One historic property is located in the indirect APE: Hanapēpē Lot No. 18 (listed on the Hawai'i Register of Historic Places on 8/31/1991 and the National Register of Historic Places on 10/13/1993).

PROJECT ACREAGE: 365 acres (Parcel Nos. 180070030000, 180080810000; 180080350000; 180080860000; 180080870000)

PROJECT 11498

DUDEK

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HANAPEPE ARCHAEOLOGICAL ASSESSMENT
359 ACRES IN TMK (4) 1-8-007:003 AND 6 ACRES IN TMKS (4) 1-8-009:035, 081, 086, AND 087

DETERMINATIONS/RECOMMENDATIONS: It is not possible to determine whether significant historic properties are present on the subject properties that would be affected by the proposed work. An archaeological inventory survey scoped in coordination with the State Historic Preservation Division is recommended to determine whether significant historic properties are present on the subject properties, and if so, their location, extent and nature.

PROJECT 11498

DUDEK

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APRIL 2019

1 INTRODUCTION

1.1 Project Description and Location

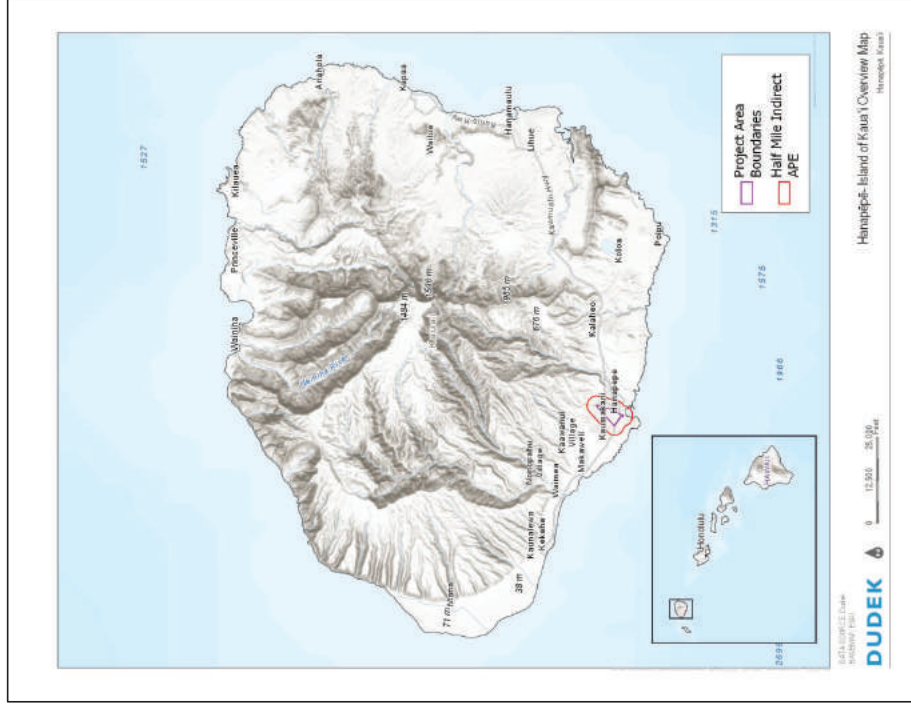
At the request of SSFM International, LLC, Dudek prepared this archaeological assessment for the 365-acre Hanapēpē Homestead Project located in Hanapēpē, Hawai'i, 96716. Hanapēpē Ahupua'a, Waimea Moku, Island of Kaua'i (Figure 1). SSFM International is coordinating Phase I planning and permitting for a rural homestead community development project on approximately 365 acres of lands owned by the Department of Hawaiian Homelands (DHHL) west of the Hanapēpē town center and Hanapēpē Heights neighborhood. Proposed is a development that will provide residential and agricultural homesteading opportunities to DHHL's waitlist beneficiaries, and support DHHL's mission to manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians.

The purpose of this archaeological assessment is to assess impacts of the proposed land use plan in accordance with the requirements set forth in Hawai'i Revised Statutes (HRS) Chapter 343 (DLNR-SHPD 2019). This assessment reviews the known heritage of Hanapēpē Ahupua'a, determines the likely presence or absence of additional heritage resources within the Project Area and recommends an Archaeological Inventory Survey, coordinated with the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD).

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The proposed project will take place on two land parcels. One is a 359-acre sloped, triangular tract of undeveloped, presently fallow agricultural land directly west of a row of existing, north-south trending DHHL homesteads in the Hanapēpē Heights residential neighborhood. It is bordered to the south by the Kaumuali'i Highway and a narrow tract of forested land, and to the west and north by agricultural lands. The other land parcel is a six-acre tract of land bordered by Kaumuali'i Highway to the north, Puolo Road, to the east, mixed residential and commercial development to the south and Lele Road to the west. The Hanapēpē Valley lies 0.25 miles east of the larger parcel, and the Hanapēpē River flows within 0.25 miles east of both parcels. The County of Kaua'i Real Property Tax Office Website (County of Kaua'i) lists Hawaiian Homelands as the owner of the larger subject property and the State of Hawai'i as the owner of the smaller subject property.

Figure 1. Island of Kauai with Project Site Locations



1.2 Area of Potential Effects

The Area of Potential Effects (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. Determination of the APE is influenced by a project's setting, the scale and nature of the undertaking, and the different kinds of effects that may result from the undertaking (36 Code of Federal Regulations [CFR] 800.16(d)).

The direct APE for the proposed project is defined as the two subject properties totaling 365-acres upon which ground disturbance for development will occur. The indirect APE is defined as a one-half (0.5)-mile radius around each of the subject properties constituting the direct APE (Figure 2).

Figure 2. South Kaua'i with Project Site Locations



1.3 Regulatory Setting

Federal

The NHPA, as amended (54 USC 300101 et seq., formerly 16 USC 470 et seq.; National Historic Preservation Act), instituted historic preservation as a national policy. The NHPA established the National Register of Historic Places (NRHP) and National Historic Landmarks Program, and implemented historic preservation as a partnership among Federal, State, Tribal, and local governments, non-profit organizations, and private individuals. The NHPA directs the Secretary of the Interior, acting through the NPS, to issue regulations governing State Historic Preservation Programs and staff. NHPA statutory provisions define the SHPO's role as assisting Federal agencies with fulfilling their review and compliance responsibilities under Section 106 of the NHPA; mandate requirements every State or Territory historic preservation office must meet in order to retain federally approved status; and, require federal agencies to create historic preservation programs, designate historic preservation officers and create processes for nominating properties to the NRHP under Section 110.

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize those who have made significant contributions to the nation's history and heritage. NRHP criteria are intended to guide state and local governments, federal agencies, and others in their evaluations of historic properties' significance and NRHP eligibility.

A historic property is defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria" (36 CFR Sections 800.160(f)).

"Integrity" is defined in NRHP guidance, How to Apply the National Register Criteria, as "the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity" (NPS 2002). NRHP guidance further states that properties be completed at least 50 years ago to be considered for eligibility. Properties completed fewer than 50 years before evaluation must be proven to be "exceptionally important" (criteria consideration G) to be considered for listing.

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location,

design, setting, materials, workmanship, feeling, and association. To be eligible for NRHP listing, a historic property must possess integrity and meet at least one of the criteria for significance:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

Effects on historic properties under Section 106 of the NHPA are defined in the assessment of adverse effects in 36 CFR Sections 800.5(a)(1) as follows:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be further removed in distance or be cumulative.

Adverse effects on historic properties are clearly defined and include the following (36 CFR 800.5(2)):

- (i) Physical destruction of or damage to all or part of the property;
- (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;
- (iii) Removal of the property from its historic location;
- (iv) Change of the character of the property's use or of physical features within the property's setting that contributes to its historic significance;

- (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- (vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- (vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

To comply with Section 106 of the NHPA, the criteria of adverse effect are applied to historic properties that exist in the area of potential effects (APE), pursuant to 36 CFR Section 800.5(a)(1). If no historic properties are identified in the APE, a finding of "no historic properties affected" is made for a project. If there are historic properties in the APE, application of the criteria of adverse effect will result in project-related findings of either "no adverse effect" or "adverse effect," as described above. A finding of no adverse effect may be appropriate when the undertaking's effects do not meet the thresholds in criteria of adverse effect under 36 CFR Section 800.5(a)(1), in certain cases when the undertaking is modified to avoid or lessen effects, or if conditions were imposed to ensure review of rehabilitation plans for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (codified in 36 CFR Part 68).

If adverse effects findings were expected to result from a project, mitigation is required, as feasible, and resolution of those adverse effects by consultation may occur to avoid, minimize, or mitigate adverse effects on historic properties, pursuant to 36 CFR Section 800.6(a).

State

The Hawai'i Register of Historic Places (Hawai'i Register) is an official list of properties recognized for their significance to the history, architecture, archaeology, or culture of communities throughout Hawai'i. Buildings, structures, sites, districts, and objects over 50 years old are eligible for nomination to the Hawai'i Register. Private residential and commercial properties listed on the Hawai'i Register are eligible for county property tax benefits and access to grant funding. The Hawai'i Register is not comprehensive, but rather intended to represent the variety of significant historic properties throughout Hawai'i.

66E-3 Historic preservation program

Hawaii's Historic Preservation Division is ensconced within the Department of Land and Natural Resources and charged with administering a comprehensive historic preservation program under the NHPA as amended, when applicable, and:

- (1) Development of an on-going program of historical, architectural, and archaeological research and development, including surveys, excavations, scientific recording, interpretation, and publications on the State's historical and cultural resources.
- (2) Acquisition of historic or cultural properties, real or personal, in fee or in any lesser interest, by gift, purchase, condemnation, devise, bequest, land exchange, or other means; preservation, restoration, administration, or transference of the property; and the charging of reasonable admissions to that property.
- (3) Development of a statewide survey and inventory to identify and document historic properties, aviation artifacts, and burial sites, including all those owned by the State and the counties.
- (4) Preparation of information for the Hawaii Register of Historic Places and listing on the National Register of Historic Places.
- (5) Preparation, review, and revisions of a state historic preservation plan, including budget requirements and land use recommendations.
- (6) Application for and receipt of gifts, grants, technical assistance, and other funding from public and private sources for the purposes of this chapter.
- (7) Provision of technical and financial assistance to the counties and public and private agencies involved in historic preservation activities.
- (8) Coordination of activities of the counties in accordance with the state plan for historic preservation.
- (9) Stimulation of public interest in historic preservation, including the development and implementation of interpretive programs for historic properties listed on or eligible for the Hawaii Register of Historic Places.
- (10) Coordination of the evaluation and management of burial sites as provided in section 6E-43.
- (11) Acquisition of burial sites in fee or in any lesser interest, by gift, purchase, condemnation, devise, bequest, land exchange, or other means, to be held in trust.

- (12) Submittal of an annual report to the governor and legislature detailing the accomplishments of the year and recommendations for changes in the state plan or future programs relating to historic preservation, and an accounting of all income, expenditures, and the fund balance of the Hawaii historic preservation special fund.
- (13) Regulation of archaeological activities throughout the State.
- (14) Employment of sufficient professional and technical staff for the purposes of this chapter without regard to chapters 76 and 77.
- (15) The charging of fees to at least partially defray the costs of administering sections 6E-3(13), 6E-8, and 6E-42 of this chapter.
- (16) Adoption of rules in accordance with chapter 91, necessary to carry out the purposes of this chapter.
- (17) Development and adoption, in consultation with the Office of Hawaiian Affairs native historic preservation council, of rules governing permits for access by native Hawaiians and Hawaii and to cultural, historic, and pre-contact sites and monuments.
(L 1976, c 104, pt of §2; am L 1987, c 330, §1; am L 1989, c 324, §2; am L 1990, c 306, §5; am L 1991, c 108, §2; am L 1993, c 323, §2; am L 1996, c 97 §4; am L 1997, c 207, §1; am L 1998, c 311, §1)

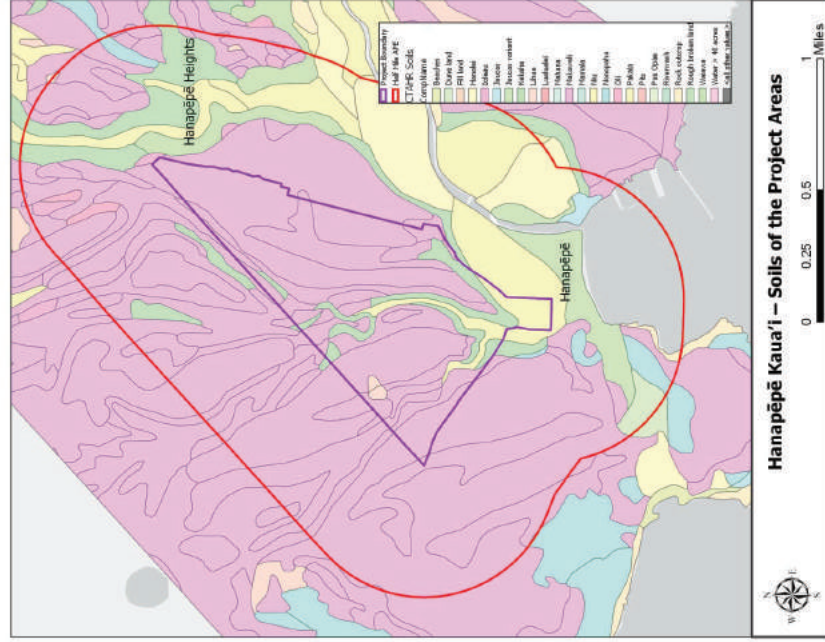
2 ENVIRONMENTAL SETTING

The proposed project will take place at Hanapēpē, Kauaʻi, Hawaiʻi, 96716, Hanapēpē Ahupuaʻa, Waimea Moku, Island of Kauaʻi. The Hawaiian archipelago consists of volcanic high mountain-islands formed by tectonic activity beginning roughly 11.3 ma to the present. The island of Kauaʻi was likely formed by the collapse of a single shield volcano roughly 5.5 million of years ago, that has since heavily eroded, sunk, and been partially inundated by the sea. Hanapēpē Bay is the mouth of a former valley. The project areas flank and perhaps are also on top of, fragments of the collapsed shield volcano, as well as younger tectonic geology (Blay and Siemens 2013:52, 53, 61). Kauaʻi and Niʻihau are the two leeward islands of the Hawaiian chain.

The two subject properties constituting the project areas are in leeward, semi-coastal, arid locations. Cane grass, as well as other unidentified trees, grasses and cacti, populate the 359-acre subject property that is also veined by ancient gorges. The remaining 6 acres are located on a flat, developed lot in a mixed residential-commercial neighborhood where vegetation consists primarily of ornamental landscaping on private and commercial property. Both project areas are predominated by the deep-red Makaweli soil series endemic to coastal Kauaʻi from Waimea to Hanapēpē, and punctuated by pukas (depressions) of rough, broken land (Figure 3). The larger subject property slopes drastically towards the sea while the other lies roughly at sea level. The majority of the project areas sit between 10 and 33 feet above sea level on a 6–12% slope. The rest of the landscape sits at sea level or is characterized by a 40–70% slope. Hanapēpē has a tropical savannah climate with light rainfall most months of the year. The mean annual temperature is 74 degrees Fahrenheit with mean annual precipitation averaging 27 inches (UHM 2014).

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Figure 3. Hanapēpē Kauaʻi – Soils of the Project Areas



3 BACKGROUND RESEARCH

3.1 Traditional and Early Post-Contact Eras to the Late 18th Century

Kauaʻi Kuapapa (ancient Kauaʻi) and Hanapēpē Ahupuaʻa hosted a rich trajectory of initial human settlement and use unique throughout the Hawaiian Islands. Kauaʻi Kuapapa was likely settled sometime after the 11th century C.E. by waves of Polynesian Seafarers from the Marquesas and Tahiti (Bayman and Dye 2013; Cozad 2008: 7). Legends and oral histories state Kauaʻi experienced famine and drought less frequently than the other islands, and served as a refuge for those fleeing violence, war and violation of kapu (Joesting 1984: 111). Known as Kauaʻi Malie (peaceful Kauaʻi), the island and was never conquered in warfare during traditional times (Cozad 2008: 7-8; Joesting 1984:1).

Hanapēpē is translated as “crushed bay”, and may be derived from Hanapēpēhi “killing bay” (Cozad 2008: 21; Pukui et al. 1974 : 41; Wichman 1998:30). Traditional land divisions and boundaries changed through time; Hanapēpē Ahupuaʻa was initially part of Kona Moku, then Waimea. It encompasses the Hanapēpē River system that winds through numerous canyons and valleys before terminating at Hanapēpē Bay. Plentiful freshwater flowing through an array of terrains and elevations ensured Hanapēpē’s natural resources were plentiful and variegated. Hauliʻi Valley was renowned for its kava. Bird catching was practiced throughout the valley (see summary of accounts in Winieski et al. 1996: 23-24). Salt was harvested from ancient salt pans (Figure 4) pockmarking the coast, and there were surf breaks off Hanapēpē’s shores (Finney and Houston 1966).

Figure 4. Undated photograph of Traditional Salt Pans in Hanapēpē



On the basis of archaeological, linguistic and botanical evidence, as well as oral history, Handy and Handy suggest Hanapepé, as well as canyons throughout Kaua'i hosted rare inland populations and settlements. They argue people within them subsisted primarily on kalo yields from dryland lo'i flanking rivers and streams and interacted rarely with the sea (Handy and Handy 1972: 266-268; 396, 397).

Eleven heiau are associated with Hanapepé Ahupua'a. Francis Gay (1875) situates three temple complexes in the valley:

- Maloku – a small heiau on top of Kahalau land
- Kauakahiuu – a small heiau proximal to Kaiilili
- Name unknown – located at West Paleilei, beneath Peapea Peak

Thrum (1907) recorded seven heiau complexes in Hanapepé Ahupua'a:

- Nihoana – a small, low-walled heiau that was destroyed
- Makole – a small heiau with a platform and walls located on Makole Bluff that was destroyed in the 1860s, although walls might remain
- Puulu – a walled, paved pookanaka heiau dedicated to Kane in disrepair
- Name unknown – Dedicated to Kaumuali'i and destroyed in roughly 1865
- Kuwiliwili – a large, high walled pookanaka heiau in Hanapepé
- Kauakahinumu – a coastal heiau at Puolo Point dedicated to Kane and Kanaloa, with walls still standing
- Moloku – an open platform heiau in decent condition near the intersection of Kuopoo and Kahalau ridges

Beckwith (1970: 53) mentions one heiau in the ahupua'a:

- Kuikahi – a heiau near Manawaioipuna Stream

Hanapepé Ahupua'a is replete with wahi pana (legendary places) and oral history. In a rare occurrence, maka'ānana (common people) purportedly disposed of an unreasonable, obsessive high chief by throwing him off Holo iwi (traveling bones) Cliff. Hanapepé Ahupua'a hosts several leina'o ka 'uhane - leaping places associated with the transit of the dead into pō, the "place of the dead", or afterlife (Beckwith 1970:154, 155; Formander 1999:575; Wichman 1998:29). In 1999, Hanapepé resident Ms. Holi identified Pūolu Point as one such location.

3.2 Early Historical Era: The Late 18th Century Through the 1830s

In 1778, Captain James Cook and the crew of *The Discovery* arrived at the mouth of the Waimea River, roughly 6 miles northwest of the project areas. James Ellis, the surgeon's mate on board, sketched Kaua'i Island's south shore (Figure 5; Kaua'i Museum 2017; Ellis in Josting 1984:64). Cook's arrival opened Kaua'i and the islands to successive eras of foreign incursion, invited settlement and colonization.

Figure 5. James Ellis' 1778 sketch of Kaua'i Island's Shouth Shore



Kamehameha I unified the major Hawaiian Islands in 1795 and solidified his rule in 1810 with the political conquest of King Kaumuali'i, and therefore Kaua'i and Ni'ihau (Joesting 1984: 54, 70). After the death of Kamehameha I, changes unfolding throughout the Hawaiian Kingdom drastically altered Hanapepé.

From the 1810s through the 1830s, the arrival of European and American missionaries, foreign diseases and establishment of the sandalwood and whaling trades shifted the population demographics, usage and economy of Hanapepé, including the subject parcel (Cozad 2008:21, 29; Ti, 1959:87-89). Kaua'i Ali'i controlled the sandalwood trade and enlisted the maka'ānana to physically transport it from inland to the port at Waimea (Joesting 1984: 92). From 1815-1817, the Russian trader and emissary Georg Scheffer engaged in commerce and efforts to establish a Russian colony on Kaua'i. Through alliance with King Kaumuali'i, Scheffer was granted land holdings throughout the island, including the 'ili of Kulioa in Hanapepé, though he was ultimately driven from the islands by Americans allied to King Kamehameha (Kaua'i Museum 2017).

On April 4, 1820, George Prince Kaumuali'i, son of King Kaumuali'i, returned to Kaua'i with missionaries sent by the American Board of Commissioners for Foreign Missions, who then

established themselves in Koloa. A decade previously, George Prince Kaumuali'i's father entrusted a sea captain with funds to transport his 5 to 6 year-old son to the northeastern United States and secure him a Western education. After enrolling him in school briefly, the sea captain relinquished charge of the child to a schoolteacher named Cotton. King Kaumuali'i's attempts to locate his son and inquire after his welfare went unanswered. As a young man, George Kaumuali'i took numerous jobs and fought as a marine with the U.S. Navy in the war of 1812 before attending a mission school and returning to the islands (Kauai Museum 2017; Joesting 1984:82-83).

In 1824, a series of skirmishes and battles occurred throughout the Hanapepe Ahupua'a and neighboring landscapes between factions of Kauai Ali'i and the forces of the O'ahu-based Liholiho (Kamehameha II) their family and retainers. In August 1824, a battle between forces loyal to Kauai Ali'i led by George Kaumuali'i and King Kamehameha occurred on the 'Ele'ele Plains of the Hanapepe Ahupua'a, east of the project area. Armed with traditional weapons, the army of the Kauai Ali'i's were overwhelmed by the cannons and rifles of King Kamehameha II's forces. Slaughter of the local community ensued. First-hand accounts state the majority of victims were women and children whose bodies were left where they fell (Cozad 2008:21; Joesting 1984:107-109).

The 1824 conflicts resulted in the re-districting and redistribution of land throughout Kauai, including the project area. An influx of settlers from throughout the Hawaiian Islands were awarded land in Hanapepe and surrounds (Joesting 1985: 1).

Located between the capital city of Waimea and busy port city of Koloa, Hanapepe town and the lands adjacent, likely including the project areas, were home to Hawaiian kalo (taro) and Chinese rice farmers, sugar and pineapple plantation workers of a variety of nationalities from 1830 onwards.

3.3 The Constitutional Monarchy of Hawaii and the Great Mahele: 1840s-1850s

Promulgated by Kamehameha III, two constitutions drafted in 1840 and 1852 transformed the Hawaiian Kingdom into a constitutional monarchy and established systems of governance, representation and law throughout the archipelago. From the maka'ainana to the Ali'i, many laws focused on distributing land and power to the Hawaiian people. Their intention was to provide a degree of landed security and autonomy against the threats of disease, increasing foreign incursion into the island, social, political and religious tumult, and the conquest of island nations elsewhere in the Pacific by the Europeans and Americans (Van Dyke 2003:30,31).

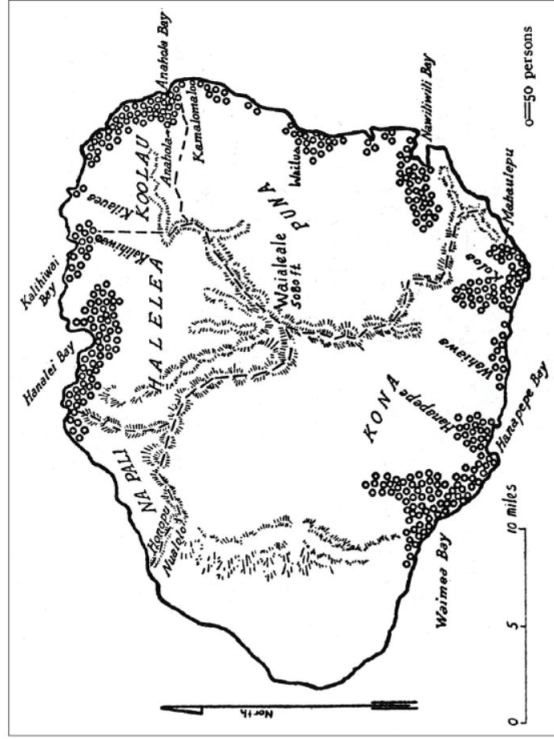
The Great Mahele (literally, "division") was a complex, sweeping series of land acts and reforms enacted between 1840 and 1856. It upended the traditional Native Hawaiian system of collective land utilization based on agricultural yield and complex social hierarchies and introduced concepts of land commodification and ownership to the Hawaiian Islands (Van Dyke 2003:11).

Three key actions and acts are pertinent to the background context of this archaeological assessment. In 1846, a Land Commission operational through 1855 was created to review and grant Native Hawaiian land claims (Van Dyke 2003: 33-34). On July 10, 1850, the Alien Land Ownership Act granted private land ownership rights to foreigners. The December 1850 Kuleana Act encouraged maka'ainana to file claim with the Land Commission for the 'Aina they were presently using plus 0.25 additional acres for a house lot. However, concepts of and paths to land ownership were unknown/unclear to maka'ainana, the majority of whom did not file claims (Van Dyke 2003:46).

During the Great Mahele, social and political upheaval heavily influenced formal land tenureship in Hanapepe. Following his victory in the Kauai rebellion, King Kamehameha III incorporated the entire ahupua'a into his private land holdings. Numerous Land Commission Awards (LCAs) were also granted to Ali'i related to or associated with King Kamehameha III. Additionally, maka'ainana from throughout the islands were granted LCAs that enabled their settlement of Hanapepe. Dudek conducted a review of LCAs for 359 acres in TMK (4) 1-8-007:003 and 6 acres in TMKS (4) 1-8-009:035, 081, 086 and 087 using Avakonohiki's online Land Commissions Awards Index and Search (Avakonohiki) and the Kipuka Database (Office of Hawaiian Affairs) to determine Victoria Kamamalu was granted a Land Commission Award (LCA) for the entire Makaweli Ahupua'a (LCA 7713:1) in 1861 that included the larger project area. Kamamalu's LCA contained 19 additional, unlocated kuleana (OHA). Notably, LCAS 3654 and 9059:1 were granted to Kamae and included Kukamahu Gulch, Kuwiliwili Heiau and a fishing shelter. No LCAs are associated with the smaller project area.

A plentitude of mid-19th century accounts describe the fertile kalo fields; inland settlements and population of Hanapepe. In 1847, Reverend Bingham situated an inland settlement of 140 cottages and seven hundred inhabitants farming kalo in Hanapepe Valley. An 1853 map of Kauai population estimates (Figure 6) counts roughly 1,400 people in the Hanapepe Ahupua'a (Coulter 1971: 16). A description of Hanapepe Valley from the same year describes its plantations, dwellings and coconut and taro patches (Coulter 1971: 15). In an 1864 letter, Norwegian settler and ally of King Kamehameha III Valdemer Knudson describes Hanapepe as replete with fallow kalo and rice fields, and states hula is still being practiced despite missionary bans.

Figure 6. Map Depicting Kauai's Population, 1853



Whaling, trade and commerce flourished between 1830 and 1861 in cities and settlements along Kauai's southwest coast (Joesting 1984: 170). Rice farming became established on Kauai between the 1850s–1860s and persisted through the 1960s. Economic prosperity and proximity to the ports led to bars and opium dens and later pool halls proliferating in Hanapepe town (Cozad 2008:29).

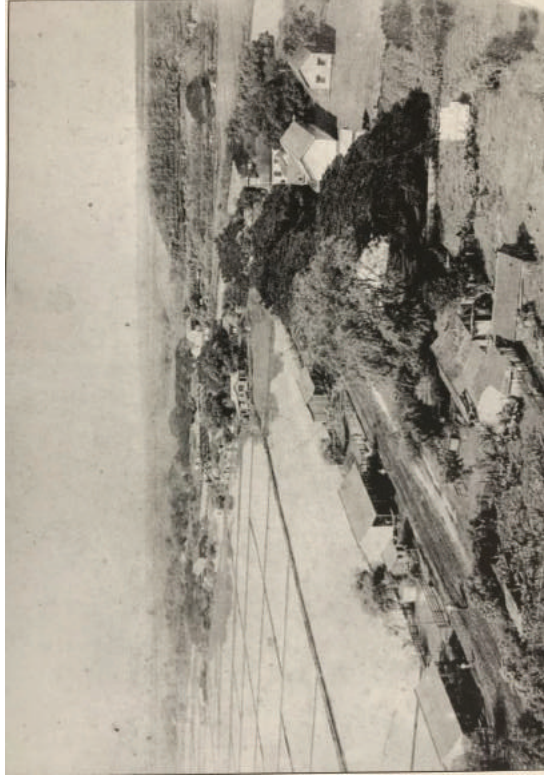
The expansive growth of the sugar cane and pineapple industries throughout the archipelago transformed settlement and land use in Hanapepe. The sugar industry in the Hawaiian Islands

began on Kauai; from 1835 through 1985, drastically altering the landscape, economy and settlement patterns across the island and on the project areas (Cozad 2008: 29).

In 1865, Elizabeth McHutcheson Sinclair, a wealthy Scottish emigrant to the islands via numerous booming economic frontiers around the Pacific Rim, purchased the land between the Hanapepe and Waimea Rivers. Sinclair's purchase is referenced as the Makaweli Ahupua'a, but by description and in maps through the early 20th century, appears to have included the project areas in adjacent Hanapepe Ahupua'a (Joesting 1984: 193). Sinclair partnered with her sons-in-law Francis Gay and Aubrey Robinson to form the Gay and Robinson partnership, purchased the lands adjoining theirs in Hanapepe, and owned the entirety of the Kona District by 1873 (Joesting 1984: 190-199). Gay and Robinson and the Hawaiian Sugar Company plantations, as well as a ranch, resulted on Makaweli and Hanapepe lands.

A photograph taken in Hanapepe town in the mid-to-late 1880s (Figure 7) shows houseplots with structures and gardens flanking a muddy thoroughfare. Rice paddies are found throughout the lowland coastal zone. The smaller project area appears as a wooded tract of land, whereas the southerly portions of the larger project area appear vacant and vegetated.

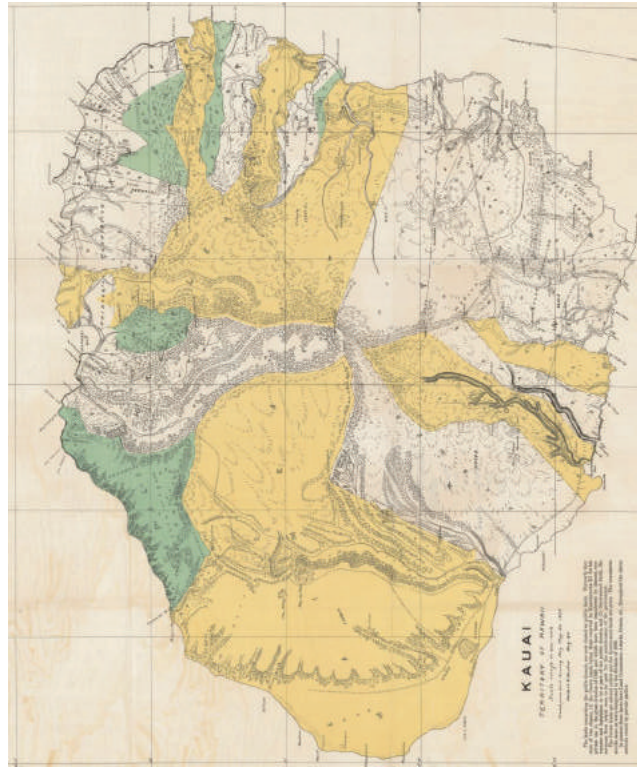
Figure 7. Hanapepe Town, Mid- to Late 1880s.



3.4 Hanapepe from the Late 19th Century to the Present

A 1901 map of Kauai (Figure 8; Newton 1901) classifies Hanapepe and the project areas as former Crown Lands initially reserved exclusively for use by Kamehameha III that transitioned into public domain before being classed as "Public Lands".

Figure 8. Map of Kauai, 1901



A 1903 map of Kaua'i (Figure 9; Newton and Wall 1903) prepared for the Governor's Annual Report shows Hanapepe and the project areas as "Public Lands". The project areas also appear as part of the Gay and Robinson Makaweli Plantation.

Figure 9. Map of Kaua'i, 1903



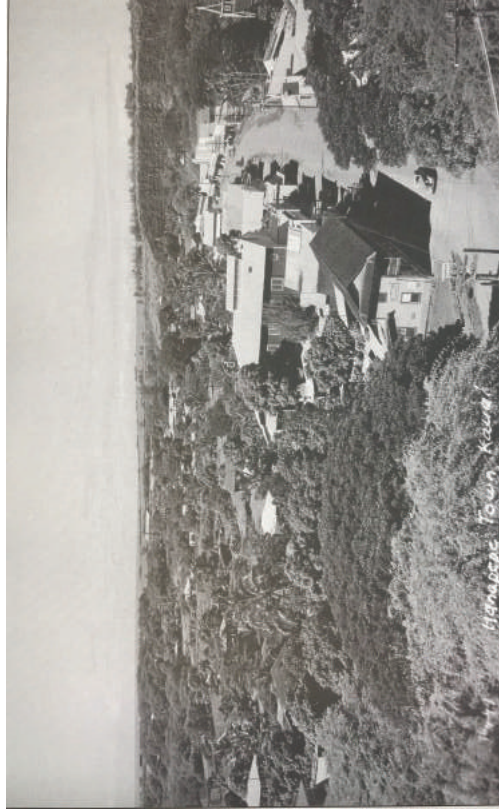
Figure 10. Hanapepe Valley, 1930s

A photograph of Hanapepe Valley taken in the 1930s from the bluff above shows a landscape under heavy agricultural cultivation (Cozad 2008: 24).



In 1941, C. Brewer Co. leased land from Gay and Robinson and established the Olokele Sugar Company, which operated until 1994 before being reabsorbed into the Gay and Robinson family holdings. Gay and Robinson is the last of three sugar plantations in the Hawaiian Islands and the last family-owned plantation (Joesting 1984: 219, 220). A photograph of Hanapepe Town in the 1940s (Figure 11), looking towards the ocean, shows the bluff comprising the southern portion of the larger project area vegetated and devoid of development. The same photograph provides an overview of the already-developed smaller project area.

Figure 11. Hanapepe Town, 1940s



During the 1950s and 1960s, numerous LCAs consisting of vacant land tracts located in the Hanapepe Heights neighborhood directly adjacent to the larger project area were granted (Table 1). Photographs of Hanapepe (Figures 12 and 13) feature vantages of the settlement east of the project areas, during the same timeframe.

Table 1. LCAs Granted in the Hanapepe Heights Neighborhood During the 1950s

LCA #	Claimant	TMK
13192	Daniel Gonsalves Peters, Sr., and Fannie Kawaimakalehua Ellis Peters	418008999
8652	Edward K. Watase	418008999
8071	Kiyoshi Kimata	418008999
13263	Koichi Kujima Kanna	418008999
13165	Masaji Obuchi and Hatsuyo Suzurikakawa Obuchi	418008999
13202	Mitsuo Nozaki	418008999
13169	Shigeo Nakao	418008999
10481	Yasue Enoki	418008999
11313	Yasue Enoki	418008999
11804	Yasue Enoki	418008999
12283	Yasue Enoki	418008999
13430	Ayako Nishimura Nakatsuka	418007017
8672	John I. Silva	418007017
10984	Masayuki Shimonishi	418007017
11695	Masayuki Shimonishi	418007017
11995	Ayako Nishimura Nakatsuka	418009999
13430	Ayako Nishimura Nakatsuka	418009999
12458	Hifumi Kawahara and Hatsuko F. Kawahara	418009999
12189	Isidro Cabugon Buduan	418009999
12077	Kenzo Watase	418009999
11861	Louis Ganansa Silva	418009999
12771	Masaichi Saito and Shigeo Saito	418009999
13542	Norman Stanley Cabral and Satsuki Fujii Cabral	418009999

Table 1. LCAs Granted in the Hanapepe Heights Neighborhood During the 1950s

LCA #	Claimant	TMK
12689	Sadao Tsuneta and Haruyo T. Tsuneta	418009999
12792	Stanley Luke Seto	418009999
12965	Thomas Cayetano Mortera and Gertrude Assignar Mortera	418009999
12094	Tsukasa Murakami and Yukie Kawakami Murakami	418009999
11799	Wah Git Dang and Amy Chuck Dang	418009999
13525	William Takashi Kanekiyo and Frances Fujie Funamura Kanekiyo	418009999
12491	Yasuo Nishikawa and Ayame Onzuka Nishikawa	418009999
11937	Yoshiyuki Ogata	418009999
11995	Ayako Nishimura Nakatsuka	418009016
11995	Ayako Nishimura Nakatsuka	418009999
13430	Ayako Nishimura Nakatsuka	418009999
12458	Hifumi Kawahara and Hatsuiko F. Kawahara	418009999
12189	Isidro Cabugon Buduan	418009999
12077	Kenzo Watase	418009999
11861	Louis Ganansa	418009999
12771	Masaichi Saito and Shigeo Saito	418009999
13542	Norman Stanley Cabral and Satsuki Fujii Cabral	418009999
12689	Sadao Tsuneta and Haruyo T. Tsuneta	418009999
12792	Stanley Luke Seto	418009999
12965	Thomas Cayetano Mortera and Gertrude Assignar Mortera	418009999
12094	Tsukasa Murakami and Yukie Kawakami Murakami	418009999
11799	Wah Git Dang and Amy Chuck Dang	418009999
13525	William Takashi Kanekiyo and Frances Fujie Funamura Kanekiyo	418009999
12491	Yasuo Nishikawa and Ayame Onzuka Nishikawa	418009999
11937	Yoshiyuki Ogata	418009999
12925	Jaime Balauro Basquez and Apolonia Funtanilia Basquez	N/A
12925	Jaime Balauro Basquez and Apolonia Funtanilia Basquez	418009034

Table 1. LCAs Granted in the Hanapepe Heights Neighborhood During the 1950s

LCA #	Claimant	TMK
12771	Masaichi Saito and Shigeo Saito	N/A
12925	Jaime Balauro Basquez and Apolonia Funtanilia Basquez	418009020
12771	Masaichi Saito and Shigeo Saito	418009020
13366	John Simao and Dorothy Kona Simao	418009020
12491	Yasuo Nishikawa and Ayame Onzuka Nishikawa	418009020
13366	John Simao and Dorothy Kona Simao	N/A
13366	John Simao and Dorothy Kona Simao	418009036
13366	John Simao and Dorothy Kona Simao	418009019
12771	Masaichi Saito and Shigeo Saito	418009019

Figure 12. Hanapepe Town, 1950s



Figure 13. Hanapepe Town, 1960s



In addition to the literature review described above, Dudek also reviewed pertinent online records from pertinent agencies and entities for additional information concerning historical development of the subject properties through the present:

- **County of Kaua'i Property Record Search.** On March 20, 2019, Dudek staff reviewed all available property information on the Kaua'i County Assessor's website. The review included details relating to owner and parcel information, commercial improvements, sales information, and of all available permit information. Dudek also reviewed the online parcel map to assess adjacent parcels within the indirect APE. The 359-acre subject property lists Hawaiian Home Lands as the Fee Owner of the subject property, currently tax-classified as agricultural land. The same website lists the State of Hawai'i as the owner of the subject property, also tax classified-as agricultural, with the County of Kaua'i as lessee. No additional permits were associated with either project area.
- **Historic Properties Located Within the Project Direct and Indirect APE.** Searching the NRHP and Historic Hawai'i Foundation's online databases located one NRHP and Hawai'i Register listed property within 0.5 miles of the direct APE: Hanapepe Town Lot #18, a pool hall constructed in 1926 (National Register of Historic Places; Historic Hawai'i Foundation).

- **Aerial Photograph and Historic Topographical Map Review.** A review of historic and modern aerial photographs and topographical map from the National Environmental Title Research, LLC (NETR) was conducted as part of archival research for the project. Aerials from 1950 and 1981 were available for the subject properties, as were topographic maps from 1965, 1971, 1984, 1985, 1998, 2013 and 2017. The 1950 aerial depicts the 359-acre project area as subdivided into fields under heavy mechanized agricultural cultivation, and the 6-acre land tract as hosting multiple buildings. Topographic maps from 1965 and 1971 depict the 359-acre subject property as vacant land and the 6-acre subject property as the location of one building. In a 1981 aerial photo, the larger project area appears subdivided into fields and under heavy agricultural cultivation and the smaller project area as developed and hosting structures. The NETR topographic maps available between 1984 and 2017 show the 359-acre subject property remained undeveloped, and a suite of buildings and features difficult to distinguish for an exact count on the 6-acre land parcel.

3.5 Previous Archaeological Background Information

On November 29, 2018, with the assistance of Helen Wong Smith, Librarian/Archivist for the SHPD, Dudek Archaeological Technician Tiffany Brown conducted an in-person search for records pertaining to the subject property. The SHPD library is located in Kapolei, O'ahu, Hawai'i, and houses cultural resources records for the Hawaiian Islands. Ms. Brown's search revealed 16 resources on file related to the subject property. Previous archaeological studies conducted within the direct and indirect project APEs, as well as their results, are mapped in Figures 14 and 15, summarized in Table 2, and discussed below.

Figure 14. Previous Archaeological Studies Conducted Within the Direct and Indirect Project APEs

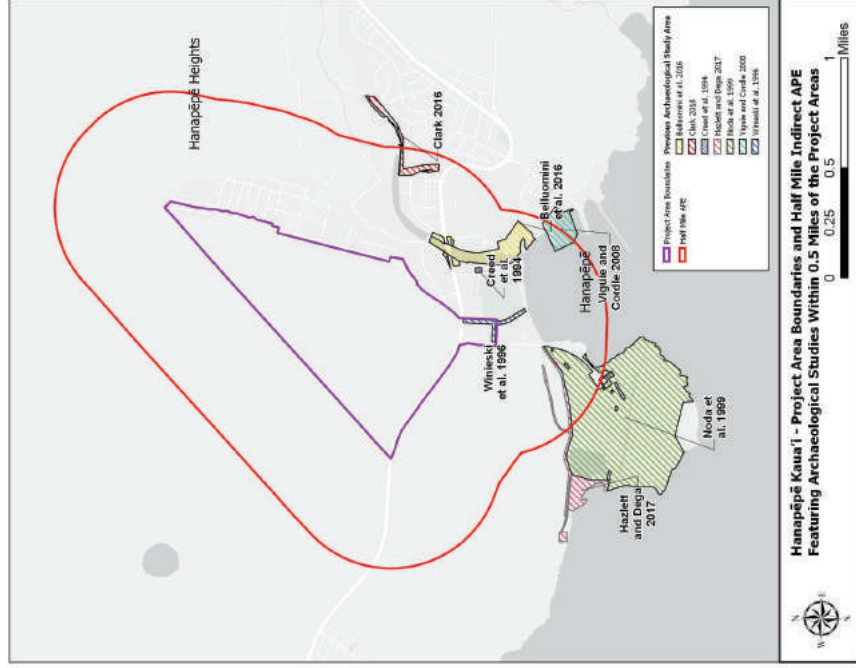


Figure 15. Hanapepe Kaua'i - Project Area Boundaries and Half Mile Indirect APE Featuring State Inventory of Historic Places-Listed Archaeological Sites

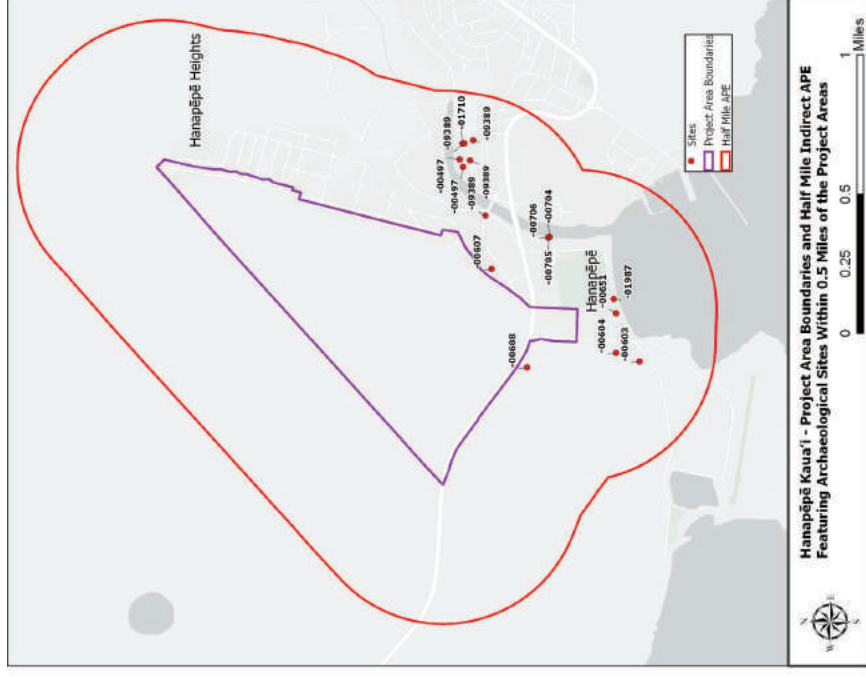


Table 2. Archaeological Resource Investigations and Technical Reports within the Project Direct and Indirect APEs

Reference	Study/Resource Type	Location	Results
Kikuchi 1963	Archaeological Inventory Survey and	Southern coast of Kaua'i from the bay of Hanapepe to the southeastern shore of Maha'ulepu	Numerous archaeological sites and features reported: Historic burials noted throughout caves in Hanapepe Valley; Akowai Heiau in Hanapepe Valley; Salt Pan Beach Park; multiple heiaus; Salt Pan harvesting areas; House sites on Pu'olu Point; rock shelters, house sites, shrines, canoe shed walls, enclosures, rock formations, middens and multiple petroglyph sites along the coast
Creed et al. 1994	Archaeological Inventory Survey	TMK (4) 1-9-10:2 and 3	Two human burials, State Inventory of Historic Places (SIHP) Site #s 50-30-09-704 and 705, and a cultural deposit, State Site 50-30-09-706
Winiwski et al. 1996	Archaeological Monitoring Report	TMK (4) 1-8-08:45	One primary coffin burial, SIHP Site # 50-30-09-1987, additional scattered/fragmented human burials
Noda et al. 1999	Environmental Assessment	TMK (4) 1-8-08:04, 33, 80, 83, 85	Reconfirmed existence of previously recorded archaeological sites. Noted no new sites.
Viguié and Cordle 2008	Archaeological Monitoring Report	TMK (4) 2-1-03:010	One historic railroad junction feature, SIHP Site #50-30-09-585
Donham 2010	Chapter 6E-8 Historic Preservation Review	TMK (4)-1-8-008:020 and :038	No historic properties affected

Table 2. Archaeological Resource Investigations and Technical Reports within the Project Direct and Indirect APEs

Reference	Study/Resource Type	Location	Results
Donham 2011a	NHPA Section 106 Consultation	(4) 1-7-006:004	Community consultation and visual impacts mitigation requested
Donham 2011b	National Historic Preservation Act (NHPA) Section 106 Consultation	TMK (3) 2-4-057:001	With proper mitigation, no adverse effect on historic properties
Donham 2014a	Chapter 6E-8 Historic Preservation Review	TMKs (4) 1-8-008:020 (portion)	Additional information requested
Donham 2014b	Chapter 6E-8 Historic Preservation Review and NHPA Section 106 Consultation	TMK (4) 1-4-004:003; 1-9-009:006-009; 1-9-010:003; 4-1-009:054; 4-1-011:016; 020 and 4-5-008:009, 012	No historic properties affected (TMKs (4) 1-6-005:003, (4) 4-1-009:054 and (4) 1-011:016 and 020) Archaeological Inventory Survey (TMKs (4) 1-9-009:006, 007,008 and 009) Burial Treatment Plan and Archaeological Monitoring Plan (TMK (4) 1-9-010:003) Archaeological Inventory Survey Report (TMKs (4) 4-5-008:009 and 012, 4-5-011:007)
Kamai and Hammatt 2014	Final Archaeological Monitoring Plan	TMK (4) Zone 1	Potential for significant sub-surface cultural deposits and pre-Contact human burials requires on-site archaeological monitoring near previously-identified historic properties

Table 2. Archaeological Resource Investigations and Technical Reports within the Project Direct and Indirect APEs

Reference	Study/Resource Type	Location	Results
Clark 2016	Emergency Archaeological Monitoring Plan	TMKs (4) 1-9-003:001, 002, 003 & 004	Archaeological monitoring plan for vegetation clearing rock scaling, post hole excavations, surface survey of cleared areas and documentation of existing historic properties
Beilumini et al. 2016	Final Archaeological Inventory Survey Report	TMK (4) 1-9-007:001 (por.), Hanapēpē River, 013 (por.), 020 (por.) and 034 (por.) and 1-9-010:014 (por.), 015 (por.), 046 (por.) and 050 (por.) Kaunualii Highway and Iona Road Rights-of-Way	SIHP Site #s 50-30-09-2280, the Hanapēpē River Bridge; 50-30-09-2281, a historic wall; 50-30-09-2282, a basalt retaining wall; 50-30-09-2283 a large earthen and piled basalt stone berm; Sites:2280 and -2283 NRHP eligible
Beilumini et al. 2017	Mitigation Plan	TMKs: [4] 1-9-007, [4] 1-9-010, [4] 2-7-001, [4]-4-6-014, [4]-4-7-003, and [4] 4-7-008	Precautionary archaeological monitoring for all ground disturbance related to the Hanapēpē River Bridge replacement project; Historic American Engineering Record documentation and interpretive signage developed and installed for the Hanapēpē River Bridge; Best management practices employed in order to preserve the historic integrity of the Hanapēpē River Bridge and earthen/basalt berm

Table 2. Archaeological Resource Investigations and Technical Reports within the Project Direct and Indirect APEs

Reference	Study/Resource Type	Location	Results
Hazlett and Dega 2017	Final Archaeological Assessment	TMK (4) 1-8-008: Portions of 016, 036, 043, 044	No cultural deposits or archaeology identified; monitoring requested by the SHPD

In 1963, Kikuchi (Kikuchi 1963) conducted an archaeological survey and test excavations focused on locating sites, determining the extent of vandalism, and assessing the archaeological potential of the Waimea District. The study was sponsored by the University of Hawaii Committee for the Preservation and Study of Hawaiian Language, Art, and Culture. It supplemented and corrected findings from a 1961 coastal survey from Hanapēpē Bay to the southeastern shore of Maha'ulepu filed with the Bishop Museum that could not be located. The 1963 fieldwork focused on Waimea District coastal zones, waterways, and valleys. Fieldwork extended inland to an indeterminate extent that may or may not have included part or all of the project area. Kikuchi noted no heritage in the project area, but confirmed seven sites and site clusters proximal to the coasts and waterways of Hanapēpē Ahupua'a. Those sites included 1) An unspecified number (possibly four, possibly more) of heavily vandalized burial caves and associated stone walls in Hanapēpē Valley; 2) Platforms, walls, a paved area, and house sites associated with Akowai Heiau, relocated from an old map belonging to Alexander and Baldwin; 3) A vandalized subsurface cultural deposit at Salt Pan Beach Park, actively being eroded by natural forces as well (Kikuchi and his team recovered bird, pig, and shell midden from the site and noted 20–30 fishhooks were previously recovered from the site); 4) A coastal fishing shelter and associated midden deposit; 5) A monument marker called "Ka-wiliwili" above "Ke-ana-kua" Point demarcating "Ku-wiliwili" Heiau, said to be a po'okanaka heiau; 6) A salt pan used by local families to procure salt in traditional through modern times; and 7) House sites and walls at Pu'ulo Point.

In 1994, Cultural Surveys Hawai'i conducted a subsurface archaeological subsurface inventory survey of a Hanapēpē house plot outside and southeast of the 359-acre project area and east of the 6-acre project area, on the west bank of the Hanapēpē River (Creed et al. 1994). During backhoe trenching, a discontinuous cultural deposit (State Site # 50-30-09-706) radiocarbon dated to the historic period and two human burials (State Site #s 50-30-09-704 and 50-30-09-705) were discovered. The human burials were left *in situ*, reburied and their locations denoted on the ground surface. Given the house plot owner's unknown future plans, archaeological

monitoring and additional protective measures in the event of ground surface disturbance were recommended.

In 1996, Cultural Surveys Hawai'i performed archaeological monitoring for the Hanapepe Drainage Improvement Project – the only archaeological study that occurred within the direct APE (Wineski et al. 1996). Work occurred south of the 359-acre project area, on a linear strip of land above a subsurface drainage pipe extending from Kaurmali Highway to Hanapepe Bay in a land tract that included the eastern boundary of the smaller project area. One historic-era coffin burial (State Site # 50-30-09-1987) as well as additional scattered/fragmented human burials. Archaeological monitoring for future ground disturbance was recommended given the history of human burial discoveries in the area.

In 1997, International Archaeological Research Institute Inc. (IARII) conducted an archaeological inventory survey included in Noda and Associates 1999 Environmental Assessment (Noda and Associates 1999). IARII's original report was not included in the documentation or available during Dudek's SHPD research trip. As stated by Noda and Associates, previously noted archaeological—House Sites (State Site #50-30-09-50), Kauakahiuni Heiau (State Site #50-30-09-51), the House or Fishing Site (State Site #50-30-09-52)—could not be relocated, perhaps due to recent hurricanes and storms; no new archaeological or historic sites were reported. Prohibiting development in sandy areas was recommended due to the high likelihood of encountering human burials. The Environmental Assessment Reviewee, the Director of Transportation, determined the project would have no significant environmental effect, including to cultural resources.

In 2008, an archaeological monitoring report produced by Scientific Consultant Services summarized results from "spot check" archaeological monitoring activities in support of septic system improvements roughly 0.5 miles southeast of the 359-acre project area and 0.5 miles east of the 6-acre project area, on the eastern shores of Hanapepe Bay (Viguie and Cordle 2008). Excavations encountered State Site # 50-30-09-585, historic plantation-era railroad infrastructure. Archaeological monitoring was recommended for all future work due to prolific sand deposits in the area.

In 2010, Theresa Donham, Acting State Historic Preservation Archaeology Branch Chief, conducted a Chapter 6E-8 Historic Preservation Review for the County of Kaua'i Planning Department for subdivision followed by consolidation of the Kaua'i Veteran's Cemetery (Donham 2010). The cemetery sits south of both project areas, northwest and inland of Hanapepe Bay. Citing high disturbance from grading visible from aerial photos and intensive,

well-documented sugar cane farming, Donham returned a determination of no historic properties affected.

In 2011, Theresa Donham, Acting State Historic Preservation Archaeology Branch Chief, conducted an NHPA Section 106 review of documentation from Earth Touch, Inc., for construction of new antenna support structures by/for the use of Federal Communications Commission (FCC; Donham 2011a; Donham 2011b). The supporting documentation was not included with the letters on file at the SHPD and available to Dudek. Proximity to the Olokele Sugar Company mill and plantation led Donham to initially requested community consultation and visual impacts mitigation (Donham 2011a), before ultimately determining the antenna collocation would have no adverse effects on historic properties and could proceed (2011b).

In 2016, Pacific Consulting Services, Inc., submitted an Emergency Archaeological Monitoring Plan in support of the Ko Road Rockfall Project roughly 0.5 miles east of the 359-acre project area and 1.5 northeast of the 6-acre project area (Clark 2016). Archaeological monitoring of vegetation clearing and redocumentation of historic sites including rock walls, an old survey marker and potential Native Hawaiian burial cave were proposed.

In 2016, Belluomini et al. submitted a final archaeological inventory survey report for the Hanapepe River Bridge Replacement project southeast of the 359-acre project area and east-northeast of the 6-acre project area (Belluomini et al. 2016). The study identified four historic properties, SHP Site #s 50-30-09-2280, the Hanapepe River Bridge; 50-30-09-2281, a historic wall; 50-30-09-2282, a basalt retaining wall; 50-30-09-2283 a large earthen and piled basalt stone berm. Mitigation recommendations for NRHP-eligible Sites -2280 and -2283 included Historic American Building Survey/Historic American Engineering Record/Historic American Landscape NPS consultation and architectural recordation, interpretive signage developed in consultation with the SHPD, best management practices exercised when removing a portion of the NRHP-eligible berm as well as avoidance and proper protection of historic properties adjacent to the APE. Precautionary archaeological monitoring undertaken with community consultation was requested by the project proponent.

In 2017, Belluomini et al. authored a mitigation plan for the Hanapepe Bridge replacement project, southeast and northeast of the project areas. Precautionary archaeological monitoring for all ground disturbance related to the Hanapepe River Bridge replacement project, Historic American Engineering Record documentation and interpretive signage developed and installed for the Hanapepe River Bridge, and best management practices employed in order to preserve the historic integrity of the Hanapepe River Bridge and earthen/basalt berm were recommended.

In 2017, Scientific Consultant Services performed an archaeological assessment in support of utilities installation by the County of Kauai Department of Public Works at the Salt Pond Beach Park. The assessment occurred south-southwest of the project areas, following Salt Pond Road from Salt Pond Beach Park to Hanapepe town (Hazlett and Dega 2017). No cultural deposits or new archaeology was noted. The SHPD recommended monitoring ground disturbance associated with the project due to the project area's proximity to Salt Pond Beach Park (State Site #50-30-09-03038) and proximal sandy, subsurface deposits likely to contain cultural materials.

4 FIELDWORK

Preliminary project fieldwork consisting of stakeholder outreach and a site visit were conducted in December 2018. On December 13, 2018, Dudek Principal Investigator and Archaeologist Rachel Hoerman, PhD, attended a stakeholder outreach meeting for the project at the Hanapepe town library convened by SSFM International and the Department of Hawaiian HomeLands. Other members of the project team were also present. The purpose of the stakeholder outreach meeting was to familiarize community members with the project, introduce the project team, and provide a forum for conversation, questions and feedback. During and after the meeting, community members informed Dr. Hoerman of sinkholes and burial caves purportedly located in the larger project area. They also provided the names and phone numbers of reputed elders with cultural/lineal ties to Hanapepe who might be able to provide additional information regarding archaeology contained in the project areas; however, multiple attempts to connect with the individuals were unsuccessful.

Dr. Hoerman conducted a site visit to the project areas alongside other members of the project team on December 14, 2018. The larger project area is densely vegetated and fenced with limited access along the east side only, via access points and gates in the Hanapepe Heights neighborhood. The smaller project area is a heavily paved and developed land parcel sitting at sea level near Hanapepe Bay.

Although recommended (see next section), an archaeological inventory survey (AIS) was not part of the scope of work for this project.

5 FINDINGS AND RECOMMENDATIONS

No archaeological features or deposits within the project areas were noted during background research of the subject parcel. Nor were archaeological features or deposits observed during the preliminary site visit, though extremely dense, tall vegetation obscures the majority of the larger land parcel. Ranching and extensive mechanized agricultural activities have taken place on the larger project area for over 150 years, and the smaller project area has undergone at least one century of development.

Based on the fact that one archaeological study has partially, definitively occurred in the project areas (it is indeterminate whether Kikuchi's 1963 pedestrian inventory survey of coastal Kaua'i covered any, part or all of the project areas), Dudek determines an AIS of the subject properties is necessary. The AIS should be developed in coordination with the DLNR-SHPD and undertaken in full compliance with Hawai'i Administrative Rules 13-275, 13-276 and all additional applicable heritage legislation. AIS results should determine whether heritage is present in the project areas, and if so, verify its location and extent, evaluate its significance and plan for its avoidance/conservation/management in consideration of the proposed project. Special attention should be given to sinkholes and caves present on the larger subject property – they may contain cultural materials/heritage destroyed or cleared from the rest of the landscape by extensive, sustained, ranching and sugar cane farming activities.

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Appendix D – Cultural Impact Assessment

A Cultural Impact Assessment for the Department of Hawaiian Home Lands, Hanapēpē

(Re-Dacted Draft for review)

Hanapēpē Ahupua‘a
Kona Moku, Kaula ‘i Mokuupuni

TMKs (4) 1-8-007:003, 1-8-008:035, 081, 086 & 087



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Introduction & Methods

Scope of Work

At the request of SSFM, Nohopapa Hawaii'i, LLC conducted a Cultural Impact Assessment (CIA) for the Hanapēpē Department of Hawaiian Home Lands (DHHL) parcels located in Hanapēpē ahupua'a, Kona moku, Kauai'i moku. Nohopapa Hawaii'i, LLC has been tasked to:

2.4. Conduct a Cultural Impact Assessment of the project area. The Cultural Impact Assessment will include: Research focusing on traditions and legends; limited historic research; research of oral histories conducted within and around project area; interviews with persons/organizations knowledgeable with the project area; assessment of the potential impacts of the Conceptual Plan alternatives, identification of mitigation measures for the selected alternative, if needed, and preparation of text documenting the methodology, results, and findings.¹

The CIA includes an English and Hawaiian review of literature, historical maps, photographs, and various ethnographic interviews related to traditional cultural practices and land use. Contents of the study include:

The structure and content of this Cultural Impact Assessment is in compliance with the primary guiding documents including: *The Hawaii'i Environmental Council's Guidelines for Assessing Cultural Impacts* (Appendix A), *A Bill for Environmental Impact Statements* (Appendix B), and *Act 50* (Appendix C). This Cultural Impact Assessment meets the standards for all of these documents, and therefore is in accordance with Chapter 343, HRS.

¹ Taken from the Scope of Services > Scope of Work > 2 > 2.4

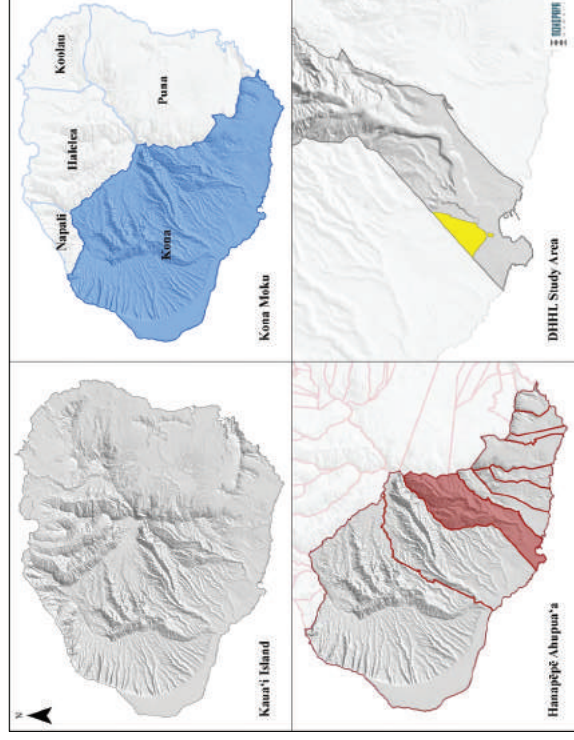


Figure 1. Introduction to Project Area, Kauai Island, Moku of Kona, Ahupua'a of Hanapēpē, Department of Hawaiian Home Lands parcels.

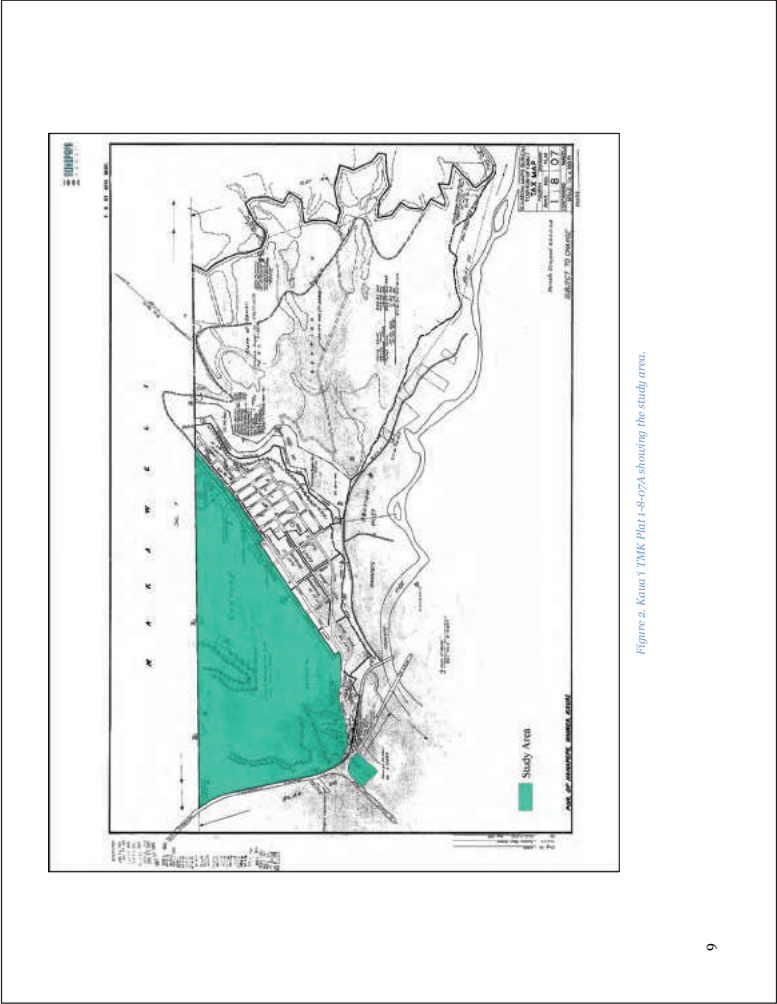


Figure 2. Kauai T.M.K. Plat 1-8-07A showing the study area.



Figure 3. Kauai T.M.K. Plat 1-8-08A showing southern, maui, parcel of study area.

E 'onipa'a i ka imi na auao.
Be steadfast in the seeking of knowledge.

Methods

A cultural impact assessment is not just an area specific, but a project specific, assessment of impacts to cultural resources, practices, and even beliefs within a study area. This CIA, therefore focuses specifically on the study area, casting the 'upena wider as our research or the community guides us. This report is not nor is it intended to be a history of Hanapepe. To the best of our ability we have kept this report relevant to the study area; incorporating larger Hanapepe alhupua'a, Kona Moku, Kaula'i Island, or even pae 'aina mea when we found connections and relevance to the project and the study area.

This CIA consisted of two phases. Phase I) ethnohistorical research and review with initial community outreach, and Phase II) community ethnographic interviews, summaries, and recommendations; with the final report being synthesized after the completion of Phase I & II.

Project personnel included: Kelley L. Uyeoka, MA and S. Kekuewa Kikilo, PhD, principals; and subcontractors Devin Kamealoha Forrest, MA, Dominique Leu Cordy, MA, and Lilia Merrin, MA. While conducting this study, Nohopapa Hawai'i's research team incorporated a set of values and beliefs to help guide our research, analysis, behavior, perspective, and overall frame of reference. The core values directing our hui included:

- **Aloha 'aina-** to have a deep and cherished love for the land which created and sustains us
- **Ha'aha'a-** to be humble, modest, unassuming, unobtrusive, and maintain humility
- **Ho'omau-** to recognize, appreciate, and encourage the preservation, perpetuation, and continuity of our wahi pana and lahui (nation)
- **'Ike pono-** to recognize, feel, and understand righteousness, properness and goodness in all we do
- **'Imi Na'auao-** to seek knowledge or education; be ambitious to learn
- **Kuleana-** to view our work as both a privilege and responsibility
- **Pule-** to open the connection and communication lines to a higher source of power so that this work is intentionally guided

These values represent the underlying foundation, spirit, and structure for this study. It was our hope that by providing a frame of reference and guiding values, the teams' efforts would be better understood in the context of our being indigenous and kama 'aina researchers genuinely believing in and practicing aloha 'aina and aloha lahui.

The collection of information was divided into two parts – ethnohistorical and ethnographic.

Ethnohistorical Research and Review

According to the State of Hawai'i Environmental Council's, *Guidelines for Assessing Cultural Impacts* (adopted 1997), "The legislature finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture."

It is with this in mind that the ethnohistorical research was conducted. To the best of our ability we have surveyed primary source material related to Hanapepe and the study area. Extensive Hawaiian language sources were surveyed.

It is our scholarly experience that second, third, and further-hand recounting of events, people, and stories, often lead back to a single English translation of a Hawaiian language source. Like the children's game telephone, this method of recounting history often changes in the telling. Unlike oral histories within a culture, the scholarly 'telephone' game comes with external agendas and perspectives, coupled with heavy missionary influences and translations from Hawaiian to English by that same missionary body, these secondary sources are often a mistelling vs a retelling or continuation of mo'olelo.

A variety of repositories and resources were examined to develop a general description of the natural, cultural, historical, and archaeological background of the study area and Hanapepe alhupua'a.

Information on the natural landscape of the Makaweli/Hanapepe borderlands was gathered primarily through reviewing County, State and Federal GIS data, atlases, maps, scientific reports, and reference books.

Inoa 'aina, nūpepa, mo'olelo, mele, oli, and 'ōlelo no'ēau were compiled from Hawaiian language and English sources in books, newspapers, online databases, and archives.

Historical accounts were collected from primary and secondary documents including records, journals, newspapers, and previous reports. Historic maps and Māhele data were gathered from various, state and private collections. Including the Bernice Pauahi Bishop Museum (BPBM) Archives in Kapālama, O'ahu and Kaula'i Hsitoric Society (KHS) in Lihū'e, Kaula'i.

Archaeological information was compiled from previous archaeological reports and studies available at the State Historic Preservation Department.

Digital Archival repositories visited include Ulu Kau, Nupepa, AVA Konohiki, Hawaii Office of Planning GIS repository, Papakilo Database, Kipuka Database, AVA Konohiki, Punawaiola, and others.

Community Ethnographic Interviews

Ethnographic research involves gathering oral histories and conducting interviews with living communities to record and acknowledge peoples' historical connections to place as well as document the visions communities have for their wahi pana. Ethnographic work provides a "voice" for a community's history, traditions, and concerns and is used to capture and understand the indigenous viewpoint (past and present) associated with cultural places. Hawaiians have always maintained intimate relationships with their environments and by generating detailed stories about places; knowledge is passed on to future generations. In South Kohala, many kūpuna and kama 'aina have maintained close connections to their 'āina and have kept the stories of the landscape alive. Through our ethnographic efforts, we attempted to capture and present some of these personal histories and mo'olelo.

Ethnographic research involves an intimate connection between the ethnographer and the participant, a trusting relationship must be developed. Nohopapa ethnographers, possess a special understanding and appreciation of Hawai'i's history, environment, and culture that allows them to collaborate and work closely with communities in a sensitive and culturally appropriate fashion. In retrospect, the professionalism and cultural sensitivity and awareness of Nohopapa staff encourages the forging of an understanding, trusting, and genuine relationship with the community.

Data Gathering

Ethnographic work is a multi-phase study, the process consisted of identifying appropriate and knowledgeable individuals, conducting oral history interviews, summarizing the digitally recorded interviews, analyzing the oral history data, and preparing the report. The data gathering methodology utilized for this study included scoping via word of mouth sampling, semi-structured interviews, site visits, and personal observations.

Scoping and Interviewee Selection Criteria:

Scoping for this project began with contacting interested and knowledgeable individuals, organizations, and groups recognized as having genealogical, cultural, historical, or managerial connections to the project ahupua'a. Initial scoping methods included utilizing emails and prepared mail out letters to inform individuals of the project, contacting and following up with individuals by telephone, and/or meeting with individuals in person to discuss the project (Appendix D).

Knowledgeable consultants were selected if they met one or more of the following criteria:

- 1) possessed genealogical ties to the project area or vicinity; and/or
- 2) were considered Hawaiian cultural practitioners. Participants were selected because of their familiarity with or knowledge of the project area and its surrounding resources. A few participants explained that a number of kūpuna who were familiar with the project area had unfortunately passed away. Consequently, project staff had to rely heavily upon those resource persons who were interviewed as well as on secondary information sources such as reports, newspapers, and other written documents and materials. A number of organizations and individuals were eventually contacted, and (at this time) four community members have participated in more formal interviews.

Knowledge Sources:

During the study, project staff learned that interview participants obtained their knowledge about the project ahupua'a from four primary sources:

1. 'Ohana knowledge or knowledge and information passed on within the 'ohana from one generation to the next.
2. Knowledge obtained from individuals outside their 'ohana such as teachers, cultural practitioners, and kūpuna.
3. Knowledge obtained through written sources such as books, documents, newspapers, reports, and studies.
4. Knowledge gathered through personal observations and practices (such as knowledge acquired through cultural practices within the project area).

Most individuals interviewed acquired their knowledge of Hanapēpē through personal experience or from older family and community members who passed on personal, historical, and/or genealogical information about Hanapēpē. Some individuals acquired their knowledge from written sources or from other individuals outside their family. A handful of cultural practitioners obtained their knowledge about the project ahupua'a by spending time in the area and through first hand observation.

Ethnographic Interviews:

The study utilized semi-structured interviews because they are open ended yet follow a general

script covering a pre-determined list of topics. The interviews were conducted in a "talk story" format to allow for a more informal dialogue and free-flowing sharing. This style of interview is typically more comfortable for interview participants as it flows more naturally and does not follow a rigid structure. The interview questions were open ended which allowed for more freedom to answer but still kept the interview focused on the desired research outcomes. Information gathered during the initial phases of archival research and scoping for this project was utilized to construct the open-ended questions for the semi-structured interviews. The interview questions were derived from those primary themes identified as being crucial for obtaining a comprehensive understanding of the historical and contemporary knowledge of Hanapēpē. The primary themes guiding the interviews included:

- * 'Ohana and individual connections and relationships to the area
- * Mo'olelo, place names, mele, oli, hula
- * Past and present cultural practices and protocols
- * Knowledge of natural and cultural resources
- * Traditional and historic land use and ownership
- * Knowledge of fishing or mauka gathering from Puolo to Puu Lani
- * Concerns and suggestions regarding the DHHL phased Homestead plan
- * Referrals of kūpuna and kama'āina who might be willing to share their cultural knowledge of the area

Data Integration

Two interviews were audio recorded, and portions were then transcribed and summarized; one interview was recorded by a note taker and then transcribed and summarized. The summaries were then sent to the interviewee for review, an accuracy check, and to confirm they were comfortable with the thoughts, information, and comments being shared. A great amount of scrutiny and care was used to ensure that all of the collected data, information, and transcriptions were presented as accurately as possible. Throughout the study, project staff remained keenly aware of the critical importance of ensuring that the voices of the community were honored and respected, correctly heard, and properly conveyed.

Ethics

Throughout the study, and particularly before any type of meeting or interview, it was explicitly and carefully explained to all participants that their involvement in the study was strictly voluntary. A comprehensive and detailed informed consent process was initiated and completed, including providing ample project background information, before participation in the study was allowed. The informed consent forms (Appendix F) included all of the specific participant rights including notification that participants could choose to remain anonymous. Project background information included explaining the study focus and the purpose, significance, and importance of the study. After proper notification and discussion, some interview participants voluntarily provided verbal consent for the researchers to use their mana'o for the study. Throughout the project period, all participants had open and regular access to the researchers. All of the interviews were scheduled and arranged for the participant's convenience, and none of the interviews or meetings was initiated until participants felt completely satisfied with the process.

Study Area

The project area for this CIA includes TMKs (4) 1-8-007:003, (4) 1-8-008:035, 081, 086 and 087, the parcels that make up the un-developed portion of the Hanapēpē Hawaiian Homelands; ahupua'a of Hanapēpē, moku of Kona, moku of Kāua'i. While the primary study area consists of these two 'āpana, divided into five (5) TMK, we took a broader look uka and makai from the study area. This widening of our lens acknowledges the interconnectedness of natural and cultural landscapes on Kāua'i; through geography, mo'olelo, oral histories, events, wahi pana the movement of people, wai, la'au, fauna, and the overlapping of cultural practices mauka to makai and across wao.

Table 1. HI State 2018 TMK parcels making up the study area.

HI State 2018 TMK	Mauka or Makai parcel	Acreage (TMK)
4-1-8-007:003	Mauka	346.36
4-1-8-008:035	Makai	4.92
4-1-8-008:081	Makai	0.32
4-1-8-008:086	Makai	0.34
4-1-8-008:087	Makai	0.63

The study is comprised of two discontinuous 'āpana, made up of five TMK parcels, totaling 355-365 acres (depending on the source, GIS or HI TMKs). The mauka, and larger, parcel is located along the northern side of the Kaunua'i Highway on the western plateau of Hanapēpē, west of Moi Road, along its border with Makaweli. The larger parcel has been in grass for years. Some existing homesteaders along Moi road have been using the fringe area to grow gardens, fruit trees and native plants, or maintaining it for a firebreak. The makai, and smaller, 'āpana is at the southeast (makai-Ele'ele) corner of Kaunua'i Highway and Lele Road, where Habitat for Humanity has its warehouse at present. (See Figures 2 and 3, previous).

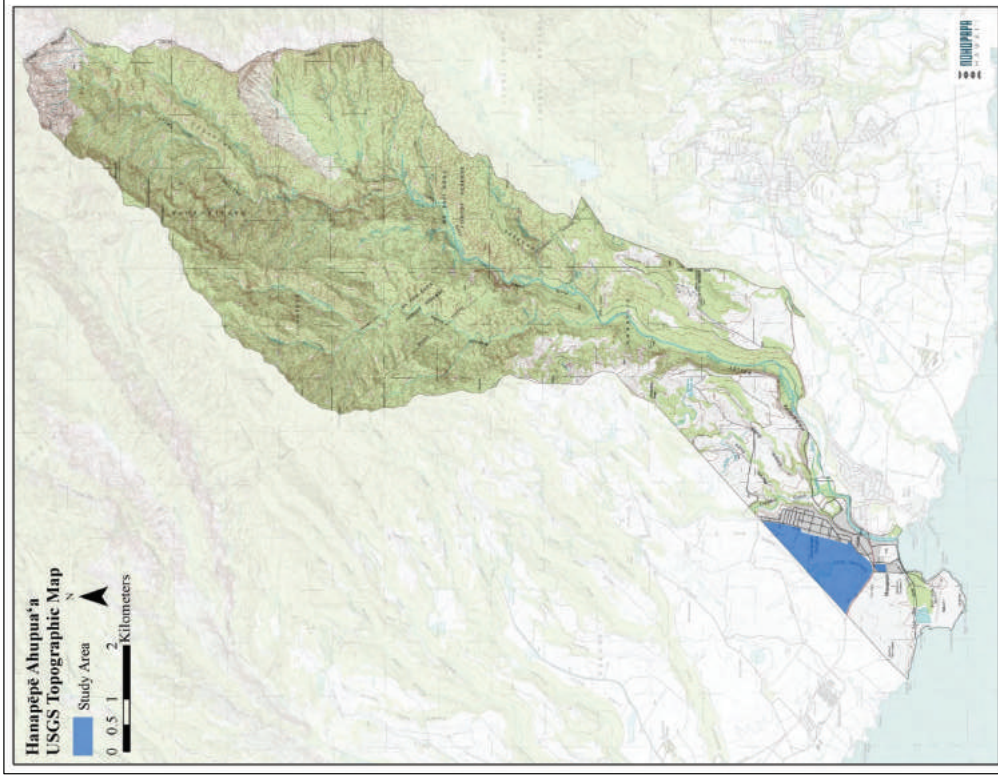


Figure 4. USGS map showing Hanapēpē Ahupua'a and the study area.

Geology & Soils

The project area is part of the Waimea Canyon volcanic series, which formed off of the “great Kauai shield volcano” (USGS Bulletin 13, MacDonald et al 1960). The study area sits upon the western flank of Hanapepe valley, deposited in the Pleistocene as part of the Koloa volcanic series.

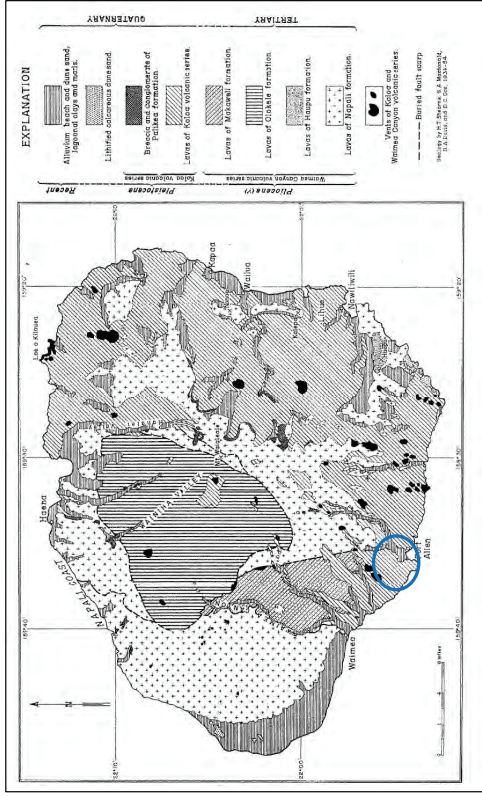


Figure 6. From USGS Bulletin 13 (1960, p18), Geology by Stearns, MacDonald, Davis & Cox, 1934-54. Study area location added in blue.

At places where the pre-Koloa slopes were gentler, lavas of the Waimea Canyon volcanic series...are weathered to depths of a few feet or a few tens of feet, and commonly are covered with several feet of soil...in the area between Makaweli and Hanapepe Valleys, where lavas of the Koloa rest on a surface of older rocks that slopes southwestward at an average angle of about 5°, the underlying lavas of the Waimea Canyon volcanic series are partly decomposed to a depth of 25 to 50 feet and capped by 2 to 5 feet of brownish-red soil (MacDonald et al 1960, p.54).

Three soil series (Lihue, Makaweli and Pakala) are represented in the study area as well as areas of “rough broken land.”

The Lihue soil series are typically upland and well-draining soils that have eroded from igneous rock (Foote et al 1972, p82). These study area soils have slow runoff with a slight erosion hazard.

The Makaweli soil series have eroded from igneous rock; these are well drained soils on the uplands (Ibid p90-91).

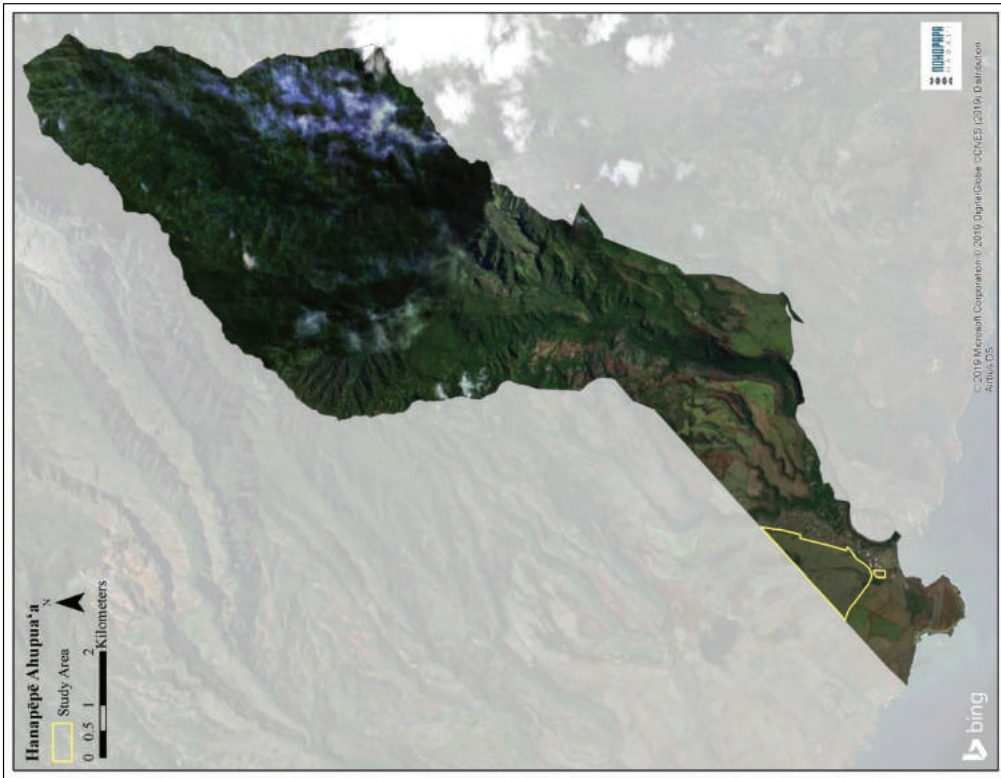


Figure 5. Aerial Imagery (Microsoft Bing Maps) showing Hanapepe Ahupua'a and the study area.

Elevations range from nearly sea level to 500 feet. The annual rainfall amounts to 20 35 inches. Three-fourths of it occurs from October through March. The mean annual soil temperature is 74°.

Table 2. Soil Symbols Key and descriptions (see Figures 5 & 6). Table data taken from Foote et al., 1972.²

MU SYM	Munsell Soil Key	description	Use
LIB	Lihue gravely silty clay	0 to 8 percent slopes. This soil contains ironstone-gobbite pebbles and has brighter colors in the B horizon.	sugarcane, pasture, and homesites
LIC		8 to 15 percent slopes.	sugarcane, pasture, wildlife habitat, and homesites
MgB		Permeability is moderate. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 5 feet or more.	for irrigated sugarcane and pasture
MgC	Makaweli silty clay loam	Runoff is medium and the erosion hazard is moderate. Included in mapping were small severely eroded areas.	sugarcane, pasture and homesites
MgD		Rapid runoff with severe erosion hazard.	Sugarcane and pasture
MdE2		Rapid runoff with severe erosion hazard.	pasture
PdA	Pakala clay loam	Runoff is very slow, and the erosion hazard is no more than slight; subject to infrequent nondamaging overflow.	Sugarcane and pasture, small acreage for truck crops.
rRR	Rough Broken Land	Runoff is rapid, and geologic erosion is active	Watershed and wildlife habitat. Some places pasture and woodland.

The Pakala soil series are geographically associated with Makaweli soils. This series consists of Alluvial fans & bottom lands. These are layered soils from sea level to 400 ft amsl (Ibid p107-8). Top, or surface layers are often dark reddish brown, with a fine sandy loam layer below, "that is massive."

Rough Broken lands, in the study area, will include the steeper slopes (40-70%) of intermittently flowing stream gulches and drainage channels; generally not stony.

Soil information is included here to highlight the connectedness of the project area geology from uka to kai. The deeper soils and hardpan connect the slopes of Pu'u Lani to the ocean, as does the flow of basal ground water. This geologic and hydrologic slope/flow crosses our Study area boundaries, as well as modern district and traditional ahupua'a, i.e. the ahupua'a of Makaweli and Hanapepe. We often describe barriers, boundary, and palena across the land and forget how soil, shallow and deep, connects places regardless of lines on a map.

² It is important to note that soil designations for 'Prime Agriculture' were developed in the mid-1900s and are based, in large part, on the sugar and pineapple industries. Soils that are prime for traditional agriculture, such as wetland kalo cultivation are often categorized as 'sub-prime'.

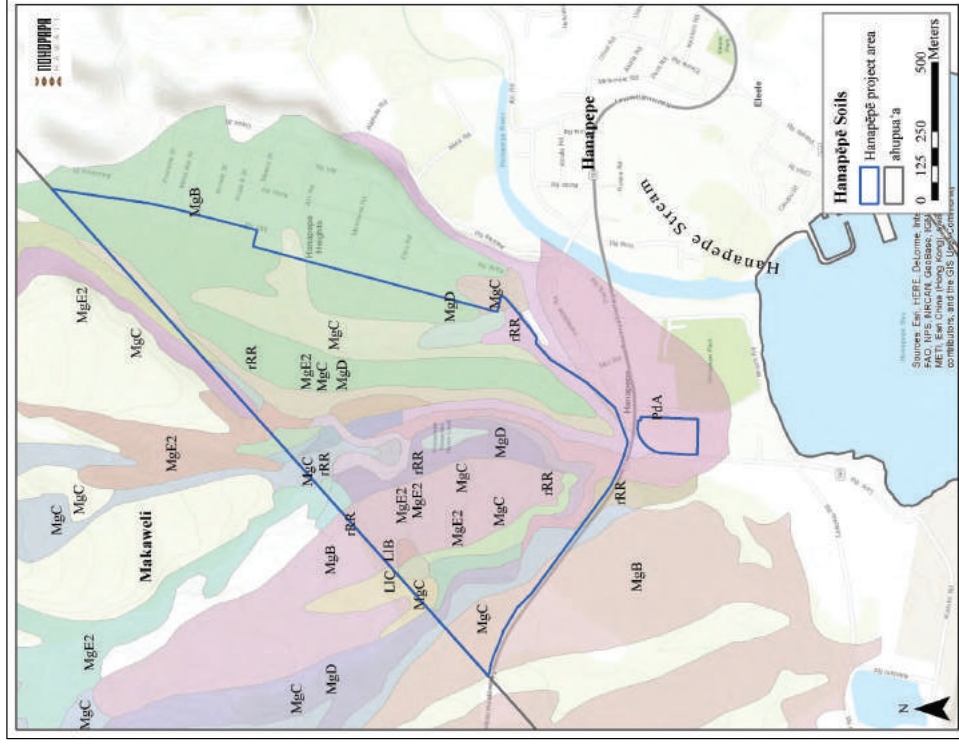


Figure 7. Map showing the soil types and distribution in and around the project area.

Historic Era

Earliest accounts of Kona Moku are from the journals of Captain Cook during his visit to Waimea. Many of the details expressed by such early visitors reveal how the economic and social changes of the following century were heavily influenced by the introduction of western religion, diseases, and commodities.

By 1822, at the time of the Hanapepe alii Kupihea and Kiaimoku, there was an American Protestant Mission station in Hanapepe (Bingham 1855, p221); Established by Nancy & Samuel Ruggles, who traveled to Waimea, Kaua'i with Humehume (George) Kaunuali'i on his return from the Americas (Ibid).

Over this next century, the lands and people of Kona Moku, and Hanapepe Ahupua'a experienced significant and lasting change. The traditional 'ohana and ahupua'a systems began to weaken and diminish soon after the advent of strong foreign influence from explorers, missionaries, and capitalists. The population of rural Kaua'i was not only decimated by disease, but affected by the migration of people to more populace areas on and off island. Additionally, foreign traders and businessmen pushed new industries such as the sandalwood, sugar, and cattle ranching. By the mid-1800s, the economy shifted from a self-sustainable one to a cash and purchase-only economy found locals dependent on currency, stores, and material goods.

Table 3. Some population data specific to Hanapepe.

Year	Population	Source
1820s	"a few hundred"	Bingham
1930	1,088	Territorial Planning Board
1950	1,250	US Census Bureau ³
1980	1,417	US Census Bureau

The 1848 Māhele also drastically changed life across Hawai'i and the surrounding areas. During that period, the traditional system of land use was transformed to a western model of property privatization. While the alii divided up the land and granted kuleana awards to maka'ānana in hopes of keeping them on the 'āina, individual land sales enabled foreigners to purchase large tracts of land for economic purposes. Cattle ranching and sugar plantations leased lands before the Māhele and bought them outright afterwards. After the overthrow in 1893, Crown lands in Hanapepe, that include the project area were no longer inalienable and often the plantation who was leasing the land purchased it.

Cattle ranching companies and to a greater extent sugar plantation significantly impacted the regions natural environment. Cattle, clearing for fields, and the introduction of non-native plants and animals caused the deforestation of entire native ecosystems. Sugar plantations set up camps and brought in hundreds and over time thousands of workers: Pilipino, Portuguese, Japanese, Chinese, and others.

All of these cultural, social, economic, environmental, and even demographic changes

³ 1950 (population of Hanapepe was ~1,250, a little more than 4% of the Island wide population of 29,683 (US Census Bureau).

significantly impacted the rural Hawaiian lifestyle. Rather than maintaining traditional practices of interdependence and reciprocity, post-contact life became increasingly Westernized, with 'ohana and households becoming more distant and isolated. Many residents left Hanapepe for the larger towns and even other islands; resulting in individuals separating themselves from 'ohana and disconnecting themselves from their ancestral lands. However, through all of this turmoil, many traditional practices and values were kept alive and continue to be cherished and practiced in contemporary times. And most importantly, the love that kama'āina maintained for the 'āina has not wavered.

Māhele of 1848

The 2nd half of the 19th century was a time of extreme upheaval of land in Hawai'i and just as importantly, Hawaiians relationship with 'āina. In the 1850s the Māhele fundamentally changed the relationship of the maka'ānana with the 'āina. Privatization of land was a slow process that began in 1848 as a transition to ownership through land claims and Government purchases. This slow transition was rocketed forward 45-years later by the overthrow of the Hawaiian monarchy in 1893.

The Hawaiian Kingdom was overthrown and Crown lands in the Ahupua'a of Hanapepe, once inalienable and in trust for the people, were sold off to large land owners just as neighboring ahupua'a and 'ili were sold by the alii who had claimed them as konohiki LCA. American understandings of private property, once a foreign idea, became part of peoples' daily relationship with land.

As with cattle, fences came with private property. Access to places and resources were changed. Of course Hawaiians were 'akamai, and to the best of their abilities they continued to access places, practice culture, and maintain a relationship with 'āina that is, even today, not completely American. Yet even Hawaiian's unique pilina to place could not prevent the erection of fences and restriction of movement that comes with the privatization of land. These movements of people and land, as it changed hands, began to limit access to places and resources that were, for generations, managed by common understanding and kapu, but open to those with kuleana. These places were now opened to those who owned lands or had business with these land owners.

At least 79 LCA were awarded in the ahupua'a of Hanapepe. None are within or bounding the study area, as much of the ahupua'a was Crown lands, including the western upland slopes and Puolo point and the coastline abutting Makaweli. Most LCA in Hanapepe are concentrated where Hanapepe Town is today, extending far upriver into the valley. However, there were two kuleana, in three separate 'āpana, that were awarded outside of Hanapepe town, to the west. These kuleana are along the coast directly downslope and makai of the project area.

Prior to the overthrow, the approximately 8,000 acres making up the Hanapepe Crown lands was estimated at \$50,000, and were under lease 53, with an annual rent of \$1,000; "Good grazing with valuable water rights," (sic, Table E, p71).

Hanapepe. – A valuable tract in the Kona District adjoining the Hawaiian Sugar Company's lands at Makaweli. The land at Hanapepe comprises about 600 acres of cane land and also a large area of good rice land. All of the upper portion of the land is suitable for grazing, there being no woodland. The water used for irrigating the Sugar Company's extensive cane field on Makaweli is obtained from a branch of the Hanapepe River. The

Ahupuaa of Hanapepe contains approximately 8000 acres, nearly all of which being rich and very fertile (Laukea 1894, p40).

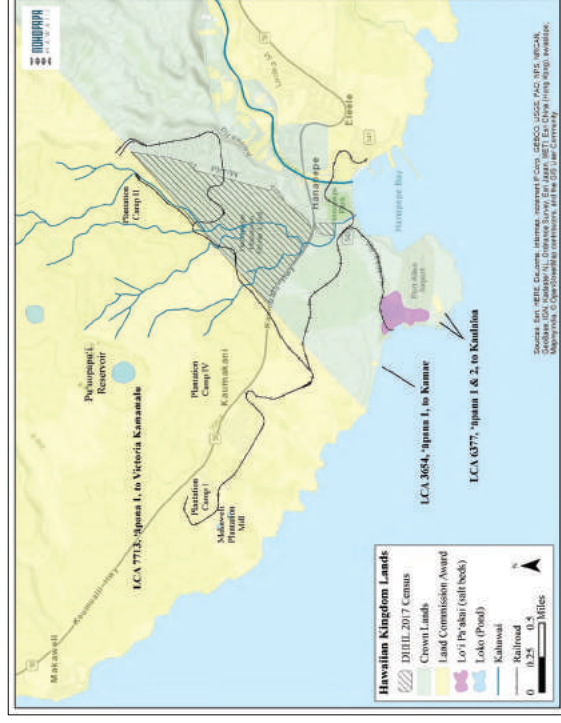


Figure 8. Map showing Mahele Land Commission Awards and Crown lands in and around the study area.

Kō (Sugar) and the mauka DHHL 'Āpana⁴

During Hawaiian Kingdom era (pre-Jan. 17, 1893) portions of Hanapēpē were already in sugar.

In the 1850s the lands of Makaweli ahupua'a, the 'ili of 'Ele'ele and neighboring ahupua'a of Wahiawa were acquired by McBryde Sugar Company (MSC), after an 1899 merger of McBryde Estate and Koloa Agricultural Company; these lands were originally the konohiki LCAs 7714 B 'āpana 6 to Moses Kekuaia and LCA 7712 'āpana 5 to Matao Kekuaiaoa. Elizabeth McHutcheson Sinclair (later Gary & Robinson) purchased Makaweli from Victoria Kamamalu, including the western uplands abutting Makaweli; the current study area. These were the lands in and around the project area purchased by Westemers, from the ali'i, for their sugar ventures.

Although in motion prior to the overthrow of the Hawaiian monarchy, the sugar industry's impacts were most widely felt as they expanded their fee-simple land base and governmental influence after the overthrow of the Queen Lili'uokalani in January of 1893.

Post overthrow, sugar rapidly changed the face of the both the land and population of Hanapēpē. Makaweli Plantation, as part of the Hawaiian Sugar Company (HSC) was the dominant plantation and mill in the area. The following pages provide a timeline and discussion of the historic industry of sugar and its impacts on the study area.

Timeline of Sugar in Hanapēpē

1865 land purchase Elizabeth McHutcheson Sinclair from (land btwn Hanapepe & Waimea rvt) this would consist of Victoria Kamamalu's Makaweli claims⁵

- Two sugar plantations & a cattle ranch
- **1886** 1st hospital built outside of Honolulu, in Makaweli

1889 Gay & Robinson - Partnership btwn: McHutcheson Sinclair, her daughters & grandsons (Aubrey Robinson & Francis Gay)

1887, December 27th, Gay & Robinson lease Hanapēpē Crown lands under lease No.53, for 30-years, \$1,000/year;

This lease was originally to expire in 1917, with *all* cane lands reverting to the Crown, ~1,000 acres. (Ibid, Table F.Rent Roll, p75). All or some of these were purchased in **1921**

1889 Sir William Renny Watson leased 7,000 ac Makaweli lands from G&R & would form the Hawaiian Sugar Company (HSCo)

- G&R kept 4,000 ac for sugar & processed at HSCo plant in Makaweli
- 1st HSCo sugar crop (no including G&R) ~11,500 tons of sugar

1921 the Hawaiian Sugar Company acquires 24-acres of former Crown lands for \$1,800. Territory of Hawai'i Land Patent Grant No.7857

1928 annual sugar yield ~27,057 tons of raw sugar

⁴ Time line (from Gay & Robinson Sugar Plantation promo)

⁵ LCA 7713 'āpana

1941 C.Brewer Co. bought out HSCo. & got lease with G&R would form Olokele Sugar Co.

1994 G&R purchase assets of Olokele Sugar Co. This was the first time G&R planted its own sugar on all of its own lands

1999 G&R sugar average yield 14.13 tons/acre

Hawaii Sugar Company's Makaweli Plantation (1889-1941)

The Makaweli Plantation extended across Makaweli ahupua'a and a portion of Hanapēpē ahupua'a; from the south bank of Kekupua stream gulch in the west to the west bank of Hanapēpē River, in the east. In fact the plantation railroad crossed Hanapēpē River and ended at 'Ele'ele Landing (today what is Port Allen). Makaweli Plantation included portions of Western Hanapēpē, including the uplands and the study area, as well as the entire 'Ukūla salt making area and the Peninsula that borders Kapalawai Bay (Shark Bay).

Portugese camp was at the base of Moi Road just below and to the west of the cemetery (see Figure 9 on the following page). Field X is the sand flats where the DHHL industrial parcel sits. Field IX was where Port Allen Airport is today, Field II and XVI were north and west of Salt Pond and the Ukūla salt pans. The mauka DHHL parcel covers portions of Fields XI, XIV and II. Camp II, Philipino camp was just outside and west of the northern apex of DHHL lands at the 'Y' Where Kalena and Kukamahu stream gulches meet. The entire area was criss-crossed with plantation railroads.

The center of the Makaweli Plantation was at Camp 1, ~1.5 miles, west, down the road from the DHHL Hanapēpē lands, connected by railways.

Fields II and XI

The majority of the study are is within Field II and partially in Field XI (237.6 ac field) of the Makaweli Plantation of the Hawaiian Sugar Company (RM2144).

The Makai, industrial parcel is within Field X (67.6 acre field)

Camp OO os just north and west of the Project area (near mauka apex) across Kalena gulch. Here there was also a paddock, stable and Overseers houses.

Plantation Ditches

In addition to its rail lines, the Hawaiian Sugar Company (HSC) maintained, dug, and utilized an extensive ditch system to water and drain its fields.

The Koula ditch system taps the very source of Hanapēpē's water at Manawaioipuna; it is the site of a waialele (falls) and the heiau Kukahi, where Kane went to pule. Water is still diverted today from Manawaioipuna, along Koula ditch across Hanapēpē and into Makaweli.

A waste water ditch ran from the Makaweli plantation all the way to Hanapēpē Bay. Based on Historic maps, its exit into the ocean today is in the same location as during plantation times. The stream gulches in mauka and makai DHHL study parcels feed into this ditch. There are a Hawaiian and a Japanese cemetery immediately to the west of where this ditch meets the

ocean.⁶ It would come as no surprise, that in 1995-6, when, “for the purpose of widening a previously existing earthen drainage channel”, that a coffin burial and fragments of “iwi (human remains) were encountered by heavy machinery. The waste water ditch was expanded by the Hawaii Housing Finance and Development Corporation (HFDC).⁷

The Hanapepe Massacre

The September 1924 confrontation between striking Philipino plantation workers and law enforcement resulted in what has been called the “Hanapepe Massacre.” Sixteen (16) Ilocano plantation workers, four (4) Hawaiian special deputies were killed, and twenty-five (25) others were wounded.⁸

Accounts have the conflict arising outside of the old school building, which was located near the road to Salt Pond. Once the shooting began, some people took cover in Brodie’s banana patch (Alcantra 1988).

Hugh H. Brodie was the principal of Hanapepe School beginning in 1897. In 1911, the Commissioners of Public Education built ‘Ele’ele school (at current location) and Hanapepe School closed in 1912. After Hanapepe school closed Brodie took over the lease of that lot (from 1922-1953). The DHHL industrial parcel, where the Habitat for Humanity warehouse is located, is within the original Government Lease of the Hanapepe School Lot and its surroundings that H. Brodie held (CSF 3957, see Appendix J).⁹

It is, therefore, likely that the Hanapepe massacre took place in and/or immediately around the current DHHL Hanapepe Industrial lot. While this is not part of the *traditional* Hawaiian history of Hanapepe, it is an important historical event. Many Hawaiians in Hanapepe today are multi-ethnic and have ties back to the labor disputes that lead to the massacre, as well as those who were involved, on both sides.

Hanapepe Plantation Dump Site

Located within the larger, mauka, DHHL study area is a sugar era plantation “dumping site.” It is within Kukamahu gulch at the terminus of a small railroad spur and inside DHHL holdings.

The Copy Survey Furnished 9977 shows General Lease 3070 to Gay & Robinson. The accompanying CSF 9977 map shows the dumping ground at the terminus of a road or railroad spur, dead-ending within, or just of the edge of Kukamahu gulch. Register Map (RM)2701 shows sketched in square “1.12 ac”, while not labelled on RM2701, this area is consistent with the “dumping site” on CSF9977.¹⁰

⁶ Register Maps 2615 (c.1918) and 2657 (c1919).

⁷ Winieski, Creed & Hammet, 1996

⁸ Advertiser, September 10, 11, 1924. Accounts from Fern who received information from the Plantation (Fern interview ESOHP, pp529, 534-35). Also, Alcantara, Ruben, Filipino History in Hawaii before 1946: The Sakada Years of Filipinos in Hawaii. Lorton, VA, 1988. Accessed 12/5/2019 from UH Mānoa Scholar Space <https://scholarspace.manoa.hawaii.edu/handle/10125/17651>

⁹ GL to H.H. Brodie and H.W. Brodie from 1922- through a series of Government General Leases. See CSF 3957 – GL1466 (addition to Lot 67), 8419 – GL2593.

¹⁰ CSFs can be downloaded and accessed by number at the HI State DAGS site, [here](https://dags.hawaii.gov/).

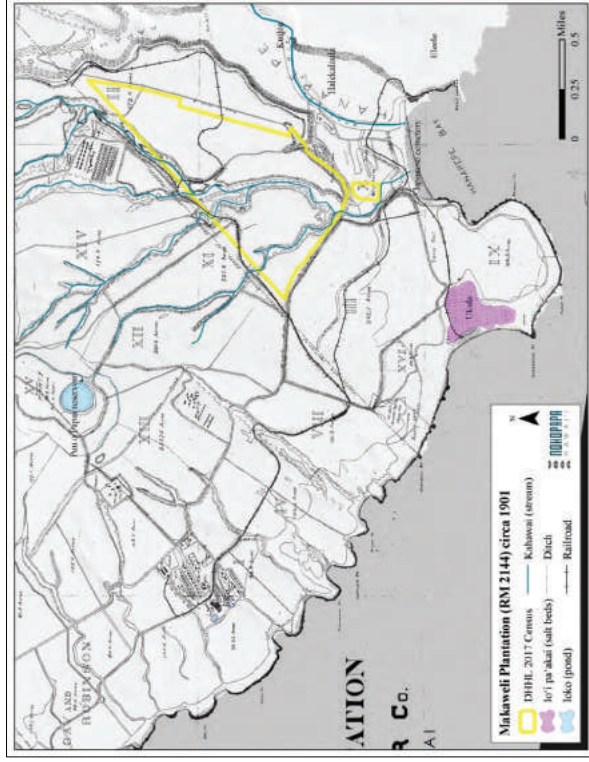


Figure 9. Portion of Hawaii’s State Register Map 2144, “The Makaweli Plantation of the Hawaiian Sugar Company”. This map dates to circa 1901. Ditches, kahawai and plantation railroads are highlighted.

Military and the Air Field

1920s US Signal Corps & US Army Air Corps established a communication station, a “Signal Corps reservation” in a field at Puolo Point. The field was used as a landing strip; Burns Field. Burns field was ~67-acres and was acquired by the Army at some point prior to WW II.

1928 the Territory of Hawaii purchased 29-35 acres for \$15,000 next to Burns Field.¹¹

After the bombing of Pearl Harbor Dec. 7th, **1941** the Territory of Hawaii was put under Martial Law by Lt. General Walter C. Short. Hawai’i became a military district under a military governor who reported to the Hawaiian Department Commander.

Burns Field (Port Allen Airstrip) was closed to civilians during WWII; Mana airstrip was used for civilian air traffic; and the Burns airfield was expanded by the US military.

Instead of retiring the airfield it rolled into civilian use, and today instead of ferrying commuters it has become a base for helicopter tours and sky diving planes for tourists.

Education –Schools in Hanapēpē

Early on, the tradition of formal education was well established in Hanapēpē with hula hālau, the prevalence of which was mentioned earlier in Nūpepa records. The first western school in Hanapēpē was established within two years of the first mission. Schools being a way of spreading European religion and customs as well as literacy. The Hawaiian Kingdom, in the 1850s, established common free school and took up part of the financial and shared managerial responsibility for schools, along with Protestant and later Catholic and Mormon Missions. Students were still instructed in Hawaiian, by this time often by Hawaiian teachers.

Below is a timeline of schools in Hanapēpē:

1822-4 Ruggles, Nancy and Samuel established first school as part of their American Protestant Mission (Bingham 1855).

In **1824**, the Ruggles school was abandoned.

1837, Samuel Whitney re-established a school, this time on western side of Hanapēpē Bay, near the road leading to Ukula.

King Kamehameha III, in **1840**, forms the Ministry of Public Education and founds the Public School System in Hawai’i.

Prior to this time schools were exclusively the province of foreign Missions, predominantly American Protestants, but also Catholics and Mormons. However, the school system and the western missions remained intimately tied together, at least until the end of the reign of Kamehameha III. (Kuykendahl 1838, p3-35-367).

By January 1, **1841**, it was “required that a school should be maintained in every community

where there were fifteen or more children of suitable age” (Ibid, p347-348). Additionally, there were guidelines laid out for teacher credentials, tax exemptions, local and General school agents who reported back to the Legislature.

In **1841**, Papohaku, a Protestant, was appointed the first Kau’i Island General School Agent.

By **1850**, an Act established that 1/20th part of all Government Lands would be reserved for education (Ibid, p-352).

In **1847**, The school teachers at Hanapēpē School(s) were Kapihemui, Iese, and Kaiwi.

By **1860** there were three schools in Hanapēpē, but only two schools remained by **1865**.

The Kingdom of Hawai’i was illegally overthrown in **1893**, and by **1896** the Hawaiian language was banned and ceased to be taught or spoken in schools.

In **1897**, Hanapēpē School had 122 students and Hugh Brodie was the principal.

After 90-years Hanapēpē School closed and a new school in ‘Ele‘ele was established in **1912**.

2020, ‘Ele‘ele School continues the tradition of educating Hanapēpē children, more than 175-years after the first formal school was established.

¹¹ Executive Order No. 338

Cultural Traditions

Oral and written mo'olelo, 'ōlelo no'eau, mele, tell of the akua, kupua, 'aumākua, ali'i, and ka po'e kīnaka whose cultural traditions are the foundations of Hawaiian culture, which continues to add new mele, 'oli, mo'ōlelo, and even 'ōlelo no'eau to its cannon.

'Ōlelo No'eau

'Ōlelo no'eau are Hawaiian proverbs. Many 'ōlelo no'eau were and still are common knowledge among Hawaiian communities across the pae 'āina, just as others are island or even moku specific. These proverbs can provide us with links to common knowledge of mo'ōlelo, history and place. 'Ōlelo no'eau, in one short phrase, provide a layered window into Hawaiian humor, observational knowledge, and cultural values; often they incorporate kaona (hidden meaning) used generously in Hawaiian language traditions.

After a long hiatus, the Hawaiian community has again begun to add to the body of 'ōlelo no'eau, perpetuating this traditional practice and adding to the body of Hawaiian knowledge.

The following 'ōlelo no'eau were gathered by Mary Kawena Pukui and published in, *'Ōlelo No'eau Hawaiian Proverbs and Poetical Sayings* (1983).

'Ōlelo No'eau of Kona Moku

No. 1775, p190:

Ke one kapu o Kahamalu 'Ihi
The sacred sand of Kahamalu 'Ihi.

A city of refuge for those of Waimea, Mānā and the Kona side of Kaula 'i.

No. 1905:

Kukui-lau-nui-o-Kona.
Thickly leaved kukui of Kona.

A thick cloud that shuts out the light of the sun, like a heavily leaved kukui tree. The expression was used in the Kona district of Kaula 'i.

No. 1097, p117:

Ho'olele ka uila o Makaweli.
Sending the lightning of Makaweli flying.

[of Makaweli Ahupua'a] A play on maka-weli (terrifying eyes), this saying refers to the sending of a god on an errand of destruction.

Nā Ōli a me nā Mele

"Ua aneane nalowale paha na mele o ka wa kahiko, kawalawala loa na kanaka i ike. He mea minamina ia, no ka mea, ma ua mau mele la, ua maopopo ke ano o ka noho ana o kanaka i ka wa mamua loa aku nei, a o ka mooolo o ka ana kekahi. O ka mea e mau aku at a

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malowale ole na mele, oia ke pai ana ma ka buke a ma ka nupepa paha, alaila, he hiki no i na hamauna hou aku ke hehuhelu a e kawiliwili iloko o ka manaao..."

-*Ka Hae Hawaii* 'i, March 21, 1860

"Traditional Hawaiian songs may soon be forgotten; they are not seen enough by people. This is very unfortunate, because it is within these compositions that the lives of those who lived before us are understood, as well as the stories of the land. What will ensure the continuance of these traditional Hawaiian songs so that they are not lost, is publishing them in books and perhaps newspapers, then, future generations will be able to read them and become entwined in their meaning..."

-English Translation, *Ka Hae Hawaii* 'i, March 21, 1860.

Oli (chants) and mele (songs) have long been a means of perpetuating traditional knowledge through artistic expression. Pukui (1949) refers to oli and mele composition and writes, "Hawaiians were lovers of poetry and keen observers of nature. Every phase of nature was noted and expressions of this love and observation woven into poems of praise, of satire, of resentment, of love and of celebration for any occasion that may arise." The word oli refers to a chant that is not danced to and the word mele refers to a song, poem, or chant of any kind (Elbert & Pukui 1959). Oli and mele are often given as ho'okupu (a gift or offering) to honor akua and ali'i, to commemorate place visits and events, to celebrate life and death, and to share stories.

In the translation of oli and mele, there are often *kaona*, layers of meaning, beyond literal translation; levels of inner meaning. Pukui explains that the kaona can sometimes be obvious, so that anyone familiar with the figurative use of the Hawaiian language can understand it. Other times, it may be so veiled that it is only understood by those to whom the composition belongs (Pukui 1949).

Presented below are mele that make reference to the renowned places of Kona, with a focus on the ahupua'a of Hanapēpē, and specifically areas in and around the study area.

E Ola Mau 'O Pū'olo

The following mele was written by Malia Nobrega Olivera of Hanapēpē and makes reference to 'Ukulā and Pū'olo at the kai, as well as the connection these places have to the uplands. The lands directly upslope of 'Ukulā and Pū'olo include the DHHL Hanapepe study area. (Alkau et al, 2019).

E Ola Mau 'O Pū'olo

Aloha Kaula 'i Moku 'o Kona
'Āina Kūpuna
Kaulana 'o Hanapēpē mai uka a i kai

Aloha 'Āina
Oia ka lae 'o Pū'olo, pū'olo pa'akahi
'Āina Kūpuna
Pa'akahi, Kūmaka 'iole, 'Ukulā,
Kūmakaiaawe

Pū'olo Continues to Live

Beloved Kaula 'i, Kona District
Ancestral Land
Famous is Hanapēpē, from the uplands
to the ocean
Love for the land
Pū'olo Point lives, salt bundles
Ancestral Land
Pa'akahi, Kūmaka 'iole, 'Ukulā,
Kūmakaiaawe

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Aloha ʻĀina
E ola mau ʻo Pū-olo, e ola nō ē
E ola!

Love for the land
Pū-olo continues to live, lives on indeed
Life!

[Insert 2nd Mele]

[pending consent]

Nūpepa Hawaiʻi

Hawaiian language newspapers (“Nūpepa Hawaiʻi”) of the nineteenth and early twentieth century present a rich source of kanaka maoli history and culture to a growing audience of Hawaiian language students and readers. These Nūpepa Hawaiʻi were used by maka ʻāmana and aliʻi alike to spread general news of the day, government business, religious teachings, as well as moʻolelo, and previously unwritten traditional oral histories.

The contributing authors of the Nūpepa Hawaiʻi articles were from many different localities around the Hawaiian Kingdom. They recorded the happenings of their communities, sometimes relating what they were witnessing, and sometimes passing on events moving and affecting the larger lāhui and metropolitan areas.

Many articles portray the Hanapēpē area as being a place of debauchery. A place where even the police were afraid to enforce the laws.¹² These accounts do not however come from a place of objectivity. These accounts instead come from authors who are from within or heavily involved in the Missions¹³ of the era – their writings clearly promote the prevalent Christian ideals of that era. At the time of these accounts 1850s-1860s, Hawaiian language newspapers in Hawaiʻi were educational vehicles of western religion. (Hori 2001).

In 1861 Hawaiian language newspapers in opposition to the religious press of the missionaries appeared. To some extent this nūpepa period maintained an essence of the Christian propriety and idealism taught in the earlier press. However, when this shell of Christian idealism is stripped away, we see Hanapēpē as a place where native Hawaiian culture thrives. Throngs of people go to the “hōʻike” or hula shows of the kumu hula in the area named Wahineaea and Kaulaloa.¹⁴ It is no wonder that many of the Kaulaʻi contributors to Helen Roberts 1924 chant and hula collection once resided in the Hanapēpē and Makaweli area.¹⁵

Despite Hanapēpē’s record of being a bastion of sin, according to early missionary opinion, it was a very productive river valley producing large amounts of rice, so much so that taro and poi production was nearly phased out (Ka Nūpepa Kuokoa 26 May 1866; Ka Nūpepa Kuokoa 10 November 1866) Hanapēpē from 1860 on would continue its rice production until it eventually becomes the second largest rice producer in the 1870s according to David Keaweamahi on his tour around Kaulaʻi (Ka Lahui Hawaiʻi 7 September 1876).

¹² Nūpepa Article 2, No ka Hula ma Hanapepe, Kauai, Ka Hae Hawaii, 5 Aug 1857, Nūpepa Article 3, Ka Puni Lealea ma Hanapepe, Ka Nūpepa Kuokoa, 27 August 1864.

¹³ Protestant mostly & to a lesser degree Catholic and Mormon.

¹⁴ Ibid, Nūpepa Article 3

¹⁵ The Honolulu Advertiser 14 October 192

During this tour Keaweamahi is taken around the Hanapēpē area and shown where people are living, fishing and farming. He is also taken to catch wī (hīhiwai/water mollusks) which are very plentiful in the river. He then journeys to far inland Hanapēpē, to storied places of the area, one being where Māui the demigod captured the sun according to his “hoʻa kama ʻāina” native guide.

After the overthrow of the Hawaiian Kingdom in 1893, and the rise of a Territorial Government, land tenure and use shifted. In the 1900s, there was a request by Judge Silas Chandler and the people of Hanapēpē to open up Government lands there for homesteading which, according to the article was requested of the governor previous (Ka Nūpepa Kuokoa 28 June 1918).

Some of these lands were eventually turned into homestead and others were auctioned off for various uses such as dairy farming (Ka Nūpepa Kuokoa 26 October 1922).

Along with farming and land use, the articles in the Nūpepa Hawaiʻi as well ʻŌlelo Hawaiʻi historical interviews collected in the early 1930s to 1980s, include records on water in the Hanapēpē area.

The earliest article “He Wai Hou” or “A New Water Source,” is printed in Ka Hae Hawaii 16 April 1856. This article explains the amazing appearance of a new spring in southern Hanapēpē on Pu ʻuopapa ʻi, now present day Makaweli; at an elevation and due west of the current study area.

There is not much talk of water until the Territorial Government brings suit against Gay & Robinson for the 5,900 acres of Hanapēpē valley lands along with their water rights. The article further explains that the land and the water that goes through it is around 40,000,000-60,000,000 gallons per day. The suit was unsuccessful (Ka Nūpepa Kuokoa 4 November 1921).

Five years after this lawsuit, the Territory sends out an attorney to check on reports of people altering the flow of the Hanapēpē river (Ka Nūpepa Kuokoa 19 August 1926). The article does not go into specifics and there is no follow up in the newspapers on whether there was any tampering with river flow.

As deduced from the earliest Nūpepa Hawaiʻi articles of the Hanapēpē area, new springs and underground tunnels have existed in the area and could affect the flow of water or runoff from the current study site. Furthermore, it would also be valuable through the development process to be aware of actions that could adversely affect the subterranean landscape.

Patapala ʻĀina

Early maps of the study area and the surrounding areas of Makaweli and Hanapēpē provide information describing the study area landscape prior to modern times. Historic maps physically document changes to the land occurring over a period of years.

The Hawaiʻi State Register Maps (RM), Copy Survey Furnished (CSF) maps can be accessed online at the Department of Agriculture and General Services (DAGS) website [here](#). The TMK Plat maps, current and historic, can be obtained through the County of Kauaʻi Real Property Tax offices in Līhū e. The Kauaʻi Historic Society (KHS) has an extensive map collection that can be obtained by membership and archival appointment with the wonderful staff at the Historic Society, also in Līhū e. Two other sources that have some maps are the Grove Farm Museum, the Kauaʻi Count Planning Office and Real Property Tax Assessment Office, Līhū e.

Table 4. Table of historic maps accessed for this project that depict the Study Area.

Map	Notes
RM158	Plan of Hanapepe, Kauai. Scale 20 chains = 1 inch, J.W. Gay, Oct. 1872.
RM163 & trace	Plan of Kuloa, the Property of Mrs. Kapiolani Kalakaua. Scale 1 inch = 4 chains, J.W. Gay, Dec. 23, 1870. Certified HTS copy, W.E. Wall, Feb. 13, 1919.
RM1374	Plan of Manuahi, Kauai. James Gay, 1875. (mataka puu)
RM1379	Plan of Kuloa, the Property of Mrs. Kapiolani Kalakaua. Scale 1 inch = 4 chains, J.W. Gay, Dec. 23, 1870. Nov 1875 trace of RM163 by M.D. Monsarrat
RM2144	Map of the Makaweli Plantation of the Hawaiian Sugar Co., Makaweli, Kauai. Scale 500 ft = 1 inch, Arthur C. Alexander, December, 1901.
RM2246	Map of Kauai Compiled from Government Surveys and Private Surveys of Lands Belonging to Gay and Robinson, 1891. Scale 1 inch = 3,000 ft. Map by L.E. Inplay, traced by H.E. Newton April-1903.
RM2438	Hanapepe Forest Reserve low line
RM2615 & trace	HI Territory Survey Hanapepe Valley, Kona-Kauai. Scale 1 inch = 100 ft. Survey & map by F.W. Thrum, June 1918. Traced by P.E. Aitoli October 1918, Sheet 1.
RM2657 & trace	HI Territory Survey, Hanapepe Valley, Hanapepe, Kona, Kauai, Showing Rice and Kula Lots. Scale 1 inch = 300 ft. Compiled from Govt Survey records [see RM2615 thru RM2620] by J. Iao, Dec. 1919.
RM2701	HI Territory Survey Hanapepe Cane Lands, Hanapepe, Kona, Kauai. Scale 1 inch = 500 ft, survey and map by A.S. Chaney, April 1923.
RM2979	Hanapepe Luna
RM4013	Hanapepe Heights House Lots, Hanapepe, Kona (Waimea), Kauai. Scale 1 inch = 100 ft, Joseph A. Aiu, July 1948
RM4017	HI Territory Survey, Hanapepe Kona (Waimea), Kauai, Hawaii. Scale 1 inch = 100 ft, Joseph A. Aiu, October 1948.
RM4065	HI Territory Survey Hanapepe Town Lots, First Series, Hanapepe, Waimea (Kona), Kauai, T.H. scale 1 inch = 50 ft, survey by Lum Hing – August, 1954. Map by Akira Fujita – March, 1955. Tracing by Osamu Fukuya – March, 1955.
CSF4093	Lease Rokuichi Gotunda Application, Hanapepe Salt Pond, Hanapepe, Kona, Kauai, Scale 1 inch = 500 ft.
CSF 9977	HI Territory Survey, Lease Sections A, B, C, and D, Hanapepe Gov't Lands, Hanapepe, Kona (Waimea), Kauai. Scale 1 inch = 1,000 ft, Joseph A. Aiu, 1944. CSF 9976-9979, see GL 3070 to Gay & Robinson.
CSF9415	HI Territory, Survey Department, Lease C.B. Hofgaard co., LTC. – Applicant, Hanapepe, Kona (Waimea), Kauai. TMK Map 1-8-08. Scale 1 inch = 100 ft, Joseph A. Aiu, Jan. 31, 1941.

Map	Notes
Plat 3054	Island of Kauai, Waimea [sic]
Plat 3075-B	HI Territory Survey, Hanapepe Heights House Lots, Hanapepe, Kona (Waimea), Kauai. Scale 1 inch = 100 ft, survey and map by Joseph A. Siu, July 1948.
KHS-W-4	USGS Topo, Hanapepe Quadrangle, 75-min series, 1963.
KHS-W-13	McBryde Sugar Co. LTD. Scale 1 inch = 24,000 ft, Oct. 1973. Heavy water damage

The following pages, Figures 10-12, include portions of historic maps of the Kona Moku focusing on the alhupua'a of Hanapepe and Makaweli and situating the current study area within a historic context.

Tables 5-7, reflects the collection of place names that collected from historic maps and archives.



Figure 12. Portion of RM2615, the map by F. W. Thrum, traced in 1988 by P. E. Arioli, showing a portion of the study area.



Figure 13. Portion of RM2657, the map compiled from Government Survey Records by J. Ito in 1919, showing a portion of the study area.

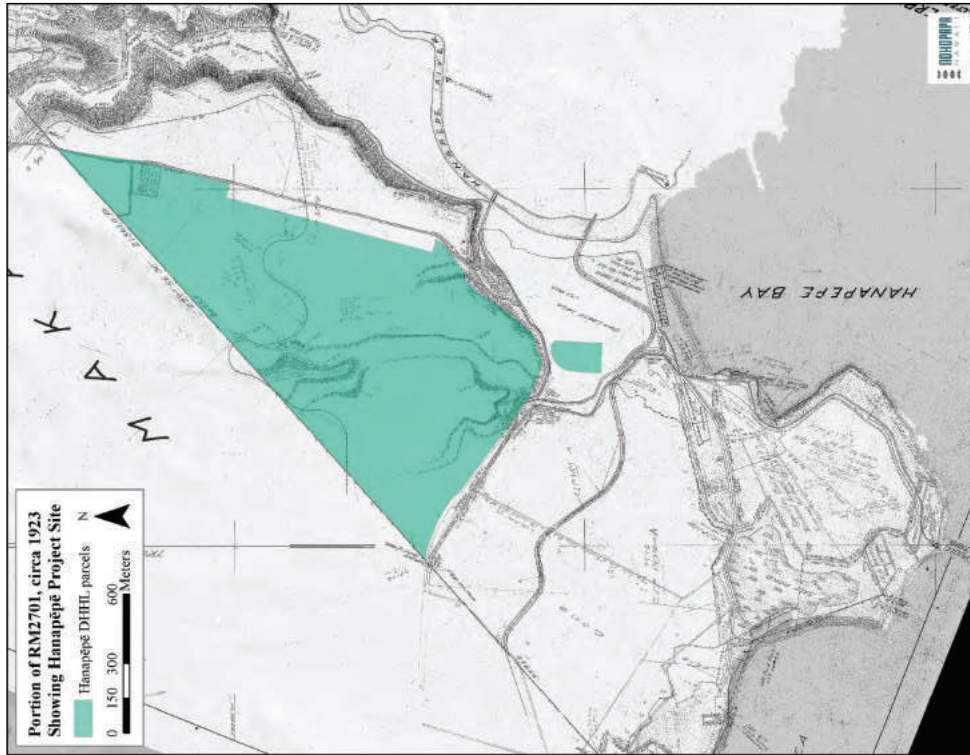


Figure 14. . Portion of RM2701, the map by A. S. Chaney, in 1923, showing the study area.

Table 5. *Wahi inoa*, place names, within the Study Area

Wahi Name	Type	Notes	Source
Hanapepe Dumping ground	dump (plantation)	Plantation Dumping ground. Directly off Railroad, within Kukamahu gulch.	RM2701 (c.1923). General Lease 3070, see CSF 9977 map and description, and CSF13507
Kalena	kahawai, gulch, streamgulch	<Null>	RM2144 (c.1901). Name from "tigerhyd_083" shapefile US Census Bureau. Line derived from "distrains" shapefile, USGS file, graphs 1988; CWRM HI Stream database 1993; DNR Div of Aquatic Reses 2004 & 2008.
Kokamahu	kahawai, gulch, streamgulch	<Null>	
Koamamunuu	kahawai, gulch, streamgulch	<Null>	

Table 6. *Wahi inoa*, place names, in immediate vicinity of the Study Area

Wahi Name	Type	Notes	Source
cemetery knoll	cemetery	Puu at base of DHHH Hanapepe apana and its current access point on M61 road, next to former "Portugese Camp." Within a 4.4 ac parcel, labelled simply "cemetery knoll" on RM2615 (c.1918).	RM2615 (c.1918). USGS Topo. RM2144 (c.1901).
Waipuhia	kualapa, ridge	Alternate name on sugar maps is Ridge B. "Waipuhia" from RM2246 (c.1891); alternate spellings, "Waipihia" on RM158 (c.1872) and "Waipohi" on CSF 9977 maps.	RM158 (c.1872). RM2246 (c.1891). CSF 9977 map for General Lease 3070 to Gay & Robinson (c.1944).
Kulei	kualapa, ridge	<Null>	RM2246 (c.1891). & Bing aerial Imagery.

Table 7. *Wahi ikaea* place names in the vicinity of project area – *uahi that are connected by gulch, pali/rau, direct watershed, etc.*

Wahi Name	Type	Notes	Source
Kaleopapa	awa, cove	Saddle or point between Keanakua and Maamaakua. At kai boundary between Makaweli & Hanapepe (oamamakai fishing coastline)	Gay Francis (1873, p7), RM2246 (c.1893)
Kapunawai	awa, cove	the cove of sand beach, per Francis Gay. What is today Salt Pond Park	Francis Gay (1873, p7)
Kaifili	kahone, sandy beach	On the middle part of the Ukula Peninsula, close to Kauhahumu	Francis Gay (1873, p7).
Mokupapa	kahone, sandy beach	Sand at Hanapepe is Mokupapa (Francis Gay, 1873). Since channelization of Hanapepe River, beach has receded and is rocky coastline now.	Francis Gay (1873, p7), RM2246 (c.1893)
Maamaakua	rocky beach, kahapahaku	Rocky beach west of salt pond, towards border with Makaweli.	RM2246 (c.1891), Francis Gay (1873, p7).
Kaleinakahoni	kahawai, gulch	<Null>	RM2144 (c.1901). Name from "tigerhd_ja83" shapefile, US Census Bureau. Line derived from "dustreams" shapefile, USGS line graphs 1983, CWRM HI Stream database 1993, DLNR Div of Aquatic Rsvcs 2004 & 2008.
Kukioleleua	kahawai, gulch	<Null>	Name from RM2246 (c.1891), RM2144 (c.1901) "tigerhd_1983" shapefile, US Census Bureau. Line derived from "dustreams" shapefile, USGS line graphs 1983, CWRM HI Stream database 1993, DLNR Div of Aquatic Rsvcs 2004 & 2008.
Kauhahumu	ko a, ahu	A umu or altar close to Kaifili, probably a ko'a.	RM2246 (c.1891), Francis Gay (1873, p7).
Puuea	hauapa, ridge	Pua (or pali?) east of the project area near the pali overlooking Hanapepe-stream main tributary Y	RM2246 (c.1891).
Kapulawai	kuono, cove & beach	Called "shark bay" by local fisherman. beach on east side on east side of point Pakahi	RM2246 (c.1891), Francis Gay (1873, p7)

Wahi Name	Type	Notes	Source
Kaatea	lae, point	Kaatea, opposite of Pakahi, marking east side of Hanapepe Bay (Francis Gay, p7), now location of Fort Allen.	RM2246 (c.1891) and Francis Gay (1873, p7).
Kawilwili	lae, point	<Null>	Francis Gay Journal (1873, p7).
Kukai point	lae, point	Location is best guess based on RM2246 & coastline (map does not georeference well).	RM2246 (c.1891).
Kumuloli point	lae, point	Location is best guess based on RM2246 & coastline (map does not georeference well).	RM2246 (c.1891).
Kumakabile	lae, point	Along coast south of salt pond. "Kumakabile" on RM2144 (c.1901) and "Kumakabile" on RM2246 (c.1891) & USGS Topo.	RM2246 (c.1891), RM2144 (c.1901). USGS Topo
Pakahi Point	lae, point	A point on the opposite end of Kaalipoint, on West side of Hanapepe Bay, Francis Gay Journal (1873, p7). At mouth of Hanapepe Bay (west-side). Spelled "Pakahi" on RM2246 (c.1891) and Francis Gay (1873, p7). "Paakahi" on RM2144 (c.1901).	RM2246 (c.1891), RM2144 (c.1901). USGS Topo
Puolo Point	lae, point	What many refer to as Ukula's entire rocky coastline. Also have heard Puolo Peninsula in place of Ukula Peninsula (unsure if traditional or colloquial).	RM2144 (c.1901). USGS Topo
Wahapuaa point	lae, point	Location is best guess based on RM2246 & coastline (map does not georeference well).	RM2246 (c.1891).
Kupuhili	lae, point, & a keana (cave)	Kupuhili is at the mouth of Hanapepe river. Francis Gay shows it as both a lae and a cave.	Francis Gay Journal (1873, p7). RM2615 (c.1918), RM2657 (c.1919).
Ukula	loi paakahi, salt bed	Ukula, flat land, now commonly known as Salt Pond.	Name from Francis Gay (1873, p7) and Napaea RM2144 (c.1901). RM2701 (c.1923). Map from cancelled CSP 4093 (a cancelled lease of the entire salt pond area to Rokiuchi Gotunda).
Manianiaula reservoir	loko, pond, reservoir	No longer has waia, not in use. Manianiaula on RM2144 and "Manianiaula" on RM2246. Reservoir in a natural crater. No longer appears on hydrological layers.	RM2246 (c.1901), RM2144 (c.1901).

Wahi Name	Type	Notes	Source
Puu o Papai	loko, pond, reservoir, & puu (bunpels (crater))	Still in use. Reservoir along SW (maka-i-foewa) end of Koula Ditch system. Camp V & steam pump tapping Koumahu stream(akeli) is just to the north. If not so bypassed this highpoint would run off into Koumahu (lowest trib) that flows directly into DHHL Hanapepe apana. Also Panopapai and Pu u o Papai	RM2444 (c.1901). HI State Office of Planning (Joan Delos Santos) shapefile "HI_Koual_surf_waterbody_area_pond". USGS Topo
Kuahuui	paena, landing	Landing at Ukula (salt ponds)	RM2246 (c.1891). Francis Gay (1873; p7).
Palikea	pali, cliff	Palikea is a pali at the head of Koupoo peak. RM2246 shows Palikea is in the plateau area to the west of this point; wahi is possibly an ili & a pali.	RM2246 (c.1891). RM2144 (c.1904). USGS Topo
Palioko	pali, cliff	<Null>	RM2246 (c.1891).
Kahai	wahi pana, storied place	Unsure what kind of wahi this is. It is a kai or coastal name. Location is best guess based on RM2246 & coastline (map does not georeference well).	RM2246 (c.1891).

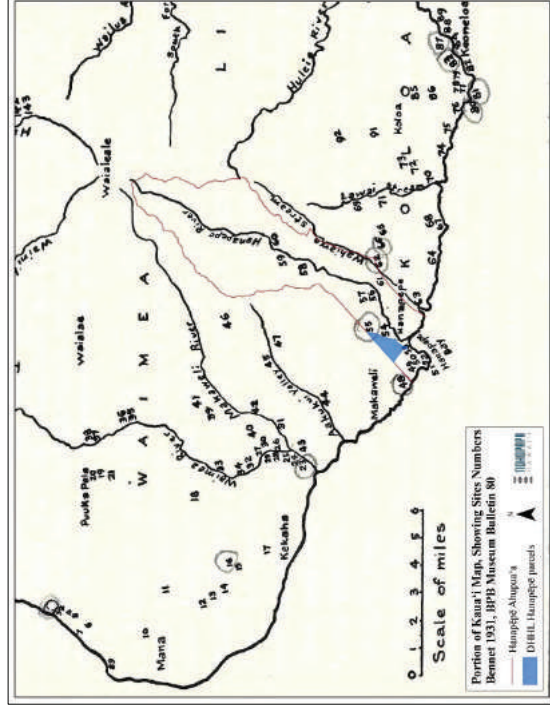


Figure 15. Is taken from p.96 of Bishop Museum Bulletin 80 (Bennett 1931)

Table 8. Table of wahi kūpuna, by archaeological site number. As documented in Bishop Museum Bulletin 8, Bennett 1931, p112-14.

Wahi kūpuna	Description	Site No.	locale
Kuwiliili Heiau	Said to be located just below Makaweli Camp 3, which site is now in the cane fields. Thrum describes this heiau as, "A large, high walled enclosure of <i>pookanaka</i> class now destroyed." At the location mentioned there is nothing to indicate a structure but a pile of rocks gathered from a cane field.	48	Makaweli
Salt Pan, near Puolo Point	The extent of this salt pan is shown on the government map. It is notable among the salt pans of Kauai in having no artificial divisions. It is merely a natural flat area on which the sea water could be let in and evaporate.	49	Salt pond
House Sites, at Pouolo Point	The remains of many house sites appear on the great flat lands near the salt pan. Most of the house sites are surrounded by walls 2 to 3 feet high, many of which have been built up recently. Walls run everywhere. East of here the field has been cleared for an airport. Along the shore the tumbled remains of wind shelters used by fisherman can be seen.	50	Ukula
Kauakahumu heiau, at Puolo point	Thrum described as "A walled heiau of medium size at the shore, part of walls still standing. Kane and Kamaloa its deities." The site is now but slightly marked by crumbled stones. It measures at the outside about 80 by 40 feet. The walls were said to have been about 4 feet high.	51	Puolo
House site or Ko'a, at Puolo Point	The front part of this structure rests on the beach stones above which it has been built up 5 to 8 feet. In rough weather the sea spray must have washed over it. The exact measurements and plan are given on figure 29 [p113 Bennett 1931]. It is composed of three sections with steps leading up to one. The paving on two of the sections is with very small beach pebbles. The other section is more tore down, and is paved with larger stones. A wall one foot high runs around the south side and across the front (sea side).	52	Puolo
Sand burials	In the sand on the northwest side of Hanapepe bay, burials are found.	53	NW Hanapepe Bay sands
Makole heiau	Makole bluff is said to be the one on the inland side of the government road west of the river, halfway between the road and Kapahuli valley. Thrum describes it as, "A small heiau platform character on side of bluff destroyed in the [eighteen] sixties; portions of the walls said to be still seen." None of the walls could be found.	54	Makole Bluff
Pualu heiau	On the east side of Kapahuli gulch, about one quarter mile from the road, and at the base of the second pali. This structure consists of a single platform 142 by 50 feet built up in front 6 feet, and backed by a wall 3 to 4 feet high and 3 feet wide. The whole structure seems to have been paved with 3 to 4 inch stones, but it is very much disturbed, and much of the rock has been hauled away....	55	Hanapēpē
Akowai heiau	At a place called Akowai on the steeply sloping side of a bluff. The structure is described by Thrum as, "A small paved heiau of about 50 feet square, in bad condition..."	56	

Community Voices

Ethnographic research involves gathering oral histories and conducting interviews with living communities to record and acknowledge people's historical connections to place as well as document continued practices and piliha communities have for their wahi pana. It is clear from the naming of virtually all things on the landscape that Hawaiians maintained an intimate relationships with their environments.

In Hanapēpē, it is the kama'āina, rather than historical archives, that have kept the stories of the landscape alive. Through our ethnographic efforts, we have tried to capture and present some of these mo'olelo. The mana'o of these long-time residents who graciously shared their 'ike and memories should be respected and acknowledged.

Ethnographic work for this study was conducted from September through December 2019. As a multi-phase study, the ethnographic process consisted of identifying appropriate and knowledgeable individuals, conducting oral history interviews, summarizing the digitally recorded interviews, analyzing the oral history data, getting consent from interviewees to use their mana'o, and preparing the report. Six individuals were contacted for this study. Three individuals participated in ethnographic interviews, one gave us mana'o off the record, and a fifth declined to participate. The table below lists the names and some background information of individuals that chose to participate in this CIA, formally and informally.

Another Method we utilized during the CIA process were surveys. The Nohopapa team put together several small menti-meter surveys which we released at Public Meeting no.1, to the pa akai hui, and others. Unfortunately this approach didn't yield any new information. Rather the best additions were informal talk stories iwth beneficiaries during DHHL community meetings. This mana'o has been incorporated into this report in "Community Concerns and Recommendations" section.

Table 9. Community Participants

Community Participant	Background	Notes
Waiting permission		
Chad Shimmelfennig	<ul style="list-style-type: none"> • Kama'āina • Generational ties to Hanapēpē • Teacher at 'Ele'ele that incorporates traditional Hawaiian values & practices into curriculum 	Interviewed.
Ku'ulei Santos	<ul style="list-style-type: none"> • Kama'āina • Generational ties to Hanapēpē • Cultural Practitioner • Of a Salt making 'ohana 	Interviewed. Also referred to interview by two other interviewees.
Waiting permission		
Alan Murakami	<ul style="list-style-type: none"> • Lawyer with Native Hawaiian Legal Corporation (NHLC) 	Asked for a written comment since he is representing pa'akai hui in current litigation.
Leanora Kaiakamalie	<ul style="list-style-type: none"> • County of Kaua'i Planner • Kama'āina • Generational ties to Hanapēpē • Cultural Practitioner • Of a Salt making 'ohana 	Not formally interviewed, but consulted in her role within Kaua'i County Planning; regarding County Westside Master Plan update status.

It is interesting to note that all of our interviewees recommended at least one of our other interviewees for this CIA. The only other person recommended by our interviewees that we were unable to interview for this study was Janet Kahalekomo, a kūpuna and long time resident of Hanapēpē. We recommend any future or additional ethnography to approach her first.

Acknowledgements

Nohopapa Hawai'i would like to mahalo the individuals who shared their precious time, memories, and stories with us. Without their willingness to share personal recollections and mana'o with us, this important study would not have been possible. The contributors below are arranged alphabetically by community participant.

[Insert Name & Bio when consent is received]

Ku'ulei Santos

Born and raised on the West side of Kaua'i, Ku'ulei Santos shares her family connection to the Hanapēpē area. "My father was born and raised in Hanapēpē. He lived right by Port Allen and he started making Hawaiian salt when he was a little kid, probably 10 or 11, I think. My grandmother lived on Ni'ihau for a really long time. My dad's brothers were raised on Ni'ihau so my family has pretty much been from that side of the Island."

Chad Shimmelfennig

Chad was born in Waiimea, raised in Hanamā'uulu with ancestral and personal connections to Hanapēpē. He is currently a 5th grade teacher at 'Ele'ele Elementary. He incorporates a good deal of mea Hawai'i into his curriculum—using hale building, and lo'i and waterflow to teach math and culture, requiring his haumāna to kāhea (entrance oli) into their classroom, and talking geography through wahi pana. Chad has introduced school wide initiatives to normalize Hawaiian culture and protocols within everyday school routine. He was approached to share his mana'o on the impacts of the proposed Hanapēpē full build out of up to 428 homes and how the increase in Hawaiian families, and students, would impact his and the school's ability to continue to reinforce Hawaiian values and incorporate culture into teaching for future DHHHL beneficiaries and the larger Hanapēpē community.

Chad was recommended to us by DHHHL beneficiaries who are parents of his (current and or former students).

Summary

At first glance, when the Nohopapa team took on this project and saw how mauka the study area was thought perhaps we would not need to focus too hard on salt or impacts in the Piulo Peninsula. But the more research we did, we realized that there were direct connections between the project area and the mauka slopes to the Salt Pond area. Not only are they on the same geographical slope, tied together by surface and ground water, but there were mo'olelo that traversed mauka-makai throughout the study area. Most importantly perhaps, it was the community that pointed out how important 'Ukulā, Salt Pond, Shark Bay and Piulo were to them, no matter where in Hanapepē they lived. So, guided by research and the community, we cast our 'upena a little wider.

For this project we visited the BPBM archives, the Hawaiian Mission Houses Archives, the Kaula'i Historical Society Archives and Nūpepa Hawai'i. Little was found in the Nūpepa Hawai'i on Hanapepē. Community members [insert when consent received], Chad Shimmelfennig and [waiting for consent to add name] all commented on the lack of archival history about Hanapepē, Hawaiian or English.

For whatever reason, little remains of the mo'olelo, 'oli, mele, hula, and place names of Hanapepē from historic times. We have found from talking with the community, and affirmed it through our own research, that even Hawaiian language repositories provide a void when it comes to researching Hanapepē.

What we have found is that Hanapepē, even at the time of the Mahele (1850s) had a large population, supported by agriculture extending deep into the valley. At this time, pa'akai was being actively harvested at 'Ukulā to support mauka and makai food preparation and preservation. And there were active hula halau with kumu hula that were kaulana, *famous*, enough to have been named in 1857 nūpepa articles:

- Wahineaea
- Kaulaloa

Kumu hula in both past and present were often repositories of history through mele. As was written about in the Nūpepa section, as long ago as the early-mid 1800s Hanapepē was place renowned for hula. The hālau Palaihiwa o Kaipuwai, established in 1945 by the late Kumu Hula Helen Kaipuwai Kekua Waiiau taught hālau in Hanapepē for a time. Her granddaughter and current Kumu Hula Kāhaulani Kekua spent time learning mo'olelo from area kūpuna in her grandmothers tradition.

Today there are twenty-two Hanapepē 'ohana who make salt. Their families have roots to the area and have been passing down mo'olelo of the area as well as the traditional cultural practice of cultivating lo'i pa akai. It is these families, grounded by practice, who that are most likely to have kept the old stories of the area alive. One well known kūpuna, and salt maker, the late Auntie Wilma Holi, shared several mo'olelo of the area, passed down to her through her family, with 'ohana and friends in her time.

While much of the place specific mo'olelo of Hanapepē are unwritten, and what is written is scattered in a variety of places, Hanapepē has a rich Hawaiian cultural past and present. We were able to pull some place names out of historic maps and were likewise shared some by community members to create new maps compiling old places. Through the CIA process we were able to identify some Hanapepē mo'olelo passed down orally, about places within and

around the study area; often emphasizing the connection from mauka to makai.

Additionally, interview mea has been incorporated into the following report section "Na Wahi o Hanapepē" rather than segregating community voices we attempt to themetize the main discussions of our interviews with study research to provide a more wholistic discussion of the places and stories connected to the project.

Maika‘i Kaua‘i, hemolele i ka mǎlie.
*Beautiful Kaua‘i, peaceful in the calm.*¹⁶

Nā Inoa ‘Āina o Hanapēpē - Place Names of Hanapēpē

When people manage their resources and live in a place they develop an intimate relationship with that wahi. For Hawaiians that means the histories and stories of place, mo‘olelo, and the names, the inoa, that went along with them. Wahi were named or revealed their names, which were passed on by the kua ‘āina and the names and stories of these places endured for generations as common knowledge.

This section is an introduction to the portions of Makwele and Hanapēpē immediately surrounding and connected to the study area, wether geological or mythological.

Even though many of the wahi of Hanapēpē have new names, the old names and their stories endure. They are sometimes held in the memories of our kūpuna, pages of books, or rolled up in old maps. The word *ioahi*, comes up frequently. According to Pukui and Elbert (1986, 2003) wahi is most simply: place.

1. n. Place, location, position, site, setting. (Ka wahi contracts to common kahi). Ma kekahi wahi, somewhere. Kēia wahi kēia wahi, everywhere. Ma ia mau wahi, hereabouts, thereabouts. Ma nā wahi āpau, everywhere, wherever, universal.

The learning and remembering wahi inoa and wahi pana lead to the understanding of the stories behind naming, and provide insight into a place itself, its people, its roll in history, in everyday life, the depths of its resources and ways to better care for and protect it.

Once spoken, an inoa took on an existence, invisible, intangible, but real. An inoa could be a causative agent, capable of marshaling mystic elements to help or hurt the bearer of the name. And, so went the belief, the more an inoa was spoken, the stronger became this name-force and its potential to benefit or harm.

-Pukui, Haertig, & Lee 1972:94

Nohopapa Hawai‘i engages in a process of re-mapping that compiles wahi inoa, place names, from different sources – most pointedly historic maps—to re-map traditional landscapes with often “mis-placed” wahi inoa. We often too quickly jump to say we have lost place names, it is more hopeful to say we have lost them and it is only a matter of re-discovery and finding.

This re-mapping is an important tool for community interviews but its real value, we hope, will be as a resource for the Hanapēpē community. Figures 16 and 17, on the following pages, are maps compiling the wahi inoa of Hanapēpē in and around the Hanapēpē Hawaiian Home Lands.

The maps on the following pages are the compilation of both the archival research and ethnographic interviews conducted during this study.



Figure 16. Map showing the stream gulches of the Hanapēpē DHHH parcels, their māiāiāiemā (fences), and their traditional names.

¹⁶ Pukui 1893, p224, “Ōlelo No‘eau no.2060, “Line from a chant.”

Cultural Beliefs, Practices, & Resources Identified

Discussions of specific aspects of traditional Hawaiian culture as they relate to the study area are presented below. These discussions are based on information from ethnohistorical resources, archaeological investigations, and ethnographic information gathered for this cultural impact assessment. This information was assessed to identify cultural beliefs, practices, and resources associated with the project area as well as the areas and communities it has connections to (ie impacts) “to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment” (OEQC 1997).

Cultural landscapes encompass the unity between kānaka and the ‘āina. They are an integration of both natural and cultural resources as well as the cultures that value these resources. The concepts of mālama ‘āina and aloha ‘āina reflect the Hawaiian worldview of preserving and protecting both the natural and cultural resources found on the land. Nā kūpuna (the ancestors) depended on their cultural beliefs, practices, and resources for survival. Many of these cultural beliefs and practices have been passed down through the generations and today are still prevalent in different places, including Hanapepé. Today, the right to perform Hawaiian traditional and customary practices is protected under Article XI, Section 7 of the Hawai‘i State Constitution. Additionally, the *Guidelines for Assessing Cultural Impacts* state, “... although traditional practices may have been interrupted for many years, these customary practices cannot be denied in the future” (OEQC 1997).

The mindset of nā kūpuna evolved and developed over centuries; responsive to the natural environment. Today, our communities must be sensitive to and better understand nature and the environment to obtain a glimpse of how their kūpuna understood and lived within their universe. Every place, feature, resource, and atmospheric element in the Hawaiian universe was either utilized or recognized by nā kūpuna and often named, described, or recorded within mo‘olelo, mele, and oli. These cultural traditions of the past help shed light on how our Hawaiian ancestors lived, what they thought about, and what they believed in.

The topic discussions on the following pages are the compilation of both the archival research and ethnographic interviews conducted during this study. These compiled reflections and discussions on the Traditional and Cultural Resources in, around, and connected to the study area establish the cultural interconnectedness of these wahi.

Wāi

Wai, water, is both the wealth of a land and its people and a signal of the health of the land and its people. Water, both fresh and brackish, underground and surface, has been a repeating theme of conversation during DHHL study area meetings, interviews, and off-record community conversations. It is certainly the one potential impact people are the most concerned about.

Mai uka i kai

Pu‘ulani, the pu‘u above the study area and the wai hālau for the stream gulches that run through the Hanapepé Hawaiian Homelands are connected to the kai at Salt Pond, ‘Ukulā through mo‘olelo involving some of the Pele clan.

56

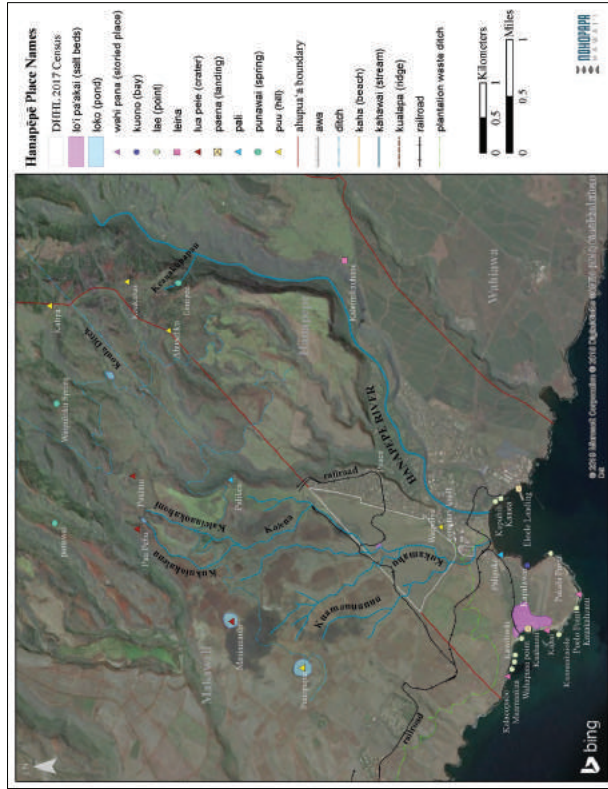


Figure 17. Map of traditional Hawaiian wahi, in and around project area, compiled from historic maps and archival sources.

Puʻulani, 2.5 miles north of Hanapepe, is a cinder cone partly veneered by a thin flow of lava. It lies on the projection of the Makaweli Graben fault, and the rise of magma may have been localized by the fault (MacDonald et al 1960, p. 69).

Puʻulani and its surrounding slopes are part of the same “localized” flow, this includes the slopes above the study area, the study area, and the slopes continuing down to Pūolo point and the Salt Pond area on the west side of Hanapepe Valley.

According to Kumu Kēhauiani Kekua, Puʻulani is not merely a wahi inoa, but a wahi pana (a storied place). “I [Puulani] is one of the last places on Kauaʻi where Pele attempted to create a volcanic home for herself and her siblings” (Hālau Newsletter). [Insert when consent received] Both Kuʻulei Santos and Kēhau Kekua shared Pele moʻolelo connecting Kamohoaliʻi to the study area, from his travels from Kapalawai (Shark Bay) mauka, along watery paths through underground tunnels and lava tubes to Puʻulani. This path takes Kamohoaliʻi directly through, albeit beneath, the study area.

Kumu Hula Kēhauiani Kekua was shared this story by respected Hanapepē kūpuna and salt maker, the deceased, Aunty Wilma Holi.

In the bay of Hanapepē (referred to more commonly as Port Allen) are numerous hale manō or shark houses. It is said that a sequence of underground ocean lava tubes enables sharks and other ocean creatures to find their way up to fresh water pool of Manowaiopuna far up in Hanapepē valley. Pele’s older brother, Kamohoaliʻi is a shark god and the navigator of her canoe. He was known to frequent this upland retreat as a favorite place of residency whenever he visited Kauaʻi (Kekua, Hālau News Letter).

Geology in the area does not lend itself to large lava tubes that we find on Hawaiʻi island (MacDonald et al 1960). However, there are geological connections of the underlying substrate mauka to makai. Perhaps these lava tubes are more metaphorical than physical, who can say? This moʻolelo does however layout the path of water flow, surface and subsurface, through the study area; establishing this connection from legendary times.

Kumu Kēhau reminds us, “As with other important natural resources in Hawaiʻi that were known to our ancestors, they were viewed as gifts from the gods themselves. The loʻi paʻakai at ʻUkulā in Hanapepē are no different. And for this amazing resource, we are reminded of the kindness and generosity of Pelehonuamea, the goddess of fire and the volcano” (Ibid).

Water flow

Just as Kamohoaliʻi travelled upslope from Kapalawai (Shark Bay), in Port Allen, to Puulani in the uplands. Water flows from the stream gulches below Puʻulani, through the project area, and into the waters of Kapalawai. This understanding of movement, the direction of the flow of water in the area is reflected in this moʻolelo.

During storm events, the occurrence of stream gulch and surface water run-off from the study area is easily visible for those who are inclined to kilo, observe. During heavy rain events, storm water run-off into Kapalawai, Shark Bay, and how the ocean is turned brown. It should be noted that Kapalawai is on the western curve of Hanapepē Bay. It is clear when storm runoff is coming out of the plantation waste ditch. Widened at its mouth, in 1996, the old plantation waste ditch funnels surface flow from the study area gulches, the highway and adjoining lands into the ocean alongside the Hanapepē Ball Park. Currents pull that water along the western coast—

Palipoko, Kapalawai, Paakahi Point—and out to sea. This is different and separate than the flow entering the Bay on its Northeast end, from Hanapepē River.

[Insert when consent received discussion of TPL & OSC acquisition].

Emerging wai

The earliest *historic* account we found of wai near the study area is in a nūpepa article. “He Wai Hou” or “A New Water Source.” Printed in Ka Hae Hawaii 16 April 1856, this article explains the amazing appearance of a new spring in southern Hanapepē on Puʻuopapa ʻi, now present day Makaweli; at an elevation with and due west of the current study area.

Puʻuopapa ʻi is a lua pele, or crater, it sits on the same slope as the project area, descending from Puʻulani and Puʻupehu. Puʻuopapa ʻi was utilized as a reservoir during plantation times. Like its neighbor to the north, the lua pele & reservoir of Manianiaula, Puʻuopapa ʻi is connected to the Koula ditch system. Unlike Manianiaula, Puʻuopapa ʻi is still an active reservoir. If it had not been modified as a plantation reservoir, the drainage for Puʻuopapa ʻi would naturally have flowed into the gulches of uamamunuu and Kukamahu, which intersect within the study area (See Title page and Figure X).

Paʻakai

It probably does not need to be said, but paʻakai and its making is deeply tied to Hanapepē. In many ways paʻakai defines Hanapepē in the modern psyche of Hawaiʻi. If someone mentions Hanapepē to someone, lets say not from Kauaʻi, they very likely will think “salt.”

ʻUkulā is the name most consistently found for the area where loʻi paʻakai are traditionally cultivated in Hanapepē. Although ʻUkulā was identified on maps, one place name that we could not locate was pointed out to us by Malia Nobrega. The wahi “Kuumakiaawe,” the name given by Christina Kali for the loʻi paʻakai in the ʻUkulā salt making area, in the KHS KCC film clip (c1974).

Salty wells

Kuʻulei Santos points out that where Hawaiian salt is cultivated is the lowest portion of the Salt Pond area. ʻUkulā sits in a subtle depressed bowl. This low lying area is more sensitive to flooding and ponding during storms and high surf events, both of which can ruin the salt harvest. But this low lying area is an important place, where clay deposits are found and where a shallow hole can reveal clean salty springs, or wells, which are critical to salt making. Kuʻulei Santos explains,

if you look at the kind of water that is in the salt making area, it’s not 100% saltwater. It’s a little bit of fresh water. And so the combination of it helps. It can’t just be all salt water.

So that’s not just coming from the ocean. We don’t really know what exactly happens underneath to give it all those elements to help us make Hawaiian salt.

The presence of a heiau and the moʻolelo that goes with it might help to explain the phenomenon. “There was a heiau at Puʻolo point very close to the loko paʻakai at ʻUkulā, it was called **Kauakahiumu**” (Kekua, Hālau Newsletter). This heiau was also recorded by Bennet (1931). The health of the salty springs at ʻUkulā are tied to this heiau and its akua (see no.51 in Figure 45 and Table 8).

It [Kauakahiunu] was specifically dedicated to the primordial gods, Kāne and Kamaloa, who are revered for the opening of springs and water sources throughout Hawai'i. In most cases, they gifted people with fresh, sweet drinking water. However, at 'Ukulā, they provided a system of brackish water (kekua).

[Insert when consent received discussion of wells & depth sensitive pūnā at 'Ukulā].

Ku'ulei Santos gives a first hand account of her experience with the wells at 'Ukulā, which support the Kāne Kamaloa mo'olelo. Emphasizing a fine balance of salt and fresh water, a rare ankylline habitat where the native 'opae can be found.

..all the entities matter to us. The way the water flows underground into our tunnels. The way the clay appears in certain areas, that helps us build the clay pods. The way the brine shrimp kind of just shows up in our wells, it's all due to how everything flows together.

[Insert once consent obtained]

The origins of pa'akai: Wai Maka o Kia

In the past, there were many centers for pa'akai cultivation across the pae āina – Honouliuli, Kalaemano, Kawaihae. Perhaps Hanapepe's renown is not merely for the endurance of the practice, but also because of its origins.

The following mo'olelo was compiled by Kumu Hula Kēhaulani Kekua in a hālau newsletter, it was shared with her by Auntie Wilma Holi of Hanapepe. It talks of the origin of salt making at 'Ukulā in Hanapepe, as well as the origin of food preservation – the salting and drying of fish.

The mo'olelo is centered around Kia – a woman from Hanapepe who often traveled to the shores of 'Ukulā to fish and gather food from the sea. One day, she experienced an unusual streak of luck and in her excitement, caught an overabundance of fish. Even after giving away portions of her catch to family, friends and strangers, Kia was left with a great excess of fish. She began to cry helplessly, knowing that she had taken far more than she had needed. The rest of the fish would rot and go to waste, poho.

From beyond the sand dune where she sat crying, an elderly woman appeared to console her. When told of her dilemma, the woman gently took Kia's hand assuring her that she would help to resolve her problem.

"Come with me," she said as she led the fisherwoman to an area just beyond the beach. She began to dig a pit in the ground until it filled up with water that came up from within the earth. "Put your fish in here for a little while, then dry it out in the sun," the woman told her, as she explained how the salt from the ocean spring would help to preserve the rest of her catch. Kia's crying subsided to a quiet stream of tears, grateful for the kind stranger who had appeared to help her. Assuring Kia that everything would be fine, the woman gently wiped the salty tears from her face and placed it in a basin of āleaa. The first salt is said to have come from Kia's tears.

This marked the beginning of the famous lo'i pa'akai of 'Ukulā at Hanapepe. From that day on, the knowledge of cultivating Hawaiian salt was spread amongst the people, along with its significance for preservation, purification and cleansing.

Ku'ulei Santos had a similar salt making story, although she did not name the crying woman. Ku'ulei's account expands on the identity of the elderly woman.

They said the lady who appeared from the bushes was Pele. They say Pele was hanging out over there because she liked the shark god who liked to visit her so he would swim underground in the tunnels. The way Hawaiian salt is made, water flows underground into our wells. So they say that's why, she [Kia] wasn't allowed to go to the ocean. They also call that bay right there before Salt Pond or Puolo Point, Sharks Bay.

'Ōlelo No'eau on pa'akai:

Continuously...since before written history, 'ohana in Hanapepe have been making salt. Salt was important to survival in subsistence (pre-refrigeration) times, and it is still important today. It is what we eat in every meal. We use it to dry fish, dry meat, tenderize, preserve and flavor our mea'ai. It is no wonder there were specific 'olelo no'eau dedicated to pa'akai.

No.1082, pg115:

Ho'okāhi no 'ōpae, 'ula ka pa'akai.
One shrimp can redder the salt.

Said of a poor fare of food due to a bad crop. A single shrimp and some salt will do for the time being, as long as the shrimp flavors and colors the salt.

No.1216, pg.132:

I komo ka 'ai i ka pa'akai.
It is the salt that makes the poi go in.

Poi tastes much better with salted meats, if there is no meat, one can make a meal of poi and salt.

No.375, p46.

E pū pa'akai aku a pa'a ka houpo.
Take a bit of salt till the diaphragm is solid.

Said by one whose fare is humble, consisting mostly of poi with salt or kukui relish. "Eat till you are satisfied of this humble fare."

No.252, p31:

E 'ai i kekāhi, e kāpi kekāhi.
Eat some, salt some.

Said to young people: Eat some now and save some for another time.

No.972, p104:

He wahi pa'akai.
Just a package of salt.

Something good; a gift of anything one has grown or made.

Like most wai, pa'akai, salt is one of the most universally appropriate ho'okupu one can offer as makana. It is both sacred and noa. As Kumu Kēhau Kekua writes, "Our kupuna knew that the establishment and continued existence of the salt beds involved a greater relationship with the sites that surrounded it. They also acknowledge the powers of nature for such profound gifts and resources that supported their well-being" (Hālau Newsletter *Na Lo'i Pa'akai Kahiko*).

Salt under threat

One of the best things about Hanapēpē salt is that isn't a commodity, or at least, it cannot be bought. It is something that is gifted. A cultural tradition that tourists cannot buy. There's something sacred in that. Yet, when we get salt nowadays its in gallon bags instead of 5-gallon buckets. Ku'u lei Santos openly acknowledged the change,

Back in the day, we used to give away five-gallon buckets. If you asked me for Hawaiian salt, I would give you a five-gallon bucket. Now, we can't give. Someone asked me yesterday for 25-pounds of Hawaiian salt. I'm like, 'We haven't made Hawaiian salt last year. I can't give you that as much as I would like to.'

Salt in Hanapēpē is under threat. The salt making season hasn't been consistent. There have been wet seasons, wet years (2018), and storm surge in the winters inundating the beds. The wells are affected by each other and other subsurface impacts. Clay deposits are becoming more scarce.

It's a lot harder to find some of the things that were so abundant in the past. Like the clay that we use to make the actual salt beds used to be so easy. Now it's like, you know, you ever watch that movie *Holes* and then you see all the like piles of dirt? There is that movie where it's holes and they're digging for treasure. And so you look on the desert and then there's all of these like mounds of dirt. That's what salt makers look like now. We're trying to dig for clay. During the summer, you'll see like all these hills of clay but you can't find it anymore. So it's harder and harder to find the clay to make Hawaiian salt."

Ku'u lei and other salt makers are worried about the future of Hanapēpē pa'akai. They are the practitioners but all of Kāua'i, in fact all of the pae 'āina benefits from pa'akai. In her Newsletter Kumu Hula Kēhau Kekua writes,

This pa'akai [from 'Ukulā] is very special. For those of us who do not have regular access to pa'akai harvested from Hanapēpē, it is downright sacred. Although, its initial and more common use was for the preservation of food, I only use this pa'akai for ceremonies, healing and to offer as special makana and ho'okupu.

As the Hawaiian community expands in Hanapēpē so to does the kuleana to protect its cultural resources and traditions.

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Makani

[additional makani to add when consent rec'd]

A more mauka wind near the project area is the **Unulau** (Stone et al, 2013).

A mauka wind, from the source of the waters in mauka Hanapēpē is the **Makaupili** (Ibid).

Mauka - Makai Connections

At the apex of the Hanapēpē watershed is its wai hālau, the source of the fresh water in the ahupua'a.

These mo'olelo establish places around the study area as legendary, storied places, wahi pana. Mo'olelo specifically connect the craters and cinder cones immediately around the study area to Pele and the waters at 'Ukulā and of mauka Hanapēpē to Kane. Most importantly these mo'olelo layout the interconnectedness of the landscape through waters above and below ground.

There are two Lua Pele (and reservoirs), Pu'u o Papa'i and Manienieula, and one cinder cone, Pu'ulani, in the lands around the Hanapēpē Hawaiian Homelands that are attributed to Pele and her time in the Hanapēpē area.

In the bay of Hanapēpē (referred to more commonly as Port Allen) are numerous hale maunō or shark houses. It is said that a sequence of underground ocean lava tubes enable sharks and other ocean creatures to find their way up to fresh water pool of Manowaiopuna far up in Hanapēpē valley. Pele's older brother, Kamohoali'i is a shark god and the navigator of her canoe. He was known to frequent this upland retreat as a favorite place of residency whenever he visited Kāua'i.

Pu'ulani is the name of a cinder hill at Hanapēpē Heights. It is one of the last places on Kāua'i where Pele attempted to create a volcanic home for herself and her siblings.

Our kupuna knew that the establishment and continued existence of the salt beds involved a greater relationship with the sites that surrounded it. They also acknowledge the powers of nature for such proground gifts and resources that supported their well being.

There is a mo'olelo or story that has been passed down through the years. It tells of the very beginnings of how these salt beds came to be. As with other important natural resources in Hawai'i that were known to our ancestors, they were viewed as gifts from the gods themselves. The lo'i pa'akai at 'Ukulā in Hanapēpē are no different. And for this amazing resource, we are reminded of the kindness and generosity of Pelehonamea, the goddess of fire and the volcano.

One 1850s Hawaiian nūpepa article cites Hanapēpē as a "leina" or dwelling place for spirits.¹⁷

¹⁷ Nūpepa Article 1. Moololo Hawaii Helu 13, Ka Hae Hawaii, 12 July 1858.

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The article is unspecific as to a place, Kumu hula Kēhaulani Kekua (Ibid) identified one of the few leina ka 'uhane on Kāua'i as being,

ma kai of the airport is Lae Pū'olo or Pū'olo Point – a promontory that has long been known to us as a leina ka 'uhane. This is one of three known leina or jumping off points from which the spirits of deceased ancestors are believed to leap into the nether land of the Pō. The others are Ka'ena and Polihale.

There is a stream gulch, Kaleinakahoni, whose source is Pu'u Lani. Kaleinakahoni flows into Kalena gulch which flows across a portion of the project area before feeding into Kukamahu gulch, the main gulch dividing the project area.

Traditional subsistence, and modern Hawaiian subsistence, for many Kāua'i families, draw from both mauka and makai. Mauka resources include pig hunting, la'au gathering, which includes wood for hana no'eau as well as wood for smoke houses. La'au for lei and hula as well as la'au lapa'au. Accessing important springs, natural reservoirs, and streams for both daily uses and ceremonial use reinforce piima and maintain the histories and stories of place for future generations.

Continuing Hawaiian Cultural Education

Chad Shimmelfennig did express concern that with a full build out of 428 new households for the DHHL Hanapēpē project, coupled with the several hundred in the Limaloo affordable housing development that is happening concurrently,

...I don't think there's enough infrastructure there ['Ele'ele school]. The campus is large enough and I know firsthand that our administration has requested more buildings and larger infrastructures. And right now, we're going the opposite direction because another private charter school has opened. So it's kind of taken away a lot of resources from us.

At the same time, we're going to have an influx of more resources, which increases the amount of teachers we're going to need. Coupled with the shortage of teachers in Hawai'i. It's going to be a double-edged sword. Because we have 500 homes here being built, we have another 400 there. We're almost near maximum capacity here."

Although it will be a challenge for the DOE to increase its capacity to provide for >600-800 future Hanapēpē households, DHHL beneficiaries and others, Chad sees an upside. If at least half of those additional Hawaiian households Hanapēpē are Hawaiian he believes the influx of Native Hawaiian students, kānaka, could have a positive impact, increasing the in school need and demand for integrate Hawaiian cultural education.

But I don't think it's going to affect the way classes are being taught because the way we're trying to focus things is it doesn't matter who you are, where you're from. This is our culture (Hawaiian). You come to Hawai'i, you're going to learn about Hawai'i. It's just that simple. Now with the increase of the Hawaiian kids, it's going to make it even more powerful because I see a lot of the parents haven't gone through things like this. So they're seeing this for the first time. It will only increase the amount of awareness in our community with our kids having a school with those kinds of foundational concept of Nā Hopena A'o. To increase the awareness in the home, they're seeing things in 'ōlelo Hawai'i and the parents say, 'What are you talking about?' So I've seen where parents have even taken a next step and they go out and learn now ('ōlelo Hawai'i). Or they're doing Duolingo with their kids in the car. They're having these conversations. It's not just you come here, you learn.

Chad cautions that such a large growth of even Hawaiians in the 'Ele'ele student body doesn't necessarily mean they will be Hawaiians from Hanapēpē. Or that new teachers will be Hawaiian or from Hanapēpē. He says that as long as teachers place an importance and priority on Hawaiian culture, haumana, Hawaiian and otherwise are drawn to that.

A lot of times it's us as teachers, we're just not comfortable being uncomfortable. We're supposed to be the wealth of knowledge or the source of knowledge. Whereas, we got to teach for the kids in our culture, our wahi pana, and their kuleana for living in this area, and what to expect when they move out from this area. And with the kids being invested in this, it should increase the amount that they would like to learn or want to learn. Luckily, we have such a great community and the ability to do these things.

To help accomplish this Chad recommends teacher take advantage of a DOE program that offers free 'ōlelo Hawai'i (Hawaiian language) classes to its employees.

When you come into our class, a lot of what you learn, you will learn in both languages. I look at and live by the quote 'To be the teacher you wish you had when you were younger' every day.

[insert mele mea when consent obtained]

Cultural Resources – Kama'āina and 'Ohana

Several participants lamented the loss of knowledge about Hanapēpē during the missionary and plantation era. We as researchers for this project also turned up with little from Hawaiian archival and even Hawaiian language sources. However, there are pockets

Chad also specifically named "a legacy kūpuna" Auntie Janet Kahelekomo. Books, *What is Hanapēpē?* and *Why they call it 'Ele'ele?*

* "We're lucky to have a few legacy kūpuna like auntie Janet Kahelekomo whose seen a lot of changes in Hanapēpē. There's books such as *What is Hanapēpē?* which has three versions and *Why they call it 'Ele'ele?*, regarding the battles that happened here. We're still discovering heiau way up in the mountains right now. We know Hanapēpē through the nūpepa which was predominantly a kalo farming area which had a good irrigation system. A lot of kalo was grown all up and down this valley. And then from there, we had houses, we had a lot of wars. From the stories I've been told from my dad and from his grandfather, the theater was like one of the main hubs from West side, South side, even Lihue. You came here to watch movies, have drinks. This was the place to be. We call it the little big town now. Stories from my dad taught me, we'd be driving down here, he'd be like, 'Oh, there was that, there was this over here. Your grandfather said that was over there.' The massacre (the Hanapēpē massacre) that happened, my grandfather was a witness. So stuff like that, you make connections. It's really cool to hear these things."

o Chad also sees the Hanapēpē Community itself as a valuable resource for cultural connections and education for students and new communities.

o As far as resources, we have an abundance of resources. We have people that have been living here for generations that have this 'ike about this area. If you want to go talk pa'akai, you can go see the source.... If you want to go talk about hunting, we have such a

bright and vibrant community. You say something and someone will say, 'Oh, go talk to this person. Go talk to uncle so and so.'

Natural Resources and Practices

Makai of the project are at the coast there are still native lowland indigenous and endemic plants. One interviewee mentioned that there are no more native plants. Another said that she has observed several species and that they are coming back. **[insert native plants observed at Pūolo when consent received]**

The project area and much of the surrounding lands to the north and west were under sugar or in cattle from 1865-1941. Whatever native forest and plants had once been within the study area have been gone for over 100+ years.

Hanapēpē is famous for having had the kahuli (Carelia knudseni), native arboreal snail, in abundance in its upland forests (Cooke 1931). The kahuli are now extinct in Kāua'i's forest; the only wild populations are on O'ahu and they are under threat. Although lacking kahuli, there are still forested uplands above the former sugar lands; including native forests.

Access

At the apex of moi road, a dirt road continues mauka where one *would* go to access the wao kele and its resources; lā'au, pua'a, etc. During both the DHHL Beneficiary Meeting for existing leasees and the County of Kāua'i West Kāua'i Plan Update meeting on Historic Resources, all those asked about mauka access above DHHL lands referred to the locked gate at the top of Moi road. That area had always been "G&R" or Gay and Robinson lands.

A northshore resident, who wished to remain anonymous, mentioned that he had gone hunting up above Moi Road on G & R lands, but that was because he was friends with the land owner; "...not just anybody can go holo over there."

At DHHL Public meeting No.1, two wahine, who did not give us permission to use their names, shared that, as children, they remember going swimming in a moss lined 'auwai above Moi road. This was possibly part of the Koula Ditch.¹⁸

¹⁸ Looking at the map together we agreed it was very likely a portion of the Koula Ditch.

Study Recommendations

Based on interviews, consultations and comments we received at community meetings, this final section is a summary of community recommendations. We encouraged people to offer solutions whenever they had concerns and included those when they were given.

1. Mauka Access in design. Even if there is no access now, plan for the possibility of future access, who knows in two+ decades?

Gay & Robinson, are the current large surrounding landowners mauka of the study area, and access is restricted through their lands by fences and gates; specifically, a gate at the apex of Moi Road. At present there is no access to the upland forests and their resources for DHHL beneficiaries *at this time*. Although it is not common knowledge, there has been access in the not too distant past, where some community members would access the waterways and wao kele (the forested) areas mauka of the study area.

It is possible, and hopeful that community access will one day be restored. The value of these resources to the continued practice of Hawaiian culture and to the ability of any future DHHL community for subsistence hunting and gathering is clear.

The suggestion was made two us by (anonymous) beneficiaries at a DHHL Hanapēpē public meeting, that the possibility of future access be taken into account during development.

- Include road access up to currently locked gates and/ or fences so that if upland gathering, hunting, etc access is available in the future the infrastructure will be in place.
2. Makai Access, ensure safety. Worries were expressed to us over the speed at which vehicles travel on Kaunuaui'i Highway along the stretch bordering Hanapēpē Hawaiian Home Lands and the intersection of Kaunuaui'i Hwy with Lele Road and Hanapēpē Road.

Keeping that in mind, addressing the high rate of speed in that down hill area is important. Three community members separately mentioned a round-a-bout. Unsure if that is a current DOT or county initiative or if that is a community idea? It could ensure a safer merge and crossing for DHHL homesteaders from Hanapēpē Heights, Moi Road, onto Kaunuaui'i Highway or accessing makai resources.

When thinking about additional driveway onto main highway, consider that access for DHHL beneficiaries will not just be to get onto, but across Kaunuaui'i Highway to access kai cultural resources.

As DHHL continues to work with DOT for additional access from its lands to Kaunuaui'i Highway for full build out, it seems important not to overlook safe access for its beneficiaries across the highway. Fishing, salt making, gathering, surfing, diving and paddling are all important cultural practices accessed through the busy intersection of Lele Road and Kaunuaui'i Highway.

3. Makai access, limiting of access to dunes and education.

Continued driving on the dunes has the effect of compacting the clay substrate beneath the sand - affecting the well used for salt making, it prevents native plant species that grow on the dunes from flourishing - increasing dune erosion and kicking up dust and debris along a very windy

shoreline—all of which are detrimental to the local ecosystem and salt production.

Pōhaku barricades were recently installed on the east (‘Ele‘ele end) of Hanapepē Salt pond to prevent driving and parking on the dunes. Access & use adversely affects community cultural resources. The County installed barricades, but have done nothing to educate the community about why they are there. Uninformed access & use adversely affects community cultural resources.

The salt makers would like to see new homesteaders informed about ways to take care of the makai area. So that protection of the area has more community buy in. The idea is that informed access and use can help preserve and even restore the resources in the area.

4. Signage – one interviewee indicated that the salt making families might be willing to work with local land managers to provide educational signage about the area.

Providing visitors with some history and guidance on being respectful. Note that in the past the salt making community was reluctant to take this step.

5. Education – Coordination with Hui Pa‘akai for homesteader and larger community education about history, protocol and ways to mālama makai ecosystem and resources.

Signage was suggested by Ku‘ulei Santos and Malia Nobrega as one way to educate visitors and new community members alike. Another suggestion was a cultural space or center when DHHL develops its makai parcel. Education about salt, fishing, native plants, and other makai resources that homesteaders might engage with as traditional cultural practices are important to prevent negative impacts to the surrounding area.

It is recommended that DHHL reach out to the Hui Pa‘akai to establish signage, huakai‘i, workdays, or even handouts for new homesteaders. This sharing of ‘ike would help knit together a growing community, help Hanapepē mālama its precious makai cultural resources, share stewardship of an important ecosystem and a threatened cultural practice. If DHHL does not try to mitigate the influx of a potential 400+ households on the immediate makai cultural resources, there is clear potential for negative impacts to the area.

Creating cultural connections with new homesteaders to Hanapepē is an important step towards growing a healthier Hawaiian community. Through active engagement and restoration, new Hawaiian Homesteads in Hanapepē could positively impact cultural resources and grow traditional cultural practice. Whether there are opportunities to learn about salt making, clean up mālama kahakai days, native outplanting and restoration workshops, place name and historical sharing, or makai resources education; these are all pathways for homesteaders to grow their pilina with Hanapepē. The relationship of people to place is the foundation of a Hawaiian community.

Include a new homesteader welcome packet to include educational material particularly about makai access and existing protections and potential future protections for cultural practices. Including reduced driving access on east end of Hanapepē salt pond.

Those who were informed about reasons behind actions had more positive reactions.

6. In school education – A growing Hawaiian population, especially after max build out of the study area, will increase the needs and awareness of Hawaiian cultural traditions in the

area, not only for Hawaiian, but all students.

Chad Shimmelfennig, in his role as a teachers at ‘Ele‘ele School, implements a great deal of traditional Hawaiian cultural practices and education into his curriculum and school activities. He said that an increased Hawaiian school age population, that we could see after full project build out, would be a *positive* impact.

DHHL, developer, and or Homestead association coordination and communication with ‘Ele‘ele school and even Waimea High to ensure there are positive impacts to Hawaiian education and cultural intergration into schools commensurate with increased Hawaiian haumāna with full build out. Perhaps DHHL, or future planning can poll incoming awarddees about their needs and hopes for Hawaiian cultural education at ‘Ele‘ele school.

7. Cultural space.

When a more detailed development design is made for the DHHL Industrial lot it should be noted that several people expressed the need for Hawaiian cultural community space. The level of request varied from “space” to a “cultural center” to things more general, educational opportunities, resources, library.

8. Ground water – There were worries expressed over the potential for contamination.

Depending on what septic, drainage, and water sources are used for housing and irrigation. (salt beds use wells to fill the salt pans). Request that proper studies (current and future), monitoring, design, and best practices will be used.

In addition, if wells are drilled for other phases, the Hui Pa‘akai would like to be re-consulted about their impacts since it was not a component of this study. It was pointed out that most regulations protect fresh, drinking, ground water. The wells for lo‘i pa‘akai are a special salty ground water and might not be taken into account.

9. Storm water – Run off from Kukamahu, which crosses the study area, meets the sea at the base of Palipoko near Kapalawai bay (Shark bay) across from Port Allen.

Concerns over surface paving, concreting and increased surface run-off were expressed; the effects and potential impacts on the fishery and tidepools along the east and southern tip of the ‘Ukūlā Peninsula.

Salt makers believe that any water run-off from the areas mauka of ‘Ukūlā has the potential to adversely affect the salt beds and affect the tidepools around Pūolo Point, the nursing grounds for the mature fish people catch and eat. Pūolo is probably the closest and best resource for traditional cultural kai (ocean) access for current Hanapepē residents. It will be the same for future Hanapepē Hawaiian homesteaders.

Gulch – Management. It was noticed that the gulch area will be open.

One community member asked who will manage gulches? For flooding, invasive species? One consultee suggested using it as a resource for gathering. Instead of moving, plant native plants that will help with soil retention and provide cultural resources for the community: lei, laau lapaaui, mea ai, etc.

Interviewees suggested active gulch management with native plants as a resource and invasive

control. Monitoring of debris and material entering the gulches. Any restoration and monitoring efforts could serve as a way to educate and connect homesteaders about wai, place names, native plants and their uses, as well as the value of things through the active mālama of their place.

*It was noted that the Curator of Living Collections at NTBG South Shore Gardens, is a current Hanapepe Homesteader. He would be a valuable resource and contact to consult on any initiatives like those recommended.

10. Additional Research

While extensive research into the Nūpepa Hawai'i has been done for this project, a more extensive record of those living in the Hanapepe area – than this CIA covers—would be valuable in order to record what the present populace has maintained or lost, in terms of area history.

We were not able to interview one respected area kūpuna in the course of this study, Janet Kahelekomo. Based on our interviewees comments, we recommend future research to include her voice.

In Sum

All those we talked to were not opposed to the proposed project. Their main concerns were that the process, design, and build out be thoughtful. And that Hawaiian Cultural Resources be protected and even restored as a result of the development of a new Hawaiian homestead area.

To close, this report we will leave you with one of Ku'ulei Santos's recommendations for future residents of Hanapepe to culturally interact and connect with place.

For me, I like to tell everyone that my house is bigger than the home that I live in and everybody has to remember that. If everybody would take the time to understand the area that they call home and what makes that part important and how can we help protect or how can we be mindful.

People just need to remember that when you're calling a place home for all these 400 [new homesteaders], it would be nice if there was a little packet to say, "These are the important things in Hanapepe. These are the historical sites in Hanapepe. This is what makes it unique or important and this is what you should do to help perpetuate or protect or at least learn about your town." Please understand why you're choosing Hanapepe to be the place that you want to call home..."

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Appendix A: Nūpepa Sources

Moololo Hawaii Helu 13. Ka Hae Hawaii, 12 July 1858

KA HAE HAWAII
 H. PROFFERER
 Pūhala kōka Pūhala
 J. P. PEELE
 L. H. BOGGS

KA HAE HAWAII
 H. PROFFERER
 Pūhala kōka Pūhala
 J. P. PEELE
 L. H. BOGGS

KA HAE HAWAII

HONOLULU, OAHU, JULAI 21, 1858. ANO HOU—HELE 16

KA HAE HAWAII
 H. PROFFERER
 Pūhala kōka Pūhala
 J. P. PEELE
 L. H. BOGGS

KA HAE HAWAII
 H. PROFFERER
 Pūhala kōka Pūhala
 J. P. PEELE
 L. H. BOGGS

KA HAE HAWAII
 H. PROFFERER
 Pūhala kōka Pūhala
 J. P. PEELE
 L. H. BOGGS

Nūpepa Article 1. Moololo Hawaii Helu 13. Ka Hae Hawaii, 12 July 1858.

No ka Hula ma Hanapepe, Kauai, Ka Hae Hawaii, 5 August 1857

KA HAE HAWAII
 AUGUST 5, 1857

KA HAE HAWAII
 AUGUST 5, 1857

KA HAE HAWAII
 AUGUST 5, 1857

KA HAE HAWAII
 AUGUST 5, 1857

KA HAE HAWAII
 AUGUST 5, 1857

KA HAE HAWAII
 AUGUST 5, 1857

Nūpepa Article 2. No ka Hula ma Hanapepe, Kauai, Ka Hae Hawaii, 5 Aug 1857.

Appendix B: Certificate of Boundaries, No. 17, Hanapēpē

81

1873
1017

Boundary of the Ahupua'a of Hanapēpē

Recurs in the following section
Honolulu July 8th 1873
Honolulu Commission of Boundaries for the Island of Hawaii, U.S.

*Some districts by the Commission of Boundaries
is made application to you to define and settle the boundaries
of the following lands of the Island of Hawaii, viz*

*The Ahupua'a of Waialeale
Hanapēpē
Pāhala
Hānalei*

I am you
Your Obedient Servant
J. B. Thomas
Commissioner and Land Agent.

*Thereupon appointed the 25th day of November A.D. 1873 for
the hearing of said application and from the evidence of the
following parties, Opaes Helelele, Helelele, Helelele, Helelele,
and there rendered the following decision*

Decision

*The eastern boundary of this land remains as the one shown at
the 18th of June of 1864 as at a point called Hanapēpē at what
place is now back in the Road to the bluff and the one within
though it shows to the center of a field of stone called Pāhala
Pāhala, there is center of field of stone called Opaes. There is
Pāhala, there is a large stone mound of gateway of Pāhala
stone wall called Mōpāhala, there is Pāhala, there is
to show from boundary from Pāhala and called Pāhala
there is Pāhala, there is high point Pāhala, there is Pāhala
there is there are clear roads and track. There is along ridge*

Ka Nupepa Kuokoa.

Ka Puni Lealea ma Hanapepe, Ka Nupepa Kuokoa, 27 August 1864

KA PUNI LEALEA MA HANAPEPE.

... (transcription of the main article text) ...

MA MI HONOPULU.

... (transcription of the left column of ads) ...

MA MI HONOPULU.

... (transcription of the right column of ads) ...

Nupepa Article 3: Ka Puni Lealea ma Hanapepe, Ka Nupepa Kuokoa, 27 August 1864.

Boundary of the Ahupua'a of Hanalei

to the top of Puuwaiaha thence containing along ridge to
 the first Puuwaiaha the north West boundary of Waianai
 thence in a N.W. direction along the ridge until joining the
 boundary from Puuwaiaha to Waialeale, thence along said
 ridge until joining open landing up the Western boundary of
 the land and Eastern boundary of Waialeale, thence to
 the boundary of Waialeale in a westerly direction to the sea

Notes of Survey Hanalei

The eastern boundary of this land commences on the mountain
 at the N.W. corner of Waialeale, at a point called Puuwaiaha at
 which place is set out and on the north side of the sea coast
 through it, at 96 links from top of Puuwaiaha on the boundary line the
 following points have been set out, to wit: Point A 125.5
 23.5 Puuwaiaha; Point B 125.5 Puuwaiaha; Point C on the boundary
 line at 37.53 E. thence from 95 links on the line at 37.53 E 2250
 links to the corner of a large field of stone called Puuwaiaha
 thence at 16.39 E 1419 links to another 157 links called Puuwaiaha
 thence at 30.35 E 1419 links to another 157 links of Puuwaiaha
 called Puuwaiaha; thence at 26.33 E 9033 links to place called Puuwaiaha
 Point is west of some water bushes, and on a N.W. corner of
 about 75 of an acre, thence at 17.153 E 5753 links (commencing at 5820
 links and 60 links to the west of a gateway of stone wall and
 a land owned by Mr. Powell) to a large stone corner called Puuwaiaha
 thence the following points have been set out, to wit: Point D
 Puuwaiaha at 15.32 E thence from Puuwaiaha at 28.16 5907 links to
 the sea; thence at 14.49 E 2800 links to place called Puuwaiaha
 (at 1700 links on the line from the N.W. corner of Puuwaiaha set
 out by the Puuwaiaha of this land), thence from Puuwaiaha
 at 5.10 E 3835 links to a large open landing, thence from
 Puuwaiaha, and called Puuwaiaha. thence at 2.37 E 2100 links to
 Puuwaiaha; thence a hole has been cut in the rock the boundary
 runs along the ridge to the entrance of the landing from the
 thence the following points have been set out, to wit: Point E
 Puuwaiaha at 15.32 E

Boundary of the Ahupua'a of Hanalei

at sharp point on the Western boundary towards Waialeale at 15.37
 Puuwaiaha at 49.48 E, thence from Puuwaiaha following along the ridge to a
 sharp landing at 10.10 E 6300 links, and called Puuwaiaha, thence following
 along the ridge to a sharp landing on the north to a large open landing
 at 10.10 E 3700 links, thence along the ridge to the top of Puuwaiaha
 at 17.65 E 3200 links from thence containing along the ridge
 until joining open landing from Puuwaiaha; Point B Puuwaiaha
 thence in a N.W. direction along the ridge until joining the open
 landing up the western boundary of the land and Eastern
 boundary of Waialeale.

The Western boundary, into districts as
 far starting from Puuwaiaha Point a place will have a
 found. The boundary from Puuwaiaha Point runs at 12.10 E 2200
 links along the ridge, thence at 41.49 E 2300 links along the ridge
 thence at 5.33 W 1710 links along ridge thence at 42.23 W 3050
 links along the ridge, thence at 13.35 W 1400 links along the
 ridge, thence at 66.30 W 780 links along the ridge, thence at 33.02 E
 3600 links along the ridge to the edge of the bush, thence
 containing along the ridge until joining the open landing from
 Puuwaiaha.

Returning again to show the points the boundary
 runs at 39.27 W 323.00 links to two flat areas at old Puuwaiaha
 thence at 36.31 W 2740 links to the sea shore, thence following
 along the shore in an easterly direction to place of commencement
 see below.

Within these lands are situated the lands of Olole
 Puuwaiaha, Waialeale, Puuwaiaha and a land owned by Mr. Powell
 thence the area is not given in survey.

James W. Gray, Surveyor
1873

Appendix C: Guidelines For Assessing Cultural Impacts

Adopted by the Environmental Council, State of Hawai'i November 19, 1997

Introduction

It is the policy of the State of Hawai'i under Chapter 343, HRS, to alert decision makers, through the environmental assessment process, about significant environmental effects which may result from the implementation of certain actions. An environmental assessment of cultural impacts gathers information about cultural practices and cultural features that may be affected by actions subject to Chapter 343, and promotes responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

The Environmental Council encourages preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance for any assessment of a project that may significantly affect cultural resources.

Background

Prior to the arrival of westerners and the ideas of private land ownership, Hawaiians freely accessed and gathered resources of the land and seas to fulfill their community responsibilities. During the Mahele of 1848, large tracts of land were divided and control was given to private individuals. When King Kamehameha the III was forced to set up this new system of land ownership, he reserved the right of access to privately owned lands for Native Hawaiian ahupua'a tenants. However, with the later emergence of the western concept of land ownership, many Hawaiians were denied access to previously available traditional resources.

In 1978, the Hawaii constitution was amended to protect and preserve traditional and customary rights of Native Hawaiians. Then in 1995 the Hawaii Supreme Court confirmed that Native Hawaiians have rights to access undeveloped and under-developed private lands. Recently, state lawmakers clarified that government agencies and private developers must assess the impacts of their development on the traditional practices of Native Hawaiians as well as the cultural resources of all people of Hawaii. These Hawaii laws, and the National Historic Preservation Act, clearly mandate federal agencies in Hawaii, including the military, to evaluate the impacts of their actions on traditional practices and cultural resources.

If you own or control undeveloped or under-developed lands in Hawaii, here are some hints as to whether traditional practices are occurring or may have occurred on your lands. If there is a trail on your property, that may be an indication of traditional practices or customary usage. Other clues include streams, caves and native plants. Another important point to remember is that, although traditional practices may have been interrupted for many

years, these customary practices cannot be denied in the future.

These traditional practices of Native Hawaiians were primarily for subsistence, medicinal, religious, and cultural purposes. Examples of traditional subsistence practices include fishing, picking opihi and collecting limu or seaweed. The collection of herbs to cure the sick is an example of a traditional medicinal practice. The underlying purpose for conducting these traditional practices is to fulfill one's community responsibilities, such as feeding people or healing the sick.

As it is the responsibility of Native Hawaiians to conduct these traditional practices, government agencies and private developers also have a responsibility to follow the law and assess the impacts of their actions on traditional and cultural resources.

The State Environmental Council has prepared guidelines for assessing cultural resources and has compiled a directory of cultural consultants who can conduct such studies. The State Historic Preservation Division has drafted guidelines on how to conduct ethnographic inventory surveys. And the Office of Planning has recently completed a case study on traditional gathering rights on Kauai.

The most important element of preparing Cultural Impact Assessments is consulting with community groups, especially with expert and responsible cultural practitioners within the ahupua'a of the project site. Conducting the appropriate documentary research should then follow the interviews with the experts. Documentary research should include analysis of mahele and land records and review of transcripts of previous ethnographic interviews. Once all the information has been collected, and verified by the community experts, the assessment can then be used to protect and preserve these valuable traditional practices.

Native Hawaiians performed these traditional and customary practices out of a sense of responsibility: to feed their families, cure the sick, nurture the land, and honor their ancestors. As stewards of this sacred land, we too have a responsibility to preserve, protect and restore these cultural resources for future generations.

Cultural Impact Assessment Methodology

Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

Such information may be obtained through scoping, community meetings, ethnographic interviews and oral histories. Information provided by knowledgeable informants, including traditional cultural practitioners, can be applied to the analysis of cultural impacts in conjunction with information concerning cultural practices and features obtained through consultation and from documentary research.

In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. Thus, for example, a proposed action that may not physically alter gathering practices, but may affect access to gathering areas would be included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural

impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices.

The historical period studied in a cultural impact assessment should commence with the initial presence in the area of the particular group whose cultural practices and features are being assessed. The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs.

The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

The Environmental Council recommends that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. Identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua'a;
2. Identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
3. Receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
4. Conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;
5. Identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and
6. Assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Interviews and oral histories with knowledgeable individuals may be recorded, if consent is given, and field visits by preparers accompanied by informants are encouraged. Persons interviewed should be afforded an opportunity to review the record of the interview, and consent to publish the record should be obtained whenever possible. For example, the precise location of human burials are likely to be withheld from a cultural impact assessment, but it is important that the document identify the impact a project would have on the burials. At times an informant may provide information only on the condition that it remain in confidence. The wishes of the informant should be respected.

Primary source materials reviewed and analyzed may include, as appropriate: Mahele, land court, census and tax records, including testimonies; vital statistics records; family histories and genealogies; previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs; and other archival documents, including correspondence, newspaper or almanac articles, and visitor journals. Secondary source materials such as historical, sociological, and anthropological texts, manuscripts, and similar materials, published and unpublished, should also be consulted. Other materials which should be examined include prior land use proposals, decisions, and rulings which pertain to the study area.

Cultural Impact Assessment Contents

In addition to the content requirements for environmental assessments and environmental impact statements, which are set out in HAR §§ 11-200-10 and 16 through 18, the portion of the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

7. A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.
8. A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.
9. Ethnographic and oral history interview procedures, including the circumstances, under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.
10. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.
11. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.
12. A discussion concerning the cultural resources, practices and beliefs identified, and, for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.
13. A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.
14. An explanation of confidential information that has been withheld from public disclosure in the assessment.
15. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.
16. An analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.
17. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

The inclusion of this information will help make environmental assessments and environmental impact statements complete and meet the requirements of Chapter 343, HRS.

Appendix D: Community Contact Letter

Aloha e [Contact Inoa]

My name is [Contact Inoa], I work with Nohopapa Hawaii, a Native Hawaiian owned and operated cultural resource management company whose mission is to preserve and perpetuate out cultural sites, stories and practices. We are undertaking the Cultural Impact Assessment (CIA) component of a larger Environmental Assessment (EA). The EA is being done on behalf of Department of Hawaiian Homelands, for the Hanapēpē Homestead Plan; specifically for the planning process being done for a proposed build out of Residential and Subsistence Agriculture Lots.

We hope to collaborate with individuals knowledgeable to the study area and its surrounding traditional resources. Our kuleana in these interviews is to better understand the traditional cultural history and resources of the area and identify potential impacts from the proposed project plan. If impacts are identified, we welcome input on solutions and alternatives that would benefit DHHL and the Hanapēpē community, present and future. I have attached some maps and fact sheets for your reference.

- Some topics and questions we were hoping you could share about regard:
- Native Hawaiian traditions and accounts (mo'olelo, inna 'āina, mele, oli, 'ōlelo no'eau, wahi pana, etc.).
- Past and present cultural practices and protocols.
- Knowledge of natural and cultural resources in the area.
- Concerns and suggestions for future management of this area.
- Solutions you think might be helpful towards these concerns.
- Additions that could be made to help benefit Hanapēpē or help build a better relationship with and its cultural resources.
- Referrals of kūpuna and kama āina who might be willing to share their cultural knowledge of the area.

If you have any questions 'ike or mana'ō you would like to share please contact Lilia Merrin at liliamerrin@hotmail.com, or Dominique Cordy at liveinthenaau@gmail.com. We look forward to collaborating with you to document some of the cultural history of the Hanapēpē Hawaiian Homelands and its surrounding community for this important study.

Look forward to hearing from you soon.

Mahalo,

Lilia Merrin

liliamerrin@hotmail.com

APPENDIX E: Interview Questions

Please note that not all questions were asked of each interviewee. List was customized based on the background, theme, or expertise and experience of the individual.

Background Information:

- o Name:
- o When and where were you born:
- o Where did you grow up:
- o Where you reside
- o Occupation /Affiliation:
- o Personal/Family connection to the Hanapēpē area:

Mo 'ōlelo, Place Names, Mele:

- o Hula
- o Legends or mo'olelo –
- o Akua & 'aumakua -
- o Place names -
- o Mele and Oli -

Cultural and historic sites:

- o Cultural or archaeological sites -
- o Historical sites (plantation days, railroad, ditches) -
- o Lava tubes, burials –
- o Trails –
- o Makai, Salt pans, Ukula –
- o Mauka, Put Lani and forest -

Historical Information:

- o Past or present land ownership and use -
 - Kuleana lands
- o Historic uses of the area:
 - Sandalwood, sugar, railway, pipi (ranching)
 - Plantation camps
- o Historic events
- o Historic persons

Resources:

- o Native plants and trees -
- Uses of these resources -
- o Water resources, springs, streams -
- o Winds & rains -
- o Mountains, pu'u, pali-
- o Fishing & marine resources -
- o Native birds or animals -

Cultural Practices (gathering, hula, protocol, ho'okupu):

- o Current cultural practices -
- o How did you learn the activities and how long have you been doing them -
- o Past cultural practices -
- o Past or present cultural protocols observed

Hunting & Fishing Practices:

- o What do you hunt/fish?
- o General area you hunt/fish?
- o What kinds of changes to the natural/marine landscape have you noticed since hunting/fishing in those areas?

Knowledge Sources:

- o Where does your knowledge come from:
- o Your own direct knowledge
- o Knowledge reported to you by 'ohana
- o Knowledge reported to you by others
- o Knowledge from sources such as written sources, archival sources, digital

Community / Individual Concerns:

- o What changes in the landscape, practices and uses of natural and cultural resources have you observed in your lifetime:
- o Do you have any, or know of any concerns the community might have related to cultural practices in the vicinity:
- o Should all the cultural information you are sharing with us be included in the study? Is there any information that you do not want to be public?


Community / Individual Recommendations:

- o Concerns about potential impacts to the Cultural resources in the area?
- o What solutions you think might be helpful towards these concerns?
- o Additions that could be made to help benefit Hanapepe or help build a better relationship with and its cultural resources

References:

- o Can you refer us to any other individuals or organizations we should talk to?

Appendix F: Informed Consent Form


INFORMED CONSENT FORM

Aloha mai, Nohopapa Hawai'i appreciates your generosity and willingness to share your knowledge of the wahi pana of Hanapepe and its surrounding areas. This form will be used to guide and inform Nohopapa Hawai'i's Cultural Impact Assessment (CIA) for the DHHL Hanapepe Homestead Project. The CIA is one component of the Environmental Assessment (EA) that is being prepared by SSPM International, for the Department of Hawaiian Home Lands (DHHL). The EA document will serve as the compliance document for the fill build out of the Hanapepe DHHL Hawaiian Homelands.

Nohopapa Hawai'i understands our responsibility in respecting the wishes and concerns of the interviewees participating in this study. Here are the procedures we promise to follow:

1. The interview will not be recorded without your knowledge and explicit permission.
2. You will have the opportunity to review the written transcript and summary of your interview. At that time, you may make any additions, deletions or corrections you wish.
3. You will be given a copy of the interview transcript and/or summary for your records.
4. You will be given a copy of this release form for your records.
5. You will be given a copy of any photographs taken of you during the interview.

For your protection, we need your written confirmation that (circle yes or no below):

1. You consent to the use of the complete transcript and/or interview quotes for the purposes of this study. Yes No
2. If a photograph is taken during the interview, you consent to the photograph being included in this study. Yes No

I, _____, agree to the procedures outlined above and, by my signature, give my consent and release of this interview and/or photograph to be used as specified.

(Please print your name here)

(Signature) _____ (Date)

Nohopapa Hawai'i, LLC nohopapa.hawaii@gmail.com

Appendix G: Bill for Environmental Impact Statements

A BILL FOR AN ACT RELATING TO ENVIRONMENTAL IMPACT STATEMENTS
[UNOFFICIAL VERSION] HOUSE OF REPRESENTATIVES H.B. NO. 2895 H.D.1
TWENTIETH LEGISLATURE, 2000, STATE OF HAWAII

A BILL FOR AN ACT RELATING TO ENVIRONMENTAL IMPACT STATEMENTS. BE IT
ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights.

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawai'i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai'i Revised Statutes, is amended by amending the definitions of "environmental impact statement" or "statement" and "significant effect", to read as follows:

"Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The initial statement filed for public review shall be referred to as the draft statement and shall be distinguished from the final statement which is the document that has incorporated the public's comments and the responses to those comments. The final statement is the document that shall be evaluated for acceptability by the respective accepting authority.

"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of

the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic [or] welfare, social welfare[,], or cultural practices of the community and State."

SECTION 3. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 4. This Act shall take effect upon its approval. Approved by the Governor as Act 50 on April 26, 2000.

Appendix H: Act 50

Act 50 [State of Hawai'i 2000]. H.B. NO. 2895 H.D.1 was passed by the 20th Legislature and approved by the Governor on April 26, 2000 as Act 50. The following excerpts illustrate the intent and mandates of this Act:

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawai'i. Articles IX and XII of the State constitution, other State laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

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Appendix I: Interview Transcripts and/or Summaries

HANAPĒPĒ CIA INTERVIEW QUESTIONS Chad Shimmelfennig

Background Information:

- o Name: Chad Shimmelfennig
- o When and where were you born?
 - 1980 and Waimea, Kaua'i
- o Where did you grow up?
 - Chad grew up mostly in Hanamā'ulu with his mother, "but my family (?) is from the West side and predominantly from Poipu, Koloa area"
- o Do you have personal or family connection to Hanapēpē area?
 - Chad shares, "Yes, basically from Koloa or Māhālepi'i to Waimea Valley. I have a lot of connections ancestrally and personally."
- o How long have you been a teacher at 'Ele'ele Elementary?
 - Four years
- o What grade to you teach?
 - Fifth grade
- o What do you currently do to incorporate 'ike Hawai'i or 'ōlelo Hawai'i into your curriculum? What kinds of activities do you do? And are these activities in the Hanapēpē area?
 - Chad shares, "The first month, when the kids come to my class, particularly, they learn a set of oli and mele. So before you can even walk through the door, we have it to where our entire fifth grade will kāhea. We'll ask permission to come into the classroom. The first few months the teachers will komo or we'll let them know when there's proper time to come in. Now we have it to the point where the students themselves are able to do their own komo to allow the rest of the classes to come in. Once they come in, we have the pledge of allegiance, Hawai'i Pono'i. We have our oli Kaua'i. For my class, we particularly do a lot of the protocols and that are associated with our culture. So they need to learn all the protocols or the names. They learn oli Kaua'i. Right now because of the current situations going on, the kids really took favor to 'Kūha'āheo' (mele) so they've already mastered the whole song. We sing that every single day. Once that is done, then we start our work. And then once we do our curricular morning work, we have another set of oli and mele that we do. I think about 10 total after that, just to kind of start the day. And right now, because Makahiki season, we have Lono Makua. In the morning we leave (the classroom), kami ka pi'i. The whole entire school gets to hear us. We walk out with Lono Makua as a class. We bring him around the school and then we set him up in front of our lo'i, and we do all our protocols in front of Lono Makua."

- Chad shares he's the only kumu that is doing this, "I'm trying to get to the point where people see this as a normal thing, creating a norm. At Kamehameha School and Anuenue, it's not a big deal (protocols). But trying to incorporate that into a DOE Public School, it's kind of taboo. So luckily it's been growing. Every year we just try continually stack more information for the kids to do. Such as building hale which is all our math. They (haumāna) wanted to do something big and wanted a lo'i. That was all math, again. This year we're doing a lot of science so construction of ahu which promotes a lot of engineering and problem solving. We get to go into the community and learn from community members, learn wahi pana, and they learn all these different protocols at the school. Our school particularly is really in favor of all this."
- Chad continues, "Kekaha School is doing a lot of big things so we communicate amongst the Kona Moku side and strengthen our kids in that sense. During Makahiki, we have a he'e hōlua so we slide on the hill. The kids learn this on 'Ulu Day. They learn the significance of 'ulu, mo'olelo, and the cultural significance behind the plants. Along with several other teachers at 'Eie'ele School, we're trying to connect the place with our sciences versus trying to teach the kids how to perform on a test. If we tell them about George Washington and the cherry tree, they have no connection to that and will ask, 'What's a cherry tree?' But if we tell them about Queen Lili'uokalani and Iolani Palace, they make the connections, 'Oh, I went there.' Or Kaunualii, 'This is where he lived and the places he went.' When we talk about pa'akai, they can see the pa'akai and the impacts happening today in their backyard. So we tie the kids into more where they're from to create what essentially we're calling Nā Hopena A'o (HĀ) for the DOE. Which is a policy that gives us (teachers) end result through our breath or hā. This is kind of what we're trying to really push as far as strengthening our kids so they know where they're from. When you're walking by, you pick up rubbish just because this is your place."
- Chad shares about DOE HĀ policy, "I think HĀ is in its fourth year. It's a policy that has been adopted through DOE. It's not a curriculum. It's not a 'thing'; it's a way of life. I mean we all come from different backgrounds. We all have been raised differently. But yet similarly we're kind of the same because when you walk into a house, you take off your slippers. It's the little things like that which creates a more intentional purpose in the classroom. So, I have the poster (HĀ), these are the values that we would like our students to see. When they leave, they have this strong sense of belonging, the sense of Hawai'i. Making them proud of where you're from."

Impacts to cultural education

- In 20 years DDHL will have 482 new residences in Hanapepé (as the max build out). Therefore, there will probably be more students enrolling in this school.
 - Is there enough infrastructure and resources (i.e. classrooms and teachers) to sustain the future in-coming student body?
 - Chad shares, "With this amount of count on top of habitat, I don't think there's enough infrastructure there. The campus is large enough and I know firsthand that our administration has requested more buildings and larger infrastructures. And right now, we're going the opposite direction because another private charter school has opened. So it's kind of taken away a lot of resources from us. At the same time, we're going to have an influx of more resources, which increases the amount of

- How will this effect your curriculum? Do you think there will be more of a need for cultural education?
 - Chad believes there will be more Native Hawaiian students or kānaka come to their school which will make it more powerful, "But I don't think it's going to affect the way classes are being taught because the way we're trying to focus things is it doesn't matter who you are, where you're from. This is our culture (Hawaiian). You come to Hawai'i, you're going to learn about Hawai'i. It's just that simple. Now with the increase of the Hawaiian kids, it's going to make it even more powerful because I see a lot of the parents haven't gone through things like this. So they're seeing this for the first time. It will only increase the amount of awareness in our community with our kids having a school with those kinds of foundational concept of Nā Hopena A'o. To increase the awareness in the home, they're seeing things in 'ōlelo Hawai'i and the parents say 'What are you talking about?' So I've seen where parents have even taken a next step and they go out and learn now ('ōlelo Hawai'i). Or they're doing Duolingo with their kids in the car. They're having these conversations. It's not just you come here, you learn."
 - Chad continues, "There will be a lot of positives. First, you're growing a community. You're going to have a lot of people because of how it works for Hawaiian Homelands. It's not necessarily you're from this area. You get to come in this area so you may have people not from this area and not knowing Hanapepé culture. Coming from someplace else and saying that this is how we do it. That's a tricky slippery slope right there because you don't know who you'll get, we're they from, what they bring, what's the history is. Whereas everyone here, if you come here and they're like, 'Oh, we know who that is.' If you see someone they don't know, everybody's already talking. As far as teaching, you would hope, knowing that the kids have an invested concern into anything we talk about, they're invested into it. I mean a lot of kids they come out, when you teach them something about their culture or even if it's not their culture, but you set such an important precedent on learning this culture. It's not their kids and it's not the parents at all and it's not the community. A lot of times it's us as teachers, we're just not comfortable being uncomfortable. We're supposed to be the wealth of knowledge or the source of knowledge. Whereas, we got to teach for the kids in our culture, our wahi pana, and their kuleama for living in this area, and what to expect when they move out from this area. That kind of thing is the biggest concerns. And with the kids being invested in this, it should increase the amount that they would like to learn or want to learn. Luckily, we have such a great community and the ability to do these things. And now that the DOE is even allowed 'ōlelo

classes for free now. So I mean that's a huge thing that we've just celebrated. When you come into our class, a lot of what you learn, you will learn in both languages. I look at and live by the quote 'To be the teacher you wish you had when you were younger' every day."

- What resources do you think you or other kumu will need in the future?
 - ✳ Chad comments, "A lot of it really comes down to just how much they're going to want to put in. You're getting what you put in. As far as resources, we have an abundance of resources. We have people that have been living here for generations that have this 'ike about this area. If you want to go talk pa'akai, you can go see the source. You know who they are. If you want to see about matuka, you know who to talk to. If you want to go talk about hunting, we have such a bright and vibrant community. You say something and someone will say, 'Oh, go talk to this person. Go talk to uncle so and so.' You'll get the answers so quickly here. And not only that, if you're going to ask, you're going to have to do also. So it's just kind of like, if you don't ask, you're not going to do nothing. But once you ask, you're thrown into it. The community in that sense is purely a beneficial thing around here."
 - I heard the office that you take your students on huaka'i. If you could have an ask, or wish list, to teach 'ike Hawai'i, what would those asks be? What would you like to see?
 - ✳ Chad would like to see more funding. "The kids want to get out, they want to see Hanapēpē Valley. More intentional funds for field trips. They connect culturally and academically for us. We go as far as Waimea to learn about that area because they will eventually go there. The fourth grade does a great job of learning about the Hanapēpē ahupua'a. We try to expand over."
 - ✳ Chad shares about the different huaka'i with haumāna, "A range from just going down to the swinging bridge to Salt Ponds to learn about the reef ecosystem there and planting limu or learning about the different limu. Pa'akai is a big one but the seasons are different from when we're in school. But a lot of the kids are luckily to be able to go with family or friends to help. As far as being from Hanapēpē, the kids all know fishing, where not to go swim because it's more sharks. These are just the kinds of things you grow up with. They know what to do."

Mo'olelo, Place Names, Mele, Hula:

- Do you know any mo'olelo for the Hanapēpē area?
 - ✳ Regarding mo'olelo, Chad mentioned a lot of it had been lost due to the Plantation Era, "We're lucky to have a few legacy kūpuna like aunty Janet Kahalekomo whose seen a lot of changes in Hanapēpē. There's books such as *What is Hanapēpē?* which has three versions and *Why they call it 'Eie'ele?*, regarding the battles that happened here. We're still discovering heiau way up in the mountains right now. We know Hanapēpē through the nūpepa which was predominantly a kalo farming area which had a good irrigation system. A lot of kalo was grown all up and down this valley. And then from there, we had houses, we had a lot of wars. From the stories I've been told from my dad and from his grandfather, the theater was like one of the main hubs from West side, South side, even Lihū'e. You came here to watch movies, have drinks. This was the place to be. We call it the little big town now. Stories from my dad taught me, we'd be driving down here, he'd be like, 'Oh, there was that,

there was this over here. Your grandfather said that was over there.' The massacre (the Hanapēpē massacre) that happened, my grandfather was a witness. So stuff like that, you make connections. It's really cool to hear these things."

- ✳ Chad continues to share about 'Eie'ele, "When you drive by it's all black because all the other street names are colors. But actually 'eie'ele was because of the war that happened to the last revolt of Kamehameha and the last loyalists to Kaumuali'i. And they said that the blood shed made the ground black because when the blood dried, it was black. That was one version. Or the smoke that could be seen from outside of Hanapēpē, they called it 'eie'ele because of the smoke against Kaumuali'i troops, which had still spears the traditional way versus Kamehameha troops which had muskets. So the black would have either been the smoke or the blood that dried in the ground that covered this whole area. And then they start naming the streets color names so then it just got lost."

Natural Landscapes, Resources, Uses:

- Can you share anything about the following in the area:
 - Water resources, springs, streams
 - ✳ Chad shares, "There's water resources but the only unfortunate part in this area because it's been badly damaged through the Plantation Era. Were there historical sites? Probably. Are they still there? Probably not because we all know in 1870s to 1950s they just moved whatever was in their way to gain more access to sugarcane. I don't know if there's even anybody alive who remembers many of the things or maybe they have mo'olelo that was passed down from their family. We know there's heiau in this area that haven't been desecrated. However, in this particular area, we can't even say for sure because it's just been bulldozed to make more land for the cane (sugar). It took away that resource that we did have. So now we're left with just fields. But on the other hand, now we can make these fields for people for growing plants. Because we know the fields are fertile. Now we're giving it back to the people and now they can farm. They can do subsistence living. We can encourage all these things."

Recommendations

- What changes in the landscape, practices and uses of natural and cultural resources have you observed in your lifetime?
 - ✳ Chad comments, "To be honest, when you're young, you really don't take notice of things. You just take things for granted. Today, I see Hanapēpē becoming more vibrant with Hanapēpē artwork, a lot of local businesses, communities are coming together. Usually you just pass through here on your way to Waimea. But now, it's becoming a place to stop because there are all kinds of good local food that you can grab. You have more of a variety now. We have two stop lights with so much resources in between those two stop lights...food to shopping to art galleries. And with that comes a negative effect with the more people coming through...more construction, more infrastructure. The biggest one right now we see in Hanapēpē is the helicopter companies that are affecting the local pa'akai. That's the last resource we have here. There's a big fight however there's not a lot of support higher up than just the people here to kind of support that."

- Do you have any recommendations or concerns regarding cultural and natural resource management or protection, and land use in the area?
 - » Chad mentions drainage. "Is the biggest concern. When they started building the access and the amount of traffic because going up Moi Road, it's pretty simple. There's a small community up there. There's not a lot of traffic. But they started bringing in machinery, loud noises that are right there. How is all of this going to be affected? Right now, when a big storm hits, many of the houses get flooded because of the terrain it was built on. The engineers really don't take that into consideration. They put ditches but they don't work. Then you have the gully, plus all this area was an old dump with metal parts. These are things that have to be taken into account. Where will the rubbish go? We take one double negative, basically, and it was turned into something, we're in the good. But ultimately what they're trying to do, it's only going to be beneficial. We know there's a lot of people on the list. It's going to increase or decrease the amount of names of the list (DHHL). But there's a limited amount of people who can apply now."
 - What solutions do you think would be helpful towards these concerns?
 - » Chad mentions there may be solutions, but he doesn't know the best solution, "You're going to have ten different people with different solutions and outcomes. So it's really hard. Wherever the drainage goes, it heads to the kai. Right now, we're in line with our local pa'akai in Hanapepe Bay. When it rains mauka, the Bay is constantly brown. I've never seen the Bay clear or blue. It's brown. There is effects from construction that far up with everything rolling downhill."
 - How would you like your 'ohana and other to culturally interact with Hanapepe? Do you think there can be improvements to sharing about cultural resources in the area? If so, how?
 - » Chad comments talking to the kūpuna is most important, "They're from here and they know this place. The State was trying to give out this land and make a place for the community to go to but they never got in touch with the community. They didn't give anybody in this area that respect their families deserved. If things are back-door, you're going to receive a lot of resistance from the communities, particularly on this side – Waimea, Kekaha. The smartest thing is to make it really transparent as far as what you want to do and get the good and the bad from the community but listen to what the community has to say. That's the biggest thing. We don't want this to turn out to be like Lihue. We want it simple. We want it country when you drive by. That's what keeps Kauai, Kauai. That's the simple way and everybody's family on this side. Finding out what the people want first versus what you think is the smartest way to do things here."

Mana'o:

- Referrals to other individuals or organizations with knowledge of Hanapepe
 - Chad refers aunty Janet Kahalekomo who was also kupuna at 'Ele'ele school for many years. Malia Nobrega Olivera. Three families in the community: Santos, Ka'ohi, Kali.
- I just need to get verbal consent, may we use the information from today's interview for our write up to SSFM for DDHL?
 - Chad gave verbal consent, "Yes."

HANAPĒPĒ CIA INTERVIEW QUESTIONS

Ku'ulei Santos

Background Information:

- Name: Ku'ulei Santos
- When and where were you born?
 - Born and raised on Kauai
- Where did you grow up?
 - West side of Kauai
- Can you share about your personal family connection to the Hanapepe area?
 - Ku'ulei shares her father was born and raised in Hanapepe. "He lived right by Port Allen and he started making Hawaiian salt when he was a little kid, probably 10 or 11, I think. That's kind of my family connection. My grandmother lived on Ni'ihau for a really long time. My dad's brothers were raised on Ni'ihau so my family has pretty much been from that side of the Island."

Mo'olelo, Place Names, Mele, Hula:

- Do you know any traditional accounts including place names, mo'olelo, 'ōlelo no'eau for the Hanapepe area?
 - » Ku'ulei shares about salt making stories, "The two that I share is how Hawaiian salt was made and its connection between why Pele was always hanging out in the area. Back in the day, Hawaiian salt was made and Hawaiians believe you only gather, you only hunt, you only fish for what you can use. So there was a woman, she was on the beach called Puolo Point or Salt Pond Beach Park. She caught too many fish and tried to give them away. She walked up and down the shoreline to try and give away all the fish but she couldn't so she felt really bad. She started to cry. A woman appeared from the bushes and said, 'Please don't cry. Follow me.' The woman followed her to an area, dug a hole, and she taught her how to preserve the fish using salt. They said the lady who appeared from the bushes was Pele. They say Pele was hanging out over there because she liked the shark god who liked to visit her so he would swim underground in the tunnels. The way Hawaiian salt is made, water flows underground into our wells. So they say that's why, she wasn't allowed to go to the ocean. They also call that bay right there before Salt Pond or Puolo Point, Sharks Bay."

Natural Landscapes, Resources, Uses:

- Can you share about the mauka-makai resources and their relationship and connection?
 - Ku'ulei comments that where Hawaiian salt is made is the lowest area which is surrounded by everything, "So all the entities matters to us. The way the water flows underground into our tunnels. The way the clay appears in certain areas, that helps us build the clay pods. The way the brine shrimp kind of just shows up in our wells, it's all due to how everything flows together. If you look at the kind of water that in the salt making area, it's not 100% saltwater. It's a little bit of fresh water. And so the combination of it helps. It can't just be all salt water. So that's not just coming from the ocean. We don't really know what exactly happens underneath to give it all those elements to help us make Hawaiian salt. Cause you figure

you've got the clay going on over there, not sure how that happens. You got the brine shrimp, not really sure how all of a sudden people have brine shrimp. And then you've got the water that flows underground into our actual wells, which is not really always a combination of salt and fresh water."

Recommendations

- o What changes in the landscape, practices and uses of natural and cultural resources have you observed in your lifetime?
 - * Ku'ulei shares, "It's not the native plants that surround the area anymore. We don't have a lot of protection because we have a parking lot that's eroding and nothing is offering enough protection. A bunch of native plants **(unsure of company helping as recording was inaudible)** are being started for us so we can plant them back for protection. So before the salt season, it's a lot harder to find some of the things that were so abundant in the past. Like the clay that we use to make the actual salt beds used to be so easy. Now it's like, you know, you ever watch that movie *Holes* and then you see all the like piles of dirt? There is that movie where it's holes and they're digging for treasure. And so you look on the desert and then there's all of these like mounds of dirt. That's what salt makers look like now. We're trying to dig for clay. During the summer, you'll see like all these hills of clay but you can't find it anymore. So it's harder and harder to find the clay to make Hawaiian salt."

- o What concerns do you have about potential impacts to the cultural resources in the area?
 - * Ku'ulei comments, "Back in the day, we used to give away five-gallon buckets. If you asked me for Hawaiian salt, I would give you a five-gallon bucket. Now, we can't give. Someone asked me yesterday for 25-pounds of Hawaiian salt. I'm like, 'We haven't made Hawaiian salt last year. I can't give you that as much as I would like to.' And it's just because my father's generation, the way his mom taught him and that whole generation prior to me, they all believe that you just go into the salt making area and you just work. That is your goal. You work, you will make a product, and you will give it away. You give it away because you love your culture, you love your history and that's just what we do. So you don't talk about it to anybody. Everybody will understand that you are creating something because everybody asks you for it. So they'll just leave you alone and they'll help you protect the area. But when they didn't talk about it, everybody either forgot about them or didn't even think to, they had to deal with it or had to protect it or had to care about it. You know what I'm saying? So what happens when that happens is that everything bad flows to us and no one cares. So people come and they'll party in our parking lot. They'll throw their glass bottles, and there's not a year goes by that we don't get hurt. We did an on excursion with a halau this past summer and someone had to go to the emergency room and get stitches because they got cut on glass. But that happens every single year. We've got people who drive on the sand. It's illegal to drive on the sand. Every time you drive on the sand, right in front of our salt making area, you take that sand away from the beach, which is our protection against the ocean and all that kind of stuff. So when the waves come up, it floods us. You have the County who illegally dumped all this old asphalt right in between the beach and our salt patch. So water doesn't flow like it used to underground anymore. The way we make Hawaiian salt is water flows underground. You throw old asphalt in that drainage system. What happened? Water won't be able to flow in and out as it used to. So we're not able to make salt as we used to make salt. You've got a helicopter company that continues to fly over us creating more dust and debris. I mean, they just don't care about what kind of neighbors they want to be. You know what I'm saying?"

- * Ku'ulei shares about the helicopter company, "When it comes to that helicopter company, the salt makers have been fighting that entity for probably 50-years. If you look at they're planning records, there is a really good intervention when the helicopter company tried to put in the fuel tank. Wilma Holi went in and they interviewed her. She tells a lot of history of the area and why they shouldn't have expanded. Then if you look at the history of that helicopter company, they have done nothing but be bad neighbors. They fly over us; they try to expand. They do things that are so shady. So the owner's prior, Smokey Mountain Helicopters, didn't pay his taxes or didn't pay his tax fees. So then what happens? They came in and wanted to transfer the lease to Maverick. We came in and we said, 'No! You haven't paid your leases. You have to go out to bid and you haven't paid your taxes. So why do all of a sudden you get to transfer your lease? You really should be voided because you haven't paid the rent for a year.' So Maverick came in, paid all their bills, paid off all their things. So then they came back and said, 'Okay, well we want to now transfer over the lease.' So they went to BLNR, because they have to go through that to get it passed. So we went again and said, 'No! These are the rules. These are the regulations. This is why we should hold space first.' (This helicopter company is the biggest helicopter company in the United States) They can only do so many flights. They can't fly over us. So BLNR said, 'Yes, you can have the lease until you guys meet with the salt makers and go over this.' They found a loophole. As soon as Maverick came in, they started doing all this expansion. We came into the Planning Department, we said, 'Wait a minute, they're doing all this stuff.' We had to send pictures before the Planning Commission would go in and do an investigation. The Planning Commission went in, did an investigation, and tried to get them, 'Wait a minute, you have all these unregistered buildings. You have a bathroom, which we told you guys not to put it, specifically told you guys to not put it in a bathroom. You did it anyway. You expanded your offices and built concrete slabs and all this kind of stuff that they weren't supposed to do.' So Maverick came back and said, 'We don't give a shit. We don't care. We're going to fight this.' So we're like, okay, bring it on! So we had to go prove our worth to everybody trying to get money, trying an attorney, try and do all this stuff. They got hit with a fine because they were like, we don't give a shit. They paid the fine. Then they came back and said, 'We don't care. We're going to keep testifying.' So we're like, okay, let's play. So then we started doing the social media and all that kind of stuff, and getting a lot of traction. So then they said, 'Okay, you know what? We're going to withdraw.' So they have withdrawn but now they're trying to find another way to get. So they couldn't hire any engineers or consultants here (Kauai). So now they're on O'ahu trying to redo all the research to get it in. Also, when they went in for their permits or after the fact permits, they hired a cultural advisor that said that the helicopters have no impact whatsoever on the salt makers. That cultural person that they hired, who's from Maui, never stepped in the salt patch, never made salt, never even called us. Never even had a conversation with any of us. I can go on and on about all the bad things that the helicopter company has done and continues to do. We have so many videos of them. They're not supposed to fly over us. They say, 'We don't fly over you.' But we ask them, 'Oh yeah, but you circle around us, you hover and circle.'"
- o Do you have any recommendations or concerns regarding cultural and natural resource management or protection, and land use in the area?
 - * Ku'ulei comments, "It would be nice to close the airport down so we can have that parking area for people to park there. Every time you drive around that area, it compacts the ground. So when you drive on a tunnel that brings in the water to and from us, the more people drive on it, the more you compact it down. So it's harder and harder for the water to flow in and

out and around. So closing the airport would be a good one. Closing the camp or at least lessening the amount of permits they give out would be great. More education for kids or locals not to destroy the area would be beneficial. And people always say, it's the tourists. It's not the tourists. The tourists don't come and party in the parking lot and break beer bottles and cans."

- How would you like others to culturally interact with Hanapepe? Do you think there can be improvements to sharing about cultural resources in the area? If there's any ask, what would you ask?
 - » Ku'uilei responds, "For me as a salt maker, I always have to prove my worth. Taro farmers don't have to prove their worth or a hula dancer doesn't need to prove that the hula is important. But for salt makers, for some strange reason, we are constantly having to tell people that we are important and it's important to protect the area. It's important to have your kids not bum rubber in the parking lot constantly or throw their beer bottles."
 - » Ku'uilei talks about improvements, "I would like to see the salt making parking lot closed off and closed off so that people can't drive in that parking lot. There's a middle road that the County illegally put in, so we would like to have that taken out. We would like to close the beach park from all the campers because it's destroying the resources and the resources at that beach park cannot hold the amount of campers that they're allowing in the area. That would be another one. The homeless camp across the street just got internet service. Don't ask me how. They don't have water, they don't have electric, but they have a generator and solar panels and so the electric company just went and installed cable for them. How can you be a homeless camp and you go to install cable? It's just mind boggling to me like! Why is it that a lady can raise a hundred cats in our borders? Because she's a little old lady and wants to start a cat colony that lines our salt area. Why is that ok? It's going to take years to get rid of her. You know what I mean? Like why is it okay that a homeless camp can pop up right in our salt patch. But for us to get somebody to kick them out, it's a process, they have to be 30 days' notice. And then you know you have to schedule a time so that they can come and do all this stuff. It's like, wait a minute, they're in our area. We are salt makers. Everyone on Kaula'i or in the State pretty much who has lived here for a certain time has consumed Hawaiian salt. We're the only place in the world that makes it yet it's shared throughout so many people and so many people have partaken in it. But yet it's so difficult to prove that we are important. We're important part of history, culture, and we continue to practice just because we love it and we're just going to give it away. It's not ever sold."
 - » Ku'uilei continues to add about the mauka side and improvements, "I wish everybody would just leave it alone and let it breathe. It would just be a place where it could be allowed to breathe. Let the salt makers be the most important part of the area and let us figure out the plan for the whole entire palena."
 - » For others to culturally interact with Hanapepe, Ku'uilei comments about the proposed project with 482 homes in the next 20-years, "For me, I like to tell everyone that my house is bigger than the home that I live in and everybody has to remember that. If everybody would take the time to understand the area that they call home and what makes that part important and how can we help protect or how can we be mindful. For example, if you go to Hanalei, I understand now why you shouldn't drive on the beach or why you shouldn't do those kinds of things. People just need to remember that when you're calling a place home for all these 400 people, it would be nice if there was a little packet to say, "These are the important things in Hanapepe. These are the historical sites in Hanapepe. This is what makes it unique or important and this is what you should do to help perpetuate or protect or at least learn

about your town." Please understand why you're choosing Hanapepe to be the place that you want to call for the next 30 years."

Mana'o:

- Is there any information you shared with us that you do not want to be public – important?
 - » Ku'uilei comments, "No, I'm very vocal about what I do and why I do it and what I think is important."
 - Referrals to other individuals or organizations with knowledge of Hanapepe
 - » Ku'uilei referred Janet Kahelekomā, Malia, and Kēhaulani Kekua
 - » Regarding Kēhaulani Kekua, Ku'uilei shares, "I love her legends because they encompass all the way up to Bougainvillea Hill and 'Eie'ele School that kind of reflect on the salt making area. So she has a lot more legends of the whole spot. I only know the salt-making one."
 - I just need to get verbal consent, may we use the information from today's interview for our write up to SSFM for DDHIL?
 - Ku'uilei comments, "Yes."

HANAPĒPĒ CIA INTERVIEW QUESTIONS
[Waiting for consent]

Background Information:

- Name: Waiting for consent form

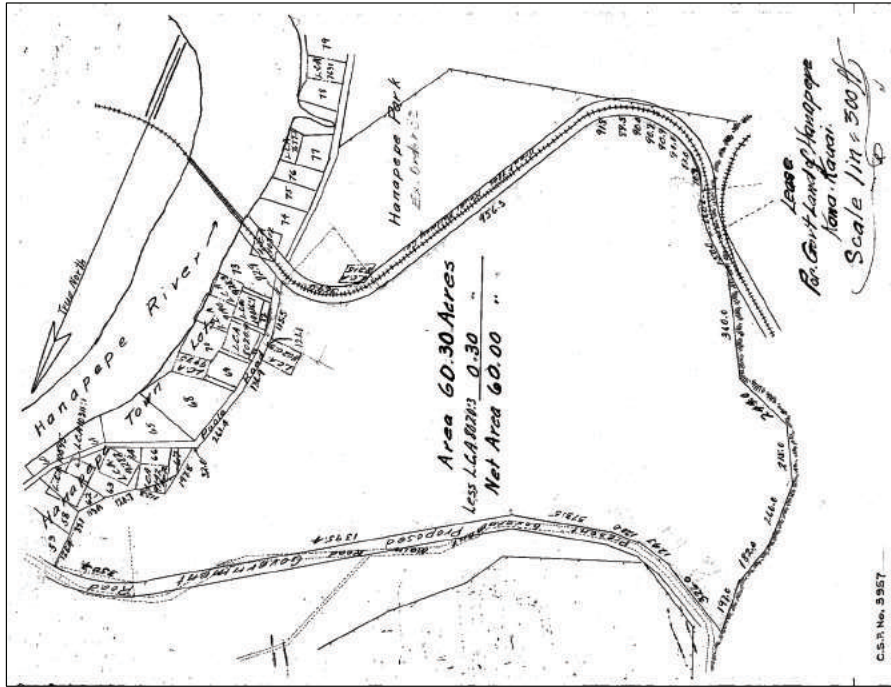
HANAPĒPĒ CIA INTERVIEW QUESTIONS
[Waiting for consent]

Background Information:

- Name: Waiting for consent form

Appendix J: Copy Survey Furnished (CSF) 3957

Showing CSF 3957 map and description, clarifying location of H.H. Brodie lease.



LEASE
CSF 3957

Por. of Gov't. Land of Hanapepe,
Kona, Kauai.
Between Gov't. Main Road and
Hanapepe Park.
General Lease No. 1466
H.H. x H.W. Brodie, Lessee.
Expiry: 30 Nov. 1978
Rental: \$600.00

Copy furnished Land Office,
January 23, 1923

See CSF 8419
See CSF 4176 and Lot 67, Hanapepe
Thru Left

see CSF {
4173
4176
4178
41710

Territory of Hawaii,

Office of the Government Surveyor.

Honolulu, T. H., January 16, 1923

LEASE.

Portion of Government Land of Hanapepe, Kona, Kauai.

Situate between Government Main Road and Hanapepe Park.

Beginning at a pipe at the Northeast corner of this piece, the Northwest corner of Lot 53, Hanapepe Town Lots, and on the South side of Government Main Road, the coordinates of said point of beginning referred to Government Survey Trig. Station "Puolo" being 6421.9 feet North and 4444.8 feet East, as shown on Government Survey Registered Map No. 2615, and running by true azimuths:-

1. 4° 49' 126.4 feet along Lot 53, Hanapepe Town Lots to a stake;
2. 359° 41' 89.1 feet along Lot 58, Hanapepe Town Lots to a stake;
3. 38° 11' 113.9 feet along Lot 66, Hanapepe Town Lots to a stake;
4. 51° 47' 120.7 feet along Lot 63, Hanapepe Town Lots;
5. 77° 18' 112.2 feet along L.C.A. 9142 Apana 2, to Kapakua;
6. 7° 10' 197.8 feet along Lot 67, Hanapepe Town Lots;
7. 68° 21' 32.4 feet along Puolo Road;
8. 16° 23' 261.4 feet along same;
9. 35° 27' 156.4 feet along same;
10. 359° 27' 121.1 feet along same;
11. 350° 27' 122.3 feet along same;
12. 34° 02' 122.3 feet along same;
13. Thence along Grant Street to the left with a radius of 282.8 feet, the direct azimuth and distance being: ~~569.0 feet~~ ^{69° 13' 22" 567.5 feet.}
14. 28° 42' 956.3 feet along same;

Thence along same on a curve to the right, the direct azimuths and distances being, as follows:-

LEASE. Por. of Gov't Land of Hanapepe, Kona, Kauai.

-2-

Jan. 16, 1923

15. 40° 05' 91.8 feet;
16. 59° 56' 89.5 feet;
17. 80° 01' 90.0 feet;
18. 98° 06' 90.7 feet;
19. 115° 19' 90.9 feet;
20. 132° 36' 91.1 feet;
21. 148° 58' 83.0 feet;
22. 157° 30' 10.9 feet along same;
23. Thence along same on a curve to the left with a radius of 365.4 feet, the direct azimuth and distance being: 142° 39' 187.7 feet;
24. 127° 44' 150.0 feet along same;

Thence along the foot of a bluff, the direct azimuths and distances being, as follows:-

25. 150° 30' 360 feet;
26. 111° 20' 244 feet;
27. 179° 30' 240 feet;
28. 179° 30' 240 feet;
29. 195° 00' 258 feet;
30. 175° 10' 258 feet to the South side of Government Main Road;

* 31. 298° 00' 366.5 feet along the South side of proposed Government Main Road;

32. 285° 47' 124.7 feet along same;

33. 287° 55' 120.0 feet along same;

34. 286° 56' 373.5 feet along same;

35. 237° 07' 1395.4 feet along same;

36. Thence along same on a curve to the right with a radius of 526.6 feet, the direct azimuth and distance being: 256° 53' 350.4 feet to the point of beginning.

Area 60-30/100 Acres.

Excepting and reserving therefrom L.C.A. 8020 Apana 3, to Kapoi, which is located within the above described area, as shown on plan hereto attached and made a part hereof, Area 30/100 of an Acre, and LEAVING A NET AREA OF 60-00/100 ACRES.

Compiled from Gov't. Survey Records, by

James M. Dunn
* Correction of *James M. Dunn*
Sept 2, 1930

Assistant Government Surveyor.

Handwritten note:
The 210 feet along the left side of the curve is 210 feet.

Handwritten notes:
The curve is 210 feet
The area is 60-30/100 acres
The net area is 60-00/100 acres

Appendix E - Traffic Impact Analysis Report

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**Hanapēpē Kauaʻi Homestead
Hanapēpē-ʻEleʻele, Kauaʻi**

**Final
Traffic Impact Analysis Report
October 12, 2020**

Prepared for
Department of Hawaiian Home Lands,
Kapolei, Oʻahu,
Hawaiʻi



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I. INTRODUCTION

The State Department of Hawaiian Home Lands (DHHL) is proposing to expand development on 365 acres of gently rolling former agricultural land west of historic Hanapēpē Town and Moʻi Road/Puolo Road on the Island of Kauaʻi. The proposed development is in line with details from the Kauaʻi Island Plan (DHHL, 2004) and includes residential and agriculture homesteading lots, community use, and commercial area including the redevelopment of an existing warehouse. It also includes the development of an internal transportation network that provides secondary access to existing and future residents.

The proposed two-phased development will be located on 359-acres (TMK: (4) 1-8-007:003) of undeveloped land mauka (towards the mountains) of Kaunuauiʻi Highway and adjacent to 59 single-family homes built on DHHL lots as a part of Phase 1. The current development is planned to include 449 residential lots, 111 subsistence agricultural lots, and 6,96 acres of commercial area to be developed over two phases (Phase 2 and 3). A 6.21-acre lot (TMK: (4) 1-8-008:035, 081, 086, and 087) with an existing operational warehouse makai (towards the ocean) of Kaunuauiʻi Highway between Puolo Road and Lele Road will also be redeveloped as commercial area as a part of Phase 3.

In total, Phase 2 plans to have 75 residential lots with an expected full buildout and occupancy by 2025. Phase 3 will have 374 residential units, 111 subsistence lots, and 13.17 acres of commercial area with an expected full buildout and occupancy by 2040. The southwest corner portion of the mauka lot is planned to have community use areas for shared homestead uses and facilities that may include spaces for parks, recreation, cultural activities utilities and other amenities. The proposed development is shown in Figure 1.

This traffic impact analysis report (TIAR) is being prepared to assess traffic impacts as a result of the proposed development of Phase 2 and 3. Multimodal turning movement traffic counts were taken at 15 study intersections in the vicinity of proposed project and analyzed for Existing (2019), Future (2025, 2040) Without Project, and Future (2025, 2040) With Project conditions. The project location and study intersections are shown in Figure 2.

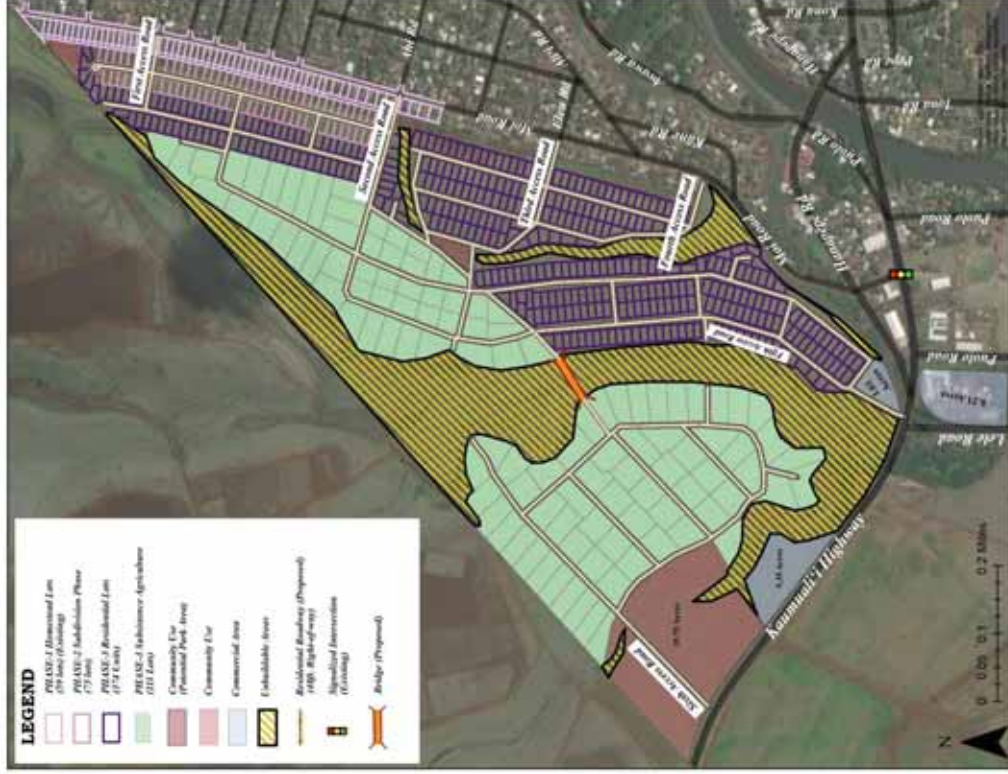


Figure 1: Proposed Development Site Plan

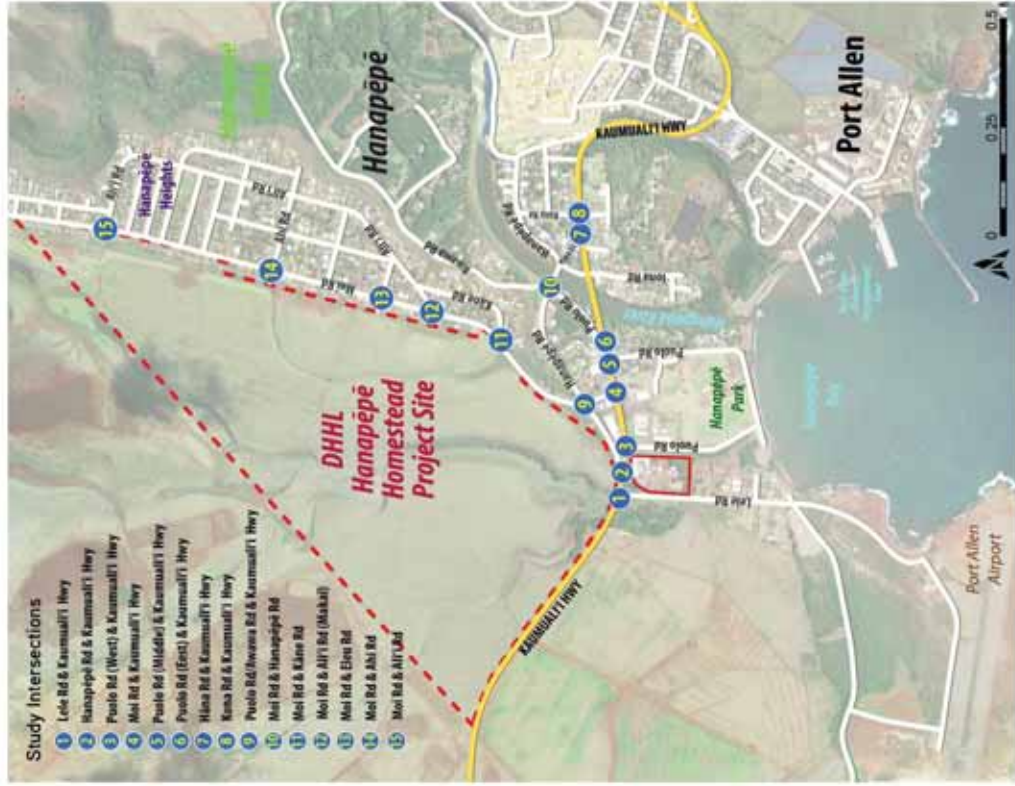


Figure 2: Project Location Map

II. EXISTING (2019) CONDITIONS

Hanapēpē is a historical town with commercial, residential, and industrial uses. Makai of Kaunualii Highway is Hanapēpē Park and Hanapēpē Bay, which is the location of culturally significant salt ponds and public beach. Port Allen is located east of Hanapēpē and is one of the island's main industrial hubs, with a harbor, power plant and solar farm. Port Allen Airport is located west of Hanapēpē.

A. Geometric Configuration

1. Roadway Configuration

Kaunualii Highway (State Route 50) is an undivided, two lane, two-way thoroughfare, classified as minor arterial, and which traverses in the east-west direction in the project area. It connects Hanapēpē to Kaunakani Village in the west and 'Eie'e Town in the east. The posted speed limit is 35-mph in the study area. Six-foot-wide shoulders are present on both sides of the road. No sidewalks, bikeways, or bike facilities exist along Kaunualii Highway in the study area.

Mōi Road starts from the signalized intersection with Kaunualii Highway and ends mauka of its intersection with Alii Road. It is a two-lane, two-way mauka-makai thoroughfare with a 25-mph posted speed limit. It connects Kaunualii Highway to the existing DHHL and Hanapēpē Heights residential neighborhoods. Dedicated left turn lanes are present for both east and westbound movements at the intersection of Mōi Road and Kaunualii Highway. No shoulders, sidewalks, bikeways, or bike facilities exist along Mōi Road.

Hanapēpē Road starts from the stop-controlled intersection with Kaunualii Highway, east of Puna Road and ends at another stop-controlled with Kaunualii Highway west of Puolo Road. It is a two-lane, two-way, east-west thoroughfare with a 25-mph posted speed limit. No shoulders, sidewalks, bikeways, or bike facilities exist along Hanapēpē Road.

Lele Road starts from the stop-controlled intersection with Kaunualii Highway, west of Puolo Road, and ends makai of its intersection with Salt Pond Road. It is a two-lane, two-way, mauka-makai thoroughfare with a 25-mph posted speed limit. It connects Kaunualii Highway to the Salt Pond Park and Port Allen Airport. No shoulders, sidewalks, bikeways, or bike facilities exist along Lele Road.

2. Intersection Configuration

Considering existing traffic movements in the project area and the anticipated impact of the proposed development, the following intersections were selected for study:

1. Lele Road and Kaunualii Highway
2. Hanapēpē Road and Kaunualii Highway
3. Puolo Road (West) and Kaunualii Highway
4. Mōi Road and Kaunualii Highway
5. Puolo Road (Middle) and Kaunualii Highway
6. Puolo Road (East) and Kaunualii Highway
7. Hāna Road and Kaunualii Highway
8. Kona Road and Kaunualii Highway
9. Hanapēpē Road and Mōi Road
10. Puolo Road/Awawa Road and Hanapēpē Road

11. Kane Road and Moi Road
12. Aliʻi Road (Makāi) and Moi Road
13. Eleu Road and Moi Road
14. Ahi Road and Moi Road
15. Aliʻi Road and Moi Road

Existing (2019) lane configurations, marked pedestrian crosswalks, and traffic control at the study intersections are shown in Figure 3 and Figure 4.

B. Multimodal Infrastructure

1. Pedestrian and Bicycle Facilities

Minimal dedicated pedestrian or bicycle facilities exist in the study area. Six-foot-wide shoulders are present on both sides of Kaunualii Highway, however no other roads in the study area have dedicated space for pedestrians or bicycles, limiting the ability for people to get around the community by means other than passenger vehicle.

2. Bus Transit System

Kāuaʻi Bus provides service to the island of Kāuaʻi from Kehaka to Hānalei. Route 100, Kekaha-Lihue mainline passes through Hanapāpē once per hour from 5:40am to 8:40pm. Bus stops are located at Hanapāpē Multipurpose Building on Puolo Road, Hanapāpē Armory and Hanapāpē 1st United Church on Kaunualii Highway. Route 200, Lihue-Kekaha mainline passes through Hanapāpē once per hour from 6:30am to 10:30pm. Bus stops are located at Westside Pharmacy, Mariko Store on Kaunualii Highway and Hanapāpē Multipurpose Building on Puolo Road.

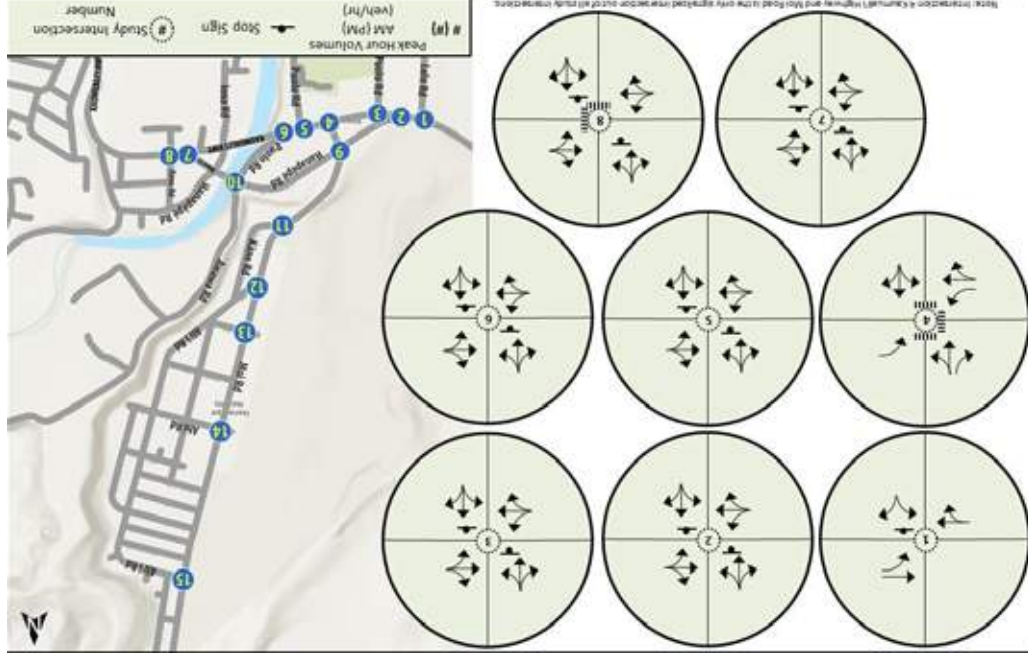


Figure 3: Existing (2019) Lane Configuration (Part 1)

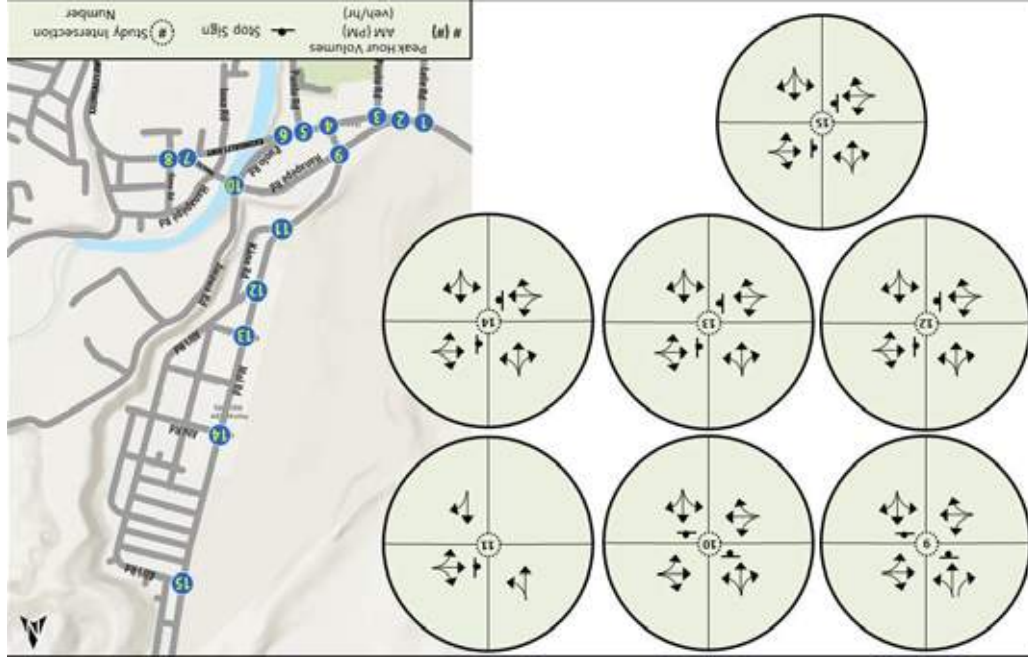


Figure 4: Existing (2019) Lane Configuration (Part 2)

C. Volumes
I. Vehicular Volume

a) Roadway Traffic Volumes

The most recent historical average daily traffic (AADT) along the roadways in the project area in the year 2016 is shown in Table 1. The data comes from annual traffic counts completed by the Hawaiʻi Department of Transportation (HDOT) and provided in *Historical Traffic Station Maps*.

Table 1: Roadway Annual Average Daily Traffic (2016)

Roadway	Station	Location	ADT
Kaunuaʻi Hwy	B730 050 01702	Between Lele Road and Kaunakani Village Road	11,200
Moi Road	B730 543 00006	Between Hanapēpē Road and Kāne Road	4,600

The 24-hour traffic volume distribution along Kaunuaʻi Highway is shown in Figure 5. Along the highway, during the morning peak hour of 6:45am - 7:45am, there were approximately 340 vehicles travelling eastbound and 540 travelling northbound for a total of 880 vehicles. During the afternoon peak hour of 3:45pm - 4:45pm, there were approximately 590 vehicles travelling eastbound and 400 travelling westbound for a total of 990 vehicles.

The 24-hour traffic volume distribution along Moi Road is shown in Figure 6. Along the highway, during the morning peak hour of 6:30am - 7:30am, there were approximately 55 vehicles travelling eastbound and 235 travelling northbound for a total of 290 vehicles. During the afternoon peak hour of 4:15pm - 5:15pm, there were approximately 250 vehicles travelling eastbound and 155 travelling westbound for a total of 405 vehicles. Detailed 24-hour counts are included in Appendix A.

b) Intersection Peak Hour Volumes

Intersection peak period turning movement traffic counts for 13 study intersections were taken on Tuesday, May 14, 2019. The intersection of Moi Road and Aliʻi Road was counted on Wednesday, May 22, 2019. For the intersection of Eleu Road and Moi Road, traffic counts were estimated through balancing that referenced adjacent intersections. These intersections were selected to provide an analysis of both local and regional impacts as a result of the proposed project.

These counts also included classification of heavy vehicles as well as the tabulation of pedestrian and bicycle movements at all intersections. Counts were taken during the AM and PM peak periods from 6:00am - 9:00am and 3:00pm - 6:00pm. Peak hours in the study area are identified as 7:00am to 8:00am in the morning and 3:30pm to 4:30pm in the evening. Peak hour vehicle volumes were balanced and are shown in Figure 7 and 8. Appendix A includes the detailed traffic count data.

2. Pedestrian Volumes

No significant pedestrian activity was observed in the study area. During the morning peak hour, a total of eight pedestrians were observed crossing the intersection of Kaunuaʻi Highway and Kona Road. During the afternoon peak hour, a total of 13 pedestrians were observed crossing the intersection of Moi Road and Aliʻi Road.

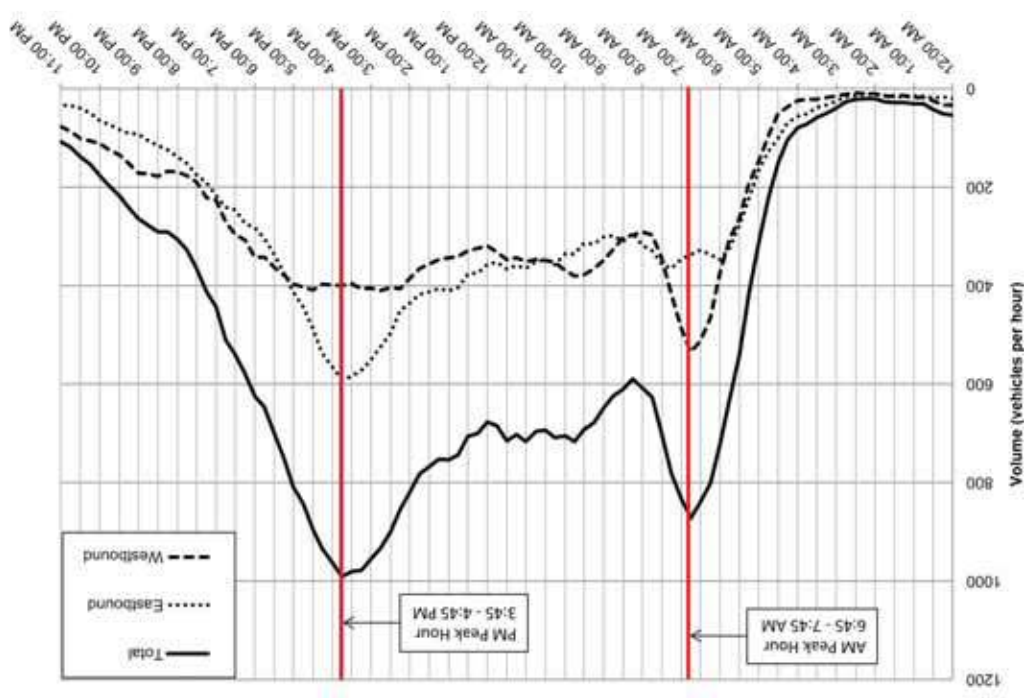


Figure 5: Kaaunali'i Highway, 24-Hour Vehicle Volume Distribution

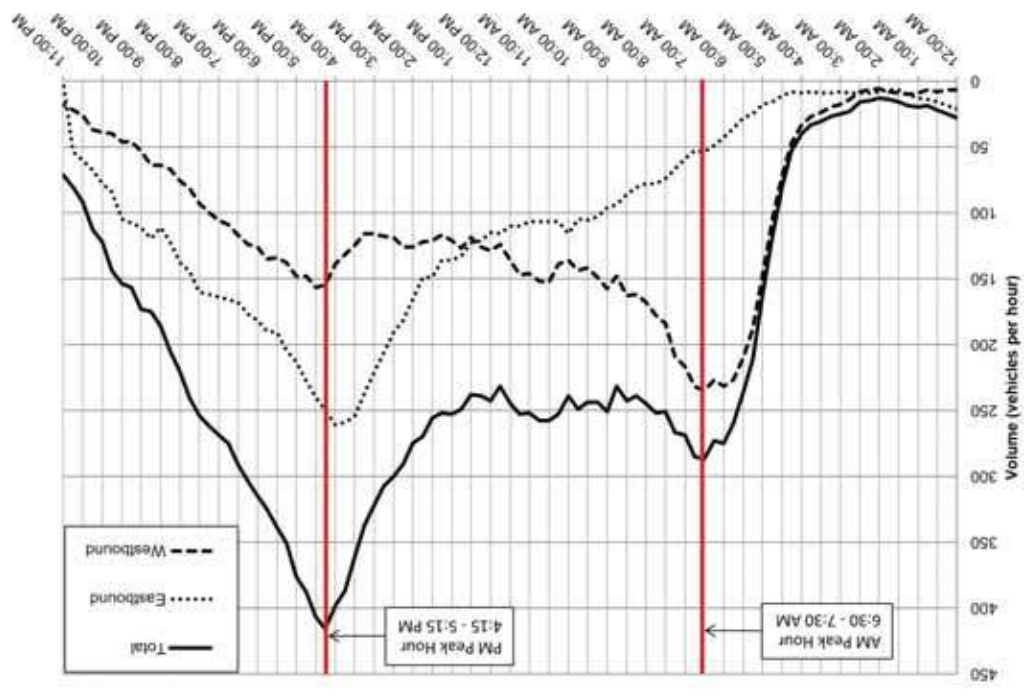


Figure 6: Moi Road, 24-Hour Vehicle Volume Distribution

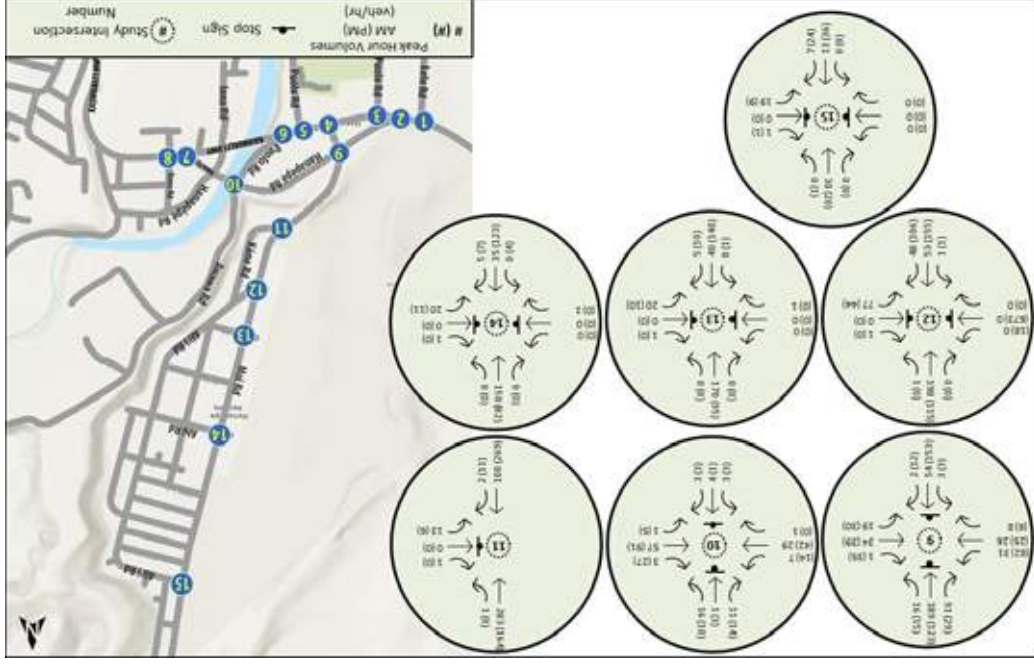


Figure 8: Existing (2019) Peak Hour Volumes (Part 2)

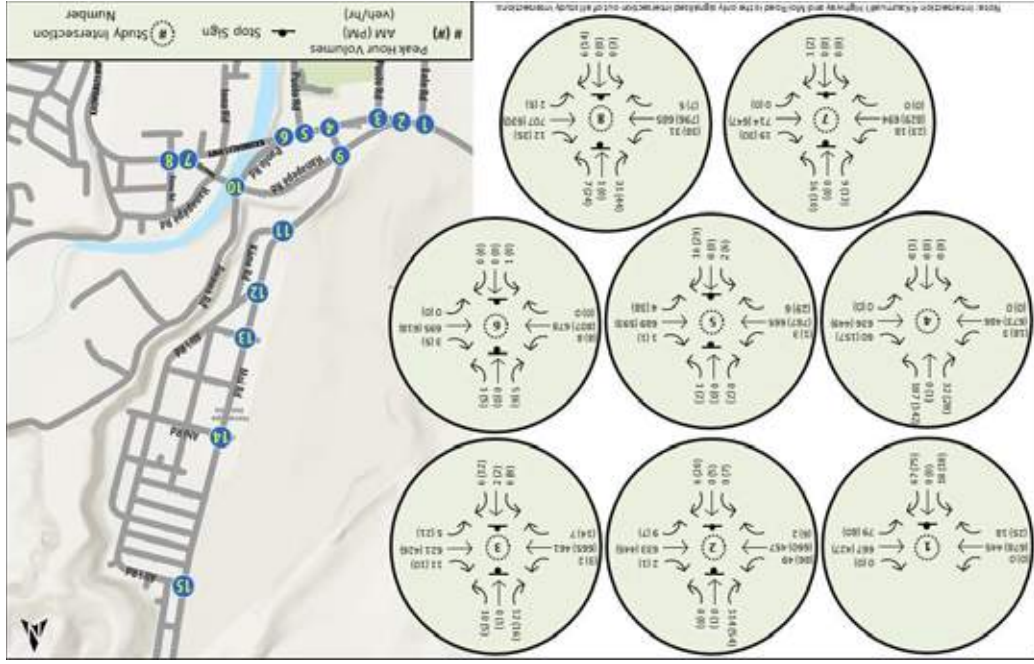


Figure 7: Existing (2019) Peak Hour Volumes (Part 1)

D. Level of Service Methodology

Level of service (LOS) is an operational analysis 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. Guidelines from the *Statewide Uniform Design Manual for Streets and Highways* (HDOT, 1980) and *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011) state that an appropriate peak hour LOS for an urban arterial is LOS C or D. The *County of Kauaʻi Street Design Manual* (COK, 2018) states that the desired LOS for intersections is LOS E in town centers and LOS D in less densely populated areas for the peak hour of traffic. Intersection LOS and delay were determined for the AM and PM peak hours using *Synchro 10* traffic analysis software and analyzed using *HCM 6th* Edition (TRB, 2016) methodologies.

As stated in the *Highway Capacity Manual (HCM) 6th* Edition (TRB, 2016), LOS for a two-way stop controlled (TWSC) intersection is determined by the measured control delay (see Table 2) and is defined for each minor movement, not for the intersection as a whole. Vehicles traveling along the major, free-flow road, of a TWSC intersection, proceed through with minimal delay or no delay at all. Those vehicles approaching the intersection along the minor movement are controlled by a stop sign and thus experience delay attributable to the volume of vehicles passing along the free-flow road and the gaps available.

Table 2: LOS Criteria for Unsignalized Intersections

Average Control Delay (s/veh)	LOS by v/c Ratio
≤ 10.0	<=1.0
>10 and ≤15	A
>15 and ≤25	B
>25 and ≤35	C
>35 and ≤50	D
>50	E
	F

Source: *HCM* (TRB, 2016)

The LOS analysis for signalized intersections is based on average total vehicle delay based on the methodologies of the *HCM* (TRB, 2016), as shown in Table 3. High numbers of vehicles passing the intersection, long cycle lengths, inappropriate signal phasing, or poor signal progression can result in long delays, and consequently poor LOS.

Another measure of intersection delay 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. A traffic movement can have a poor LOS but low v/c which suggests that the traffic volumes along that movement are low but have to wait a long time to make the movement. This is

common for low volume protected turn movements or side streets that have to wait through a long cycle length for their split to come up.

Table 3: LOS Criteria for Signalized Intersections

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

Source: *HCM* (TRB, 2016)

2. Intersection Results

Existing intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. The signalized intersection of Kaunualiʻi Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All stop-controlled intersection turning movements resulted in acceptable LOS D or better except for following approaches:

- Puolo Road (Middle) and Kaunualiʻi Highway (Intersection #5): southbound approach resulted in LOS E for both AM and PM peak hours.
- Puolo Road (East) and Kaunualiʻi Highway (Intersection #6): northbound approach resulted in LOS E for the AM peak hour.
- Hāna Road and Kaunualiʻi Highway (Intersection #7): southbound approach resulted in LOS E for both AM and PM peak hours.
- Kona Road (East) and Kaunualiʻi Highway (Intersection #8): southbound approach resulted in LOS F with volume-to-capacity (v/c) ratio less than 1.0 for the PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaunualiʻi Highway during the peak hours.

The Existing (2019) intersection and movement LOS are shown in Tables 4 and 5.

Table 4: Existing (2019) Intersection Level of Service (Part 1)

Intersection		AM			PM			
Approach	Movement	Intersection/ Approach Control	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
1. Lele Rd and Kaunuali'i Hwy								
Northbound	LR	Stop	18.40	0.25	C	22.30	0.32	C
Westbound	L	Free	8.70	0.08	A	9.70	0.10	A
2. Hanapepe Rd and Kaunuali'i Hwy								
Northbound	LTR	Stop	1.90	-	-	1.80	-	-
Eastbound	L	Free	12.70	0.01	B	28.60	0.18	D
Westbound	L	Free	9.40	0.06	A	8.80	0.09	A
Southbound	LTR	Stop	8.50	0.01	A	9.20	0.01	A
3. Puolo Rd (West) and Kaunuali'i Hwy								
Northbound	LTR	Stop	15.70	0.26	C	12.30	0.11	B
Eastbound	L	Free	0.70	-	-	0.90	-	-
Westbound	L	Free	21.10	0.06	C	22.40	0.10	C
Southbound	L	Free	8.90	0.00	A	8.30	0.00	A
4. Moi Rd and Kaunuali'i Hwy								
Northbound	L	Free	8.40	0.01	A	9.20	0.03	A
Westbound	L	Free	21.00	0.09	C	17.00	0.07	C
Southbound	LTR	Stop	9.40	-	A	17.70	-	B
5. Puolo Rd (Middle) and Kaunuali'i Hwy								
Eastbound	L	Free	10.00	0.01	B	20.00	0.08	C
Westbound	TR	Signal	6.10	0.46	A	18.90	0.79	B
Northbound	LTR	Signal	8.90	0.67	A	17.30	0.74	B
Southbound	L	Free	0.00	0.00	A	12.50	0.00	B
Eastbound	L	Free	18.50	0.46	B	14.80	0.25	B
Westbound	L	Free	15.70	0.11	B	12.80	0.06	B
Southbound	L	Free	0.30	-	-	1.00	-	-
6. Puolo Rd (East) and Kaunuali'i Hwy								
Northbound	LTR	Stop	17.30	0.06	C	24.90	0.17	C
Eastbound	L	Free	9.20	0.00	A	8.90	0.00	A
Westbound	L	Free	10.20	0.01	B	11.50	0.07	B
Southbound	LTR	Stop	43.30	0.01	E	36.10	0.04	E
7. Häna Rd and Kaunuali'i Hwy								
Northbound	LTR	Stop	13.70	-	-	0.30	-	-
Eastbound	L	Free	44.20	0.01	E	0.00	0.00	A
Westbound	L	Free	3.90	0.01	A	9.00	0.01	A
Southbound	LTR	Stop	19.20	0.03	C	30.40	0.08	D
8. Hanapepe Rd and Kaunuali'i Hwy								
Northbound	LTR	Stop	0.80	-	-	0.70	-	-
Eastbound	L	Free	13.70	0.00	B	15.60	0.01	C
Westbound	L	Free	9.40	0.02	A	9.20	0.03	A
Southbound	LTR	Stop	43.50	0.22	E	36.70	0.18	E

Table 5: Existing (2019) Intersection Level of Service (Part 2)

Intersection		AM			PM			
Approach	Movement	Intersection/ Approach Control	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
8. Kona Rd and Kaunuali'i Hwy								
Northbound	LTR	Stop	0.90	-	-	2.80	-	-
Eastbound	L	Free	14.70	0.02	B	27.00	0.10	D
Westbound	L	Free	9.50	0.04	A	9.30	0.05	A
Southbound	LTR	Stop	9.20	0.00	A	9.70	0.01	A
9. Hanapepe Rd and Moi Rd								
Northbound	LTR	Stop	25.30	0.19	D	53.20	0.51	F
Eastbound	L	Free	9.60	-	-	10.90	-	-
Westbound	L	Free	11.10	0.10	B	16.10	0.38	C
Southbound	LTR	Stop	7.40	0.02	A	7.60	0.07	A
10. Puolo Rd/Awawa Rd and Hanapepe Rd								
Northbound	L	Free	7.40	0.01	A	7.40	0.02	A
Westbound	L	Free	7.40	0.01	A	7.40	0.02	A
Southbound	LTR	Stop	13.30	0.36	B	16.00	0.33	C
11. Käne Rd and Moi Rd								
Northbound	L	Free	8.90	0.10	A	8.70	0.03	A
Eastbound	L	Free	3.10	-	-	2.30	-	-
Westbound	L	Free	9.30	0.01	A	9.40	0.01	A
Southbound	LTR	Stop	7.80	0.01	A	8.00	0.01	A
12. Ali'i Rd (Makai) and Moi Rd								
Northbound	L	Free	7.30	0.00	A	7.30	0.00	A
Westbound	L	Free	9.30	0.04	A	9.80	0.04	A
Southbound	LTR	Stop	0.40	-	-	0.20	-	-
13. Eleu Rd and Moi Rd								
Northbound	L	Free	11.90	0.03	B	12.70	0.02	B
Eastbound	L	Free	7.50	0.00	A	0.00	-	A
Westbound	L	Free	2.40	-	-	1.20	-	-
Southbound	LTR	Stop	7.70	0.00	A	7.50	0.00	A
14. Ahi Rd and Moi Rd								
Northbound	L	Free	11.60	0.14	B	11.70	0.09	B
Eastbound	L	Free	7.40	0.00	A	0.00	0.00	A
Westbound	LTR	Stop	1.00	-	-	0.40	-	-
Southbound	LTR	Stop	0.00	0.00	A	7.40	0.00	A
15. Ali'i Rd and Moi Rd								
Northbound	L	Free	9.20	0.00	A	0.00	0.00	A
Eastbound	L	Free	10.10	0.03	B	10.30	0.02	B
Westbound	LTR	Stop	1.00	-	-	0.60	-	-
Southbound	LTR	Stop	0.00	0.00	A	7.40	0.00	A
16. Hanapepe Rd and Kaunuali'i Hwy								
Northbound	L	Free	9.20	0.00	A	0.00	0.00	A
Eastbound	L	Free	10.10	0.03	B	10.30	0.02	B
Westbound	LTR	Stop	2.50	-	-	1.10	-	-
Southbound	LTR	Stop	8.90	0.02	A	9.00	0.01	A
17. Hanapepe Rd and Kaunuali'i Hwy								
Northbound	L	Free	0.00	0.00	A	7.40	0.00	A

III. FUTURE (2025) CONDITIONS

DHHL is planning on building out the new development in two phases, Phase 2 and 3, with projected buildout years of 2025 and 2040 respectively. Phase 2 is proposing to develop 75 residential lots and the associated access roads with an expected full buildout and occupancy by 2025. These residential lots will be located to the west of the existing homestead lots (see Figure 2) that were built in Phase 1 and are intended to include a single-family home on each lot.

A. Geometric Configuration

An internal transportation network will be developed that provides connectivity by extending existing roadway stubouts in the existing residential community. In order to maintain connectivity throughout the development, it is likely that a bridge will be needed to span the existing gulch on the western side of the property. Two new access roads are proposed off of Kaunuaʻi Highway for traffic circulation and emergency access (see Figure 1).

- The first access road travels in the east-west direction, intersecting Moi Road at the intersection with Aliʻi Road (mauka) as the west leg of intersection (#15).
- The second access road also travels in the east-west direction, intersecting Moi Road at the intersection with Ahi Road as the west leg of intersection (#14).

B. Multimodal Infrastructure

With the development of residential lots, it is recommended to include dedicated space for bicycles and pedestrians as a part of new roadway buildout. This may look like one of the Residential Street cross-sections provided in the County of Kauaʻi Street Design Manual, with minimum five-foot-wide sidewalks included on either side and travel speeds low enough for people on bicycles to share the road.

C. Volumes

The County of Kauaʻi Housing Agency is proposing to build an affordable housing project mauka of the intersection of Halewilli Road and Kaunuaʻi Highway in the town of Eleʻele. The proposed project would include approximately 550 residential units (single family, multi-family and senior residential units) at full buildout. The project would be designed with roadways, green sustainable energy efficiency features, a community center, vegetable drainage swales, landscape areas, a water storage tank, and bike and pedestrian paths. This project is projected to be completed and fully occupied by the year 2040.

No other developments or construction projects which effect the travel patterns, in close proximity to the project area were identified, based on the best available information from research completed on January 2020 at the State of Hawaiʻi Office of Environmental Quality Control (OEQC) website and the Statewide Transportation Improvements Program (STIP). The County planning department provided the *Elele Residential and Commercial Project Traffic Impact Report Update* (WOC, 2020) for the proposed 30-acre development with access via a new driveway off-of Waiāloa Road. This development proposes the construction of 120 single-family residential units with approximately 35,000 square feet for commercial uses by the Year 2029 and therefore will not be included in the future 2025 analysis but will be included for future 2040.

1. Future (2025) Without Project

The Kauaʻi County General Plan forecasts a socio-economic growth rates of 1.10% for population, 1.06% for jobs, 1.07% for housing per annum between 2010 and 2035 for County of Kauaʻi. Out of the projected growth, 47 % of the future growth is allocated to the Lihue District, 26% to South Kauaʻi, 13% to East Kauaʻi and 14 % to the remaining three districts – North Shore, Waimea-Kekaha, and Hanapēpē- Eleʻele combined to provide for natural population increase.

Traffic forecasting for the study area for Future (2025) Without Project conditions were based on known surrounding developments as well as background growth anticipated in the area. Therefore, a 0.25% growth rate per annum was applied to all intersection movements in the study area from 2019 till 2025. Resulting Future (2025) Without Project intersection volumes are shown in Figures 9 and 10.

2. Phase 2 - Project Related

Phase 2 of the development proposes to include 75 residential lots. Trips generated from Phase 2 of the proposed development were estimated using nationally accepted land use rates from *Trip Generation, 10th Edition* (ITE, 2016). The estimates for new trips generation rates and volumes are shown in Table 6 and 7 respectively.

Table 6: Phase 2 - Trip Generation Rates

Land Use [ITE Code]	Qty	Units	Trip Generation Average Rate	
			AM	PM
Single Family Housing [210]	75	Dwelling Units	0.74	0.99

Table 7: Phase 2 - Trip Generation Volumes

Land Use [ITE Code]	Project Related Trips					
	AM			PM		
	In	Out	Total	In	Out	Total
Single Family Housing [210]	14	42	56	47	27	74

The volumes of entering and exiting vehicles were estimated equally distributed between the two access roads which intersect the Moi Road. The resulting project-related peak hour volumes are shown in Figures 11 and 12.

3. Future (2025) With Project

Project related trips were added to the Future (2025) Without Project volumes to estimate Future (2025) With Project peak hour volumes. The volumes for Future (2025) With Project conditions are shown in Figures 13 and 14.

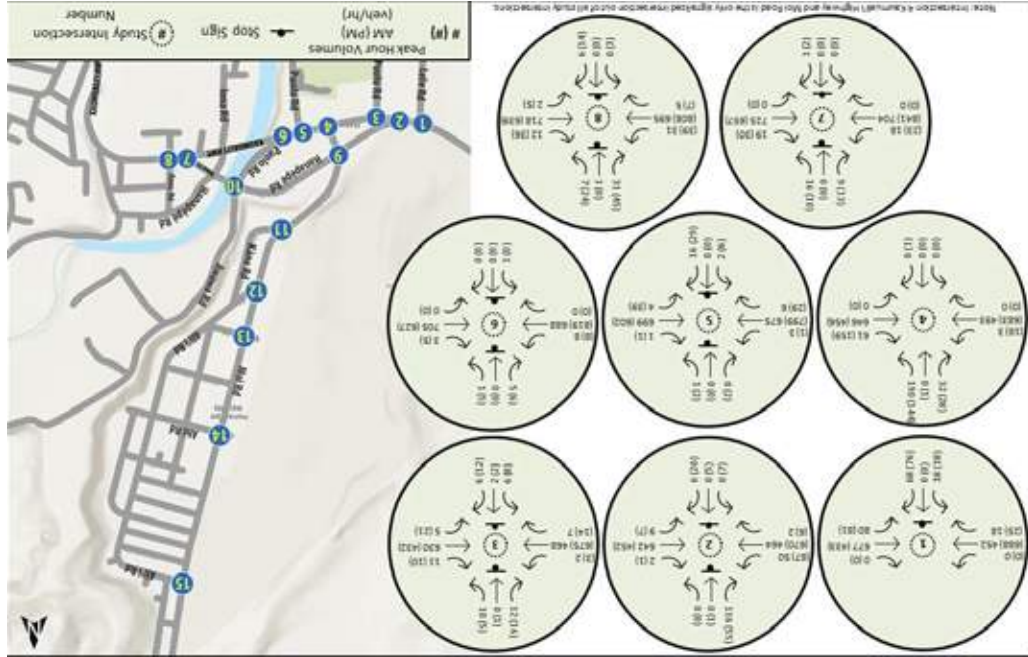


Figure 9: Future (2025) Without Project Peak Hour Volumes (Part 1)

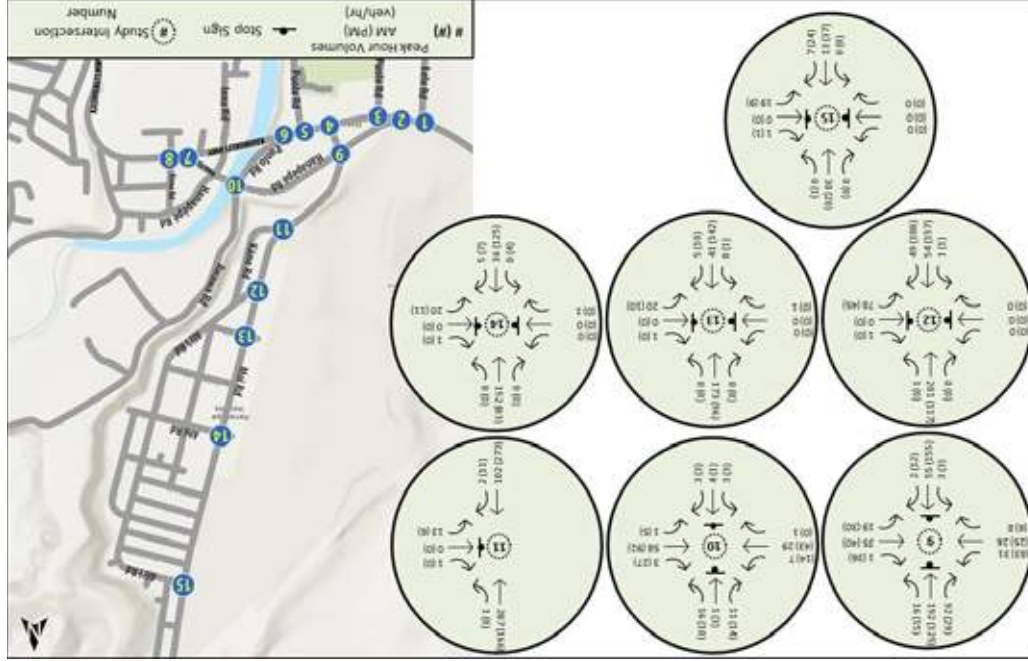


Figure 10 Future (2025) Without Project Peak Hour Volumes (Part 2)

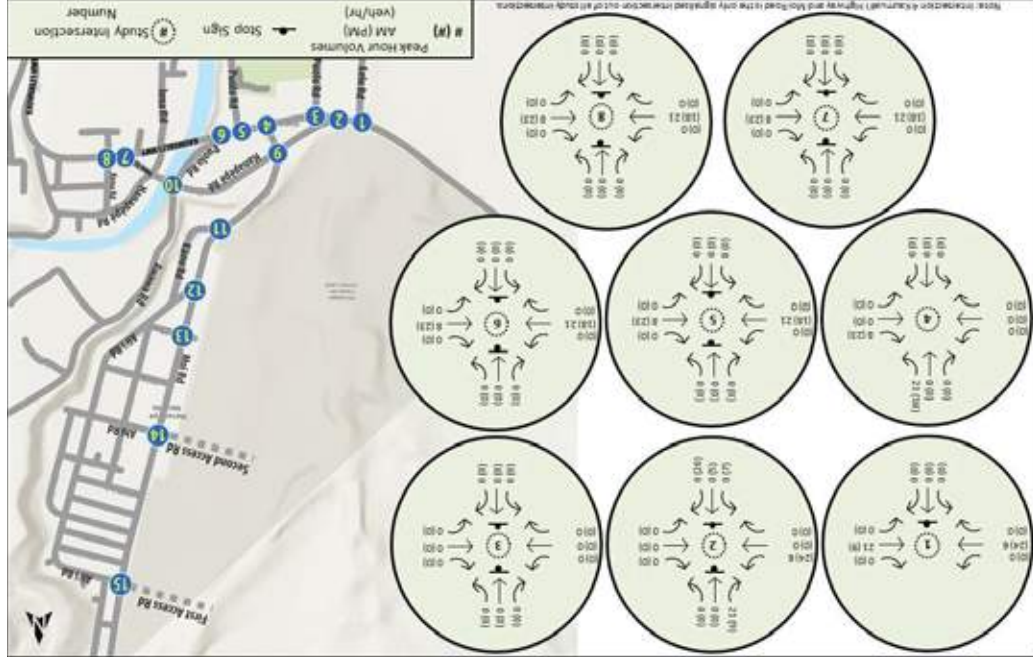


Figure 11: Phase 2 - Project Related Peak Hour Volumes (Part 1)

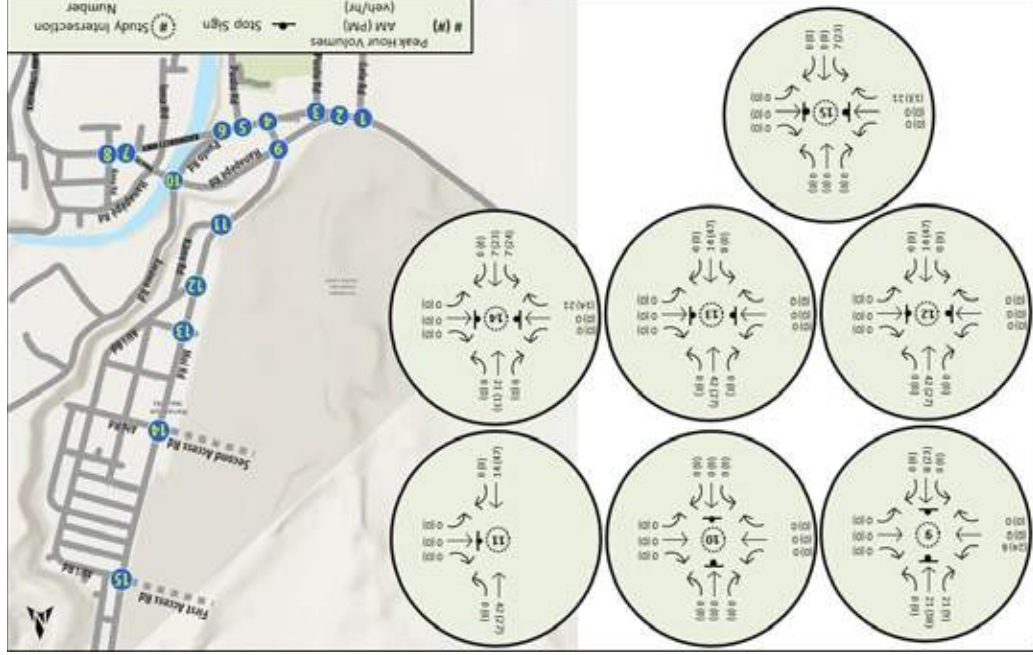


Figure 12: Phase 2 - Project Related Peak Hour Volumes (Part 2)

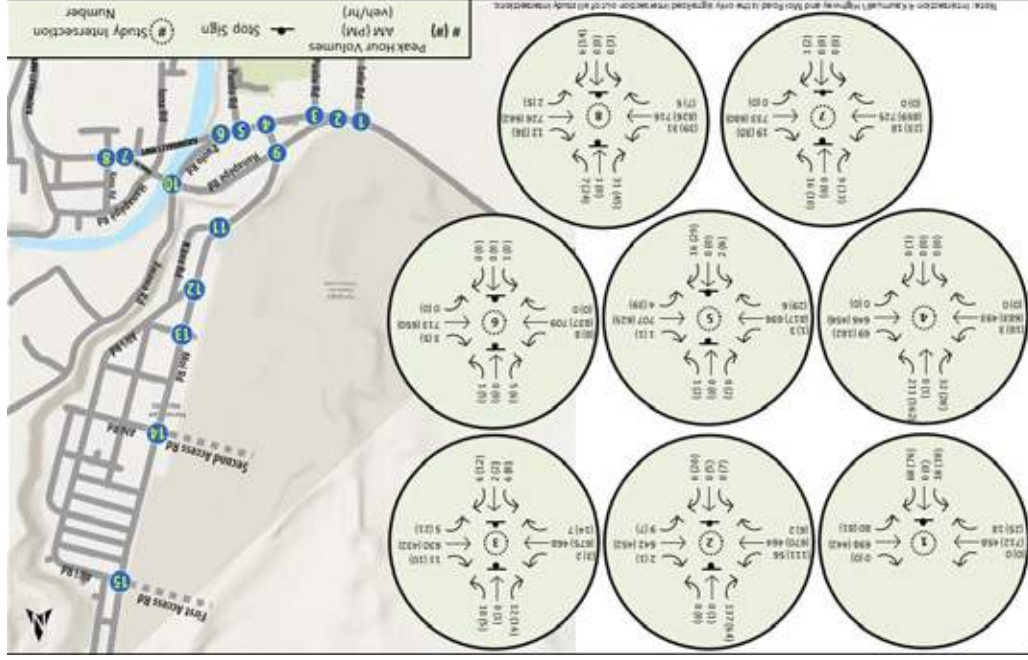


Figure 13: Future (2025) With Project Peak Hour Volumes (Part 1)

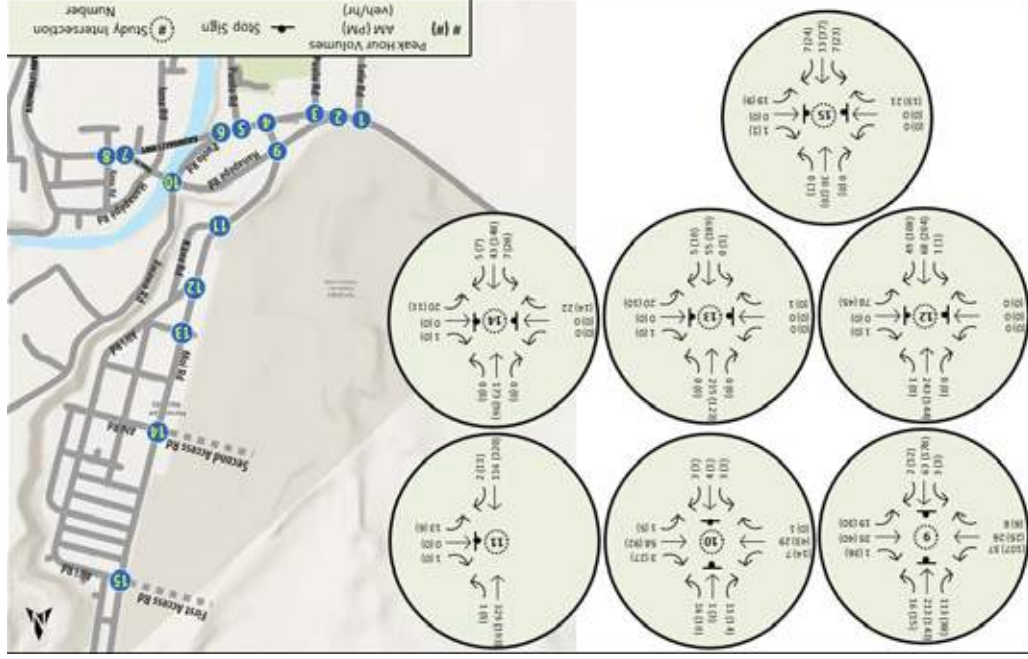


Figure 14: Future (2025) With Project Peak Hour Volumes (Part 2)

D. Level of Service

1. Future (2025) Without Project

Future (2025) Without Project intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. At the signalized intersection of Kaunali'i Highway and Mo'i Road all intersection movements resulted in acceptable LOS C or better. All stop-controlled intersection turning movements resulted in acceptable LOS D or better except for following turning movements:

- Puolo Road (Middle) and Kaunali'i Highway (Intersection #5): southbound movements resulted in LOS E for both AM and PM peak hours.
- Puolo Road (East) and Kaunali'i Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour.
- Hana Road and Kaunali'i Highway (Intersection #7): southbound movements resulted in LOS E for both AM and PM peak hours.
- Kona Road (East) and Kaunali'i Highway (Intersection #8): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaunali'i Highway during the peak hours.

The Future (2025) Without Project intersection and movement LOS are shown in Tables 8 through 10.

Table 8: Future (2025) Without Project Intersection Level of Service (Part 1)

Intersection Approach	Intersection Movement	Intersection/Approach Control	AM		PM			
			Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
1. Lele Rd and Kaunali'i Hwy								
Northbound	LR	Stop	18.70	0.26	C	22.90	0.33	C
Westbound	L	Free	8.70	0.08	A	9.70	0.10	A
2. Hanalei Rd and Kaunali'i Hwy								
Northbound	LTR	Stop	12.80	0.01	B	29.40	0.19	D
Eastbound	L	Free	9.40	0.06	A	8.80	0.09	A
Westbound	L	Free	8.50	0.01	A	9.30	0.01	A
Southbound	LTR	Stop	15.90	0.27	C	12.40	0.11	B
3. Puolo Rd (West) and Kaunali'i Hwy								
Northbound	LTR	Stop	21.40	0.06	C	22.80	0.10	C
Eastbound	L	Free	9.00	0.00	A	8.30	0.00	A
Westbound	L	Free	8.40	0.01	A	9.20	0.03	A
Southbound	LTR	Stop	21.40	0.10	C	17.20	0.07	C
4. Mo'i Rd and Kaunali'i Hwy								
Eastbound	L	Signal	17.70	-	B	18.10	-	B
Westbound	TR		22.30	0.02	C	20.40	0.08	C
Northbound	LTR		13.00	0.58	B	19.40	0.80	B
Southbound	R		21.70	0.84	C	17.70	0.75	B
5. Puolo Rd (Middle) and Kaunali'i Hwy								
Northbound	LTR	Stop	0.30	-	-	1.00	-	-
Eastbound	L	Free	17.60	0.06	C	25.70	0.18	D
Westbound	L	Free	9.30	0.00	A	8.90	0.00	A
Southbound	LTR	Stop	10.30	0.01	B	11.60	0.07	B
6. Puolo Rd (East) and Kaunali'i Hwy								
Northbound	LTR	Stop	44.60	0.01	E	37.20	0.04	E
Eastbound	L	Free	0.20	-	-	0.30	-	-
Southbound	LTR	Stop	46.00	0.01	E	0.00	0.00	A
Southbound	LTR	Stop	9.40	0.01	A	9.00	0.01	A
Southbound	LTR	Stop	19.60	0.03	C	31.30	0.08	D

Table 9: Future (2025) Without Project Intersection Level of Service (Part 2)

Intersection		Intersection/ Approach Control	AM		PM			
Approach	Movement		Delay (s/veh)	v/c	LOS	v/c	LOS	
7. Hāna Rd and Kaunualii Hwy			0.90	-	-	0.70	-	-
Northbound	LTR	Stop	13.80	0.00	B	15.80	0.01	C
Eastbound	L	Free	9.50	0.02	A	9.30	0.03	A
Southbound	LTR	Stop	45.20	0.23	E	38.20	0.19	E
8. Kona Rd and Kaunualii Hwy			0.90	-	-	3.00	-	-
Northbound	LTR	Stop	14.80	0.02	B	28.00	0.11	D
Eastbound	L	Free	9.60	0.04	A	9.40	0.05	A
Westbound	L	Free	9.30	0.00	A	9.80	0.01	A
Southbound	LTR	Stop	26.10	0.20	D	57.10	0.54	F
9. Hanapēpē Rd and Moi Rd			9.60	-	-	11.10	-	-
Northbound	LTR	Stop	11.10	0.11	B	16.50	0.39	C
Eastbound	L	Free	7.40	0.02	A	7.70	0.07	A
Westbound	L	Free	7.40	0.01	A	7.40	0.02	A
Southbound	LT R	Stop	13.40 8.90	0.36 0.10	B A	16.20 8.80	0.34 0.03	C A
10. Puolo Rd/Awawa Rd and Hanapēpē Rd			3.10	-	-	2.20	-	-
Northbound	LTR	Stop	9.30	0.01	A	9.50	0.01	A
Eastbound	L	Free	7.80	0.01	A	8.00	0.01	A
Westbound	L	Free	7.30	0.00	A	7.30	0.00	A
Southbound	LTR	Stop	9.40	0.04	A	9.80	0.04	A
11. Kāne Rd and Moi Rd			0.40	-	-	0.20	-	-
Westbound	LR	Stop	12.00	0.03	B	12.80	0.02	B
Southbound	L	Free	7.50	0.00	A	0.00	0.00	A
12. Aliʻi Rd (Makaa) and Moi Rd			2.40	-	-	1.20	-	-
Northbound	L	Free	7.70	0.00	A	7.50	0.00	A
Westbound	LTR	Stop	11.60	0.14	B	11.80	0.09	B
Southbound	L	Free	7.40	0.00	A	0.00	0.00	A
13. Eleu Rd and Moi Rd			0.90	-	-	0.40	-	-
Northbound	L	Free	0.00	0.00	A	7.40	0.00	A
Eastbound	LTR	Stop	9.20	0.00	A	0.00	0.00	A
Westbound	LTR	Stop	10.10	0.03	B	10.30	0.02	B

Table 10: Future (2025) Without Project Intersection Level of Service (Part 3)

Intersection		Intersection/ Approach Control	AM		PM			
Approach	Movement		Delay (s/veh)	v/c	LOS	v/c	LOS	
14. Ahi Rd and Moi Rd			1.00	-	-	0.60	-	-
Northbound	L	Free	0.00	0.00	A	7.40	0.00	A
Eastbound	LTR	Stop	9.20	0.00	A	0.00	0.00	A
Westbound	LTR	Stop	10.10	0.03	B	10.40	0.02	B
15. Aliʻi Rd and Moi Rd			2.50	-	-	1.10	-	-
Westbound	LTR	Stop	8.90	0.02	A	9.00	0.01	A
Southbound	L	Free	0.00	0.00	A	7.40	0.00	A

2. Future (2025) With Project

Future (2025) With Project intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. The signalized intersection of Kaunualii Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All the two-way stop controlled (TWSC) intersection turning movements resulted in acceptable LOS of D or better except for following turning movements:

- Puolo Road (Middle) and Kaunualii Highway (Intersection #5): southbound movements resulted in LOS E for both AM and PM peak hours.
- Puolo Road (East) and Kaunualii Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour.
- Hāna Road and Kaunualii Highway (Intersection #7): southbound movements resulted in LOS E for both AM and PM peak hours.
- Kona Road (East) and Kaunualii Highway (Intersection #8): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaunualii Highway during the peak hours.

The Future (2025) With Project intersection and movement LOS are shown in Tables 11 through 13.

Table 11: Future (2025) With Project Intersection Level of Service (Part 1)

Intersection		Intersection/ Approach Control		AM		PM	
Approach	Movement	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
1. Lele Rd and Kaunuali'i Hwy							
Northbound	LR	19.20	0.26	C	24.00	0.35	C
Westbound	L	8.70	0.08	A	9.80	0.10	A
2. Hanapepe Rd and Kaunuali'i Hwy							
Northbound	LTR	12.80	0.01	B	32.30	0.20	D
Eastbound	L	9.40	0.07	A	8.90	0.11	A
Westbound	L	8.50	0.01	A	9.30	0.01	A
Southbound	LTR	16.70	0.32	C	12.50	0.13	B
3. Puolo Rd (West) and Kaunuali'i Hwy							
Northbound	LTR	21.40	0.06	C	22.80	0.10	C
Eastbound	L	9.00	0.00	A	8.30	0.00	A
Westbound	L	8.40	0.01	A	9.20	0.03	A
Southbound	LTR	21.40	0.10	C	17.20	0.07	C
4. Moi Rd and Kaunuali'i Hwy							
Eastbound	L	18.20	-	B	18.70	-	B
Westbound	TR	22.80	0.02	C	21.60	0.09	C
Northbound	LTR	13.00	0.58	B	19.40	0.80	B
Southbound	L	22.60	0.85	C	19.10	0.79	B
5. Puolo Rd (Middle) and Kaunuali'i Hwy							
Northbound	L	0.00	0.00	A	12.50	0.00	B
Westbound	L	16.30	0.36	B	15.20	0.28	B
Southbound	R	12.80	0.07	B	12.80	0.06	B
Northbound	LTR	0.30	-	-	1.00	-	-
Eastbound	L	18.10	0.07	C	26.90	0.18	D
Westbound	L	9.30	0.00	A	9.00	0.00	A
Southbound	L	10.40	0.01	B	11.70	0.07	B
Northbound	LTR	46.90	0.01	E	40.10	0.04	E
Westbound	L	0.20	-	-	0.30	-	-
Southbound	LTR	47.40	0.01	E	0.00	0.00	A
Eastbound	L	9.40	0.01	A	9.10	0.01	A
Southbound	LTR	20.00	0.03	C	33.40	0.09	D

Table 12: Future (2025) With Project Intersection Level of Service (Part 2)

Intersection		Intersection/ Approach Control		AM		PM	
Approach	Movement	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
7. Hana Rd and Kaunuali'i Hwy							
Northbound	LTR	14.10	0.00	B	16.10	0.01	C
Eastbound	L	9.50	0.02	A	9.40	0.03	A
Southbound	LTR	48.50	0.25	E	41.10	0.20	E
8. Kona Rd and Kaunuali'i Hwy							
Northbound	LTR	0.90	-	-	3.20	-	-
Eastbound	L	15.10	0.02	C	29.60	0.11	D
Westbound	L	9.60	0.04	A	9.50	0.05	A
Southbound	LTR	9.40	0.00	A	9.90	0.01	A
Northbound	LTR	26.80	0.21	D	63.20	0.57	F
9. Hanapepe Rd and Moi Rd							
Northbound	LTR	10.20	-	-	13.00	-	-
Eastbound	L	11.40	0.12	B	19.80	0.48	C
Westbound	L	7.40	0.03	A	7.70	0.09	A
Southbound	L	7.40	0.01	A	7.40	0.02	A
Northbound	L	14.30	0.41	B	19.20	0.42	C
Southbound	R	9.00	0.13	A	8.80	0.04	A
10. Puolo Rd/Awawa Rd and Hanapepe Rd							
Northbound	LTR	3.10	-	-	2.20	-	-
Eastbound	L	9.30	0.01	A	9.50	0.01	A
Westbound	L	7.80	0.01	A	8.00	0.01	A
Southbound	LTR	7.30	0.00	A	7.30	0.00	A
Northbound	L	9.40	0.04	A	9.80	0.04	A
Southbound	R	0.40	-	-	0.20	-	-
11. Kāne Rd and Moi Rd							
Westbound	L	12.70	0.04	B	13.80	0.02	B
Eastbound	L	7.50	0.00	A	0.00	0.00	A
Southbound	L	2.20	-	-	1.10	-	-
12. Ali'i Rd (Makai) and Moi Rd							
Northbound	L	7.80	0.00	A	7.50	0.00	A
Westbound	LTR	12.40	0.16	B	12.80	0.10	B
Southbound	L	7.50	0.00	A	0.00	0.00	A
Northbound	L	0.80	-	-	0.30	-	-
Eastbound	L	0.00	0.00	A	7.50	0.00	A
Westbound	LTR	9.50	0.00	A	0.00	0.00	A
Southbound	LTR	10.60	0.03	B	11.00	0.02	B

Table 13: Future (2025) With Project Intersection Level of Service (Part 3)

Intersection Approach	Movement	Intersection/ Approach Control	AM		PM			
			Delay (s)	v/c	LOS	Delay (s)	v/c	LOS
14. Ahi Rd and Moi Rd								
Northbound	L	Free	7.70	0.01	A	7.50	0.02	A
Eastbound	L/TR	Stop	9.50	0.03	A	8.90	0.02	A
Westbound	L/TR	Stop	10.80	0.04	B	11.60	0.02	B
15. Ali'i Rd and Moi Rd								
Northbound	L	Free	4.20	-	-	3.00	-	-
Eastbound	L/TR	Stop	7.30	0.01	A	7.30	0.02	A
Westbound	L/TR	Stop	8.50	0.02	A	8.50	0.01	A
Southbound	L	Free	9.20	0.03	A	9.50	0.01	A
			0.00	0.00	A	7.40	0.00	A

IV. FUTURE (2040) CONDITIONS

Phase 3 of the development proposes the construction of 374 residential lots, 111 subsistence agricultural lots, 13.17 acres of commercial area, and the associated transportation network with an expected full buildout and occupancy by 2040. All of the residential lots, 50 (out of 111) subsistence agricultural lots, and 1.61 acres of commercial area are proposed to be constructed immediately adjacent to the existing residential lots with homes, including those built in Phase 2. The remaining 61 subsistence agricultural lots and 5.3 acres of commercial area are separated from these by a gulch resulting in unbuildable area/terrain, of which a bridge is likely needed to ensure connectivity between communities. 6.21 acres of commercial area, currently housing an operational warehouse and separated by all other proposed development by Kaunuauli'i Highway, will also be redeveloped as a part of Phase 3.

A. Geometric Configuration

The following new access roads are planned for connection to the existing transportation network:

- Third access road: Oriented in east-west direction intersecting Moi Road at the intersection with Eleu Road. Will be referred to as the west leg of Intersection #13.
- Fourth access road: Oriented in east-west direction intersecting Moi Road 300' north of the intersection with Kane Road. For analysis purposes this access road is assumed to intersect at Moi Road and Kane Road and will be referred to as the west leg of Intersection #11.
- Fifth access road: Oriented north-south direction intersects Kaunuauli'i Highway at the intersection with Lele Road. Will be referred to as the north leg of Intersection #1.
- Sixth access road: Oriented north-south intersects Kaunuauli'i Highway, 0.5 miles west to the intersection of Kaunuauli'i Highway and Lele Road. Will be referred to as a Driveway that intersects with Kaunuauli'i Highway at Intersection #16.

In addition, the west end of Hanapepe Road will be dead-ended prior to the intersection with Kaunuauli'i Highway so as to improve traffic flow through consolidated access control along the highway.

B. Multimodal Infrastructure

With the development of residential lots, it is recommended to include dedicated space for bicycles and pedestrians as a part of new roadway buildout. This may look like one of the Residential Street cross-sections provided in the County of Kaua'i Street Design Manual, with minimum five-foot-wide sidewalks included on either side and travel speeds low enough for people on bicycles to share the road. A continuous off-street path may also be considered to connect the residential neighborhood mauka of the highway to the commercial center and beach makai of the highway. Enhanced crosswalks should be included where appropriate. It is also recommended that Kaunuauli'i Highway be widened in the vicinity of the project to allow for safe and comfortable travel by pedestrians and bicyclists along the shoulders. The proposed pedestrian plan is shown in Figure 15.

C. Volumes

I. Surrounding Area Developments

The 'Ele'ele Residential and Commercial Project is a 30-acre development with access via a new driveway off of Waialo Road. This development proposes the construction of 120 single-family residential units with approximately 35,000 square feet for commercial uses by the Year 2029. The development is estimated to generate 164 and 204 vehicle trips during the AM and PM peak hours respectively. Twenty-one (21) vehicle trips are projected to travel west towards Hanapepe and 16 vehicles trips are projected to travel to the

development from Hanapēpē during the AM peak hour. Similarly, 31 vehicle trips are projected to travel west towards Hanapēpē and 36 vehicles trips are projected to travel to the development from Hanapēpē during the PM peak hour.

Lima Ola Workforce Development is proposed to the east of Kaunuauiʻi Highway in 'Ele'ele, on the island of Kauaʻi. The proposed project would construct approximately 550 affordable residential units of various densities by the year 2040. Project access would be through the easterly extensions of Maheua Road and Laulea Street. This development is estimated to generate 276 and 347 vehicle trips during AM and PM peak hours respectively. Fifty-four (54) vehicle trips are projected to travel west towards Hanapēpē and 15 vehicles trips are projected to travel to the development from Hanapēpē during AM peak hour. Similarly, 31 vehicle trips are projected to travel west towards Hanapēpē and 56 vehicles trips are projected to travel to the development from Hanapēpē during PM peak hour.

Since both the developments are projected to finish before or in 2040. The trips generated by these developments were included in the Future (2040) analysis.

2. Future (2040) Without Project

Traffic forecasting for the study area for future year 2040 without project conditions was based on known surrounding developments as well as background growth anticipated in the area. This includes the Waimea sports complex and internal developments that will likely impact travel. Therefore, a 0.25% growth rate per annum was applied to all roadways in the study area from 2019 till 2040. The trips generated from the Lima Ola Workforce Development and the 'Ele'ele Residential and Commercial Development were also accounted for separately in the analysis. Resulting Future (2040) Without Project intersection volumes are shown in Figures 16 and 17.

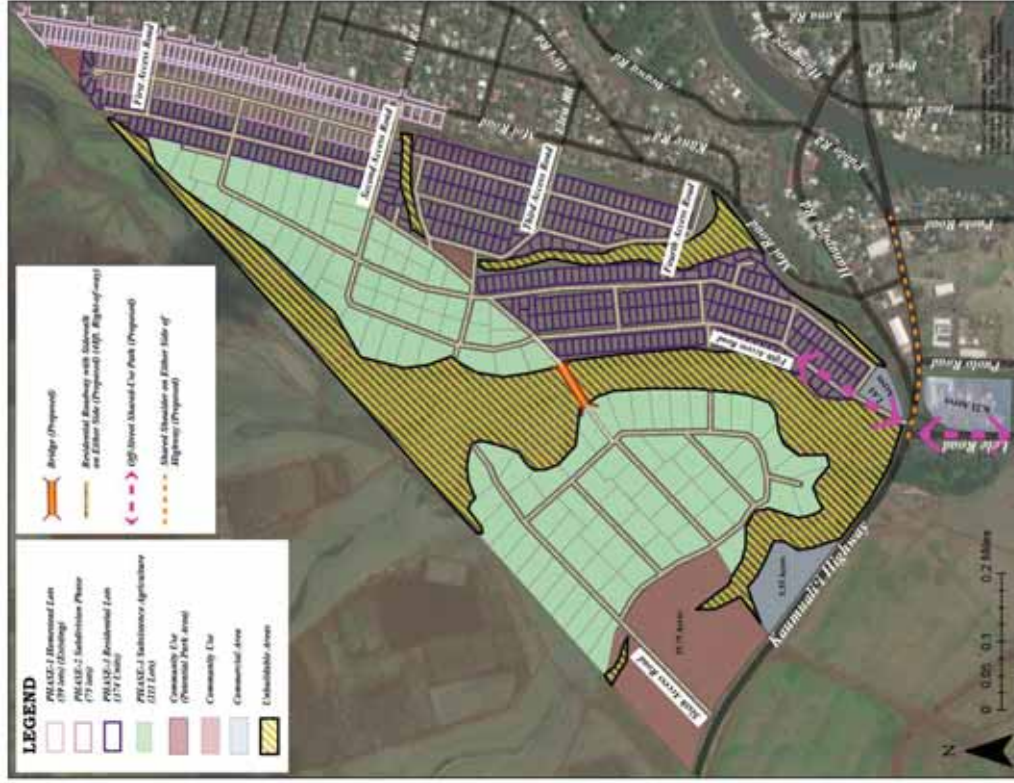


Figure 15: Proposed Pedestrian Plan

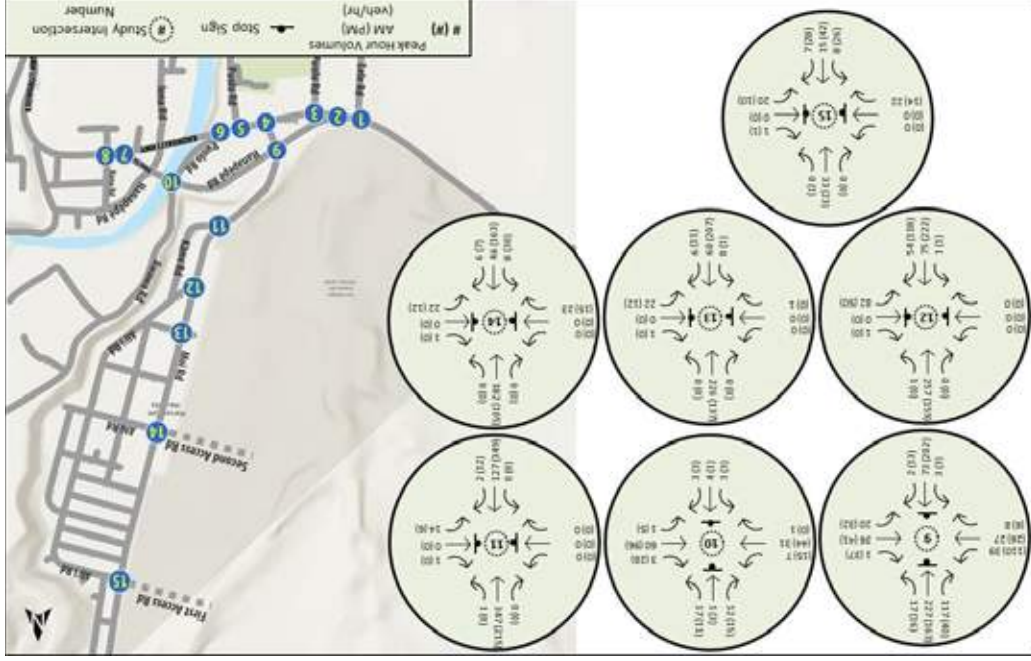


Figure 17: Future (2040) Without Project Peak Hour Volumes (Part 2)

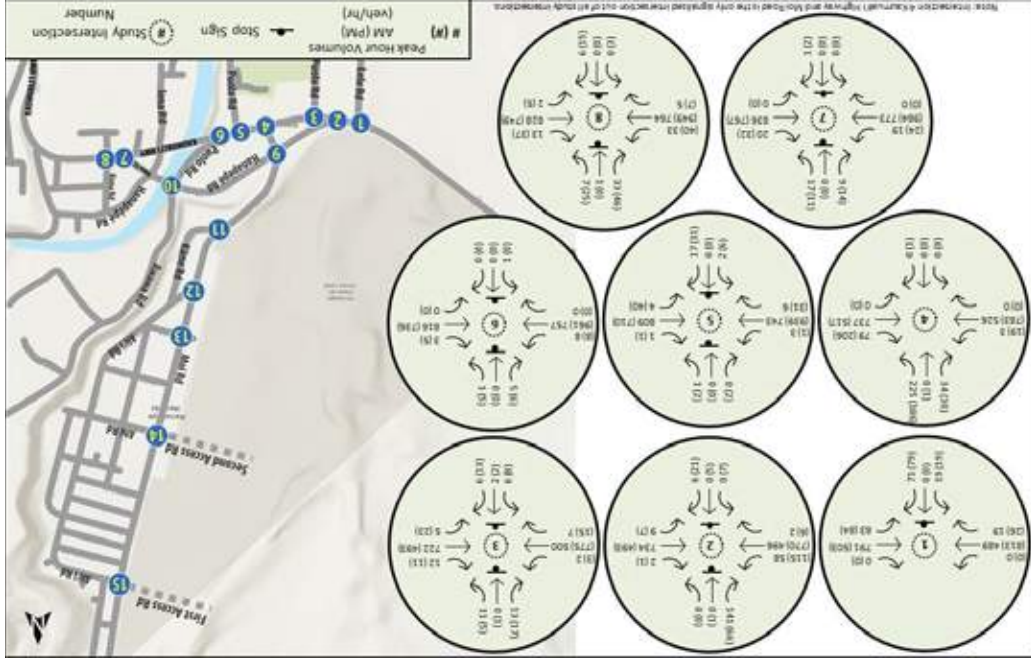


Figure 16: Future (2040) Without Project Peak Hour Volumes (Part 1)

3. Phase 3 - Project Related

Phase 3 of the development proposes the construction of 374 residential lots, 111 subsistence agricultural lots, 6.96 acres of new commercial area, and 6.21 acres of redeveloped existing commercial area.

DHHL's 2004 Kauaʻi Island Plan envisions the commercial areas located along the highway to cater services to the resident, highway travelers and to generate income for the department. For use in calculating the potential land use/development associated with this commercial area, the following assumptions were made:

- In the 1.61 acres of new commercial area proposed adjacent to the existing homes, a Gas Station with convenience store was assumed. For trip generation purposes, the Gross Floor Area (GFA) was assumed to be 1000 sq. ft, which is equivalent to trips generated by a gas station with four to six vehicle fueling positions. This Gas Station will have access off Lele Street.
- In the remaining 5.35 acres of new commercial area mauka of Kaunuaʻi Highway, a Shopping Center was assumed. For trip generation purposes, Gross Leasable Area (GLA) is assumed to be 50,000 sq. ft, which is equivalent to the trips generated by a shopping center with approximately 100 employees. The access for this development will be off Sixth Access Road.
- In the 6.21 acres makai of Kaunuaʻi Highway, it was assumed that warehouse use will be retained and limited only to a portion of the lot. With operations remaining as exists, no new trips were estimated.
- In the remaining area, the development of multiple small restaurants/food carts was assumed. For trip generation purposes, the trips generated are assumed equivalent to the trips generated by 10 food carts. The access for the restaurants will be off Lele Road.

Trips generated from the proposed development were estimated using nationally accepted land use rates from *Trip Generation, 10th Edition* (ITE, 2016). The estimates for new trips generation rates and volumes are shown in Tables 14 and 15.

Table 14: Phase 3 - Trip Generation Volumes by Residential

Land Use [ITE Code]	Qty	Project Related Trips					
		AM			PM		
		In	Out	Total	In	Out	Total
Single Family Housing [210]	485	90	269	359	302	178	480

Table 15: Phase 3 - Trip Generation Volumes by Commercial

Land Use [ITE Code]	Qty	Project Related Trips					
		AM			PM		
		In	Out	Total	In	Out	Total
Gas Station with store [945]	GFA: 1000 sq. ft.	39	37	76	45	43	88
Shopping Center [820]	GLA: 50,000 sq. ft.	29	18	47	91	100	191
Food Cart Pod [926]	Food Carts: 10	0	0	0	31	31	62

The bridge proposed over the gulch connects the residential and commercial developments in the project site mauka of Kaunuaʻi Highway. The trips made from the residential to commercial uses will be considered as internal trips as they are entering the adjacent street on the existing networks. NCHRP 684:

Enhancing Internal Trip Capture Estimation for Mixed-Use Developments (MXD), estimates unconstrained internal trip capture rates within MXD, between residential and retail, as 31% during PM Peak Hour on the adjacent streets. Internal trips for commercial are shown in Table 16.

Table 16: Phase 3 - Internal Trips for Commercial

Land Use [ITE Code]	Qty	Project Related Trips					
		AM			PM		
		In	Out	Total	In	Out	Total
Shopping Center [820]	GLA: 50,000 sq. ft.	0	0	0	28	31	59

The commercial developments proposed mauka of Kaunuaʻi Highway also attract vehicles for intermediate stops passing on the adjacent streets. These are the pass-by trips. The percentage of pass-by trips generated by the commercial use was estimated using the data provided in the Trip Generation Handbook, ITE, September 2017. Gas Stations have a pass-by rate of 62% during the AM peak period and 58% during the PM peak period. Shopping Centers have a pass-by rate of 34% during the PM peak period. Pass-by trips for commercial are shown in Table 17. The total trips generated by the commercial development, after the reduction of internal and pass-by trips are shown in Table 18.

Table 17: Phase 3 - Pass-by Trips for Commercial

Land Use [ITE Code]	Qty	Project Related Trips					
		AM			PM		
		In	Out	Total	In	Out	Total
Gas Station with store [945]	GFA: 1000 sq. ft.	24	23	47	25	24	49
Shopping Center [820]	GLA: 50,000 sq. ft.	0	0	0	31	34	65

Table 18: Phase 3 - Total Trips Generated by Commercial

Land Use [ITE Code]	Qty	Project Related Trips					
		AM			PM		
		In	Out	Total	In	Out	Total
Gas Station with store [945]	GFA: 1000 sq. ft.	15	14	29	20	19	39
Shopping Center [820]	GLA: 50,000 sq. ft.	29	18	47	32	35	67
Food Cart Pod [926]	Food Carts: 10	0	0	0	31	31	62

4. Future (2040) With Project

Project related trips for Phases 2 and 3 were added to the Future (2040) Without Project volumes to estimate Future (2040) With Project peak hour volumes. The volumes for Future (2040) With Project conditions are shown in Figures 20 and 21.

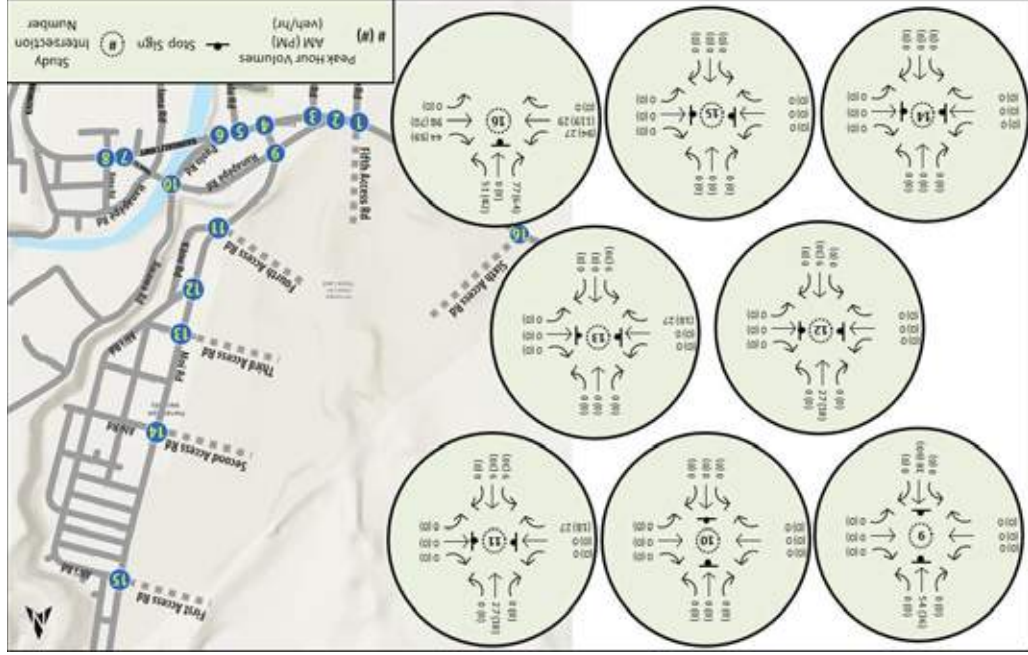


Figure 19: Phase 3 - Project Related Peak Hour Volumes (Part 2)

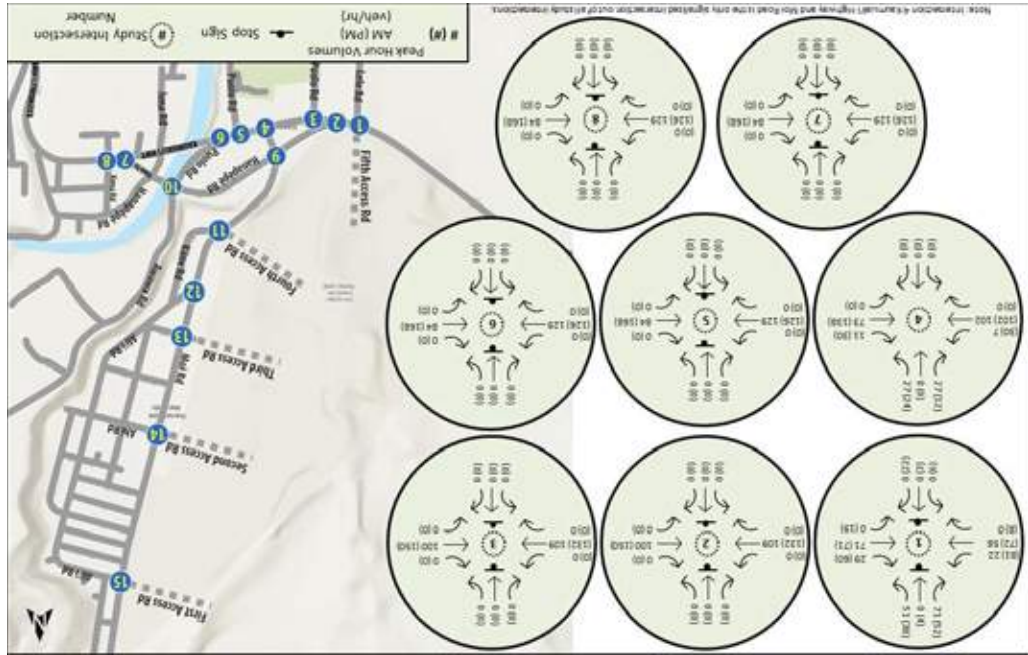


Figure 18: Phase 3 - Project Related Peak Hour Volumes (Part 1)

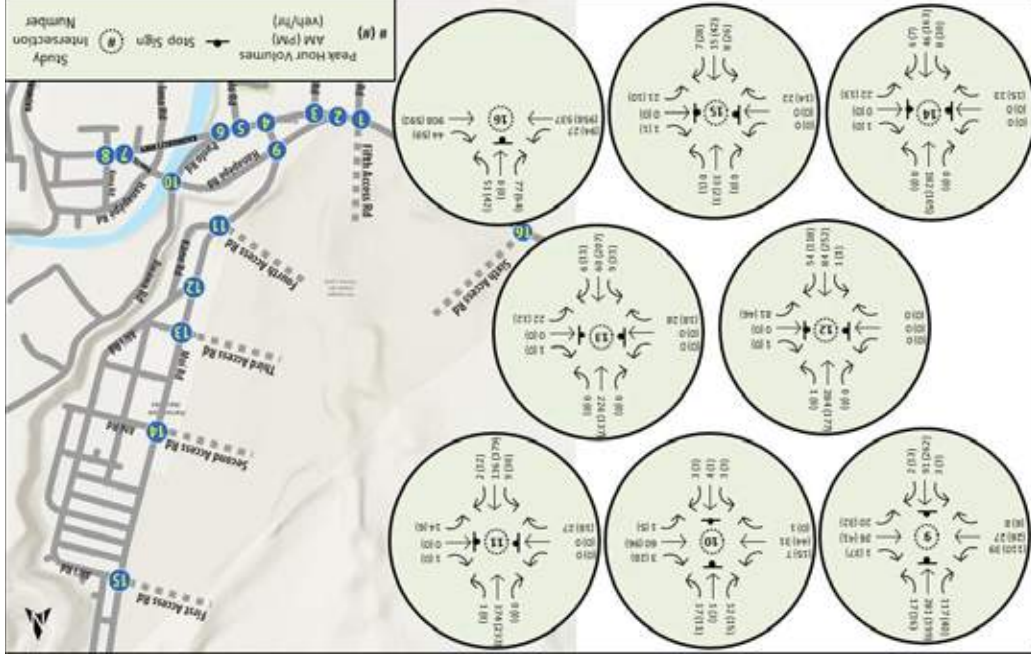


Figure 21: Future (2040) With Project Peak Hour Volumes (Part 2)

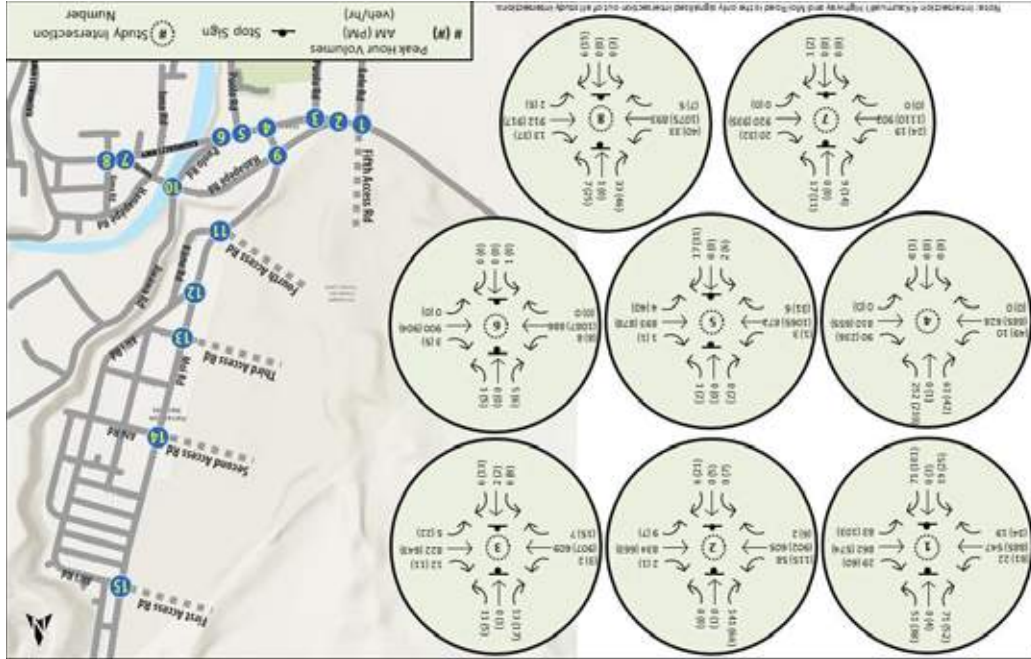


Figure 20: Future (2040) With Project Peak Hour Volumes (Part 1)

D. Level of Service

1. Future (2040) Without Project

determined for the AM and PM weekday peak hours utilizing the existing lane configurations. The signalized intersection of Kaunali'i Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All the two-way stop controlled (TWSC) intersection turning movements resulted in acceptable LOS D or better except for following turning movements:

- Hanapepe Road and Kaunali'i Highway (Intersection #2): northbound movements resulted in LOS E for PM peak hour.
- Puolo Road (Middle) and Kaunali'i Highway (Intersection #5): northbound movements resulted in LOS E for PM peak hour, southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for AM and LOS E for PM peak hours.
- Puolo Road (East) and Kaunali'i Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour and southbound movements resulted in LOS E for PM peak hour.
- Hana Road and Kaunali'i Highway (Intersection #7): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.
- Kona Road (East) and Kaunali'i Highway (Intersection #8): northbound movements resulted in LOS E for PM peak hour, southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for PM peak hour.

All poorly operating approaches are for the side streets and are due to the lack of gaps in heavy traffic volumes on Kaunali'i Highway during the peak hours.

The Future (2040) Without Project intersection and movement LOS are shown in Tables 19 through 21.

Table 19: Future (2040) Without Project Intersection Level of Service (Part 1)

Intersection Approach	Intersection Movement	Intersection/Approach Control	AM		PM			
			Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
1. Lele Rd and Kaunali'i Hwy								
Northbound	LR	Stop	22.30	0.31	C	31.80	0.44	D
Westbound	L	Free	8.90	0.09	A	10.40	0.12	B
2. Hanapepe Rd and Kaunali'i Hwy								
Northbound	LTR	Stop	13.20	0.01	B	43.70	0.27	E
Eastbound	L	Free	9.90	0.08	A	9.20	0.12	A
Westbound	L	Free	8.60	0.01	A	9.70	0.01	A
Southbound	LTR	Stop	19.40	0.37	C	13.50	0.14	B
3. Puolo Rd (West) and Kaunali'i Hwy								
Northbound	LTR	Stop	0.80	-	-	1.00	-	-
Eastbound	L	Free	9.30	0.00	A	8.50	0.00	A
Westbound	L	Free	8.50	0.01	A	9.70	0.03	A
Southbound	LTR	Stop	25.50	0.13	D	20.10	0.09	C
4. Moi Rd and Kaunali'i Hwy								
Eastbound	L	Signal	26.40	0.02	C	24.30	0.11	C
	TR		12.20	0.58	B	21.80	0.85	C
Westbound	TR		26.30	0.90	C	20.50	0.83	C
Northbound	LTR	Signal	0.00	0.00	A	14.70	0.00	B
	LT		19.80	0.42	B	18.70	0.35	B
Southbound	R		15.10	0.07	B	15.10	0.07	B
5. Puolo Rd (Middle) and Kaunali'i Hwy								
Northbound	LTR	Stop	0.30	-	-	1.20	-	-
Eastbound	L	Free	20.00	0.08	C	36.70	0.26	E
Westbound	L	Free	9.70	0.01	A	9.30	0.00	A
Southbound	LTR	Stop	10.70	0.01	B	12.80	0.09	B
6. Puolo Rd (East) and Kaunali'i Hwy								
Northbound	LTR	Stop	60.50	0.02	F	57.40	0.06	E
Eastbound	L	Free	0.20	-	-	0.30	-	-
Southbound	LTR	Stop	61.30	0.02	F	0.00	0.00	A
Eastbound	L	Free	9.80	0.01	A	9.50	0.01	A
Southbound	LTR	Stop	23.60	0.03	C	45.90	0.12	E

Table 20: Future (2040) Without Project Intersection Level of Service (Part 2)

Intersection		Intersection/ Approach/ Control	AM		PM		
Approach	Movement		Delay (s/veh)	v/c	Delay (s/veh)	v/c	LOS
7. Hana Rd and Kaunualii Hwy			1.20	-	1.00	-	-
Northbound	LTR	Stop	14.80	0.00	18.30	0.01	C
Eastbound	L	Free	10.00	0.03	9.80	0.03	A
Southbound	LTR	Stop	70.10	0.34	63.90	0.31	F
8. Kona Rd and Kaunualii Hwy			1.10	-	5.90	-	-
Northbound	LTR	Stop	15.90	0.02	39.70	0.16	E
Eastbound	L	Free	10.10	0.05	9.90	0.05	A
Westbound	L	Free	9.60	0.00	10.50	0.01	B
Southbound	LTR	Stop	34.20	0.27	137.90	0.85	F
9. Hanapepe Rd and Moi Rd			10.60	-	15.20	-	-
Northbound	LTR	Stop	11.60	0.14	23.00	0.57	C
Eastbound	L	Free	7.50	0.03	7.70	0.09	A
Westbound	L	Free	7.40	0.02	7.40	0.03	A
Southbound	LT	Stop	14.90	0.44	22.40	0.51	C
	R	Stop	9.00	0.13	8.80	0.05	A
10. Puolo Rd/Awawa Rd and Hanapepe Rd			3.00	-	2.30	-	-
Northbound	LTR	Stop	9.30	0.01	9.50	0.01	A
Eastbound	L	Free	7.80	0.01	8.00	0.01	A
Westbound	L	Free	7.30	0.00	7.30	0.00	A
Southbound	LTR	Stop	9.40	0.04	9.80	0.04	A
11. Kane Rd and Moi Rd			0.40	-	0.20	-	-
Westbound	LR	Stop	13.10	0.04	14.60	0.02	B
Southbound	L	Free	7.50	0.00	0.00	0.00	A
12. Alif'i Rd (Makah) and Moi Rd			2.30	-	1.20	-	-
Northbound	L	Free	7.80	0.00	7.60	0.00	A
Westbound	LTR	Stop	12.90	0.17	13.50	0.12	B
Southbound	L	Free	7.50	0.00	0.00	0.00	A
13. Eleu Rd and Moi Rd			0.80	-	0.40	-	-
Northbound	L	Free	0.00	0.00	7.50	0.00	A
Eastbound	LTR	Stop	9.50	0.00	0.00	0.00	A
Westbound	LTR	Stop	10.80	0.04	11.40	0.02	B

Table 21: Future (2040) Without Project Intersection Level of Service (Part 3)

Intersection		Intersection/ Approach/ Control	AM		PM		
Approach	Movement		Delay (s/veh)	v/c	Delay (s/veh)	v/c	LOS
14. Ahi Rd and Moi Rd			1.80	-	1.50	-	-
Northbound	L	Free	7.70	0.01	7.50	0.02	A
Eastbound	LTR	Stop	9.50	0.03	9.00	0.02	A
Westbound	LTR	Stop	11.00	0.04	12.00	0.03	B
15. Alif'i Rd and Moi Rd			4.20	-	2.90	-	-
Northbound	L	Free	7.30	0.06	7.30	0.02	A
Eastbound	LTR	Stop	8.60	0.02	8.50	0.01	A
Westbound	LTR	Stop	9.30	0.03	9.60	0.02	A
Southbound	L	Free	0.00	0.00	7.40	0.00	A

2. Future (2040) With Project

Future (2040) With Project intersection/movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours utilizing the existing lane configuration. The signalized intersection of Kaunali'i Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements. All the two-way stop controlled (TWSC) intersection turning movements resulted in acceptable LOS D or better except for following turning movements:

- Lele Road and Kaunali'i Highway (Intersection #1): northbound movements resulted in LOS E for AM peak hour and LOS F with volume-to-capacity (v/c) ratio greater than 1 for PM peak hours; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio greater than 1 for both AM and PM peak hours.
- Hanapepe Road and Kaunali'i Highway (Intersection #2): northbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for the PM peak hour.
- Puolo Road (West) and Kaunali'i Highway (Intersection #3): northbound movements resulted in LOS E for the PM peak hour.
- Puolo Road (Middle) and Kaunali'i Highway (Intersection #5): northbound movements resulted in LOS E for the PM peak hour; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.
- Puolo Road (East) and Kaunali'i Highway (Intersection #6): northbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for the AM peak hour; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for the PM peak hour.
- Hana Road and Kaunali'i Highway (Intersection #7): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.
- Kona Road (East) and Kaunali'i Highway (Intersection #8): northbound movements resulted in LOS E for PM peak hour; southbound movements resulted in LOS E for the AM peak hour and LOS F with volume-to-capacity (v/c) ratio greater than 1 for PM peak hour.
- Sixth Access Road and Kaunali'i Highway (Intersection #16): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for AM peak hour and volume-to-capacity (v/c) ratio equal to 1 for PM peak hours.

The Future (2040) With Project signalized and unsignalized intersection LOS are shown in Tables 22 through 24.

Table 22: Future (2040) With Project Intersection Level of Service (Part 1)

Intersection Approach	Intersection Movement	Intersection/Approach Control	AM		PM			
			Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
1. Lele Rd and Kaunali'i Hwy								
Northbound	LTR	Stop	60.00	0.53	E	330.60	1.45	F
Eastbound	L	Free	10.10	0.03	A	9.30	0.10	A
Westbound	L	Free	9.10	0.09	A	11.10	0.15	B
Southbound	LTR	Stop	296.90	1.37	F	828.90	2.38	F
2. Hanapepe Rd and Kaunali'i Hwy								
Northbound	LTR	Stop	2.40	-	-	2.80	-	-
Eastbound	L	Free	14.70	0.02	B	82.30	0.44	F
Westbound	L	Free	10.40	0.08	B	9.90	0.14	A
Southbound	LTR	Stop	9.00	0.01	A	10.30	0.01	A
3. Puolo Rd (West) and Kaunali'i Hwy								
Northbound	LTR	Stop	23.10	0.43	C	16.30	0.18	C
Eastbound	L	Free	0.90	-	-	1.10	-	-
Westbound	L	Free	33.80	0.11	D	42.90	0.21	E
Southbound	LTR	Stop	9.70	0.00	A	9.00	0.00	A
4. Moi Rd and Kaunali'i Hwy								
Eastbound	L	Free	8.90	0.01	A	10.30	0.03	A
Westbound	L	Free	34.60	0.17	D	28.70	0.14	D
Southbound	LTR	Stop	20.40	-	B	21.80	-	C
5. Puolo Rd (Middle) and Kaunali'i Hwy								
Eastbound	L	Free	29.50	0.07	C	36.40	0.32	D
Westbound	TR	Signal	11.90	0.62	B	18.70	0.83	B
Northbound	LTR	Stop	24.20	0.90	C	22.30	0.88	C
Southbound	LT	Free	0.00	0.00	A	21.60	0.00	B
Southbound	R	Free	27.80	0.54	C	29.10	0.49	C
6. Puolo Rd (East) and Kaunali'i Hwy								
Northbound	LTR	Stop	20.60	0.15	C	22.60	0.11	B
Eastbound	L	Free	0.40	-	-	1.60	-	-
Southbound	LTR	Stop	25.20	0.11	D	61.60	0.39	E
Eastbound	L	Free	10.10	0.01	B	10.00	0.00	A
Westbound	L	Free	11.50	0.01	B	14.00	0.10	B
Southbound	LTR	Stop	87.00	0.02	F	108.60	0.11	F
6. Puolo Rd (East) and Kaunali'i Hwy								
Northbound	LTR	Stop	0.20	-	-	0.50	-	-
Eastbound	L	Free	88.90	0.03	F	0.00	0.00	A
Southbound	LTR	Stop	10.20	0.01	B	10.30	0.01	A
Southbound	LTR	Stop	29.40	0.04	D	78.10	0.20	F

Table 23: Future (2040) With Project Intersection Level of Service (Part 2)

Intersection		AM			PM		
Approach	Movement	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
7. Hana Rd and Kaunualii Hwy							
Northbound	LTR	16.80	0.00	C	21.00	0.01	C
Eastbound	L	10.40	0.03	B	10.60	0.04	B
Southbound	LTR	115.00	0.48	F	136.70	0.53	F
8. Kona Rd and Kaunualii Hwy							
Northbound	LTR	18.200	0.02	C	65.00	0.25	E
Eastbound	L	10.60	0.05	B	10.80	0.06	B
Westbound	L	10.20	0.00	B	11.20	0.01	B
Southbound	LTR	50.00	0.36	F	410.20	1.50	F
9. Hanapepe Rd and Moi Rd							
Northbound	LTR	11.90	0.18	B	31.90	0.73	D
Eastbound	L	7.50	0.03	A	7.70	0.09	A
Westbound	L	7.40	0.02	A	7.40	0.03	A
Southbound	LT	17.00	0.54	C	28.40	0.63	D
	R	9.00	0.13	A	8.80	0.05	A
10. Puolo Rd/Awara Rd and Hanapepe Rd							
Northbound	LTR	9.30	0.01	A	9.50	0.01	A
Eastbound	L	7.80	0.01	A	8.00	0.01	A
Westbound	L	7.30	0.00	A	7.30	0.00	A
Southbound	LTR	9.40	0.04	A	9.80	0.04	A
11. Kane Rd and Moi Rd							
Northbound	L	8.30	0.01	A	7.90	0.03	A
Eastbound	LTR	11.20	0.05	B	9.90	0.03	A
Westbound	LTR	16.00	0.05	C	19.50	0.03	C
Southbound	L	7.60	0.00	A	0.00	0.00	A
12. Ali'i Rd (Makai) and Moi Rd							
Northbound	L	7.90	0.00	A	7.60	0.00	A
Westbound	LTR	13.50	0.18	B	14.30	0.13	B
Southbound	L	7.50	0.00	A	0.00	0.00	A
13. Eleu Rd and Moi Rd							
Northbound	L	1.70	-	-	1.30	-	-
Eastbound	LTR	9.70	0.04	A	9.10	0.02	A
Westbound	LTR	11.40	0.04	B	12.50	0.03	B

Table 24: Future (2040) With Project Intersection Level of Service (Part 3)

Intersection		AM			PM		
Approach	Movement	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
14. Ahi Rd and Moi Rd							
Northbound	L	7.70	0.01	A	7.50	0.02	A
Eastbound	LTR	9.50	0.03	A	9.00	0.02	A
Westbound	LTR	11.00	0.04	B	12.00	0.03	B
15. Ali'i Rd and Moi Rd							
Northbound	L	7.30	0.01	A	7.30	0.02	A
Eastbound	LTR	8.60	0.02	A	8.50	0.02	A
Westbound	LTR	9.20	0.03	A	9.60	0.02	A
Southbound	L	0.00	0.00	A	7.40	0.00	A
16. Sixth Access Road and Kaunualii Hwy							
Eastbound	L	10.60	0.04	B	9.60	0.12	A
Southbound	LR	87.80	0.84	F	155.50	1.00	F

E. Mitigation Measures

Mitigation measures were analyzed to alleviate the congestion at the intersections which resulted in higher delays for Future (2040) With Project conditions. The following changes in geometric configurations or change in control-type at the intersection were applied as mitigation measures and results shown in Table 25.

- **Two-Way Left-Turn Lane (TWLTL):** To alleviate the existing and future delay for the side-street movements, a TWLTL is proposed along Kaunuali'i Highway between Lele Road (Intersection #1) and Puolo Road (East) (Intersection #6). This will allow for side-street movements to turn into the center lane, requiring drivers to find gaps in only one direction of traffic at a time. With this proposed mitigation treatment, all side-street movements are expected to result in acceptable LOS. Due to the non-standard lane configuration, this mitigation cannot be analyzed in Synchro.
- **Lele Road and Kaunuali'i Highway (Intersection #1):** The intersection resulted in LOS F with volume-to-capacity (v/c) ratio 1.18 (> 1) and 1.79 (> 1) for the AM and PM peak hours respectively. Signal Warrants from MUTCD were analyzed with 70% factor as Hanapepe is an isolated community with population less than 10,000. County of Kauai's General Plan forecasts the population Hanapepe-Ele'ele district will grow to 7,094 by 2035 (Table 1-1 Kauai's County Population, Island-Wide and By District (1990-2035)). Four Hour Signal Warrants passed by using the existing volumes and Peak Hour Signal Warrants passed for Future (2040) With Project Conditions. Warrants are included in Appendix G. A traffic signal and roundabout were analyzed at this location and the resulting intersections had appropriate LOS D or better for all approaches.
- **Hanapepe Road and Kaunuali'i Highway (Intersection #2):** The Future Transportation Network proposes the removal of the misaligned (< 90-degrees) north leg at the intersection Hanapepe Road and Kaunuali'i Road. As a result, Hanapepe Road is turned into a dead-end street north of the intersection. The right turning vehicles from Hanapepe Road to Kaunuali'i Highway were redistributed to make a right turn at the signalized intersection of Moi Road and Kaunuali'i Highway (Intersection #4).
- **Kona Road and Kaunuali'i Highway (Intersection #8):** Due to heavy volumes along Kaunuali'i Highway, the side street volumes trying to turn onto the highway from Kona Road are experiencing higher delays and poor LOS. Signal warrants will not pass at this location due to the low side-street volumes, however as a roundabout, all movements resulted in acceptable LOS D or better.
- **Sixth access Road and Kaunuali'i Highway (Intersection #16):** Delay can be reduced for southbound vehicles turning right from Sixth access Road onto Kaunuali'i Highway by providing a dedicated right-turn lane. However, the southbound shared left movement resulted in LOS F with v/c < 1.0 for both AM and PM peak hours. Widening Kaunuali'i Highway in the vicinity of intersection to provide a storage lane for left-turn vehicles onto Sixth access Road, as well as a refuge lane for the left-turning vehicles from Sixth access Road, allows drivers to find a gap in only one direction of traffic at a time. It is expected that with this change, all turning movements will result in acceptable LOS.

Table 25: Future (2040) With Mitigations Level of Service

Intersection		Intersection/ Approach Control		AM		PM	
Approach	Movement	Delay (s/veh)	v/c	LOS	Delay (s/veh)	v/c	LOS
1. Lele Rd and Kaunuali'i Hwy							
Eastbound	LTR	14.00	-	B	22.60	-	C
	LTR	9.50	0.54	A	32.80	0.94	D
Westbound	LTR	17.60	0.81	C	12.10	0.66	B
	LTR	7.40	0.15	A	14.70	0.33	B
Southbound	LTR	12.40	0.29	B	7.80	0.17	A
	LTR	22.90	-	C	25.90	-	C
1. Lele Rd and Kaunuali'i Hwy							
Eastbound	LTR	28.00	0.85	C	36.50	0.96	D
	L	8.30	0.22	A	8.30	0.37	A
Westbound	TR	21.70	0.88	C	7.20	0.51	A
	LTR	18.90	0.19	B	40.70	0.42	D
Southbound	LTR	19.80	0.27	B	38.20	0.31	D
	LTR	20.60	-	C	20.60	-	C
4. Moi Rd and Kaunuali'i Hwy							
Eastbound	L	38.70	0.42	D	52.60	0.74	D
	TR	10.90	0.59	B	10.20	0.66	B
Westbound	TR	20.40	0.86	C	13.20	0.76	B
	LTR	0.00	0.00	A	35.90	0.00	D
Southbound	LT	31.70	0.58	C	52.60	0.67	D
	R	31.30	0.58	C	44.20	0.46	D
8. Kona Rd and Kaunuali'i Hwy							
Northbound	LTR	15.10	-	-	19.30	-	-
	LTR	14.70	0.76	B	21.40	0.86	C
Eastbound	LTR	15.80	0.78	C	18.00	0.82	C
	LTR	8.90	0.02	A	10.80	0.05	B
Southbound	LTR	8.80	0.10	A	10.20	0.17	B
	LTR	8.80	0.10	A	10.20	0.17	B

The proposed transportation network improvements are shown in Figure 22.

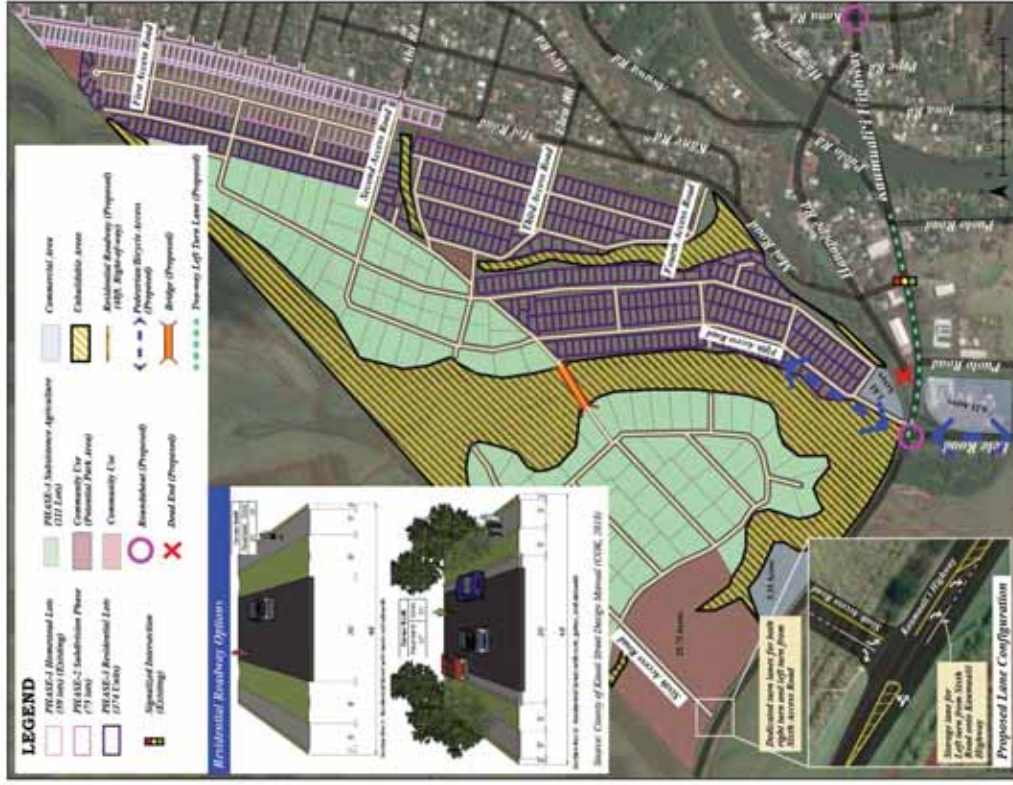


Figure 22: Proposed Transportation Network

V. SUMMARY

The State Department of Hawaiian Home Lands (DHHL) is proposing to expand development on 365 acres of gently rolling former agricultural land west of historic Hanalei Town and Mōi Road/Puolo Road on the Island of Kaua'i. The project is being proposed for development over two phases (Phase 2 and 3). In total, Phase 2 plans to have 75 residential lots with an expected full buildout and occupancy by 2025. Phase 3 will have 374 residential units, 111 subsistence lots, and 13.17 acres of commercial area with an expected full buildout and occupancy by 2040.

Intersection/movement LOS and average delay were determined for the AM and PM weekday peak hours for existing, future without project, and future with project conditions:

- Existing (2019) Conditions:
 - The signalized intersection of Kaunuauli'i Highway and Mōi Road resulted in acceptable LOS C or better for the intersection and movements.
 - All stop-controlled intersection turning movements resulted in acceptable LOS D or better except for following approaches:
 - Puolo Road (Middle) and Kaunuauli'i Highway (Intersection #5): southbound approach resulted in LOS E for both AM and PM peak hours.
 - Puolo Road (East) and Kaunuauli'i Highway (Intersection #6): northbound approach resulted in LOS E for the AM peak hour.
 - Hāna Road and Kaunuauli'i Highway (Intersection #7): southbound approach resulted in LOS E for both AM and PM peak hours.
 - Kona Road (East) and Kaunuauli'i Highway (Intersection #8): southbound approach resulted in LOS F with volume-to-capacity (v/c) ratio less than 1.0 for the PM peak hour.
- Future (2040) Without Project conditions:
 - The signalized intersection of Kaunuauli'i Highway and Mōi Road resulted in acceptable LOS C or better for the intersection and movements.
 - All the two-way stop controlled (TWSC) intersection turning movements resulted in acceptable LOS D or better except for following turning movements:
 - Puolo Road (Middle) and Kaunuauli'i Highway (Intersection #5): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for AM and LOS E for PM peak hours.
 - Puolo Road (East) and Kaunuauli'i Highway (Intersection #6): northbound movements resulted in LOS E for AM peak hour and southbound movements resulted in LOS E for PM peak hour.
 - Hāna Road and Kaunuauli'i Highway (Intersection #7): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for AM and LOS E for PM peak hours.
 - Kona Road (East) and Kaunuauli'i Highway (Intersection #8): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for PM peak hour.

- Future (2040) With Project conditions:
 - The signalized intersection of Kaunuauli`i Highway and Moi Road resulted in acceptable LOS C or better for the intersection and movements.
 - All the two-way stop controlled (TWSC) intersection turning movements resulted in acceptable LOS D or better except for following turning movements:
 - Lele Road and Kaunuauli`i Highway (Intersection #1): northbound movements resulted in LOS E for AM peak hour and LOS F with volume-to-capacity (v/c) ratio greater than 1 for PM peak hours; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio greater than 1 for both AM and PM peak hours.
 - Hanapēpē Road and Kaunuauli`i Highway (Intersection #2): northbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for the PM peak hour.
 - Puolo Road (West) and Kaunuauli`i Highway (Intersection #3): northbound movements resulted in LOS E for the PM peak hour.
 - Puolo Road (Middle) and Kaunuauli`i Highway (Intersection #5): northbound movements resulted in LOS E for the PM peak hour; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.
 - Puolo Road (East) and Kaunuauli`i Highway (Intersection #6): northbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for the AM peak hour; southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for the PM peak hour.
 - Hāna Road and Kaunuauli`i Highway (Intersection #7): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.
 - Kona Road (East) and Kaunuauli`i Highway (Intersection #8): northbound movements resulted in LOS E for PM peak hour; southbound movements resulted in LOS E for the AM peak hour and LOS F with volume-to-capacity (v/c) ratio greater than 1 for PM peak hour.
 - Sixth Access Road and Kaunuauli`i Highway (Intersection #16): southbound movements resulted in LOS F with volume-to-capacity (v/c) ratio less than 1 for both AM and PM peak hours.

Mitigation measures were analyzed to alleviate the congestion at the intersections which resulted in higher delays for Future (2040) With Project conditions. The following changes in geometric configurations or change in control-type at the intersection were applied as mitigation measures which resulted in the following:

- **Two-Way Left-Turn Lane (TWLTL):** To alleviate the existing and future delay for the side-street movements, a TWLTL is proposed along Kaunuauli`i Highway between Lele Road (Intersection #1) and Puolo Road (East) (Intersection #6). With this proposed mitigation treatment, all side-street movements are expected to result in acceptable LOS. Due to the non-standard lane configuration, this mitigation cannot be analyzed in Synchro.
- **Lele Road and Kaunuauli`i Highway (Intersection #1):** The intersection resulted in LOS F with volume-to-capacity (v/c) ratio 1.18 (> 1) and 1.79 (> 1) for the AM and PM peak hours respectively.

Four Hour Signal Warrants were run and passed for Future (2040) With Project Conditions. A roundabout and traffic signal were analyzed at this location which resulted in appropriate LOS D or better for all approaches.

- **Hanapēpē Road and Kaunuauli`i Highway (Intersection #2):** The Future Transportation Network proposes the removal of the misaligned (< 90-degrees) north leg at the intersection Hanapēpē Road and Kaunuauli`i Road. As a result, Hanapēpē Road is turned into a dead-end street north of the intersection. The right turning vehicles from Hanapēpē Road to Kaunuauli`i Highway were redistributed to make a right turn at the signalized intersection of Moi Road and Kaunuauli`i Highway (Intersection #4).
 - **Kona Road and Kaunuauli`i Highway (Intersection #8):** A roundabout is proposed to alleviate the poor LOS for side-street approaches. With the roundabout the LOS for all movements resulted in acceptable LOS D or better.
 - **Sixth access Road and Kaunuauli`i Highway (Intersection #16):** Delay can be reduced for southbound vehicles turning right from Sixth access Road onto Kaunuauli`i Highway by providing a dedicated right-turn lane. In addition, providing a refuge lane on Kaunuauli`i Highway for the left-turning vehicles from Sixth access Road, allows drivers to find gaps in only one direction of traffic at a time. With these changes all turning movements are expected to result in acceptable LOS D or better.
- With the development of residential lots, it is recommended to include dedicated space for bicycles and pedestrians as a part of new roadway buildout. This may look like one of the Residential Street cross-sections provided in the County of Kāua`i Street Design Manual, with minimum five-foot-wide sidewalks included on either side and travel speeds low enough for people on bicycles to share the road. A continuous off-street path may be an appropriate solution to connect the residential neighborhood mauka of the highway to the commercial center and beach makai of the highway. Enhanced crosswalks should be included where appropriate. It is also recommended to include a shared shoulder space along Kaunuauli`i Highway in the vicinity of the project.
- In addition, the State DOT recommends a 60-foot design setback from Kaunuauli`i Highway to accommodate future roadway improvements.

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Appendix F – Drainage Master Plan



PRELIMINARY ENGINEERING REPORT

Hanepepe Homestead Drainage Master Plan

6, March 2020

Island Experts



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Appendix B

Soils Mapping

1.0 Introduction and Project Description

The Hanapepe Homestead community was identified in the Department of Hawaiian Homelands (DHHL) Kauai Island Plan with the majority of lands designated for subsistence agriculture and residential homesteading. Other complementary uses of DHHL Hanapepe land are designated for Commercial and Community use. The area is envisioned as DHHL largest residential and agricultural community on the west side of Kauai. It is situated adjacent to the Hanapepe town center and within commuting distance to local employment centers.

The project site is currently undeveloped and is used for agriculture crops and grazing. The (DHHL) is planning to develop the project site with a mix of land uses including, residential, subsistence agriculture and commercial/community areas.

The project will be developed over multiple phases, and as an initial development phase, it is anticipated that 75 residential lots would be developed near the Mauka end of the site, and would be situated to the west of the existing homes on Moi Road. The residential lots will be relatively low density, with an average size in the range of 0.25 acres each. The anticipated zoning is R-6.

The subsistence agriculture lots will range in size from less than 1 acre to lots that are in the range of 2 acres. At Full Build-out it is anticipated that the total development will encompass 407 residential lots, plus 82 subsistence agriculture lots (107.8 ac) and 14.5 acres of commercial/community areas.

The future commercial area is planned for the western portion of the development, and will be located near Kaunualii Highway.

The purpose of this master drainage plan is to determine the preliminary locations and sizes of the various storm water management facilities to ensure that the proposed development can proceed with minimal impacts on the downstream receiving waters.

2.0 Existing Conditions

Mauka Site

Hanapepe has a tropical savannah climate with light rainfall most months of the year. The mean annual temperature is 74 degrees Fahrenheit with mean annual precipitation averaging 27 inches. The terrain on the Mauka site is gently to moderately sloping in the south west direction and is largely defined by the Kukamahu Gulch which bisects the property into an eastern half and western half. The land area to the east of the gulch slopes towards the valley at an average slope of approximately 3%, and ranges in elevation from 50 feet to 260 feet above mean sea level.

The land to the west of the gulch generally slopes in the Makai direction, also at an average grade of around 3% and ranges in elevation from 30 feet to 250 feet.

There is also a smaller gulch near the eastern side of the property which extends northward from Moi Road and then turns gradually to the east and terminates near Ahi Road.

Soils within the Mauka site are primarily composed of Makaweli silt clay loam, as nearly 80% coverage. Other soil types, include Pakala Clay Loam and Lihue gravelly silty clay. See Appendix B for the soils mapping.

The Mauka site is located with Flood Zone X, which includes areas that are outside the 0.2% annual chance floodplain. Refer to **Figure 1** for the flood zone mapping for the Mauka Site.

Makai Site

The terrain on the Makai site is quite flat and slopes in a north to south direction at an average grade of 1.5% to 2%. The site is currently developed for industrial/commercial uses. The Makai site is comprised of one type of soil identified as Pakala soil, which is classified as Class B clay loam. This soil is deep and moderately deep, moderately well-drained soils with moderately coarse textures. Soil layers of this type of soil are generally segregated at the site as follows:

- 0-16 inches: Clay Loam Silt-clay material, clayey soils;
- 16-59 inches: Silty Clay Loam Silt-clay materials, clayey-soils.

The Makai site contains two separate flood zone designations. The northern side of the site is within Flood Zone XS, which contains areas of 0.2% annual chance flood; areas of 1% chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile and areas protected from the 1% annual chance flood.

The southern portions of this site are within the AE flood zone, which is a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. The 1% annual chance flood is also referred to as the base flood or 100-year flood. Refer to **Figure 2** for the flood zone mapping for the Makai Site.

3.0 Drainage Design Criteria

This report uses the County of Kauai, Department of Public Work, Storm Drainage Standard (February 1972) for appropriate and acceptable drainage design requirements, criteria and calculations.

Recurrence Interval (T_m)

For drainage areas of 100 acres or less:

T_m= 10- year based on 1-hour storm, unless otherwise specified.

Retention and Detention Basin

T_m= 50-year based on 1 hour for drainage areas 100 acres or less.

Runoff Quantity

Off-site Drainage

For the larger, upstream watersheds, which are located further Mauka of the development site, the WinTR-55 software was used to estimate the runoff for the 10-year and 50-year runoff events. This software is a single-event rainfall-runoff, small watershed hydrologic model which generates hydrographs from both urban and agricultural areas. The runoff hydrographs are routed downstream through channels and/or reservoirs, towards the outlet.

The WinTR-55 software uses runoff curve numbers which reflect the soil types and type of ground cover within each watershed area. The upstream, undeveloped areas were modeled using a Hydrologic Soil Type B, and a runoff curve number of 48 to reflect the brush-weed mixture of vegetative cover.

The upstream watersheds also encompass approximately 84 acres of urban development to the east of the DHHL site, within the Cliffside at Hanapepe development. This area was developed circa 1992, and extends from Ahi Road through to Walea Street. The existing storm water collection system captures the urban runoff, which is then released, unattenuated, into the existing gulch within the eastern portion of the DHHL site. Based on the available as-built drawings, there is a 66-inch diameter outlet located at the head of the gulch near Ahi Road.

Onsite Drainage

Since the drainage area for this project is considerably larger than 100 acres, the Rational Method was not considered applicable. To model the existing and post-development conditions, the hydrologic and hydraulic modeling was completed using the EPASWM 5.1 software. The EPASWMM 5.1 model is an open-source, comprehensive model for continuous and single-event simulation of runoff quantity and quality.

The model has a variety of input parameters such as rainfall data, amount of previous and impervious area, infiltration and watershed slope to estimate the stormwater runoff.

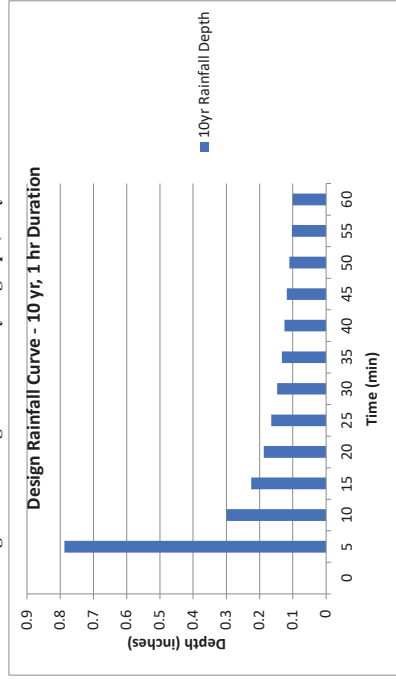
The following is a list of typical values used to model the sub-catchment's characteristics throughout the study area:

- Impervious percentage in Single Family lots; 48%
- Impervious percentage in subsistence agriculture lots; 10%
- Impervious percentage in commercial/community lots; 85%
- Initial abstractions; 0.05 inches in impervious areas and 0.2 inches in pervious areas
- Soil infiltration; maximum of 3.0 in/hour and minimum of 0.5 in/hour
- Sub-catchment slope; 2 to 3%
- Sub-catchment width; 200 ft to 700 ft

The rainfall depth for the 1-hour storm was obtained from Plate 1 of the County of Kauai Storm Drainage Standards, with a total rainfall depth of 2.5 inches for the 10-year recurrence interval. The design rainfall hyetograph was simulated using the rainfall distribution curves as published

in the Guam Department of Public Works, Transportation Stormwater Drainage Manual. The one-hour duration storm pattern represents a short duration, high intensity storm, considered typical of the south pacific region. A copy of the design rainfall hyetograph is presented below as **Figure 4**.

Figure 3 – Design Rainfall Hyetograph, 10-year Storm



The hydraulic modeling, flow routing and proposed storm water detention systems were also modeled within EPASWM 5.1, in conjunction with the hydrologic modeling as noted above. For the purposes of the drainage master plan, the hydraulic conveyance system was assumed to generally follow the existing topographic patterns, with the drainage pipes assumed to be in the order of 3 to 5 feet below ground surface. The hydrologic and hydraulic analysis was carried out iteratively to select the appropriately sized drainage pipes. The proposed pipe sizes were increased during each iteration to ensure that flooding did not occur at the pipe junctions, and that the pipe capacity did not exceed 75% to 80% full during the 10-year storm with a 1-hour duration.

The hydraulic design parameters used in the enclosed analysis were based on the following:

- Minimum pipe size- 18-inch diameter
- Manning's *n* for pipes: 0.011
- Manning's *n* for channels; 0.20 to 0.30

The existing gulches will form an integral part of the overall drainage network and will serve as the outlet location for the various proposed stormwater detention facilities.

Storm Water Quality

The County of Kauai currently does not have published criteria governing the storm water quality requirements. To ensure that the proposed development follows the industry standards and good engineering principles relating to stormwater runoff quality, the results of this report also form the basis for preliminary sizing of water quality treatment devices, which DHHL may elect to implement with the storm drainage improvement works.

Should DHHL elect to utilize flow-through water quality units, it is anticipated that these water quality units would be located on the downstream side of the proposed detention basins, so that the design capacity of the flow-through units can be minimized, resulting in more cost effective facilities.

To further address runoff water quality issues and to reduce peak runoff rates, DHHL may also consider implementing a series of Low Impact Development (LID) measures within the residential subdivision and roadway design and also within the commercial development sites. These LID measures may include features such as biofiltration swales, grassed swales, tree wells and biofiltration gardens. In addition, there are a series of on-lot measures that can be implemented within the residential parcels to capture, retain and promote infiltration of the runoff from impervious surfaces such as the building roof tops and driveways.

The underlying objective of the LID measures and techniques is to maximize infiltration, provide retention, slow runoff and reduce impervious surfaces. There are several techniques available, and if desired, should be reviewed in more detail based on the site-specific conditions. These can be implemented on a block-by-block basis to address the runoff quantity and quality issues as close to the source as possible.

4.0 Drainage Analysis

Offsite Drainage

As noted previously, there are three gulches which travel in a Mauka-Makai direction through the development site. The approximate catchment boundaries have been shown on **Figure 4**.

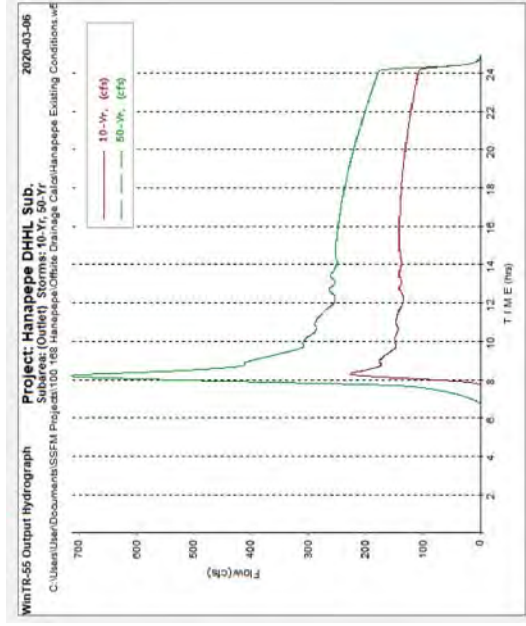
The western gulch includes a contributing area of 280 acres, comprised of undeveloped land. These are shown as areas C1-C3 on Figure 5. This gulch merges with the center gulch at the Makai edge of the site and also discharges into the existing box culvert crossing at Kaunualii Highway.

The largest of the three gulches, Kukamahu Gulch, travels through the center of the development site and outlets at Kaunualii Highway, approximately 80 feet west of Lele Road. The contributing watershed area for this gulch is approximately 1320 acres and extends in a Mauka direction up to the 920 ft elevation. This catchment area includes sub-basins B1, B2 and A1-A5 on Figure 5.

Since the catchment areas exceed 100 acres, the WinTR-55 software was used to estimate the runoff hydrographs for the 10-year and 50-year recurrence intervals. The peak flow rate for the

10 year event is estimated at 226 cfs, and for the 50 year event is estimated at 715 cfs. The runoff hydrographs are presented below for reference.

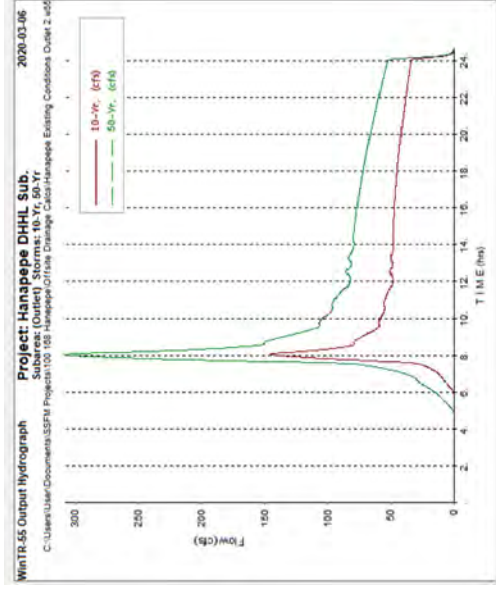
Figure 5 – Runoff Hydrographs, Kukamahu Gulch (Outlet 1)



The eastern gulch includes a contributing area of 84 acres, comprised of urban development lands, located to the east of the project limits. The gulch discharges into the Moi Road drainage system and then into the Hanapepe Road concrete channel, and ultimately into the multiple culvert crossing at Kaunualii Highway west of Puolo Road. The peak flow rate for the 10 year, 24-hour event is estimated at 145cfs, and for the 50 year, 24-hour event is estimated at 308 cfs. The runoff hydrographs are presented in **Figure 6**, for reference.

As noted above, there is an existing 66 -inch drainage pipe outlet located near Ahi Road, which discharges the runoff from the Cliffside at Hanapepe development.

Figure 6 – Runoff Hydrographs, Eastern Gulch



On-site

As noted above, the EPASWM 5.1 software was used to perform the hydrologic and hydraulic analysis for the development area.

The individual sub-basins were delineated based upon existing topography and proposed drainage basins which would reflect the anticipated site grading. The peak flow rates were generated from each of the sub-basins and routed through the various drainage systems.

Existing Conditions

Mauka Site

As noted above, the site is currently undeveloped and consists of grasslands and brush. In general, there are three main drainage basins within the project site, which are directly influenced by the existing gulches.

Although the off-site areas were modeled using Win-TR55 as noted above, the undeveloped on-site areas were modeled in further detail using the EPASWM 5.1 software to determine the existing runoff, as generated directly from the site for the 10-year, 1 hour storm, which can then

be used in determining allowable release rates and the design volume of the various detention basins.

Runoff from the south-western portion of the site drains into the smaller gulch that is located just to the north of Kaunualii Highway. The gulch travels eastward and then joins with the Kukamahu Gulch which bisects the property and ultimately crossing Kaunualii Highway to the west of Lele Road. As these gullies extend in the Makai direction, they converge just upstream of the Kaunualii Highway and cross under the highway through an existing 48-inch x 48-inch concrete box culvert.

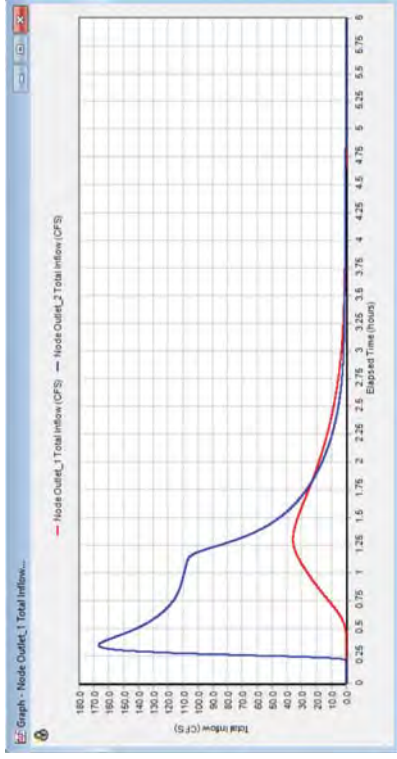
The third drainage gulch is located near the eastern edge of the site. This drainage gulch collects runoff from the north-eastern portion of the site and outlets into the drainage network at Moi Road. The majority of runoff entering this drainage corridor enters DHHL Hanapepe lands near the Ahi Road and Moi Road intersection and originates from the Cliffside at Hanapepe development.

The predeveloped condition is represented by six (6) drainage areas, E1 through E6 as depicted in Figure 7. Runoff from the on-site areas was modeled to determine the existing runoff rates for the 10-year storm. These runoff rates can then be used to determine the appropriate storage and release rates for the various storm water management facilities. Since the existing urban watershed of the Cliffside at Hanapepe development is a major contributor to the flow within the eastern gulch, this area was included within the post-development storm water model to ensure that the proposed roadway crossings and conveyance systems were adequately sized.

The upstream, undeveloped basins to the north and west were not included in the post-development model since the watershed properties are considerably different and the peak runoff rates would not likely be coincidental with the runoff from 1-hour design storm within the local urban areas. The conveyance capacity of any proposed crossings however must include the offsite flow rates from these large, undeveloped watersheds. The sub-catchment areas and peak runoff rates are attached in the appendix.

The runoff hydrographs under the pre-development conditions for Outlet 1 (Kaunualii Highway) and Outlet 2 (Moi Road) are shown in the following Figure 8.

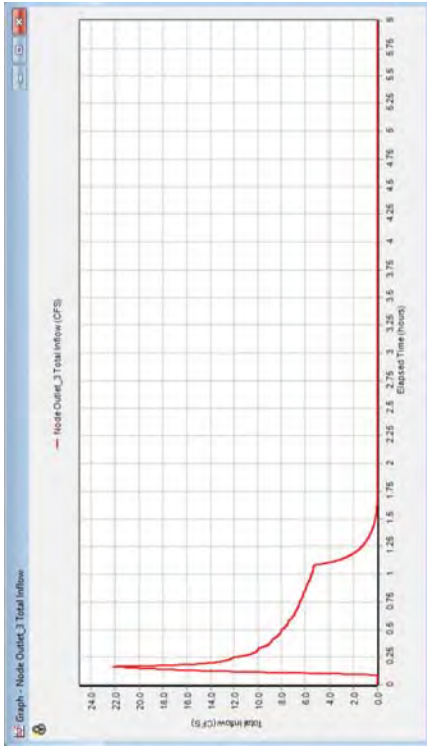
Figure 8 – Pre-Development Runoff Hydrographs 10-year, 1-Hr Storm: Mauka Site



Makai Site

The Makai site is currently developed as commercial/industrial. Runoff from this site generally flows towards the existing drainage channel located on the west side of Puolo Road. Although a topographic survey has not yet been completed, the existing 5.66 ac site has been modeled using the EPASWM 5.1 software based on an existing impervious area of 2.1 ac, or 37% of the site. The peak runoff for the 10-year, 1-hour storm under existing conditions is estimated to be 22 cfs as shown in the following figure.

Figure 9 – Pre-Development Runoff Hydrograph 10-year, 1-Hr Storm: Makai Site



Post- Development Conditions

Mauka Site

Similar to the existing conditions, the various subcatchment areas for the post-development conditions, were discretized based on the existing topography and probable direction of flow for the on-site roads and drainage system. In general, the runoff patterns will remain consistent with the existing topography, with the western portions flowing into the outlet on Kaunuauii Highway Road (Outlet 1) and the eastern portions of the site draining to the existing gulch with an outlet at Moi Road. (Outlet 2)

Figure 10 provides a summary of the proposed development areas, subcatchment boundaries and direction of flow. Under the post-development conditions, the amount of runoff increases due to the increase in impervious surfaces such as roadways and building rooftops. The roadway design will include a network of storm drainage pipes which will collect the runoff and convey it to the proposed detention facilities.

To mitigate the impacts from the increased impervious area, a series of storm water detention basins is proposed at various locations throughout the development. The objective of the detention basins is to collect and store the net increase in storm water runoff and release it to the downstream drainage system at a reduced rate, similar to the existing runoff conditions. Where the soil conditions are suitable, these detention basins will also function as infiltration facilities, to maximize water quality enhancement opportunities and promote infiltration to-ground.

Figures 11A to 11E present a preliminary layout of the storm water collection system including the estimated pipe sizes and detention basin locations. There are 10 proposed detention basins, and the estimated sizes and release rates have been shown below. It is anticipated that the proposed commercial and community sites will include significant amounts of impervious area and as such, on-site detention and Low Impact Development measures would be included within the limits of each site to mitigate the impacts of the increased urban runoff conditions.

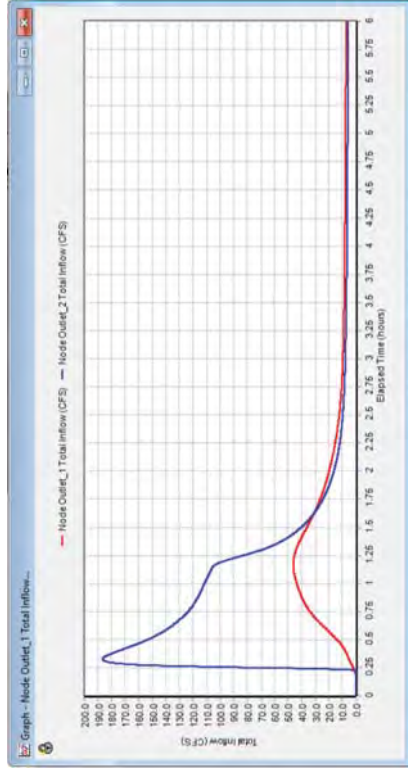
The following table provides a summary of the preliminary detention basin volumes and release rates for the 1-hour, 50-year storm within the Mauka site.

Table 1 – Summary of Detention Basins

Basin Number	Estimated Detention Volume (CY)	Release Rate (cfs)
1	13,000	2.01
2	3,500	1.16
3	1,700	1.15
4	1,500	0.66
5	6,800	1.84
6	4,000	2.15
7	6,800	2.80
8	750	1.78
9	1,850	1.83
10	10,000	2.11

The runoff hydrographs under the post-development conditions for Kaunuauii Highway (Outlet 1) and Moi Road (Outlet 2) are shown in **Figure 12**.

Figure 12 – Mauka Site, Post-Development Runoff Hydrographs; 10-year, 1-Hour Storm

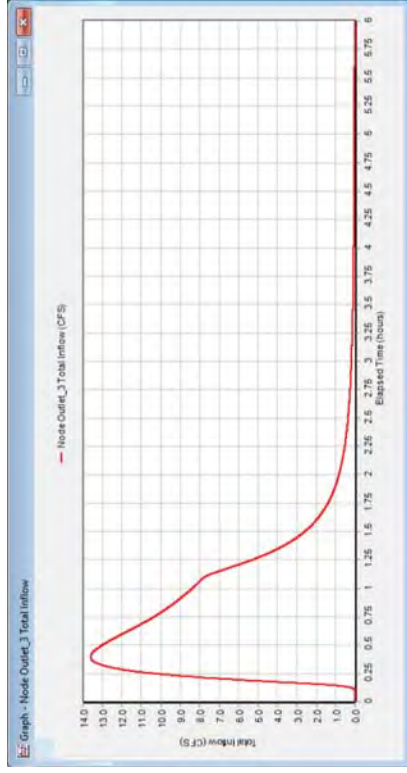


Makai Site

As noted above, the makai site is presently developed for industrial and commercial uses. It is anticipated that the Makai site will be re-developed as commercial property. The post-development conditions have been modeled based on an increase in impervious area such that the site is 90% impervious surfaces, such as building rooftops and parking areas. The preliminary runoff hydrograph, reflecting these post-development conditions is shown in **Figure 13**. Additional site investigation is recommended to determine the suitability for Low Impact Development measures such as infiltration facilities and biofiltration gardens can be used to provide water quality improvements and mitigate the increased runoff potential.

With an increase in impervious area as estimated from 37% to 90% impervious, a detention storage volume in the order of 650 cy would be required for the 1-hour, 50-year storm. This should be confirmed in more detail upon completion of the topographic survey outlining the existing conditions, and comparison to the proposed development plan.

Figure 13 – Makai Site, Post-Development Runoff Hydrograph; 10-year, 1-Hour Storm



5.0 Conclusions

Under existing conditions, the peak flow rate generated from within the site is 35 cfs at the Kaunualii Highway crossing (Outlet 1). When including the watershed areas upstream of the project site, which increases the contributing area to 1597 acres, the peak flow rates at the Kaunualii culvert crossing are estimated at 226 cfs and 715 cfs for the 10-year and 50-year recurrence intervals respectively. The conveyance capacity of the 48-inch x 48-inch box culvert is estimated to be in the range of 130 cfs.

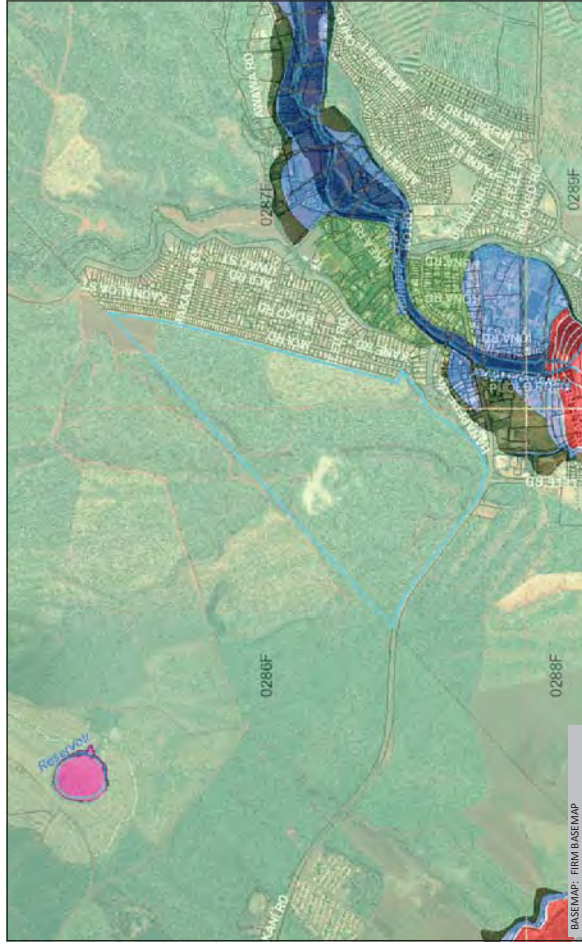
The peak runoff rate at the Moi Road outlet (Outlet 2), under existing conditions is estimated at 160 cfs, which includes the undeveloped area within the project site, plus the upstream areas within the adjacent Cliffside at Hanapepe development, which are directly connected to the DHHL Hanapepe development site.

With the proposed stormwater detention basins and controlled release rates to the downstream systems, the post development peak flow rate at Kaunualii Hwy (Outlet 1) is estimated to be 45 cfs, which is an increase of approximately 28% compared to existing conditions, but is within the hydraulic capacity of the existing culvert

Similarly, with the proposed stormwater detention basins and controlled release rates to the downstream systems, the post development peak flow rate at Moi Road (Outlet 2) is estimated to be 185 cfs, which represents an increase of only 15% compared to existing conditions.

For the Makai site, with an anticipated re-development as commercial property, and an increase in impervious surfacing from 37% to 90%, a detention storage volume of 650 cy would be required, to maintain pre-development flow rates, and no adverse impacts are expected in the downstream areas.

Based on the above analysis, the implementation of the various detention ponds, combined with the benefits of Low Impact Development (LID) measures, there are no adverse impacts anticipated on the surrounding drainage system from the DHHL Hanapepe development.



Flood Hazard Assessment Report
www.hawaiiifip.org

Property Information

COUNTY: KAUAI
 TMK NO: (4) 1-8-007-003
 WATERSHED: HANAPEPE; KULIMAKANI; KUKIAPU
 PARCEL ADDRESS: ADDRESS NOT DETERMINED
 HANAPEPE, HI 96726

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 26, 2010
 LETTER OF MAP CHANGES: NONE
 FEMA FIRM PANEL - EFFECTIVE DATE: 1500020288F - NOVEMBER 26, 2010
 1500020287F - NOVEMBER 26, 2010

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: YES (EXTREME)
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>
 THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://dlnr.hawaii.gov/dam/>

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If this map has been identified as "PRELIMINARY", please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determination to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(Note: Legend does not correspond with NFHJ)

SPECIAL FLOOD HAZARD AREAS (SFHA) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AD, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

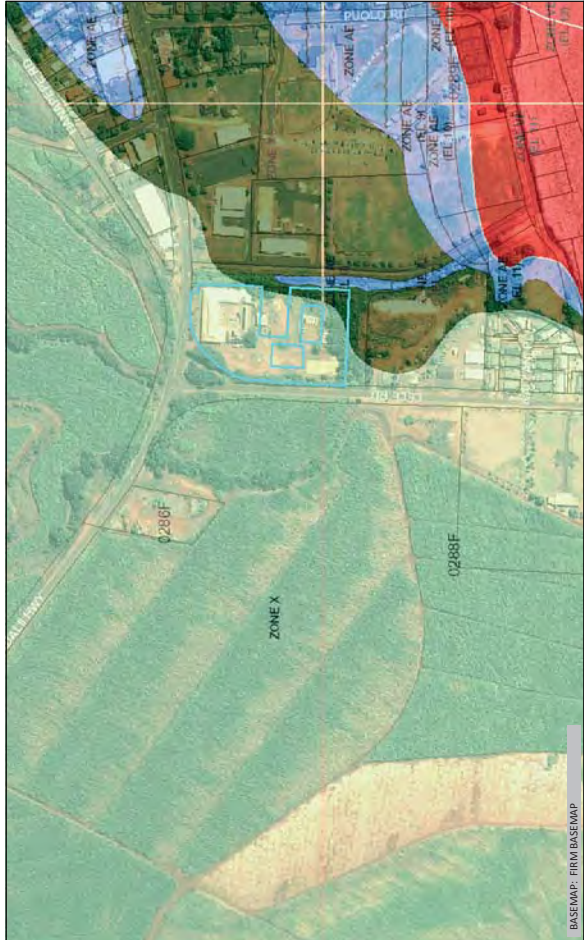
- █ Zone A: No BFE determined.
- █ Zone AE: BFE determined.
- █ Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- █ Zone AD: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- █ Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
- █ Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
- █ Zone AEF: Flashy areas in Zone AE. The flashiness in the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.


NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- █ Zone X1 (X shaded): Areas of 0.2% annual chance flood; areas of flood with drainage areas less than 1 square mile and areas protected by levees from 1% annual chance flood.
- █ Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- █ Zone D: Unstudied areas where flood hazards are undetermined, but coverage is available in participating communities.





Flood Hazard Assessment Report

www.hawaiiifip.org

Property Information

COUNTY: KAUAI
 TANK NO: (4) 1-8-008-035
 WATERSHED: KUKAMAHU
 PARCEL ADDRESS: ADDRESS NOT DETERMINED
 HANAPEPE, HI 96716

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 26, 2010
 LETTER OF MAP CHANGES: NONE
 FEMA FIRM PANEL: 1500020288F - NOVEMBER 26, 2010
 EFFECTIVE DATE: NOVEMBER 26, 2010

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
 (Note: Legend does not correspond with NFH)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AD, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- Zone A: No BFE determined.
- Zone AE: BFE determined.
- Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- Zone AD: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
- Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
- Zone AEF: Fishway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- Zone X5 (X shaded): Areas of 0.2% annual chance flood; areas of floodway that are not subject to mandatory flood insurance purchase or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- Zone D: Unstudied areas where flood hazards are undetermined but that may be covered by flood insurance purchase; apply, but coverage is available in participating communities.

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: YES
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>

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 If this map has been identified as "PRELIMINARY", please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determination to be used for compliance with local floodplain management regulations.

FIGURE 3

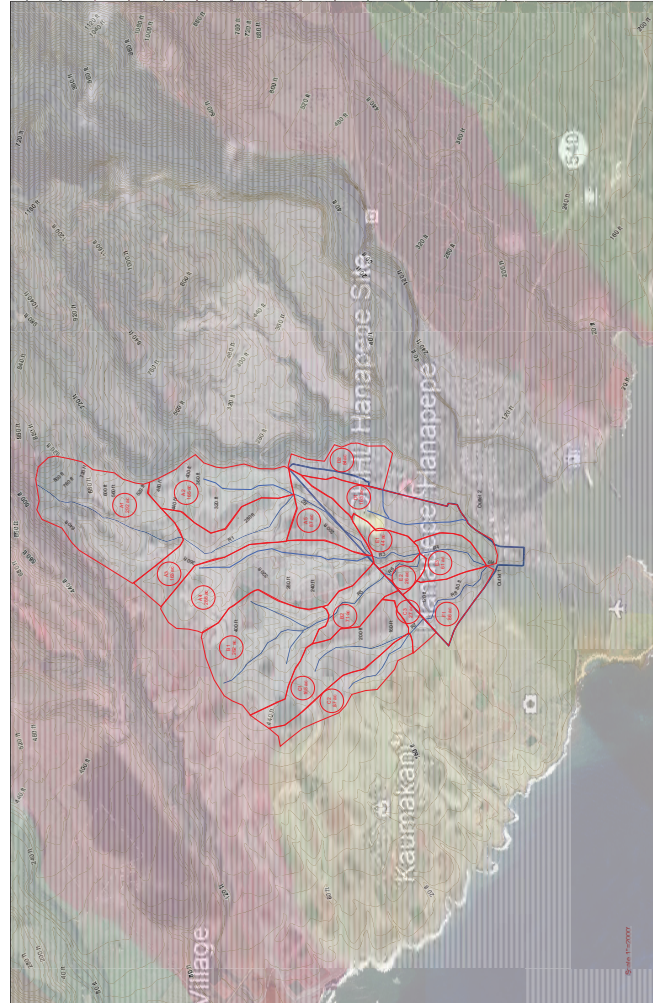
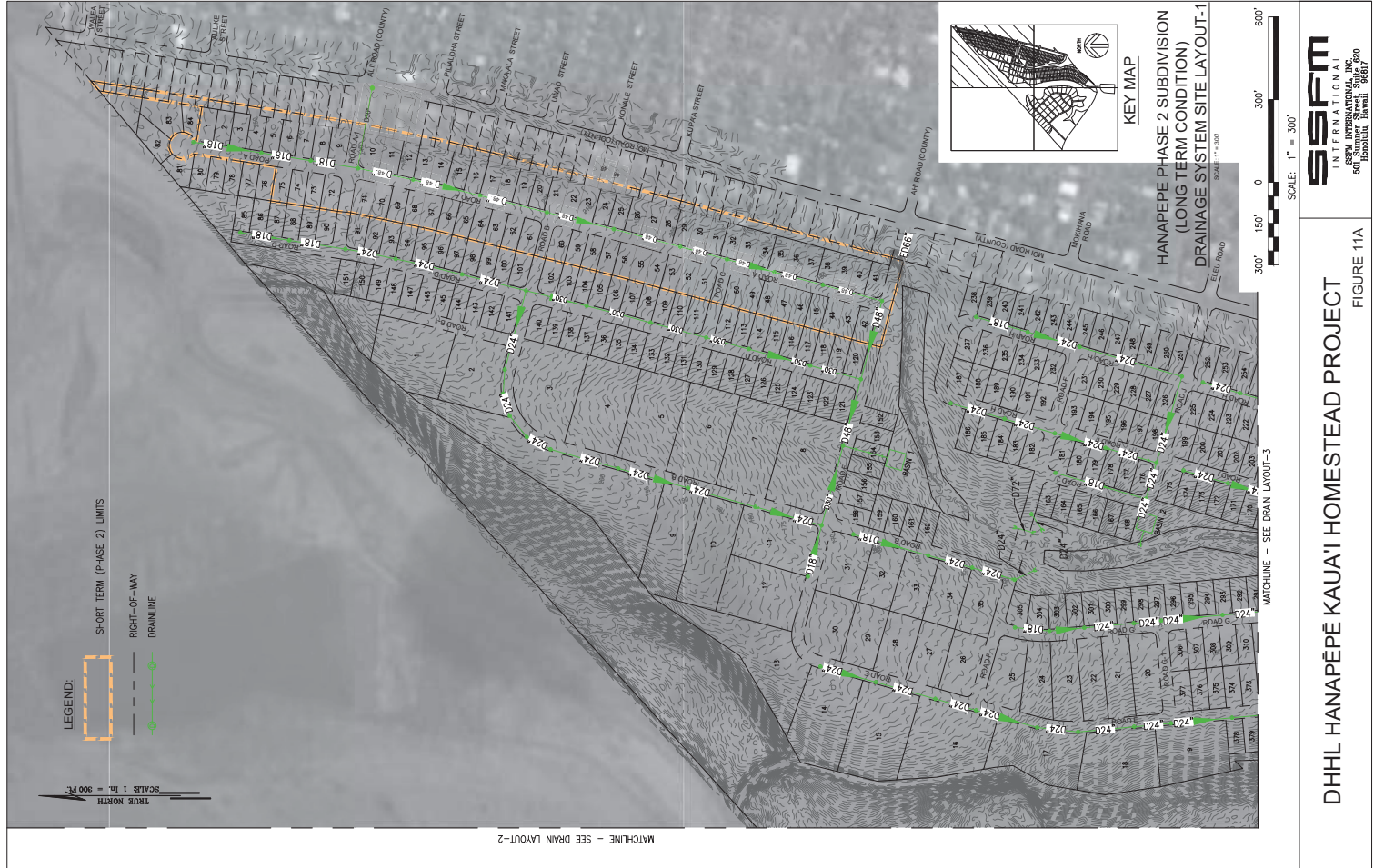




FIGURE 7



FIGURE 10



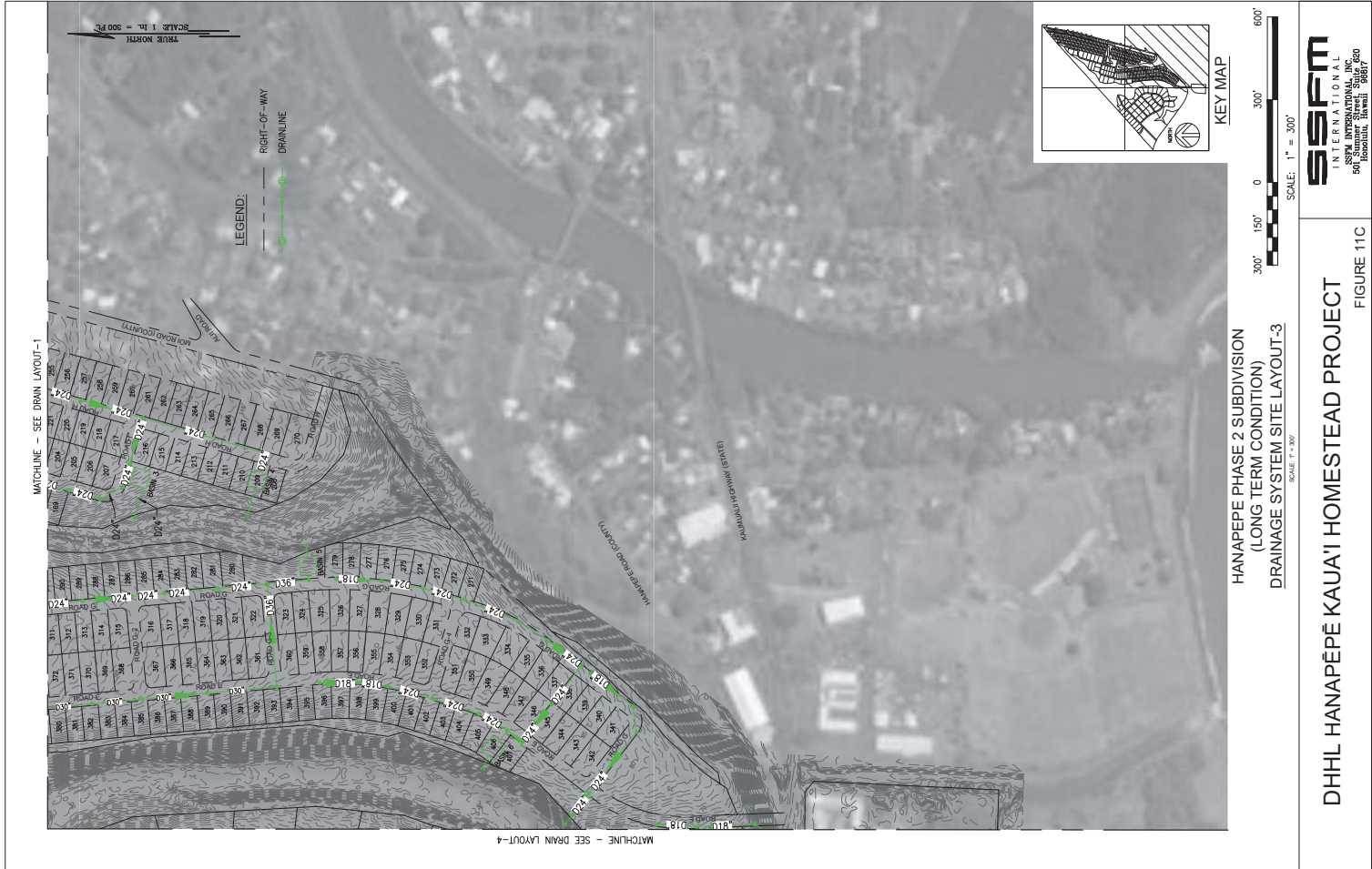
DHHL HANAPEPE KAUA'I HOMESTEAD PROJECT
FIGURE 11A

SSFM
INTERNATIONAL
SURVEYING & ENGINEERING
605 HANALEI AVENUE
HONOLULU, HAWAII 96817



DHHL HANAPEPE KAUA'I HOMESTEAD PROJECT
FIGURE 11B

SSFM
INTERNATIONAL
SURVEYING & ENGINEERING
605 HANALEI AVENUE
HONOLULU, HAWAII 96817



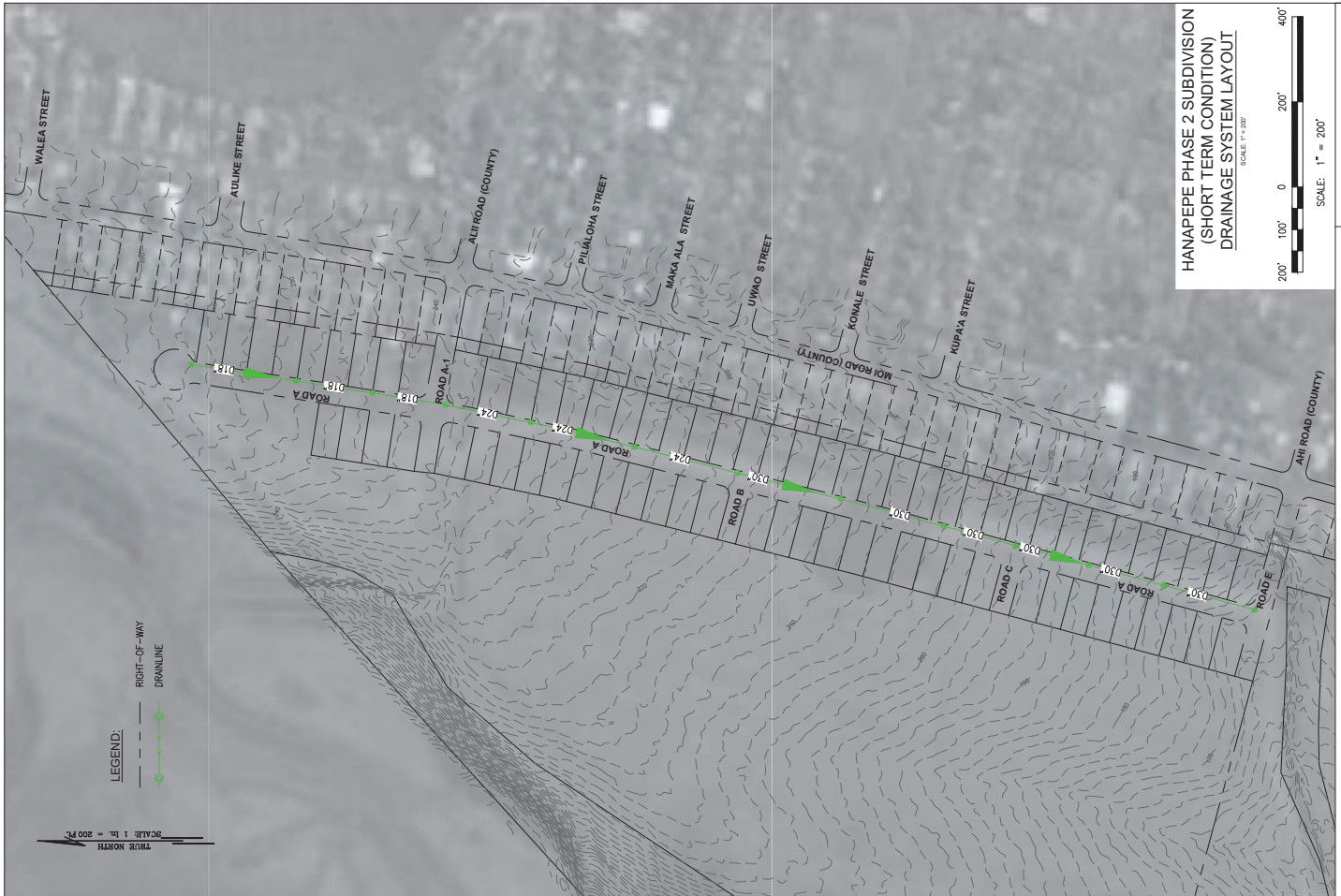
DHHL HANAPEPE KAUA'I HOMESTEAD PROJECT

FIGURE 11C



DHHL HANAPEPE KAUA'I HOMESTEAD PROJECT

FIGURE 11D



HANAPEPE PHASE 2 SUBDIVISION
 (SHORT TERM CONDITION)
 DRAINAGE SYSTEM LAYOUT

SCALE: 1" = 200'

200' 100' 0 200' 400'

SCALE: 1" = 200'

Appendix G – Water Master Plan



PRELIMINARY ENGINEERING REPORT

Hanepepe Homestead Water Master Plan

10, June 2020

Island Experts



PREPARED FOR:

Department of Hawaiian Home Lands
91-5420 Kapolei Parkway
Kapolei, Hawaii 96707

SUBMITTED BY:

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Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

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6.0	Hanapepe- Eleele Water System Analysis	12
7.0	Conclusions	17

Appendix A

Figure 1	Overall Existing Water System Map
Figure 2	Water System Site Layout
Figure 3	Residential Demand Pattern
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1.0 Introduction and Project Description

The Hanapepe Homestead community was identified in the Department of Hawaiian Homelands (DHHL) Kauai Island Plan with the majority of lands designated for subsistence agriculture and residential homesteading. Other complementary uses of DHHL Hanapepe land are designated for Commercial and Community use. The area is envisioned as DHHL's largest residential and agricultural community on the west side of Kauai. The project site is situated adjacent to the Hanapepe town center and within commuting distance to local employment centers.

The project site is currently undeveloped and is used for agriculture crops and grazing. The DHHL is planning to develop the project site with a mix of land uses including residential, subsistence agriculture and commercial/community areas.

The project will be developed over multiple phases and as an initial development phase, it is anticipated that 75 residential lots (Phase 2) would be developed near the mauka end of the site, and would be situated to the west of the existing homes on Moi Road. The residential lots will be relatively low density with an average size in the range of 7,500 square feet each. The anticipated zoning is R-6.

The subsistence agriculture lots will range in sizes from less than 1 acre to lots that are in the range of 2 acres. At Full Build-out it is anticipated that the total development will encompass 407 residential lots, plus 82 subsistence agriculture lots (107.8 acres) and approximately 14.5 acres of commercial/community areas.

The future commercial area is planned for the western portion of the development and will be located near Kaunualii Highway.

The purpose of this master water plan is to determine the ultimate demands and for the proposed development, assess the adequacy of the existing Hanapepe-Eleele water system and determine how the existing waster system may be affected by the addition of the proposed development. In addition, the master water plan identifies the preliminary sizes for the various system components including proposed water mains, pressure zone limits and pressure reducing valve requirements and pipe sizes.

2.0 Water System Design Criteria

The proposed water master plan utilizes the State of Hawaii, Water System Standards (2002). The criterion used in the development of this water master plan is included in this section.

Consumption Guidelines

The average daily demands were obtained from the consumption guidelines. Table 1 summarizes these guidelines for the County of Kauai.

Table 1: Kauai County Consumption Guidelines

Zoning Designation	Average Daily Demand
Single Family (R-6 Lots)	500 gallons / unit
Subsistence Agriculture	500 gallons / unit 3400 gallons/acre
Commercial (Neighborhood Business)	3000 gallons / acre

Demand Factors

The demand factors which calculate the maximum daily demand and peak hour demand are summarized in Table 2.

Table 2: Demand Factors

Maximum Daily Demand	Peak Hour
1.5 x Average Day	3.0 x Average Day

Fire Flow Requirements

The fire flow requirements for the Kauai County are summarized in Table 3.

Table 3: Fire Flow Requirements

Land Use	Flow Gallons per Minute (GPM)	Duration (Hours)	Fire Hydrant Spacing (Feet)
Single Family (R-6)	1,000	2.0	500
Agriculture	250	1.0	500
Commercial	2,000	2.0	350

Pipeline Sizing

Pipelines need to be designed to meet the following requirements:

- Maximum daily flow plus fire flow with a residual pressure of 20 pounds per square inch (psi) at the critical fire hydrant.
- Peak hour flow with a minimum residual pressure of 40 psi.
- “C” factors as shown in Table 4.

Table 4: "C" Factors

Pipe Diameter	"C"
4", 6"	100
8", 12"	110
16", 20"	120

- Maximum velocity in the distribution main (without fire flow) is 6 feet per second (fps).
- Maximum static or pumping pressure, whichever is greater, shall not exceed 125 psi.

Reservoir (Tank) Capacity

Reservoirs (tanks) need to be designed to meet the following requirements:

- Meet maximum day consumption. Reservoir (tank) full at the beginning of the 24-hour period with no source input to the reservoir (tank).
- Meet maximum day rate plus fire flow for duration of fire. Reservoir (tank) $\frac{3}{4}$ full at start of fire, with credit for incoming flow from pumps, one maximum size pump out of service.
- Minimum size reservoir (tank) shall be 0.1 million gallon (MG). The standard sizes for reservoirs (tanks) are 0.1 MG, 0.2 MG, 0.25 MG, 0.3 MG, 0.5 MG, 1.0 MG, and 0.5 MG increments thereafter.

Where there are two or more reservoirs (tanks) serving the same system, the design shall be made on the basis of combined protection provided by all facilities available.

Total Pump Capacity

The system is deemed to have adequate pumping capacity if it meets the maximum day demand with an operating time of 24 hours.

3.0 Hanapepe-Eleele Water System

Existing Water System

The Kauai County Department of Water (DOW) has four (4) well sources in the Hanapepe-Eleele water system. Two (Hanapepe A and Hanapepe B) of the four wells are situated in the Hanapepe Valley. Hanapepe A was drilled in 1974 and has a pumping capacity of 500 gpm. The existing ground elevation at Hanapepe A is 98 feet above mean sea level (MSL).

Hanapepe B was drilled in 1980 and has a pumping capacity of 900 gpm. The existing ground elevation at Hanapepe B is 99 feet MSL.

The two other wells (Hanapepe 25-1 and Hanapepe 4) that are part of the Hanapepe-Eleele system are located on the west side of the Hanapepe Valley. Hanapepe 25-1 was drilled in 1966 and has a pumping capacity of 150 gpm. Hanapepe 25-1 has been abandoned in place and is no longer being used by the DOW due to a pump/motor problem. The existing ground elevation at Hanapepe 25-1 is 78 feet MSL. Hanapepe 4 was drilled in 1993 and has a pumping capacity of 700 gpm. The existing ground elevation at Hanapepe 4 is 463 feet MSL.

The DOW has three (3) water storage tanks located along Kaunualii Highway, two (2) 0.4-MG steel tanks with 340-foot spillway elevations and one (1) 0.2-MG concrete tank with a 402-foot spillway elevation. Delivery of water from any of the wells into the storage tanks is accomplished by two 750 gpm Eleele booster pumps in Hanapepe Valley and a 27-inch pipe up the valley wall to the steel tanks at the 340-foot elevation. A smaller 120 gpm booster pump delivers water from the 340-foot tanks to the 402-foot tanks.

The existing Hanapepe-Eleele water system is shown in **Figure 1 - Overall System Map** in Appendix A.

Pumping Capacity Analysis

The pumping capacity of the Hanapepe-Eleele water system was analyzed with two wells (Hanapepe A and Hanapepe 4) as water sources. Based on the County of Kauai's Water System Standards, the largest pumping unit in the system is considered out of service (on standby). Therefore, Hanapepe B being the well with the largest pump (900 gpm) in the Hanapepe-Eleele water system was considered out of service.

$$\begin{aligned}
 \text{Total Pumping Capacity of Well 'Hanapepe A'} &= 500 \text{ gpm} \\
 \text{Total Pumping Capacity of Well 'Hanapepe 4'} &= 700 \text{ gpm} \\
 \text{Total Pumping Capacity of the Hanapepe-Eleele System} &= 1,200 \text{ gpm} \\
 &= \mathbf{1,728,000 \text{ (gpd)}}
 \end{aligned}$$

Water Storage Analysis

The water storage capacity of the Hanapepe-Eleele water system was analyzed with four existing water tanks as summarized below.

Table 5. Summary of Existing Water Storage Tanks

Location	Overflow Elevation (feet)	Volume (gal.)
Upper Hanapepe Tank	402	500,000
Kaunaulii Hwy Tank	402	200,000
Eleele Steel Tank No. 1	340	400,000
Eleele Steel Tank No. 2	340	400,000
Hanapepe Tank	212	500,000
Total Available Storage		2,000,000

4.0 Proposed Development

Pumping Capacity

The maximum daily demand of the proposed development was analyzed to investigate the additional water consumption and pumping capacity that would be required to support the DHHL Hanapepe development. The water demand analysis was performed separately for the initial development phase of 75 single family lots and for the Full Build-out scenario.

The pumping capacity of the existing system was analyzed for two (2) different scenarios as presented below.

Scenario 1: The first scenario uses the maximum water demand of the Hanapepe-Eleele water system based on water consumption data provided by the DOW plus the water demands for 75 lots (Phase 2) within the DHHL Hanapepe Development based on the Water System Standards, 2002.

The existing Average Daily Demand for the Hanapepe-Eleele Water System was based on the information provided by DOW from the Consumption Reports up to February 29, 2020 and was calculated to be 323,552 gpd.

Maximum Day Factor = 1.5 x Average Day Demand

Maximum Day Demand = 1.5 x 323,552 gpd = 485,328 gpd

Water demands for the proposed DHHL Hanapepe Development are shown in the following Tables 6 and 7. Each table represents phases of development.

Table 6 - Phase 2 Water Consumption

Land Use	Water Demand Per Land Use (gpd/Unit)	No. of Units	Area (Ac.)	Average Demand (gpd)	Max Daily Demand (gpd)
Single Family	500	75	-	37,500	56,250
Totals				37,500	56,250

Calculated Maximum Day Demand for DHHL Hanapepe (Phase 2) = 56,250 gpd

Phase 2 (75 Single Family Lots)

Existing 485,328 gpd

DHHL Hanapepe 56,250 gpd

Total 541,578 gpd < 1,728,000 gpd

Total Maximum Demand is less than Total Pumping Capacity. Therefore, pumping capacity is adequate to meet the Phase 2 demands.

Scenario 2: The second scenario uses the maximum water demand of the Hanapepe Eleele water system based on water consumption data provided by the DOW, as noted above, plus the water demands at Full Build-out within the DHHL Hanapepe Development based on the Water System Standards, 2002.

Table 7: Full Build-out Water Consumption

Land Use	Water Demand Per Land Use (gpd/Unit)	No. of Units	Area (Ac.)	Average Demand (gpd)	Max Daily Demand (gpd)
Single Family	500	489	-	244,500	366,750
Subsistence Agriculture (Domestic)	500	82	-	41,000	61,500
Subsistence Agriculture (Irrigation @ 25% of area)	3400		107.5 x 0.25	91375	150,770
Commercial	3,000	-	14.5	43,500	65,250
Totals				420,375	644,270

Note: Irrigation on Subsistence agriculture lots is anticipated to include 25% of the available lot. Maximum Day peaking factor of 1.65 was used for the irrigation demands.

Calculated Maximum Day Demand for Build-out of DHHL Hanapepe = 644,270 gpd

Total Demand of the Hanapepe-Element Water System is summarized as follows.

Build-Out	
Existing	485,328 gpd
DHHL Hanapepe	644,270 gpd
Total	1,129,598 gpd < 1,728,000 gpd

Total Maximum Day Demand is less than Total Pumping Capacity. Therefore, pumping capacity is adequate to meet the water demands at Full Build-out.

Water Storage

The maximum daily demand of the proposed development was also analyzed to investigate if additional water storage would be required to support the DHHL Hanapepe development. As above, the water demand analysis was performed separately for the initial development phase of 75 single family lots and also for the Full Build-out scenario.

The calculations for the required storage volumes are presented below.

Scenario 1 - Phase 2 (75 Lots)

Criteria 1

Meet maximum day consumption. Tank is full at the beginning of the 24-hour period with no source input to the tank.

Maximum day consumption = 541,578 gpd

Therefore, the tank must have a 541,578-gallon capacity.

Criteria 2

Meet the maximum day rate plus fire flow for duration of fire. Tank is ¾ full at the start of fire, with credit for incoming flow from pumps, one maximum size pump out of service.

$$\left[\frac{541,578 \text{ gpd}}{24 \text{ hr} \times 60 \frac{\text{min}}{\text{hr}}} + 2000 \frac{\text{gpm}}{\text{hr}} - 1200 \frac{\text{gpm}}{\text{hr}} \right] \times 120 \text{min} = 188,175 \text{ gal}$$

0.75

Therefore, the required storage volume is 188,175 gallons.

Criteria 1 governs. The required overall storage volume is 541,578 gallons for Phase 2.

Scenario 2 - Full Build-Out

Criteria 1

Meet maximum day consumption. Tank is full at the beginning of the 24-hour period with no source input to the tank.

Maximum day consumption = 1,129,598 gpd

Therefore, the required storage volume is 1,129,598 gallons.

Criteria 2

Meet the maximum day rate plus fire flow for duration of fire. Tank is ¾ full at the start of fire, with credit for incoming flow from pumps, one maximum size pump out of service.

$$\left[\frac{1,129,598 \text{ gpd}}{24 \text{ hr} \times 60 \frac{\text{min}}{\text{hr}}} + 2000 \frac{\text{gpm}}{\text{hr}} - 1200 \frac{\text{gpm}}{\text{hr}} \right] \times 120 \text{min} = 253,510 \text{ gal}$$

0.75

Therefore, the required storage volume is 253,510 gallons.

Criteria 1 governs. The required overall storage volume is 1,129,598 gallons for Full Build-out.

5.0 DHHL Distribution Analysis

The proposed DHHL Hanapepe distribution system water is shown in Figures 2A-2E. The on-site distribution system modeled using EPANET 2.0, which was developed by the United States Environmental Protection Agency. EPANET can perform extended-period simulation of the hydraulic and water quality behavior within pressurized pipe networks, which consist of pipes, nodes (junctions), pumps, valves, storage tanks, and reservoirs. It can be used to track the flow of water in each pipe, the pressure at each node, the height of the water in each tank, a chemical concentration, the age of the water, and source tracing throughout the network during a simulation period. The various components within the model have been based on the current development plan and existing tank elevations.

To estimate the peak flow rate and allow for extended period simulation within the model, various diurnal demand patterns were included in the analysis. The demand pattern encompasses the peaking factors from Table 100-20 of the DWS criteria, and as presented below. The model uses Average Day Demand (ADD) as the basic water demand and modifies the ADD with multipliers, or peaking factors to determine the maximum day demand rate and peak hour demand flow rates. The maximum day demand multiplier is 1.5 times the average day demand and the peak hour demand multiplier is 3.0 times the average day demand. Demand patterns representing the various water uses have been developed for the Residential demand, Irrigation demand and Commercial areas. The demands patterns are presented below.

Figure 3 - Residential Demand Pattern

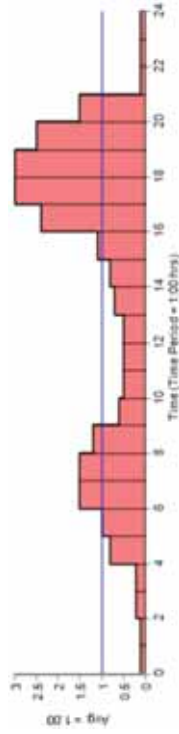
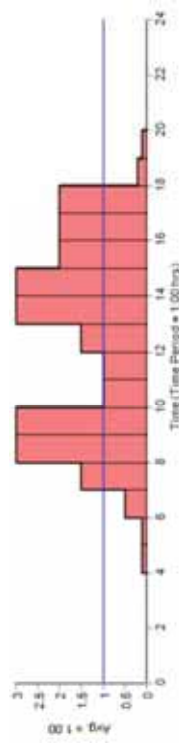


Figure 4 - Irrigation Demand Pattern



Figure 5 - Commercial Demand Pattern



Using the above demand patterns, the system performance can be reviewed to ensure that an adequate residual pressure of at least 40 psi is provided throughout the system during peak hour. Using the water demand rates as outlined above, the overall system demand was modeled for the Phase 2 and Full Build-out conditions. **Figure 6** and **Figure 7** depict the peak consumption rates for these development scenarios.

Figure 6 - Overall System Flow, Phase 2

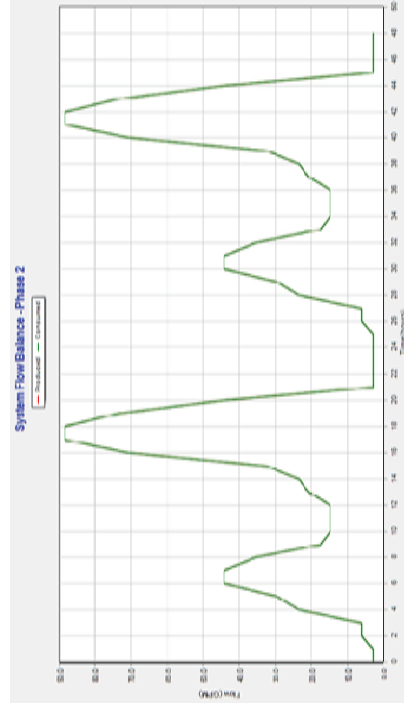
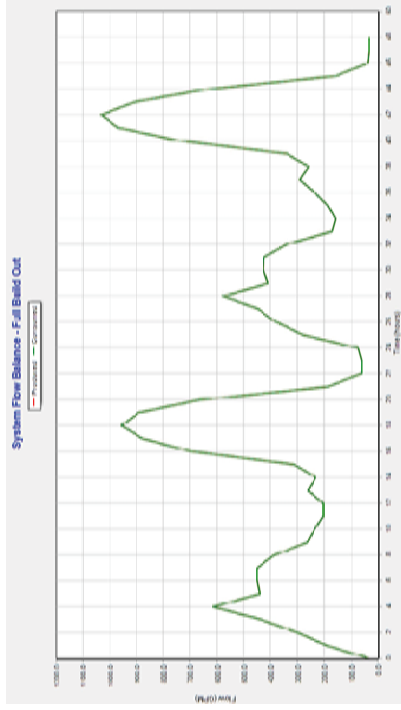


Figure 7 - Overall System Flow, Full Build-out



In addition to the above domestic water usage, a fire flow analysis was modeled at various junctions throughout the network to ensure that the required fire flow and residual pressures are maintained. The fire flow demands were simulated between the hours of 6:00 am and 8:00 am to coincide with the demand multiplier of 1.5, which represents maximum day demand. **Figure 8** depicts the residual pressure within the proposed commercial area, with a fire flow demand of 2000 gpm. To ensure adequate pressures within the commercial area, a 12-inch watermain is required from the connection point on Moi Road through to the commercial development parcels.

Figure 8- Residual Pressures with 2000 gpm Commercial Fire Flow



6.0 Hanapepe-Eleeele Water System Analysis

The existing Hanapepe-Eleeele water supply network was also analyzed to assess the performance of the existing water supply system with the increased demands resulting from the DHHL development project. The water supply system was modeled using the Innovyze *InfoWater* model, based on the available Department of Water Supply mapping information. The *InfoWater* model uses the EPANET engine to perform the hydraulic analysis and is also capable of completing extended period simulation modeling. The various junction elevations, pipe sizes and demands were based on the available contour mapping and aerial photos to estimate the water demands throughout the system. The unit rates as noted above were then applied at the nearest junction within the water model.

The well and storage tank capacities as noted above were incorporated into the water supply model to ensure that the pump rate and transmission mains were able to replenish the water levels in each of the storage tanks. The figures below present the graphic results of the well pump rates and water levels within the existing storage tanks, as modeled under existing conditions and the various development scenarios.

Three separate modeling scenarios were conducted as part of the system analysis. The initial analysis included the existing conditions in order to establish the baseline of the water system performance.

The second scenario included the development of the DHHL lands including the 75 single family homes as noted above plus the development of Phase 1 of the Lima Ola Development, which is understood to include 38 single family homes, 111 multi-family homes plus 3 acres for the community center and 2.5 acres of irrigation.

The third scenario included the full build out of the DHHL lands including all residential areas, commercial sites and the subsistence agricultural areas. In addition, this scenario included the full build out of the Lima Ola Development, including Phase 2, Phase 3 and Phase 4. Facility improvements associated with the Lima Ola build out include a proposed storage tank at the 402 feet elevation plus upgrades to the Eleele Nani pump station to a capacity of 350 gpm.

Well Pumps

The pump run times for the supply wells have been indicated below for the three development scenarios as described above. Figures 9 to 11 present a plot of the pump run times for Hanapepe Well A, Well B and Well No. 4. As can be seen in the figures below, the pump run times increase with the Phase 2 and full build out conditions compared to the existing conditions, however, the wells are able to meet the overall system demands in less than 24 hours.

Figure 9- Hanapepe Well A

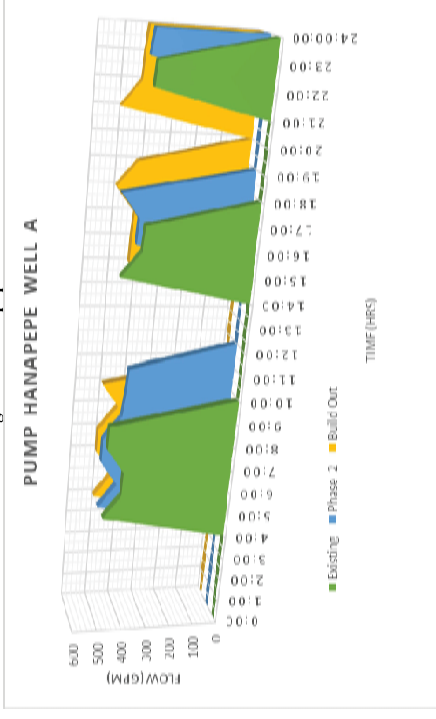


Figure 10- Hanapepe Well B

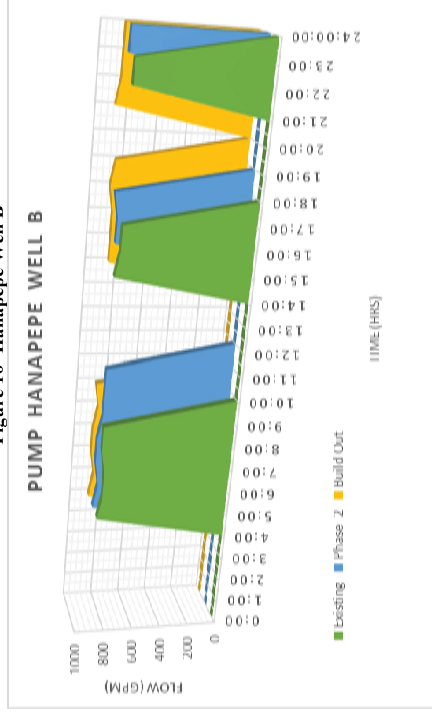
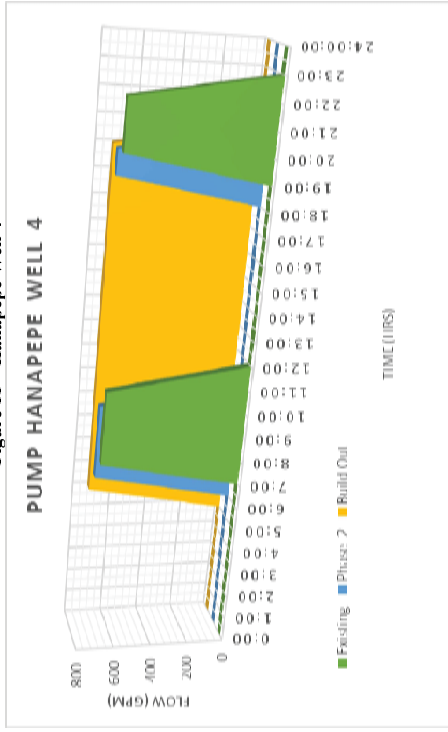


Figure 11 – Hanapepe Well 4



Storage Tanks

In addition to the well pump run times, the enclosed analysis also included a review of the water levels within the storage tanks, and in particular a review the ability for the system to replenish the water level in the various tanks within a 24 hour cycle. Figures 12 to 14 depict the water levels within the Upper Hanapepe storage tank, the Hanapepe Heights storage tank and the Eleele storage tanks. As can be observed in the figures below, the water supply system is able to replenish the levels in each of the storage tanks within the 24-hour cycle for each of the above noted development scenarios.

Figure 12 – Upper Hanapepe Storage Tank

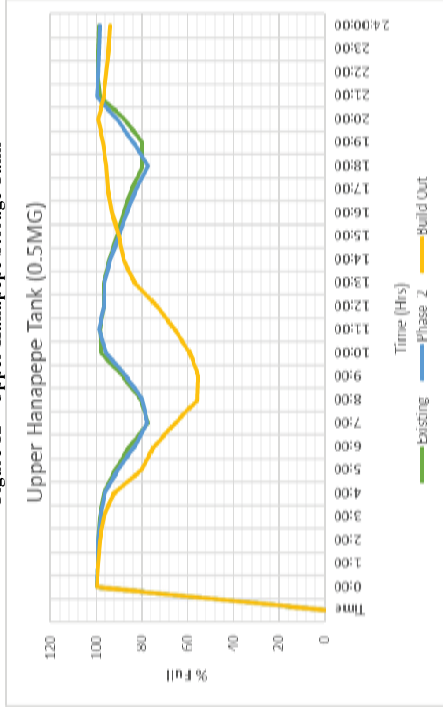


Figure 13 – Hanapepe Heights Storage Tank

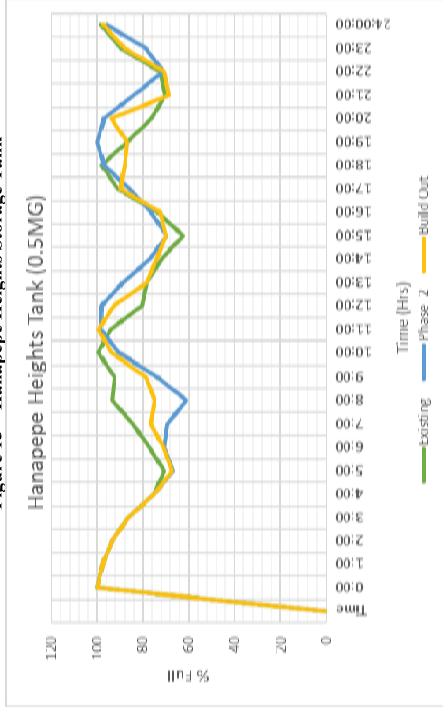
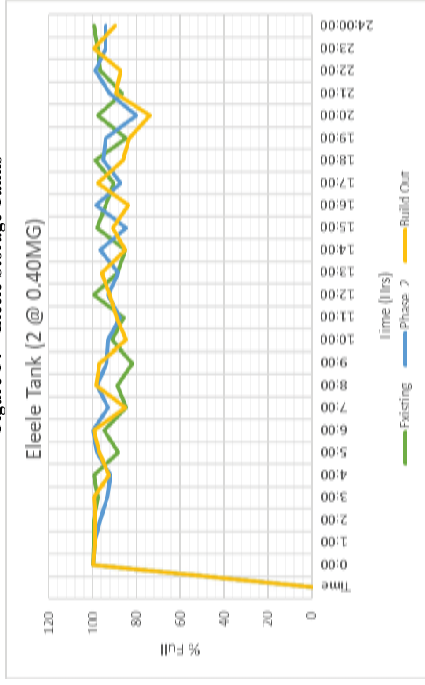


Figure 14 – Eleele Storage Tanks



7.0 Conclusions

The increased water demands for the DHHL Hanapepe Development have been estimated for the initial phase of development (Phase 2) as well as the full build-out conditions. The initial phase of development will increase the maximum day demand by 56,250 gallons with a peak flow of approximately 90 gpm and under full build-out conditions will increase the maximum day demand by 644,270 gallons with a peak demand rate in the range of 1000 gpm.

This water master plan for the DHHL Hanapepe Development shows that the pumping capacity of the Hanapepe-Eleele water system is adequate to support the proposed DHHL Hanapepe. No additional source wells are required.

This water master plan for the DHHL Hanapepe Development shows that the existing storage capacity of the Hanapepe-Eleele water system is adequate to support the proposed DHHL Hanapepe, no additional storage is required.

Based on the water system model analysis for proposed water distribution system for the DHHL Hanapepe Development, the pipe sizes vary from 6 to 12 inches in diameter with the majority of the distribution system including 8-inch diameter pipes. Pipes were sized in accordance with the State of Hawaii, Water System Standards (2002) to ensure that the required domestic and fire flow rates could be provided while ensuring that the system pressures did not drop below

allowable levels. Pressure reducing valves will be included within the water system extension to ensure compatibility with the existing DOW pressure zones.

The existing water supply and distribution system was reviewed to assess the ability of the water system to meet the increased demands associated with the DHHL development. The water system was modeled using the Innoyze software to simulate the existing conditions; Phase 2 of the DHHL development in parallel with the Lima Ola Phase 1 development; and in addition, the full build out conditions for the DHHL and Lima Ola developments. The existing water supply system is able to meet the increased demands associated with the initial phases of development.

With the facility improvements planned for the Eleele system to support the Lima Ola build out conditions, the existing supply and distribution network are able to meet the increased demands and ensure that the storage tanks are adequately replenished within a 24-hour cycle.

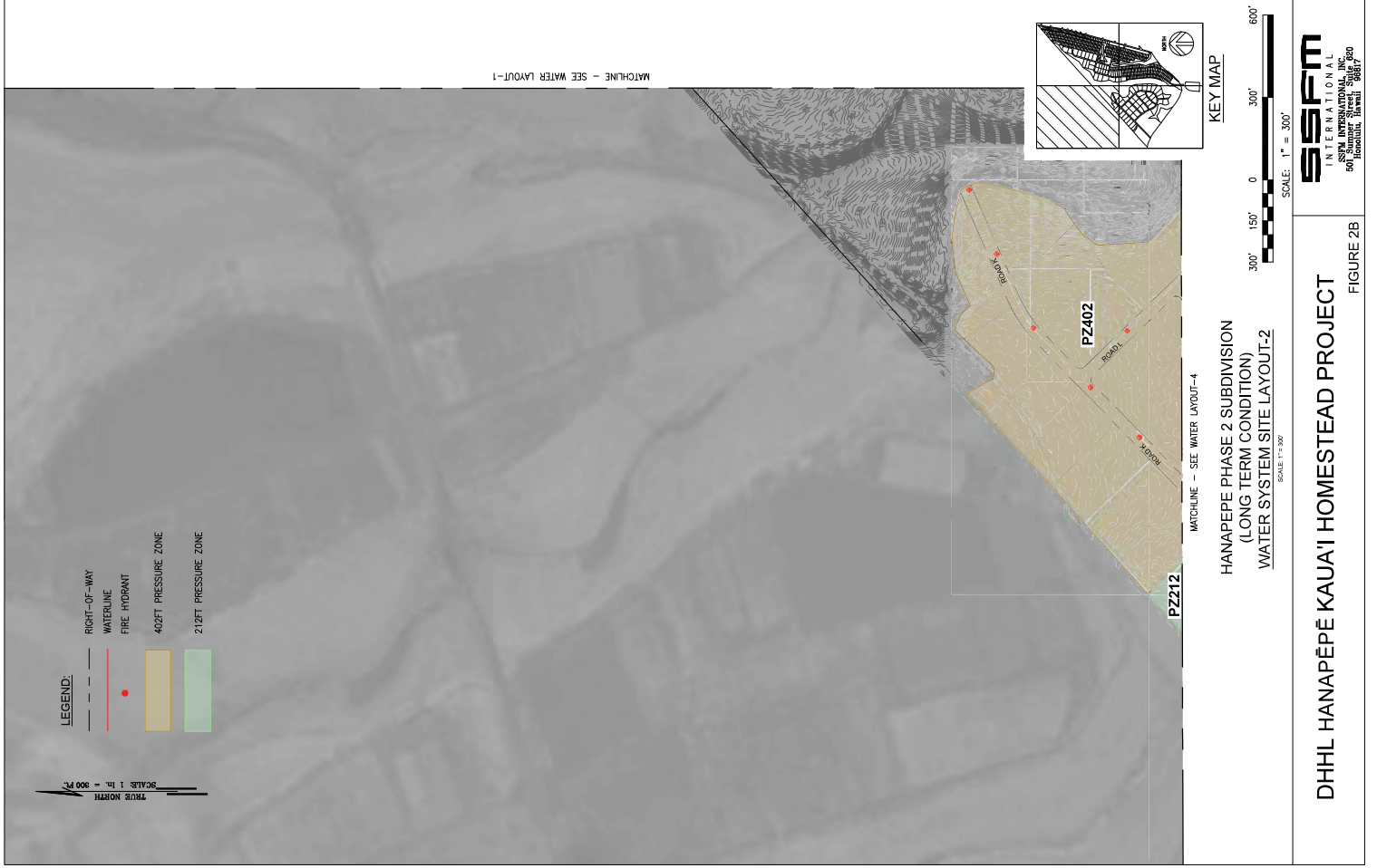


FIGURE 1
OVERALL EXISTING WATER SYSTEM MAP



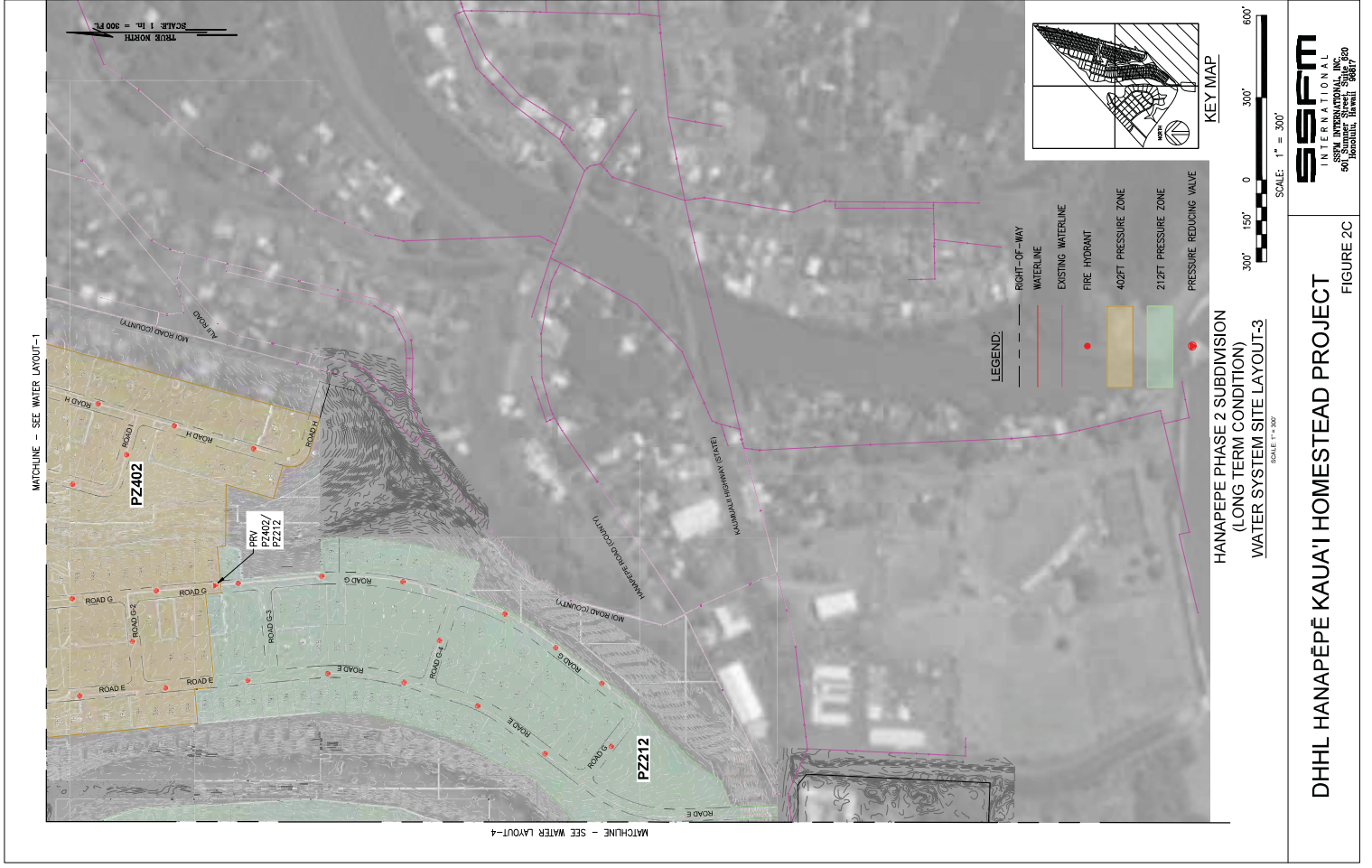
DHHL HANAPEPE KAUAI HOMESTEAD PROJECT
FIGURE 2A





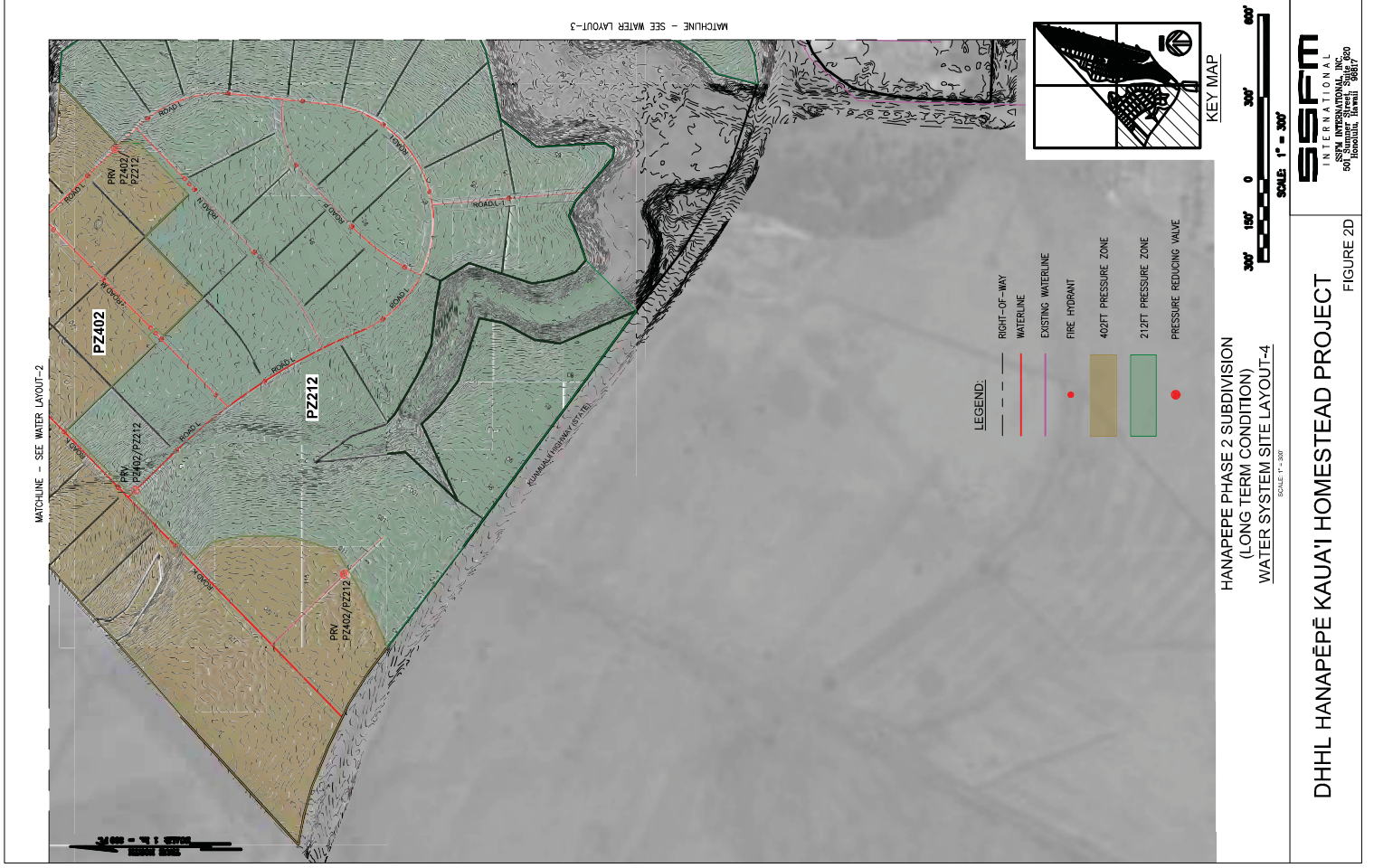
DHHL HANAPEPE KAUAI HOMESTEAD PROJECT

FIGURE 2B



DHHL HANAPEPE KAUAI HOMESTEAD PROJECT

FIGURE 2C



DHHL HANAPEPE KAUAI HOMESTEAD PROJECT

FIGURE 2D



DHHL HANAPEPE KAUAI HOMESTEAD PROJECT

FIGURE 2E

Hanaapepe Water System
Existing Water System
Pipe Data

PIPE: ID	PIPE: MATERIAL	PIPEHYD: LENGTH (ft)	PIPEHYD: DIAMETER (in.)	PIPEHYD: ROUGHNESS	LINK: FROM	LINK: TO	RANGE: MAX_VALUE (gpm)	RANGE: MIN_VALUE (gpm)	RANGE: AVE_VALUE (gpm)
P104		1,206.15	3	90.00	J104	J102	3.12	0.00	0.98
P13		88.81	8	110.00	J108	J104	8.97	0.28	3.23
P15		41.2	6	100.00	J108	C-151	9.39	0.31	2.95
P19	DI	145.66	6	100.00	J110	J112	16.98	0.57	5.34
P21	PVC	141.06	2.5	90.00	J112	J114	9.39	0.31	2.95
P23	DI	265.19	8	100.00	J108	J116	18.36	0.59	6.18
P25	DI	65.14	8	100.00	J116	J110	18.36	0.59	6.18
P27		45.78	12	100.00	J116	C-23	0.00	0.00	0.00
P29	DI	340.36	8	110.00	J116	J120	93.58	2.42	26.53
P31		56.59	6	100.00	J120	C-58	0.00	0.00	0.00
P33	AC	109.29	8	110.00	J128	J126	121.55	5.45	51.04
P35	AC	198.65	8	110.00	J126	J124	95.97	16.16	49.53
P37	AC	980.65	8	110.00	J124	J122	94.74	16.16	37.73
P39	DI	273.47	8	110.00	J122	J120	94.74	16.16	37.73
P41	AC	378.6	6	100.00	J128	J132	91.65	0.00	18.33
P43	PVC	267.38	4	100.00	J132	J130	91.65	0.00	18.33
P45		57.27	1.5	90.00	J132	J134	0.00	0.00	0.00
P47	AC	213.09	12	110.00	J138	J136	175.09	12.39	75.79
P49		31.96	6	100.00	J136	C-65	0.00	0.00	0.00
P51	AC	494.38	12	110.00	J136	J128	174.79	12.10	73.92
P53	AC	301.70	12.00	110.00	J138	J144	1,163.31	74.69	492.41
P55	AC	474.34	12.00	110.00	J42	J138	1,164.61	33.15	418.27
P57	AC	461	8	110.00	J42	J46	274.00	5.03	61.66
P59		28.65	6	100.00	J46	C-26	0.00	0.00	0.00
P61	AC	522.69	8	100.00	J46	J50	269.49	0.52	57.15
P63		28.76	6	100.00	J50	C-25	0.00	0.00	0.00
P65	CI	156.27	4	100.00	J50	J48	61.14	0.52	15.48
P67	CI	391.6	4	100.00	J48	J52	56.13	0.21	12.52
P69	CI	30.48	4	100.00	J52	J54	53.90	0.07	11.21
P71	PVC	242.12	1.5	80.00	J54	J56	2.07	0.07	0.65
P73	PVC	713.61	1.5	80.00	J54	J58	52.80	0.00	10.56
P75	AC	211.32	12.00	110.00	J160	J214	1,159.97	2.06	393.20
P77	AC	221.44	6	100.00	J160	J161	36.45	1.22	11.47
P79		28.76	6	100.00	J162	C-29	10.41	0.35	3.28
P83	PVC	443.3	2.5	90.00	J162	J166	3.12	0.10	0.98
P85	AC	451.41	6	100.00	J162	J170	12.51	0.42	3.94
P87	AC	56.42	6	100.00	J170	J164	1.05	0.33	0.33
P91		134.81	6	100.00	J170	J172	11.46	0.38	3.61
P93		247.26	2	100.00	J172	J168	4.17	0.14	1.31
P95	PVC	217.79	2	100.00	J172	J174	4.17	0.14	1.31
P97	AC	321.71	12.00	110.00	J176	J160	1,228.86	10.86	425.96
P99	PVC	214.07	2	90.00	J176	J178	0.00	0.00	0.00
P101	AC	373.72	12.00	110.00	J176	J180	1,228.86	10.86	425.96
P103	PVC	238.11	1.5	90.00	J180	J184	20.65	0.00	6.10
P105	PVC	230.12	2	90.00	J182	J184	27.33	0.42	9.50
P107	CI	338.79	4	100.00	J184	J186	27.33	0.42	9.50
P109	PVC	349.77	2	90.00	J184	J188	1.05	0.04	0.33
P111	AC	303.26	12.00	110.00	J190	J192	1,221.45	4.17	419.17
P113	AC	95.16	12.00	110.00	J192	J180	1,221.45	5.28	419.92
P115		26.17	6	100.00	J192	C-38	0.00	0.00	0.00
P117	AC	78.71	6	100.00	J190	J191	211.41	1.72	72.75
P119	AC	55.57	8	110.00	J194	J196	207.83	0.08	76.77
P121	AC	401.9	8	110.00	J196	J186	207.83	0.08	76.77
P123		31.47	6	100.00	J196	C-62	0.00	0.00	0.00
P125	DI	320.77	12.00	110.00	J194	J198	1,271.34	3.40	439.04
P127	AC	193.22	12.00	110.00	J198	J199	1,276.98	3.40	440.18
P129	DI	312.14	12.00	110.00	J200	J190	1,010.04	0.61	344.83
P131	DI	551.93	4	100.00	J200	J202	76.49	0.12	26.95
P133	CI	344.35	6	100.00	J200	J212	207.54	0.31	72.86
P135		13.84	6	100.00	J212	C-33	0.00	0.00	0.00

APPENDIX

P407	DI	231.7	12	110.00	J418	J416	71.88	0.00	23.00	DI	204.14	8	110.00	J530	J532	2.07	0.07	0.65
P409	DI	21.75	12	110.00	J424	J426	178.77	0.00	57.21	DI	328.5	8	110.00	J530	J534	30.21	1.01	9.51
P411	DI	204.24	12	110.00	J424	J428	30.63	0.00	9.80	DI	413.32	8	110.00	J534	J536	10.41	0.35	3.28
P413	DI	123.64	12	110.00	J430	J426	178.77	0.00	57.21	DI	245.16	8	110.00	J538	J540	124.37	4.15	39.14
P415	DI	338.89	8	110.00	J430	J432	40.15	0.98	14.41	AC	137.5	6	100.00	J540	J544	14.58	0.49	4.52
P417	DI	281.53	8	110.00	J434	J436	41.26	0.33	13.99	PVC	219.96	3	90.00	J544	J548	8.34	0.28	2.62
P419	DI	280.02	8	110.00	J434	J438	19.07	0.21	6.88	AC	178.85	8	110.00	J544	J548	101.45	3.38	31.92
P421	DI	148.46	6	110.00	J436	J438	4.17	0.14	1.31	AC	209.57	8	110.00	J546	J550	93.11	3.10	29.30
P423	DI	244.31	8	110.00	J436	J440	15.92	0.32	5.55	PVC	253.59	3	90.00	J548	J552	0.00	0.00	0.00
P425	DI	29.46	6	100.00	J440	C-163	0.00	0.00	0.00	AC	421.11	8	110.00	J548	J552	83.72	2.79	26.34
P427	DI	364.52	8	110.00	J440	J442	17.04	0.18	5.21	AC	249.98	8	110.00	J552	J556	74.33	2.48	23.99
P429	DI	304.63	8	110.00	J442	J444	22.23	0.23	7.71	AC	232.85	8	110.00	J554	J558	56.94	1.90	17.92
P431	DI	411.48	8	110.00	J444	J446	30.05	0.75	12.63	AC	340.44	6	100.00	J556	J560	17.73	0.59	5.58
P433	DI	102.64	6	100.00	J444	J450	4.17	0.14	1.31	PVC	217.3	3	100.00	J558	J562	8.34	0.28	2.62
P435	DI	285.3	8	110.00	J446	J448	36.79	0.45	13.62	AC	182.44	8	110.00	J556	J562	28.80	0.96	9.06
P437	DI	353.59	8	110.00	J448	J454	30.54	0.93	9.69	AC	427.48	8	110.00	J562	J566	18.39	0.61	5.79
P439	DI	252.78	12	100.00	J454	J452	265.88	3.35	106.62	AC	452.71	8	110.00	J566	J570	7.98	0.27	2.51
P441	DI	247.64	12	100.00	J452	C-144	0.00	0.00	0.00	AC	257.81	8	110.00	J568	J572	2.76	0.09	0.87
P443	DI	25.04	12	100.00	J458	J456	154.76	0.98	54.82	AC	368.01	8	110.00	J570	J574	45.88	1.53	14.44
P445	DI	395.29	12	100.00	J458	V8002	265.88	3.35	106.62	AC	323.83	8	110.00	J572	J576	8.00	0.27	2.52
P447	DI	33.91	12	110.00	J456	J452	68.92	1.34	27.56	AC	24.55	6	100.00	J574	J578	126.82	4.23	39.91
P449	DI	419.28	8	110.00	J452	J460	283.32	8.18	115.12	AC	395.81	8	110.00	J578	J582	137.23	4.57	43.18
P451	DI	461.13	16	120.00	J462	J456	265.88	3.35	106.62	AC	495.81	8	110.00	J582	J586	276.18	9.21	86.91
P453	DI	281.54	12	110.00	J460	J464	35.04	2.26	12.73	DI	345.41	8	110.00	J586	J590	94.83	3.16	29.84
P455	DI	370.62	4	100.00	J464	J466	11.45	0.09	4.12	DI	444.51	8	110.00	J590	J594	76.08	2.54	23.94
P457	CI	632.21	6	100.00	J464	J468	16.37	1.88	7.30	DI	111.57	8	110.00	J594	J598	56.28	1.88	17.71
P461	CI	351.17	6	100.00	J468	J470	8.28	0.00	2.34	DI	237.59	6	100.00	J598	J602	56.28	1.88	17.71
P463	CI	377.71	4	100.00	J468	J472	20.32	1.17	8.22	DI	205.72	6	100.00	J602	J606	34.41	1.15	10.83
P465	CI	236.66	6	100.00	J472	J474	2.07	0.07	0.65	DI	248.57	6	100.00	J606	J610	88.8	3.07	28.7
P467	PVC	171.95	2	90.00	J472	J476	16.13	0.35	7.41	DI	536.56	8	110.00	J610	J614	25.02	0.83	7.82
P469	CI	625.28	2	100.00	J476	J480	1.59	0.19	0.55	DI	227.11	8	100.00	J614	J618	13.53	0.45	4.26
P471	PVC	169.38	2	100.00	J476	J482	21.35	0.82	8.69	AC	761.01	12	110.00	J618	J622	805.54	61.54	345.44
P473	CI	169.38	6	100.00	J482	J480	21.54	0.52	10.17	AC	953.33	12	110.00	J622	J626	805.54	61.54	345.44
P475	CI	208.99	6	100.00	J482	J478	26.17	0.14	10.88	DI	39.06	6	100.00	J626	J630	25.02	0.83	7.82
P477	CI	411.88	12	110.00	J478	J484	32.41	1.42	12.63	DI	543.44	12	110.00	J630	J634	15.63	0.52	4.92
P479	DI	156.1	12	110.00	J484	C-166	0.00	0.00	0.00	AC	667.13	12	110.00	J634	J638	5.22	0.17	1.64
P481	DI	14.55	6	100.00	J486	C-166	0.00	0.00	0.00	AC	341.45	6	100.00	J638	J642	22.92	0.76	7.21
P483	DI	344.15	12	110.00	J486	J488	190.69	7.48	47.65	AC	289.54	3	90.00	J642	J646	10.41	0.35	3.28
P485	DI	315.72	12	110.00	J488	J486	193.47	7.65	49.30	PVC	264.18	8	110.00	J646	J650	74.36	2.48	23.40
P487	DI	235.62	12	110.00	J490	J488	187.63	17.03	56.77	AC	326.95	8	100.00	J650	J654	42.05	1.40	13.23
P489	AC	230.22	8	110.00	J490	J492	97.93	5.42	27.17	AC	243.7	8	110.00	J654	J658	32.66	1.09	10.28
P491	PVC	177.36	3	100.00	J492	J494	4.17	0.14	1.31	AC	241.81	3	90.00	J658	J662	9.39	0.31	2.95
P493	CI	207.56	6	100.00	J492	J488	24.02	0.14	11.06	PVC	302.1	6	100.00	J662	J666	13.88	0.46	4.37
P495	AC	194.92	8	110.00	J496	J496	91.69	5.63	25.99	AC	186.32	6	100.00	J666	J670	12.51	0.42	3.94
P497	AC	164.2	6	100.00	J498	J500	14.58	0.49	4.59	AC	183.63	6	100.00	J670	J674	7.29	0.24	2.29
P499	PVC	274.26	3	100.00	J500	J504	8.34	0.28	2.62	PVC	294.13	6	100.00	J674	J678	23.89	0.80	7.41
P501	AC	230.67	8	100.00	J498	J502	70.87	0.23	22.04	AC	334.85	6	100.00	J678	J682	11.14	0.37	3.51
P503	AC	217.97	8	100.00	J502	J504	64.63	1.71	21.28	AC	403.78	6	100.00	J682	J686	10.41	0.35	3.28
P505	AC	448.42	8	110.00	J504	J508	214.67	15.84	85.93	AC	25.90	12.00	110.00	J686	J690	3.657.27	24.35	1,809.28
P507	DI	300.24	12	110.00	J508	J510	210.31	7.33	74.05	AC	176.57	8	110.00	J690	J694	3,657.27	24.35	1,809.28
P509	DI	270.26	12	110.00	J508	J512	399.16	36.18	189.96	AC	2,210.96	12	110.00	J694	J698	0.00	0.00	0.00
P511	AC	57.33	12	110.00	J506	J510	381.67	35.60	184.45	AC	14.9	12	110.00	J698	J702	805.54	61.54	345.44
P513	AC	535.69	12	110.00	J512	J516	12.25	0.82	5.12	AC	23.61	8	100.00	J702	J706	805.54	61.54	345.44
P515	CI	384.23	4	100.00	J518	J482	7.80	0.14	2.50	AC	31.15	8	100.00	J706	J710	0.00	0.00	0.00
P517	CI	330.21	4	100.00	J518	J482	7.80	0.14	2.50	AC	18.95	8	100.00	J710	J714	0.00	0.00	0.00
P519	DI	320.23	16	120.00	J510	J514	263.48	6.55	108.71	PVC	31.71	8	100.00	J714	J718	0.00	0.00	0.00
P521	DI	54.24	16	120.00	J514	J516	296.60	10.33	124.18	AC	1,126.88	12	110.00	J718	J722	3.72	35.08	35.08
P523	DI	288.52	16	120.00	J516	J520	286.37	8.56	117.09	AC	70.24	12	110.00	J722	J726	0.00	0.00	0.00
P525	DI	734.31	16	120.00	J520	J462	283.32	8.18	115.12	AC	209.65	8	100.00	J726	J730	59.76	1.99	18.80
P527	PVC	430.88	2	90.00	J520	J470	2.13	0.07	0.99	DI	1,276.14	12	110.00	J730	J734	111.48	3.72	35.08
P529	AC	430.88	6	100.00	J514	J522	35.72	3.95	17.11	DI	70.24	12	110.00	J734	J738	11.48	0.37	3.51
P531	PVC	193.24	3	90.00	J522	J524	4.17	0.14	1.31	DI	209.65	8	100.00	J738	J742	59.76	1.99	18.80
P533	PVC	215.69	6	100.00	J522	J526	39.37	4.20	19.40	DI	231.74	8	110.00	J742	J746	8.34	0.28	2.62
P535	CI	499.63	8	110.00	J526	J528	42.49	4.40	21.37	DI	499.98	8	110.00	J746	J750	51.42	1.71	16.18
P537	DI	285.33	8	110.00	J528	J530	131.28	4.38	41.31	DI	230.99	8	110.00	J750	J754	16.18	0.53	5.00
P539	DI	195.25	8	110.00	J506	J528	191.72	9.51	69.56	DI	230.99	8	110.00	J650	J652	24.33	0.81	7.66

Hanapepe Water System
Existing Water System
Tank Data

TANK ID (Cherf)	TANKHYD: ELEVATION (ft)	TANKHYD: MIN_LEVEL (ft)	TANKHYD: MAX_LEVEL (ft)	TANKHYD: INT_LEVEL (ft)	TANKHYD: DIAMETER (ft)	TANKHYD: MAX_VALUE (ft)	TANKHYD: MIN_VALUE (ft)	TANKHYD: AVE_VALUE (ft)	TANKHYD: RANGE: MAX_VALUE (%)	TANKHYD: RANGE: MIN_VALUE (%)	TANKHYD: RANGE: AVE_VALUE (%)
T5000	384	5	18	18	68	402	399.03	400.99	100	77.16	92.26
T5002	387	5	15	15	47.64	398.07	395.89	398.28	100	60.7	78.87
T5004	310	5	30	30	47.64	340	335.45	338.17	100	81.81	93.13
T5004B	310	5	30	30	47.64	340	334.93	338.17	100	79.74	92.69
T5008	194	5	18	18	68.76	212	207.15	210	100	69.69	84.59

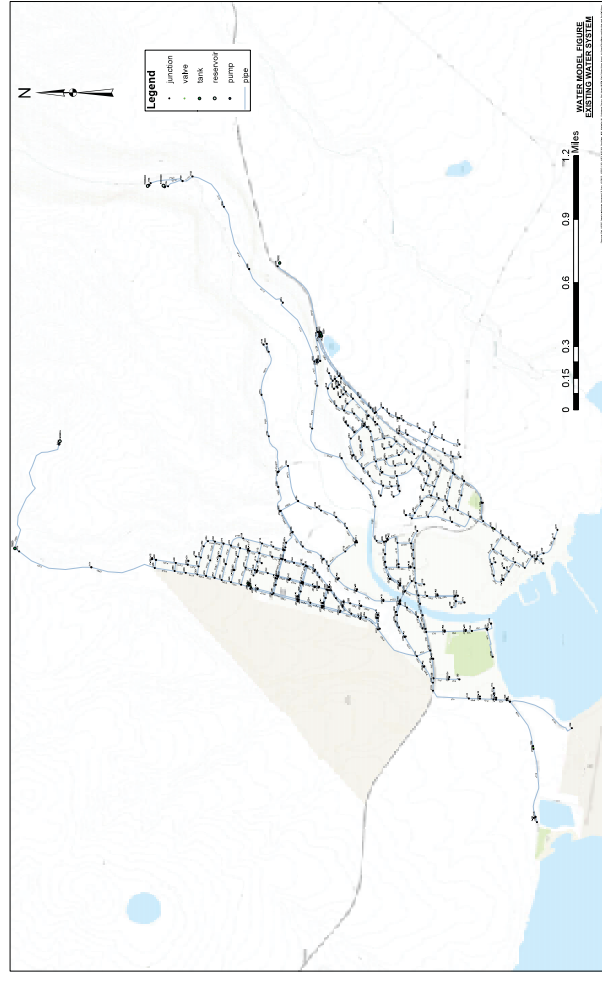
PUMP ID	PUMPHYD: ELEVATION (ft)	PUMPHYD: DIAMETER (in)	PUMPHYD: SHUT HEAD (ft)	PUMPHYD: DESIGN HEAD (ft)	PUMPHYD: DESIGN FLOW (gpm)	PUMPHYD: HIGH HEAD (ft)	PUMPHYD: HIGH FLOW (gpm)	PUMPHYD: MAX_VALUE (gpm)	PUMPHYD: RANGE: MAX_VALUE (gpm)	PUMPHYD: RANGE: MIN_VALUE (gpm)	PUMPHYD: RANGE: AVE_VALUE (gpm)	PUMPHYD: RANGE: MAX_TIME (hrs.)	PUMPHYD: RANGE: MAX_VALUE (psi)	PUMPHYD: RANGE: MIN_VALUE (psi)	PUMPHYD: RANGE: AVE_VALUE (psi)
U7000	310	4	0	105	120	0	0	0	0	0	0	0.00	39.86	38.16	38.94
U7002	310	4	0	105	120	0	0	0	0	0	0	0.00	39.86	38.16	38.94
U7004	0	6	400	300	850	400	378.33	378.33	378.33	378.33	378.33	0.00	131.03	131.03	131.03
HANAPEPE_WELL_B	0	6	400	300	850	200	888.97	888.97	888.97	888.97	888.97	5.00	131.03	131.03	131.03
HANAPEPE_WELL_A	0	6	300	250	480	150	550	550	550	550	550	5.00	131.03	131.03	131.03
U7016	25	6	400	360	650	300	700	700	700	700	700	8.00	137.33	137.33	137.33
U7018	25	6	400	360	650	300	700	700	700	700	700	8.00	137.33	137.33	137.33

Downstream Pressure

PUMP ID	PUMPHYD: ELEVATION (ft)	PUMPHYD: DIAMETER (in)	PUMPHYD: SHUT HEAD (ft)	PUMPHYD: DESIGN HEAD (ft)	PUMPHYD: DESIGN FLOW (gpm)	PUMPHYD: HIGH HEAD (ft)	PUMPHYD: HIGH FLOW (gpm)	PUMPHYD: MAX_VALUE (gpm)	PUMPHYD: RANGE: MAX_VALUE (gpm)	PUMPHYD: RANGE: MIN_VALUE (gpm)	PUMPHYD: RANGE: AVE_VALUE (gpm)	PUMPHYD: RANGE: MAX_TIME (hrs.)	PUMPHYD: RANGE: MAX_VALUE (psi)	PUMPHYD: RANGE: MIN_VALUE (psi)	PUMPHYD: RANGE: AVE_VALUE (psi)
U7000	310	4	0	105	120	0	0	0	0	0	0	0.00	39.86	38.16	38.94
U7002	310	4	0	105	120	0	0	0	0	0	0	0.00	39.86	38.16	38.94
U7004	0	6	400	300	850	400	378.33	378.33	378.33	378.33	378.33	0.00	131.03	131.03	131.03
HANAPEPE_WELL_B	0	6	400	300	850	200	888.97	888.97	888.97	888.97	888.97	5.00	131.03	131.03	131.03
HANAPEPE_WELL_A	0	6	300	250	480	150	550	550	550	550	550	5.00	131.03	131.03	131.03
U7016	25	6	400	360	650	300	700	700	700	700	700	8.00	137.33	137.33	137.33
U7018	25	6	400	360	650	300	700	700	700	700	700	8.00	137.33	137.33	137.33

Hamapee Water System
Existing Water System
Valve Data

VALVE ID	VALVE DESCRPT	VALVEHYD: ELEVATION (ft)	VALVEHYD: DIAMETER (in)	VALVEHYD: SETTING (psi)	RANGE: MAX_VALUE (psi)	RANGE: MIN_VALUE (psi)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (psi)	RANGE: MIN_TIME (hrs.)	RANGE: AVE_VALUE (psi)	RANGE: DIFFERENCE (psi)
V8802	OUT 50PSI	66	8	35	118.69	113.08	0.00	113.08	7.00	116.78	5.61
V8803	Linden Road	120	8	35	120.00	115.39	0.00	115.39	7.00	118.77	3.37
V8910	Hamapee Heights	124	6	35	90.12	86.29	0.00	86.29	7.00	89.22	3.73
V8912	Hamapee Heights	203	6	50	59.33	53.65	0.00	53.65	7.00	57.44	5.68



P255		210.33	4	100.00	J292	J310	2.58	0.09	0.81	P383	PVC	96.37	2.5	100.00	J402	J404	3.12	0.10	0.98
P257		210.33	4	100.00	J310	J306	1.59	0.05	0.50	P385	DI	499.96	12	110.00	J398	J406	492.95	16.43	158.75
P259		210.33	4	100.00	J310	J306	0.00	0.00	0.00	P387	DI	205.13	6	100.00	J406	J408	112.36	3.75	36.16
P261	AC	77.2	6	100.00	J312	J312	0.44	0.00	0.13	P389	DI	501.87	12	100.00	J400	J408	98.80	3.29	31.89
P263	AC	345.51	6	100.00	J312	J308	0.44	0.00	0.13	P391	DI	98.94	6	100.00	J408	J410	4.17	0.14	1.31
P265		11.69	6	100.00	J314	C-7	0.00	0.00	0.00	P393	DI	26.41	6	100.00	J410	C-106	0.00	0.00	0.00
P267	CI	102.13	12	100.00	J314	J318	70.01	2.33	22.03	P395	DI	1,651.71	12	110.00	J406	J414	613.65	20.46	197.54
P269		202.2	12	100.00	J318	J308	56.94	1.90	17.92	P397	DI	1,923.92	12	110.00	J414	J5000	613.65	20.46	197.54
P271	CI	309.28	6	100.00	J322	J314	74.18	2.47	23.34	P399	DI	129.17	12	110.00	J412	J5000	613.65	20.46	197.54
P273	CI	35.44	6	100.00	J324	J324	78.35	2.61	24.65	P401	DI	65.24	12	110.00	J424	J422	148.14	0.00	47.40
P275	GS	209.13	1.5	80.00	J288	J326	2.08	0.07	0.65	P403	DI	169.87	12	110.00	J422	J420	113.13	0.00	36.20
P277	GS	205.04	1.5	80.00	J326	J322	2.09	0.07	0.66	P405	DI	494.82	12	110.00	J420	J418	108.12	0.00	34.60
P279		17.87	6	100.00	J328	C-3	0.00	0.00	0.00	P407	DI	231.7	12	110.00	J418	J416	71.88	0.00	23.00
P281	AC	70.37	6	100.00	J286	J328	7.19	0.24	2.26	P409	DI	21.75	12	110.00	J424	J426	178.77	0.00	57.21
P283	AC	347.33	6	100.00	J328	J324	7.19	0.24	2.26	P411	DI	204.24	12	110.00	J424	J428	30.63	0.00	9.80
P285	CI	290.41	6	100.00	J332	J330	78.45	2.62	24.68	P413	DI	123.64	12	110.00	J430	J426	178.77	0.00	57.21
P287	CI	316.35	6	100.00	J330	J324	73.23	2.44	23.04	P415	DI	338.89	8	110.00	J430	J432	40.15	0.88	14.41
P289	DI	216.4	6	100.00	J284	J334	146.36	4.88	46.05	P417	DI	281.53	8	110.00	J432	J434	41.26	0.33	13.99
P291		158.96	6	100.00	J334	J336	141.14	4.70	44.41	P419	DI	280.02	8	110.00	J434	J436	19.07	0.21	6.88
P293		42.64	6	100.00	J336	C-9	0.00	0.00	0.00	P421	DI	148.46	6	100.00	J436	J438	4.17	0.14	1.31
P295	DI	49.08	6	100.00	J336	J338	141.14	4.70	44.41	P423	DI	244.31	8	110.00	J436	J440	15.92	0.32	5.55
P297		41.52	6	100.00	J338	J338	0.00	0.00	0.00	P425	DI	29.46	6	100.00	J440	C-163	0.00	0.00	0.00
P299	PVC	141.06	2.5	100.00	J348	J346	3.12	0.10	0.98	P427	DI	364.52	8	110.00	J440	J442	17.04	0.18	5.21
P301		58.42	6	100.00	J346	J344	13.56	0.45	4.27	P429	DI	304.03	8	110.00	J442	J444	22.23	0.23	7.71
P303	CI	37.32	6	100.00	J344	C-120	0.00	0.00	0.00	P431	DI	411.48	8	110.00	J444	J446	30.05	0.75	12.63
P305	CI	275.5	6	100.00	J344	J342	13.56	0.45	4.27	P433	DI	102.64	6	100.00	J444	J450	4.17	0.14	1.31
P307	CI	221.64	6	100.00	J342	J388	4.17	0.14	1.31	P435	DI	285.3	8	110.00	J446	J448	36.79	0.45	13.62
P311	DI	436.37	6	100.00	J350	J352	18.55	0.62	6.89	P437	DI	533.59	8	110.00	J448	J454	30.54	0.03	9.69
P313	DI	433.19	6	100.00	J354	J354	9.41	0.31	2.97	P439	DI	252.78	12	100.00	J452	J452	265.88	3.35	100.62
P315	DI	42.93	6	100.00	J354	C-114	0.00	0.00	0.00	P441	DI	247.64	12	100.00	J452	J457	192.57	2.00	71.66
P317	DI	37.31	6	100.00	J356	C-114	0.00	0.00	0.00	P443	DI	25.04	12	100.00	J458	C-144	0.00	0.00	0.00
P319	CI	237.98	6	100.00	J346	J346	13.38	0.45	4.49	P445	DI	395.29	12	100.00	J430	J430	154.76	0.98	54.82
P321	DI	211.69	12	110.00	J352	J358	251.01	8.37	78.98	P447	DI	33.91	12	110.00	J458	J454	265.88	3.35	100.62
P323	DI	260.87	12	110.00	J352	J360	279.97	9.73	89.15	P449	DI	31.61	12	110.00	V8002	V8002	265.88	3.35	100.62
P325	DI	314.31	6	100.00	J360	J362	23.50	0.78	9.11	P451	DI	419.28	8	110.00	J456	J456	68.92	1.34	27.56
P327	DI	345.87	6	100.00	J362	J363	14.77	0.40	5.50	P453	DI	461.13	16	120.00	J462	J460	283.31	8.18	115.12
P329	DI	26.56	12	100.00	J362	C-122	0.00	0.00	0.00	P455	DI	281.54	12	110.00	J460	J456	265.88	3.35	100.62
P331	DI	203.82	6	100.00	J356	J364	32.89	0.32	9.97	P457	DI	370.62	6	100.00	J460	J464	35.04	2.26	12.73
P333	DI	408.87	6	100.00	J366	J368	29.15	0.97	9.76	P459	CI	62.21	4	100.00	J464	J468	11.45	0.20	4.13
P335	DI	481.02	6	100.00	J368	J370	18.74	0.62	6.48	P461	CI	351.17	6	100.00	J464	J468	16.37	1.88	7.30
P337	DI	238.78	12	110.00	J366	J366	312.85	10.43	101.22	P463	CI	377.71	4	100.00	J470	J470	8.28	0.00	2.34
P339	DI	236.81	6	100.00	J364	J370	30.24	1.01	10.91	P465	CI	236.66	6	100.00	J468	J472	20.32	1.17	8.21
P341	DI	184.58	12	110.00	J366	J372	353.46	11.78	114.58	P467	PVC	171.95	2	90.00	J472	J474	2.07	0.07	0.65
P343	DI	556.26	6	100.00	J372	J374	28.86	0.96	9.45	P469	CI	625.28	6	100.00	J466	J476	16.13	0.35	7.41
P345	DI	25.28	6	100.00	J374	C-124	0.00	0.00	0.00	P471	PVC	538.36	2	90.00	J476	J480	1.59	0.19	0.53
P347	DI	328.02	6	100.00	J374	J376	13.23	0.44	4.53	P473	CI	169.38	6	100.00	J472	J482	21.36	0.82	8.68
P349	DI	192.02	6	100.00	J370	J376	50.76	1.69	17.05	P475	CI	208.99	6	100.00	J480	J480	21.54	1.51	10.17
P351	DI	219.52	12	110.00	J372	J378	393.78	13.13	127.64	P477	DI	411.88	12	100.00	J476	J478	25.79	0.14	10.86
P353	DI	404.28	6	100.00	J378	J380	36.79	1.23	11.87	P479	DI	156.1	12	110.00	J478	J484	32.03	1.42	12.61
P355	DI	481.07	6	100.00	J380	J382	22.21	0.74	7.28	P481	DI	14.55	6	100.00	J486	C-166	0.00	0.00	0.00
P357	DI	220.65	6	100.00	J376	J382	44.82	1.49	14.82	P483	DI	344.15	12	110.00	J486	J484	190.69	7.48	47.64
P359	DI	217.99	12	110.00	J378	J384	442.04	14.74	143.11	P485	DI	315.72	12	110.00	J488	J488	193.47	7.65	49.28
P361	DI	203.79	6	100.00	J384	J386	4.65	0.16	1.62	P487	DI	235.62	12	110.00	J490	J488	187.63	17.03	56.77
P363	DI	228.43	6	100.00	J386	J388	54.92	1.83	17.70	P489	AC	230.22	8	110.00	J490	J492	97.93	5.42	27.17
P365	PVC	124.29	2.5	90.00	J388	J390	3.12	0.10	0.98	P491	PVC	177.36	3	100.00	J492	J494	4.17	0.14	1.31
P367	DI	288.96	6	100.00	J388	J392	46.58	1.55	15.08	P493	CI	207.56	6	100.00	J488	J488	24.03	0.14	11.08
P369	DI	169.85	6	100.00	J392	J394	37.19	1.24	12.13	P495	AC	194.92	8	100.00	J492	J496	91.69	5.63	25.99
P371	DI	178.34	6	100.00	J384	J382	29.90	1.00	9.83	P497	AC	164.2	6	100.00	J496	J496	14.58	0.49	4.59
P373	DI	291.56	12	110.00	J384	J386	481.12	16.04	155.26	P499	PVC	274.26	3	100.00	J498	J500	8.34	0.28	2.62
P375	DI	281.49	12	110.00	J386	J396	490.51	16.35	158.21	P501	AC	230.67	8	100.00	J496	J502	70.87	0.23	22.05
P377	DI	204.1	6	100.00	J398	J400	11.09	0.37	3.71	P503	AC	117.97	8	100.00	J502	J504	64.63	1.72	21.28
P379	DI	300.46	6	100.00	J400	J402	75.20	2.51	24.24	P505	AC	448.42	8	110.00	J504	J504	214.67	15.84	85.93
P381	DI	270.43	6	100.00	J402	J386	67.91	2.26	21.95	P507	DI	300.24	12	110.00	J510	J508	210.31	7.33	74.05

P509	DI	270.26	12	110.00	J508	J490	206.42	7.58	71.78	AC	P641	294.13	6	100.00	J570	J622	29.89	1.00	9.41
P511	AC	57.33	12	110.00	J506	J512	399.16	36.18	189.96	AC	P643	334.85	6	100.00	J622	J616	11.14	0.37	3.51
P513	AC	595.69	12	110.00	J512	J510	381.67	35.60	184.45	AC	P645	403.78	6	100.00	J622	J624	10.41	0.35	3.28
P515	CI	384.23	4	100.00	J516	J518	12.25	1.12	25.90		P647	25.90	12.00	110.00	J630	J628	3,652.33	28.69	1,750.10
P517	CI	390.21	4	100.00	J518	J482	7.80	0.84	2.50		P649	30.57	12.00	110.00	J626	J628	3,652.33	28.69	1,750.10
P519	DI	320.23	16	120.00	J510	J514	263.48	6.55	108.71		P651	176.57	8	100.00	J628	J632	0.00	0.00	0.00
P521	DI	54.24	16	120.00	J514	J516	296.59	10.33	124.18		P653	2,212.09	12	110.00	J596	J634	805.54	61.54	345.44
P523	DI	288.52	16	120.00	J516	J520	286.37	8.56	117.09		P655	14.9	12	110.00	J626	J632	805.54	61.54	345.44
P525	DI	734.31	16	120.00	J520	J462	283.31	8.18	115.12		P657	23.61	8	100.00	J632	J7000	0.00	0.00	0.00
P527	PVC	377.87	2	90.00	J520	J470	2.13	0.27	0.99		P659	31.15	8	100.00	J7000	J638	0.00	0.00	0.00
P529	AC	430.98	6	100.00	J514	J522	35.72	3.95	17.11		P661	18.95	8	100.00	J632	J7002	0.00	0.00	0.00
P531	PVC	193.24	3	90.00	J522	J524	4.17	0.14	1.31		P663	31.71	8	100.00	J638	J638	0.00	0.00	0.00
P533	AC	215.69	3	100.00	J522	J526	39.37	4.20	19.40		P665	29.59	12	100.00	J638	J638	0.00	0.00	0.00
P535	DI	499.63	8	110.00	J528	J528	42.49	4.40	21.37	DI	P667	1,276.14	12	110.00	J636	J640	111.48	3.72	35.08
P537	DI	285.33	8	110.00	J528	J530	131.28	4.38	41.31	DI	P669	126.88	12	110.00	J640	J646	111.48	3.72	35.08
P539	DI	195.25	8	110.00	J506	J528	191.72	9.51	69.56	DI	P671	70.24	12	110.00	J646	J642	59.76	1.99	18.80
P541	DI	204.14	8	110.00	J530	J532	2.07	0.07	0.65	DI	P673	209.65	8	100.00	J642	J644	8.34	0.28	2.62
P543	DI	328.5	8	110.00	J530	J534	30.21	1.01	9.51	DI	P675	231.74	8	110.00	J642	J648	51.42	1.71	16.18
P545	DI	413.32	8	110.00	J534	J536	10.41	0.35	3.28	DI	P677	499.98	8	110.00	J648	J650	34.74	1.16	10.93
P547	AC	245.16	8	110.00	J538	J540	124.37	4.15	39.14	DI	P679	230.99	8	110.00	J650	J652	24.33	0.81	7.66
P551	AC	137.5	6	100.00	J540	J544	14.58	0.49	4.59	DI	P681	189.3	8	110.00	J652	J654	20.49	0.68	6.45
P553	PVC	219.96	3	90.00	J544	J542	8.34	0.28	2.62	DI	P683	189.31	8	110.00	J654	J656	25.71	0.86	8.09
P555	AC	179.85	8	110.00	J546	J546	93.15	3.38	31.92	DI	P685	96.99	8	110.00	J658	J660	6.24	0.21	1.96
P557	AC	209.57	8	110.00	J546	J548	101.14	3.10	29.30	DI	P687	101.14	4	100.00	J660	J662	6.24	0.21	1.96
P559	PVC	253.59	3	90.00	J548	J550	0.00	0.00	0.00	DI	P689	246.75	8	100.00	J664	J666	34.05	1.13	10.71
P561	AC	421.11	8	110.00	J548	J552	83.72	2.79	26.34		P691	73.57	8	100.00	J664	J666	5.22	0.17	1.64
P563	AC	249.98	8	100.00	J552	J554	74.33	2.48	23.39		P693	93.98	4	100.00	J666	J668	5.22	0.17	1.64
P565	AC	232.85	8	110.00	J554	J556	56.94	1.90	17.92	DI	P695	237.78	8	110.00	J668	J664	42.36	1.41	13.33
P567	PVC	340.44	6	100.00	J556	J558	17.73	0.59	5.58	DI	P697	114.9	8	110.00	J668	J670	49.65	1.66	15.62
P569	PVC	217.3	3	100.00	J558	J560	8.34	0.28	2.62	DI	P699	67.83	8	110.00	J670	J676	51.72	1.72	16.28
P571	AC	182.44	8	110.00	J556	J562	28.80	0.96	9.06	PVC	P701	104.53	3	90.00	J674	J676	3.12	0.10	0.98
P573	AC	427.48	8	110.00	J562	J564	18.39	0.61	5.79	DI	P703	356.56	8	110.00	J672	J672	25.02	0.83	7.87
P575	AC	452.71	8	110.00	J564	J566	7.98	0.27	2.51	DI	P705	262.7	8	110.00	J672	J672	36.48	1.22	11.48
P577	AC	219.53	8	110.00	J566	J568	2.76	0.09	0.87	DI	P707	346.65	6	100.00	J674	J678	16.68	0.56	5.25
P579	AC	257.81	8	110.00	J568	J570	3.48	0.12	1.09	DI	P709	228.34	8	110.00	J678	J680	13.56	0.45	4.27
P581	AC	505.55	8	110.00	J570	J572	45.88	1.53	14.44	PVC	P711	104.17	4	100.00	J680	J682	5.22	0.17	1.64
P583	AC	368.01	8	110.00	J572	J554	8.00	0.27	2.52	DI	P713	572.14	8	110.00	J686	J686	3.12	0.10	0.98
P585	AC	323.83	8	110.00	J572	J574	126.82	4.23	39.91	DI	P715	228.35	8	110.00	J686	J684	3.12	0.10	0.98
P587	AC	24.95	6	100.00	J574	C-75	0.00	0.00	0.00	DI	P717	99.14	12	110.00	J5002	J688	111.48	3.72	35.08
P589	AC	395.81	8	110.00	J574	J538	137.23	4.57	43.18	DI	P719	2,025.71	12	110.00	J688	J686	111.48	3.72	35.08
P591	AC	495.81	8	110.00	J538	J504	276.18	9.21	86.91	HDPE	P729	737.13	16.00	120.00	J690	J690	1,516.69	0.00	359.77
P593	DI	345.41	8	110.00	J530	J576	94.83	3.16	29.84	AC	P731	1,749.42	12.00	110.00	J692	J694	1,397.06	0.00	636.47
P595	DI	444.51	8	110.00	J576	J578	76.08	2.54	23.94	AC	P733	1,251.22	12.00	110.00	J694	J696	1,397.06	0.00	636.47
P597	DI	111.57	8	110.00	J578	J584	56.28	1.88	17.71	AC	P735	1,699.22	12.00	110.00	J696	J698	1,397.06	0.00	636.47
P603	DI	237.59	6	100.00	J580	J586	48.99	1.63	15.42	DI	P737	1,164.78	12.00	110.00	J702	J698	1,397.06	0.00	636.47
P605	DI	205.72	6	100.00	J582	J580	34.41	1.15	10.83	DI	P739	290.32	16.00	120.00	J700	J702	1,397.06	0.00	636.47
P607	DI	248.57	6	100.00	J582	J588	25.02	0.83	7.87	DI	P741	404.09	12	110.00	J704	J704	506.74	0.00	218.30
P609	DI	536.56	8	110.00	J528	J590	13.53	0.45	4.26	AC	P743	821.72	12	110.00	J706	J700	890.32	0.00	418.16
P611	DI	227.11	8	100.00	J590	J592	6.24	0.21	1.96	DI	P745	419.19	6	100.00	J370	J708	29.86	1.00	9.67
P613	AC	761.01	12	110.00	J596	J594	805.54	61.54	345.44	DI	P747	485.26	6	100.00	J708	J710	17.35	0.58	5.73
P615	AC	952.27	12	110.00	J594	J596	805.54	61.54	345.44	DI	P749	253.38	6	100.00	J710	J712	2.77	0.09	1.14
P617	DI	39.06	6	100.00	J588	J598	25.02	0.83	7.87	DI	P751	251.07	6	100.00	J354	J712	14.09	0.11	4.34
P619	AC	543.44	12	110.00	J600	J598	15.63	0.52	4.92	DI	P753	214.78	6	100.00	J712	J714	8.52	0.00	2.58
P621	AC	667.13	12	110.00	J600	J602	5.22	0.17	1.64	DI	P755	218.33	6	100.00	J714	J346	8.52	0.00	2.58
P623	AC	341.45	6	100.00	J604	J606	22.92	0.76	7.21	DI	P757	291.47	6	100.00	J710	J718	0.00	0.00	0.00
P625	PVC	289.54	3	90.00	J606	J608	10.41	0.35	3.28	DI	P761	331.2	6	100.00	J712	J722	0.00	0.00	0.00
P627	AC	264.18	8	110.00	J572	J604	74.36	2.48	23.40	DI	P765	39.25	6	100.00	J724	J724	0.00	0.00	0.00
P629	AC	326.95	8	100.00	J604	J612	42.05	1.40	13.23	DI	P767	34.31	6	100.00	J720	J720	0.00	0.00	0.00
P631	AC	243.7	8	110.00	J612	J610	32.66	1.09	10.28	DI	P769	262.6	6	100.00	J718	J720	0.00	0.00	0.00
P633	PVC	241.81	3	90.00	J610	J614	9.39	0.31	2.95	DI	P771	226.47	6	100.00	J722	J726	0.00	0.00	0.00
P635	AC	302.1	6	100.00	J610	J616	13.88	0.46	4.37	PVC	P773	233.18	2.5	100.00	J724	J724	0.00	0.00	0.00
P637	AC	186.32	6	100.00	J616	J618	12.51	0.42	3.94	PVC	P775	71.85	2.5	100.00	J726	J726	0.00	0.00	0.00
P639	PVC	183.63	6	100.00	J618	J620	7.29	0.24	2.29	DI	P777	20.2	6	100.00	J332	J338	59.57	1.98	18.74

Hanapepe Water System
DHHL Ph. 2 with Lima Ola Ph. 1
Tank Data

	ELEVATION (ft)	TANKHYD: MIN LEVEL (ft)	TANKHYD: MAX LEVEL (ft)	TANKHYD: INIT LEVEL (ft)	TANKHYD: DIAMETER (ft)	RANGE: MIN VALUE (ft)	RANGE: MAX VALUE (ft)	RANGE: AVE. VALUE (ft)	RANGE: MIN VALUE (%)	RANGE: MAX VALUE (%)	RANGE: AVE. VALUE (%)
J7248	170										
J728	164										
J732	168										
J734	168										
J736	168										
J738	167										
J740	167										
J742	173										
J744	164										
J746	163										
J748	164										
J750	164										
J752	40										
C-19	40										
J754	45	1.39	RES	4.17	1.14	1.31	80.94	59.97	73.93	91.51	96.33
C-20	45										
J756	42	2.08	RES	7.78	0.99	77.86	59.09	71.64	91.51	96.33	
C-59	42										
J758	40	1.04	RES	6.24	0.11	1.96	78.48	61.37	72.84	91.51	96.33
J760	38	1.04	RES	3.12	0.11	0.98	78.84	62.97	73.64	91.51	96.33
J762	40	1.04	RES	3.12	0.11	0.98	79.47	64.19	74.48	91.51	96.33
J764	36	1.04	RES	3.12	0.11	0.98	77.94	64.31	73.58	91.51	96.33
J766	36	1.04	RES	3.12	0.11	0.98	79.23	66.75	75.21	91.51	96.33
J768	33	1.04	RES	3.12	0.11	0.98	80.54	67.96	76.48	91.51	96.33
J770	26	1.04	RES	3.12	0.11	0.98	84.09	70.08	79.56	91.51	96.33
J772	23	1.39	RES	4.17	0.14	1.31	84.91	72.12	80.79	91.51	96.33
J774	22	1.04	RES	3.12	0.11	0.98	85.31	71.62	81.22	91.51	96.33
J776	21	2.08	RES	6.24	0.21	1.96	85.74	73.07	81.65	91.51	96.33
J778	21	2.78	RES	8.34	0.28	2.62	85.75	73.06	81.65	91.51	96.33
J780	27	1.04	RES	3.12	0.11	0.98	88.14	70.47	79.05	91.51	96.33
J782	30	1.04	RES	3.12	0.11	0.98	89.54	72.90	81.40	91.51	96.33
J784	32	1.04	RES	3.12	0.11	0.98	90.97	75.31	83.69	91.51	96.33
J786	30	1.04	RES	3.12	0.11	0.98	91.84	77.75	87.89	91.51	96.33
J788	30	1.04	RES	3.12	0.11	0.98	92.67	79.05	89.86	91.51	96.33
J790	26	1.74	RES	5.42	0.17	1.68	94.84	81.32	93.38	91.51	96.33
J792	26	1.39	RES	4.17	0.14	1.31	95.37	83.69	91.51	96.33	96.33
J794	32	24.31	AGR	46.62	2.43	23.43	80.97	68.11	76.81	91.51	96.33
J796	29	6.94	AGR	13.88	0.69	6.69	82.27	69.4	78.1	91.51	96.33
J798	79	1.04	RES	3.12	0.11	0.98	60.6	47.74	56.44	91.51	96.33
J800	35	1.04	RES	3.12	0.11	0.98	67.23	55.44	66.34	91.51	96.33
J802	35	1.04	RES	3.12	0.11	0.98	80.53	67.23	75.48	91.51	96.33
J804	164										
J806	19										
J808	24	1.88	COMM	5.64	0.0	0	96.08	60.74	84.2	91.51	96.33
J810	24	0									
J812	35	0									
J814	40	0									
J816	20	0									
J818	18	0									
J820	20	0									
J110A	20	0									
J110B	20	0									
J140	21	0									
J214	29	0									
C60	38										
C62	38										
J952	134										
J953	201	4.44	PARKS	27.2	0	4.44	87.09	62.93	86.08	91.51	96.33
J733	167	1.39	RES	4.17	0.14	1.31	36.69	33.38	36.07	91.51	96.33
J161	27	3.47	RES	10.41	0.35	3.28	88.84	62.31	79.93	91.51	96.33
J162	27	3.47	RES	10.41	0.35	3.28	88.84	62.31	79.93	91.51	96.33
J163	27	3.47	RES	10.41	0.35	3.28	88.84	62.31	79.93	91.51	96.33
J164	27	3.47	RES	10.41	0.35	3.28	88.84	62.31	79.93	91.51	96.33
J165	27	3.47	RES	10.41	0.35	3.28	88.84	62.31	79.93	91.51	96.33
J166	27	3.47	RES	10.41	0.35	3.28	88.84	62.31	79.93	91.51	96.33
J167	25	1.67	PARKS	8.35	0.0	1.67	92.84	65.15	83.2	91.51	96.33
J201	194										
J205	194										
J206	194										
J207	194										
J208	194										
C135	261	0.68	RES	2.04	0.07	0.64	100.05	106.02	108.49	91.51	96.33
C132	135										
C83	181										
C40	30										
C41	30										
J1024.LA	174	6.6	RES	63.43	5.48	25.45	43.95	44.75	44.75	91.51	96.33
J1022.LA	235										
J1022.LA	230	6.6	RES	68.43	5.48	25.45	47.66	46.11	46.91	91.51	96.33
J1024	185	13.19	RES	35.07	1.32	12.65	88.49	86.67	88.67	91.51	96.33
DH2006	180										
DH2008	170	12.85	RES	38.55	1.28	12.13	100.52	96.32	99.51	91.51	96.33

Hanapepe Water System
DHHL Ph.2 with Lima Ols Ph.1
Pump Data

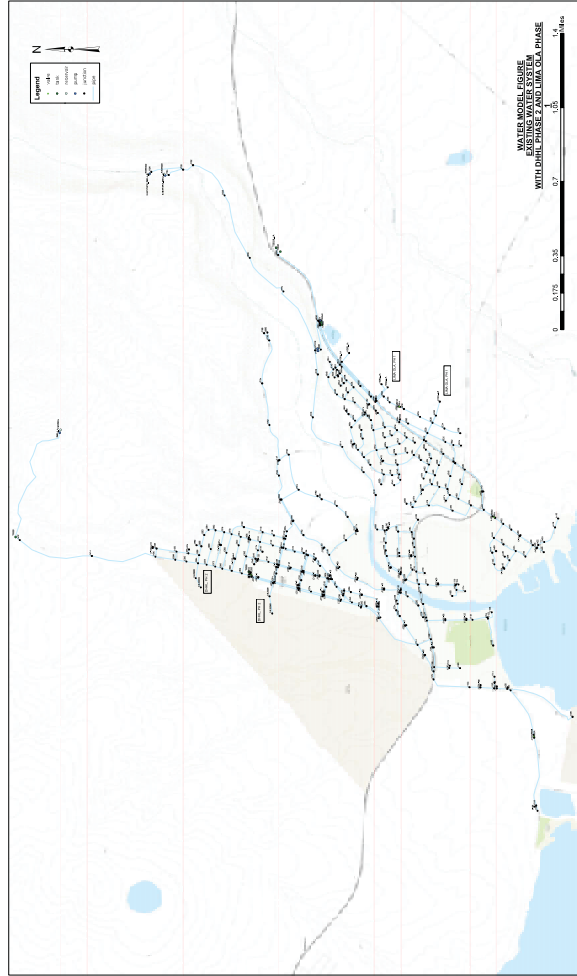
PUMP_ID	ELECTRICAL ELEVATION (ft)	PUMP_HD SHUT-OFF HEAD (ft)	PUMP_HD DESIGN HEAD (ft)	PUMP_HD OPERATING HEAD (ft)	PUMP_HD MINIMUM HEAD (ft)	PUMP_HD MAXIMUM HEAD (ft)	PUMP_HD RANGE (ft)	PUMP_HD ELECTRICAL ELEVATION (ft)	PUMP_HD SHUT-OFF HEAD (ft)	PUMP_HD DESIGN HEAD (ft)	PUMP_HD OPERATING HEAD (ft)	PUMP_HD MINIMUM HEAD (ft)	PUMP_HD MAXIMUM HEAD (ft)	PUMP_HD RANGE (ft)
U7000	310	0	105	120	0	0	0:00	39.86	38.16	38.94	38.94	38.94	38.94	0:00
U7002	310	0	105	120	0	0	0:00	39.86	38.16	38.94	38.94	38.94	38.94	0:00
WELL_4	0	600	535	600	400	720	728.2	728.2	172.91	174.39	174.39	174.39	174.39	0:00
HANAPEPE_WELLB	0	400	300	850	200	900	890.32	890.32	131.92	131.92	131.92	131.92	131.92	0:00
HANAPEPE_WELLA	0	400	300	850	200	900	890.32	890.32	131.92	131.92	131.92	131.92	131.92	0:00
U7016	25	400	360	650	300	700	758.51	758.51	137.03	134.95	134.95	134.95	134.95	0:00
U7018	25	400	360	650	300	700	758.51	758.51	137.03	134.95	134.95	134.95	134.95	0:00

Hanapepe Water System
DHHL Ph.2 with Lima Ols Ph.1
Valve Data

VALVE_ID	VALVE_DESCRPT	VALVE_HD ELECTRICAL ELEVATION (ft)	VALVE_HD DIAMETER (in)	VALVE_HD SETTING (psi)	VALVE_HD MAX VALUE (psi)	VALVE_HD MIN VALUE (psi)	VALVE_HD RANGE (psi)	VALVE_HD ELECTRICAL ELEVATION (ft)	VALVE_HD DIAMETER (in)	VALVE_HD SETTING (psi)	VALVE_HD MAX VALUE (psi)	VALVE_HD MIN VALUE (psi)	VALVE_HD RANGE (psi)
V8002	OUT SPOCK	65	8	35	135.69	135.69	135.69	65	8	35	135.69	135.69	135.69
V8008	Lakeloa Road	100	2	50	55.36	55.36	55.36	100	2	50	55.36	55.36	55.36
V8010	Hanapepe Heights	194	6	25	90.12	90.12	90.12	194	6	25	90.12	90.12	90.12
V8012	Hanapepe Heights	203	6	50	59.33	59.33	59.33	203	6	50	59.33	59.33	59.33

Hanaapepe Water System
 DIHL Build out with Lima Ola Build out
 Pipe Data

PIPE ID	PIPE MATERIAL	PIPEHYD: LENGTH (ft)	PIPEHYD: DIAMETER (in)	PIPEHYD: ROUGHNESS	LINK: FROM	LINK: TO	RANGE: MAX_VALUE (gpm)	RANGE: MIN_VALUE (gpm)	RANGE: AVE_VALUE (gpm)
P104	1206.15	3	90.00	J104	J102	3.12	0.10	0.98	
P13	88.81	8	110.00	J108	J104	8.97	0.28	3.23	
P15	41.2	6	100.00	J108	C-151	9.39	0.31	2.95	
P19	145.66	6	100.00	J110	J112	16.98	0.57	5.34	
P21	141.06	2.5	90.00	J110	J114	9.39	0.31	2.95	
P23	265.19	8	100.00	J108	J116	18.36	0.59	6.18	
P25	65.14	8	100.00	J116	C-23	18.36	0.59	6.18	
P27	45.78	12	100.00	J116	C-23	0.00	0.00	0.00	
P29	340.36	8	110.00	J110	J120	93.58	2.42	26.53	
P31	56.59	6	100.00	J120	C-58	0.00	0.00	0.00	
P33	109.29	8	110.00	J128	J126	145.16	3.44	60.45	
P35	199.65	8	110.00	J126	J124	95.97	16.16	49.53	
P37	980.65	8	110.00	J124	J122	94.74	16.16	37.73	
P39	273.47	8	110.00	J122	J120	94.74	16.16	37.73	
P41	378.6	6	100.00	J128	J132	91.65	0.00	18.33	
P43	267.38	4	100.00	J132	J130	91.65	0.00	18.33	
P45	57.27	1.5	90.00	J132	J134	0.00	0.00	0.00	
P47	213.09	12	110.00	J138	J136	175.09	9.78	87.81	
P49	31.36	6	100.00	J136	C-65	0.00	0.00	0.00	
P51	494.38	12	110.00	J136	J128	174.80	8.90	85.50	
P53	361.70	12.00	110.00	J138	J144	1,093.60	65.63	481.40	
P55	474.54	12.00	110.00	J142	J138	1,134.60	39.39	484.64	
P57	461	8	110.00	J142	J146	274.00	5.03	61.66	
P59	28.65	6	100.00	J146	C-26	0.00	0.00	0.00	
P61	522.69	8	100.00	J146	J150	269.49	0.52	57.15	
P63	28.76	6	100.00	J150	C-25	0.00	0.00	0.00	
P65	156.27	4	100.00	J150	J148	61.14	0.52	15.48	
P67	391.6	4	100.00	J148	J152	56.13	0.21	12.52	
P69	30.48	4	100.00	J152	J154	53.90	0.07	11.21	
P71	242.12	1.5	80.00	J154	J156	2.07	0.07	0.65	
P73	713.61	1.5	80.00	J154	J158	52.80	0.00	10.56	
P75	211.32	12.00	110.00	J160	J214	1,128.16	2.08	467.98	
P77	221.44	6	100.00	J160	J161	36.45	1.22	11.47	
P79	28.76	6	100.00	J162	C-29	10.41	0.35	3.28	
P83	443.3	2.5	90.00	J162	J166	3.12	0.10	0.98	
P85	451.41	6	100.00	J162	J170	12.51	0.42	3.94	
P87	56.42	6	100.00	J170	J164	1.05	0.04	0.33	
P89	134.81	6	100.00	J170	J172	11.46	0.38	3.61	
P93	247.26	2	100.00	J172	J168	4.17	0.14	1.31	
P95	321.71	12.00	110.00	J176	J174	4.17	0.14	1.31	
P97	214.07	2	90.00	J176	J180	0.00	0.00	0.00	
P99	373.72	12.00	110.00	J176	J180	1,213.63	10.85	507.33	
P101	238.11	1.5	90.00	J180	J185	7.97	0.48	3.55	
P103	230.12	2	90.00	J182	J184	20.65	0.17	6.69	
P105	338.79	4	100.00	J184	J186	27.33	0.69	10.47	
P107	349.77	2	90.00	J184	J188	1.05	0.04	0.33	
P109	303.26	12.00	110.00	J190	J192	1,206.94	4.17	500.61	
P111	95.16	12.00	110.00	J192	J180	1,206.94	5.28	501.28	
P113	26.17	6	100.00	J192	C-38	0.00	0.00	0.00	
P115	78.71	6	100.00	J190	J191	208.18	1.72	86.70	
P119	55.37	8	110.00	J194	J196	211.76	0.14	90.52	
P121	401.9	8	100.00	J196	J186	211.76	0.14	90.52	
P123	31.47	6	100.00	J196	C-62	0.00	0.00	0.00	
P125	320.77	12.00	110.00	J194	J198	1,268.83	3.40	528.63	
P127	193.22	12.00	110.00	J198	J199	1,271.07	3.40	529.19	
P129	312.14	12.00	110.00	J200	J190	1,000.62	0.62	412.52	
P131	551.93	4	100.00	J200	J202	76.19	0.46	32.24	
P133	344.35	6	100.00	J200	J212	206.56	0.92	87.58	
P135	13.84	6	100.00	J212	C-33	0.00	0.00	0.00	
P137	282.18	6	100.00	J212	J204	207.98	2.21	87.79	

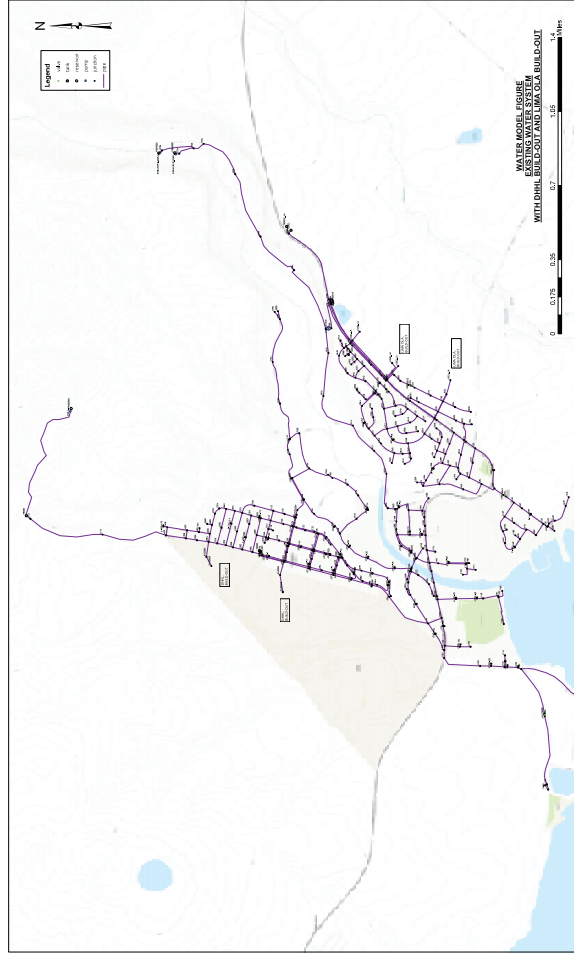


Honapepe Water System
 DPHI Build out with Uima Ota build out
 Night Shift

JUNCTION ID	ELEVATION (ft)	DEMAND (gpm)	PATTERN	DEMAND (gpm)	DEMAND PATTERN	RANGE: MINIMUM VALUE (gpm)	RANGE: MAXIMUM VALUE (gpm)	RANGE: MINIMUM VALUE (ft)	RANGE: MAXIMUM VALUE (ft)	RANGE: MINIMUM VALUE (ft)	RANGE: MAXIMUM VALUE (ft)
J100	20	1.04	RES	0	0	3.12	0.0	0.1	0.98	84.66	69.73
C48	0	0				0	0	0	0	84.66	69.73
J102	20	1.74	RES	0	0	5.72	0.0	0.7	1.64	89.62	69.73
J106	20	0.63	COMM	0	0	1.89	0	0	0	89.62	69.73
J108	20	3.13	RES	0	0	9.39	0.0	1.35	3.95	89.62	69.73
C151	0	0				0	0	0	0	89.62	69.73
J110	24	2.53	RES	0	0	7.59	0.0	1.06	3.18	89.62	69.73
J112	24	3.13	RES	0	0	9.39	0.0	1.35	4.05	89.62	69.73
J114	24	3.13	RES	0	0	9.39	0.0	1.35	4.05	89.62	69.73
J116	25	5.53	RES	0	0	16.59	0.0	2.33	7.00	89.62	69.73
J118	25	5.53	RES	0	0	16.59	0.0	2.33	7.00	89.62	69.73
J120	29	11.67	IND	0	0	35.01	0	5.0	15.0	89.62	69.73
C158	0	0				0	0	0	0	89.62	69.73
J122	30	12.29	IND	0	0	36.87	0	5.0	15.0	89.62	69.73
J124	30	12.29	IND	0	0	36.87	0	5.0	15.0	89.62	69.73
J126	30	8.9	PARKS	0	0	26.7	0	3.8	11.4	89.62	69.73
J128	36	8.9	PARKS	0	0	26.7	0	3.8	11.4	89.62	69.73
J130	30	18.33	PARKS	0	0	54.5	0	7.8	23.4	89.62	69.73
J132	28	0				0	0	0	0	89.62	69.73
J134	28	0				0	0	0	0	89.62	69.73
J136	37	2.92	COMM	0	0	8.76	0	1.2	3.6	89.62	69.73
J138	33	11.94	PARKS	0	0	35.8	0	5.1	15.3	89.62	69.73
C45	0	0				0	0	0	0	89.62	69.73
J142	33	2.5	COMM	0	0	7.5	0.0	1.0	3.0	89.62	69.73
J144	33	2.5	COMM	0	0	7.5	0.0	1.0	3.0	89.62	69.73
J146	12	4.51	RES	0	0	13.53	0.0	1.9	5.7	89.62	69.73
C26	0	0				0	0	0	0	89.62	69.73
J148	12	3.13	RES	0	0	9.39	0.0	1.35	4.05	89.62	69.73
J150	12	3.13	RES	0	0	9.39	0.0	1.35	4.05	89.62	69.73
C25	0	0				0	0	0	0	89.62	69.73
J152	11	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J154	10	0.65	RES	0	0	1.95	0.0	0.3	0.9	89.62	69.73
J156	10	10.56	PARKS	0	0	31.68	0	4.5	13.5	89.62	69.73
J160	28	1.25	COMM	0	0	3.75	0	0	0	89.62	69.73
J162	26	3.47	RES	0	0	10.41	0.0	1.5	4.5	89.62	69.73
C29	0	0				0	0	0	0	89.62	69.73
J164	23	1.04	RES	0	0	3.12	0.0	0.4	1.2	89.62	69.73
J166	23	1.04	RES	0	0	3.12	0.0	0.4	1.2	89.62	69.73
J168	23	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J170	23	1.04	RES	0	0	3.12	0.0	0.4	1.2	89.62	69.73
J172	23	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J174	23	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J176	27	2.5	RES	0	0	7.5	0.0	1.0	3.0	89.62	69.73
J178	25	4.17	PARKS	0	0	12.51	0.0	1.8	5.4	89.62	69.73
J180	24	4.17	PARKS	0	0	12.51	0.0	1.8	5.4	89.62	69.73
J182	24	3.82	RES	0	0	11.46	0.0	1.6	4.8	89.62	69.73
J184	21	3.82	RES	0	0	11.46	0.0	1.6	4.8	89.62	69.73
J186	21	3.13	RES	0	0	9.39	0.0	1.35	4.05	89.62	69.73
J188	33	0.35	RES	0	0	1.05	0.0	0.1	0.3	89.62	69.73
J190	25	1.04	PARKS	0	0	3.12	0.0	0.4	1.2	89.62	69.73
J192	24	1.11	PARKS	0	0	3.33	0.0	0.5	1.5	89.62	69.73
C38	0	0				0	0	0	0	89.62	69.73
J194	21	1.46	COMM	0	0	4.38	0	0	0	89.62	69.73
C62	0	0				0	0	0	0	89.62	69.73
J198	25	1.88	COMM	0	0	5.64	0	0	0	89.62	69.73
J200	26	3.13	COMM	0	0	9.39	0	0	0	89.62	69.73
J202	29	1.88	COMM	0	0	5.64	0	0	0	89.62	69.73
J204	29	1.88	COMM	0	0	5.64	0	0	0	89.62	69.73
J206	29	0.35	RES	0	0	1.05	0.0	0.1	0.3	89.62	69.73
J208	29	1.88	COMM	0	0	5.64	0	0	0	89.62	69.73
J210	26	1.88	COMM	0	0	5.64	0	0	0	89.62	69.73
C32	0	0				0	0	0	0	89.62	69.73
J214	25	0.35	RES	0	0	1.05	0.0	0.1	0.3	89.62	69.73
J216	25	0.35	RES	0	0	1.05	0.0	0.1	0.3	89.62	69.73
J218	31	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J220	26	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J222	26	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J224	26	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J226	31	0.85	COMM	0	0	2.55	0	0	0	89.62	69.73
J228	31	0.85	COMM	0	0	2.55	0	0	0	89.62	69.73
J230	38	2.08	PARKS	0	0	6.24	0	0.8	2.4	89.62	69.73
C17	0	0				0	0	0	0	89.62	69.73
J232	38	1.75	RES	0	0	5.25	0	0.7	2.1	89.62	69.73
J234	38	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J236	38	1.39	RES	0	0	4.17	0.0	0.6	1.8	89.62	69.73
J238	38	0.69	RES	0	0	2.07	0.0	0.3	0.9	89.62	69.73
J240	35	0				0	0	0	0	89.62	69.73
C52	0	0				0	0	0	0	89.62	69.73

Hanapepe Water System
 DHH, Build out with Lima Ola Build out
 Valve Data

VALVE: ID	VALVE: DESCRPT	VALVEHYD: DIAMETER (in)	VALVEHYD: SETTING (psi)	RANGE: MAX_VALUE (psi)	RANGE: MIN_VALUE (psi)	RANGE: MIN_TIME (hrs.)	RANGE: AVE_VALUE (psi)	RANGE: DIFFERENCE (psi)
V8002	OUT 50PSI	8	35	118.69	113.19	7:00	116.51	5.5
V8008	Lokolai Road	2	50	54.96	35.07	20:00	48.12	19.89
V8010	Hanapepe Heights	6	25	90.1	76.22	7:00	86.75	13.88
V8012		6	50	59.33	53.75	7:00	57.17	5.57



Appendix H – Wastewater Master Plan



FINAL ENGINEERING REPORT

Hanepepe Homestead
Wastewater Master Plan

24, June 2020

Island Experts



PREPARED FOR:

Department of Hawaiian Home Lands
91-5420 Kapolei Parkway
Kapolei, Hawaii 96707

SUBMITTED BY:

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1.0 Introduction

1.1 Description of Work

- 1.1.1 Prepare a sewer (hydraulic) study within the civil master plan utilities assessment document covering the existing onsite and offsite sewer systems and identifying needed improvements.
- 1.1.2 Prepare a Rough Order of Magnitude (ROM) Cost Estimate for the design and construction of the project program elements and on-site/off-site infrastructure improvements for the project site.
- 1.1.3 The project scope will cover the Phase 2, a 1.5-acre development of 75 residential lots scheduled to be built within the next three to five years, and a full build out for additional residential, subsistence agriculture and commercial land use, covering about 350 acres in about 10 years.

1.2 Reference Documents

- 1.2.1 County of Kauai, Department of Public Works, Division of Wastewater Management (DWWM), "Construction Plans for Elele Wastewater Treatment Plant-Process Equipment, Electrical System and Disinfection System Upgrades," dated September 2000.
- 1.2.2 County of Kauai, Department of Public Works, DWWM, "Hanapepe Sewage Pump Station No. 1 Force Main and Trunk Sewer," Russ Smith Corp and Calvin Kim and Assoc. Inc., dated July 1978.
- 1.2.3 County of Kauai, Department of Public Works, DWWM, "Hanapepe Sewage Pump Station No. 2 Force Main and Trunk Sewer," Russ Smith Corp and Calvin Kim and Assoc. Inc., dated July 1978.
- 1.2.4 County of Kauai, DWWM April 5, 2019 Meeting Minutes, prepared by SSFM International, Inc., 501 Summer St, Honolulu, HI, dated April 2019.
- 1.2.5 County of Kauai, Wastewater Division, "DPW Sewer Design Standards," June 1973.

- 1.2.6 Dudek, LIDAR Topographic map prepared by Dudek, 970 N. Kaliaheo Ave, Kailua, Oahu, HI, dated February 2019.

- 1.2.7 Kauai County General Plan Infrastructure Assessment, Kauai General Plan Update, prepared by SSFM International, Inc., 501 Summer St, Honolulu, HI, dated August 2016.

- 1.2.8 Jones, Sanks, Tchobanoglous, Bosserman II, "Pumping Station Design" Third Edition, dated 2008.

- 1.2.9 Metcalf & Eddy, "Wastewater Engineering Treatment Disposal Reuse" Third Edition, dated 1972.

- 1.2.10 Raymond Hoe, Realtor, Inc., "Construction Plans for Cliffside at Hanapepe a Residential Subdivision," dated 1900.

- 1.2.11 State of Hawaii Dept. of Hawaiian Home Lands, "Hanapepe Heights Residence Lots, Unit 1 Phase 1," dated August 1997.

- 1.2.12 State of Hawaii Dept. of Land and Natural Resources, "Hanapepe Heights Residential Subdivision, Hanapepe, Kauai," dated June 1971.

- 1.2.13 United States Environmental Protection Agency, Office of Water, "Wastewater Technology Fact Sheet Package Plants," EPA 852-F-00-016, September 2000.

1.3 Codes and Standards

- 1.3.1 Hawaii Administrative Rules, Chapter 62 of Title 11 (HAR 62-11) "Wastewater Systems" as amended March 2016.
- 1.3.2 City and County of Honolulu Design Standards of the Department of Wastewater Management Volume 1 dated July 1993.
- 1.3.3 City and County of Honolulu, Department of Environmental Services Wastewater System Design Standards, dated July 2017.

2.0 Existing Condition

The project site is currently undeveloped land used for agriculture crops and grazing. The topographic condition is described in the drainage section. The general slope is about 3 percent along the ridge.

According to record plans, Moi Road was designed in 1945 and the roadway segment had terminated just beyond the Ahi Road intersection. A segment of the existing sewer collection system, located within Moi Road, was designed in 1997 by Esaki Surveying and Mapping, Inc. as part of the DHHL Hanapepe Residence Lots Unit 1 Phase 1. The downstream sewer connection occurs makai of the Moi Road and Kupaa Street intersection to an 8" sewer collection system. According to DWV, the gravity sewer discharges raw sewage into Sewer Pump Station (SPS) #1 located west of Hanapepe River. From the construction drawings location map, SPS #1 conveys the wastewater 1,100 ft downstream to SPS #2, nestled between Hanapepe Road and Kona Road, east of Hanapepe River. The construction plans for both SPS were dated 1978, or 42 years ago. Wastewater from SPS #2 is then conveyed to an existing flow control box at Waialo Road and gravity flows into the Elelele Wastewater Treatment Plant (WWTP). The WWTP is located further east and going makai along Waialo Road, approximately 2,700 ft away (radial distance, and not roadway travel distance at 3,900 LF).

Note that the built DHHL Phase 1 gravity flow sewer pipe is an existing 8" diameter vitrified clay pipe, sloping at about 1 to 9 percent. The existing design flow is about 0.055 million gallons per day (MGD). At a 3 percent pipe slope, the available capacity is about 1.18 MGD indicating that additional flow from the proposed Phase 2 is possible. At the end of Moi Road, the terrain is not as steep, as existing sewer lines increase to 12" and then 18" at SPS #1.

The design team recently forwarded the proposed Phase 2 design flows to the County of Kauai, Dept. of Public Works, Division of Wastewater Management Division (DWWWM) for hydraulic capacity analysis and to determine if the pump station will require improvements to increase flow capacity. Meanwhile, record plans for the existing SPS #1 indicate duplex pump configuration, lead and lag pumps, each with a design discharge of about 1,200 gallons per minute, or 1.13 million gallons per day (and maximum capacity 1,900 gpm; 2.74 MGD if high flow alarm is triggered). The actual peak flows have not been confirmed. Similarly, record plans for the existing SPS #2 indicate duplex pumps, each with an initial discharge of about 1,150 to 1,250 gpm, and a maximum design discharge of 1,750 to 1,850 gpm; 2.52 to 2.66 MGD.

The wet well storage volume for each SPS seems to be small and deep, thus reducing the overall lift station footprint. The design utilizes the large capacity pumps to offset peak flows during the extreme flow events.

3.0 Proposed Conditions

The Hanapepe Subdivision will be split into two distinct phases, Phase 2 is the proposed increment to be completed within the next three to five years, whereas the larger Long-Term development is scheduled to be constructed around six to ten years from now. The basic assumption for design flow is based upon the number for dwelling units/single family lots, 4 persons (pn) per lot at 100 gallons per capita day. With COK approval, additional dwelling units could increase the population. Note however, there will be households with two or less persons, conceptually offsetting the overall density with the sewer tributary area, keeping the average number of persons to 4.

3.1 Phase 2

The domestic sewer design flows were based upon a total of 75 residential lots with one dwelling unit per lot. For each unit, a total of four persons per dwelling unit is assumed. This assumption could be conservative in cases where occupants total less than four persons per unit. The methodology used to determine the design flows are based upon the DWWWM design standards and presented in the flow model calculations shown on the following two pages. Results are highlighted as shown:

Residential Lots

Total number of lots = 75 ea
Area 13.2 acres

Given the above inventory, the sewer design flow model results are:

Residential Sewer Design Flows

Average Daily Flow 0.030 MGD
Peak Flow 0.166 MGD

The worksheets below provide the intermediate calculations following the COK design standards to determine design flows. The average daily flow is the basis of comparison used when determining available downstream treatment capacity, and the higher peak or maximum flows are used to determine required design flow into pipes and pump stations. The existing 8" sewer along Moi Road has adequate pipe flow capacity to accept the proposed Phase 2 flows.

A meeting was held in April 2019 with DWWWM to confirm that the anticipated flows from Phase 2 will be accepted by the COK. Since there are no pump station and WWTP capacity improvements within the near future, DWWWM will not be able to accept the additional flow for the subsequent long term (full) development

Project: 2018.021.DHHL Hanapepe Phase 2

Sewer for Phase 2 will be collected into the existing gravity treatment system

Reference:

1. COK, DPW) Sewer Design Standards, June, 2013

Given:

75 Dwelling Units

8 Major Use

300 Total PN

Determine Average Daily Design Flows:

Tributary	Residents PN	8-Hr Shift PN	8-Hr Shift GPCD	Residents GPCD	Average Daily Flow (Qd)	
					8-Hr Shift	Total
Phase 2	75	0	100	30,000	30,000	30,000
Total					30,000	30,000

MGD_{max} = 0.031

Determine Maximum Flows (Qm)

Tributary	Residents GPD	8-Hr Shift GPD	Total GPD	Maximum Flow (Qm)		
				8-Hr Shift	Total	
Phase 2	30,000	0	30,000	150,000	150,000	
Total					150,000	150,000

MGD_{max} = 0.689

Determine Dry Weather Infiltration/Inflow (I/Dry)

Tributary	Residents PN	8-Hr Shift PN	Total PN	Average Daily Flow (Qd)		
				8-Hr Shift	Total	
Phase 2	75	0	75	0	0	
Total					0	0

MGD_{max} = 0.000

Determine Design Average Daily Flows (Qdes)

Tributary	Residents GPD	8-Hr Shift GPD	Total GPD	Average Daily Flow (Qd)		
				8-Hr Shift	Total	
Phase 2	30,000	0	30,000	30,000	30,000	
Total					30,000	30,000

MGD_{max} = 0.000

Determine Design Maximum Flows (Qdm):

Tributary	Qdm GPD	I/Dry GPD	Design Maximum Flow (Qdm)		
			GPD	cfh	
Phase 2	150,000	0	150,000	0.332	
Total					0.332

Determine Wet Weather Infiltration/Inflow (I/Wet):

Tributary	Acres	I/Wet GPD	Design Maximum Flow (Qdm)		
			GPD	cfh	
Phase 2	17.9	16,142	166,142	0.257	
Total					0.257

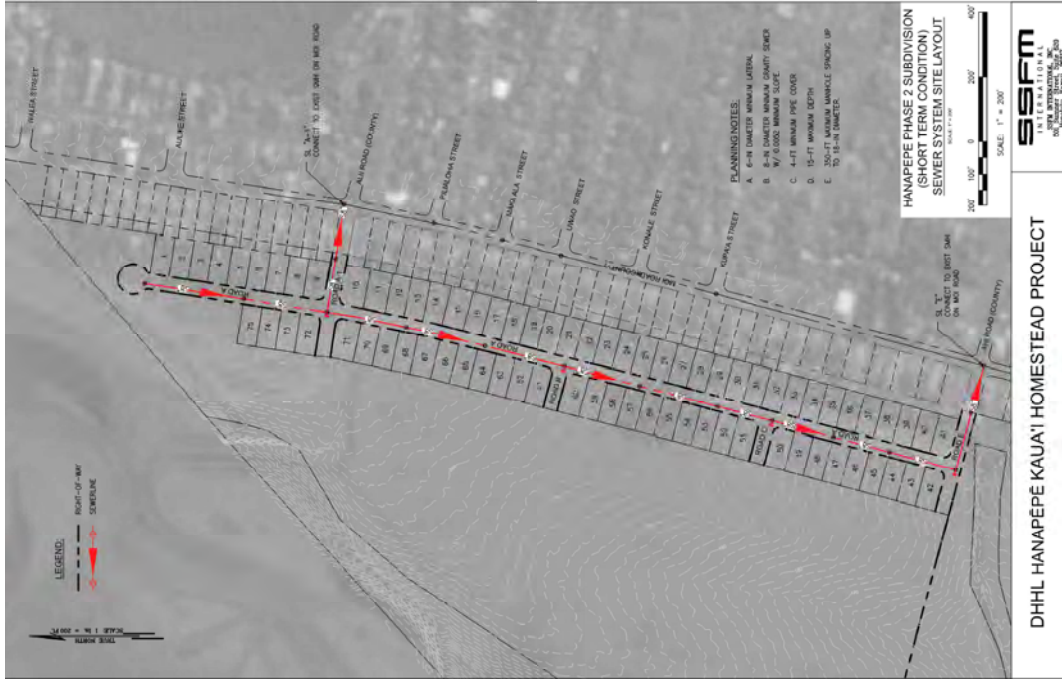
Use, Gallons per acre/yr = 1790

Determine Design Peak Flows (Qsp):

Tributary	Qdm GPD	I/Wet GPD	Design Peak Flow (Qsp)		
			GPD	cfh	
Phase 2	150,000	16,142	166,142	0.257	
Total					0.257

The Phase 2 layout is shown on the following page. An 8" gravity sewer running parallel to Moi Road, at roughly 3 percent grade will connect downstream to existing sewer manholes at the upper Moi Road / Ahi Road intersection and further downslope at the lower Moi Road / Ahi Road intersection. The grade is flatter approaching SPS #1 resulting in sewer pipes increasing to 12" and later to 18" gravity sewer.

The DWWM indicated that there is enough capacity at the Elelee 0.800 MGD WWTP for 75 dwellings from Phase 2. The adjacent Lima Ola subdivision has already been included in the DWW WWTP capacity study, so the remaining treatment capacity will be based upon a first come, first served policy. Since Phase 2 is scheduled to be complete within three to five years, it would be unlikely that other future developments would complete before Phase 2.



3.2 Long-Term Development (Full Buildout)

The sewer design flows for a full build out is a long-term plan scheduled within the next 6 to 10 years, and mostly likely broken down into incremental phases. The following list summarizes the long-term development that:

Residential Lots

Total number of lots = 332 ea

Area = 67.4 acres

Agriculture Lots:

Total number of lots = 82 ea (Note 16 lots are less than 1 acre)

Area = 107.5 acres

Commercial Lots

Area = 14.5 acres (assumed 75 persons PN per acre)

Given the above inventory, the sewer design flow model results are:

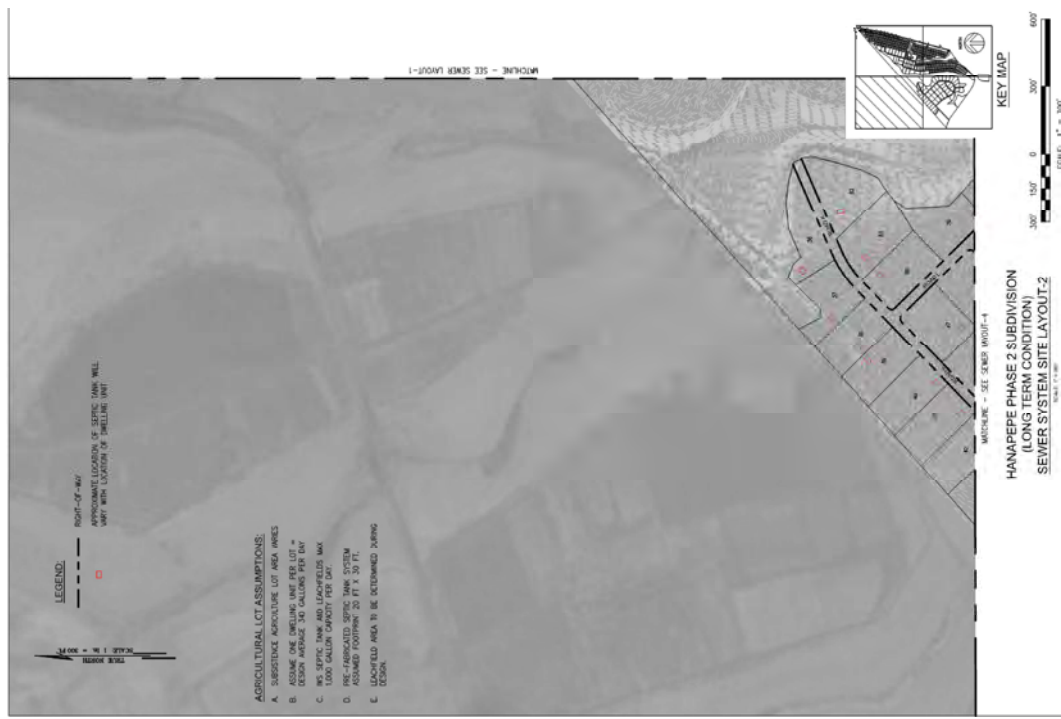
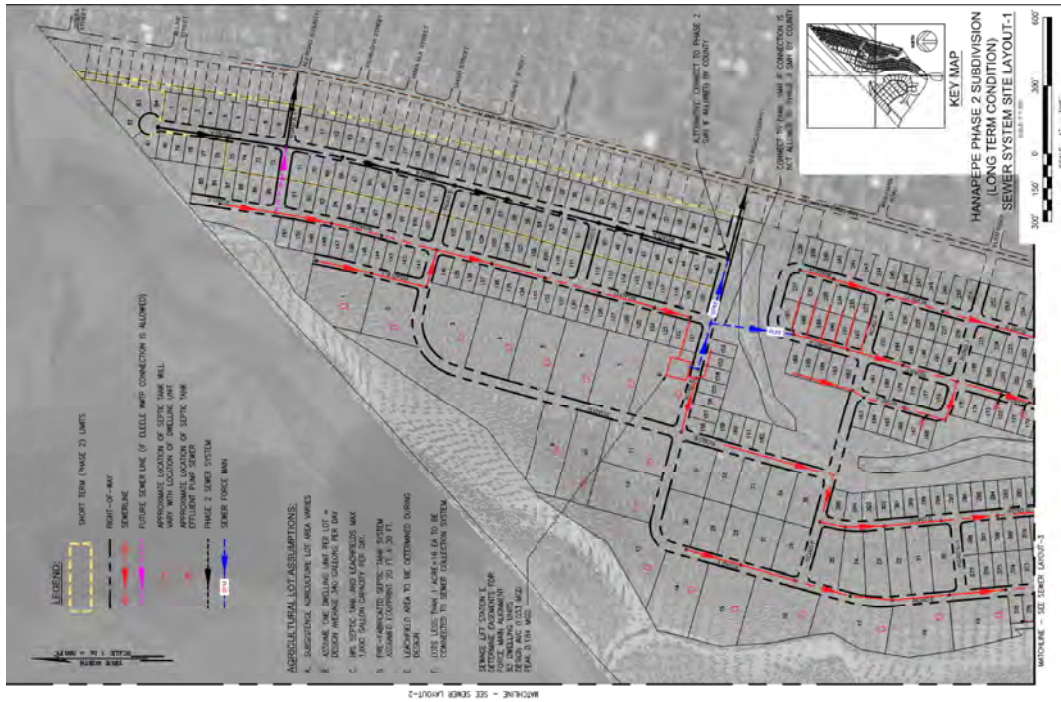
Residential + Commercial Sewer Design Flows

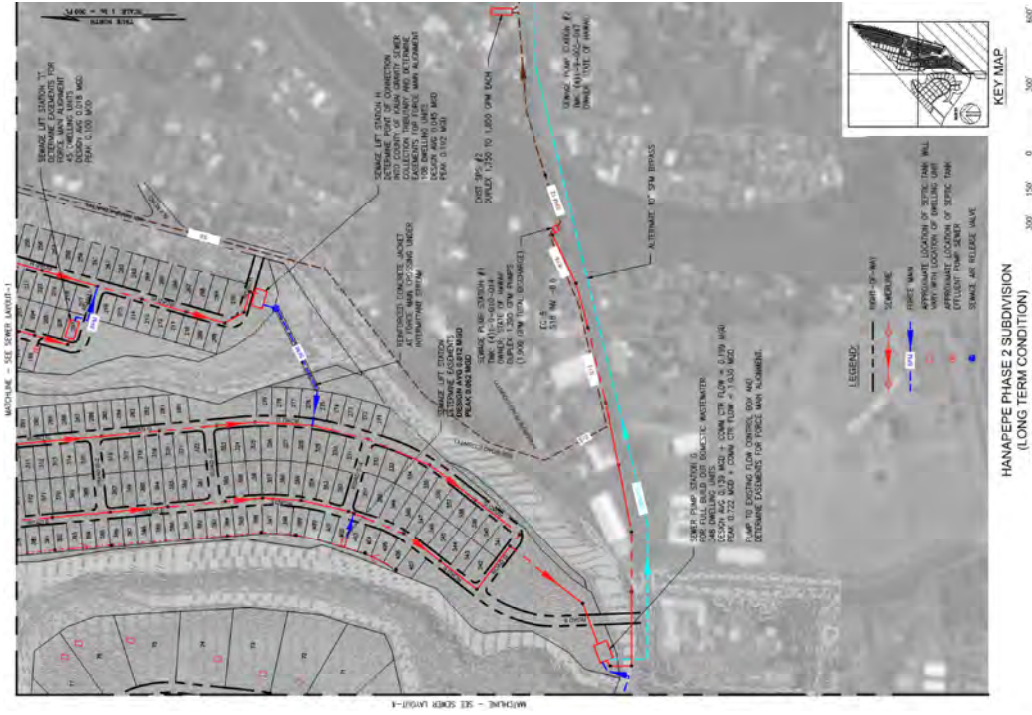
Design Average Flow 0.199 MGD

Design Peak Flow 1.030 MGD

The previous prefinal report assumed the long-term development wastewater design is conveyed via several proposed SPS and ultimately into a proposed private WWTP. Considerable drawbacks with a new WWTP include a need to occupy buildable open land, thereby reducing the masterplan commercial land area, and having to obtain a Department of Health Wastewater Branch National Pollutant Elimination Discharge System (NDPES) discharge permit, and approval from the Safe Drinking Water Branch to discharge effluent directly into the ground. Use of effluent injection wells mauka of the highway is not ideal due to concerns of the potential of effluent impacting groundwater and Hanapepe River surface water quality.

Besides the land and NPDES issues, DHHL land development planning expressed concerns of having to own and maintain the proposed SPS and WWTP. The recommended plan is to propose a design with DWWM to upgrade to the wastewater collection and treatment works. Options include cost sharing, such as (incremental) funding the upgrades and in return DWWM issuing sewer credits for the phased build out for long term development occurring about five years and beyond. The notional sewer works for long-term development is illustrated at 1"=300' scale, consisting of four separate panels. A copy of these maps is shown in the following pages:





Since the proposed development is generally in a down slope direction, the lift stations and pump stations are located at the low spots along the proposed roadway network. The assumed gravity sewer pipe size is 8" diameter with more than adequate flow capacity along the main sewers following the roadway profiles (generally at 3 percent). When the design phase begins, the sewer collection system hydraulics will be refined and optimized. Sewer force mains for the design flows are likely to be in the 4" to 6" diameter sizes. The proposed layout is showing a segment of the force main being located along the State highway, such that sewer easements will be required.

For lots which are sloping away from the proposed roadway, depending upon the severity of the falling slope, it is possible to sewer split level lots either by gravity and/or by sewage sump pumps. For those lots a bit too steep, a septic tank effluent pump (STEP) setup is proposed. These STEP sewers feature a septic holding tank installed with a low-profile sump pump, typical two pump, one of which is on standby. As much as possible, if the existing grade building pad could be raised such that the sanitary plumbing is able to slope down to the collector sewer in the roadway, these sump pumps will not be required.

The following is a list of the conceptual lift stations and pump stations. The footprint/land requirement will be refined during the design phase. These structures and underground wet wells will require an area no bigger than a residential lot. Based upon the existing topography, and assumed sewer collection system layout, the following list summarizes the design capacity of the sewer lift stations:

Long-Term Sewer Collection and Treatment Works

Description	Design Avg Daily Flow MGD	Design Peak Flow MGD
Sewer Lift Station 402	0.012	0.060
Sewer Lift Station E	0.033	0.184
Sewer Lift Station "I"	0.018	0.100
Sewer Lift Station H	0.045	0.192
Sewer Pump Station G (Option)	0.139+ Commercial Ctr LS	0.722 + Commercial Ctr LS
Commercial Center Lift Station (Off Kaunualii Hwy)	0.058	0.308

Sewer Pump Station G is located further downstream of the other three smaller lift stations and it will not be required if the design flows are accepted at SPS #1 and SPS #2. More data gathering at each existing SPS is recommended to confirm that the high capacity pumps will handle the existing peak and additional peak flows from the Long-Term development. If the existing pumps are inadequate, improvements to consider are supplemental wet storage tanks and upgrading pump motors, controls and increasing power. An alternative plan is to include SPS G

and bypass both existing SPS with a new 10" force main 5,750 linear feet along Kaunualii Highway, then discharging flows into the existing flow control box at Waialo Road.

Depending upon the category of commercial activities within the planned 14.5 acres, wastewater pretreatment could be required by the County and State, such as fast foods and restaurants requiring grease traps, grease interceptor tanks, and oil-water separator chambers. Also, the available area will be reduced due to the land requirements for the new WWTP and effluent disposal fields

According to the State Department of Health Wastewater Branch, domestic sewage from the proposed subsistence agriculture lots will be collected from lots less than one-acre. Based upon the current layout, there are 16 lots identified. For the remaining 66 lots equal or greater to one-acre, individual wastewater systems (IWS) up to 1,000 gallons per day (GPD) of domestic wastewater will be allowed. Septic tanks and leach fields are recommended. No sewer connection and treatment by WWTP are required when the IWS is properly maintained. The average daily design flow per lot is about 333 gallons, significantly lower than the maximum allowable limit for IWS.

A range of magnitude construction cost estimate for the sewer works is present in the table below, excluding cost of land, easements, design and permits.

Phase 2 SEWER Construction Cost for 75 Dwelling Units

Sewer					
20	8" Sewerline (in-place complete)	3,257	LF	\$175	\$569,975
21	8" Sewer Lateral (in-place complete)	1,800	LF	\$160	\$288,000
22	8" Cleanout to Grade	75	EA	\$470	\$35,250
23	Sewer Manhole	13	EA	\$8,200	\$106,600
24	Connection to Existing 8" Sewer	2	EA	\$2,100	\$4,200
				Subtotal	\$1,004,025

Notes:

1. Potential upgrade costs for COK sewer pump station is not included. Phase 2 design flows sent to DWWM to check if equipment and power requires upgrade.

For the Long-Term Full Build Out sewer ROM, the base cost assumes that the wastewater flow can be accepted at both existing SPS #1 and SPS #2, assuming that the pumps, motors and controls can be upgraded, and a precast reinforced concrete wet well storage can be added to the existing site. Also, this project will provide funding for the Eleele WWTP for the additional flows.

An alternative plan to bypass SPS #1 and SPS #2 is presented. A new SPS and 10" sewer force main up to the existing flow control box is recommended.

Long-Term SEWER Construction Cost

Sewer						
22	8" Sewerline (in-place complete)	12,447	LF	\$175		\$2,178,225
23	6" Sewer Laterals (in-place complete)	102,900	LF	\$160		\$16,464,000
24	6" Cleanout to Grade	2,058	EA	\$170		\$349,860
25	4" to 10" Force Mains	2,235	LF	\$180		\$402,300
26	Sewer Manhole	141	EA	\$8,200		\$1,156,200
27	Connection to Existing 8" Sewer	0	EA	\$2,100		\$0
28	Sewer Lift Station 0.012 to 0.045 MGD	4	EA	\$321,750		\$1,287,000
29	Sewer Pump Station 0.0 1.40 MGD (Alternate)	0	EA	\$1,180,000		\$0
37	Septic Tank Effluent Pump (STEP)	23	EA	\$20,000		\$460,000
38	Septic Tank + Leachfields at Agr Lots 1 Acre or More	66	EA	\$12,000		\$792,000
39	Oil Water Separators/Grease Interceptors Commercial Lot	3	EA	\$25,000		\$75,000
40	Expand Elelele WWTP + Inject Wells	1	EA	\$5,600,000		\$5,600,000
41	Expand SPS#1 and #2 Wet Well Capacity and Pumps	1	EA	\$3,080,000		\$3,080,000
				Sewer Total		\$32,461,985

Notes:

1. If existing SPS#1 cannot be expanded, add \$1,180,000 Line 29 SPS G and additional 10" sewer force main 5,750 LF at \$1,035,000; a total of \$2,215,000; and subtract Line 41 SPS G at \$3,080,000. A net decrease of \$865,000. The SPS G and bypass 10" force main shown in blue dashed line are shown in the figure below:

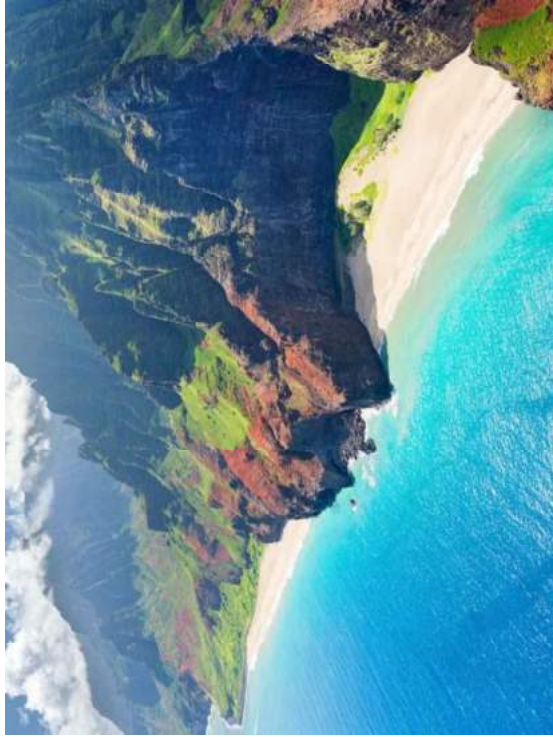


Appendix I – Electrical Report

**DEPARTMENT OF HAWAIIAN HOME LAND
HANAPEPE MASTER PLAN
ELECTRICAL REPORT**

Hanapepe, Kaua'i

March 06, 2020



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Department of Hawaiian Home Land Hanapepe Master Plan – Electrical

Electrical Systems Scope of Work:

The scope of work for the master planning phase involves utility infrastructure improvements required to support the proposed Hanapepe development. Electrical utility planning for the development includes primary electrical (Power) and telecommunication (Telephone, Internet and CATV) utility infrastructure and street lighting systems along existing and new roadways.

For the purpose of this report, the existing off-site utility distribution systems are assumed to have sufficient spare capacity to support the proposed development, and the scope of work is limited to the project site and adjoining streets. Further discussions with utility companies will be necessary to confirm and identify any necessary improvements, upgrades or modifications to the respective utility distribution systems.

The utility companies are typically responsible for the construction of overhead utility pole lines (pole, overhead conductors, pole-mounted transformers, etc.), underground distribution cables and pad-mounted primary transformers. However, service charges for utility company work are not known at this time.

Electrical Utility (Power) Distribution System:

There are existing electrical distribution system in the area that runs overhead on wooden utility poles and are owned by Kauai Island Utility Cooperative (KIUC). These overhead power lines consist of 12kV and secondary power lines. Three phase and single phase pole mounted transformers are utilized to step the 12kV distribution voltage down to secondary utilization voltages. The joint use poles support the overhead secondary power lines, which distribute the power from the pole mounted transformers. Many existing KIUC customers are serviced by these pole mounted transformers. For larger customers, a primary 12kV feeder is generally run underground to their property for use with a KIUC pad-mounted transformer.

From observations along Moi Road during the site visit, there are combination of overhead and underground electrical, telecom, and CATV distribution systems. The existing electrical distribution system in the area runs overhead on wooden utility poles along Moi Road and Kaunaulii Highway. Along Moi Road, the overhead distribution system then transitions underground via a pole near a water reservoir before the intersection of Moi Road and Kupa'a Street. There is an existing handhole group across the water reservoir that distributes power, telecom, and CATV to the existing homes. This is where it is believed the underground distribution system toward the end of Moi Road starts. Opening up the handholes showed KIUC, Sandwith Isles Communications (SIC) and possibly Hawaiian Telecom (HT) cables/conduits. At the bottom of Moi Road, there are existing electrical poles on Puolo Road that distributes power to the surrounding facilities. There are existing KIUC substations in Kaunakami and Port Allen with transmission and distribution lines along Kaunaulii Highway. Hanapepe circuits are fed from Port Allen substation (South of Hanapepe project site).

Based on preliminary discussions with KIUC, the existing capacity are sufficient to support the proposed development. In addition, KIUC is looking to extend its distribution lines along Kaunaulii Highway, that way they can provide services to the properties along the Highway. As of now, only transmission lines are available along Kaunaulii Highway between Lele road and the highway side border of the proposed site.

In general, assume that the new KIUC underground infrastructure will follow the alignment of the new or existing roadways and will be located within the road right-of-way. It may be possible to place new distribution infrastructure outside the road right-of-way, however KIUC will likely require easements for all of their facilities outside the right-of-way. In addition, KIUC may also require vehicular access to their facilities/equipment, particularly to their pad mounted transformers and primary switches. Further discussion with KIUC will be required to coordinate easement and access requirements for any portion of KIUC infrastructure planned to be located outside the right-of-way.

Three-phase electrical service by KIUC will be extended from existing electrical overhead service from Kaunaulii Highway and Moi Road. Electrical service will transition to underground upon entering the development. Conduit stubs will be provided to extend KIUC primary service to various development parcels. KIUC pad mounted transformers are to be used to provide secondary service for each of these development parcels.

Telephone Utility Distribution System:

Telephone and related telecommunications services for DHHL properties are provided to customers in the area by SIC. There are existing overhead telephone lines along Kaunaulii Highway and Moi Road. Along Moi Road, the overhead telephone line then transition underground via a pole near a water reservoir before the intersection of Moi Road and Kupa'a Street.

New underground telecommunication infrastructure will be extended from the existing overhead utility poles along Kaunaulii Highway and Moi Road. New underground telecommunication infrastructure will also be extended from the existing underground system along Moi Road. The underground distribution system will consist of handholes and concrete encased ductlines with muletape and will generally follow the alignment of the proposed underground KIUC distribution system. SIC conduit stubs will be provided from SIC handholes to the property line of each lot for future utility services to the properties. Further communication, coordination and confirmation with the utility company is required as the project progresses forward.

Cable Television (CATV) Utility Distribution System:

CATV services for DHHL properties are provided to customers in the project area by Hawaiian Telecom. Existing Hawaiian Telecom CATV lines also run overhead and follow the path of the existing distribution lines.

New underground CATV infrastructure will be extended from the existing overhead utility distribution system along Kaunaulii Highway and Moi Road. The underground distribution system will consist of handholes and concrete encased ductlines with muletape and will generally

follow the alignment of the proposed underground telecommunication infrastructure. CATV conduit stubs will be provided from Hawaiian Telecom handholes to the property line of each lot for future utility services to the properties. Offsite improvements for CATV are not covered in this scope of work. Further communication, coordination and confirmation with the utility company is required as the project progresses forward.

Street Lighting System:

A new street lighting system consisting of Kaua'i County street light standards and underground lighting circuits will be provided for new roadways within the development. The typical street lighting standard consists of a steel pole with transformer base, steel bracket arm, and "cobra head" street light luminaire. Street light luminaires will have cutoff optics to minimize glare, light trespass and sky glow. If acceptable to the County of Kaua'i, the new street light luminaires will utilize LED lamps. If not, the new street light luminaires will utilize induction lamps in lieu of high pressure sodium lamps. The power for the street lighting system will be supplied by a new underground secondary lighting circuit which will consist of ductlines, handholes, and conductors. New metered KIUC's secondary services will be provided to power these new lights. Offsite improvements for street lighting are not covered in this scope of work. Further communication, coordination and confirmation with the utility company is required as the project progresses forward.

Hanapepe Well No. 4

According to record drawings, there is an existing electrical distribution system at the Hanapepe Well No. 4 site that runs overhead on wooden utility poles and are owned by Kauai Island Utility Cooperative (KIUC). These overhead power lines consist of 12kV power lines and a three phase pole mounted transformer is utilized to step the 12kV distribution voltage down to secondary utilization voltages. The secondary service then transitions underground to service the existing Chlorination building and the existing 700 gallons per minute (GPM), 150 HP well pump located at the site. Further site investigation is required to confirm existing electrical distribution system at and around Hanapepe Well No. 4.

Traffic Signalization Systems:

Traffic signal designs are not included in this scope of work. It is assumed that a traffic consultant will study the effect of the project on the traffic volume and flow, and provide recommendations on the need for new traffic signalization systems. If warranted, new traffic signal systems will consist of traffic signal controllers, traffic signal standards, signal heads, pedestrian pushbuttons and vehicle loop detectors.

Bike and Pedestrian Path Lighting System:

A lighting system consisting of pole mounted luminaires and underground lighting circuits can be provided along bike and pedestrian paths within the development. Further discussion with the County will be needed to identify light pole, luminaire and lamp preferences, however it is our recommendation that luminaires are provided with cutoff optics to minimize glare, light trespass

and sky glow. The power for the pathway lighting system will be supplied by new underground secondary lighting circuits which will consist of ductlines, handholes, and conductors. New metered KIUC secondary services will be provided as required to power these new lights.

I. ESTIMATED ELECTRICAL COST ESTIMATE

The following is the estimated electrical infrastructure cost estimate for the proposed Hanapepe development:

Electrical Cost Estimate		
Item No.	Description	Total Cost (US Dollars)
Full Minus Short Build		
1	Electrical	\$14,055,093
	Overhead, Tax, Etc. @ 24.72%	\$3,474,419
	Total Electrical	\$17,529,512
2	Telecom	\$8,036,405
	Overhead, Tax, Etc. @ 24.72%	\$1,986,599
	Total Telecom	\$10,023,004
	TOTAL (ELECTRICAL + TELECOM)	\$27,552,516
Short Build		
3	Electrical	\$2,052,115
	Overhead, Tax, Etc. @ 24.72%	\$507,283
	Total Electrical	\$2,559,398
4	Telecom	\$1,437,020
	Overhead, Tax, Etc. @ 24.72%	\$355,231
	Total Telecom	\$1,792,251
	TOTAL (ELECTRICAL + TELECOM)	\$4,351,649
	TOTAL CONSTRUCTION	\$31,904,165

Note: Electrical cost estimate is a rough order of magnitude for the proposed Hanapepe development consisting of about 407 residential units, 82 agricultural lots and 3 commercial lots. Total cost is subject to change.

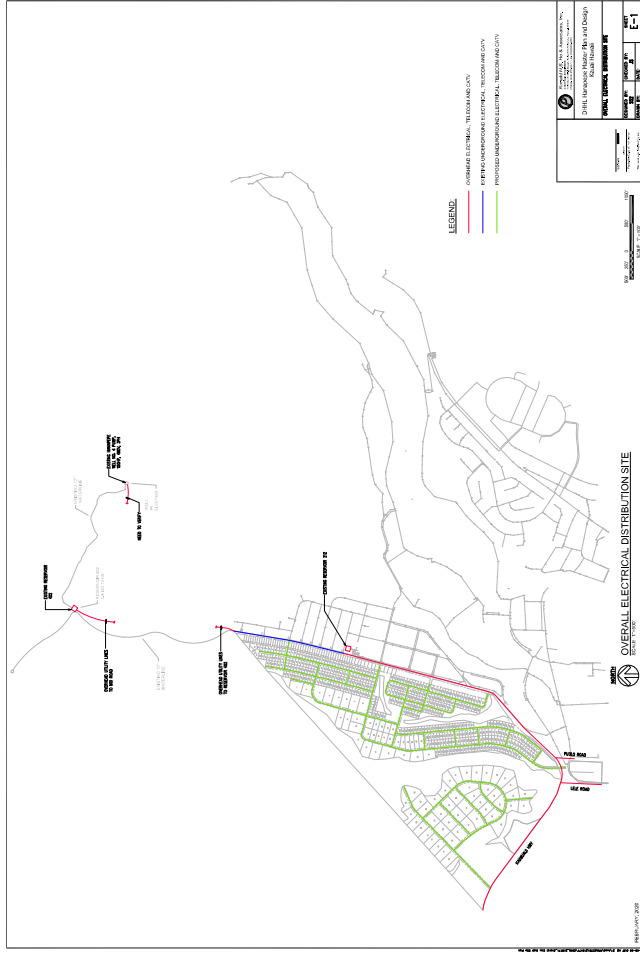
II. CONCLUSIONS

The Hanapepe development goal is to provide residential and agricultural homesteading opportunities to Department of Hawaiian Homelands' (DHHL) waitlist beneficiaries on Kauai. Hanapepe development will provide new agricultural, commercial, residential and community use to the people of Kauai, thereby improving the economic condition of the region.

Currently, there are no electrical, telecommunication and CATV infrastructure at the proposed Hanapepe development site. There are existing electrical, telecommunication and CATV distribution systems in the area that can be extended and provide new services into the proposed Hanapepe development site via underground distribution system. Further coordination and discussion with the utility companies will be required as the project progresses forward.

APPENDIX A

SCHEMATIC SITE PLAN



Appendix J - Community Outreach Meeting Summaries

HANAPĒPĒ LESSEES MEETING SUMMARY

Time: 6:00pm- 8:00 pm
Date: December 13, 2018
Location: Hanapēpē Library

Event Description

The purpose of the lessees meeting was to introduce the project team and meet the existing lessees, share information regarding the process and timeline for the project, hear and collect lessee mana'o on existing homesteads, project site, and the relationship of the homesteads to the greater community and island. The project team shared a presentation and distributed fact sheets with the plans and timeline for the project. A copy of the presentation is appended to this summary.

Agenda

- 6:00- 6:15pm** Introductions and welcome
- 6:15- 6:35pm** Presentation
- 6:35- 7:10pm** Question and Answer Session
- 7:10- 8:00pm** Discussion

Project Team Attendees

DHHL: Andrew Choy, Kaleo Manuel, Erna Kamibayashi
SSFM: Jared Chang, Melissa White, Carlos Kelton
Subconsultants: Rachel Hoerman, Dudek; Dominique Cordy, Nohopapa

Stakeholder Attendees

Attendees at the meeting included both existing lessees and applicants as indicated below.

Lessees

1. Carlie Kaohelaulii
2. Danny Kanahele
3. Debbie Apo
4. Ellen Albarado
5. Jerry Albarado
6. Kuulei Kaaumoana
7. Lavonne Kanahele
8. Leonard Kanahele
9. Pua Chin
10. Pualei Kaohelaulii
11. Winna Kaohelaulii

Applicants

1. Kehau Decosta
2. Kukui Lang
3. Kuulei Vidinha
4. Laceyann Kanahele
5. Myrna Bucasas
6. Michael Karratti
7. Odetta Borja
8. Pauline Kupo
9. Piilani Aguon
10. Sharon Nerpio
11. Thomas Nizo

Notes from Q & A and Group Discussion

Following the presentation, attendees were given the opportunity to ask questions of the project team, followed by a discussion of existing conditions, issues, and opportunities pertaining to the project area. The discussion is documented in the section below. Input gathered from lessees can be grouped into nine main themes:

- Vehicular Access
- Fire management
- Natural disasters & hazards
- Land uses and product types
- Homestead lot density & size
- Timing of project
- Tsunami
- Uses behind existing lessee lots
- Water supply

Input and questions pertaining to each of the eleven discussion themes is summarized below.

Vehicular Access to Phase II Development

- Where will the entry for the new lots be located? A: Will be determined by site studies and community outreach.
- Access from the roads to the parcel is difficult because the locked gates prevent entry.
- There is only one road to enter and exit the community.
- Traffic is generally not an issue except in an emergency. Another exit from the community is needed.
- No one currently uses the site.
- Is it possible to improve the road west of the site as a second access? It's owned by Gay & Robinson (G&R).
- Prefer there not be roads behind the lots, because homes would be stuck between two roads.
- Adding more homes to the community will increase congestion.

Fire Management

- Community is concerned with fire because the parcel behind their homes is overgrown and dry, and there is no fire break to prevent a fire from spreading.
- Some of the land should be managed to provide protection from fires.
- Fire breaks are a priority issue.
- Roads on this site are overgrown with shrubbery.
- G&R road is an important access for fire management
- Develop a partnership with the local Fire Department. Would be good to have a fire station on the site.

- As a fire prevention solution, lessees would like to steward area behind their lots (i.e., clear & maintain brush; create a firebreak).

Natural Disasters & Hazards

- Make sure residential areas are safe from flooding.
- Heavy rains create sheet flow runoff across the highway.
- Lack of drainage causes runoff from roads onto properties.
- Some residents are creating their own slopes and berms to alleviate pooling and runoff.
- Are there better locations for new home lots? The top portion of the project area is cooler, and the lower elevations flood.
- Use drones for topographic survey of all 365 acres of the project area.
- Drainage concerns should be addressed as a priority.
- Sinkholes are a concern. There are some behind existing lots and others forming.
- Would water run up into the gulch from a tsunami?
- Can there be a buffer for homes?

Land Use and Product Type

- How to determine agricultural areas and residential areas?
- Are the new homes going to be turnkey or habitat, rent to own, self-help, or a mix of products? A: will be determined by site studies and beneficiary input.
- Most beneficiaries at the meeting expressed a preference for turnkey because developing own homes has proven difficult.
- Q. How much will be allocated for residential vs. agriculture? A: depends on findings of site studies and beneficiary outreach.
- Make the upper lands green and provide opportunities for subsistence agriculture.
- Homestead residents would like to see a community center with uses such as a playground, emergency Shelter, disaster response, DHHL office, and a County DMV. Create as a shared space for all lessees, not just Hanapepe.
- Even though the Hanapēpē lots are not pastoral, many West Side beneficiaries raise animals and some may want to do small scale grazing on their homesteads.
- There is an active bartering economy on the West Side- people trade meat, fruit, and other food products. It would be beneficial to have communal butchering and food processing/prep facilities in the community use areas.
- One beneficiary 'ohana submitted a written letter asking for consideration of including a church in the Hanapēpē Homestead area. The letter is appended to this summary.

Homestead Lot Density & Size

- Consider not building houses so close to each other.
- **Question posed by project team to lessees:** What is the Homesteads' relationship to the community? **A:** Everyone gets along well. We all treat each other like family.
- Most beneficiaries and program participants are from the West Side of Kauai.

Timing of Project

- Waitlist applicants are concerned with the length of the process, hope it will be faster than ten years. DHHL clarified that the process is limited by sufficient funding. DHHL is working through the Legislature to secure funding for the project.
- If sufficient funds are made available, project implementation can proceed more quickly.

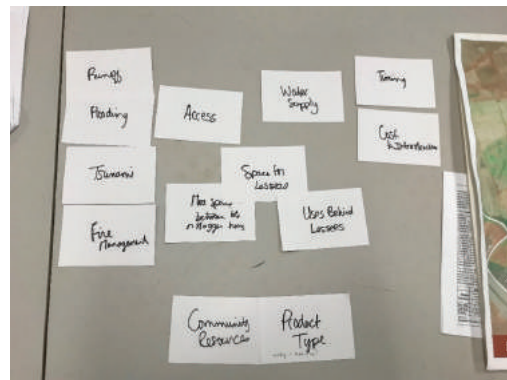
Uses Behind Existing Lessee Lots

- The land at the top of the homestead lots behind the homes were previously used as gardens to grow food. Other lessees have extended their yards into this area.
- Lessees would like to see areas behind homestead lots extended to allow the lessees to maintain a firebreak in order to protect their homes.

Water Supply

- **Q:** The community needs a new well for water because Hanapepe only has one well and pump. How much water is being used for potable water? **A:** This will be determined through the site studies and infrastructure assessment.

Meeting Photos



Written Comments

<p>13 October 2018 Aloha Hawaiian Homes Commission:</p> <p>Na Ohana Haipule Iloko O Kristo Hawaiian Church, would like to ask for your consideration for a Church in the Hanapepe Hawaiian Homes Area. We have been serving the community since 2015. Prophet Evan: Louis Kanahale and Pō Kahu Leonard Kanahale both live in the Hanapepe Hawaiian Homes Subdivision. When we first started it was in the garage of Evans parents Darryl & Linda Kanahale. We also held services at Evans home in Waimea, before he moved in with his dad after the passing of his mom over a year ago. We are now holding services at the Waimea Baptist Church, which we are sharing with the Baptist congregation. The Baptist Church uses it on their set days and any holidays or special occasions. As of now, we only have one service Sundays at 4 pm. Any holidays or special occasions has to approved before hand. If the Baptist congregation are using the Church we either do our service on another day and time. They have been great to partner with, but we can't do what we want as a Church. The Church is not ours but theirs. We did have 3 services a week: Thursday at 5pm, Saturday at 6am, and on Sunday at 4 pm. We cancelled services to be easier for the Baptist Church schedule. If we want to have gatherings</p>	<p>or meetings, we use the Waimea Neighborhood Center. We use it for Pastor meetings, conferences, surprise baby party for Prophet Evans' daughters 1st birthday and much more. We don't use the Hall at the Baptist Church because a wrestling team is using it. They have a long standing relationship with the Baptist Church. In 2017, Na Ohana Haipule Iloko O Kristo Hawaiian Church painted the Waimea Baptist Church's exterior walls. The Church had not been painted for over 20 plus years. We went and got a local paint company to donate 4-5 gallon buckets of paint, a local framing company to lend, deliver, and pickup a skylift for painting. We also had all that came to help which was the congregation of our church. We also give the Baptist Church a donation monthly for electricity and water. If we have any special function in a particular month we donate more. It is very hard to do the things that you want to when the Church doesn't belong to you. We have a very good partnership with the Baptist Church. We feel that we can do more for our Church and Community, if we had our own Church. All we are asking is for you to consider what we are asking for. It will not only benefit us as a Church, but the Community as a whole. Mahalo nui loa and Iesu Pu.</p> <p style="text-align: right;">Mahalo: "for we walk by faith and not by sight" 2 Corinthians 5:7 Na Ohana Haipule Iloko O Kristo</p>
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HANAPĒPĒ BENEFICIARY MEETING #1 SUMMARY

Time: 6:00pm- 8:00 pm

Date: July 24, 2019

Location: 'Ele'ele Elementary School

Event Description

The purpose of the meeting was to introduce the project, share findings from work done to date, share preliminary findings from the beneficiary survey, gather input on preliminary land use plan alternatives, and gather input on desired qualities and land uses for a Hanapēpē Homestead community.

The project team shared a presentation in English, and it was also translated into 'Ōlelo Ni'ihau by an interpreter. During the meeting, informative and interactive boards were on display in an open house format. Attendees received copies of the agenda in English and 'Ōlelo Ni'ihau, as well as copies of the presentation and project fact sheet. A copy of the presentation is appended to this summary.

Agenda

- 6:00- 6:05 pm** Introductions and welcome
- 6:05 - 6:40 pm** Presentation (English and Ni'ihau Hawaiian)
- 6:40 - 7:00 pm** Question and Answer Session
- 7:00 - 8:00pm** Open House and Refreshments

Project Team Attendees

- DHHL: Andrew Choy, Nancy McPherson, Erna Kamibayashi, Bryan Toda
- Hawaiian Homes Commission: Commissioner Dennis Neves
- SSFM: Jared Chang, Melissa White, Carlos Kelton, Matt Fernandez
- Interpreter: Hokulani Cleeland

Stakeholder Attendees

Attendees at the meeting included both existing lessees and applicants as indicated below.

Lessees

1. Avery Puaoi
2. Chris Kanahu
3. Christina Trugillo
4. Dwyle Lee
5. Ellen Albarado
6. Harold Vidinha
7. James Poe
8. Jasmine Aviguetero
9. Jerry Albarado
10. James S. Beniamina
11. Kuulei Kaaumoana
12. Leonard Kanahele, Jr
13. Lavonne Kanahele
14. Lorna Poe
15. Lyle Keith Bargamento
16. Nani Jean DeMotta
17. Sue Ann Char
18. Tracey Camara
19. Victoria N. Mahuka
20. William K. Akau

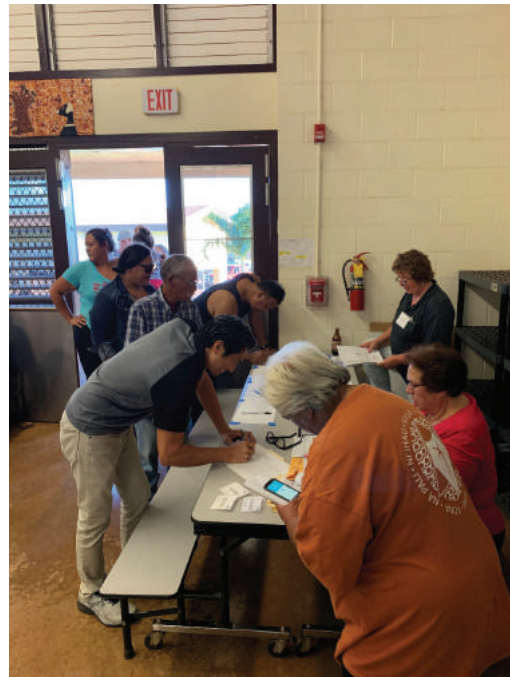
Applicants

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Adelaide Emura 2. Annie Kanahele 3. Angela L. Kahalelio-Yadao 4. Anuenue Kanahele 5. Billi Topp 6. Brandee Kahalekomo Coughlin 7. Charity Kanahele 8. Chris Kanahele 9. Dianna Kaulili Phillips 10. Dynamite Lee 11. Elvira Kimoeko 12. Ermine Akuna 13. Eula Mae Taala 14. F. Kaawa 15. Gilroy Yorkman 16. Golden Wong 17. Grace Makuaole Acain 18. Hualani Duncan 19. James I. Beniamina 20. Jamesette Johnson 21. Jimmy Beniamina 22. Judie L. Shintani 23. Frederick J. Kahalelio 24. Kahalelio 25. Kainalu Wong | <ol style="list-style-type: none"> 26. Kalalena Lum Won 27. Kaleo (Jake) Kanahele 28. Kainalu Wong 29. Kalalena Lum Won 30. Kay Kanahele 31. Katelyn Kanehele 32. Kau Castillo 33. Kekoa Woo 34. Keoki Puaoi 35. Kuulei Vidinha 36. Laurie Pahulehua 37. Liberta Albao 38. Liselle Lee 39. Marilyn Beniamina 40. Melanie Okamoto 41. Myna Bucasas 42. Odetta Borja 43. Ori Soto 44. Pauline Kupo 45. Penny P. Anakalea 46. Piilani Aguon 47. Randy Ortiz 48. Ray K. Holt 49. Romayne Matsuyoshi 50. Scott Topp |
|---|---|

- | | |
|---|---|
| <ol style="list-style-type: none"> 51. Stanley K. Wong 52. Tamra Medeiros 53. Telissa Agbulos 54. Thelma Ruiz 55. Verlie Anne Aiu 56. Wilson Kanahele | <ol style="list-style-type: none"> 17. Lori Cosier 18. Marissa Lilo 19. Patrick Pereira 20. Roland Sagum 21. Rolina Faagai 22. Tim Albao Jr. 23. Taryn Silva 24. Tony Camara 25. Wendy Vidinha 26. Yvette Nakaahiki |
|---|---|

Other

1. Annette Lazaro
2. Angela L. Kahalelio-Yadao
3. Anuheha Anakalea
4. Billie Topp
5. Britnee Swain
6. Bryce Boeder
7. Chelise Kahalekomo Schmidt
8. Clyde H. Anakalea
9. Cynthia K. Kalikini Blair
10. Diane Rodrigues
11. Ellen Albarado
12. Faa Taala
13. Fredna Kahelelio-Me
14. James Poe
15. Jim Beniamina
16. Kimi Vidinha
17. Lavonne Kanahele



Notes from Q & A and Group Discussion

Following the presentation, attendees were given the opportunity to ask questions of the project team, followed by an open house. The comments from the open house are documented in the section below.

Comments, Question and Answer Session

- **Q.** What is the status of increasing lot size of existing Hanapēpē lessee lots?
 - **A.** To be determined. We have heard lessee desires for more space and it is being considered. The more space we provide existing lessees, the less we have to accommodate those on the waiting list.
- **Q.** If there is sewer, will that mean lot sizes are smaller than 10,000 SF? Will the lots get bigger for existing lessees?
 - **A.** To be determined. We are gathering input on the appropriate lot size through this process.
- **Q.** How much funding has been secured for the project?
 - **A.** \$1 million for planning and design work
- **Q.** How soon will subsistence agriculture lots be awarded?
 - **A.** Awards are contingent on securing funding.
- **Q.** Will there be a solar farm on the agricultural land like in Anahola?
 - **A.** We are asking for everyone's input regarding what they would like to see on the land. You can also share if there are things you would not like to see.
- **Q.** For agriculture land, is there an option to live on or not? Will there be self-help, turnkey options?
 - **A.** Occupancy is optional on subsistence agricultural lots. We are surveying applicants on their preferences for housing type, and that will inform the options. You can provide your input here tonight also.
- **Q.** Will fiber optics be installed?
 - **A.** To be determined. We don't know the status of the technology or companies providing it.
- **Q.** When will decisions be made? You are asking us questions but we need answers. We need a proposal to react to.
 - **A.** The planning process is meant to make sure that the homestead community meets the needs of the applicants. We understand many have been waiting a long time. We are close to building this one and want to make sure it's done right.
- **Q.** Do the gulches flood when it rains a lot?
 - **A.** Yes. We will look at utilizing and capturing water from gulches and agriculture lots.
- **Q.** How many people are on the agriculture waiting list on Kaua'i?
 - **A.** There are about 2,200 people on the agriculture waitlist.
- **Q.** How will subsistence agriculture lots be awarded? **A.** From the waitlist.

Input from Open House: Envisioning a Future Hanapēpē Homestead Community

An open house was set up to enable people to learn more about the project, talk with team members, and provide input on what they would like to see in a future Hanapēpē Homestead community. The open house included seven stations, described below. Input received during the open house follows this page.

Open House Stations**Project Orientation:**

- Informational poster about project (based on fact sheet)

Beneficiary Survey:

- Board explaining purpose of survey, highlighting preliminary findings

Land Use Types:

- One board each for Residential, Subsistence Ag, Community Use, and Commercial Designations that showed examples, provided definitions of each land use, and asked people what they would like to see in each land use type.
- Beneficiaries used sticky notes to add their input to these boards.

Land Use Plan Alternatives:

- One board for each of the two alternatives, with acreage tables and highlights of each alternative.
- Beneficiaries used dots to indicate which alternative they preferred.

Alternatives for Next Phase of Homes:

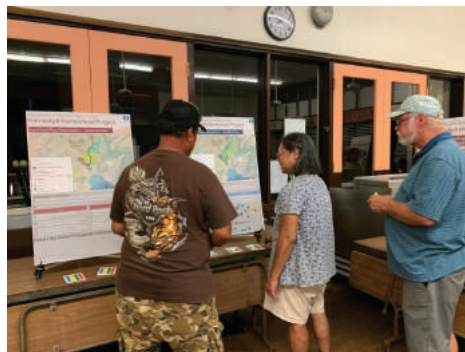
- One board for each of the two alternatives, with bullet point highlights.
- Beneficiaries used dots to indicate which alternative they preferred.

Parking Lot:

- Easel with markers for general comments

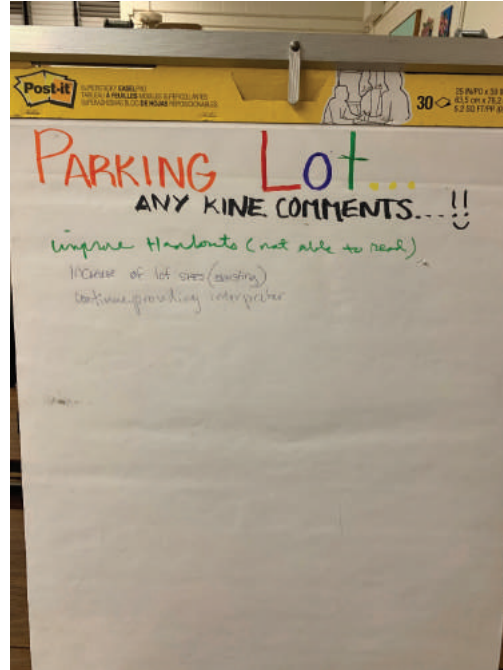
Keiki Coloring Station:

- Coloring sheets with crayons and markers

Refreshments

"Parking Lot" – General Comments

- Existing lessees would like expansion of their lots to match other homestead lot sizes.
- Not able to read handouts
- Increase lot sizes
- Continue providing interpreter



Residential Areas

What would you like to see in residential areas?

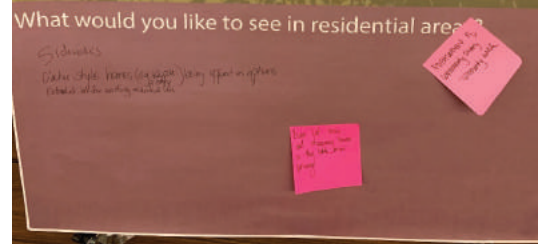
- Sidewalks
- O'ahu Style Homes, like Kapolei, being offered as options.
- Extended lot for existing residential lots
- Larger lot sizes and staggering houses so they have more privacy.
- Enforcement of Community Safety (Community Watch)

using infrastructure.
 lot sizes are less than 1 acre.
 minimum lot size for septic systems is 10,000 SF.
 typically planned in conjunction with community use areas, to create healthy, self-sustaining communities.

Examples



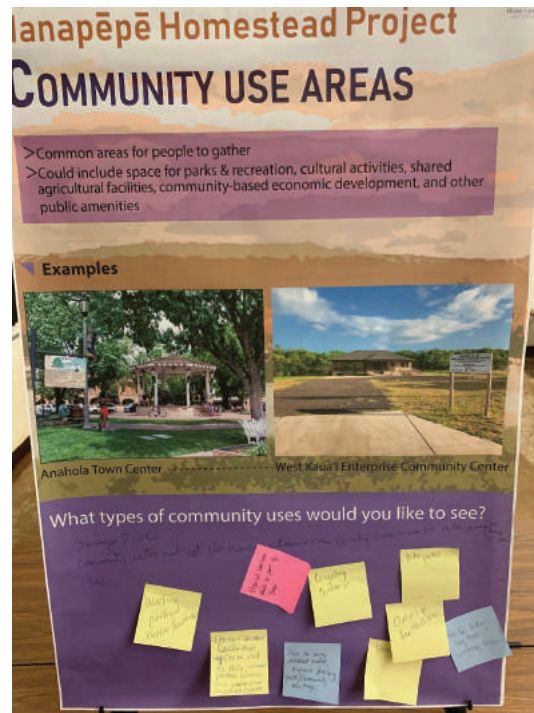
Hanapēpē Residential Lots Residential Lots on O'ahu



Community Use Areas

What types of community uses would you like to see?

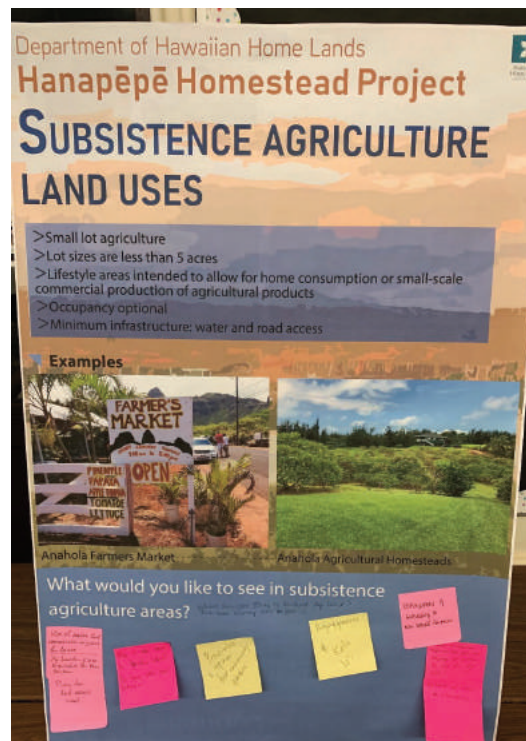
- Walking path and water fountains
- Place for early childhood center
- Kupuna housing
- Youth community meeting center
- A learning or educational center that can be used for hula, cultural practices and even as a satellite school for college courses
- An outreach health clinic
- Park for kids
- Dog parks
- Bike paths
- Walking paths
- Physical exercise area as part of park
- Community center, but not like Kekaha neighborhood center
- Parenting classes, basic life skills, financial planning, etc.



Subsistence Agriculture Land Uses

What would you like to see in subsistence agriculture land use areas?

- Use of water that accumulates in gulch for agriculture use. Agriculture lands – close to gulches for this purpose
- Plan for a second access road.
- Where is water coming for agriculture lands? Plus having water over electrical.
- Provision some space for community gardens.
- When are you going to award agriculture land? Have been waiting for over 20 years.
- Aquaponics and Kalo Lo'i.
- Enforcement of subleasing to non-Hawaiian farmers.
- Have a reservoir that we can get our source of water to use for agriculture lands.
- Agriculture land with home enforcement.

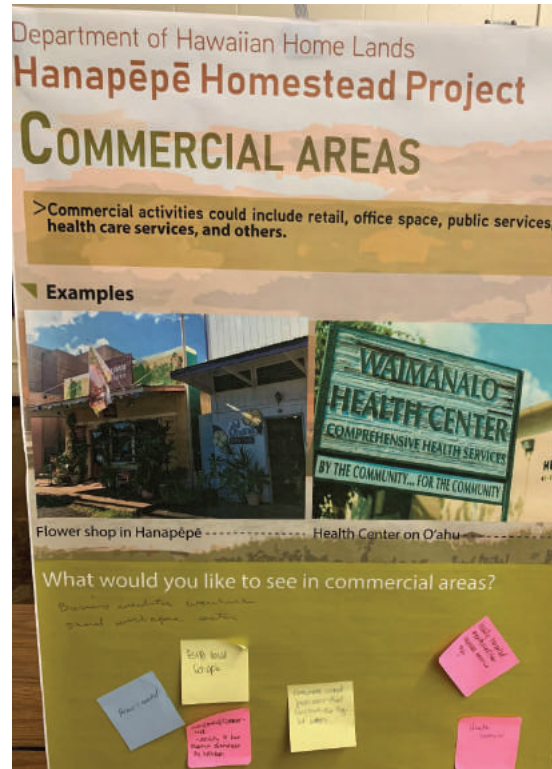


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Commercial Areas

What would you like to see in commercial areas?

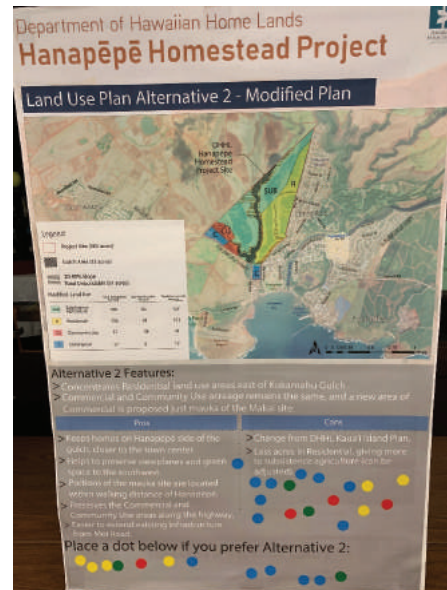
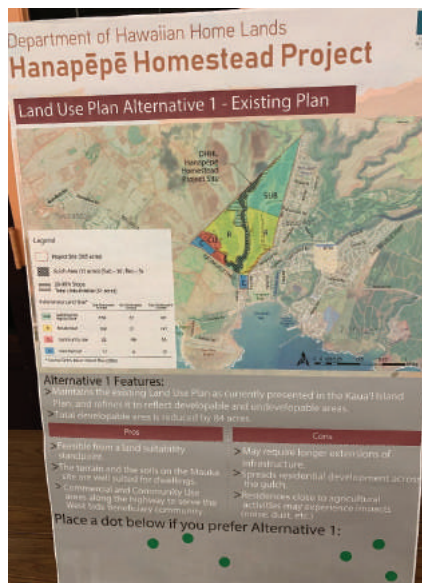
- Business incubator
- Warehouse
- Shared workspace center
- Farmers market
- Establish local Co-ops
- Health Sciences Center
- Locally targeted businesses/ non corporate American organizations
- Hawaiian owned businesses that support the agriculture lot leases



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Land Use Plan Alternatives 1 and 2

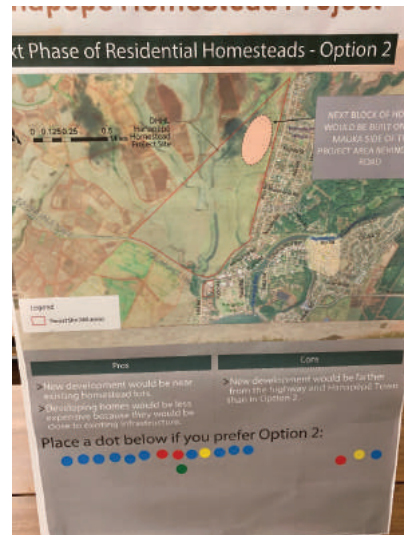
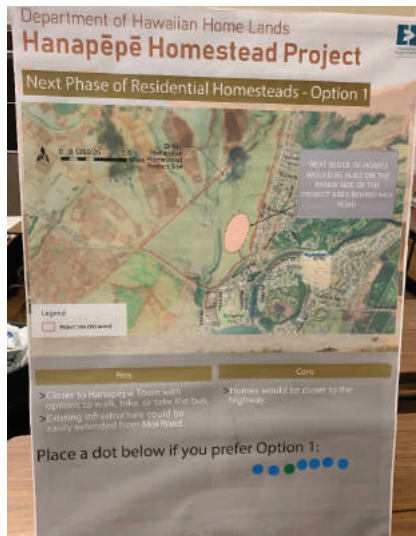
- Open house participants preferred Land Use Plan Alternative 2 (Modified Land Use Plan) over the Alternative 1 (Existing Land Use Plan). 29 dots were placed on the Alternative 2 plan.
- 6 dots were placed on Alternative 1 Plan.



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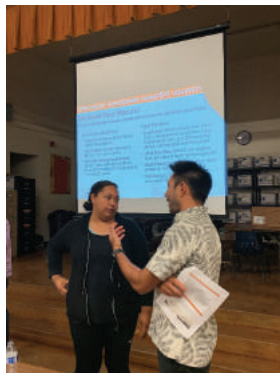
Next Phase of Residential Homesteads

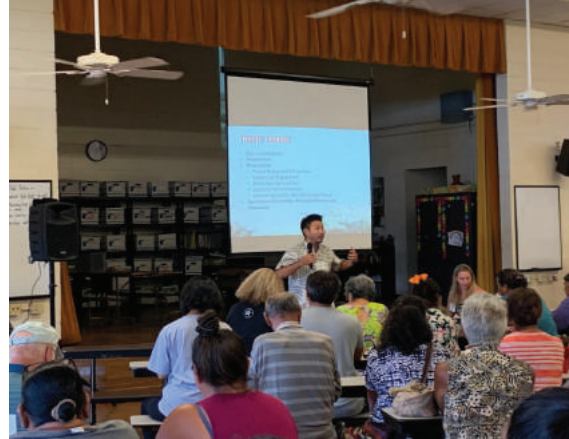
- Open house participants preferred Option 2 with 17 dots placed on the board.
- Open house participants placed 7 dots on the Option 1 board.



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Hanapēpē Homestead Environmental Assessment Project

Meeting Photos





HANAPĒPĒ BENEFICIARY MEETING #2 SUMMARY

Time: 6:30pm- 8:30 pm
 Date: December 5, 2019
 Location: 'Ele'ele Elementary School

Event Description

The purpose of the meeting was to present and gather input on two proposed layout scenarios for full buildout, as well as preferred uses within Community Use and Commercial areas. Additionally, input was gathered on what should be addressed in the Environmental Assessment. The project team provided a brief overview of the project and a re-cap of beneficiary input and findings from early consultations, technical studies, and the beneficiary survey and meetings. The project team also presented land use plan alternatives for the Environmental Assessment including the preferred layout and the alternative layout. The project team shared the presentation in English, and it was also translated into 'Ōlelo Ni'ihau by an interpreter. Map stations were set up to allow attendees to review and mark up the proposed site layout, as well as provide input on preferred uses within Community Use and Commercial Areas. Informational and interactive boards were on display in an open house format. Attendees received copies of the agenda in English, as well as copies of the presentation and project fact sheet. A copy of the presentation is appended to this summary.

Agenda

- 6:30- 6:40 pm** Introductions and welcome
- 6:40 - 7:15 pm** Presentation (English and 'Ōlelo Ni'ihau)
- 7:15 - 7:30 pm** Question and Answer Session
- 7:30 - 8:30 pm** Mapping Stations, Open House and Refreshments

Project Team Attendees

- DHHL: Stewart Matsunaga, Andrew Choy, Nancy McPherson, Erna Kamibayashi
- Hawaiian Homes Commission: Commissioner Dennis Neves
- SSFM: Jared Chang, Melissa White, Carlos Kelton, Matt Fernandez
- Interpreter: Hokulani Cleeland

Hanapēpē Homestead Environmental Assessment Project

Stakeholder Attendees

Attendees at the meeting included both existing lessees and applicants as indicated below.

26. Angela Mahoe-Yamamoto
27. June Aviguetero
28. Thelma Ruiz
29. Laurie Ann Ruiz
30. Connie (Tano) Castaneda

Applicants

1. Marvaleen Vidinha
2. May K Gallion
3. Lynette Neves
4. Alice Morris
5. Cheryl Kahokuloa
6. John Kahokuloa
7. Luella Lemn
8. Kekoa Woo
9. Pauline Kupo
10. Blossom L. Kanahele
11. Blossom H. Kanahele
12. Sharon Nerpio
13. Ruth Garza
14. James I Beniamina
15. Jimmy K Beniamina
16. Nani Jean Demotta
17. Solomon (Sa'ce) Potts
18. Loui Cabebe
19. Waylon Kanahele
20. Delayne Pai
21. May Adams
22. John Ruiz
23. Myrnadette Bucasas
24. Dwyle Lee
25. Princess A. Pahulehua

Lessees

1. Virginia Nizo-Keamoai
2. Alice Morris
3. Kuulei Kaaumoana
4. William (Billy) Lemn
5. Ruth Garza
6. Nani Jean Demotta
7. Christina Trugillo
8. Dwyle Lee
9. Leonard Kanahele

Other

1. Devi (Keala) Nordmeier
2. Marilyn Beniamina
3. Kimo Beniamina
4. Kyle Kelley
5. Telissa Agbulos
6. Holly Pahulehua
7. Susan Kanahele
8. Marian K. Beniamina
9. Mike Demotta
10. Lauren Yamamoto
11. Felicia Cowden



Hanapēpē Homestead Environmental Assessment Project

Notes from Q & A and Group Discussion

Following the presentation, attendees were given the opportunity to ask questions of the project team, followed by an open house. No questions were posed during the Q&A discussion. Written comments from the open house are documented below.

Open House Comments

- If I'm on the county's first-time homebuyer waiting list, can I use it on Hawaiian Home Lands?
- Like the locations of community spaces in residential areas.
- Think about putting solar farm along the gulch. Make most use of the land.
- Think about developing DHHL-owned sewer treatment.
- Need new elementary school to handle increased population. Locate school in makai community use area, not on highway.
- Put terraces in the gulch.



Input from Map Study and Open House: Envisioning a Future Hanapēpē Homestead Community

An open house was set up to enable people to learn more about the project, talk with team members, and provide input. Mapping stations focused on gathering feedback on the proposed layouts for the next residential phase and full buildout.

Open House Stations

Project Orientation:

- Informational poster about project (based on fact sheet).

Beneficiary Input:

- Highlights of input from beneficiary survey, lessee/beneficiary meeting.

Land Use Types:

- One board each for Residential, Subsistence Ag, Community Use, and Commercial Designations that showed examples, provided definitions of each land use, and asked people what they would like to see in each land use type.
- Beneficiaries used sticky notes to add their input to these boards.

Land Use Alternatives:

- Board showing preferred and alternative land use plans for the site.

Site Layout Maps:

- Showing two layout scenarios for proposed lots, road network, and next phase of homes for the preferred alternative.

Parking Lot:

- For miscellaneous comments.

Keiki Coloring Station



Map Study Station 1

For review and comments on overall layout, including road network, lot layout, on number of lots.

Overall comments

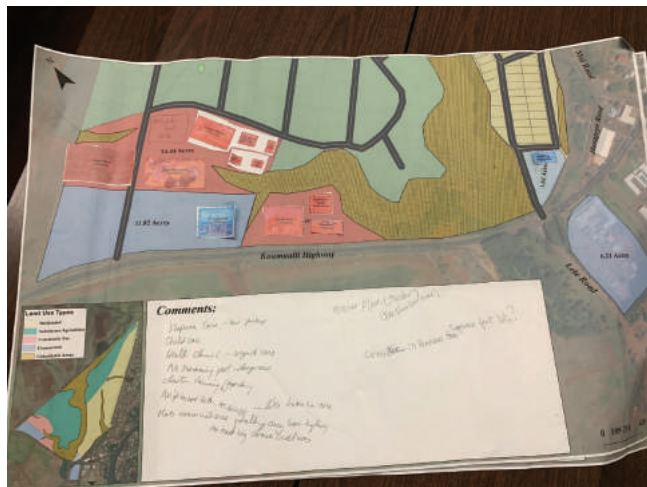
- No swimming pool – dangerous
- Cluster farming/ag services near ag lots
- Neighborhood center for events
- Move commercial area away from highway
- No need for big commercial uses
- Consider 10,000 sq. ft lots.
- Movie theater for family time
- Roundabout at exit of entrance road

Preferred Commercial Uses

- Small supermarket
- Gas station/convenience store

Preferred Community Uses

- Soccer field
- Kupuna Center
- Neighborhood center
- Large playground
- Farmers market
- Health clinic / Urgent care
- Preschool / Child Care
- Commercial kitchen/ag uses



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Map Study Station 2

For review and comments on overall layout, including road network, lot layout, on number of lots.

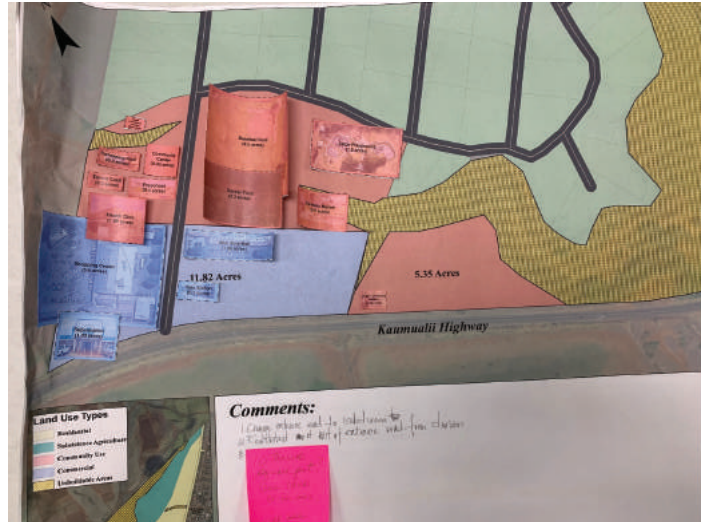
- Change entrance road to subdivision
- Roundabout at exit of entrance road from division

Preferred Commercial Uses

- Supermarket
- Shopping center
- Gas station
- Mini strip mall

Preferred Community Uses

- Health clinic
- Preschool
- Tennis court
- Community center
- Swimming pool
- Baseball field
- Soccer field
- Large Playground
- Farmers Market



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Map Study Station 3

For review and comments on overall layout, including road network, lot layout, on number of lots.

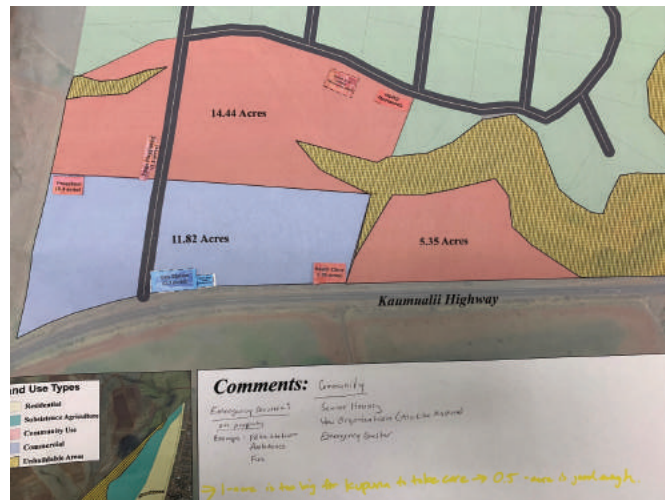
- Emergency Services on property
- Emergency shelters
- Hawaiian Organizations
- "1 acre is too big for Kupuna to take care of"

Preferred Commercial Uses

- Gas station
- Convenience store
- Health clinic

Preferred Community Uses

- Preschool
- Large Playground
- Community Center
- Health Clinic
- Large Community Garden
- Community Center



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Map Study Station 4

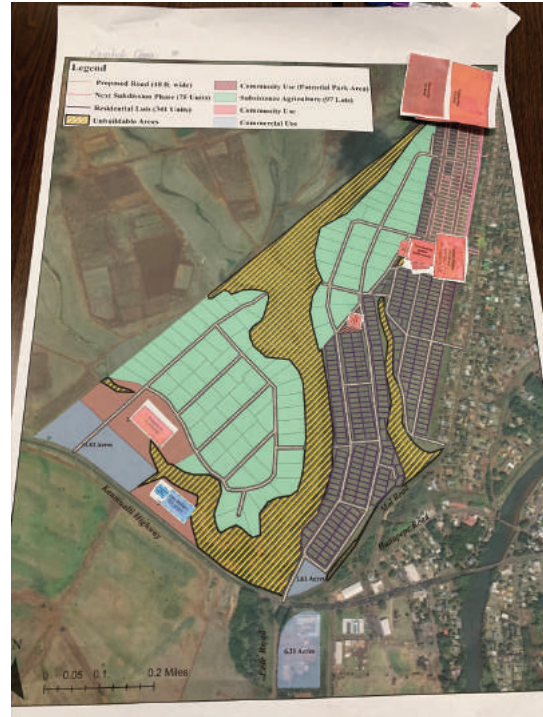
For review and comments on overall layout, including road network, lot layout, on number of lots.

Preferred Commercial Uses

- Gas station

Preferred Community Uses

- Preschool
- Small Playground
- Large Playground
- Soccer field
- Baseball Field
- Community Center
- Basketball Court
- Farmers Market
- Health Clinic

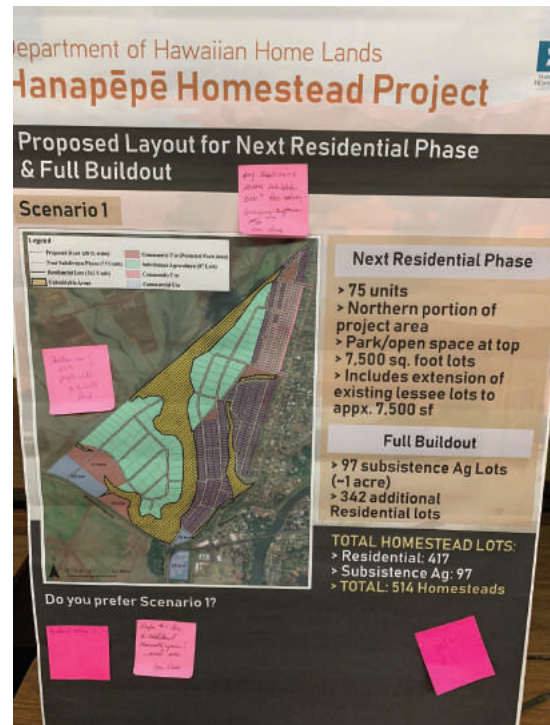


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Proposed Layout for Next Residential Phase & Full Buildout (Scenario 1)

Comments

- Any transitions across unbuildable areas?
- Fire safety or emergency response access?
- Question use of parks. People will go to Salt Ponds.
- Prefer scenario 1 due to additional community space. Need more!



Proposed Layout for Next Residential Phase & Full Buildout (Scenario 2)

- Two votes for scenario 2 layout
- Prefer scenario 2 because it includes more homes



Meeting Photos





HANAPĒPĒ COMMUNITY MEETING #1 SUMMARY

Time: 9:30am- 1:30 pm

Date: October 26, 2019

Location: 'Ele'ele Elementary School

Event Description

The purpose of the meeting was to introduce the project, share findings from work done to date, share preliminary findings from the beneficiary survey, present land use plan alternatives for EA, gather input on what's important to residents of Hanapēpē and how they view their community, and gather input on what should be addressed in the EA.

The project team shared a presentation and developed informative and interactive boards on display in an open house format. Attendees received copies of the agenda, as well as copies of the presentation and project fact sheet. A copy of the presentation is appended to this summary.

Agenda

- Introductions and welcome
- Presentation (repeated at 10:00 and 12:00 pm)
- Question and Answer Session (following each presentation)
- Open House and Refreshments (throughout)

Project Team Attendees

- DHHL: Andrew Choy, Nancy McPherson, Erna Kamibayashi
- Hawaiian Homes Commission: Commissioner Dennis Neves
- SSFM: Jared Chang, Carlos Kelton, Abbey Seitz

Stakeholder Attendees

Attendees at the meeting included both existing lessees and applicants as indicated below.

Lessees

1. James S. Beniamina
2. John Beniamina
3. Kuulei Kaaumoana
4. Leonard Kanahele, Jr
5. Lavinne Kanahele
6. Tracey Camara
7. Marian Beniamina
8. Sherlin Beniamina

Anuenue Kanahele**Other**

- 1) Alex Wong
- 2) Kalawaia Lee
- 3) Kaimana Castaneda
- 4) Malcolm Azeka
- 5) Richard Harter
- 6) Susan Remoaldo
- 7) Terilynn Denson
- 8) Wendy Vidinha
- 9) Kathleen Lee
- 10) Arnette Lee
- 11) Roland Lee
- 12) Don Mitchell
- 13) Jinna Mitchell
- 14) Marylynn Naumu
- 15) Gerald Naumu
- 16) Jonathan Rivera
- 17) Russel Beniamina
- 18) Marian K. Beniamina
- 19) Jared Chang

Applicants

1. Brad Akana
2. Dianna Kaulili-Phillips
3. Elvira Kimoeko
4. Golden Wong
5. James Beniamina
6. Jasmine Taniguchi-Kahepuu
7. John Beniamina
8. John Ruiz
9. Lana Kukona (Pua Ayau)
10. Laurie Ann Ruiz
11. Marilyn Beniamina
12. Myrnadette Bucasas
13. Olivia Kimoko
14. Penny P. Anakalea
15. Sharon C.K. Nerpio
16. Thelma Lauhiwa Ruiz

Notes from Q & A and Group Discussion

Following the presentation, attendees were given the opportunity to ask questions of the project team, followed by an open house. They were also given comment cards to provide written comments. The discussion from the Q&A and input received on comment cards are documented below.

Comments, Question and Answer Session

- **Q.** Even if you finish on schedule, what happens in the 5-8 years?
 - **A.** We need to do the design- nail down location, lots, specs, drainage. Need approvals, coordinate with the County. Timing depends on funding availability.
- **Q.** How old is General Plan?
 - **A.** County just updated general plan in 2018. Prior that that, it was last updated in 2000. The DHHL Island Plan was finalized in 2004. In the process of updating now.
- **Q.** What is the funding for?
 - **A.** Planning, Environmental Assessment, Design
- **Q.** If residential is a priority, when will Ag happen?
 - **A.** It depends on funding. We are doing EA for entire lot, not just residential. We are doing EA for entire lot, not just residential. Awarding will take place during construction.
- **Q.** Your funding is for what portion of the project?
 - **A.** Phase 2 of the project – up to 75 homes.

- **Q.** Funding could delay this project – is there a way to pre-award if we know the project is coming?
 - **A.** In the past we have given out accelerated awards. Waited for infrastructure- looking at ways to expedite the process.
- **Q.** Most of us will be in our 70's, 80's, and 90's- most of our kids cannot be beneficiaries because they are not 50%. Is there a way to have relatives or children of beneficiaries qualify?
 - **A.** We acknowledge this and is an area DHHL is working on.
- **Q.** What assistance is provided for Subsistence Agriculture?
 - **A.** Currently no assistance on Kaua'i – looking to expand this. Technical assistance needs to be included in the DHHL budget.
- **Q.** Will Hanapēpē have undivided interest?
 - **A.** We don't want to repeat the same mistakes from Anahola. We can go back and review this and the legal implications.
- **Q.** How far along is the Pu'u 'Ōpae Project?
 - **A.** It is a couple years down the road, we're trying to work with the department to figure out the best balance.
- Would like to see a Hanapēpē homeowners association with non-profit arm.

Comment Cards

- Need more funding to help expedite projects and award the Kupunas their land
- Drop the blood quantum to 45 percent so there are beneficiaries that can be awarded these lands if their Kupunas pass.
- Need someone to ask for grants to help with funding these projects.
- Need a community center with an emergency shelter because there are not enough disaster centers for locals.
- Drop the blood quantum to 45% those that fit the 50% blood quantum or higher are now older retirement age with no way to make the required down payment.
- Hire someone to follow up on grant money or ask for funding necessary to complete projects.
- On behalf of neighbor beneficiary: Uncle has been maintaining DHHL behind his land for over 40 years. Now (2019) DHHL is taking custody of those lands (gardens, grass, trees) in anticipation of development. His worry: now that DHHL "cutting and maintaining grass" will they continue to do that timely and responsibly as a fire break? Because he had been doing it previously. He is worried it won't be maintained.
- Eventually there needs to be an easement for and land set aside for another access road.

Infrastructure cost money, but the set aside shouldn't cost much.

- Funding is an issue and need the commission to give more money to help fund these projects. so our kupunas can be awarded their lands, so they can pass it down to their moopuna.
- Have a community or cultural center available for the community to use.
- If building across the gulch, where will our water system come from?
- Need more technical assistance to help with funding projects.

**Input from Open House: Envisioning a Future Hanapēpē Homestead Community**

An open house was set up to enable people to learn more about the project, talk with team members, and provide input on what they would like to see in a future Hanapēpē Homestead community. The open house included eleven stations, described below. Input received during the open house follows this page.

Open House Stations**Project Orientation:**

- Informational poster about project

Beneficiary Input:

- Board explaining input received from beneficiaries based on survey, lessees meeting, beneficiary meeting

Land Use Types:

- Boards explaining Residential, Subsistence Ag, Community Use, and Commercial Designations that showed examples, provided definitions of each land use, and asked people what they would like to see in Community Use and Commercial areas.
- Participants used sticky notes to add their input to these boards.

Land Use Plan Alternatives:

- One board for each of the two alternatives, with acreage tables and highlights of each alternative.

Next Phase of Homesteads:

- A board showing the two locations considered for the next phase of homesteads.

Cultural Resources:

- A board showing place names, wahi pana, and information on the Cultural Impact Assessment underway for the project.

Land Suitability Analysis:

- A board describing key findings of the Land Suitability Analysis for the project.

Community Input:

- Board asking community members what they love about Hanapēpē and what should be considered in the Environmental Assessment.

DHHL Background

- A board explaining the Hawaiian Homes Commission Act, DHHL authority, and DHHL planning system.

Parking Lot:

- Easel with markers for general comments

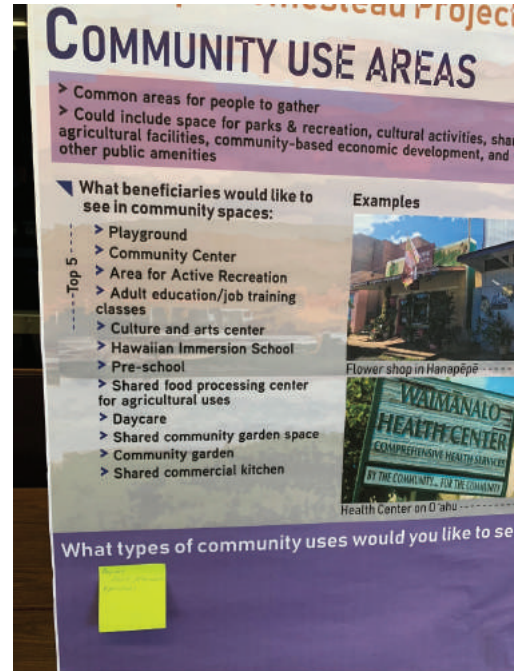
Keiki Coloring Station:

- Coloring sheets with crayons and markers

Community Use Areas

What types of community uses would you like to see?

- Daycare
- Adult school
- Afterschool
- Preschool



Commercial Areas

What would you like to see in commercial areas?

- Low rental for new starter businesses to get experience and a feel for products

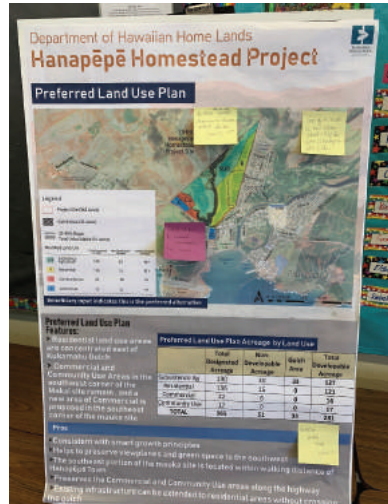
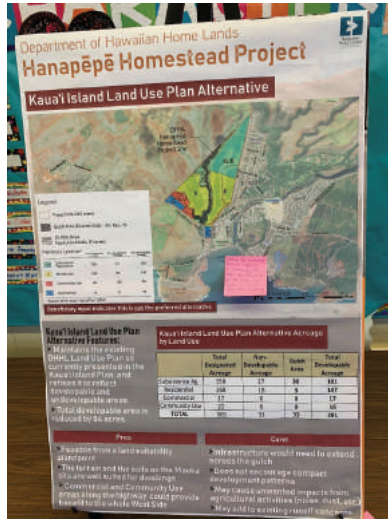


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Land Use Plan Alternatives 1 and 2

What would you like to see in the plan?

- Shelter and community center
- Will need a new elementary school – ‘Ele‘ele school already has 500 kids
- Residential needs include a community center and park
- Extend the commercial to cover highway and community use closer to residential



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Meeting Photos



HANAPĒPĒ COMMUNITY MEETING #2 SUMMARY

Virtual Community Meeting: July 9, 2020, 5:00 PM – 7:00 PM, using Microsoft Teams

Virtual Open House: July 8-August 8, 2020

Event Description

A virtual community meeting was held on July 9, 2020 to solicit input from the public on the Hanapēpē Homestead Project Environmental Assessment, representing the second of two community meetings for the project. A virtual open house was also conducted from July 8-August 8, 2020 to coincide with the comment period for the Draft Environmental Assessment (DEA). The virtual open house included a website with a recorded presentation of this virtual community meeting, a digital copy of the DEA, an interactive map of the project site, and a comment form for the DEA.

The purpose of the community meeting was to provide a project overview, share findings from work done to date, provide an overview of the DEA and a tour of the virtual open house, explain how the community can provide input for the DEA, and answer any questions or comments about the project during the question and answer (Q&A) session. A summary of attendees and input received at the meeting follows below.

Community Meeting Agenda

- Welcome and Team Introductions
- Meeting Ground Rules
- Presentation
- Q&A Session
- Meeting De-brief

Project Team Attendees

- DHHL: Andrew Choy, Nancy McPherson, Cedric Duarte, Gigi Cairel, Pearlyn Fukuba
- Hawaiian Homes Commission: Commissioner Dennis Neves
- SSFM: Jared Chang, Melissa May, Matt Fernandez, Vera Tong, Megan Julian

Community Attendees

Attendees of the virtual community meeting included DHHL waitlist applicants and Hanapēpē residents. Note: The below list of names was generated based on what attendees entered when signing into the meeting on Microsoft Teams. Not all participants provided their full names.

Attendees:

1. Christina Trugillo
2. Claire
3. Kalalena
4. Lani Torres
5. Dr. Kamuela Ka'ahanui
6. Renee Aguiar
7. Tom Kanahale
8. Phyllis Karratti
9. Steven Karratti
10. KV
11. Lani@parriskauai.com
12. Lorna Poe
13. DKW
14. Lavonne Kanahale
15. Dallas Wilcox
16. Chanel Josiah
17. Ola
18. Pauline
19. Malia
20. Romayne Nakaahiki

Presentation & Q&A

A copy of the presentation given at the meeting is appended to this summary. Following the presentation, attendees were given the opportunity to ask questions of the Project Team about the project and the DEA. Questions could either be typed into the Microsoft Teams chat box, or they could verbally ask questions. A summary of questions received and answers provided is below.

Comments, Questions, and Answers

Q. Since the agricultural lots won't require as much infrastructure as the residential lots, will those be open sooner than the house lots? And how can someone get on the list for those?

A. I heard two questions -- one was, how can I get on the list for agricultural lots? And the second question is, how quickly will those lots be available since they will not require as much infrastructure? Related to the first question, you can go to the district office if you live on the island of Kaua'i and ask for an application to be on the wait list for an agricultural lot, if you are not already on the agricultural wait list. If you are already on the waitlist the Department goes in the order of the waitlist, so there is no special waitlist for this specific project. The second question was about the timing. DHHL is planning on doing the first 75 residential lots first, depending on receiving enough funds from the legislature. We are doing it in phases because we know there is enough infrastructure and capacity to accommodate the first 75 lots. We hope that we can construct those 75 lots within the next 5 years. Beyond the first 75 residential lots we do not have a timeline but we hope to have them completed as quickly as possible. Thank you for your comments regarding wanting to do the subsistence agricultural lots sooner rather than later, and wanting to not have to wait for the residential lots.

Q. Will there be a buffer zone or road behind the current home on Moi Road?

A. Right now there is not a road or buffer behind the current homes. So, the backyards of the existing homes would be up against another home's back yard.

Q. Are the kuleana lots considered agricultural or residential?

A. In this planning area there are not kuleana lots. There are subsistence agricultural lots. We do have another project at Pu'u Opae above Kekaha that will be a kuleana homestead project available to applicants on the agricultural wait list.

Q. Just a question about the decision for it to be on crown lands, was there no other option? That's why it's on crown lands?

A. These lands came into the Department's inventory as a result of the settlement with the state in 1994. The state transferred 16,000 acres to the Department and this parcel was one of the tracts that the state transferred to the Department.

Q. There is a ditch behind existing Hanapēpē residential lots. Won't there need to be a buffer?

A. That is a good question. We know about the ditch because it shows up on the topo and the plans, and right now the next phase of residential is going to be above it, further down on Moi Road. In the future phases of the development it will have to be addressed, but for the next phase I don't think it came into play. We will get back to you if that is not correct.

Q. For Hawaiians that cannot qualify for a mortgage, will they be out of the running for these new houses?

A. Right now, we haven't gotten to the details as to what the mix of the 75 residential lots will be -- whether it will be owner builder, turn-key homes, or another type of single-family residential project. It is something that when we go through the design phase, we will flesh out which lots would be turn-key or which would be owner builder, which might allow for opportunities for self-help housing, or Habitat for Humanity type of construction. Kuleana homestead projects offer more possibilities for folks who can't qualify for a mortgage, but the only infrastructure typically provided will be graded gravel roads, and possibly standpipes for accessing water.

Q. Would the homes be considered for seniors also, would there be a financial qualification to be able to have a home? Would seniors who are on the waiting list be able to qualify for these residential homes?

A. That's a good question. And again, it's something that we haven't quite gotten to the details yet, as to the type of award it would be in order to accommodate a mix of income levels. Thank you for sharing that concern, that is something that we will take back to the Department and share. Once we are done with the planning phase, we can share that there is sentiment for opportunities for lower incomes or kupuna so that we can try to create opportunities for that type of demographic.

C. It floods when it rains.

A. Changes will have to be made to the drainage in order to implement the new residential lots.

Q. What type of infrastructure do you need for the subsistence agriculture side of the project?

A. When the Department envisioned subsistence agriculture lots we envisioned less than county standards. That varies depending on the location. But basically, you will need a road, we will have to decide how wide the road is, and if it's going to be paved or not. Secondly, you will need water for both irrigation and for drinking water. We have identified potential

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sources for potable water for drinking water from the county, another potential source is non-potable water from the Gay & Robinson irrigation system. We have started the conversation with them but it's just a conceptual idea right now. And lastly, we would need to deal with wastewater, it would be handled by individual wastewater systems, so those would be septic tanks. Then depending on the cost and the beneficiary preferences we would also have to put in electricity.

Q. What is a Special District?

A. Special District areas will need additional planning by the community & DHHL to determine acceptable uses. The special district areas in Hanapēpē are basically Kukamahu Gulch. It's these areas that are constrained by the slopes that could be kind of hazardous. Some of the uses that could be allowed might be cultural uses, possibly agriculture, or open space, or drainage and storm water management. So not houses, or commercial, or subsistence agriculture lots. Just special uses that would have to be considered okay for that area.

Q. Are there any plans for kupuna housing?

A. We haven't developed all the details of the housing product type that we would be offering for single-family residences. Some of the basic types that the Department offers are turn-key homes or owner builder lots. Owner builder lots allow the lessee to build a home that they can afford. They could get self-help housing, package housing, or Habitat for Humanity services to help with the construction of the home. If that question is more directed toward a shared living kupuna housing, that could be a potential use in the community use area. Usually the Department doesn't do detailed planning in the community use areas, we wait until at least part of the community has been awarded lots and moved in, and then we work with them to decided what they would like to see in the community use area. The same would go for the use of the special district as well.

Q. Given the housing crisis that the state, specifically Kaua'i is facing, what efforts can DHHL put forward to fast track these plans, permits, etc.? Is there a plan in place?

A. This is a big part of our plan to provide more residential housing on Kaua'i. Unfortunately, we are constrained by our resources. The sooner that we get the resources the sooner we can construct these lots. The reason why we were able to conduct this planning process and the environmental process is because we got funding from the legislature. Once we got it, we wanted to act as quickly as possible because we know that there are many people on the waitlist that have been waiting a long time. Hopefully we can get additional funding to continue with development.

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Q. If we have further questions regarding other lands on Kaua'i (Pi'ilani Mai Ke Kai, etc.), where can we send those to?

A. You can send those questions to dhhl.planning@hawaii.gov

Q. With the recent Supreme Court decision that is requiring DHHL to pay people for being on the waiting list so long, how is that going to affect the funding that DHHL has for this project? Is it going to drain from it?

A. That is a good question. Unfortunately, I do not know that answer and I do not want to give you incorrect information. The next step for the plaintiffs is that the judges need to determine a methodology for the payout. Then it is going to be up to the legislature to determine how to fund that potential settlement. The money goes to the plaintiffs and not the Department.

Discussion De-Brief

All questions and discussion points from the Q&A Session were compiled and presented back to the community near the conclusion of the virtual community meeting. The discussion de-brief is shown below:

DISCUSSION DE-BRIEF

Recap of the discussion points from the meeting...

- Concerns about timing and availability of agricultural lots
- Uses behind existing lessee lots (buffer or road)
- Flooding issues
- Concern about availability of lots for people who cannot qualify for mortgages
- Questions about kuleana lots
- Qualifications for seniors to have homes, kupuna housing
- Infrastructure needed for subsistence agriculture
- Question about Special District Designation
- Ability to fast track plans/permits for housing
- Effect of Supreme Court decision on available funding
- How DHHL acquired these lands