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OCT - 8 2019

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

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DEPUTY DIRECTOR

IN REPLY REFER TO:
19-242

October 1, 2019

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

Dear Mr. Glenn:

SUBJECT: Chapter 343, Hawai'i Revised Statutes and
Title 11, Chapter 200.1, Hawai'i Administrative Rules
Draft Environmental Assessment and Anticipated Finding of
No Significant Impact (DEA-AFONSI) for the
'Ewa Villages R-1 Replacement Project, 'Ewa, O'ahu

The City and County of Honolulu Department of Facility Maintenance (DFM) hereby transmits the DEA-AFONSI for the 'Ewa Villages R-1 Replacement Project, Ewa District, O'ahu. We respectfully request publication in the next available edition of the Environmental Notice. Simultaneously with this letter, we will be uploading an Adobe Acrobat pdf file of the DEA-AFONSI and a shapefile of the action location map.

If you have any questions, please call Mr. Eduardo Manglallan, DFM Deputy Director at 768-3343.

Sincerely,

Ross S. Sasamura, P.E.
for Director and Chief Engineer

Enclosures

20-088

Submittal Form for HRS Chapter 343 Publications in the Periodic Bulletin : Entry # 613

Action Name

'Ewa Villages R-1 Replacement Project

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (4) Propose any use within any historic site as designated in the National Register or Hawai'i Register

Judicial district

'Ewa, O'ahu

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

(1) 9-1-016:142; (1) 9-1-017:103; (1) 9-1-017:111; (1) 9-1-017:112; (1) 9-1-017:113; (1) 9-1-095:163; (1) 9-1-097:103; (1) 9-1-126:003; (1) 9-1-126:014; (1) 9-1-126:110; and Renton Road right-of-way between Kihi Street and Park Row

Action type

Agency

Other required permits and approvals

See Draft EA Section 1.2 (page 1-4)

Proposing/determining agency

City and County of Honolulu Department of Facility Maintenance

Agency contact name

Ed Manglallan

Agency contact email (for info about the action)

colsonorr@hhf.com

Email address or URL for receiving comments

colsonorr@hhf.com

Agency contact phone

(808) 768-3343

Agency address

Submittal Form for HRS Chapter 343 Publications in the Periodic Bulletin : Entry # 613

1000 Uluohia Street, Suite 215
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Map It

Was this submittal prepared by a consultant?

Yes

Consultant

HHF Planners

Consultant contact name

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Consultant address

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813
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Map It

Action summary

The City and County of Honolulu Department of Facility Maintenance is proposing to construct a R-1 (non-potable) waterline to upgrade existing irrigation water service for the 'Ewa Villages community. Roughly one mile of new pipe would be trenched underground within the Renton Road right-of-way between Ka Makana Ali'i Shopping Center and Park Row with a new connection to an existing 16-inch water main that runs parallel to the shopping center's eastern boundary. System improvements are needed to bypass the 'Ewa Villages Golf Course irrigation pond (where R-1 water is currently stored) and deliver R-1 water directly from the Honouliuli Water Recycling Facility. Construction staging and equipment storage would occur on one of two City-owned properties on Renton Road: either the vacant parcel directly across from Leialoalo Street or next to the 'Ewa Plantation Manager's Home which is currently underutilized. Project funding would be from City funds and U.S. HUD-CDBG funds.

Reasons supporting determination

HRS 343 significance criteria is discussed in Chapter 9: ANTICIPATED DETERMINATION AND FINDINGS of the Draft EA.

Attached documents (signed agency letter & EA/EIS)

- DFM-Ltr-to-OEQC-dtd-10-1-19.PDF
- EwaVillagesR1-DraftEA-Oct-2019.pdf

Action location map

Submittal Form for HRS Chapter 343 Publications in the Periodic Bulletin : Entry # 613

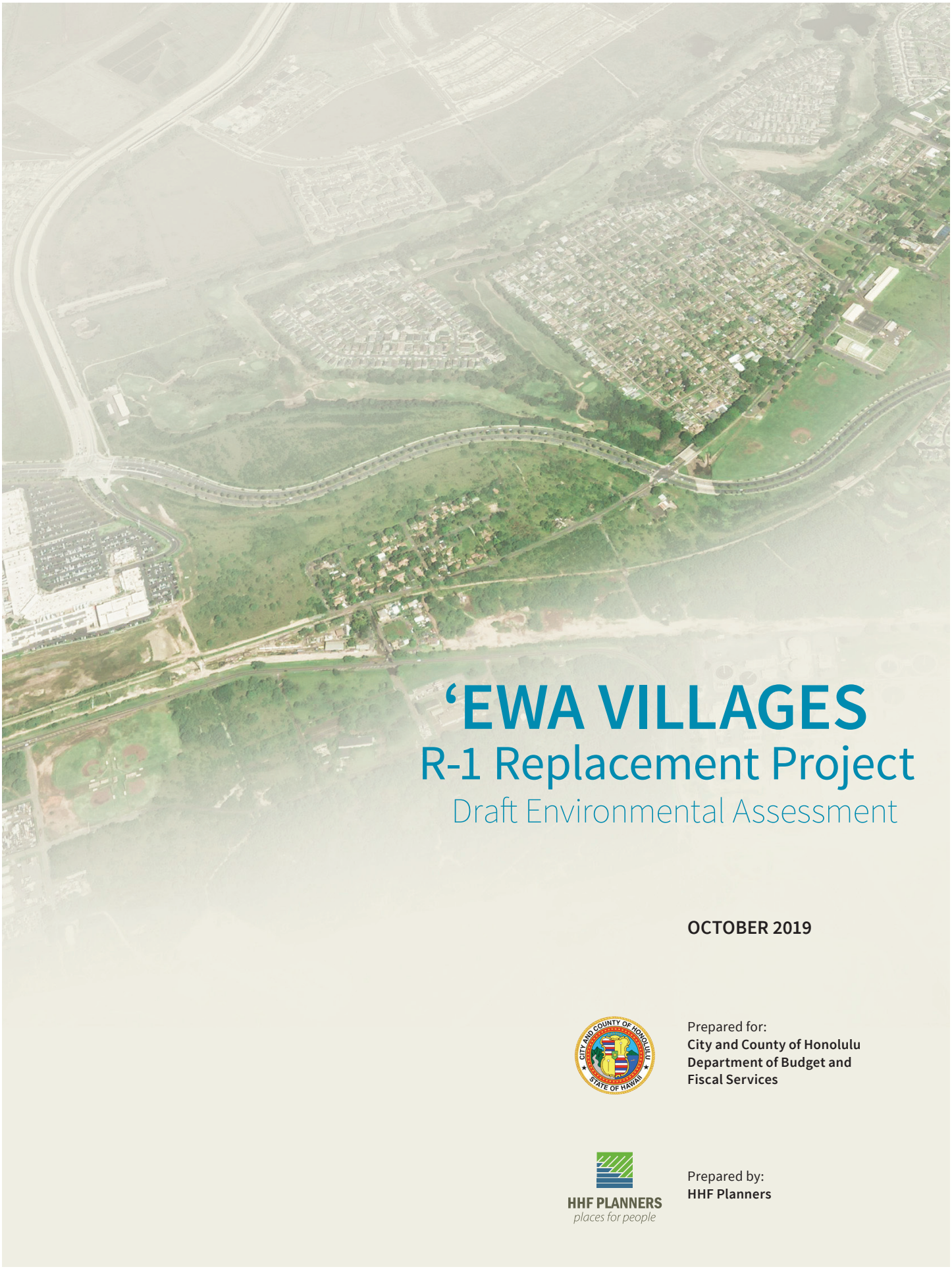
- Ewa-Villages.zip

Authorized individual

Corlyn Orr

Authorization

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



‘EWA VILLAGES
R-1 Replacement Project
Draft Environmental Assessment

OCTOBER 2019

Prepared for:
City and County of Honolulu
Department of Budget and Fiscal Services

HHF PLANNERS
places for people

Prepared by:
HHF Planners

‘EWA VILLAGES
R-1 Replacement Project
Draft Environmental Assessment

OCTOBER 2019

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Prepared by Legrande Biological Surveys, Inc.

Appendix B Avian and Terrestrial Mammalian Surveys
Prepared by Rana Biological Consulting

Appendix C Archaeological Literature Review and Field Inspection for the 'Ewa Villages R-1 Water Main Project
Prepared by Honua Consulting, Inc.

Appendix D Cultural Impact Assessment Prepared by Honua Consulting, Inc.

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ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standards
ALISH	Agricultural Lands of Importance in the State of Hawai'i
APZ	accident potential zone
BFS	City and County of Honolulu Department of Budget and Fiscal Services
BMPs	best management practices
BWS	City and County of Honolulu Board of Water Supply
CCD	Census County Division
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIA	cultural impact assessment
City	City and County of Honolulu
CO	carbon monoxide
CWB	Clean Water Branch
CWRM	State of Hawai'i Commission on Water Resources Management
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dBA	A-weighted decibels
DFM	City and County of Honolulu Department of Facility Maintenance
DLNR	State of Hawai'i Department of Land and Natural Resources
DNL	Day-Night Equivalent Sound Level
DOH	State of Hawai'i Department of Health
DP	Development Plan
DPA	Development Plan Area
DTS	City and County of Honolulu Department of Transportation Services
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
ENV	City and County of Honolulu Department of Environmental Services
EPA	Environmental Protection Agency
ESA	Endangered Species Act
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
H_2S	
HAR	Hawai'i Administrative Rules
HECO	Hawaiian Electric Company
HPD	Honolulu Police Department
HRS	Hawai'i Revised Statutes
HUD	United States Department of Housing and Urban Development
HWRF	Honouliuli Water Recycling Facility
HxA	Honouliuli clay, 0 to 2 percent slopes
LCA	Land Commission award
LUO	City and County of Honolulu Land Use Ordinance
LSB	Land Study Bureau
mgd	million gallons per day
mg/L	milligrams per liter
MnC	Mamala cobbly silty clay loam, 0 to 12 percent slopes
mph	miles per hour
MSL	mean sea level
NAAQS	National ambient air quality standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O_3	ozone
OR&L	O'ahu Railway and Land Company
Pb	lead

$PM_{2.5}$	fine particulate matter, 2.5 microns (size) or smaller
PM_{10}	particulate matter, 10 microns (size) or smaller
R-1	R-1 high-quality recycled water
RO	reverse osmosis high-purity water
ROH	Revised Ordinances of Honolulu
ROW	right(s)-of-way
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SIHP	State Inventory of Historic Places
SLR	sea level rise
SMA	Special Management Area
$S0_2$	sulfur dioxide
TMK	Tax Map Key
UIC	underground injection control
USC	United States Code
USFWS	United States Fish and Wildlife Service
WMAs	groundwater management areas

CHAPTER 1
INTRODUCTION

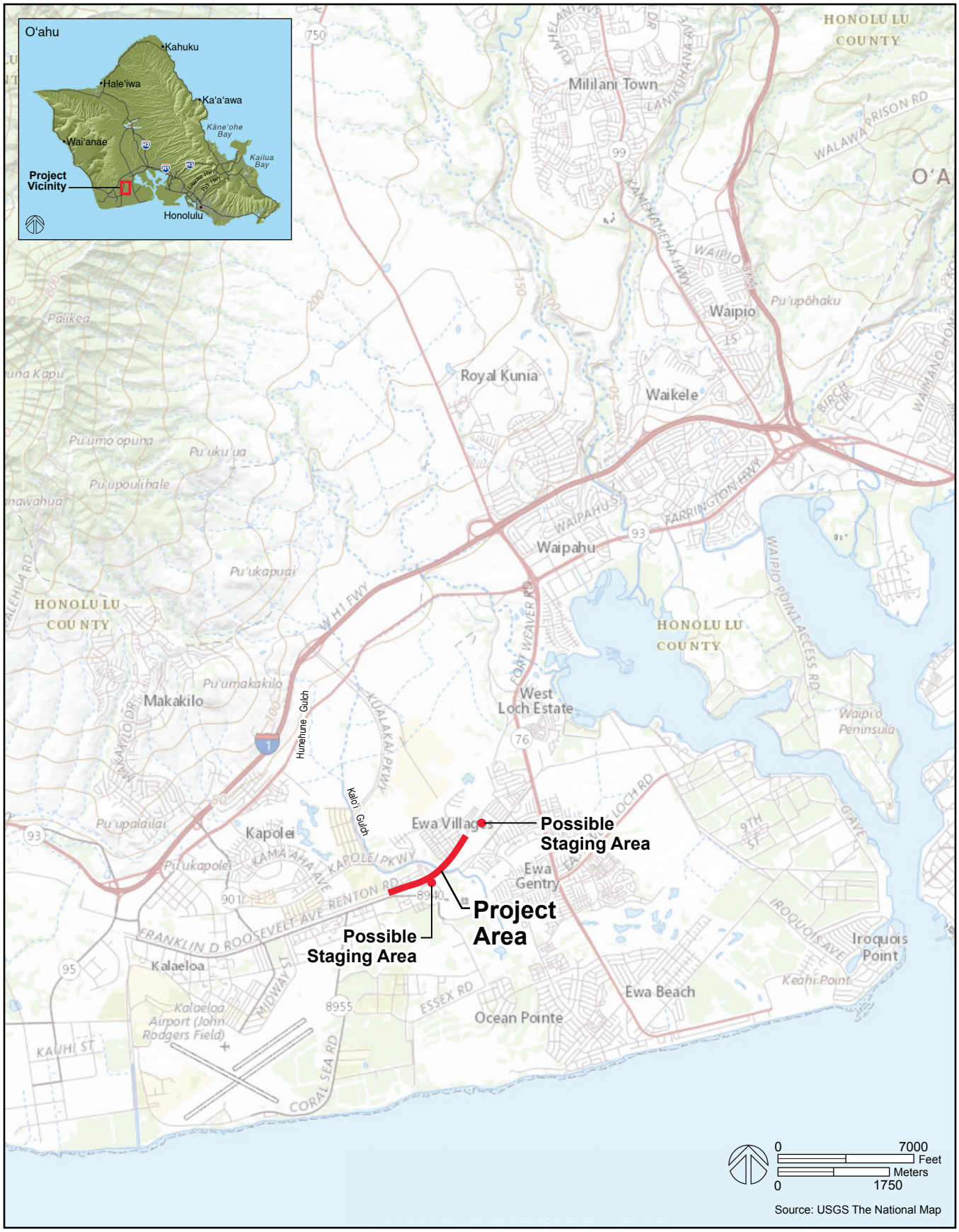
The Honouliuli Water Recycling Facility (HWRF) processes wastewater from the Honouliuli Wastewater Treatment Plant to produce water for irrigation, agricultural and industrial needs in the 'Ewa District, island of O'ahu. The HWRF produces two grades of recycled water: (1) R-1 (recycled) water, which is high-quality disinfected recycled water used for irrigating golf courses and landscaped areas; and (2) Reverse Osmosis (RO) demineralized recycled water, which is used for industrial purposes at refineries and power generation plants in Campbell Industrial Park and Kahe. The HWRF has a capacity of 10 million gallons of R-1 water per day, and 2 million gallons of RO water per day. R-1 water from the HWRF is delivered to users across Kapolei and 'Ewa through a dedicated R-1 water distribution system that is owned and operated by the Honolulu Board of Water Supply (BWS) separate from the potable water distribution system.

The City and County of Honolulu Department of Facility Maintenance (DFM) is proposing to construct a R-1 water line and associated connections to upgrade existing irrigation water service to the 'Ewa Villages community. With a new connection to an existing 16-inch recycled water main at the west end of Renton Road, the new 12-inch and 8-inch water line would run for a length of roughly 0.75 mile along Renton Road between Ka Makana Ali'i Shopping Center and Park Row (see Figure 1-1 for regional location). The new water line would be dedicated to the BWS upon completion. The proposed infrastructure, which replaces the current source of R-1 water from the irrigation pond at the 'Ewa Villages Golf Course, would provide a direct connection to the BWS's R-1 distribution system and allow the 'Ewa Villages community to receive high-quality R-1 water directly from the HWRF.

1.1 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) is prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) §4321 et seq.) as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations (CFR) Parts 1500-1508) and 24 CFR Part 58 Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities, as well as Chapter 343, Hawai'i Revised Statutes (HRS), as amended, and Title 11, Chapter 200.1, Hawai'i Administrative Rules (HAR) which sets forth the State's requirements for preparing environmental assessments. The proposed project is planned to receive funding from both the United States Department of Housing and Urban Development (HUD) and the DFM. In addition, the project area is owned by the City and County of Honolulu (City). Compliance with NEPA and 24 CFR Part 58 is required because the project proposes use of Federal funds through HUD. Compliance with the environmental review process under Chapter 343, HRS is required because the project proposes to use county funds and county land.

This EA analyzes the potential environmental and socioeconomic consequences of the Proposed Action and reasonable alternatives. The intent of the EA is to provide sufficient analysis for determining whether the Proposed Action requires preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) pursuant to both NEPA and Chapter 343 HRS.



Regional Location Map **Figure 1-1**

Ewa Villages R1 Water Replacement Line

Environmental Assessment

City and County of Honolulu, Department of Facility Maintenance

1.2 PROJECT SUMMARY

PROJECT NAME:	‘Ewa Villages R-1 Replacement Project
PROPOSING AGENCY:	Department of Facility Maintenance City and County of Honolulu 1000 Uluohia Street, Suite 215 Kapolei, Hawaii 96707
RESPONSIBLE ENTITY (NEPA):	Department of Budget and Fiscal Services City and County of Honolulu 530 South King Street, Room 208 Honolulu, Hawaii 96813
AUTHORIZED AGENT:	HHF Planners Corlyn Orr, Senior Planner 733 Bishop Street, Suite 2590 Honolulu, Hawai‘i 96813 Phone: (808) 545-2055 x168
FEDERAL FUNDING AGENCY:	U.S. Department of Housing and Urban Development
PROJECT LOCATION:	Honouliuli, ‘Ewa District, O‘ahu, Hawai‘i Renton Road between Ka Makana Ali‘i Shopping Center and Park Row
TAX MAP KEY PARCEL NUMBERS:	<u>R-1 water line</u> 9-1-016: 142 9-1-017: 103; 111; 112; and 113 9-1-095:163 9-1-097:103 9-1-126:110 and Renton Road right-of-way between Kihi Street and Park Row <u>Possible staging areas</u> 9-1-126: 003 and 014
LANDOWNER:	City and County of Honolulu
PROPOSED PROJECT:	Installation of a new R-1 water line to service the ‘Ewa Villages community
STATE LAND USE DISTRICT CLASSIFICATION:	Agriculture District and Urban District
COUNTY DEVELOPMENT PLAN DESIGNATION:	‘Ewa Development Plan Medium Density Apartment/Commercial Mixed Use, and Residential and Low Density Apartment

COUNTY ZONING DISTRICT:	AG-1 Restricted Agriculture and R-5 Residential
SPECIAL MANAGEMENT AREA:	Outside the SMA Boundary
FLOOD ZONE DESIGNATION:	Map 15003C0310G, effective on 01/19/2011 • Zone D (Area with possible but undetermined flood hazards; no flood hazard analysis conducted) • Zone X (Determined to be outside the 500-year flood and protected by levee from 100-year flood) • Zone AE (Base floodplain where base flood elevations are provided) • Zone AEF (Flood way areas in Zone AE)
PERMITS AND APPROVALS REQUIRED:	National Environmental Policy Act Compliance Section 106 Historic Preservation Compliance National Pollutant Discharge Elimination System Permit Chapter 343 HRS Hawai`i Environmental Policy Act Compliance Americans with Disabilities Act Compliance Grading, Grubbing, and Stockpiling Permits Construction Plans Approval Community Noise Permit and/or Noise Variance
ANTICIPATED DETERMINATION:	Finding of No Significant Impact (FONSI)

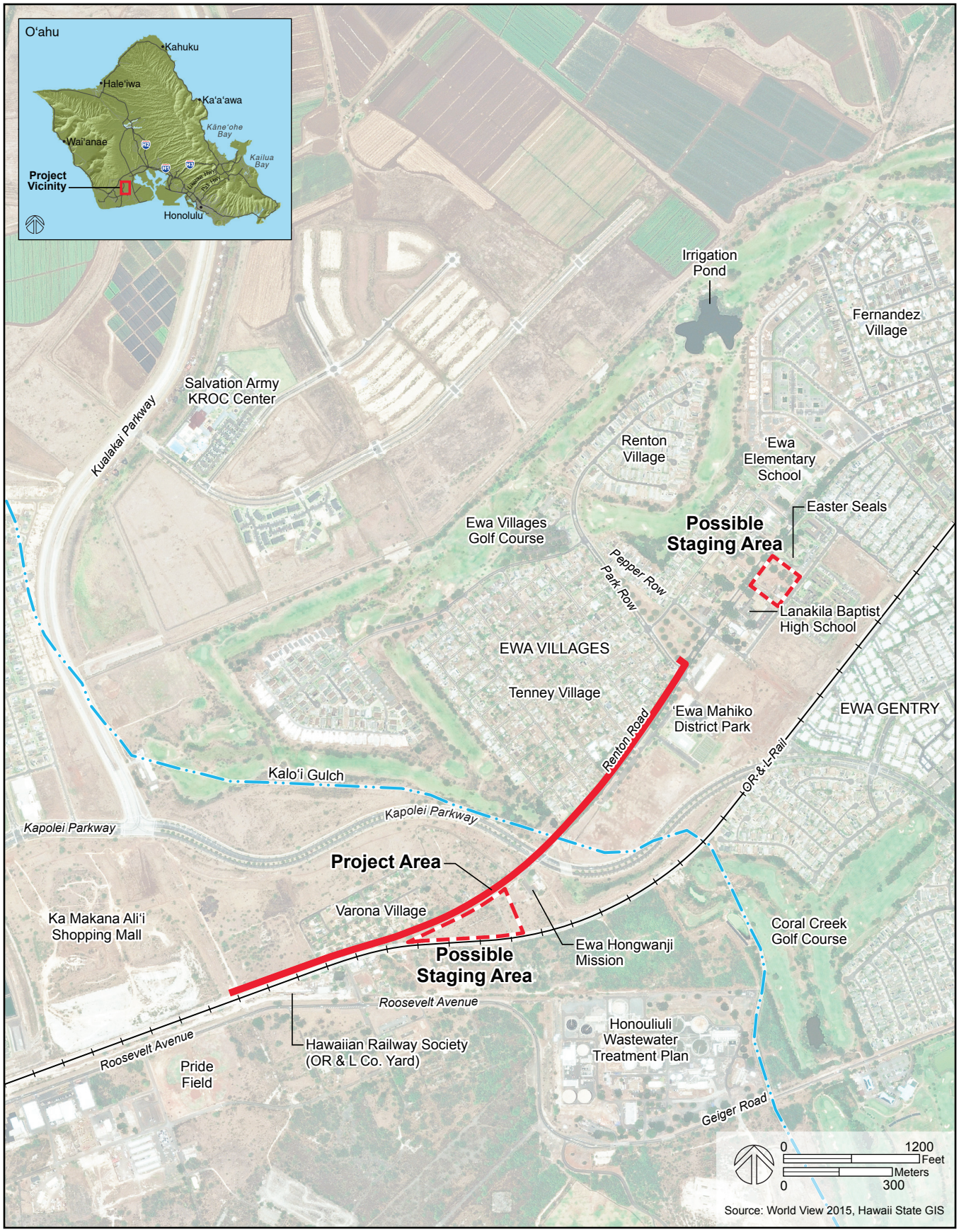
CHAPTER 2
PROJECT DESCRIPTION AND ALTERNATIVES

2.1 PROJECT LOCATION

The community known as ‘Ewa Villages is located roughly 20 miles west of Downtown Honolulu on the south side of O‘ahu in the ahupua‘a of Honouliuli and the traditional moku of ‘Ewa. Within the ‘Ewa region, ‘Ewa Villages is roughly three miles east of O‘ahu’s second city of Kapolei, between the growing communities of Kalaeloa and ‘Ewa (see Figure 1-1 for general vicinity of ‘Ewa Villages and Kapolei). Dating back to when sugar production was Hawai‘i’s dominant industry, ‘Ewa Villages was originally constructed between the 1900s and the late-1950s as eight geographically-distinct villages to provide company housing for sugar plantation employees. Of the eight original villages, four remain relatively intact and have been, or are in the process of being improved (Tenney, Renton, Varona, and Fernandez), while the other four have been demolished ("C", Mill, Middle, and Lower Villages).

Figure 2-1 presents a location map showing the project area in relation to ‘Ewa Villages. The project area, which consists of the water line alignment and two separate sites for construction staging, is sandwiched within the western portion of ‘Ewa Villages. The project area generally follows the alignment of Renton Road and extends from the western terminus of Renton Road near Ka Makana Ali‘i Shopping Center and Park Row to the east. The residential areas of Varona Village and Tenney Village and the ‘Ewa Villages Golf Course border the project area to the north. Renton Village and newer residential subdivisions are to the east; ‘Ewa Mahiko District Park, historic plantation homes, and the O‘ahu Railway and Land Company (OR&L) Railroad right-of-way (ROW) are to the south; and the Ka Makana Ali‘i Shopping Center and Pride Baseball Field are to the west. Kapolei Parkway, a major east-west thoroughfare connecting Kapolei to ‘Ewa, intersects Renton Road near the middle of the project area. The Honouliuli Wastewater Treatment Plant and HWRF, and the Coral Creek Golf Course, are located farther south of the OR&L Railroad ROW.

Figure 2-2 presents a tax map key (TMK) parcel map of the project area. As shown in Figure 2-2, the project area crosses 10 separate parcels, with two additional detached parcels for possible construction staging areas. Table 2-1 identifies the TMK parcels, their property ownership and overall parcel acreage.

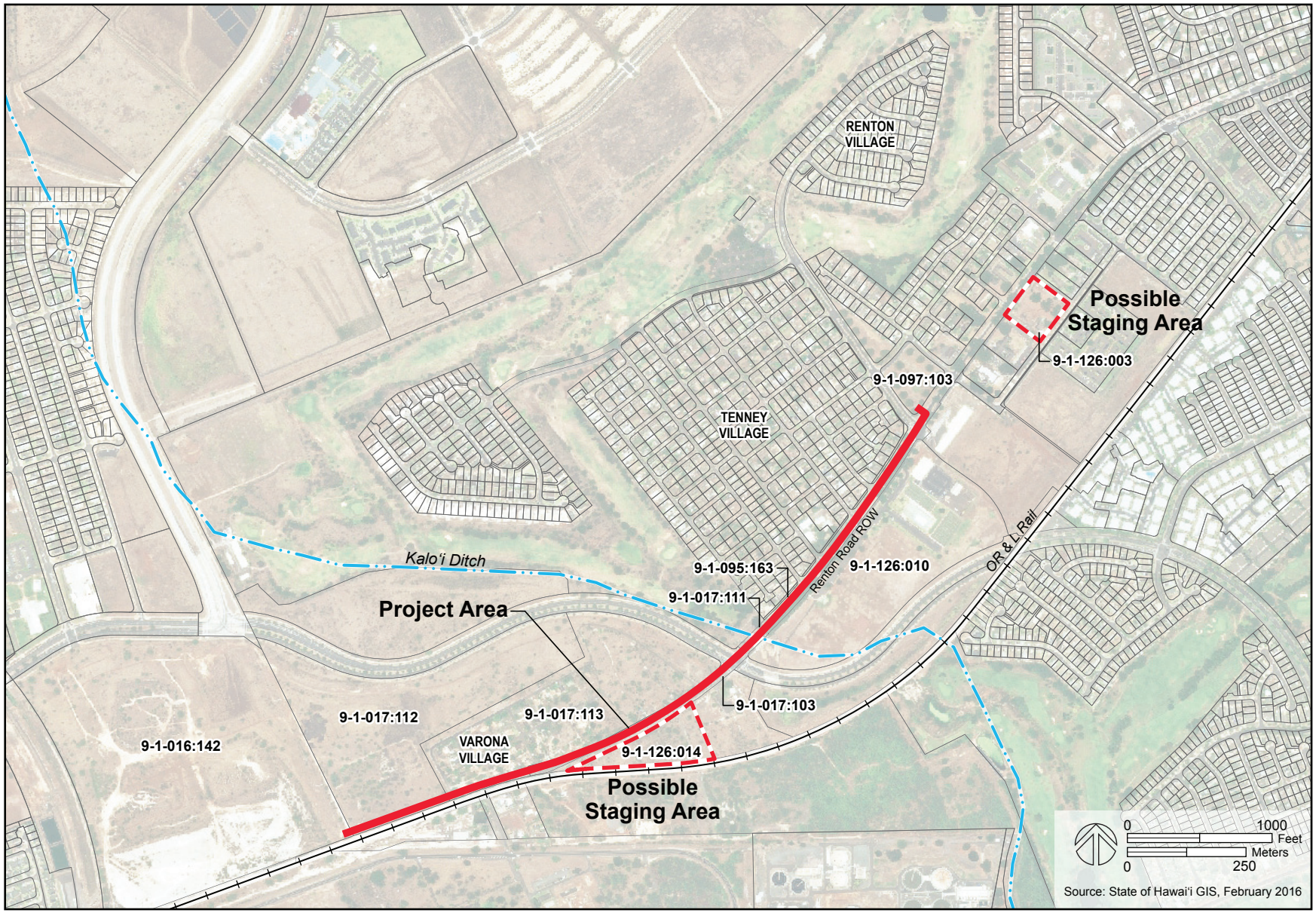


Project Location Map **Figure 2-1**

Ewa Villages R1 Water Replacement Line

Environmental Assessment

City and County of Honolulu, Department of Facility Maintenance



Tax Map Key (TMK) Parcels **Figure 2-2**

Ewa Villages R1 Water Main Replacement

Environmental Assessment

City and County of Honolulu Department of Facility Maintenance

Table 2-1
TMK Parcel Information

TMK Parcel	Owner	Parcel Size (acreage)
PROJECT AREA		
9-1-016: 142	Department of Hawaiian Home Lands	67.3 acres
9-1-017: 103	City and County of Honolulu	11 acres
9-1-017: 111	City and County of Honolulu	211 acres
9-1-017: 112	City and County of Honolulu	31.9 acres
9-1-017: 113	City and County of Honolulu	26.4 acres
9-1-095: 163	City and County of Honolulu	0.2 acres
9-1-097: 103	City and County of Honolulu	2.8 acres
9-1-126: 010	City and County of Honolulu	26 acres
Renton Road ROW between Kihi Street and Park Row *(No TMK parcel number)*	City and County of Honolulu	N/A
CONSTRUCTION STAGING AREA		
9-1-126: 003	City and County of Honolulu	2 acres
9-1-126: 014	City and County of Honolulu	4 acres

2.2 PURPOSE AND NEED FOR ACTION

The City's involvement in the 'Ewa Villages community began in the early 1980s with the redevelopment of Fernandez Village. Revitalization of the remaining 'Ewa Villages neighborhoods commenced more than ten years later with the City's preparation of the *'Ewa Villages Master Plan (1992)*, which formalized a strategy to rehabilitate and preserve the villages as an historic plantation community with the intent of providing homeownership opportunities for existing tenants with ties to the plantation.[1] In addition to rehabilitating existing homes and community buildings, the master plan envisioned more than 900 new residential units, a new commercial plaza at the old mill site, a new 18-hole municipal golf course (i.e., 'Ewa Villages Golf Course) and the expansion of 'Ewa Mahiko District Park. Infrastructure improvements in accordance with City standards, including roadway, water, drainage and wastewater system upgrades and additional community parks and open space, were also planned.

Construction of the 'Ewa Villages Golf Course was completed in 1996. The 18-hole golf course, which is owned and operated by the City and County of Honolulu Department of Enterprise Services , serves the dual function as a recreational and open space amenity and a detention basin for regional flood control purposes. In addition, the existing R-1 irrigation system that services the golf course is used to deliver

[1] The master plan identified a total of 1,230 residential units for the three villages, including construction of 957 new units. The City's investment strategy provided for the City's acquisition of the land from the Estate of James Campbell, the subsequent rehabilitation of existing structures and construction of new community facilities and infrastructure upgrades, followed by the sale of homes and lots to residents.

R-1 water to the common landscaped areas and public facilities in 'Ewa Villages. Signage informing the public that irrigation water is R-1 recycled water is distributed throughout the irrigated area.

Although the R-1 water distributed through the golf course irrigation system is sourced from the HWRF, the golf course system stores the R-1 water received from HWRF in an open irrigation pond at the east end of the golf course. The 'Ewa Villages golf course open pond storage allows runoff (e.g., fertilizers and pesticides) into the irrigation pond, and the presence of organisms such as fish, snails, birds and insects and other debris in the pond contribute to degradation of the pond water. Even though the R-1 water entering the pond is disinfected, because the pond is exposed to the atmosphere, best management practices condition its use to limit public contact by irrigating during nighttime hours, which hampers the City's ability to maintain landscaped areas. Day time irrigation is permitted only under close supervision to allow City crews to inspect, adjust and repair the sprinkler systems. This is in contrast to other nearby areas where water users that are connected to the City's R-1 regional distribution system are receiving R-1 water sourced directly from the HWRF system, which is the highest quality disinfected recycled water available (i.e., 99.99% pathogen free). Secondly, high discharge pressures (exceeding 100 psi) involved in pumping water from the pond causes frequent breaks in the pipe joints and pop-up sprinklers within the 'Ewa Villages irrigation system. According to DOH regulations, such events must be addressed immediately and reported to the DOH under the approved DOH irrigation management plan.

The purpose of the proposed project is to improve both the quality and system reliability of existing non-potable water delivered to customers in 'Ewa Villages. The project is needed because the existing water distribution system that draws from the 'Ewa Villages Golf Course irrigation pond presents regulatory, operational and maintenance challenges that increase costs. System improvements are needed to optimize the use of R-1 water from HWRF and reduce system maintenance/repair costs.

2.3 OVERVIEW OF ALTERNATIVES

Several alternatives were identified and considered during the planning process to select the Proposed Action. Alternatives that were initially considered and eliminated from further consideration based on their feasibility and practicability of implementation or lack of alignment with the project purpose and need are described in Section 2.3.1. The discussion of probable impacts associated with the No Action Alternative (described in Section 2.3.2) and the Proposed Action (described in Section 2.3.3) are presented in the following chapters.

2.3.1 Alternatives Considered But Eliminated From Further Evaluation

Renovation/Modernization of Existing Distribution Lines

The Renovation/Modernization Alternative would replace the existing R-1 water lines currently servicing the 'Ewa Villages Golf Course with new distribution lines designed to withstand the discharge pressure of the irrigation pond pump. This alternative was considered but is not being carried forward for detailed analysis in the EA because it would not address the distribution issue of using R-1 water sourced directly from the HWRF system. Because R-1 water would continue to be sourced from the golf course irrigation pond and the practice of watering during nighttime hours would continue, this alternative would perpetuate the existing challenges and higher costs.

Replacement of the Water Storage Source

The Replacement Alternative would provide a new contained water storage unit to replace the existing golf course irrigation pond as the current source of R-1 water. Possible options for storage units that were considered included an artificial pond with edges high enough to deflect surface water runoff or an enclosed/contained tank that reflects all types of introduced substances. In addition to the cost of construction, this alternative would require that the golf course provide additional land area in the vicinity of the existing irrigation pond to accommodate the new storage unit. Based on the current design and layout of the golf course, this alternative is not cost effective or feasible.

Alignment along the Entire Southern (Makai) side of Renton Road

This alternative would involve installation of a 12-inch water line with a connection point at the western end of Renton Road such that the water line would follow on the southern (makai) side of the Renton Road ROW to the west side of the Kapolei Parkway intersection. From this point eastward, instead of veering north and crossing the intersection and Renton Road bridge on the northern side of the road ROW, the water line would continue along the southern side of Renton Road. (Between Haakei Street and the Kapolei Parkway intersection, the water line would follow the same alignment as the Proposed Action.) The alignment would cross the intersection and Renton Road bridge on the southern side of the road ROW and run through the City's ROW in the 'Ewa Mahiko Park, and continue to the western side of the Park Row intersection. The water line would then turn northward and cross Renton Road, and follow the roadway shoulder on the north side of the roadway to the same connection point at the east side of Park Row as the Proposed Action. This alternative was initially favored because siting within 'Ewa Mahiko Park minimizes roadway closures and traffic disruption. However, this alternative is not being carried forward for detailed analysis in the EA because of conflicts with existing property easements and the presence of existing underground utilities (e.g., water, sewer, drainage and electrical systems) and drainage structures.

Directional Drilling as a Construction Method

Directional drilling is a method of installing underground utilities under existing developed surfaces (pavement, sidewalks, landscaping, etc.) through the use of a boring unit and drilling equipment to drill the pipe path underground followed by the installation of the pipe. Open trenching is typically only required at the points of connections, with the possibility for additional trenches depending on the engineering design of the piping installation and existing subsurface conditions. This option would prevent traffic disruption, result in less excavation and damage to the existing roadway surface, and minimize utility crossing conflicts. However, because this method is extremely expensive, this alternative was not carried forward as a reasonable alternative.

2.3.2 No Action

Under the No Action Alternative, a new R-1 water line with a direct connection to the City's R-1 distribution system would not be constructed. The existing R-1 distribution system serving 'Ewa Villages would remain in use, and 'Ewa Villages would continue to receive irrigation water from the 'Ewa Villages Golf Course pond. The No Action Alternative would not provide the infrastructure to deliver high-quality R-1 water sourced directly from the HWRF system, and the existing system would continue to deteriorate, which would result in costly maintenance and repair costs to operate the existing system and prolong inefficient water resource management practices. Although the No Action Alternative

would not meet the purpose and need for action, it was carried forward for analysis in this EA as a requirement of NEPA to provide a baseline for analysis of the environmental consequences.

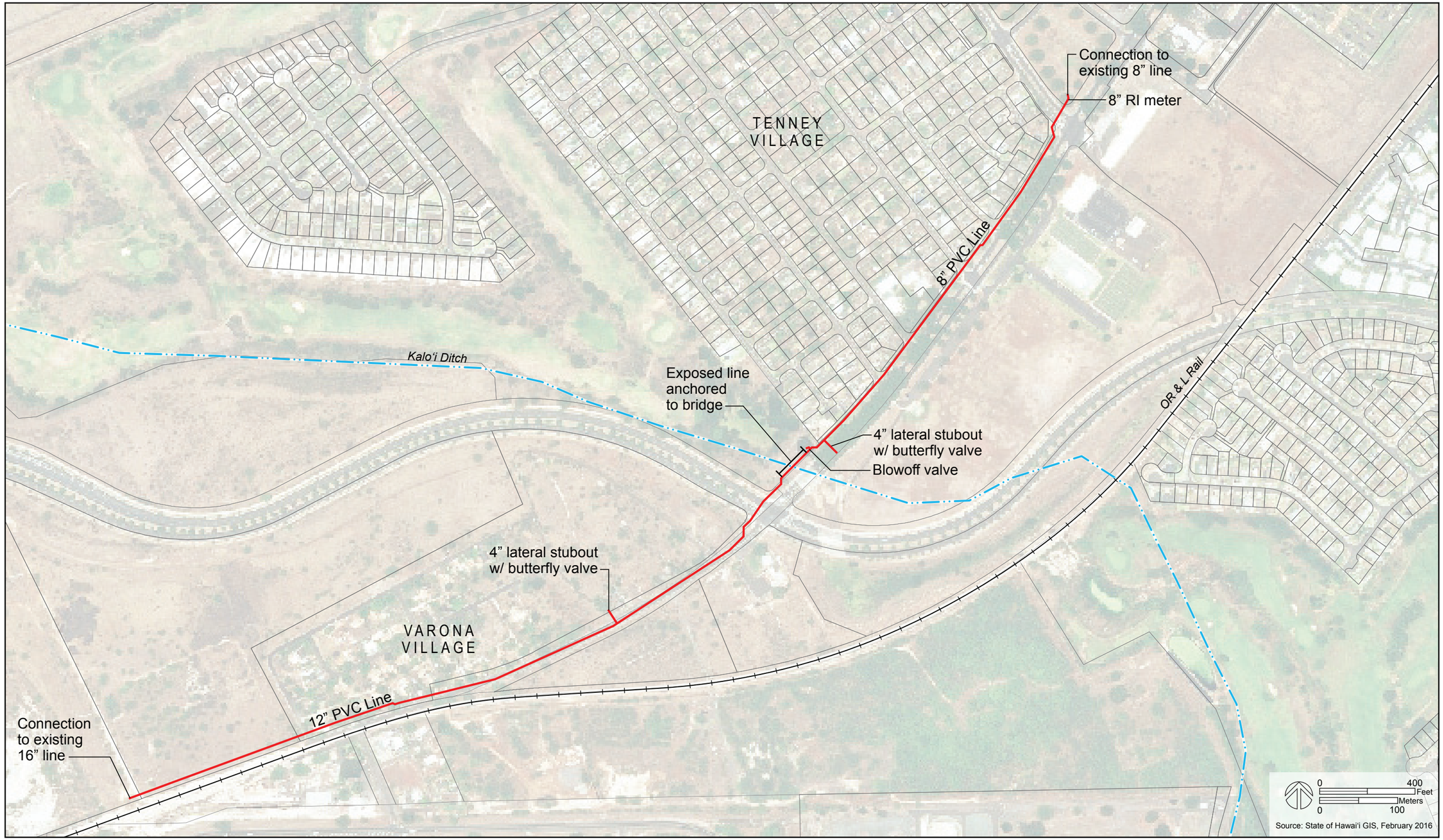
2.3.3 Proposed Action

The proposed R-1 water line consists of roughly 5,000 linear feet of 12-inch and 8-inch PVC pipe trenched underground along Renton Road from Ka Makana Ali'i Shopping Center in the west to Park Row in the east (see Figure 2-3). At the west end, a new 12-inch PVC line would connect to an existing 16-inch PVC R-1 water main that runs perpendicular to Renton Road on the east-southeast side of Ka Makana Ali'i Shopping Center. The new line would follow the length of Renton Road on the northern (mauka) side of the ROW to the west side of the Haakei Street intersection, where the alignment would veer to the south (makai) side of Renton Road. The line would continue along the south (makai) side of the Renton Road ROW to the Kapolei Parkway intersection. Just before reaching the Kapolei Parkway intersection (roughly 100 feet west of the intersection), the line would cross back to the northern side of Renton Road and continue through the Kapolei Parkway intersection on the north (mauka) side of the road. After the intersection, the line would be structurally anchored to the north side of the bridge crossing, followed by installation of a blow-off line. (A blow-off line is normally required along long transmission mains to flush out the line and remove excess water from the pipe to accommodate emergency main break repairs.) At the blow-off valve, the pipe would reduce to an 8-inch PVC line and continue within the north (mauka) side of Renton Road towards the eastern point of connection near the intersection of Renton Road and Park Row. Just before the intersection of Renton Road and Park Row (roughly 50 feet west of the intersection), the alignment would pivot north through the landscaped shoulder and sidewalk to avoid the numerous utility main junctions within the intersection. The line would eventually cross Park Row and reach the point of connection.

At the bridge crossing over Kalo'i Gulch, a new pipe support system would be constructed off of the existing bridge supports to attach the new water line (see Figure 2-4). The support system would consist of a steel beam spanning between corbels at the abutments and at the center wall of the bridge. As the line continues along the bridge abutments, the pipe would be supported with steel brackets bolted to the existing wall. The pipe would return below grade at the ends of the bridge by a vertical bent above the ground or straight into the side of the slope with a concrete jacket encasing the pipe. The new concrete corbels supporting the new steel beam would utilize rebar dowels set into the existing structure using an epoxy adhesive. The new corbels would not project into the open area below the bridge, and the bottom of the steel beam would be at an elevation of approximately 41 feet above mean sea level.

The system includes two 4-inch lateral stub-outs with butterfly valves: one installed at the intersection of Leialoalo Street and a second installed east of the blow-off line to serve 'Ewa Mahiko Park. Air relief valves would also be installed throughout the water line to comply with current Non-potable Water System Standards. Additional lateral connections would be installed through the lifespan of the pipeline as new users are identified and approved to expand water reuse.

A staging area would be required during the construction phase of the project. Two proposed construction staging areas are identified for planning purposes, although the preferred site would be selected by the construction contractor during the design phase. The two proposed staging areas



Proposed Water Line Alignment

Figure 2-3

Ewa Villages R1 Water Main Replacement

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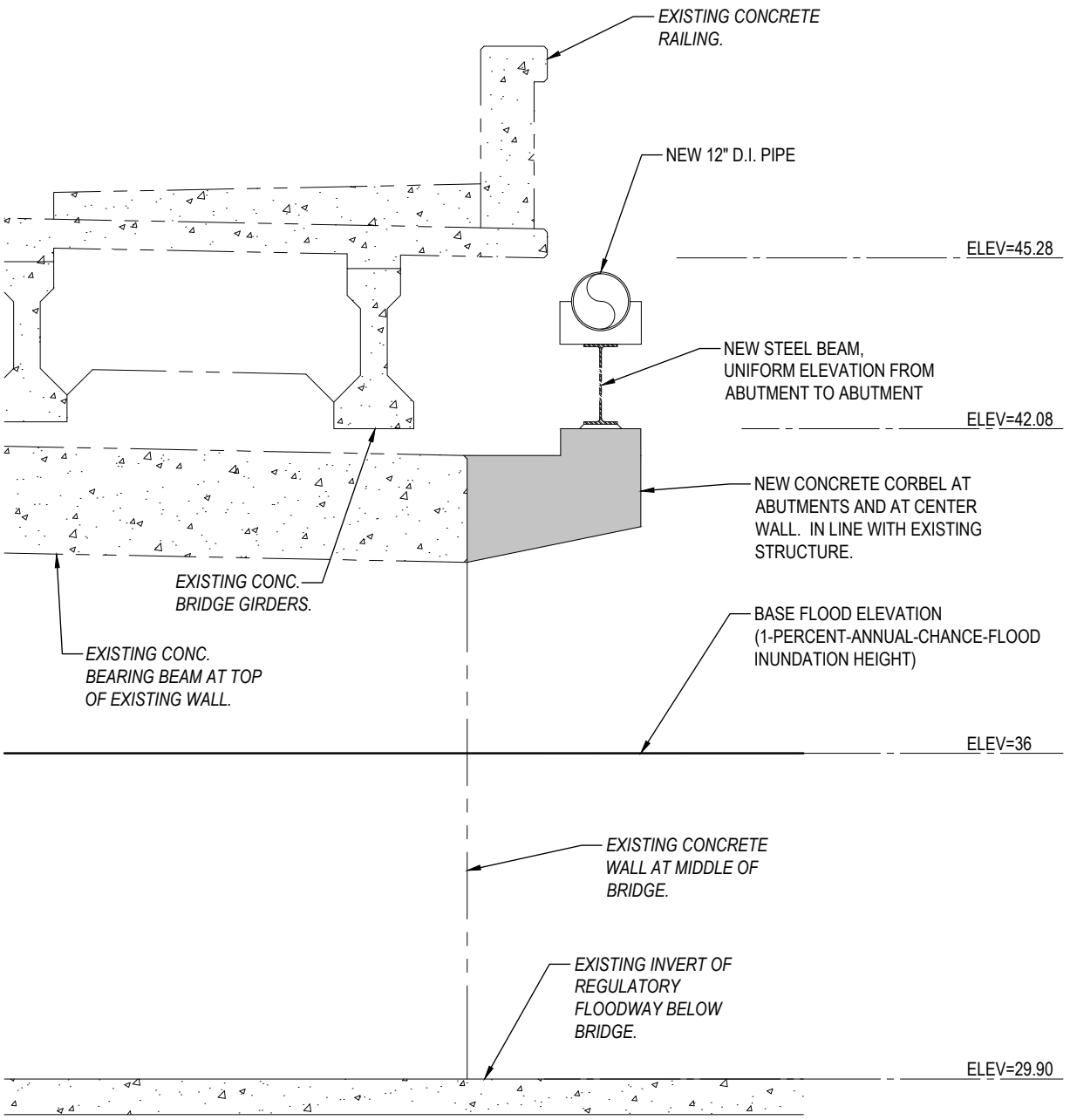

Source: Shigemura, Lau, Sakanashi, Higuchi and Associates, Inc. September 2019

Proposed Renton Road Bridge Pipe Support System **Figure 2-4**

Ewa Villages R1 Water Replacement Line

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include: 1) Open, bare land southeast of Leialoalo Street and Paionia Street within TMK (1) 9-1-126:014 and 2) Open area approximately 600 feet northeast of the proposed Park Row point of connection directly south of Renton Place within TMK: (1) 9-1-126:003. The staging areas would have perimeter security barriers, BMPs, possible construction trailers, construction equipment, and storage of materials. After completion of the project, the site will be restored to the original condition or better.

The proposed alignment is subject to change based on on-going consultations with the various county agencies involved in approving the permit plans and the input from owners of property easements.

All work would occur on City-owned property, with the exception of the western connection which is on property owned by DHHL. Construction staging and storage would be directed to one of two City-owned properties on Renton Road: either the vacant property fronting Varona Village directly across from Leialoalo Street (TMK Parcel 9-1-126: 014) or the open/underutilized space next to the 'Ewa Plantation Manager's Home roughly 0.2 miles northeast of the project area (TMK Parcel 9-1-126: 003). Construction would consist mainly of trenching to install the new water line, followed by backfill, resurfacing and new landscaping to restore disturbed areas to the existing condition or better.

Upon completion of construction, the new water line would be dedicated to BWS. The existing R-1 pipes from the 'Ewa Villages Golf Course irrigation pond to the isolation valves fronting the golf course clubhouse would be abandoned in place and the isolation values would remain shut. Construction is anticipated to take six months to complete at an estimated cost of $3 million, with funding provided by HUD and City programs.

2.4 REGULATORY OVERVIEW

This EA has been prepared based upon federal and state laws, statutes, regulations, and policies that are pertinent to the implementation of the proposed action, including the following:

- NEPA (42 USC sections 4321 et seq), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508)
- HUD Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities (24 CFR Part 58), which provides policy for implementing CEQ regulations and NEPA
- Clean Air Act (42 USC section 7401 et seq.)
- Clean Water Act (33 USC section 1251 et seq.)
- Coastal Zone Management Act (CZMA) (16 USC section 1451 et seq.)
- National Historic Preservation Act (NHPA) (as amended) (54 USC section 306108 et seq.)
- Endangered Species Act (ESA) (16 USC section 1531 et seq.)
- Safe Drinking Water Act of 1974 (SDWA) (42 USC section 300f et seq.)
- Migratory Bird Treaty Act (16 USC sections 703-712)
- Executive Order 11988, Floodplain Management

- Executive Order 11990, Protection of Wetlands
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Chapter 343, HRS, and Title 11, Chapter 200.1 HAR

A description of the Proposed Action's consistency with the relevant laws, policies and regulations, and regulatory agencies responsible for their implementation, is presented in Chapter 5.

2.4.1 Environmental Permits and Required Approvals

Table 2-2 lists the Federal, State and County permits and approvals that may be required for the Proposed Action. The City Department of Budget and Fiscal Services (BFS) has delegated authority from HUD to ensure compliance with NEPA and other related federal laws and authorities required under 24 CFR 58.5 and 58.6.

Table 2-2
Permits and Approvals Required

Permit/Approval/Consultation	Agency
Federal	
National Environmental Policy Act, Finding of No Significant Impact (NEPA FONSI) or Notice of Intent to prepare Environmental Impact Statement	Housing and Urban Development (delegated to the City and County of Honolulu Department of Budget and Fiscal Services)
Section 106, National Historic Preservation Act consultation	State Historic Preservation Officer Office of Hawaiian Affairs
Section 7, Endangered Species Act consultation	U.S. Fish and Wildlife
State of Hawai'i	
CWA, Section 402, National Pollutant Discharge Elimination System Permit	State of Hawai'i Department of Health, Clean Water Branch
Air Quality Permit	State of Hawai'i Department of Health, Clean Air Branch
City and County of Honolulu	
Chapter 343, Hawai'i Revised Statutes Environmental Review and Determination	City and County of Honolulu Department of Facility Maintenance (proposing agency)
Construction Plan Approval	City and County of Honolulu Board of Water Supply
Engineering and Construction Permits	City and County of Honolulu Department of Planning and Permitting
Street Usage Permit	City and County of Honolulu, Department of Transportation Services

3. NATURAL AND PHYSICAL ENVIRONMENT

3.1 CLIMATE

3.1.1 Existing Conditions

Located at the northern edge of the tropics, the Hawaiian Islands enjoy a moderate climate with almost continual trade winds. Generally, the islands' climate has little day-to-day and month-to-month variability. Situated on the southern, leeward side of O'ahu, the 'Ewa Plain (where the project area is located) is known to be sunny and dry with relatively low rainfall. Historical data from the 'Ewa Plantation 741 recording station shows monthly temperatures range from a low of 61 degrees Fahrenheit (°F) in January-February to a high of 88°F in August. Total annual rainfall averages about 21.5 inches per year. The historic monthly average rainfall varies from a low of roughly 0.4 inches during the summer (June) to a high of 4.2 inches during winter (January) (wrcc.dri.edu/cgi-bin/cliMAIN.pl?hi0507).

Trade winds flowing from the northeast to the southwest are the prominent air circulation feature across Hawai'i. The trade winds in the project area typically range from 15 to 25 mph, with gusts upwards of 35 mph (City and County of Honolulu Department of Environmental Services 2018). In general, trade winds are present between 80% to 95% of the time between May and September, and become less consistent between October through April (wrcc.dri.edu/narratives/HAWAII.htm). Extremely high winds occur only occasionally and then only as a result of a major storm, which mostly occur during the winter season and may yield high winds from any direction.

3.1.2 Potential Impacts and Mitigation

Both the Proposed Action and the No Action Alternative consist of primarily underground systems that have a limited number of aboveground valves and fixtures that would be exposed to the climate. Neither alternative would have an impact on climate, although the Proposed Action would provide the additional benefit of a more flexible watering usage schedule which would ultimately promote better, more consistent watering of landscaped areas to contribute to cooler temperatures. Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Shaded surfaces, for example, may be 20°F to 45°F cooler than the peak temperatures of unshaded materials. Evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by as much as 9°F (epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands). Since the Proposed Action would not have the same restrictions on watering hours as the No Action Alternative, the Proposed Action would improve the City's ability to regularly water and maintain the shade trees, lawns and landscaping features within the 'Ewa Villages service area, which is a key component to reducing surface and air temperatures associated with urban heat islands.

3.2 TOPOGRAPHY AND SOILS

3.2.1 Existing Conditions

The project site, which is relatively flat, slopes slightly from the west to east with ground elevations ranging from roughly 52 to 44 feet above mean sea level (MSL). The highest elevation within the project site—at roughly 52 feet above MSL—is near the proposed connection point to the existing 16-inch R-1 line at the west end of Renton Road. The central portion of the project area near Kapolei Parkway slopes

slightly to an elevation of roughly 44 feet above MSL, and gradually rises to an elevation of roughly 47 feet above MSL at the east end between Alaiki Street and Park Row.

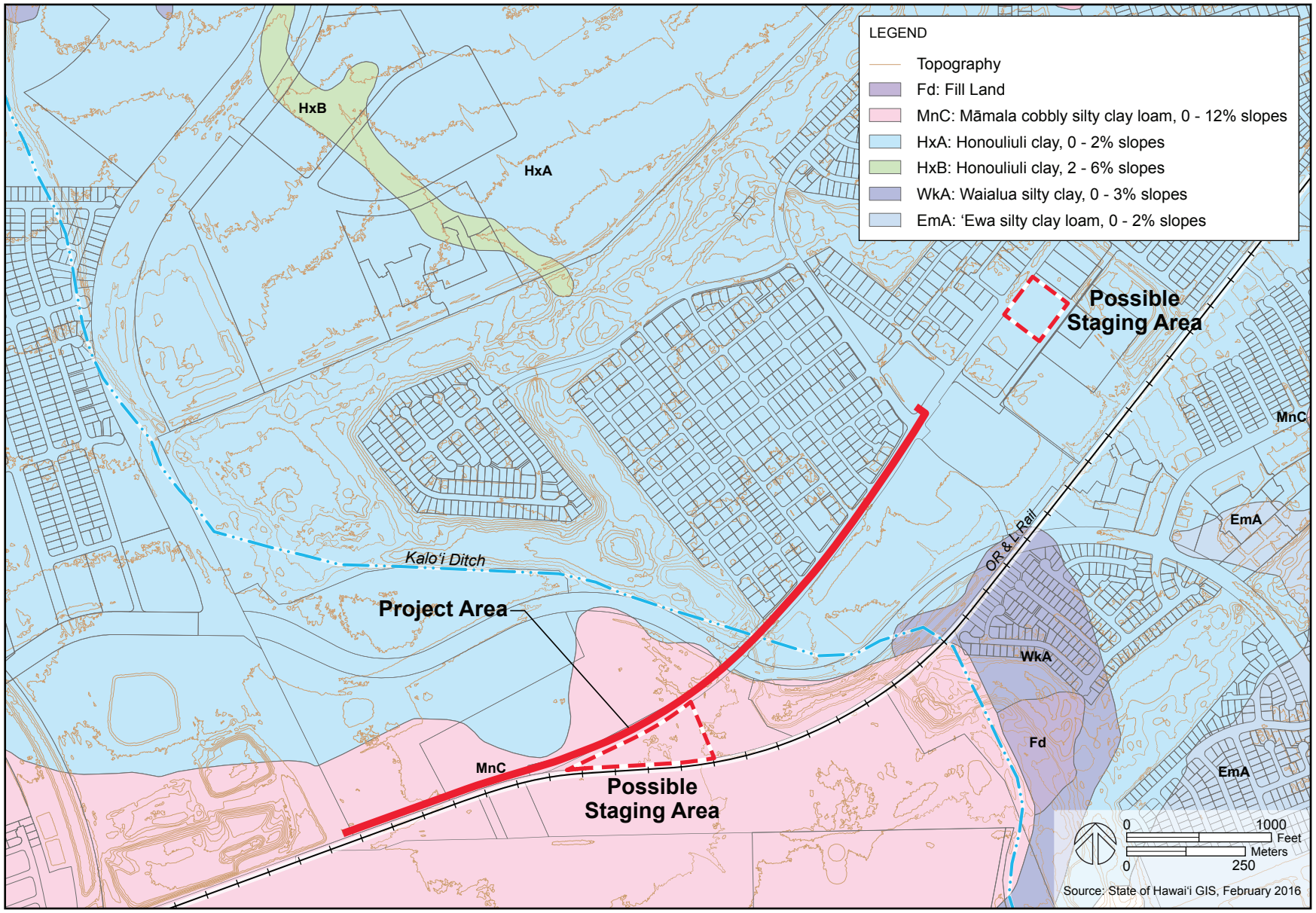
The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) classifies the soils within the project area as Honouliuli clay, 0 to 2 percent slopes (HxA) and Mamala cobbly silty clay loam, 0 to 12 percent slopes (MnC) (see Figure 3-1). The Honouliuli series consists of deep, well drained soils that formed in alluvium weathered from basic igneous rock. The Mamala series consists of shallow, well drained soils that formed from alluvium deposited over coral limestone and consolidated calcareous sand. Honouliuli clay, 0 to 2 percent slopes (HxA) is found on the eastern half of the project area including Kapolei Parkway to Park Row. This soil profile is dark reddish-brown, very sticky and very plastic clay throughout, with a high shrink-swell potential. Permeability is moderately slow, runoff is slow, and the erosion hazard is no more than slight. Mamala cobbly silty clay loam, 0 to 12 percent slopes (MnC) is found on the western half of the project area from the connection at the existing 16-inch R-1 main to the west edge of Kapolei Parkway. This soil profile is characterized by a surface layer that is dark reddish-brown stony silty clay loam, a subsoil that is dark reddish-brown silty clay loam, and a substratum comprised of coral limestone and consolidated calcerous sand. The shrink-swell potential is low, while permeability is moderate, runoff is very slow to medium, and the erosion hazard is slight to moderate.

The University of Hawaiʻi Land Study Bureau (LSB) prepared an inventory—the *Detailed Land Classification-Island of Oʻahu* (1972)—that evaluated the quality of lands outside the State Urban District for their potential crop productivity and suitability for agricultural use. The LSB land type classifications provide an overall productivity rating that ranges from A to E, with A representing the highest productivity and E representing the lowest. Portions of Renton Road within the western half of the project area are classified by the LSB: this includes roughly 1,000 feet extending from the western project area boundary which has the highest agricultural productivity rating (A: Excellent); 720 feet in the vicinity of Kapolei Parkway which has the second highest productivity rating (B: Good); and roughly 400 feet across from Varona Village (east from Haakei Street) which has the lowest productivity rating (E: Very Poor). The remaining soils were not classified and do not have an LSB rating (see Figure 3-2).

The Agricultural Lands of Importance in the State of Hawaiʻi (ALISH) land classification system, which was developed by the State Department of Agriculture, establishes three classes of agricultural land: Prime, Unique and Other Agricultural Land. Most of the project area has not been classified under the ALISH system. The western end of the project area is classified as “Other” by ALISH, and the central portion surrounding Kapolei Parkway (between Paalua Street and Orrick Street) includes a 40-foot segment classified as “Other” and an 800-foot segment classified as “Prime”. The remainder of the project area is Unclassified (see Figure 3-3).

3.2.2 Potential Impacts and Mitigation

The No Action Alternative would not impact existing soil or topographic conditions since no construction activities would occur and the ground surface would remain unchanged.



NRCS Soil Classifications and Topography **Figure 3-1**

Ewa Villages R1 Water Main Replacement

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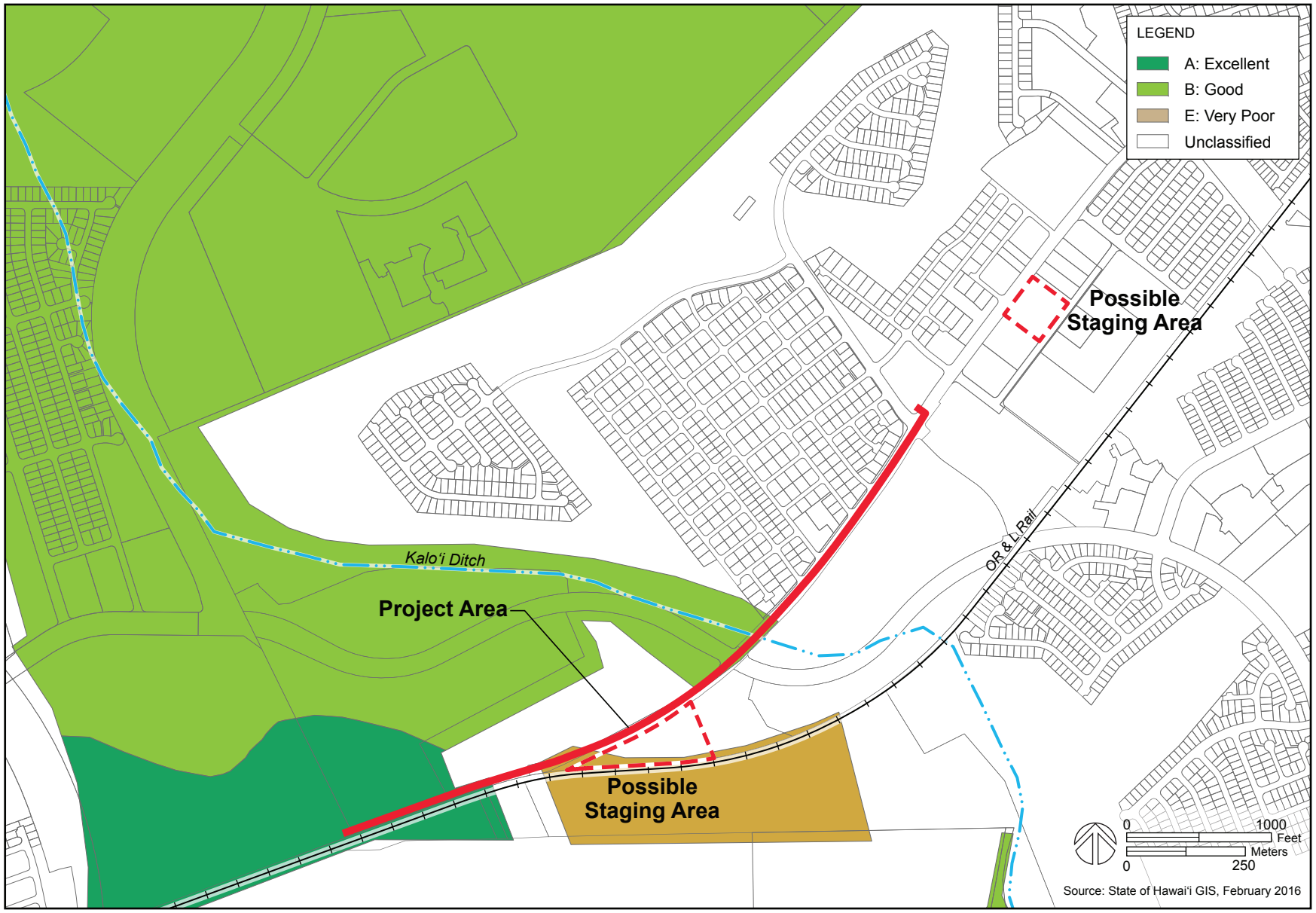

Land Study Bureau (LSB) Soil Ratings **Figure 3-2**

Ewa Villages R1 Water Main Replacement

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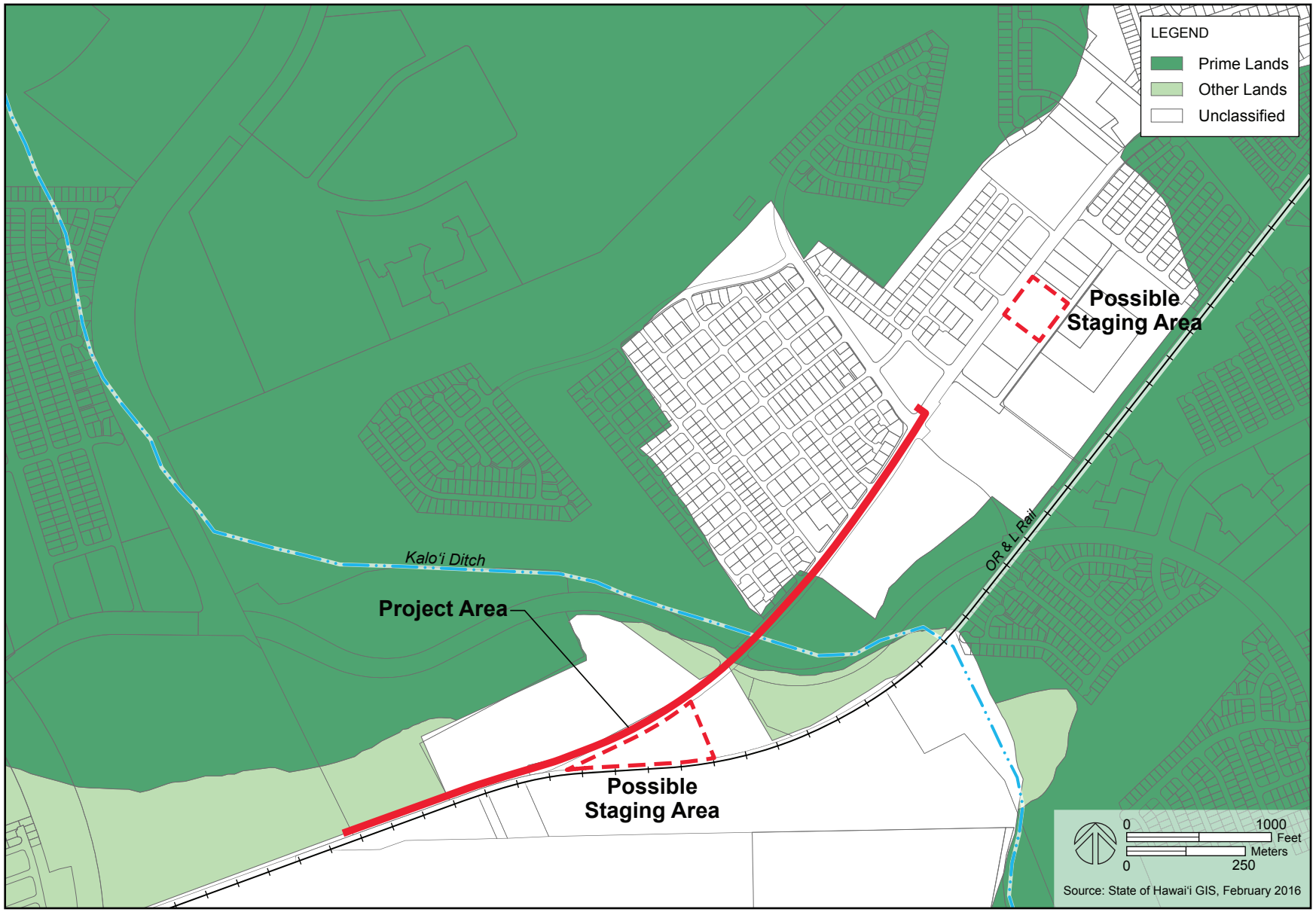

Agricultural Lands to Importance to the State of Hawai'i (ALISH) Classifications **Figure 3-3**

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The existing topography of the project area is relatively level, and soil types are not highly susceptible to erosion and runoff. Although small sections of the soils within the project area are rated highly for agricultural use by both the LSB inventory and the ALISH system, the project area follows the Renton Road row, which is characteristically a major thoroughfare in an urbanized area that has been previously disturbed and is no longer used for agricultural production. Additionally, the entire project area and adjacent lands are designated for urban use in the City's long range land use plan (i.e., the 'Ewa Development Plan, see Section 5.2.2), and are not planned for future agricultural production.

Construction of the proposed water line would require trenching between the two points of connection to install the water line below-grade. Existing soils would be excavated to install the new main and associated pipe cushion, with backfill consisting of crushed rock for trench stabilization and soil cover to subgrade level. Upon completion of the water line installation, the existing ground would be restored to existing condition or better. Excavated soils would be used as general backfill material to the extent practical. The use of erosion and sediment control BMPs would minimize potential impacts from soil erosion and fugitive dust emissions. Prior to construction activities, temporary erosion control measures would be installed to control soil erosion and prevent run-off from entering nearby drainage structures and systems. Recommended best management practices (BMPs) include the use of silt fences, filter socks, and sediment control filters at drain inlets and catch basins, frequent watering and phasing work in sections to minimize exposure.

3.3 GROUND AND SURFACE WATER RESOURCES

3.3.1 Existing Conditions

The project area is located within the Kalo'i watershed, which extends from the Wai'anae mountain range above Makakilo through the 'Ewa plains to the ocean. Covering a land area of approximately 11 square miles, the watershed has a maximum elevation of 2,572 SF and is drained by two non-perennial streams (Kalo'i Stream and Hunehune Stream) (hawaiiwatershedatlas.com/watersheds/oahu/34022.pdf). In the vicinity of the project area, Kalo'i Stream crosses under Renton Road roughly 100 feet to the east of the Kapolei Parkway intersection. The stream gulch in this area appears as a concrete-lined drainage channel that is normally dry. The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (2019) defines the drainage channel as a Palustrine Scrub-Shrub Broad-Leaved Evergreen Temporary Flooded wetland (PSS3A classification code). Except for the 'Ewa villages golf course irrigation pond which is designed to receive storm drainage flows from adjacent developed areas, there are no other surface water features in the vicinity of the project area.

The groundwater beneath the project area is associated with the Waipahu-Waiawa Aquifer System Area of the Pearl Harbor Aquifer Sector Area. The Pearl Harbor Aquifer Sector Area is a regional groundwater unit that extends from Ko Olina in the west to Moanalua in the east. Three basal aquifer system areas—Waimalu, Waipahu-Waiawa, and 'Ewa-Kunia—make up the larger sector area. Based on the sustainable

yield of the three aquifer system areas, the Pearl Harbor Aquifer Sector Area has a total sustainable yield of 165 million gallons per day (mgd).[2]

Overlying the basal aquifer is the 'Ewa Caprock aquifer, which stretches across the lower 'Ewa plain between Kahe Point and West Loch (Honolulu Board of Water Supply 2017). The project area is within the 'Ewa Caprock-Pu'uloa aquifer system, which is the largest of the three aquifer systems that make up the larger 'Ewa Caprock aquifer. Because water in the caprock is brackish and not suitable for human consumption, the 'Ewa caprock aquifer is strictly a non-potable aquifer to support irrigation and industrial uses. Unlike the sustainable yield of the basal aquifer systems based on withdrawal limits, the sustainable yield of the 'Ewa caprock aquifer is set by a chloride limit of 1,000 milligrams per liter (mg/L) for individual wells. The caprock aquifer has shrunk and shown an increase in salinity since the sugar plantations closed and no longer irrigate the area (i.e., loss of aquifer recharge). Without any modifications, the caprock aquifer may become saltier over time and may become unsuitable for irrigation at current pumping levels.

Both the Pearl Harbor Aquifer and the 'Ewa Caprock Aquifer are designated as groundwater management areas (WMAs) subject to regulation by the State Commission on Water Resource Management (CWRM). Any water withdrawal from a WMA for non-domestic use requires approval of a water use permit from CWRM. The Pearl Harbor Aquifer is also part of the Southern O'ahu Basal Aquifer as designated under the U.S. Environmental Protection Agency (EPA) Sole Source Aquifer Program. The EPA designation as a sole source aquifer is associated with the aquifer's function supplying at least 50 percent of the drinking water for O'ahu's service area and the absence of reasonably available alternative drinking water sources should the aquifer become contaminated. EPA review is required for federal financially-assisted projects within the sole source aquifer area which have the potential to contaminate the aquifer. Projects that lie outside the sole source aquifer project review area or that do not receive federal financial assistance are not subject to EPA review.

The Underground Injection Control (UIC) program administered by the DOH serves to protect the quality of Hawaii's underground sources of drinking water from chemical, physical, radioactive and biological contamination that could originate from injection well activity. Through the UIC line, the DOH regulates the location and use of injection wells to protect aquifers that are designated as underground sources of drinking water from being contaminated by injected fluids. In general, the groundwater above or inland (mauka) of the UIC line is considered a potential source of drinking water that could be contaminated by the injection of fluids into the ground, and the groundwater below or seaward (makai) of the UIC line is <u>not</u> considered to be a potential source of drinking water. The project area is mauka of the UIC line (i.e., within the area where the underlying groundwater is considered a potential source of potable water).

3.3.2 Potential Impacts and Mitigation

The No Action Alternative would not impact existing water resources since no construction activities would occur and current conditions would remain unchanged. However, continued use of the existing

[2] The Commission of Water Resources Management (CWRM) determines sustainable yield values, which represent the maximum level of withdrawal permissible for each aquifer system. The sustainable yield for the aquifer systems in the Pearl Harbor Aquifer Sector Area is as follows: Waimalu (45 million gallons per day (mgd)), Waipahu-Waiawa (104 mgd) and 'Ewa-Kunia (16 mgd).

R-1 distribution system would prolong the frequent occurrence of pipe joint and sprinkler head breaks that result in unnecessary water loss.

Like the No Action Alternative, the source of water (from HWRF), the service area and end users, and the amount of water used would remain the same for the Proposed Action as current conditions. The Proposed Action is limited to the installation of a new water line to replace the existing R-1 delivery system. There are no activities involved in the Proposed Action that withdraw or affect ground or surface water resources from an aquifer or stream, so there would be no impact to existing water resources.

No impact to Kalo'i Stream would occur with development of the Proposed Action. The proposed water line would be structurally mounted to the bridge that passes above Kalo'i Gulch (see Section 2.3.3 for proposed pipe support system), and would therefore be elevated away from the drainage channel and USFWS designated wetland. To minimize potential impacts from stormwater runoff and erosion entering Kalo'i Stream and nearshore areas, construction activities would implement and maintain BMPs designed to minimize soil erosion and also prevent construction debris from entering the stream channel and drainage ways. A NPDES permit and a Storm Water Pollution Prevention Plan would be required for the construction activities since the disturbed area (i.e., the water line trenching and staging areas) would exceed one acre. Based on available information, there is not anticipated to be any need for dewatering onsite.

3.4 NATURAL HAZARDS

3.4.1 Earthquake Hazards

Earthquakes can cause extensive property damage and endanger lives, with earthquake-related injuries resulting from collapsing buildings and bridges, fire from broken gas and power lines, flooding from ruptured water and drainage systems, landslides and debris falls (fema.gov/earthquake/why-earthquakes-occur). In Hawai'i, earthquakes are mainly associated with volcanic activity resulting from magma movement beneath the earth's surface and have been historically concentrated around Hawai'i Island where volcanic activity is highest.

3.4.1.2 Existing Conditions

Earthquake hazard maps produced by the U.S. Geological Services Earthquake Hazards Program are used as planning tools in designing buildings, bridges, highways and utilities to withstand shaking associated with earthquake events (Hawai'i Emergency Management Agency 2018). The Seismic Hazard Maps indicate that all islands across the state have low levels of seismic hazard, except for Hawai'i Island which has intermediate levels of seismic hazard.

3.4.1.2 Potential Impacts and Mitigation

Impacts associated with earthquake hazards are minimal for both the No Action Alternative and the Proposed Action. Neither alternative involves the construction of major structures that could be damaged or pose a threat to occupants during an earthquake. Furthermore, since the majority of the water line is an underground system with limited valves and fixtures located aboveground in both alternatives, the potential impacts from shaking during an earthquake would be further minimized.

The new water line constructed under the Proposed Action would be designed to current standards for earthquake events. This increases the possibility that the new water line would withstand an earthquake event better than the existing system.

3.4.2 Hurricane Hazards

A hurricane is a tropical cyclone with maximum sustained winds of 74 miles per hour or higher. Major hazards associated with hurricanes are excessive rainfall and inland flooding, strong winds, storm surge and shoreline erosion, and tidal and coastal flooding. Hawai‘i experienced the destructive force of a hurricane when Hurricane Iniki struck the island of Kaua‘i in 1992 with sustained winds of 130 mph and caused $2.3 billion in property damage (Businger 1998).

3.4.2.1 Existing Conditions

According to the *2015 Hawai‘i Catastrophic Hurricane Plan/FEMA Region IX Hawai‘i Catastrophic Annex*, a hurricane of any size and duration may pose a threat to the infrastructure, environment and economy and impact the daily lives of residents, primarily because of Hawai‘i’s geographic isolation and dependency on imported goods, and the concentration of developments along coastal shores (Hawai‘i Emergency Management Agency 2018).

3.4.2.2 Potential Impacts and Mitigation

Impacts associated with hurricane hazards are minimal for both the No Action Alternative and the Proposed Action. Neither alternative involves the construction of major structures that could be damaged or pose a threat to occupants during a hurricane. Furthermore, since the majority of the water line is an underground system with limited valves and fixtures located aboveground in both alternatives, the potential impacts from storm damage during a hurricane would be further minimized.

3.4.3 Tsunami Hazards

A tsunami is a series of large, long ocean waves generated by an underwater disturbance such as an earthquake, landslide or volcanic eruption. Tsunamis strike with devastating force and quickly flood all low-lying coastal areas, threatening all life and property along or near the coastline. In general, areas less than 25 feet above sea level and within a mile of the shoreline are at greatest risk of tsunami inundation. While drowning is the most common cause of death associated with tsunamis, hazards associated with tsunamis include flooding, contamination of drinking water and fires from gas lines or ruptured tanks (Hawai‘i Emergency Management Agency 2018).

3.4.3.1 Existing Conditions

The project area is located nearly two miles inland from the nearest shoreline and is not subject to tsunami threat. The Tsunami Evacuation Zone Maps prepared by the City Department of Emergency Management (March 2017) identify three zones: a tsunami evacuation zone where most of O‘ahu’s tsunami warning events will occur; an extreme tsunami evacuation zone for very large (magnitude 9+) earthquake and tsunami; and a safe zone that provides guidance for the minimum safe evacuation distance. Tsunami Evacuation Zone Map 17, Inset 2 Kahe Point to ‘Ewa Beach places the project area within the safe zone.

3.4.3.2 Potential Impacts and Mitigation

Neither the No Action Alternative nor the Proposed Action would experience impacts from a tsunami. The project area is located outside a designated tsunami evacuation zone.

3.4.4 Flood Hazards

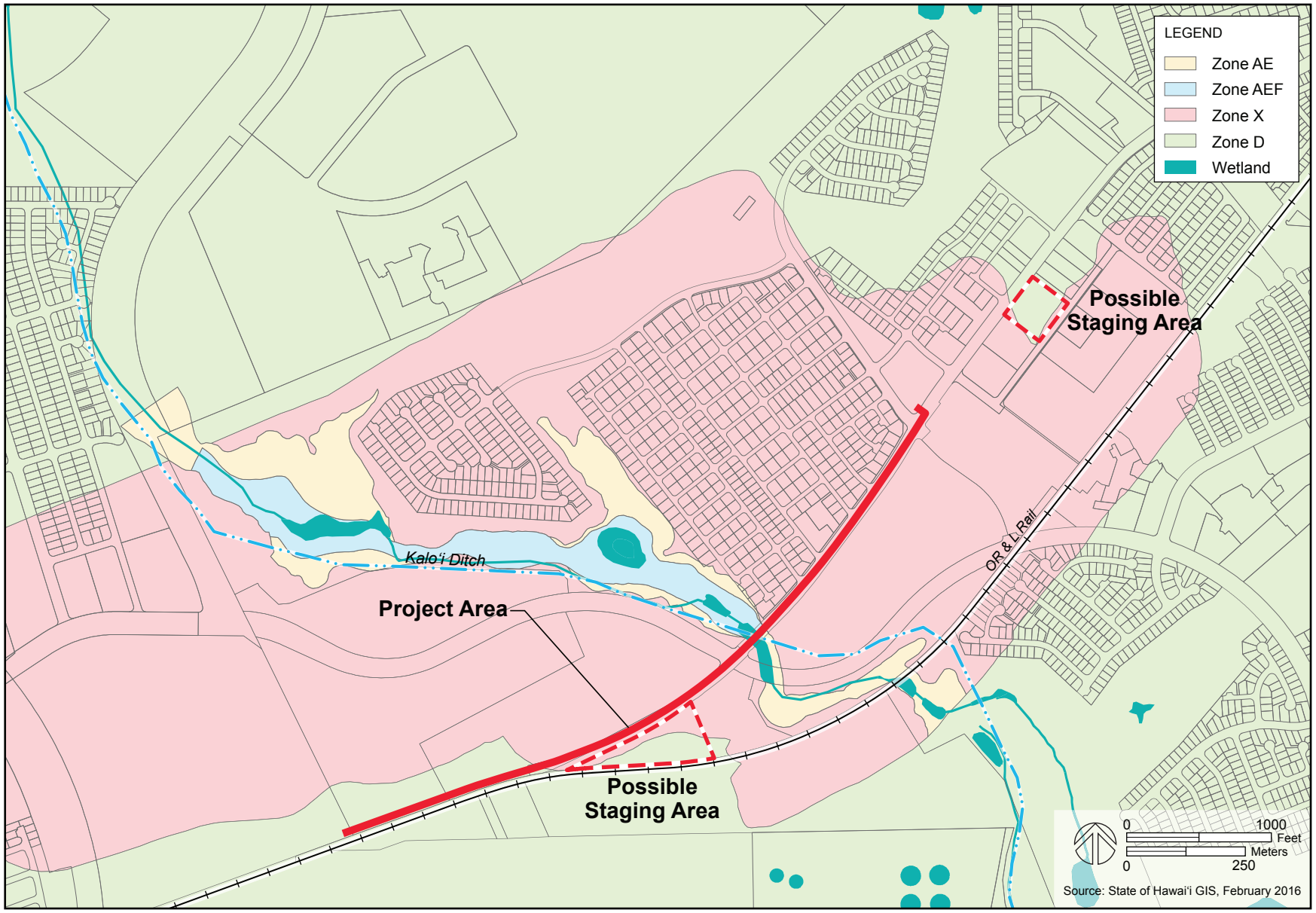
3.4.4.1 Existing Conditions

The Federal Emergency Management Agency (FEMA) classifies flood hazard zones as part of the Flood Insurance Program for the City and County of Honolulu. As shown in Figure 3-4, the Flood Insurance Rate Map (FIRM), Map Panel Number 15003C0310G effective date of January 19, 2011 places the majority of the project area in Zone X, which is defined as an area outside the 0.2 percent chance of flooding (outside the boundaries of the 100 and 500-year floodplains). Roughly 750 feet along the western length of the project area (to the west of Haakei Street) is in Zone D, defined as unstudied areas where flood hazards are undetermined but flooding is possible. Only the central portion of the project area surrounding Kaloʻi Gulch (east of Kapolei Parkway) is located within the 100-year floodplain (Zone AE and Zone AEF).

3.4.4.2 Potential Impacts and Mitigation

The No Action Alternative would not impact existing flood hazard conditions since no construction activities would occur and the ground surface would remain unchanged.

No significant flood hazards or impacts to existing flood hazard conditions would occur with construction of the Proposed Action since the existing topography and regional drainage pattern would not be altered. The proposed water line would be structurally mounted to the bridge that passes above Kaloi Gulch, and would therefore be elevated away from the flood zone. Figure 2-4 (see Section 2.3.3.) illustrates the proposed pipe support system across the Renton Road Bridge, which would be in line with the existing bridge structure. Figure 3-5 shows a graphic representation of the base flood elevation in relation to the proposed pipe support system. With the base flood elevation of 36 feet at this location, all of the new pipe support system, including the concrete corbels would be above the one percent annual chance floodplain and would not change the hydrology at this location.



Flood Zones

Figure 3-4

Ewa Villages R1 Water Main Replacement

Environmental Assessment

City and County of Honolulu Department of Facility Maintenance

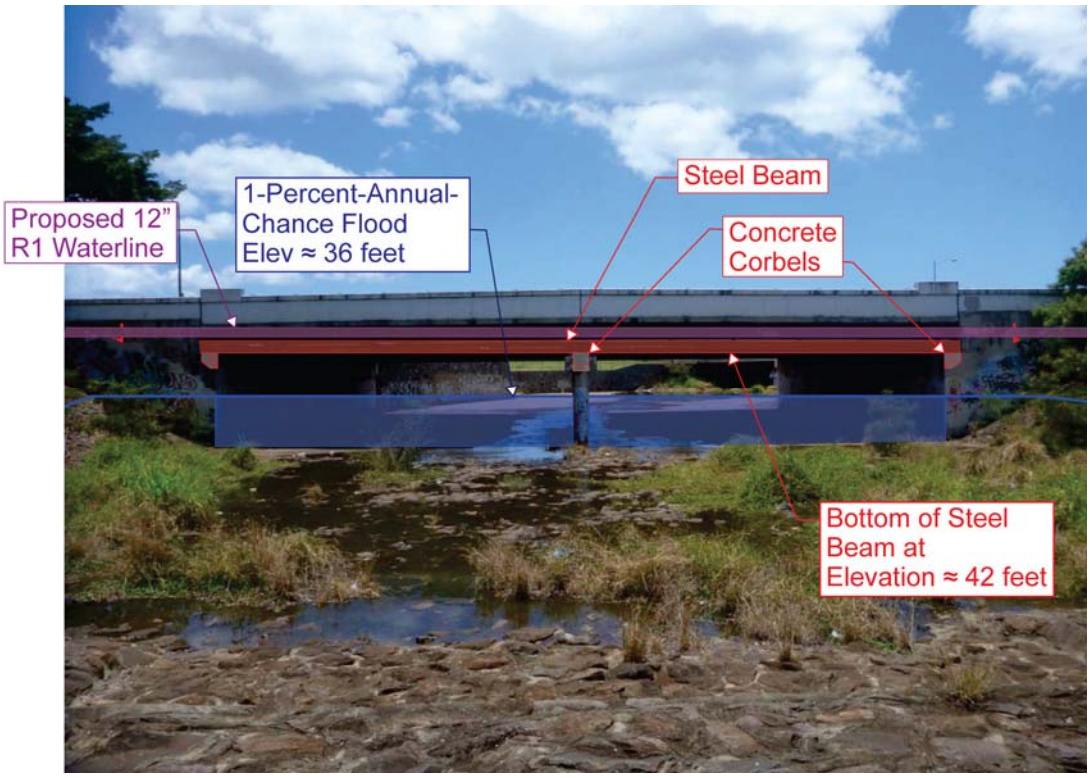


Figure 3-5 Base Flood Elevation at Kalo'i Gulch

3.4.5 Sea Level Rise and Climate Change

Climate change is a long-term shift in patterns of temperature, precipitation, humidity, wind and seasons. Scientific data show that earth's climate has been warming and mostly attributable to rising levels of carbon dioxide and other "greenhouse gases" generated by human activity. These changes are already impacting Hawai'i and the Pacific Islands through rising sea levels, increasing ocean acidity, changing rainfall patterns, decreasing stream flows, and changing wind and wave patterns.

3.4.5.1 Existing Conditions

In accordance with the findings and recommendations of the City's Climate Change Commission[3], Mayor Kirk Caldwell issued Directive 18-02 (July 16, 2018) to establish policies to address, minimize risks from and adapt to the impacts of climate change and sea level rise (SLR). All City departments and semi-autonomous agencies are required to take a proactive approach in both reducing greenhouse gas emissions and adapting to impacts caused by SLR, and to align programs wherever possible to help protect and prepare the infrastructure, assets, and citizens of the City for the impacts of climate change. The SLR Guidance authored by the City's Climate Change Commission recommends a planning benchmark for high tide flooding associated with 3.2 feet of SLR by mid-century and to consider a

[3] Findings and recommendations of the City Climate Change Commission are presented in the *Sea Level Rise Guidance* and *Climate Change Brief* (both adopted on June 5, 2018) and the *Hawai'i Sea Level Rise and Adaptation Report* (Hawai'i Climate Change Mitigation and Adaptation Commission, 2017).

planning benchmark up to 6 feet SLR toward the end of 2100 for critical infrastructure projects (City and County of Honolulu, 2018).

The project area is within a highly developed urban area roughly two miles inland of the shoreline, and is not susceptible to stream flooding or inundation that may occur as a result of SLR. The Hawai'i Sea Level Rise Viewer pacioos.hawaii.edu/shoreline/slr-hawaii/ shows the project area to be unaffected by inundation predicted for the 3-foot SLR exposure area. Similarly, the National Oceanic and Atmospheric Administration SLR viewer (coast.noaa.gov/slr/#/layer/slr/6/-17592330.803774867/2430606.7304975158/15/satellite/none/0.8/2050/interHigh/midAccretion) shows the project area to be unaffected by inundation projected for the 6-foot SLR inundation scenario.

3.4.5.2 Potential Impacts and Mitigation

Based on the location of the project area outside the predicted 3-foot SLR exposure area and the 6-foot SLR inundation scenario, neither alternative (i.e., the No Action Alternative and the Proposed Action) would be subject to stream flooding or inundation associated with sea level rise.

The No Action Alternative does not generate large amounts of greenhouse gas emissions that contribute to climate change. At most, greenhouse gas emissions produced by the No Action Alternative come from electrical generation needed for pumping, treating and transporting the water. The Proposed Action would use similar amounts of electricity and generate similar amounts of greenhouse gas emissions during operation, but would also result in short-term increases in greenhouse gas emissions from the use of fossil-fueled construction equipment and construction worker commuting to the job site. The increase in emissions is unavoidable; the use of BMPS would help to control emissions.

The demand for irrigation water is likely to increase as temperatures increase and precipitation become more variable (U.S. Department of the Interior Bureau of Reclamation 2013). Both the No Action Alternative and Proposed Action provide the beneficial impact of supporting non-potable water delivery to conserve limited potable water sources. The Proposed Action also provides the additional benefit of an upgraded water delivery system that contributes to better irrigation practices, which in turn supports maintaining vegetated areas and trees that contribute to sequestering carbon.

3.5 BOTANICAL RESOURCES

3.5.1 Existing Conditions

A survey of the proposed water line alignment was conducted to inventory the flora and provide a general description of the existing vegetation, search for threatened and endangered species and species of concern, and provide recommendations regarding potential impacts to the plant resources in regards to the proposed project (LeGrande, 2019). The findings of the survey are summarized in this section and in Section 3.5.1.

The project area has been altered from its natural state by human use, which has included agricultural activities, urban development, and roadway and rail construction. The entire survey area is characterized as a disturbed weedy grass land with scattered trees. Maintained and/or mowed lawns and scattered trees and shrubs dominate large sections of the survey area. The field survey noted a total of 56 observed plant species. Of these, 54 are alien (introduced) and 2 are indigenous (native to the

Hawaiian Islands and elsewhere). No threatened or endangered species were observed during the survey. An inventory of all the plants observed within the survey area is included in the botanical assessment report (see Appendix A).

The dominant plant species were non-native including, opiuma (*Pithecellobium dulce*), kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), buffelgrass (*Cenchrus ciliaris*), Guinea grass (*Panicum maximum*), castor bean (*Ricinus communis*), common sandbur (*Cenchrus echinatus*), and Australian saltbush (*Atriplex semibaccata*). The few native plants observed included the indigenous 'uhaloa (*Waltheria indica*) along with a few 'ilima (*Sida fallax*) at the western tie in area near Ka Makana Ali'i Shopping Center. The alignment of Renton Road east of Kapolei Parkway is characterized by planted street trees such as banyan (*Ficus microcarpa*), *Tabebuia* sp., and fiddlewood (*Citharexylum caudatum*). Maintained grassy strips between the street and sidewalk were observed on both sides of the roadway. Other planted ornamental species include hibiscus (*Hibiscus* sp.), croton (*Codiaeum variegatum*), and mock orange.

The western construction staging area across from Haakei Street is dominated by buffelgrass and kiawe, opiuma, and koa haole trees. The eastern construction staging area fronting the Manager's Mansion along Renton Road is characterized by maintained lawns and scattered monkeypod trees.

No critical habitat is designated within the project area. An area of mapped wetlands located at the southeastern corner of Kapolei Parkway and Renton Road is defined as a Freshwater Forested/Shrub Wetland (PSS3A) by the USFWS National Wetland Inventory (2019) (see Section 3.3.1). In actuality, this concrete basin is currently used for drainage serving the broader region of Kapolei.

3.5.2 Potential Impacts and Mitigation

The No Action Alternative would not impact existing botanical resources since no construction activities would occur and there would be no change to existing conditions.

Construction associated with the Proposed Action would not have an adverse impact on threatened or endangered plant species or critical habitat. No threatened, endangered or candidate listed plant species protected by Federal or State regulations are known to exist on or adjacent to the project area. Likewise, there is no federally delineated critical habitat within or adjacent to the project area.

Construction activities would be generally located within the road ROW, which, due to its urbanized nature and previous disturbance by agricultural activity, does not contain any sensitive botanical resources. The unpaved western portion of the project area is characterized by undeveloped open land, and the paved portion of Renton Road consists of street trees and maintained landscaped areas. Although existing vegetation along the water line route would be temporarily disturbed during construction, the contractor would restore disturbed areas to their pre-construction condition. Mature trees that line Renton Road within the project area would not be damaged during construction; the proposed water line has been sited to avoid removal of any trees.

Use of the R-1 water under the Proposed Action would not impact existing biological resources since the landscaped areas within the project area are currently being irrigated with the R-1 water. The use of and exposure to the R-1 water would remain the same as current conditions.

3.6 TERRESTRIAL FAUNAL RESOURCES

3.6.1 Existing Conditions

Avian and terrestrial mammalian surveys were conducted for the proposed water line alignment to determine the presence of any avian and terrestrial mammalian species currently listed, or proposed for listing under the federal or State of Hawaiʻi endangered species statutes within or adjacent to the project area (Rana Biological Consulting, 2019). The findings of the survey are summarized in this section and in Section 3.6.2. The survey report is presented in Appendix B.

Avian Survey

Four avian point count stations were sited roughly equidistant from each other along the water line route, and a fifth count station was sited in the middle of the eastern construction staging area fronting the Manager's Mansion. A total of 629 individual birds of 22 species, representing 13 separate families, were recorded during point counts. The sole native species recorded during the course of the survey—Pacific Golden-Plover (*Pluvialis fulva)*—is an indigenous migratory shorebird species. The remaining 21 species recorded are all established alien or feral species. No additional avian species were detected while transiting the site.

Avian diversity and densities were relatively high, but in keeping with the location and the eclectic vegetation along the route. Four introduced species, African Silverbill (*Euodice cantans)*, Japanese White-eye *(Zosterops japonicus*), Zebra Dove (*Geopilia striata)*, and Redvented Bulbul *(Pycnonotus cafer)*, accounted for 54-percent of the total number of birds recorded. African Silverbill was the most commonly tallied species, which accounted for 25 percent of the birds recorded during point counts. Although no seabirds were detected during the field survey, several seabird species potentially overfly the site on occasion.

The Oʻahu population of White-Tern (*Gygis alba*) is listed as an endangered species by the State of Hawaii; it is not listed under federal statute. This ephemeral species was not recorded during the field survey, nor was it expected as the current resident population of White Terns on Oʻahu are found concentrated in the Waikīkī area.

No owl species were recorded during the survey. The two resident owl species on Oʻahu are the introduced Barn Owl (*Tyto alba*) and the indigenous endemic sub-species of the Short-eared Owl, or *Pueʻo* (*Asio flammeus sandwichesis*). The *Pueʻo* (*Asio flammeus sandwichesis*) has become increasingly scarce; the Oʻahu population is listed as an endangered species by the State of Hawaiʻi (not listed under Federal statute). It is probable that this resident indigenous species occasionally uses resources in the general project area on a seasonal basis. This species is not habitat restricted on Oʻahu, though there certainly is less suitable nesting habitat than there once was across the island. Because this species is a ground-nesting diurnal species, the shear number and densities of mammalian predator on the island make it very difficult for this species to successful nest except within protected areas that have a strong mammalian predator control program in place.

Mammalian Survey

The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. Three terrestrial mammalian species were detected within the project area. Numerous dogs *(Canis familiaris)* were heard barking from areas outside of the study site. Three small Indian mongoose (*Herpestes auropunctatus*) was seen along the study corridor, and a large number of cats (*Felis catus*) were seen within the site. Although no rodents were recorded during the survey, it is likely that one or more of the other four established alien Muridae found on O‘ahu—European house mouse (*Mus musculus domesticus*), roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*)—use various resources found within the general project area on a seasonal basis. These human commensal species are drawn to areas of human habitation and activity. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependent on them.

No mammalian species currently proposed for listing or listed under either the federal or State of Hawai‘i endangered species statutes were recorded on this site (State of Hawai‘i Department of Land and Natural Resources 1998; USFWS 2016). The findings are consistent with the current habitat present along the survey corridor and the highly developed nature of the project area.

No endangered Hawaiian hoary bats were detected during the survey. It is only in recent years that this species is being recorded on a regular basis on the Island of O‘ahu. It is within the realm of possibility that this species may use resources within the project area on a seasonal basis.

Critical Habitat

Critical habitat is a term defined and used in the federal Endangered Species Act (ESA). It specifies geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection.

There is no federally delineated Critical Habitat for any avian or mammalian species on, or close to the proposed project site. There is no equivalent statute under State law.

3.6.2 Potential Impacts and Mitigation

The No Action Alternative would not impact existing terrestrial faunal resources since no construction activities would occur and there would be no change in existing conditions.

The following discussion describes the potential impacts that the Proposed Action poses to protected species, including seabirds, short-eared owl (pue‘o), and Hawaiian hoary bat.

Seabirds. The possibility that seabirds would become disoriented by lights and downed during the nesting season is the principal potential impact that the Proposed Action poses to protected seabirds. Outdoor lighting could pose a threat to these nocturnally flying seabirds: 1) during nighttime construction activities that required lighting; and 2) during the operational phase, if streetlights or other exterior lighting were introduced and used during the seabird fledging season (September 15th through December 15th).

If nighttime construction work is necessary during the seabird fledging season, all lighting would be shielded and directed toward the ground. Since no permanent outdoor lighting would be installed, the Proposed Action would not result in deleterious impacts to protected seabirds.

Short-eared Owl – Pue'o. The principal potential impact that the Proposed Action poses to short-eared owls would be from clearing and grubbing activities related to construction in areas where this state listed species nests. However, since there is no suitable nesting habitat within the project area, the Proposed Action would not result in deleterious impacts to this species.

Hawaiian hoary bat. The principal potential impact that the Proposed Action poses to the Hawaiian hoary bat would be from clearing and grubbing activities related to construction. The trimming or removal of foliage and/or trees within the construction areas may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, female carrying their pups may be less able to rapidly vacate a roost site while vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they themselves forage, and very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15-feet), between June 1 and September 15, the pupping season. Since the Proposed Action would not remove any trees or woody vegetation that is suitable bat roosting substrate, it would not result in deleterious impacts to Hawaiian hoary bats.

Critical Habitat. Since there is no federally delineated critical habitat within or close to the project area, the Proposed Action would be unlikely to adversely affect federally designated critical habitat.

The Proposed Action would be unlikely to adversely affect threatened or endangered terrestrial faunal species or critical habitat. No threatened, endangered or candidate listed avian and terrestrial mammalian species protected by Federal or State regulations, or federally delineated critical habitat, are known to exist on or adjacent to the project area. During the operational period, due to the underground nature of the water line, the Proposed Action is unlikely to adversely affect wildlife that may traverse the project area.

Consultation with the USFWS under Section 7(a)(2) of the Endangered Species Act has been initiated and is in progress. Based on the findings of the recent biological surveys, it is anticipated that the Proposed Action is *not likely to adversely affect* listed species or critical habitat. USFWS written concurrence to support the determination of effect is expected.

4. HUMAN ENVIRONMENT

4.1 EXISTING AND SURROUNDING LAND USE

4.1.1 Existing Conditions

The project area, which consists of the water line alignment and two separate sites for construction staging, is sandwiched within the western portion of the 'Ewa Villages community. The surrounding area is predominately urban and densely developed for residential and community uses. Renton Road is the main thoroughfare that provides access to 'Ewa Villages via Fort Weaver Road, a north-south principal arterial, and Kapolei Parkway, an east-west principal arterial. The historic plantation homes of Varona Village and Tenney Village and the 'Ewa Villages Golf Course border the project area to the north. Renton Village, newer residential subdivisions and community uses including schools and churches are to the east of the project area along Renton Road; 'Ewa Mahiko District Park, former plantation buildings, and the O'ahu Railway and Land Company (OR&L) Railroad right-of-way (ROW) are to the south; and the Ka Makana Ali'i Shopping Center and Pride Baseball Field are to the west. The Honouliuli Wastewater Treatment Plant and HWRF, and the Coral Creek Golf Course, are located farther south of the OR&L Railroad ROW.

From a regional perspective, 'Ewa Villages is situated between the major towns of Kapolei, Ko Olina, Kalaeloa and 'Ewa Beach. O'ahu's growing second city of Kapolei is roughly three miles to the west, and the resort community of Ko Olina is roughly nine miles to the west of the project area. Kalaeloa (formerly the Barbers Point Naval Air Station), which is being planned for future residential, commercial and industrial growth, is to the southwest of Roosevelt Avenue, and 'Ewa Beach is to the southeast.

The project area is approximately five miles west of the Daniel K. Inouye International Airport and more than 1.5 miles east of the Kalaeloa Airport. The project area lies outside of the 55 DNL Contour for both airports. The project is located outside of the airport clear zone and accident potential zone (APZ) for Honolulu International Airport (Department of Planning and Permitting, 2014).

4.1.2 Potential Impacts and Mitigation

Both the Proposed Action and the No Action Alternative consist of water distribution lines installed primarily underground, which minimizes the impact to surrounding land uses. Land uses within the project area are not constrained by any aircraft hazard zones.

The No Action Alternative would not impact existing or surrounding land uses since no construction activities would occur and there would be no change in existing conditions.

The Proposed Action would be installed in a previously-disturbed, urbanized area, primarily within the road ROW where a number of underground utility lines are currently located. The aboveground valves would be strategically located to minimize conflict with existing uses. Since the entire project area consists of State- and county-owned land currently used for public uses and no new land uses or changes to existing uses or land use patterns would be introduced, the Proposed Action would have no long-term impact to existing or surrounding land uses. Neighboring properties immediately adjacent to the project area may experience typical short-term, construction related impacts such as traffic, noise and dust, which would be minimized through the use of standard construction BMPs. Unlike the No

Action Alternative, the Proposed Action would provide the additional benefit of a more flexible watering usage schedule that would allow for better, more consistent watering of landscaped areas.

4.2 AIR QUALITY

4.2.1 Existing Conditions

Ambient air quality pertains to the purity of the general outdoor atmosphere, external to buildings, to which the general public has access. Ambient concentrations of air pollution are regulated by both National and State ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 CFR, while State of Hawai'i AAQS are defined in Chapter 11-59 HAR . National and State AAQS have been established for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), ozone (O_3).and concentrations of airborne particulate matter (less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$)). In addition, the State has also established a standard for hydrogen sulfide (H_2S).

The two types of national standards are primary and secondary standards. Primary standards define limits to protect public health with an "adequate margin of safety," including the health of sensitive populations such as asthmatics, children and the elderly. Secondary standards define limits to protect public welfare from "any known or anticipated adverse effects of a pollutant," which includes protection against decreased visibility, diminished comfort levels, and damage to animals, crops, vegetation and the man-made environment. State AAQS, which are designed "to protect public health and welfare and to prevent the significant deterioration of air quality," are generally more stringent than national standards.

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both National and State standards allow a specified number of exceedances each year.

The State DOH collects data on selected gaseous and particulate air pollutants from a statewide network of monitoring stations. There are currently four air quality monitoring stations on O'ahu. The Kapolei monitoring station is located between Lauwiliwili Street and Franklin D. Roosevelt Boulevard, and is the closest monitoring station to the project area (roughly 4 miles west of the project). Based on the *State of Hawai'i Annual Summary Air Quality Data* prepared by the Department of Health Clean Air Branch, the Kapolei monitoring station recorded criteria pollutant levels that were below both state and federal AAQS standards for the years 2012 to 2016. Excluding exceedances due to the volcano on Hawai'i Island, the State of Hawai'i was in attainment of all NAAQS in 2016 (State Department of Health 2016).

Air pollution is caused by many different man-made and natural sources, including industrial sources such as power plants and refineries; mobile sources such as vehicles, trucks and boats; agricultural sources such as cane burning; and natural sources such as windblown dust and volcanic activity. Present air quality at the project area is mostly affected by air pollutants from vehicular and natural sources.

4.2.2 Potential Impacts and Mitigation

The No Action Alternative would not impact air quality or air resources since no construction activities would occur and there would be no change in existing conditions.

Similar to the No Action Alternative, the Proposed Action would not introduce any new air emissions sources or modify existing stationary sources to affect long-term air quality. The existing waterline does not currently generate air pollution; operation and use of the proposed waterline would not be a source of air pollution to cause direct air quality impacts either. Short-term, temporary air emissions such as fugitive dust and exhaust emissions from construction equipment would be generated during the construction period. These potential impacts would be minor and short-lived, as construction activities would proceed along the length of the project area as the segments of waterline are installed. The contractor would be required to employ BMPs to minimize particulate emissions during construction. All construction activities would comply with the provisions of HAR 11-60.1-33 (Fugitive Dust). Because the State of Hawai'i is in attainment of the NAAQS, the Proposed Action is not subject to the Clean Air Act's General Conformity Rule.

4.3 NOISE

4.3.1 Existing Conditions

Noise levels in the vicinity of the project area are typical of an urban residential area. Consistent with the character of the surrounding residential community, the predominant noise sources in the project area include vehicular traffic primarily from Renton Road and Kualakai Parkway, overhead aircraft traffic and railroad activities.

The nearest sensitive noise receptors along the project area are the homes adjacent to Renton Road, and the 'Ewa Hongwanji Mission at the Kualakai Parkway intersection near the central portion of the project area. At the east end of the project area, Friendship Christian School is approximately 500 feet directly east of the proposed waterline alignment and 'Ewa Elementary School is approximately 1,600 feet to the east of the proposed waterline alignment.

Various local and federal agencies have established guidelines and standards for assessing environmental noise impacts and have set noise limits as a function of land use. The State of Hawai'i's Community Noise Control Rule (HAR §11-46) identifies three classes of zoning districts and specifies maximum permissible sound levels due to stationary noise sources. Noise related to construction activities is also regulated. For Class A zoning districts—the equivalent to lands zoned residential, public space and open space—the maximum permissible sound levels are 55 A-weighted decibels (dBa) for daytime (7 a.m. to 10 p.m.) and 45 dBa for nighttime (10 p.m. to 7 a.m.). Noise sources above the permissible sound levels are required to obtain a permit prior to the related activities.

4.3.2 Potential Impacts and Mitigation

The No Action Alternative would not impact noise levels or noise generating sources since no construction activities would occur and there would be no change in existing conditions.

Similar to the No Action Alternative, the Proposed Action would not introduce any new noise sources or modify existing noise levels to affect the long-term noise environment. The existing waterline is not a major source of noise, and the operation and use of the proposed waterline would not be a major noise source either. Short-term, temporary noise impacts would be unavoidable during the construction phase. Homes and other properties adjacent to the project area, as well as motorists and pedestrians traveling through the construction area, would be exposed to increased noise levels during construction. The dominant sources of noise during construction would be from site preparation activities requiring the use of earth-moving and material-handling equipment, such as backhoes, compactors, pavers and trucks. The noise level of typical construction equipment is estimated to range between 75-95 dBA at a distance of 50 feet (EPA 1971), although actual noise levels produced would relate to the methods employed during each stage of the construction. Limiting construction work to day-time hours in residential areas would minimize noise disturbances experienced by surrounding residences. Noise disturbances to schools and other nearby uses east of Park Row would be lessened by the distance between the project area and the properties.

Compliance with the State of Hawai‘i, Department of Health (DOH) standards for allowable noise levels (Chapter 11-46 HAR Community Noise Control) would help to minimize construction-related noise impacts. The use of appropriate measures, such as scheduling activities during specific times of the day (i.e., no nighttime work near noise-sensitive uses), installing mufflers on construction equipment and vehicles with exhaust systems and installing noise barriers, would further minimize potential noise impacts to surrounding neighbors.

4.4 HISTORIC AND ARCHAEOLOGICAL RESOURCES

4.4.1 Existing Conditions

An Archaeological Literature Review and Field Inspection was prepared by Honua Consulting, Inc. to determine the land-use history of the project area and to identify any potential artifacts, architecture, or cultural deposits present on the ground surface of the property. The findings of the study are summarized in this section and in Section 4.4.2. The study is presented in Appendix C.

The project area is located in the ahupua‘a of Honouliuli in the moku (district) of ‘Ewa (“crooked”). Honouliuli ahupua‘a is the largest and western-most ahupua‘a in ‘Ewa. The translation of Honouliuli as “dark bay” likely refers to the nature of West Loch (west side of Pearl Harbor or Pu‘uloa). Early historical accounts and Hawaiian legends of Honouliuli ahupua‘a indicate wide-spread pre-Contact habitation of the region, including Hawaiian ali‘i occupation. Marine resources were plentiful, irrigated lowlands were suitable for wetland taro cultivation, and forest resources were found along the lower mountain slopes. Following the Great Mahele of 1848, kuleana Land Commission Awards (LCA) in the Honouliuli ahupua‘a were concentrated in areas containing water resources near Pu‘uloa; no LCAs were found within the project area.

Historic background research revealed that the entire project area was heavily modified by sugarcane cultivation and residential development. From the late-19th century through the later half of the 20th century, plantation sugar cultivation was the dominant industry throughout the ‘Ewa plain. The ‘Ewa Plantation Company was in operation from the 1890s to the 1970s. By the early 1900s, the ‘Ewa Plantation Company grew to encompass most of the eastern half of Honouliuli ahupua‘a, including the

project area. With growth of the sugar industry introducing more demand for residential development to house the increasing numbers of immigrant workers in the fields, the plantation company constructed more than 1,200 residences in eight distinct villages to house their workers. Construction of the OR&L Railroad began in 1889, and the railroad reached the 'Ewa Plantation Company lands in 1892.

The project area extends through the 'Ewa Sugar Plantation Villages Historic District (State Inventory of Historic Places [SIHP] #50-80-12-9786), listed on the Hawai'i Register of Historic Places (State Register). Several previous archaeological studies have been conducted within the historic district with only surface findings of plantation-era houses, foundations, and structures. No significant sub-surface findings have been recorded. Adjacent to the project area, a historic street light (SIHP # -7133) was documented along the north side of Renton Road. Additionally, the OR&L ROW (SIHP # -9714, NR #75000621) and Hawaiian Railway Society 'Ewa Railroad Yard (SIHP # -7387) are located adjacent to a southern portion of the project area. Within the railroad yard are several train cars that are listed on the State and National Registers, including the OR&L rolling stock (SIHP # -9761) and Waialua Agricultural Company locomotive #6 ("WaCo 6", Sadn IHP # -9708, NR #74000719). Figure 4-1 shows the location of all State and National Register sites within, adjacent, and in close proximity to the project area.

The pedestrian survey conducted for this study did not discover any new historic properties and no significant cultural materials were identified within the project area. It is very likely that any pre-contact (pre-1778 AD), traditional Hawaiian surface features and/or subsurface cultural deposits that may have existed in the area at one time were destroyed by historic modifications conducted throughout the vicinity.

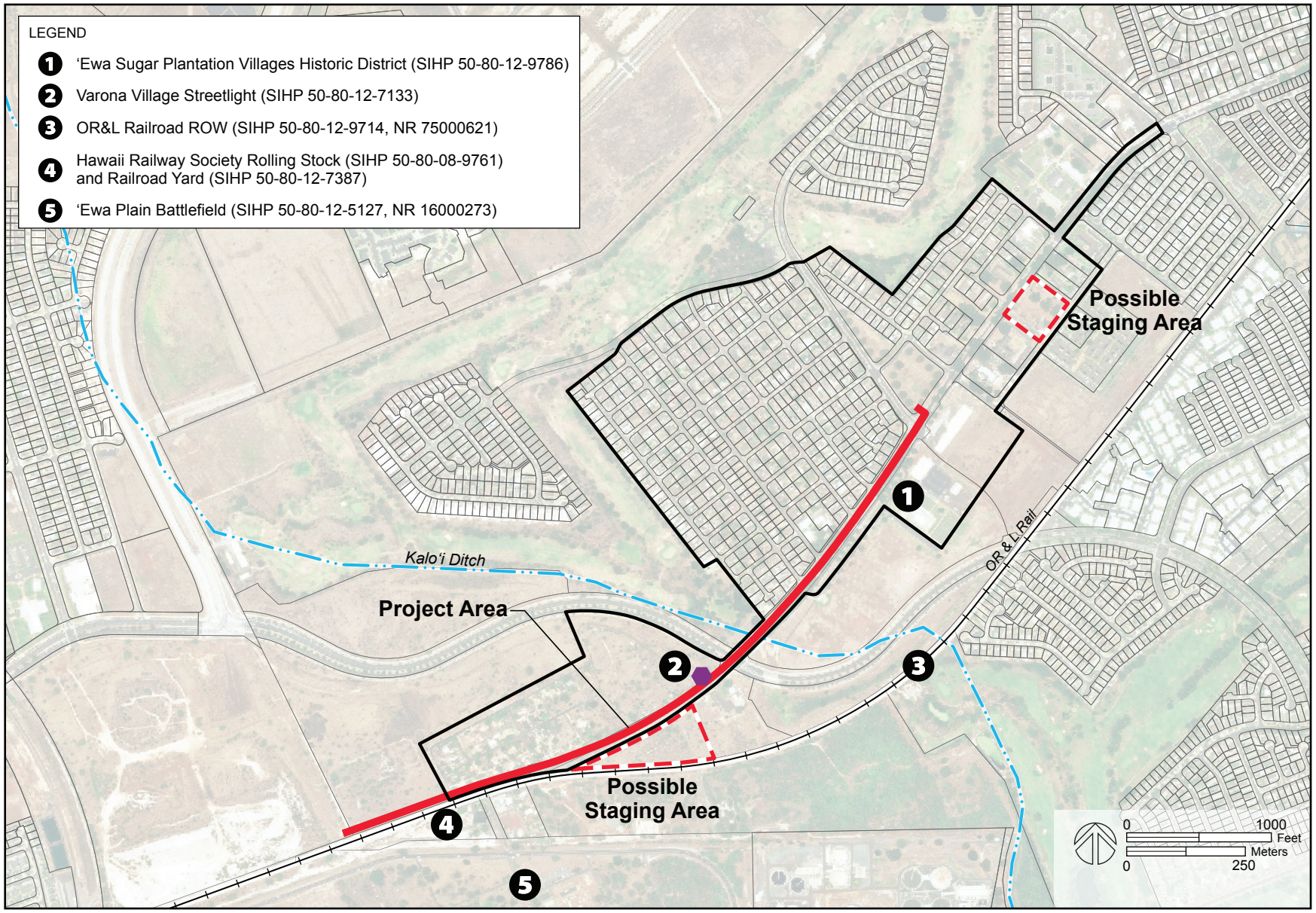
4.4.2 Potential Impacts and Mitigation

The No Action Alternative would not impact historic and archaeological resources within or adjacent to the project area since no construction activities would occur and there would be no change in existing conditions.

The Archaeological Literature Review and Field Inspection (Honua Consulting 2019) concluded that the Proposed Action would not affect the integrity of the significant historic properties in the vicinity of the project area. Recommendations to minimize potential impacts to historic properties include:

1. Avoiding structures within the 'Ewa Sugar Plantation Historic District (SIHP # -9786), the historic streetlight (SIHP # -7133), and the adjacent OR&L infrastructure during construction, and
2. Conducting construction activities under an archaeological monitoring plan in accordance with HAR 13-279 (Rules Governing Standards for Archaeological Monitoring Studies). Monitoring is recommended to record project stratigraphy and document any potentially significant surface artifacts and/or subsurface deposits and artifacts that may be encountered within the project area, including but not limited to items associated with plantation-era habitation and/or use of the OR&L railroad.

In compliance with Section 106 of the NHPA, the City has initiated consultation with the State Historic Preservation Officer (SHPO) and other consulting parties. Concurrence to determine the effect and mitigation required for the Proposed Action is pending.



Historic Resources

Figure 4-1

Ewa Villages R1 Water Main Replacement

Environmental Assessment

City and County of Honolulu Department of Facility Maintenance

4.5 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) was prepared by Honua Consulting, Inc.(2019) to comply with the State of Hawai'i's environmental review process under Chapter 343 HRS and HAR Section 11-200.1 rules for the environmental impact assessment process which require project proponents to assess proposed actions for their potential impacts to cultural properties, practices, and beliefs. The findings of the study are summarized in this section and in Section 4.5.2. The CIA is presented in Appendix D.

4.5.1 Existing Conditions

The CIA extensively researched primary documents in both Hawaiian and English in a good faith and comprehensive effort to identify valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area. The CIA provides the results of the background research, including a summary of land usefrom pre-contact times to the development of the 'Ewa Sugar Plantation and O'ahu Railway & Land Company in the late-1800s to the U.S. military's establishment of bases during the 20th century. While the Honouliuli region is rich with both pre-contact and post-contact histories, the majority of the sites and features identified in the CIA are outside the project area.

4.5.2 Potential Impacts and Mitigation

The No Action Alternative would not impact cultural resources within or adjacent to the project area since no construction activities would occur and there would be no change in existing conditions.

The CIA (Honua Consulting, Inc. 2019) concluded that the Proposed Action is unlikely to have any adverse impact on pre-contact historic properties, Hawaiian cultural practices, and traditional or customary Native Hawaiian rights in the project area or in the larger geographic extent. The study, which looked comprehensively at all historical records for the region, did not identify any current cultural practices or customs that would potentially be impacted by the project activity. This find was supported by interviews conducted with two cultural practitioners from the area. Due to the long history of development in the vicinity of the project, there are no known traditional or customary Native Hawaiian rights that have been identified to date by area cultural practitioners, including the lineal descendant interviewed during preparation of the CIA. Cultural resources that may have once existed in the project area were likely irreparably destroyed by decades of industrial and agricultural use. The land was previously used to grow sugar, and before that, this part of the 'Ewa plain was not thought to be highly inhabited. Pu'uokapolei, which is recognized as a wahi pana (storied or sacred place), is the closest site for ongoing cultural practices (i.e., hula, resource management and cultural gatherings). Located roughly two miles to the southwest of Pu'uokapolei, the Proposed Action is unlikely to impact the traditional and customary practices that take place at the pu'u.

4.6 VISUAL ENVIRONMENT

4.6.1 Existing Conditions

The visual character along the western extent of Renton Road between Ka Makana Ali'i Shopping Center and Kihi Street is characterized as an undeveloped area surrounded by urban uses. The unimproved, gravel roadway through this section and the Hawaiian Railway Society Yard to the south of the project

area embarks an industrialized character. From Kihi Street to the Kapolei Parkway intersection, Renton Road is an undivided, two-lane roadway with single-family plantation homes bordering the north side of the street and the OR&L ROW, overhead utility poles and open space along the south side. The lack of curb/gutters and sidewalk improvements along this stretch of roadway, together with the undeveloped open space to the south, evokes a rural, plantation character. East of the Kapolei Parkway intersection, Renton Road is a divided, two-lane roadway that has been improved with a tree-lined median strip, curb/gutters, sidewalks and landscaped roadway shoulders, and utilities placed underground. The single-family homes visible along the north side of Renton Road coupled with the 'Ewa Mahiko District Park on the south side of the roadway and the mature trees lining the roadway contribute to the suburban residential character within this stretch of Renton Road.

4.6.2 Potential Impacts and Mitigation

Both the Proposed Action and the No Action Alternative consist of water distribution lines buried underground with some aboveground valves. The below-grade design of the utility system minimizes the impact to the visual environment.

The No Action Alternative would have no impact on the visual environment since no construction activities would occur and there would be no change in existing conditions. The Proposed Action would not introduce any new structures or obvious improvements that would change the existing visual character of the project area. Visibility of the new waterline constructed under the Proposed Action would be similar to the No Action Alternative. No significant impacts to visual resources would result, as the water line would be buried beneath the ground surface and only the valves would be visible aboveground. Anchoring the waterline to the outside of the bridge crossing would minimize visibility of the exposed pipe.

4.7 HAZARDOUS AND REGULATED MATERIALS AND WASTE

4.7.1 Existing Conditions

A search of available environmental records for the 'Ewa Villages Master Plan area was conducted by Environmental Data Resources, Inc. (EDR) in 2010 (Department of Planning and Permitting 2014). Environmental and historic records pertaining to properties within a two mile radius of 'Ewa Villages were surveyed, including standard federal and State government data bases of known or potential sources of hazardous materials or waste. No sites of concern that would be a threat to human health and the environment were identified directly within the project area (i.e., the Renton Road ROW) in any of the records surveyed by EDR.

The former use of the 'Ewa Villages area for sugar production and the associated industrial and agricultural practices related to the sugar mill has resulted in several sites where hazardous or regulated materials were stored, used or released in the vicinity of the project area. The sites identified within parcels adjacent to the project area are listed in Table 4-1.

Table 4-1
Regulated Waste Release Sites Adjacent to the Project Area

Name ***Facility Owner***	***Location or Address***	***Additional Information***
'Ewa Sugar Mill/O'ahu Sugar Co. 'Ewa Sugar Mill/O'ahu Sugar Co.	Renton Road	Site inspection completed in 1999. No Further Remedial Action Planned.
'Ewa Mill Former Vehicle Maintenance Area City and County of Honolulu	91-1201 Renton Road	Two 2,000 gallon gasoline tanks and one 9,000 gallon heating oil tank. All tanks permanently out of use since 1993. Site clean-up completed. No Further Action status 1999.
'Ewa Village Project City Department of Housing and Community Development	Corner of Renton Road and Tenney Road	Three tanks identified: two 2,000 gallon gasoline tanks, one 9,000 gallon heating oil tank. All tanks permanently out of use since 1993. Site clean-up completed. No Further Action status 1999.
'Ewa Sugar Mill/O'ahu Sugar Company Mill Site	Renton Road	TCE release. Capacity, assessment, clean-up, and monitoring not reported. Closure status is unknown.
Ace Transmission Ala Kona Corporation	91-1205 Renton Road	Assessment conducted, hazard undetermined, site closed; No Further Action status 2004.
'Ewa Elementary School State of Hawai'i	Renton Road	Mercury release. Capacity, assessment, clean-up, and monitoring not reported. Closure status is unknown.

Source: EDR Radius Map™ Report with GeoCheck prepared by Environmental Data Resources, Inc. in 2010 for the Ewa Villages Review and Assessment, Department of Planning and Permitting, 2014.

Review of two EPA web-based applications, NEPAssist epa.gov/nepa/nepassist and EPA Cleanups in My Community epa.gov/cleanups/cleanups-my-community, was conducted to locate any sites of concern near the project area that have hazardous materials, contamination, toxic chemicals, gases or radioactive substances near the project area. The NEPAssist review compiles information from EPA databases, including the EPA's Superfund List (Comprehensive Environmental Response, Compensation and Liability Information System) National Priorities List, hazardous waste sites contained in the Resource Conservation and Recovery Act Information, stationary sources of air pollution, Toxic Release Inventory, Brownfields, radiation facilities, and water discharge permits issued under the National Pollutant Discharge Elimination System program. The EPA Cleanups in My Community review provides progress profiles of sites where pollution is being or has been cleaned up, including Superfund, RCRA Corrective Action, Brownfields, emergency responses, incidents of national significance, and federal facilities monitored by the EPA. NEPAssist identified two inactive RCRA sites adjacent to Renton Road (i.e., the project area): Hawaiian Railway Society (91-1001 Renton Road, Handler ID HIP000143057); and 'Ewa Mill (91-1201 Renton Road, Handler ID HIP000113878). No sites that have hazardous materials, contamination, toxic chemicals, gases or radioactive substances were identified near the project area under the EPA Cleanups in My Community review.

4.7.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on hazardous and regulated materials and waste since no construction activities would occur and there would be no change in existing conditions.

Construction of the Proposed Action would involve trenching and excavation of soils to install the proposed waterline. Although there are no known environmental areas of concern identified within the specific boundaries of the project area, soils may contain petroleum, asbestos, lead, or chemical residues used for agricultural production due to the historical use of the site. The contractor would be responsible to identify the presence or absence of hazardous materials prior to construction, and to remediate and dispose such materials in accordance with State and federal regulations. Likewise, the contractor would ensure that all hazardous or regulated materials used for construction would be handled in accordance with State applicable State and federal regulations.

4.8 SOCIO-ECONOMIC FACTORS

4.8.1 Population, Housing and Community Character

4.8.1.1 Existing Conditions

Table 4-2 presents 2010 census data for the 'Ewa Villages Census-Designated Place (CDP) in comparison to the 'Ewa Census County Division (CCD) and the island of O'ahu as a whole. The 'Ewa Villages CDP follows the geographic boundaries that correspond to the 'Ewa Villages community, while the 'Ewa CCD covers a larger geographic area that covers a large section of West and Central O'ahu, from Ko Olina in the west across the 'Ewa Plain to Halawa Valley, Pearl Harbor and Hickam Air Force Base in the east, and from the southern shoreline to Makakilo and Mililani/Launani Valley in the north.

In 2010, there were 6,108 residents reported for the 'Ewa Villages CDP, which represents less than two percent of the resident population reported for the 'Ewa CCD. As shown in Table 4-2, residents of 'Ewa Villages had a slightly lower median age than the residents of the 'Ewa CCD area and O'ahu as a whole, with a higher percentage of the population under 19 years old. The percentage of residents with a high school diploma was higher for the 'Ewa Villages CDP than the 'Ewa CCD and the islandwide total CDP (almost 45% compared to 28% and 38%, respectively), while the percentage of residents with a college degree was significantly lower for the 'Ewa Villages CDP (almost 6% compared to 27% and 31%, respectively). Households within the 'Ewa Villages CDP were larger than the 'Ewa CCD and islandwide average household size, and the median value of owner-occupied housing units was lower.

With roots that originate back to housing development for immigrant workers employed by the 'Ewa Sugar Company, the 'Ewa Villages community has been able to retain its rural plantation town character. Many of the historic plantation homes, mill buildings, and street layouts associated with the plantation era remain, and the City continues its commitment to develop the remaining vacant and undeveloped areas for affordable housing. Many of the former plantation workers or families of plantation workers are still living in the same homes they lived in since the plantation days, which contributes to the community's rural character. This is evidenced by the racial composition of 'Ewa Villages CDP, which is almost half (48.5%) Filipino, significantly higher than the 14.9% islandwide share of residents who identify as Filipino.

Table 4-2
2010 Socio-Economic Characteristics of 'Ewa Villages, 'Ewa CCD and O'ahu

	'Ewa Villages CDP	*'Ewa CCD*	*O'ahu*
POPULATION AND AGE			
Total population	6,108	323,118	953,207
Median age	35.0	36.0	36.2
Population 19 and under (%)	1,908 (31%)	88,167 (27%)	234,570 (25%)
Population 65 and over (%)	782 (13%)	38,984 (12%)	138,490 (15%)
EDUCATIONAL ATTAINMENT			
Population 25 years and over with high school diploma (includes equivalency) or higher (%)	1,702 (44.8%)	58,893 (28.3%)	176,711 (28.0%)
Population 25 years and over with bachelor's degree or higher (%)	213 (5.6%)	956,395 (27.1%)	196,276 (31.1%)
HOUSEHOLD			
Average household size	4.32	3.3	2.95
Median household income in 2010*	$67,344	$81,599	$70,093
Percent of individuals living below poverty level (for whom poverty status is determined)[1]	8.3%	5.7%	8.8%
Percent of households receiving public assistance income (cash)	6.7%	3.1%	3.3%
Percent of households receiving public assistance (food stamps/SNAP[2])	18.5%	5.2%	6.8%
Percent of working residents 16 years and over traveling 30+ minutes to work*	60.9%	52.3%	44.6%
HOUSING MARKET			
Total housing units	1,427	99,570	334,812
Median value of owner occupied units	$435,100	$517,400	$559,000
EMPLOYMENT			
Employed civilian population 16 years and over	3,299	173,429	501,779
Total non-construction jobs	2,894	136,900	407,949
Percent unemployed	2.7%	4.7%	5.0%

[1]Inflation-adjusted dollars [2]Supplemental Nutrition Assistance Program
SOURCE: Department of Planning and Permitting, 2014

Table 4-3 presents population, housing and employment trends for the 'Ewa Development Plan Area (DPA) and the island of O'ahu. During the 30-year period between 1980 and 2010, 'Ewa's population increased by nearly 200 percent from 35,500 residents to 101,400 residents (+65,900 persons). Future projections estimate a 70 percent increase in regional population over the next 30 years to the year 2040 when the 'Ewa DPA is projected to accommodate 172,700 residents (+71,000 persons) accounting for an estimated 15.9 percent of O'ahu's total projected population. In general, the population growth and related housing growth for the region is consistent with the City's directed growth policies that designate 'Ewa/Kapolei as Honolulu's secondary urban center to accommodate future economic development and residential growth.

Table 4-3
Population, Housing and Employment Trends, 'Ewa DP Area (1980 To 2040)

	1980	1990	2000	2010	2020 est.	2025 est.	2040 est.
RESIDENT POPULATION							
'Ewa DPA	35,523	42,931	68,696	101,397	130,700	146,100	172,700
O'ahu	762,565	836,231	876,156	953,207	1,003,700	1,029,400	1,086,700
Share of O'ahu total	4.7%	5.1%	7.8%	10.6%	13.0%	14.2%	15.9%
RESIDENT HOUSING UNITS							
'Ewa DPA	9,413	11,734	20,797	30,726	40,899	46,425	57,505
O'ahu	252,038	281,683	315,988	336,899	364,900	379,200	414,600
Share of O'ahu total	3.7%	4.2%	6.6%	9.1%	11.2%	12.2%	13.9%
VISITOR UNITS							
'Ewa DPA	14	14	392	1,154	6,323	6,541	7,198
O'ahu	34,334	36,972	36,321	33,596	34,800	36,000	39,400
Share of O'ahu total	0.0%	0.0%	1.1%	3.4%	18.2%	18.2%	18.3%
TOTAL JOBS							
'Ewa DPA	9,281	11,563	16,408	28,294	44,567	46,028	73,607
O'ahu	358,621	477,299	478,118	600,214	649,200	670,500	727,800
Share of O'ahu total	2.6%	2.4%	3.4%	4.7%	6.9%	6.9%	10.1%

Source: *Annual Report on the Status of Land Use on O'ahu for Fiscal Year 2014* (Department of Planning and Permitting 2016) and *Annual Report on the Status of Land Use on O'ahu for Fiscal Year 2017* (Department of Planning and Permitting, 2019).

4.8.1.2 Potential Impacts and Mitigation

Neither the No Action Alternative nor the Proposed Action would result in impacts to population, housing or community character since existing socio-economic conditions would remain unchanged under both alternatives. The Proposed Action provides upgraded infrastructure to replace the existing distribution system. No new facilities or uses that would result in an increase in resident or visitor populations, that would affect demographics or the demand for housing, or alter the island's housing inventory are proposed.

4.8.2 Employment and Income Patterns

4.8.2.1 Existing Conditions

Table 4-2 presents 2010 census information for employment and income across 'Ewa Villages, the 'Ewa CCD, and O'ahu island. The 'Ewa Villages CDP reported a lower percentage of unemployed workers (2.7%) than both the 'Ewa CCD (4.7%) and O'ahu island (5.0%). However, a larger share of 'Ewa Villages residents reported longer commute times to get to work (60.9% for 'Ewa Villages CDP) than the 'Ewa CCD and O'ahu island share (52.3% and 44.6%, respectively). The 'Ewa Villages CDP also reported a lower median household income ($67,344) than both the 'Ewa CCD ($81,599) and O'ahu island

($70,093). The share of residents below the poverty level and the share of residents receiving public assistance was also higher for the 'Ewa Villages CDP than the 'Ewa CCD.

Major employment centers in the 'Ewa region are concentrated around Kapolei, Kalaeloa and Ko Olina. As indicated in Table 4-3, the number of jobs in the region has increased by nearly 200 percent (+19,013 jobs) during the 30-year period between 1980 and 2010. Future projections to the year 2040 estimate steady job growth for the region as a whole (an increase of 160 percent, +45,313 jobs).

4.8.2.2 Potential Impacts and Mitigation

The No Action Alternative would not impact existing employment or income patterns since no construction activities would occur and existing socio-economic conditions would remain unchanged.

The Proposed Action would have a beneficial short-term effect on the economy, due to the temporary increase in construction-related jobs. No long-term changes in employment or income patterns are expected since the Proposed Action is limited to replacing the existing R-1 distribution system. No new facilities or uses that affect employment are proposed.

4.9 INFRASTRUCTURE AND UTILITIES

4.9.1 Potable Water

4.9.1.1 Existing Conditions

The Board of Water Supply provides potable water to the 'Ewa Villages community through the 228-foot elevation system, which consists of a 5-million gallon storage tank and a system of transmission mains that transport water across the 'Ewa plain. Potable water is distributed via 12-inch and 16-inch transmission lines and 8-inch and 6-inch service lines laid out in a looped system specified in the *'Ewa Villages Water Master Plan* prepared in 1996 (Department of Planning and Permitting, 2014).

4.9.1.2 Potential Impacts and Mitigation

Neither the No Action Alternative nor the Proposed Action would introduce additional demand for potable water or impact existing potable water sources or transmission systems. The No Action Alternative would have no impact on potable water resources or transmission systems since no construction activities would occur and existing conditions would remain unchanged. The Proposed Action provides upgraded infrastructure to replace the existing R-1 water distribution system. No new uses or activities that would increase the demand for potable water or require system modifications are proposed under the Proposed Action. Since the nonpotable water system is a dual system separate of the potable system, there would be no impact to the potable water system. Overall, the Proposed Action supports protection of O'ahu's drinking water supply by substituting reclaimed wastewater for drinking water as a source for irrigation.

Consultation with the BWS would continue through the planning and design phase to ensure that the R-1 waterline alignment would avoid conflict with existing potable water distribution lines. Construction contractors would be required to verify BWS infrastructure locations (especially underground waterlines, valves, and valve boxes) prior to the start of construction to prevent damage and avoid undue disruptions in service. Water service is not expected to be disrupted during construction

activities, and the relocation or modification of any existing infrastructure is not expected. Access to fire apparatus would be maintained throughout the construction site.

4.9.2 Non-Potable Water

4.9.2.1 Existing Conditions

The BWS currently owns and operates the municipal non-potable water system serving the 'Ewa region. This system, which is separate from the potable water distribution system, consists of two independent systems with separate lines for each grade of water (RO and R-1). All pipes and fixtures using recycled water are painted purple for identification purposes. The HWRF provides approximately 10 million gallons of R-1 water per day for irrigation, and approximately 2 million gallons of RO water per day for industrial use at refineries and power plants.

The BWS R-1 distribution system delivers R-1 water to Kapolei, Fort Weaver Road, and golf course users, including at Kapolei, Ewa Villages, West Loch, Coral Creek, and Hawai'i Prince Golf Course. The R-1 distribution system within the vicinity of the project area provides for a 16-inch PVC line that runs in a north-south direction within the future Kualaka'i Parkway extension (i.e., the western connection of the proposed waterline alignment). An 8-inch main runs along the northern boundary of the 'Ewa Villages Golf Course to supply R-1 water to the golf course irrigation pond. Two 8-inch lines withdraw water from the irrigation pond and feed a network of distribution lines that service the 'Ewa Villages community, including an 8-inch line that crosses the golf course, an 8-inch line that runs along Park Row and a 6-inch line that runs in an east-west direction along Renton Road between Kapolei Parkway and Fort Weaver Road. Separating the 'Ewa Villages common areas from the golf course irrigation system is necessary to fulfill requirements pursuant to the City's 'Ewa Villages Master Plan and redevelopment plans for the area (Department of Planning and Permitting, 2014).

4.9.2.2 Potential Impacts and Mitigation

The No Action Alternative would have a negative impact on non-potable water resources since no construction activities would occur and existing conditions would remain unchanged. The existing R-1 distribution system that currently draws water from the golf course irrigation pond would continue to be used, and the frequent pipe joint and sprinkler head breaks would continue to cause unnecessary water loss.

No new uses or activities that would increase demand or require major system modifications are proposed under the Proposed Action. Since the Proposed Action would replace the existing R-1 water distribution system with upgraded infrastructure, implementation of the Proposed Action would provide the positive benefit of reducing pressure leaks that deplete the resource.

Consultation with the BWS would continue through the planning and design phase to ensure that installation of the waterline alignment would be performed in compliance with DOH standards. The project would comply with the applicable provisions of Chapter 11-62 HAR Wastewater Systems Rules and the DOH's Reuse Guidelines dated January 2016, which governs the reuse of recycled water for irrigation purposes. Water service is not expected to be disrupted during construction activities, except for a temporary disruption when the new system is switched on.

4.9.3 Wastewater

4.9.3.1 Existing Conditions

The City and County of Honolulu Department of Environmental Services (ENV) provides collection and treatment of wastewater generated throughout 'Ewa Villages and the larger 'Ewa region. With the exception of Varona Village, the 'Ewa Villages community is connected to gravity-fed sewer lines that transport wastewater to the Honouliuli WWTP located to the south. The backbone infrastructure for the 'Ewa Villages wastewater system is based on the *'Ewa Villages Sewerage Master Plan* prepared in 1995 (Department of Planning and Permitting, 2014).

4.9.3.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on wastewater systems since no construction activities would occur and existing conditions would remain unchanged. The Proposed Action would have no impact on wastewater systems since it would not introduce any new uses or activities that produce wastewater.

Consultation with the BWS would continue through the planning and design phase to ensure that the R-1 waterline alignment would avoid conflict with existing wastewater utilities within the project area. Construction contractors would be required to verify the location of existing wastewater infrastructure prior to the start of construction to prevent damage and avoid undue disruptions in service. Wastewater service is not expected to be disrupted during construction activities, and the relocation or modification of any existing infrastructure is not expected.

4.9.4 Drainage

4.9.4.1 Existing Conditions

Historically, areas within the 'Ewa Villages community (including both Tenney and Renton Villages) were prone to flooding from the Kalo'i Gulch drainage area. The 'Ewa Villages Golf Course was designed to collect surface water runoff and provide flood control for the surrounding residential areas. As a result, major flood events have greatly reduced regional flood issues.

According to the *'Ewa Villages Drainage Master Plan* prepared in 1997, the 'Ewa Villages storm drain system consists of underground drainlines ranging in diameter from 18- to 66-inches, and culverts and intake boxes designed in accordance with City drainage standards. The larger lines are installed along, or connected to Renton Road. Except for Varona Village which has yet to be improved, the 'Ewa Villages community is connected to the City's regional drainage system.

4.9.4.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on drainage patterns or drainage infrastructure since no construction activities would occur and existing conditions would remain unchanged. No impact to flooding or flood zones would occur with development of the Proposed Action. The proposed water line would be structurally mounted to the bridge that passes above Kaloi Gulch, and would therefore be elevated away from the flood zone.

The proposed blow-off valve into Kaloʻi Gulch would allow BWS to drain R-1 water from the pipeline during emergencies in the event of a water main break. The frequency would be infrequent; discharge would be only during emergencies if there is a main break and BWS would notify DOH under these conditions and obtain the required permitting for such events. BMPs would be applied such that R-1 water would be drained during dry periods. In the event of a main break during a storm, repairs would be put on hold until the weather clears.

4.9.5 Solid Waste

4.9.5.1 Existing Conditions

Solid waste collected on Oʻahu is disposed of at the Waimānalo Gulch Sanitary Landfill and at the James Campbell Industrial Park H-Power energy recovery incinerator, both of which are located in the ʻEwa District of Oʻahu. Construction and demolition waste may also be disposed of at the privately-owned PVT Landfill in Nānākuli (owned by PVT Land Company, Ltd.). The landfill is a licensed construction and demolition material solid waste landfill. In addition to operating the landfill, PVT Land Company, is also licensed to accept asbestos-containing material and petroleum-contaminated soil.

The City ENV provides curbside collection service for residential refuse, green waste and mixed recycled products. Commercial enterprises and private organizations are required to independently coordinate waste removal services with private refuse collection companies.

4.9.5.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on solid waste facilities or collection services since no construction activities would occur and existing conditions would remain unchanged.

Construction of the Proposed Action would generate a minor amount of solid waste from construction material debris and construction workers. Material excavated from the trenching operation would be used as backfill to minimize waste and the need for off-site disposal. Since the Proposed Action would not introduce any new waste-generating uses or activities, there would be no impacts to solid waste facilities or collection services.

4.9.6 Electrical and Communication Systems

4.9.6.1 Existing Conditions

Hawaiian Electric Company (HECO) provides electrical service to the ʻEwa Villages community. The western half of the project area (west of Kapolei Parkway) is served by overhead distribution from electrical utility poles routed along the southern (makai) side of Renton Road. The eastern half of the project area (east of Kapolei Parkway) is served by underground conduits.

Land-line telephone service and cable television for the area is provided by Hawaiian Telcom, Inc. and Spectrum/Charter Communications, the largest communication providers across Oʻahu. Cellular telephone and internet connectivity are available through a variety of providers.

4.9.6.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on electrical or communication systems since no construction activities would occur and existing conditions would remain unchanged. The Proposed Action would have no impact on electrical or communication systems since it would not introduce any new uses or activities that require service.

Consultation with HECO and telephone and cable/communications providers would continue through the planning and design phase to ensure that the R-1 waterline alignment would avoid conflict with existing utilities within the project area. Construction contractors would be required to verify the location of existing utilities prior to the start of construction to prevent damage and avoid undue disruptions in service. Electrical and communications services are not expected to be disrupted during construction activities, and the relocation or modification of any existing infrastructure is not expected.

4.10 TRANSPORTATION AND ROADWAYS

4.10.1 Existing Conditions

Renton Road is an old plantation-era roadway which now serves as the main thoroughfare for the 'Ewa Villages community. It is a two-lane collector roadway with a posted speed limit of 25 miles per hour (mph), extending west from Fort Weaver Road to a cattle gate on the west side of Kihi Street that marks the end of the paved road surface. The section between Fort Weaver Road and Kapolei Parkway is a standard improved two-lane residential street with a divided landscaped median, sidewalks with curbs/gutters and planting strips. The section between Kapolei Parkway and Kihi Street is an undivided two-lane rural residential street (i.e., no sidewalks, curbs/gutters and planting strips); west of Kihi Street, the Renton Road ROW is unpaved and unimproved.

The project area is bisected by a relatively new section of Kapolei Parkway (circa 2007) that serves as a major corridor to access the Kapolei region. Kapolei Parkway is an east-west arterial roadway planned to eventually connect 'Ewa Beach to Ko 'Olina. (Department of Planning and Permitting, 2014). At the eastern terminus of the project area, Park Row extends north from Renton Road and ends in a residential cul-de-sac. The roadway is a two-lane street with a divided landscaped median that provides the sole access to the 'Ewa Villages Golf Course. A number of smaller internal roadways lead from Renton Road to adjacent residential areas: these include Kihi Street, Philippine Sea Street, Haakei Street, Leialoalo Street, Paionia Street, Malio Street, Puahio Street, and Paalua Street to the west of Kapolei Parkway; and Orrick Street, Bond Street, Tenney Street, and Alaiki Street to the east of Kapolei Parkway. All of these roads, with the exception of Phillipine Sea Street, are owned by the City and County of Honolulu. The Hawaiian Railway Society acquired Philippine Sea Street in 2004, and allows the public to use the roadway.

A future extension of Kualaka'i Parkway along the east side of the Ka Makana Alii Shopping Center is planned to connect Kapolei Parkway and Kalaeloa.

Existing municipal bus routes that provide service to the 'Ewa Villages community are limited to Route 44 Waipahu—'Ewa Beach which travels along Renton Road and Route 41 Kapolei Transit Center—'Ewa Beach Transit Center which travels along Roosevelt Avenue south of the Hawaiian Railway Society rail yard. Bus stops are located on Philippine Street to the south of Renton Road (Stop No. 1846 and 4392),

and along Renton Road in the vicinity of Haakei Street (Stop No. 1825 and 1827), Paionia Street (Stop No. 1824), Paalua Street (Stop No. 1828), Orrick Street (Stop No. 1823 and 1829), Tenney Street (Stop No. 1822 and 1830), and Park Row (Stop No. 1821 and 1831).

There are no designated bicycle facilities on Renton Road or any of the roadways surrounding the project area. Future bike lanes are proposed for Kapolei Parkway and the future extension of Kualaka'i Parkway, and a future bike path is proposed for Park Row. Renton Road is proposed to have a future bike route (City and County of Honolulu, 2012).

4.10.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on transportation systems or roadways since no construction activities would occur and existing conditions would remain unchanged.

Temporary, short-term traffic impacts would be expected during construction of the Proposed Action due to lane closures required for trenching and installation of the waterline, the addition of construction equipment and truck traffic in the neighborhood, and the daily arrival and departure of construction workers at the start and end of the workday. Most of the project would take place within the road right-of-way, varying between the travel lanes, landscaped shoulders and adjacent unpaved areas. During the construction period, which is expected to last roughly six months, the length and extent of lane closures would depend on site conditions and the complexity of work within each project segment. Traffic flow would be disrupted during construction hours, which would be restricted primarily to weekdays during daylight hours.

A street usage permit from the City and County of Honolulu Department of Transportation Services (DTS) would be required for construction work within the road ROW that requires road closure. Contractors would be responsible for providing traffic controls and precautions to maintain traffic safety and to minimize potential conflicts and service disruptions. A traffic management plan that identifies construction-related traffic impacts and applies Complete Streets principles to mitigate such impacts would be prepared in consultation with the appropriate City agencies, with the following measures included:

- Scheduling deliveries and transportation of construction materials and equipment during non-peak traffic hours (typically 8:30 am to 3:30 pm) to minimize possible disruption to traffic on the local streets. Delivery hours would be confirmed as part of the construction management plan.
- Providing alternate routes for vehicles, pedestrians and bicyclists that are safe and clearly marked in the event of any roadway, sidewalk or crosswalk closures.
- Maintaining existing pedestrian, bicycle and vehicle access/crossings in a passable and safe condition during construction.
- Using BMP controls at the construction site to prevent trailing of dirt and debris onto adjacent roadways.
- Requiring construction-related vehicles and construction workers to park in a designated off-street parking area.

- Covering open trenches with a non-skid bridging material during after work hours.
- Providing off-duty police officers and/or trained construction flagmen for traffic control.
- Limiting the length and frequency of street lane closures to minimize disruptions to bus service and vehicular and pedestrian circulation.
- Conducting necessary sidewalk closures in consultation with the appropriate City agencies.
- Maintaining appropriate signage, barriers and safety equipment to control traffic.
- Informing the public of any potential delays in and around the project site.
- Restoring sidewalks and roadways damaged by construction to original pre-construction condition.

Short-term impacts to public transportation would be likely during the construction phase. This may include temporary traffic congestion which could delay bus schedules and the temporary relocation of bus stops along Renton Road. Construction activities that could affect public transportation facilities and services would be coordinated with the DTS Public Transit Division and O'ahu Transit Services. The contractor would also seek to communicate project details and construction status to residents and representatives, emergency personnel, and the Neighborhood Board. No long-term impacts to public transportation are anticipated.

4.11 PUBLIC SERVICES

4.11.1 Educational, Cultural and Commercial Facilities

4.11.1.1 Existing Conditions

There are no schools immediately adjacent to the project area along Renton Road. Several schools are concentrated on Renton Road to the east of Park Row: this includes Friendship Christian School and Lanakila Baptist School on the southern (makai) side of Renton Road directly east of 'Ewa Mahiko District Park, and 'Ewa Literacy Preschool and 'Ewa Elementary School on the northern (mauka) side of Renton Road. 'Ewa Elementary School, a public elementary school that is part of the State Department of Education's Campbell Complex Area, is roughly 0.4 miles to the east of Park Row.

Cultural facilities along Renton Road immediately adjacent to the project area include uses related to the former sugar plantation era, including the Hawaiian Railway Society railroad yard near the western terminus of the project area and the buildings within the historic plantation district at the eastern end of the project area. The 'Ewa Hongwanji Mission, which is a Buddhist temple, is situated at the southwestern corner of the Kapolei Parkway intersection. Several churches and religious organizations are located on Renton Road east of the project area.

Commercial facilities in the vicinity of the project area are limited to the Hawaiian Railway Society which sells train rides from its baseyard and the Ka Makana Ali'i Shopping Center, both of which are located near the western terminus of the project area. At the eastern end of the project area, a U.S. Post Office station is located roughly 500 feet to the east of Park Row. The *'Ewa Villages Master Plan* (1992) proposes redevelopment of the old sugar mill site (directly south of Park Row) for a commercial

marketplace to house neighborhood services such as a grocery store, barber shop/salon, restaurants and retail services. There are currently no plans to proceed with this proposal.

4.11.1.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on schools or cultural or commercial services since no construction activities would occur and existing conditions would remain unchanged.

Similarly, the Proposed Action would have no impact on the demand for schools or cultural or commercial services since no new uses or activities that increase local demand for such services would be introduced. The uses located on Renton Road adjacent to the project area would experience typical construction-related impacts. Such impacts—including nuisances such as increased noise and air emissions from construction activities, and traffic congestion related to lane closures and traffic re-routing—would be temporary and short-term. The schools and churches concentrated to the east of the project area and the Hawaiian Railway Society rail yard at the western end of the project area would also experience some construction-related impacts, although the distance from the construction activity would minimize the extent of the impacts. The Proposed Action would connect to an existing 16-inch R-1 water main at the outer perimeter of the Ka Makana Ali'i Shopping Center. This location at the southeast corner of the shopping center parcel and the center's orientation towards the center of the parcel minimizes construction-related impacts to the shopping center.

4.11.2 Health Care and Social Services

4.11.2.1 Existing Conditions

The Queen's Medical Center—West O'ahu is the largest medical facility and the only acute-care hospital servicing West O'ahu. It is located along Fort Weaver Road south of Farrington Highway roughly 3 miles northeast of the project area. Opened in 2014, the medical center offers primary care services, 24-hour emergency room, inpatient and outpatient surgery, imaging, cardiology and specialty clinics, and an 80-bed hospital. Kaiser Permanente is planning to build a 40,000 square foot medical office in Kapolei. The project, which will be located at the corner of Kapolei Parkway and Kamokila Boulevard, is expected to be completed in 2021. There are also a number of smaller clinics and health care providers in various locations across 'Ewa and Kapolei.

4.12.2.2 Potential Impacts and Mitigation

Neither the No Action Alternative nor the Proposed Action would impact the operations, facilities or demand for health care and social service providers. The No Action Alternative would have no impact since no construction activities would occur and existing conditions would remain unchanged. The Proposed Action would have no impact since it would not introduce any new uses or activities that increase local demand for such services.

4.11.3 Parks, Open Space and Recreational Facilities

4.11.3.1 Existing Conditions

Recreational facilities in the vicinity of the project area include the City's 'Ewa Mahiko District Park and the 18-hole 'Ewa Villages Golf Course. The 26-acre 'Ewa Mahiko District Park, originally opened in 1998

and renovated in 2010, consists of several ball fields and restrooms, a gymnasium and multipurpose building, basketball, tennis and volleyball courts, and 200+ parking stalls. Several recreational facilities—including golf courses, parks and a community center—are located within a one mile radius of the project area; these include Geiger Community Park, Launani Neighborhood Park, Coral Creek Golf Course, Barbers Point Golf Course and the Salvation Army Kroc Center.

4.11.3.2 Potential Impacts and Mitigation

The No Action Alternative would have no impact on parks, open space or recreational commercial facilities since no construction activities would occur and existing conditions would remain unchanged.

The Proposed Action is limited to providing upgraded infrastructure to replace the existing R-1 distribution system. Since no new facilities or uses that would result in an increase in resident or visitor populations would occur, the Proposed Action would not impact the demand or usage of parks or recreational facilities in the region. Implementation of the Proposed Action would provide the positive benefit of improving the City's ability to regularly water and maintain landscaping and open space features along Renton Road, including 'Ewa Mahiko District Park. The current practice of using R-1 water to irrigate these areas would continue; there are no immediate plans to expand the current service area. Irrigation practices would continue to follow the *Guidelines for the Treatment and Use of Recycled Water* (Department of Health 2002) to protect public health and safety.

4.11.4 Police, Fire and Emergency Medical Response

4.11.4.1 Existing Conditions

The City and County of Honolulu Police Department (HPD) provides police protection to the entire island of O'ahu. The project area falls within the jurisdiction of the HPD's District 8, which encompasses the entire Leeward coast from West Loch to Ka'ena Point, including 'Ewa, the City of Kapolei, Makakilo and the Wai'anae Coast. The district headquarters is at the Kapolei Police Station, located approximately 3 miles northwest of the project area.

The City and County of Honolulu Fire Department Battalion 4 provides fire protection services for Leeward O'ahu. The East Kapolei Fire Station Number 43 is located at the intersection of Kapolei Parkway and Kinoiki Street, approximately one mile northwest of the project area. The next closest station is the 'Ewa Beach Fire Station Number 24, located roughly 2.5 miles southwest of the project area at the corner of Keone'ula Boulevard and Kaileolea Drive. Station 43 is equipped with both an engine and ladder company. Station 24 is equipped with an engine company and a personal water craft for ocean rescues.

The City and County of Honolulu Department of Emergency Services provides emergency medical services and emergency medical ambulance services on O'ahu through 20 emergency medical services ambulance units stationed across the island. The ambulance unit closest to the project area is based at the 'Ewa Villages Golf Course. An ambulance unit is also located at the Kapolei Fire Station Number 43, located roughly one mile northwest of the project area. The nearest emergency hospital is the Queen's Medical Center—West O'ahu, located approximately 3 miles northeast of the project area.

4.11.4.2 Potential Impacts and Mitigation

Neither the No Action Alternative nor the Proposed Action would impact the operations, facilities or services provided by the City and County of Honolulu for fire and emergency services. The No Action Alternative would have no impact since no construction activities would occur and existing conditions would remain unchanged. The Proposed Action would have no impact since it would not introduce any new uses or activities that increase local demand for such services.

5. CONFORMANCE WITH EXISTING STATE AND COUNTY PLANS, POLICIES AND LAND USE CONTROLS

This chapter discusses the project's conformance with the State Land Use District regulations, the State Environmental Policy (Chapter 344, HRS), and the State Coastal Zone Management program. Conformance with the relevant plans and policies of the City and County of Honolulu, including the City's General Plan, the Primary Urban Center Development Plan, the Special Management Area (Chapter 205A, HRS) and zoning, is also addressed.

5.1 STATE OF HAWAIʻI

5.1.1 State Land Use

Pursuant to Chapter 205, HRS, all lands in the State of Hawaiʻi are classified into one of four major land use districts by the State Land Use Commission. The four land use districts are the Urban, Rural, Agricultural and Conservation Districts. Permitted uses within the State Land Use Districts are prescribed under Chapter 205, HRS and the State LUC's Administrative Rules (Title 13, Chapter 13, HAR).

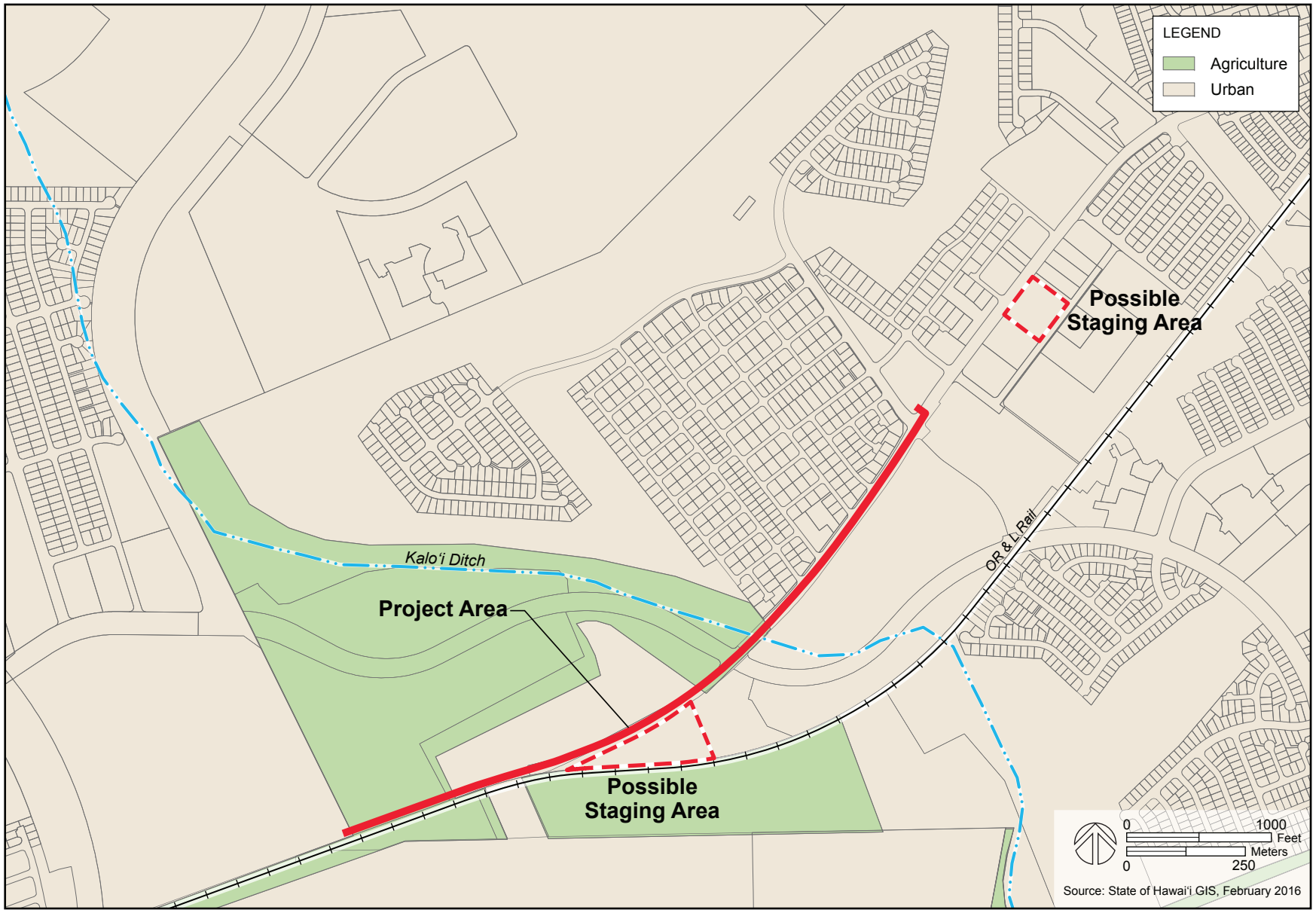
The project site includes lands within both the State Agricultural District and the State Urban District. Some of the undeveloped lands to the north and south of Varona Village are designated within the State Agricultural District, although the majority of the project site is designated within the State Urban District. The boundaries of the State Agricultural District by definition "include lands with a high capacity for agricultural production;… [and] may include lands with significant potential for grazing or for other agricultural uses; and may include lands surrounded by or contagious to agricultural lands or which are not suited to agricultural and ancillary activities by reason of topography, soils, and other related characteristics" (Chapter 15-15-19, HAR). The boundaries of the State Urban District are defined to include "lands characterized by 'city-like' concentrations of people, structures, streets, urban level of services and other related land uses" (Chapter 15-15-18 (1), HAR). Figure 5-1 shows the State land use district boundaries in relation to the project site.

Discussion: The Proposed Action is in conformance with both the State Agricultural and Urban land use classifications. Permitted uses within the State Agricultural District are specified in HRS Chapter 205-4.5, and include "public, private and quasi-public utility systems and roadways…" Permitted uses or activities within the State Urban District are regulated by ordinances and land use controls of the respective county.

5.1.2 Chapter 344, HRS, State Environmental Policy

Chapter 344, HRS establishes the State of Hawaiʻi Environmental Policy. The purpose of Chapter 344 is to "establish a State policy to encourage productive and enjoyable harmony between people and their environment, promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, and enrich the understanding of the ecological systems and natural resources important to the people of Hawaiʻi" (Chapter 344-1, HRS).

The following discussion addresses the proposed project's conformance and consistency with the policies and guidelines prescribed in Chapter 344, HRS.



State Land Use Districts

Figure 5-1

Ewa Villages R1 Water Main Replacement

Environmental Assessment

City and County of Honolulu Department of Facility Maintenance

Chapter 344-3, HRS. Environmental Policy
(1) "Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawai'i

Discussion: The Proposed Action would provide the 'Ewa Villages community with a direct connection to the BWS R-1 distribution system. The new, upgraded system would improve the quality of the R-1 water being delivered, and by providing new infrastructure that supports the use of non-potable water, would help to conserve valuable potable water resources.

(2) Enhance the quality of life by:

- *(A) Setting population limits so that the interaction between the natural and artificial environments and the population is mutually beneficial;*
- *(B) Creating opportunities for the residents of Hawai'i to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments;*
- *(C) Establishing communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment which is uniquely Hawaiian; and*
- *(D) Establishing a commitment on the part of each person to protect and enhance Hawai'i's environment and reduce the drain on nonrenewable resources.*

Discussion: The project area extends through the 'Ewa Villages, which is an established, historic plantation-era community listed on the Hawai'i Register of Historic Places (SIHP #50-80-12-9786). Maintaining its identity as a plantation town, 'Ewa Villages is centrally positioned on the 'Ewa plain between the growing communities of Kapolei, 'Ewa Beach and Kalaeloa. Development of the upgraded R-1 water distribution system ensures that 'Ewa Villages is served with adequate non-potable water for irrigation purposes.

Chapter 344-4, HRS. Guidelines

1) Population

- *A) Recognize population impact as a major factor in environmental degradation and adopt guidelines to alleviate this impact and minimize future degradation;*
- *B) Recognize optimum population levels for counties and districts within the State, keeping in mind that these will change with technology and circumstance, and adopt guidelines to limit population to the levels determined.*

Discussion: The Proposed Action would not affect existing or future resident or visitor populations at the local or state level. Proposed improvements do not involve construction of any new homes, new visitor units or new activities that would result in population increases.

2) Land, water, mineral, visual, air, and other natural resources

- *A) Encourage management practices which conserve and fully utilize all natural resources;*

B) Promote irrigation and waste water management practices which conserve and fully utilize vital water resources;
C) Promote the recycling of waste water;
D) Encourage management practices which conserve and protect watersheds and water sources, forest, and open space areas;
E) Establish and maintain natural area preserves, wildlife preserves, forest reserves, marine preserves, and unique ecological preserves;
F) Maintain an integrated system of state land use planning which coordinates the state and county general plans;
G) Promote the optimal use of solid wastes through programs of waste prevention, energy resource recovery, and recycling so that all our wastes become utilized.

Discussion: The Proposed Action would promote the conservation of valuable potable water resources by providing an alternative source of water for irrigation purposes. The Proposed Action upgrades an existing R-1 distribution system, which will allow for more efficient management practices and support the use of R-1 water derived from recycled wastewater. The Proposed Action would have no impact to sensitive ecological areas, watersheds, water sources or open space areas.

3) Flora and fauna

A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard;
B) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.

Discussion*:* The project site is an existing urbanized area that has been previously disturbed for development. There are no rare, threatened, or endangered species or habitats known to exist on the project site. It is predominately covered with non-native plants, most of which are common, cultivated plants or noxious invasive species. Likewise, faunal species expected on the site consist primarily of introduced species typically found in other urbanized area.

4) Parks, recreation, and open space

A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses;
B) Protect the shorelines of the State from encroachment of artificial improvements, structures, and activities;
C) Promote open space in view of its natural beauty not only as a natural resource but as an ennobling, living environment for its people.

Discussion*:* The project area is located nearly two miles inland from the nearest shoreline. Parks and landscaping features in the 'Ewa Villages service area would receive an upgraded water product for irrigation purposes when the new water line is completed.

5) Economic development

A) Encourage industries in Hawai'i which would be in harmony with our environment;
B) Promote and foster the agricultural industry of the State; and preserve and conserve productive agricultural lands;

C) Encourage federal activities in Hawaiʻi to protect the environment;
D) Encourage all industries including the fishing, aquaculture, oceanography, recreation, and forest products industries to protect the environment;
E) Establish visitor destination areas with planning controls which shall include but not be limited to the number of rooms; and
F) Promote and foster the aquaculture industry of the State; and preserve and conserve productive aquacultural lands.

Discussion*:* Construction of the Proposed Action would provide short-term economic benefits resulting from the temporary increase in construction-related jobs. The project area is within an urbanized, developed area that is identified for future residential use. No agricultural or aquacultural activities currently occur within the project area, or are planned to occur. The intent of the Proposed Action is to replace existing water distribution infrastructure; it would not introduce any facilities or activities that involve the visitor industry or any other industries.

6) Transportation

A) Encourage transportation systems in harmony with the lifestyle of the people and environment of the State;
B) Adopt guidelines to alleviate environmental degradation caused by motor vehicles;
C) Encourage public and private vehicles and transportation systems to conserve energy, reduce pollution emission, including noise, and provide safe and convenient accommodations for their users.

Discussion*:* Transportation system improvements are not included as part of the Proposed Action. Appropriate measures would be followed during construction to minimize potential traffic impacts resulting from roadway closures during construction.

7) Energy

A) Encourage the efficient use of energy resources.

Discussion*:* No new uses or activities that use additional energy resources are planned as part of the Proposed Action. Energy would be required for construction activities; the contractor would be encouraged to utilize conservation practices.

8) Community life and housing

A) Foster lifestyles compatible with the environment; preserve the variety of lifestyles traditional to Hawaiʻi through the design and maintenance of neighborhoods which reflect the culture and mores of the community;
B) Develop communities which provide a sense of identity and social satisfaction in harmony with the environment and provide internal opportunities for shopping, employment, education, and recreation;
C) Encourage the reduction of environmental pollution which may degrade a community;
D) Foster safe, sanitary, and decent homes;
E) Recognize community appearances as major economic and aesthetic assets of the counties and the State; encourage green belts, plantings, and landscape plans and designs in urban areas; and preserve and promote mountain-to-ocean vistas.

Discussion: By providing infrastructure for the 'Ewa Villages community, the City is further implementing its long-term master plan to rehabilitate and preserve the villages and provide housing opportunities for former plantation workers and their families. The new water line would establish a consistent and dependable means to deliver irrigation water used to maintain parks and landscaping features in 'Ewa Villages.

9) Education and culture

A) Foster culture and the arts and promote their linkage to the enhancement of the environment;

B) Encourage both formal and informal environmental education to all age groups.

Discussion*:* The Proposed Action would not affect existing or future educational programs since no new uses or activities that involve such programs would be introduced.

10) Citizen participation

A) Encourage all individuals in the State to adopt a moral ethic to respect the natural environment; to reduce waste and excessive consumption; and to fulfill the responsibility as trustees of the environment for the present and succeeding generations; and

B) Provide for expanding citizen participation in the decision making process so it continually embraces more citizens and more issues.

Discussion*:* The EA review process provides opportunity for public input at various stages, including the pre-assessment consultation process and the Draft EA 30-day public comment period during which the public has an opportunity to provide input on the project. Thirty-eight agencies and organizations were consulted as part of the pre-assessment consultation, of which 13 agencies and organizations submitted comments (see Section 8.1). In addition, as part of the consultation process prescribed under Section 106 of the NHPA, twenty-one agencies and organizations were sent consultation letters seeking information pertaining to the historic properties and cultural resources within the vicinity of the project area.

5.1.3 Hawai'i State Plan, Chapter 266 HRS

The Hawai'i State Plan (Chapter 226, HRS, as amended) is a long-range comprehensive plan that establishes the overall theme, goals, objectives, policies, and priority guidelines for statewide planning. The Plan provides a framework for determining priorities, allocating public resources, and improving coordination between State and county plans, policies, programs, projects, and regulatory activities.

Discussion: Review and analysis of Chapter 226, HRS indicates that the proposed project is consistent with the State Plan policies listed below. The Proposed Action provides upgraded infrastructure for a well-established community, and would not contribute to population growth or new development in the area. Construction of the proposed water line within the Renton Road ROW minimizes impacts to the surrounding community. Ultimately, the Proposed Action would result in more efficient use of recycled water resources and help to reduce reliance on potable water resources.

§226-5 Objectives and policies for population.

(b)(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.

§226-6 Objectives and policies for the economy—in general.
(b)(19) Promote and protect intangible resources in Hawaiʻi, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.

§226-9 Objective and policies for the economy—federal expenditures.
(b)(3) Promote the development of federally supported activities in Hawaiʻi that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaiʻi's environment.
(b)(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaiʻi.

§226-11 Objectives and policies for the physical environment—land-based, shoreline, and marine resources.
(b)(1) Exercise an overall conservation ethic in the use of Hawaiʻi's natural resources.
(b)(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
(b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.
(b)(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.
(b)(8) Pursue compatible relationships among activities, facilities, and natural resources.

§226-12 Objective and policies for the physical environment—scenic, natural beauty, and historic resources.
(b)(1) Promote the preservation and restoration of significant natural and historic resources.
(b)(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaiʻi's ethnic and cultural heritage.
(b)(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

§226-13 Objectives and policies for the physical environment—land, air, and water quality.
(b)(2) Promote the proper management of Hawaiʻi's land and water resources.
(b)(3) Promote effective measures to achieve desired quality in Hawaiʻi's surface, ground, and coastal waters.
(b)(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaiʻi's people.
(b)(6) Encourage design and construction practices that enhance the physical qualities of Hawaiʻi's communities.

§226-14 Objective and policies for facility systems—in general.
(b)(1) Accommodate the needs of Hawaiʻi's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
(b)(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
(b)(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.

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

§226-15 Objectives and policies for facility systems—solid and liquid wastes.
(b)(1) Encourage the adequate development of sewerage facilities that complement planned growth.
(b)(2) Promote reuse and recycling to reduce solid and liquid wastes and employ a conservation ethic.
(b)(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.

§226-16 Objective and policies for facility systems—water.
(b)(1) Coordinate development of land use activities with existing and potential water supply.
(b)(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.
(b)(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.
(b)(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.

§226-19 Objectives and policies for socio-cultural advancement—housing.
(b)(4) Promote appropriate improvement, rehabilitation, and maintenance of existing rental and for sale housing units and residential areas.

§226-20 Objectives and policies for socio-cultural advancement—health.
(b)(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.

§226-23 Objective and policies for socio-cultural advancement—leisure.
(b)(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.
(b)(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.
(b)(10) Assure adequate access to significant natural and cultural resources in public ownership.

§226-25 Objective and policies for socio-cultural advancement—culture.
(b)(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai'i.

§226-27 Objectives and policies for socio-cultural advancement—government.
(b)(1) Provide for necessary public goods and services not assumed by the private sector.
(b)(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.
(b)(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.

5.1.4 Coastal Zone Management

The objectives and policies of the Hawai'i Coastal Zone Management (CZM) Program are described in Chapter 205A-2, HRS, Part I. The objectives of the program are intended to promote the protection and

maintenance of valuable coastal resources. All lands in the State of Hawai'i and the area extending seaward from the shoreline are classified as valuable coastal resources within the State's CZM area.

Part II of Chapter 205A, HRS contains the general objectives and policies upon which all counties within the State of Hawai'i, including the City and County of Honolulu, have established Special Management Areas (SMAs). The project site is outside the boundaries of the City and County's SMA, and does not require an SMA permit. The specific provisions of the county SMA (Chapter 25, Revised Ordinances of Honolulu) are discussed in Section 4.2.5.

No impacts to the coastal zone are anticipated as a result of the proposed project. The following discussion assesses the project's conformance with the objectives of the State's CZM program (HRS Chapter 205A-2 (b)).

(1) Recreational Resources
(A) Provide coastal recreational opportunities accessible to the public.

Discussion*:* The project area is located in an inland area that is not coastal dependent. There are no coastal recreational opportunities associated with this site.

(2) Historic Resources
(A) Protect, preserve, and where desirable, restore those natural and man-made historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Discussion*:* The Proposed Action would have no adverse significant impact on historic and prehistoric resources. The archaeological literature review and field inspection prepared for the proposed project concluded that: (1) pre-contact traditional Hawaiian surfaced features and or/subsurface cultural deposits are unlikely to be found due to the former agricultural use and urbanization of the project area; and (2) the Proposed Action would not affect the integrity of the 'Ewa Sugar Plantation Villages Historic District which extends through the project area, or any other significant historic properties in the vicinity of the project area (see Section 4.4).

(3) Scenic and Open Space Resources
(A) Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Discussion*:* The Proposed Action is limited to the installation of underground water lines and aboveground valves, which will not impact views or scenic open space resources.

(4) Coastal Ecosystems
(A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Discussion*:* The Proposed Action would not involve alterations to streams, water bodies or other water sources, and project activities would not have significant negative impacts on natural resources or natural environmental characteristics. The project site is within a densely urbanized area, with no known

rare, threatened or endangered species or sensitive natural habitats present. Appropriate BMPs would be employed during construction to minimize soil loss and control erosion and runoff.

(5) Economic Uses
(A) Provide public or private facilities and improvements important to the State's economy in suitable locations.

Discussion*:* The proposed water line would eventually be part of the BWS R-1 water distribution system which delivers non-potable water service to the 'Ewa region.

(6) Coastal Hazards
(A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

Discussion*:* Due to the project area's location, roughly two miles inland, and the installation of the water line underground and across the Kalo'i Gulch bridge above the base flood elevation, there is no risk from tsunami, storm waves, stream flooding, erosion, subsidence or pollution.

(7) Managing Development
(A) Improve the development and review process, communication and public participation in the management of coastal resources and hazards.

(8) Public Participation
(A) Stimulate public information, education and participation in coastal management.

Discussion*:* The EA review process provides opportunity for public input at various stages, including the pre-assessment consultation process and a Draft EA 30-day public comment period during which the public has an opportunity to provide their input on the project (see Chapter 8 for consulted agencies and organizations). The consultation process prescribed under Section 106 of the NHPA also provides opportunity for public participation.

(9) Beach Protection
(A) Protect beaches for public use and recreation.

(10) Marine Resources
(A) Promote the protection, use and development of marine and coastal resources to assure their sustainability.

Discussion*:* The project area is located in an inland community with no public beaches or shoreline areas nearby. Appropriate BMPs would be employed during construction to control runoff and erosion that has the potential to impact marine and coastal resources.

5.2 CITY AND COUNTY OF HONOLULU

5.2.1 General Plan

The *General Plan for the City and County of Honolulu* was first adopted in 1977 and has been subsequently amended (most recently in 2002). A revised plan (*O'ahu General Plan Proposed Revised*

Draft, 2017) was transmitted from the Planning Commission to the City Council in April 2018, and is currently pending Council review and approval (Resolution 18-093).

The Plan is a comprehensive statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of O'ahu, including broad policy statements that facilitate the attainment of the Plan's objectives. It is organized into 11 subject areas: population; economic activity; the natural environment; housing; transportation and utilities; energy; physical development and urban design; public safety; health and education; culture and recreation; and government operations and fiscal management. The growth policy presented in the Plan calls for full development of the Primary Urban Center (including lands between Kahala and Pearl City), development of the secondary urban center at Kapolei and the 'Ewa and Central O'ahu urban-fringe areas, and management of the physical growth and development in the remaining urban-fringe and rural areas to maintain their low densities.

Discussion*:* The proposed project is consistent with the following objectives and policies of the *General Plan* (1992 edition, amended in 2002).

II. Economic Activity

Objective F. To increase the amount of Federal spending on O'ahu.

Policy 1. Take full advantage of Federal programs and grants which will contribute to the economic and social well-being of O'ahu's residents.

III. Natural Environment

Objective A. To protect and preserve the natural environment.

Policy 7. Protect the natural environment from damaging levels of air, water, and noise pollution.

Policy 8. Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of O'ahu.

Policy 9. Protect mature trees on public and private lands and encourage their integration into new developments.

IV. Housing

Objective A. To provide decent housing for all the people of O'ahu at prices they can afford.

Policy 5. Make full use of State and Federal programs that provide financial assistance for low- and moderate-income homebuyers.

Policy 9. Encourage the preservation of existing housing which is affordable to low- and moderate-income persons.

Objective C. To provide the people of Oahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.

Policy 6. Preserve older communities through self-help, housing-rehabilitation, improvement districts, and other governmental programs.

V. Transportation and Utilities

Objective B. To meet the needs of the people of O'ahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 1. Develop and maintain an adequate supply of water for both residents and visitors.

Policy 2. Develop and maintain an adequate supply of water for agricultural and industrial needs.
Policy 3. Encourage the development of new technology which will reduce the cost of providing water and the cost of waste disposal.
Policy 6. Support programs to recover resources from solid-waste and recycle wastewater.

Objective C. To maintain a high level of service for all utilities.
Policy 1. Maintain existing utility systems in order to avoid major breakdowns.
Policy 2. Provide improvements to utilities in existing neighborhoods to reduce substandard conditions.
Policy 3. Plan for the timely and orderly expansion of utility systems.

Objective D. To maintain transportation and utility systems which will help O'ahu continue to be a desirable place to live and visit.
Policy 1. Give primary emphasis in the capital improvement program to the maintenance and improvement of existing roads and utilities.
Policy 4. Evaluate the social, economic, and environmental impact of additions to the transportation and utility systems before they are constructed.
Policy 5. Require the installation of underground utility lines wherever feasible.

VII. Physical Development and Urban Design
Objective A. To coordinate changes in the physical environment of O'ahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.
Policy 1. Plan for the construction of new public facilities and utilities in the various parts of the Island according to the following order of priority: first, in the primary urban center; second, in the secondary urban center at Kapolei; and third, in the urban-fringe and rural areas.

Objective D. To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.
Policy 2. Coordinate plans for developments within the 'Ewa and Central O'ahu urban-fringe areas with the State and Federal governments and with the sugar, pineapple, and other emerging agricultural industries.
Policy 4. Coordinate plans for the development of the secondary urban center at Kapolei with the State and Federal governments and with the sugar industry.

Objective E. To create and maintain attractive, meaningful, and stimulating environments throughout O'ahu.
Policy 7. Promote public and private programs to beautify the urban and rural environments.
Policy 8. Preserve and maintain beneficial open space in urbanized areas.

Objective F. To promote and enhance the social and physical character of O'ahu's older towns and neighborhoods.
Policy 1. Encourage new construction to complement the ethnic qualities of the older communities of O'ahu.
Policy 2. Encourage, wherever desirable, the rehabilitation of existing substandard structures.

Policy 3 Provide and maintain roads, public facilities, and utilities without damaging the character of older communities.

VIII. Public Safety

Objective B. To protect the people of O'ahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.

Policy 1. Keep up-to-date and enforce all City and County safety regulations.

Policy 2. Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard.

XI. Government Operations and Fiscal Management

Objective A. To promote increased efficiency, effectiveness, and responsiveness in the provision of government services by the City and County of Honolulu.

Policy 1. Maintain City and County government services at the level necessary to be effective.

Policy 3. Ensure that government attitudes, actions, and services are sensitive to community needs and concerns.

Objective B. To ensure fiscal integrity, responsibility, and efficiency by the City and County government in carrying out its responsibilities.

Policy 2. Allocate fiscal resources of the City and County to efficiently implement the policies of the General Plan and Development Plans.

5.2.2 'Ewa Development Plan

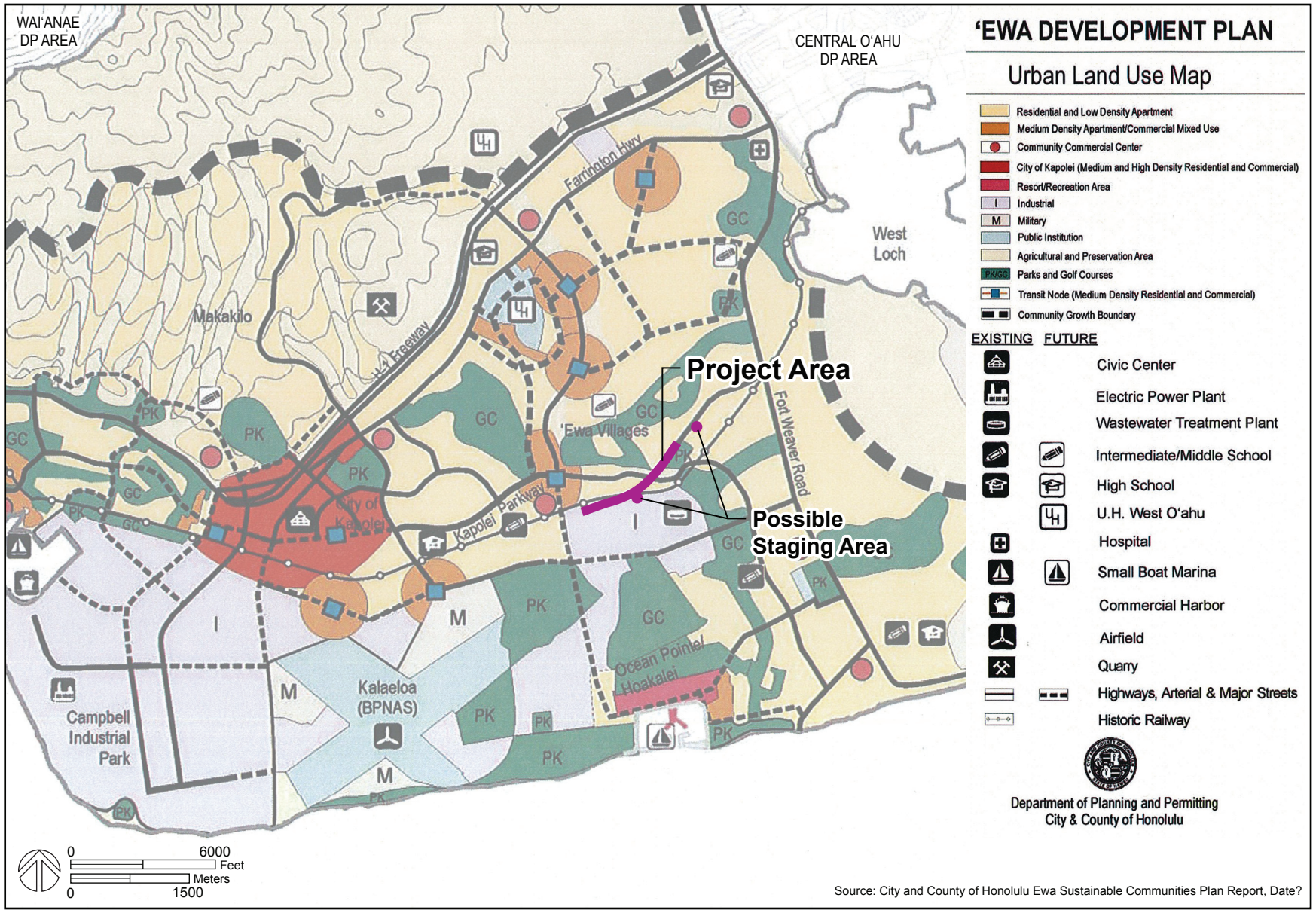
The City and County of Honolulu's Development Plan (DP) program provides a conceptual framework for implementing the objectives and policies of the General Plan on a regional basis. Eight geographical DP areas have been established on O'ahu, including the 'Ewa DP area where the project site is located. The eight community-oriented plans articulate the long-range future vision and policies for regional land use, and establish policies and guidelines for land use, public facilities and infrastructure improvements over a 20-year period.

The 'Ewa DP was first adopted by Ordinance 97-49 in 1997, and most recently revised in 2013 and codified as Ordinance No. 13-26. The 'Ewa DP area, stretching between West Loch and Ko Olina along O'ahu's southern shoreline and mauka to Makakilo, contains O'ahu's secondary urban center and secondary resort area, and major job centers and residential communities. The 'Ewa DP's vision statement and implementing policies support growth and development centered around the City of Kapolei; preservation of agricultural lands in Kunia and West Loch and protection of open space resources; new master-planned residential communities to accommodate projected increases in jobs and residential population; protection of natural, historical and cultural resources; and adequate infrastructure to meet current and future development.

The Open Space Map, Urban Land Use Map, Public Facilities Map and Phasing Map appended to the 'Ewa DP graphically demonstrate the desired long-range pattern for land use, open space and public facilities. The four maps conceptually illustrate the areas adjacent to Renton Road for urban use, park and golf course. The Urban Land Use Map is presented in Figure 5-2.

Discussion*:* The proposed project is consistent with the following concepts expressed as land use policies and guidelines in the 'Ewa DP:

- *Conserve potable water (Section 3.5.1).*
- *Protect valuable habitat for waterbirds and other endangered animals and plants (Section 3.5.1).*
- *Make infrastructure improvements to support full development planned for the 'Ewa Plantation Villages (Section 3.7.1).*
- *Preserve and maintain existing landscaping within Renton, Tenney, and Varona Villages, especially existing stands of mature palm, mango, banyan, and monkey pod trees.*
- *Where trees have been removed, provide appropriate replacements. Landscape and maintain yards and other open spaces to enhance open space appearance (Section 3.7.2).*
- *Provide for water use efficiency and conservation measures, such as low-flow plumbing fixtures, drought-resistant landscaping, sub-metering and efficient irrigation systems, as well as regular water audits and repairs to existing systems to reduce water loss (Section 4.2.1).*
- *Use dual water systems to conserve the supply of potable water and use nonpotable water for irrigation and other appropriate uses (Section 4.2.1).*
- *Prioritize the use of recycled water reclaimed from wastewater effluent and brackish waters as nonpotable irrigation sources in the coastal caprock area such as the 'Ewa Plain (Section 4.2.1).*
- *Require nonpotable water used for irrigation above Pearl Harbor aquifer to be low in chlorides and total dissolved solids to protect the quality of drinking water withdrawn from wells located down-gradient of the application (Section 4.2.1).*
- *Where feasible, use recycled water recovered from wastewater effluent for irrigation and other uses below the Underground Injection Control (UIC) line of the State Department of Health and the Board of Water Supply "No-Pass" Line (Section 4.3.1).*
- *Use native landscape materials with low water demand, non-potable water for irrigation, and efficient irrigation systems wherever possible to conserve groundwater resources (Section 3.2.2.2, Section 3.3.2.1 and Section 3.9.2).*
- *Preserve significant historic features from the plantation era and earlier periods, including the 'Ewa Plantation Villages and the OR&L right-of-way and railway stock (Section 3.4.1, 3.4.2.2, and 3.4.2.3).*



'Ewa Development Plan Urban Land Use Map **Figure 5-2**

Ewa Villages R1 Water Main Replacement

Environmental Assessment

City and County of Honolulu Department of Facility Maintenance

5.2.3 City and County of Honolulu Zoning

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the General Plan and Development Plans. The LUO, which is also referred to as the Zoning Ordinance, describes the various zoning districts, the uses allowed within each zoning district, and the applicable development standards for each district. Zoning designations are shown on the zoning maps for the City. Under the current LUO zoning, the Renton Road ROW is zoned AG-1 Restricted Agricultural and R-5 Residential (see Figure 5-3). The purpose of the AG-1 Restricted Agricultural District is to conserve and protect important agricultural lands for agricultural functions. The purpose of the R-5 Residential District is to allow for a range of residential densities, the primary use being detached residences.

Discussion: The LUO defines Type A utility installations as "those with minor impact on adjacent land uses" (e.g., 46 kilovolt transmission substations; water wells, tanks and distribution equipment; sewage pump stations; minor telecommunications antennas). Under the LUO, the proposed water line is considered a Type A utility installation, and is a permitted use in both the AG-1 and R-5 zoning districts.

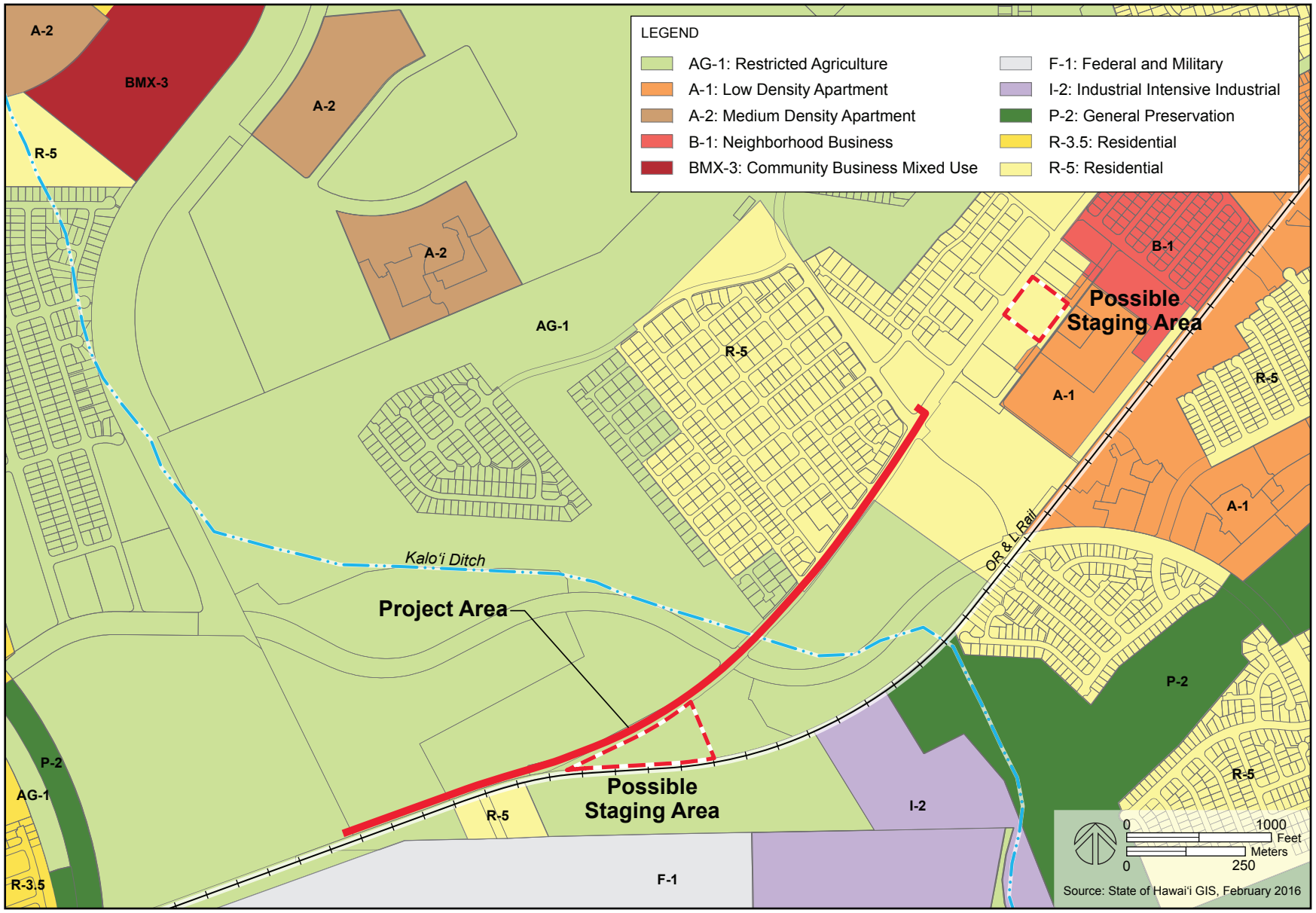
5.2.4 Special Management Area

The Hawai'i Coastal Zone Management Program embodied in Chapter 205A, HRS contains the general objectives and policies upon which all counties within the State have structured specific legislation creating Special Management Areas (SMA). The City and County of Honolulu, similar to other counties in Hawai'i, has adopted: (1) boundaries which identify the SMA; and (2) rules and regulations which are consistent with Chapter 205A, HRS that control development within the SMA. Proposed development within the SMA is subject to review and approval in order to ensure adequate access to recreation areas and minimal adverse impacts to water resources, and scenic and recreational amenities.

Discussion: The project site is located outside the boundaries of the SMA, and does not require an SMA Permit.

5.2.5 'Ewa Villages Master Plan

The 'Ewa Villages Master Plan was prepared by the City and County of Honolulu Department of Housing and Community Development in 1992. The 606-acre project area encompasses the historic sugar plantation residential areas of Tenney, Renton and Varona villages and surrounding vacant lands formerly used for sugar production. Providing the framework for the City's efforts to revitalize and develop the 'Ewa Villages community, the master plan envisioned a total 1,230 residential units (including rehabilitation of existing plantation homes and construction of more than 900 new units), rehabilitation of existing community buildings, a new commercial plaza at the old mill site, a new 18-hole municipal golf course (i.e., 'Ewa Villages Golf Course) and the expansion of 'Ewa Mahiko District Park. Infrastructure improvements in accordance with City standards, including roadway, water, drainage and wastewater system upgrades and additional community parks and open space, were also identified.



City and County of Honolulu Zoning Districts **Figure 5-3**

Ewa Villages R1 Water Main Replacement

Environmental Assessment

City and County of Honolulu Department of Facility Maintenance

Plan objectives include the following:

1. Establish rehabilitation, rental, and homeownership programs for the Tenants of Record of Renton Village, Tenney Village, and Varona Village
2. Develop new housing units to meet a portion of O‘ahu’s affordable housing demand
3. Preserve the historic nature of the villages
4. Develop a drainage program to alleviate flooding within Renton, Tenney, and Varona Villages and to provide recreation/open space via an integrated golf course design, and
5. Develop economic opportunities for area residents.

Since the Master Plan was first developed in 1992, implementation has included the following:

- Opportunities for original tenants and former employees of the ‘Ewa Plantation Company within Renton and Tenney Villages to purchase and rehabilitate their existing homes, purchase a home in a new village, or relocate to a different area
- Development of three new villages: Lincoln, Laulima, and Lōkahi Greens
- Development of two affordable housing projects: Franciscan Vistas ‘Ewa was completed in 2010 with 149 affordable rental units for low-income seniors; and Hui Kauhale
- Construction of the ‘Ewa Villages Golf Course (opened in 1996), providing flood control and recreation
- Construction of the ‘Ewa Mahiko District Park (opened in 1998), with recent addition of a gym, ball courts and parking
- Construction of a children’s residential nursing facility, Kūlana Mālama (opened in 2007), and
- Preservation of the historic character of the plantation villages (Department of Planning and Permitting, 2014).

Discussion: Improvements to the existing R1 water irrigation system in ‘Ewa Villages including separation of ‘Ewa Villages common areas from the golf course is necessary to fulfill requirements pursuant to the City’s Master plan and redevelopment plans for the area.

6. CONFORMANCE WITH FEDERAL PLANS AND POLICIES

The proposed project is planned to receive funding from both HUD and the City. The funding portion from HUD constitutes a federal action that requires the project to comply with NEPA and 24 CFR Part 58 requirements.

6.1 NATIONAL ENVIRONMENTAL POLICY ACT

This EA is being prepared to comply with the National Environmental Policy Act (NEPA) of 1969 (42 USC §4321 et seq.), as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508). HUD instructions and guidance—Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities (24 CFR Part 58)—are being followed to ensure proper compliance. Coordination with the City BFS is on-going to complete HUD documentation for NEPA documents, which includes the environmental review record (Environmental Assessment Determinations and Compliance Findings for HUD-Assisted Projects 24 CFR Part 58).

6.2 NATIONAL HISTORIC PRESERVATION ACT OF 1966

The National Historic Preservation Act of 1966 (NHPA) (as amended) (16 USC §470) recognizes the nation's historic heritage and establishes a national policy for the preservation of historic properties as well as the National Register of Historic Places. Section 106 of the NHPA requires Federal agencies to take into account the effects of Federal undertakings on historic properties and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The Section 106 process, as defined in 36 CFR §800, provides for the identification and evaluation of historic properties, for determining the effects of undertakings on such properties, and for developing ways to resolve adverse effects in consultation with consulting parties.

In accordance with Section 106 of the NHPA, the City has initiated consultation with the SHPO and other consulting parties, as listed in Section 8.2. Concurrence to determine the effect and mitigation required for the Proposed Action is pending.

6.3 COASTAL ZONE MANAGEMENT ACT OF 1972

The purpose of the Coastal Zone Management Act (CZMA) of 1972, as amended (16 USC §145 et seq.) is to encourage coastal states to manage and conserve coastal areas as a unique, irreplaceable resource. Federal activities that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of Federally-approved State CZM programs. The CZMA federal consistency provision ensures that federal agencies cannot act without regard for, or in conflict with, state policies that have been officially incorporated into a state's CZM program. Federal actions affecting any coastal use or resource must be reviewed by the state CZM program to ensure that proposed activities are consistent with state enforceable policies.

The State of Hawai'i Office of Planning is the lead agency that administers the State CZM Program. The Hawai'i CZM Program does not review any HUD-funded projects for CZMA federal consistency.

6.4 SAFE DRINKING WATER ACT OF 1974

The Safe Drinking Water Act (SDWA), 42 USC. §300f et seq. (1074) was established to protect public health by regulating the nation's public drinking water supply. The law focuses on all waters, including those actually or potentially designed for drinking use from both above ground and underground sources. Under the SDWA, the EPA is authorized to establish minimum standards to protect potable water and require all owners or operators of public water systems to comply with these standards. The SDWA also establishes the Sole Source Aquifer Program, under which the EPA may evaluate Federally-funded projects to determine whether they have the potential to contaminate a sole source aquifer.

As described in Section 3.3, the project area overlies the Pearl Harbor Aquifer, which is part of the Southern O'ahu Basal Aquifer as designated under the EPA's Sole Source Aquifer Program. Since the Proposed Action would deliver R-1 water sourced directly from the reclamation facility, the quality and system reliability of non-potable water used for irrigation would be improved. There are no activities involved in the Proposed Action that withdraw or affect groundwater resources, so there would be no risk of contamination to the aquifer. Appendix E presents the Memorandum of Understanding between HUD Region IX and EPA Region IX (April 2019) concerning projects receiving federal financial assistance that are subject to EPA review for their potential to affect sole source aquifer. In accordance with the MOU, the Proposed Action does not meet the project criteria for referral to the EPA under Section 1424(a) of the SDWA, and is identified as an activity that need not be referred to EPA for evaluation prior to HUD approval (i.e., modernization of an existing public facility).

6.5 ENDANGERED SPECIES ACT OF 1973

The Endangered Species Act (ESA) (16 USC §1531 et seq.) establishes a process for identifying and listing species. It requires all Federal agencies to carry out programs for the conservation of federally listed endangered and threatened plants and wildlife, and prohibits actions by Federal agencies that may adversely affect listed species or adversely modify designated critical habitat without formal consultation with the USFWS or the National Oceanic and Atmospheric Administration (NOAA). Section 7 of the ESA specifies consultations with Federal wildlife management agencies on actions that may jeopardize species or habitat. Section 9 of the ESA prohibits the "taking" of endangered species by causing harm or harassment.

In accordance with Section 7 requirements, the City has initiated consultation with the USFWS Based on the findings of the recent biological surveys, it is anticipated that the Proposed Action is *not likely to adversely affect* listed species or critical habitat. USFWS written concurrence to support the determination of effect is anticipated.

6.6 CLEAN AIR ACT

The Clean Air Act (42 USC §7401 et seq. (1970) regulates air emissions from stationary and mobile sources. It authorizes the use of National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. In addition to setting these pollutant standards, this Act directs the states to develop state implementation plans, applicable to appropriate industrial sources, to achieve these standards.

The General Conformity rule established by the Clean Air Act (Section 176(c)(4)) plays an important role in helping states improve air quality in areas that do not meet NAAQS. Under the General Conformity rule, federal agencies must work with state and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state implementation plans https://www.epa.gov/general-conformity/what-general-conformity. Since the State of Hawai'i is in attainment of the NAAQS, the Proposed Action is not subject to the Clean Air Act's General Conformity Rule.

6.7 CLEAN WATER ACT

The Clean Water Act of 1972 (33 USC §1251 et seq.) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters, including lakes, rivers and coastal areas. The primary objective of the Clean Water Act is to restore and maintain the integrity of the nation's waters.

- Section 401 requires a Water Quality Certification be obtained from the State (or territory) for actions that require a Federal permit to conduct an activity, construction or operation that may result in a discharge into waters of the United States. The State of Hawai'i Department of Health, Clean Water Branch (DOH-CWB) has jurisdiction to issue water quality certification permits for activities affecting jurisdictional waters.

- Section 402 establishes a National Pollutant Discharge Elimination System (NPDES) permit program for discharge of pollutants from point and non-point sources into surface waters (e.g., storm water discharges associated with construction activities). Such a permit would be required if construction activities disturb a land area of one acre or more and discharge storm water from the construction site to waters of the U.S. The DOH-CWB implements this NPDES program for the State.

- Section 404 requires a permit for the discharge of dredged or fill material into a wetland, navigable water, or jurisdictional waters of the United States. The U.S. Army Corps of Engineers has jurisdiction to issue permit under these regulations.

A NPDES permit would be required prior to construction since the disturbed area (i.e., the water line trenching and staging areas) would exceed one acre. Based on available information, there is not anticipated to be any need for dewatering onsite.

6.8 WILD AND SCENIC RIVERS ACT OF 1968

The Wild and Scenic Rivers Act of 1968 (16 USC §1271 et seq.) was created to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act safeguards the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. There are no designated Wild or Scenic rivers in the State of Hawai'i.

6.9 FARMLAND PROTECTION POLICY ACT OF 1981

The purpose of the Farmland Protection Policy Act of 1981 is to minimize the effect Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures, to the extent possible, that federal programs are administered to be compatible with state and local government and private programs and policies to protect farmland. For the purpose of the Act, farmland includes prime and unique farmland, and land of statewide or local importance, including lands not currently in use for crop production such as forest and pasturelands. Water and urban built-up land is excluded.

Two agricultural classification systems are used in Hawai'i: the University of Hawai'i Land Study Bureau (LSB) inventory and the Agricultural Lands of Importance in the State of Hawai'i (ALISH) developed by the State Department of Agriculture. Figure 3-2 identifies the LSB land type classifications in relation to the project area. Figure 3-3 identifies the ALISH classifications in relation to the project area. The majority of the project area is unclassified by both the LSB and ALISH systems, except for: the western end of the project area which has an "Excellent" LSB productivity rating and is classified as "Other" by ALISH; a section makai (south) of Varona Village which has a "Very Poor" LSB productivity rating and is unclassified by ALISH; and the central portion of the project area which has a "Good" LSB productivity rating and is classified as "Other" and "Prime" by ALISH.

The project area consists primarily of the Renton Road ROW, which is a publicly-owned roadway that serves as the main thoroughfare for the 'Ewa Villages community. The central portion of the project area that has a "Prime" designation by the ALISH system is urban built-up land that is excluded from consideration under this Act. The western end of the project area that has an "Excellent" LSB productivity rating is currently undeveloped, vacant land that has not been used for crop production since its association with the sugar plantation. This undeveloped portion is the unpaved corridor of the Renton Road ROW intended to support future residential development planned for this area. No impacts on prime or unique, statewide, or locally important farmland is expected to occur.

6.10 COASTAL BARRIER RESOURCES ACT

The Coastal Barrier Resources Act of 1982 (16 USC §3501 et seq.) encourage conservation of hurricane-prone, biologically rich coastal barriers by prohibiting federal expenditures that encourage development within designated units of the Coastal Barrier Resources System. Across the United States, there are a total of 584 system units encompassing approximately 1.3 million acres of land and associated aquatic habitat regulated by this legislation. There are no system units established for the State of Hawai'i.

6.11 EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

Executive Order 11988, Floodplain Management requires Federal activities to avoid impacts to floodplains and to avoid direct and indirect support of floodplain development to the extent practicable. The Federal Emergency Management Agency (FEMA) designates floodplains as geographic zones subject to varying levels of flood risk, with each zone reflecting a specific severity or type of potential flooding in the area.

As discussed in Section 3.4.4, the majority of the project area is within Zone X or Zone D. Only the central portion of the project area surrounding Kalo'i Gulch is within the 100-year floodplain. The proposed water line would be structurally mounted to the bridge that passes above Kalo'i Gulch, and would therefore be elevated away from the flood zone (see Section 2.3.3. for description of the pipe support system across the Renton Road bridge).

6.12 EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

Executive Order 11990, Protection of Wetlands requires Federal activities to avoid adverse impacts to wetlands, where practicable, and avoid construction in wetland areas. Federal agencies are required to make a determination whether or not a proposed action is located within wetlands identified on the National Wetlands Inventory, or consult with the USFWS.

The project area contains an area of mapped wetlands at the southeastern corner of Kapolei Parkway and Renton Road defined as a Freshwater Forested/Shrub Wetland (PSS3A) by the USFWS National Wetland Inventory (see Section 3.3 and 3.5). This section of Kalo'i Gulch corresponds with the location of the modified, concrete-lined stream channel. The proposed water line would be structurally mounted to the bridge that passes above Kalo'i Gulch, and would therefore avoid this wetland area.

6.13 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

Environmental justice means ensuring that the environment and human health are protected fairly for all people regardless of race, color, national origin, or income (hudexchange.info/programs/environmental-review/environmental-justice/). Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations requires certain federal agencies, including HUD, to consider whether federally-assisted projects would have disproportionately high and adverse human health or environmental effects on minority and low-income populations. Additionally, it requires that access to public information and meaningful opportunities for public involvement by minorities and low-income populations be provided during project planning and development.

The EPA maintains an on-line environmental justice screening and mapping tool called EJSCREEN epa.gov/ejscreen which combines demographic and environmental indicators for selected areas in reports and maps. Table 6-1 presents a summary of the EJSCREEN report for the 'Ewa Villages community using 2010 U.S. Census Blockgroups 150030086172, 150030086171 and 150030086174. The demographic information presented in Table 6-1 indicates that the 'Ewa Villages community, with a population of 7,568 persons—is a minority population, but not a low-income population when compared to the state average. According to the report, 98 percent of the 'Ewa Villages population is minority, which is equal to or higher percentage minority than where 94 percent of the State population lives. Only 13 percent of the 'Ewa Villages population is reported to be low income, which is equal to or higher percentage low income than where 25 percent of the State population.

The Proposed Actionis not likely to cause disproportionately high and adverse human health or environmental effects on minority or low-income populations, as no adverse environmental impacts have been identified. The Proposed Action would have minor and temporary construction-related impacts such as increased noise levels, dust and exhaust emissions, traffic lane and sidewalk closures

resulting in traffic delays, all of which are typical for construction involving trenching. No major, lasting impacts have been identified. The design, operation and use of the recycled water system would be regulated and monitored in accordance with the regulations established in Chapter 11-62 HAR Wastewater Systems Rules and the DOH's Reuse Guidelines dated January 2016. Strict compliance with these regulations would safeguard public health and safety.

Table 6-1
EJSCREEN Report (Blockgroup 150030086172,150030086171,150030086174

Selected Variables	Value	State Average	Percentile in State	EPA Region Average	Percentile in EPA Region	USA Average	Percentile in USA
Environmental Indicators							
Particulate matter (PM 2.5 in µg/m^3)	N/A	N/A	N/A	10.1	N/A	9.53	N/A
Ozone (ppb)	N/A	N/A	N/A	48.3	N/A	42.5	N/A
NATA* Diesel PM (µg/m^3)	0.11	0.15	61	0.978	<50th	0.938	<50th
NATA* Air toxics cancer risk (risk per MM)	35	34	66	43	<50th	40	<50th
NATA* Respiratory hazard index	1	1	60	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	630	1000	70	1100	63	600	81
Lead paint indicator (% pre-1960s housing)	0.21	0.16	67	0.24	58	0.29	53
Superfund proximity (site count/km distance)	0.13	0.096	79	0.14	75	0.12	78
RMP proximity (facility count/km distance)	0.13	0.37	43	0.97	23	0.72	30
Hazardous waste proximity (facility count/km distance)	0.22	1.4	36	2.8	24	4.3	38
Wastewater discharge indicator (toxicity-weighted concentration/m distance)	0.00091	0.04	89	12	70	30	67
Demographic Indicators							
Demographic index	55%	51%	64	47%	63	36%	78
Minority population	98%	78%	94	59%	94	38%	96
Low income population	13%	25%	25	35%	17	34%	18
Linguistically isolated population	6%	6%	65	8%	50	4%	74
Population less than high school education	17%	9%	88	17%	60	13%	72
Population under age 5	7%	6%	58	6%	55	6%	59
Population over age 64	16%	16%	50	13%	69	14%	62

The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

6.14 AIRPORT HAZARDS

Projects assisted with HUD funds cannot be located in the runway protection zone of a commercial airport or in the runway protection zone of a military airfield. In addition, HUD requires that any project proposed in an accident potential zone of a military airfield must be consistent with the land use plans that have been developed for these areas. HUD regulatory standards to prevent incompatible development around civil airports and military airfields are detailed in 24 CFR Part 51, Subpart D.

The project area is not located within 2,500 feet of a civilian airport or within 15,000 feet of a military airfield. The nearest civilian airport is the Kalaeloa Airport, located roughly 1.5 miles (7,900 feet) southwest of the project area (see Figure 1-1). The nearest military airfield runway serves Joint Base Pearl Harbor-Hickam located roughly five miles (26,400 feet) southeast of the project area. Hickam shares runways with the Daniel K. Inouye International Airport, which is the State's largest commercial civilian airport.

6.15 EXPLOSIVE AND FLAMMABLE FACILITIES

HUD has regulations that restrict how close HUD-assisted projects can be located to facilities that store, handle or process products or substances of an explosive or flammable nature, including specific guidelines to determine an acceptable separation distance beyond which assisted projects may be located. A blast or explosion hazard evaluation is required to avoid establishing a facility near a potentially explosive source such as an above ground storage tank or a facility manufacturing or handling explosive or fire-prone substances. HUD regulatory standards to protect from explosive and flammable hazards are detailed in 24 CFR Part 51, Subpart C.

The Proposed Action would construct a new underground waterline to replace an existing, aged waterline. The Proposed Action is not subject to the separation distance standards for explosive and flammable facilities because it is a public utility excluded from consideration as a HUD-assisted project.[4]

[4] According to 24 CFR § 51.201 , the definition of HUD-assisted project is "development, construction, rehabilitation, modernization or conversion with HUD subsidy, grant assistance, loan, loan guarantee, or mortgage insurance, of any project intended for residential, institutional, recreational, commercial or industrial use."

7. SUMMARY OF OTHER IMPACTS

7.1 CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (HAR Section 11-200.1-2). Secondary impacts or indirect effects are defined as "effects which are caused by the action and are later in time or father removed in distance, but still reasonably foreseeable. [It] may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (HAR Section 11-200.1-2).

The analysis of cumulative impacts takes into account future developments planned for the 'Ewa Villages community, which corresponds to the area currently served by the existing R-1 water line. The only known developments and infrastructure improvements for this area include projects identified in the *'Ewa Villages Master Plan* and the BWS's expansion of the 'Ewa nonpotable water system (Honolulu Board of Water Supply 2005). However, since these are long-range plans with no specified timeframe for development, they were not considered contributing factors to the cumulative impact. Future development and population growth planned for the 'Ewa region was also not accounted for because of their location outside the boundaries of the 'Ewa Villages community.

Because there are no other known actions occurring in the present or reasonably foreseeable future, no cumulative impacts are expected. The Proposed Action replaces an existing water line and would not introduce any new facilities or uses that would result in population changes or impacts on public facilities. Impacts would be limited to construction-period impacts (such as increased noise levels, dust and air quality impacts, traffic, etc.) which would be short-term and temporary in duration. Secondary impacts resulting from the Proposed Action include the conservation of limited water resources for future water needs and more efficient watering practices for R-1 water users.

7.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those that cannot be recovered if the proposed project is implemented. The Proposed Action would irreversibly and irretrievably commit three types of resources: (1) human labor; (2) fuel, oil, and lubricants for construction vehicles and equipment; and (3) energy and resources used to produce the materials and components used in the project (e.g., pipe, construction products, roadway materials). The Proposed Action and the No Action Alternative would require similar resources—electricity, water and manpower—to operate and maintain the systems.

8. AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED

8.1 CHAPTER 343, HRS PRE-ASSESSMENT CONSULTATION

An informational letter was sent on April 3, 2019 to 38 agencies, organizations and individuals to gather comments on the proposed project during the pre-assessment consultation process to prepare this Draft EA. A total of 13 agencies and organizations provided written comments. Agencies and organizations that were consulted during preparation of the Draft EA are listed as follows. The parties who formally responded during the pre-assessment consultation process are identified by an asterisk (∗). Copies of the pre-assessment consultation letter, written comments received in response to the letter, and subsequent response letters addressing those comments are presented in Appendix F

<u>Federal</u>

Department of Army, Army Corps of Engineers
∗ Department of the Interior, Fish and Wildlife Service

<u>State of Hawai'i</u>

∗ Department of Business, Economic Development & Tourism, Office of Planning
∗ Department of Hawaiian Home Lands
∗ Department of Health, Environmental Health Administration
∗ Department of Health, Environmental Management Division
- Responses were received from: (1) Wastewater Branch and (2) Indoor and Radiological Health Branch

∗ Department of Land and Natural Resources, Land Division
DLNR, State Historic Preservation Division
∗ Department of Transportation
Office of Hawaiian Affairs
Office of Environmental Quality Control
State Land Use Commission

<u>City and County of Honolulu</u>

∗ Department of Design and Construction
∗ Department of Enterprise Services
Department of Environmental Services
∗ Department of Parks and Recreation
∗ Department of Planning and Permitting
∗ Department of Transportation Services
∗ Honolulu Fire Department
∗ Honolulu Police Department

<u>Utility Companies</u>

Hawaiian Electric Company
Hawaiian Telcom
Charter Communications

Community Organizations and Others

Ewa Neighborhood Board No. 23
Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34
Historic Hawai'i Foundation
Senator Kurt Fevella, District 19
Senator Mike Gabbard, District 20
Representative Rida Cabanilla Arakawa, District 42
Representative Ty Cullen, District 39
Representative Stacelynn Eli, District 43
Councilmember Kymberly Marcos Pine, District 1
Councilmember Ron Menor, District 9
'Ewa Villages Owners Association
'Ewa Villages Golf Course
'Ewa Villages Owners Association, Associa Hawaii, AAMC(r)
Hawaiian Properties, Ltd.
Savio Group of Companies

8.2 NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION

Consultation letters were sent to the following agencies and organizations as part of the initial NHPA Section 106 consultation process. Correspondence in presented in Appendix D.

Agencies

Advisory Council on Historic Preservation
O'ahu Island Burial Council
State Historic Preservation Office

Native Hawaiian Organizations

Association of Hawaiian Civic Clubs
Council for Native Hawaiian Advancement
'Ewa / Pu'uloa Hawaiian Civic Club
The Friends of 'Iolani Palace
Hoakalei Cultural Foundation
Kalaeloa Heritage and Legacy Foundation
Kawaihapai Ohana
Malu'ōhai Residents' Association
Na Ku'auhau 'o Kahiwakaneikopolei
O'ahu Council, Association of Hawaiian Civic Clubs
Office of Hawaiian Affairs
Papa Ola Lokahi
Royal Hawaiian Academy of Traditional Arts

Additional Consulting Parties

Hawai'i Maoli
Hawaiian Railway Society

Historic Hawai‘i Foundation
Kanehili Cultural Hui
Ku‘iwalu

8.3 CULTURAL IMPACT ASSESSMENT CONSULTATION

In addition to the EA pre-assessment consultation and NHPA Section 106 consultation, the two individuals listed as follows were contacted to support research for preparation of the CIA:

Mikiala Lidstone, President, Ulu A‘e Learning Center and Kumu Hula, Hālau ‘o Kaululaua‘e
Ku‘uwainani Eaton, Executive Director, Hoakalei Cultural Foundation

9. ANTICIPATED DETERMINATION AND FINDINGS

9.1 CHAPTER 343, HRS ANTICIPATED DETERMINATION AND FINDINGS

To determine whether a proposed action may have a significant impact on the environment, the proposing agency needs to consider all phases of the action, the expected primary and secondary consequences, cumulative effect, and the short- and long-term effects. The agency's review and evaluation of the proposed action would result in a determination of either: 1) the action may have a significant effect on the environment, and an Environmental Impact Statement Preparation Notice should be issued, or 2) the action is not likely to have a significant effect and notice of a Finding of No Significant Impact should be issued.

Based on the findings presented in this document, the Proposed Action is not expected to result in a significant impact on the environment. In accordance with Chapter 343, HRS and Section 11-200.1, HAR, it is anticipated that DFM will determine that the proposed project will not have a significant environmental impact and an EIS will not be required. A Finding of No Significant Impact is anticipated.

The anticipated determination was based on review and analysis of the significance criteria specified in Section 11-200.1-13, HAR. An action shall be determined to have a significant effect on the environment if it meets any of the following criteria:

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

The project site encompasses lands that have been previously used for agricultural activity and have long been used for urban development. There are no threatened or endangered species of plants or wildlife that inhabit the project area, and there would be no impact to coastal resources. The mapped wetlands associated with Kalo'i Gulch that underlies the Renton Road bridge would be avoided since construction would be contained on the bridge structure. No significant archaeological or cultural resources are anticipated, and Native Hawaiian cultural practices would not be impacted. Likewise, the integrity of the significant historic properties in the vicinity of the project area—including the 'Ewa Sugar Plantation Villages Historic District which encompasses most of the project area, a historic street light, the OR&L ROW and Hawaiian Railway Society 'Ewa Railroad Yard—would not be affected. To minimize potential loss or destruction of resources, construction activities would be conducted under an archaeological monitoring plan prepared in concurrence with SHPO and the consulting parties.

2. Curtail the range of beneficial uses of the environment

The alignment of the proposed water line primarily within the City-owned ROW and the underground installation of the water line preserves use of the surrounding area for other uses. Providing a new R-1 distribution system to replace the existing system supports the City's efforts to substitute recycled water as a means to conserve limited potable water resources. No significant adverse impacts to the natural environment would result from the proposed development. Construction and operation of the new facilities would be performed in accordance with applicable State and County regulations, thereby minimizing potential impacts to air and water quality and ambient noise levels.

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

The Proposed Action is consistent with the State's long-term environmental policies and guidelines specified in Chapter 344, HRS. Conformance and consistency with Chapter 344, HRS is reviewed in Section 5.1.2.

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

The Proposed Action does not include any new facilities or uses to increase resident or visitor populations, employment patterns, housing demand or community character. The Proposed Action would have a beneficial short-term effect on the economy, due to the temporary increase in construction-related jobs

5. Have a substantial adverse effect on public health

The proposed project would not substantially affect public health. Parks and landscaped areas within the 'Ewa Villages service area are currently using R-1 water for irrigation purposes, so the only change from the current situation would be the ability to deliver the highest grade of R-1 water directly from HWRF (i.e., not stored in the 'Ewa Villages Golf Course irrigation pond). Typical short-term construction-related impacts (noise, air quality, and traffic) would be experienced, but these would be temporary and limited to the construction period. Standard construction BMPs would be used to minimize the temporary impacts. Compliance with applicable State and County regulations would ensure that public health concerns are addressed.

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

No foreseeable changes in land use or intensity of existing use, population or employment levels, or demand for public facilities is anticipated. The Proposed Action is limited in scope to replacing an existing utility system at the current level of demand. Positive secondary impacts resulting from the Proposed Action include the conservation of limited water resources for future water needs and more efficient watering practices for R-1 water users.

7. Involve a substantial degradation of environmental quality

The environmental quality would not change as a result of the Proposed Action. The water line would be installed underground and would not affect surrounding uses. The use of standard construction and erosion control BMPs would minimize anticipated construction-related short-term impacts (i.e., noise, air quality, water quality, solid waste generation and traffic). The implementation of this project will have an overall beneficial impact to the quality of the R-1 water because it will no longer be exposed to storage conditions associated with the golf course irrigation pond storage.

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

The Proposed Action would not result in any adverse cumulative impacts since no major foreseeable future actions or regional changes have been identified. A discussion of cumulative and secondary impacts is discussed in Section 7.1.

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

The project area is an existing urbanized area that has been previously disturbed for development. There are no threatened, endangered or candidate listed animal or plant species or habitats that require protection under Federal or State regulations within the project area. Consultation with the USFWS under Section 7(a)(2) of the Endangered Species Act has been initiated and is in progress. Based on the findings of the recent biological surveys, it is anticipated that the Proposed Action is *not likely to adversely affect* listed species or critical habitat. USFWS written concurrence to support the determination of effect is expected.

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

The proposed project would not substantially affect air or water quality or ambient noise levels, as the water system does not generate air, noise or water pollutants. Although temporary, short-term increases such as noise and dust would be experienced during construction, BMPs would be used to minimize impacts.

11. Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters

The project area is within an urbanized, developed area that is identified for existing and future residential use; it is not an environmentally sensitive area. Due to the project area's inland location and the installation of the water line underground (except for the exposed section that would be attached to the bridge crossing Kalo'i Stream), there is no risk from tsunami, beach activities or coastal erosion or stream flooding. The project area is outside both the predicted 3-foot SLR exposure area and the 6-foot SLR inundation scenario, and would not be subject to stream flooding or inundation associated with sea level rise. There are no known erosion or subsidence problems, or geological hazards in the area. BMPs would be designed to minimize soil erosion and also prevent construction debris from entering Kalo'i Stream and nearshore areas.

12. Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies; or

The water line would be buried beneath the ground surface, with only the valves visible aboveground. The underground installation of the water line ensures that scenic vistas and viewplanes identified in County or State plans or studies would not be affected. No new lighting that could alter the nighttime environment would be installed.

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

Construction, operation and maintenance of the proposed water line would require minimal energy consumption. The proposed water line would replace an existing water line already in use, and the amount of energy used and the amount of greenhouse gas emissions produced during operation would be similar to the current use. No new uses or activities that are major users of energy or major producers/sources of greenhouse gases would be introduced.

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APPENDIX A

Botanical Assessment
Prepared by Legrande Biological Surveys, Inc.

BOTANICAL ASSESSMENT FOR
PROPOSED NEW R-1 WATER MAIN ALONG RENTON ROAD
KAPOLEI, OAHU, HAWAII

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May 2019

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INTRODUCTION

This report includes the findings of a botanical inventory conducted for the proposed installation of an R-1 water main along Renton Road, Kapolei, Oahu. LeGrande Biological Surveys Inc. carried out a botanical field survey of the above location on February 5, 2019. The primary objectives of the field studies were to:

1) inventory the flora;
2) provide a general description of the vegetation on the project site;
3) search for threatened and endangered species as well as species of concern; and
4) provide recommendations regarding potential impacts to the plant resources of the area in regards to the proposed project.

Federal and State of Hawaii listed species status follows U.S. Fish and Wildlife (USFWS, 2015).

SITE DESCRIPTION

The survey area is located in the Ewa plain of Oahu in the Kapolei region. The proposed water main installation begins near Ka Makana Ali`i along the Makai or southern side of Renton Road to the intersection of Renton Road and Kapolei Parkway where the alignment crosses over at the east side of the intersection to run along the mauka or north side of Renton Road terminating at Park Row. An alternative alignment along the southern side of Renton Road from Kapolei Parkway to Park Row was also included in the current survey. The transect is composed primarily of flat or gently sloping land dominated by weedy maintained lawns and landscaped street trees. The area has been altered from its natural state by human use including, agricultural activities, urbanization, and most recently roadway and rail construction. The NRCS Soil Survey shows the substrate characterized by Honouliuli clay (HxA) and Mamala Cobbly Silty (MnC) (NRCS, 2019).

SURVEY METHODS

Topographic maps were examined to determine terrain characteristics, access, boundaries, and reference points. Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. A pedestrian survey was carried out where the principal investigator walked the entire proposed transect for the water line and included a 100-foot wide area along the length of the proposed water line. Two laydown areas that are proposed for the project were also surveyed and included in the report.

DESCRIPTION OF VEGETATION

The entire survey area is characterized by a disturbed weedy grass land with scattered trees. The NRCS Soil Survey map provided a substrate of Honouliuli Clay (HxA) for the eastern section of the project area and Mamala Cobbly Silt (MnC) for the western section of the project area along Renton Road (NRCS, 2019).

Most of the area is level land dominated by maintained or mowed grass with scattered shrub and tree species. The dominant plant species were non-native including, opiuma (*Pithecellobium dulce*), kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), buffelgrass (*Cenchrus ciliaris*), Guinea grass (*Panicum maximum*), castor bean (*Ricinus communis*), common sandbur (*Cenchrus echinatus*), and Australian saltbush (*Atriplex semibaccata*). The few native plants observed included the indigenous `uhaloa (*Waltheria indica*) along with a few `ilima (*Sida fallax*) at the western tie in area near Ka Makana Ali`i.

Both alternatives, north and south sides, of the proposed line to the east of Kapolei Parkway along Renton Road are characterized by planted street trees such as banyan (*Ficus microcarpa*), *Tabebuia* sp., and fiddlewood (*Citharexylum caudatum*). Maintained grassy strips between the street and sidewalk were observed on both sides of the roadway. Other planted ornamental species include hibiscus (*Hibiscus* sp.), croton (*Codiaeum variegatum*), and mock orange.

The western laydown area is to the south of Renton Road across from Haakei Street to Leialoalo Street. It is dominated by buffelgrass and kiawe, opiuma, and koa haole trees. The eastern laydown area fronting the Manager's Mansion along Renton Road is characterized by maintained lawns and scattered monkeypod trees.

There was a total of 56 plant species observed within the survey area. 54 are alien (introduced), and 2 are indigenous (native to the Hawaiian Islands and elsewhere). Therefore, 98% of the plant species observed are alien and 2% are native. An inventory of all the plants observed within the survey area is presented in the species list (Table 1) at the end of the report.

DISCUSSION

The survey areas: R-1 water line transect, lay down areas, blow-off area, are all dominated by non-native and weedy plant species and landscaped street trees. The proposed water line project is not expected to having any long lasting detrimental effects to the vegetation within the project area.

No critical habitat is designated within the project area. An area of mapped wetlands is located at the southeastern corner of Kapolei Parkway and Renton Road. It is defined as a Freshwater Forested/Shrub Wetland (PSS3A) by the USFWS National Wetland Inventory (2019). Essentially, it is a concrete basin that is currently used for drainage in the broader region of Kapolei. No changes are assumed to be made to the area for the current project.

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TABLE 1. PLANT SPECIES LIST

The following checklist is an inventory of all the plant species observed during the survey conducted on February 5, 2019. The plant names are arranged alphabetically by family and then by species into two groups: Monocots and Dicots. The taxonomy and nomenclature follow in accordance with Wagner *et al*. (1990), Wagner and Herbst (1999) and Staples and Herbst (2005). Recent name changes are those recorded in the Hawaii Biological Survey series (Evehuis and Eldredge, eds., 1999-2002) and the BISH native-naturalized checklist March 2010.
For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Where the plant was observed; marked as in either the coastal or mauka sections of the project area or both.
4. Biogeographic status. The following symbols are used:

A = Alien species introduced to the Hawaiian Islands by humans, intentionally or accidentally.
I = Indigenous species native to the Hawaiian Islands and also found elsewhere in the world.

SCIENTIFIC NAME	COMMON NAME	STATUS
MONOCOTS		
ALOEACEAE		
Aloe vera (L.) N.L.Burm.		A
POACEAE		
Cenchrus ciliaris L.	buffelgrass	A
Cenchrus echinatus L.	Common sandbur	A
Digitaria insularis (L.) Fedde	sourgrass	A
Cynodon dactylon (L.) Pers	manienie	A
Eragrostis amabilis (L.) Wight&Arn. Ex Nees	lovegrass	A
Melinis repens (Willd.) Zizka	Natal redtop	A
Panicum maximum L.	Guinea grass	A
Setaria verticillata (L.) P.Beauv.	Bristly foxtail	A
DICOTS		
ACANTHACEAE		
Asystacia gangetica (L.) T.Anderson	Chinese violet	A

AMARANTHACEAE		
Alternanthera pungens Kunth	khaki weed	A
Amaranthus viridus L.	slender amaranth	A
Amaranthus spinosus L.	spiny amaranth	A
APOCYNACEAE		
Plumeria rubra L.	plumeria	A
ASTERACEAE		
Bidens pilosa L.	Spanish needle	A
Emilia fosbergii Nicolson	Pualele	A
Flaveria trinerva L.	clustered yellowtips	A
Sonchus oleraceus L.	sow thistle, pualele	A
Tridax procumbens L.	coat buttons	A
BIGNONIACEAE		
Tabebuia sp.		A
CHENOPODIACEAE		
Atriplex semibaccata R.Br.	Australian saltbush	A
Chenopodium murale L.	`aheahea	A
Salsola tragus L.	Russian thistle	A
CONVOLVULACEAE		
Ipomoea obscura (L.) Ker Gawl.	morning glory	A
Merremia aegyptia (L.) Urb.	hairy merremia	A
EUPHORBIACEAE		
Chamaesyce hirta (L.) Millsp.	hairy spurge, garden spurge	A
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	A
Codiaeum variegatum L.	croton	A
Ricinus communis L.	castor bean	A

FABACEAE		
Acacia farnesiana (L.) Willd.	klu	A
Chamaecrista nictitans subsp. *patellaria* var. *glabrata* (Vogel) H.S.Irwin & Barneby	Partridge pea	A
Crotalaria pallida Aiton	smooth rattlepod	A
Desmanthus pernambucans (L.) Thelung	Slender mimosa	A
Indigofera suffruticosa Mill.	indigo	A
Leucaena leucocephala (Lam.) de Wit	koa haole	A
Macroptilium atropurpureum (DC) Urb.	wild bean	A
Pithecellobium dulce (Roxb.) Benth.	opiuma	A
Prosopis pallida (Humb. & Bonpl. Ex Willd.) Kunth	kiawe, mesquite	A
Samanea saman (Jacq.) Merr.	monkeypod	A
Tamarindus indica L.	tamarind	A
LAMIACEAE		
Leonotis nepetifolia (L.) R.Br.	lion's ear	A
MALVACEAE		
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	A
Hibiscus sp.	hibiscus	A
Malva parviflora L.	cheese weed	A
Malvastrum coromandelianum (L.) Garcke	false mallow	A
Sida fallax Walp.	`ilima	I
Sida spinosa L.	Prickly sida	A
MORACEAE		
Ficus microcarpa L.f.	Chinese banyan	A
MORINGACEAE		
Moringa oleifera Lam.	malungaay	A

NYCTAGINACEAE		
Boerhavia coccinea Mill.		A
Bougainvillea sp.	bougainvillea	A
RUTACEAE		
Murraya paniculata (L.) Jack	mock orange	A
SOLANACEAE		
Physalis peruviana L.	Poha, cape gooseberry	A
Solanum lycopersicum var. *cerasiforme* L.	cherry tomato	A
STERCULIACEAE		
Waltheria indica L.	uhaloa	I
VERBENACEAE		
Citharexylum caudatum L.	fiddlewood	A

Appendix
Site Photographs

Figure 1. Alignment follows to the left of gravel roadway along the existing power poles. Mowed grasses and weeds dominate the transect.

Figure 2. Western terminis of R-1 tie in area. Gravel and buffelgrass dominate the area.

Figure 3. Alignment along Renton Road and one of the proposed lay down areas across from Haakei Street. Vegetation dominated by buffelgrass, koa haole, and kiawe.

Figure 4. Preferred alignment along the northern side of Renton Road is dominated by grassy lawns and street trees such as fiddlewood and Tabebuia.

Figure 5. Northern alignment along Renton Road at the crossing with Alaiki Street. Bougainvillea hedge along home property boundary.

Figure 6. Southern alternative alignment follows the Makai edge (left) of the road between the sidewalk and roadway.

Figure 7. Banyan trees and hibiscus shrubs along southern alternative alignment.

Figure 8. One of two proposed lay down areas. This one is located to the south of Renton Road in front of the existing Manager's Mansion. Monkeypod trees, aloe, and maintained lawns dominate the area.

APPENDIX B

Avian and Terrestrial Mammalian Surveys
Prepared by Rana Biological Consulting

Avian and Terrestrial Mammalian Surveys Conducted for the Ewa Villages R-1 Water Main Project, ‘Ewa District, Island of O‘ahu

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February 7, 2019

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Introduction

The proposed action is to install 4,225 linear feet of 12-inch DR-14, PVC recycled water main along Renton Road from Ka Makana Ali'i to Ewa Mahiko Park This water main will provide R-1 water to the 'Ewa Villages area. The new R1 water main will cross the following Tax Map Keys (TMK): 9-1-016:142; 9-1-017:103, 111, 112, and 113; 9-1-095:163; 9-1-097:103; 9-1-126:003, 010, and 014; and Renton Road right-of-way

This report describes the methods used, and the results of the avian and terrestrial mammalian surveys conducted along the proposed water main routes as part of the environmental disclosure process associated with the proposed project.

The primary purpose of the surveys was to determine if there are any avian or mammalian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes within or adjacent to the study area. The federal and State of Hawai'i listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998; U. S. Fish & Wildlife Service (USFWS) nd). Fieldwork was conducted on January 30, 2019.

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text.

General Site Description

The propose waterline will be installed along Renton Road in Kapolei. All but the western couple of hundred yards of Renton Road is paved (Figure 1). The bulk of the waterline will be installed in areas that are fully developed (Figure 2). Vegetation within the area surveyed is best characterized as weedy grassland with scattered trees. Maintained and/or mowed lawns and scattered trees and shrubs dominate large sections of the survey area. The vegetation within the survey corridor is dominated almost to the exclusion of native plant species (LeGrande, 2019).

Methods

The avian phylogenetic order and nomenclature used in this report follows the *AOU Check-List of North American Birds* (American Ornithologists' Union, 1998), and the 42nd through the 58th supplements to the Check-List (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser *et al*., 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018). Mammal scientific names follow (Wilson and Reeder, 2005)). Place names follow (Pukui et al., 1976).

Figure 1 – Western end of Renton Road currently unpaved

Figure 2 – Eastern terminus of the waterline route showing developed nature of project site

Avian Survey Methods

Four avian point count stations were sited roughly equidistant from each other along the waterline route. Additionally a fifth count station was sited in the middle of the proposed Koga laydown area, located to the east of the pipeline route. A single eight-minute avian point count was made at each count station. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. The point counts were conducted between 8:00 am and 10:00 am, the period when birds are most active and vocal. Time not spent counting the point count stations was used to search the rest of the site for species and habitats not detected during the point counts.

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *ʻōpeʻapeʻa* as it is known locally, all terrestrial mammals currently found on the Island of Oʻahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area during the time spent on the site.

Results

Avian Survey

A total of 629 individual birds of 22 species, representing 13 separate families, were recorded during point counts. The sole native species recorded during the course of the survey Pacific Golden-Plover (*Pluvialis fulva*), is an indigenous migratory shorebird species. The remaining 21 species recorded are all established alien or feral species (Table 1). No additional avian species were detected while transiting the site.

Avian diversity and densities were relatively high, but in keeping with the location and the eclectic vegetation along the route. Four introduced species, African Silverbill (*Euodice cantans*), Japanese White-eye (*Zosterops japonicus*), Zebra Dove (*Geopilia striata*), and Red-vented Bulbul (*Pycnonotus cafer*), accounted for 54-percent of the total number of birds recorded. African Silverbill was the most commonly tallied species, which accounted for 25 percent of the birds recorded during point counts.

Table 1 – Avian Species Detected During Point Counts ʻEwa Villages R1 Water Line – January 2019

Common Name	*Scientific Name*	*ST*	*RA*
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Gray Francolin	*Francolinus pondicerianus*	A	1.60
Domestic Chicken	*Gallus* sp.	A	1.00
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	5.00
Zebra Dove	*Geopelia striata*	A	12.60
	CHARADRIIFORMES		
	CHARADRIIDAE - Lapwings & Plovers		
	Charadriinae - Plovers		
Pacific Golden-Plover	*Pluvialis fulva*	IM	0.80
	PELECANIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Cattle Egret	*Bubulcus ibis*	A	4.80
	PASSERIFORMES		
	PYCNONOTIDAE - Bulbuls		
Red-vented Bulbul	*Pycnonotus cafer*	A	10.20
Red-whiskered Bulbul	*Pycnonotus jocosus*	A	1.00
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	Zosterops japonicus	A	2.60
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	7.20
Northern Cardinal	Cardinalis cardinalis	A	0.60
	THRAUPIDAE - Tanagers		
	Thraupinae - Core Tanagers		
Red-crested Cardinal	*Paroaria coronata*	A	0.20
Saffron Finch	*Sicalis flaveola*	A	2.00
	FRINGILLIDAE - Fringilline and Carduline Finches & Allies		
	Carduelinae - Carduline Finches and Hawaiian Honeycreepers		
House Finch	*Haemorhous mexicanus*	A	7.60
Yellow-fronted Canary	*Ceithagra mozambica*	A	2.20
	PASSERIDAE - Old World Sparrows		
House Sparrow	*Passer domesticus*	A	5.00
	ESTRILDIDAE - Estrildid Finches		
Common Waxbill	*Estrilda astrild*	A	5.20
Red Avadavat	*Amandava amandava*	A	1.20
African Silverbill	*Euodice cantans*	A	31.80
Java Sparrow	*Lonchura oryzivora*	A	13.20
Scaly-breasted Munia	*Lonchura punctulata*	A	7.40

Table 1- continued

Common Name	*Scientific Name*	ST	RA
Chestnut Munia	*Lonchura atricapilla*	A	13.20

Key to table 1

ST Status

A Alien – Introduced to the Hawaiian Islands by humans

IM Indigenous Migrant – Native but not restricted to the Hawaiian Islands, migratory, non-breeder in Hawaii

RA Relative Abundance - Number of birds detected divided by the number of point counts (~5)

Mammalian Survey

Three terrestrial mammalian species were detected on the site during the course of this survey. Numerous dogs (*Canis lupus familiaris*) were heard barking from areas outside of the study site. Three small Indian mongoose (*Herpestes javanicus auropunctatus*) was seen along the study corridor, and a large number of cats (*Felis catus*) were seen within the site.

No mammalian species currently proposed for listing or listed under either the federal or State of Hawai'i endangered species statutes was recorded on this site (DLNR 1998; USFWS, 2016).

Discussion

Avian Resources

The findings of the avian survey are consistent with the current habitats present along the study corridor. All but one of the species recorded on this survey, Pacific Golden-Plover (*Pluvialis fulva*) are alien to the Hawaiian Islands (Table 1).

Pacific Golden-Plover, are a native, indigenous migratory shorebird species which nest in the high Arctic during the late spring and summer months, returning to Hawai'i and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawai'i for their trip back to the Arctic in late April or the very early part of May. They are widely distributed in the Hawaiian Islands during the winter month.

Although no seabirds were detected during the course of this survey, several seabird species potentially overfly the site on occasion. The primary cause of mortality in resident seabirds is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983; Simons and Hodges 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality in locally nesting seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When

disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961; Telfer 1979; Sincock 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al. 1998; Ainley et al., 2001; Hue et al., 2001; Day et al 2003).

The O'ahu population of White-Tern (*Gygis alba*) is listed as an endangered species by the State of Hawaii; it is not listed under federal statute. This ephemeral species was not recorded during this survey, nor was it expected. The current resident population of White Terns on O'ahu is found on the leeward side of the Island concentrated in the Waikiki area.

No owl species were recorded during this survey, there are two resident owl species on O'ahu the introduced Barn Owl (*Tyto alba*) and the indigenous endemic sub-species of the Short-eared Owl, or *Pue'o* as it is locally know (*Asio flammeus sandwichesis*). This species has become increasingly scarce on the Island; the O'ahu population is listed as an endangered species by the State of Hawai'i it is not listed under federal statute. It is probable that this resident indigenous species occasionally uses resources in the general project area on a seasonal basis. This species is not habitat restricted on O'ahu, though there certainly is less suitable nesting habitat than there once was, this species faces daunting odds on an Island as heavily populated as O'ahu – they are a ground nesting diurnal species, the shear number and densities of mammalian predator on the Island make it very difficult for this species to successful nest except within protected areas that have a strong mammalian predator control program in place.

Mammalian Resources

The findings of the mammalian survey are consistent with the current habitat present along the survey corridor and the highly developed nature along the survey route. All of the mammalian species detected are alien species. All of the mammalian species recorded are deleterious to native ecosystems and the organisms on which they depend.

Although, no rodents were recorded during the course of this survey, it is likely that one or more of the other four established alien Murida*e* found on O'ahu - European house mouse (*Mus musculus domesticus*), roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*) - use various resources found within the general project area on a seasonal basis. These human commensal species are drawn to areas of human habitation and activity. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependent on them.

No Hawaiian hoary bats were detected during the course of this survey. It is only in recent years that this species is being recorded on a regular basis on the Island of O'ahu. It is within the realm of possibility that this species may use resources within the project area on a seasonal basis.

Potential Impacts to Protected Species

Seabirds

The principal potential impact that the construction of the project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the proposed action during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds is if; a) during construction, if it is deemed expedient, or necessary to conduct night-time construction activities – currently no nighttime construction is anticipated; b) following build-out, the potential use of streetlights or other exterior lighting during the seabird fledging season which runs from September 15 through December 15th. As no outdoor lighting will be installed as part of this project, and no night-time construction is being proposed, it is not expected that the proposed action will result in deleterious impacts to protected seabirds.

Short-eared Owl – Pueo

The principal potential impact that the construction of the project might pose to Short-eared Owls would be during the clearing and grubbing phases of the project in areas where this state listed species nests – as there is no suitable nesting habitat along the proposed R-1 waterline it is not expected that the construction of the waterline will result in deleterious impacts to this species.

Hawaiian hoary bat

The principal potential impact that construction could pose to bats is during the clearing and grubbing phase of the construction. The trimming or removal of foliage and/or trees within the construction areas may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, female carrying their pups may be less able to rapidly vacate a roost site while vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they themselves forage, and very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15-feet), between June 1 and September 15, the pupping season. It should be noted that the proposed project is unlikely to need to remove any trees or woody vegetation that is suitable bat roosting substrate – thus it is not expected that the construction of the waterline will result in deleterious impacts to Hawaiian hoary bats.

Critical Habitat

There is no federally delineated Critical Habitat for any avian or mammalian species on, or close to the proposed project site. Thus, modifications of habitat on the site will not result

in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

Glossary

Alien – Introduced to Hawai'i by humans
Commensal – Animals that share humans' food and lodgings, such as rats and mice.
Diurnal – Daytime, an animal that hunts and feeds during daylight hours, the opposite of nocturnal
Endangered – Listed and protected under the Endangered Species Act of 1973, as amended (ESA) as an endangered species
Endemic – Native to the Hawaiian Islands and unique to Hawai'i
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
Nocturnal – Night-time, after dark
'Ōpe'ape'a – Endemic endangered Hawaiian hoary bat (Lasiurus cinereus semotus)
Pelagic – An animal that spends its life at sea – in this case seabirds that only return to land to nest and rear their young
Phylogenetic – The evolutionary order that organisms are arranged by
Pue'o - Short-eared Owl (*Asio flammeus sandwichensis*)
Threatened – Listed and protected under the ESA as a threatened species

DLNR – Hawai'i State Department of Land & Natural Resources
ESA – Endangered Species Act of 1973, as amended
USFWS – United State Fish & Wildlife Service

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APPENDIX C

Archaeological Literature Review and Field Inspection
Prepared by Honua Consulting, Inc.

Archaeological Literature Review and Field Inspection for the Ewa Villages R-1 Water Main Project, Honouliuli Ahupuaʻa, ʻEwa District, Oʻahu Island TMKʼS: (1) 9-1-016:142, (1) 9-1-017:111, (1) 9-1-017:112, (1) 9-1-017:113, (1) 9-1-017:103, (1) 9-1-095:163, (1) 9-1-097:103, and (1) 9-1-126:110

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June 2019

Management Summary

This Literature Review and Field Inspection report is for the Ewa Villages R-1 Water Main project located in Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu TMKʼS: (1) 9-1-016:142, (1) 9-1-017:111, (1) 9-1-017:112, (1) 9-1-017:113, (1) 9-1-017:103, (1) 9-1-095:163, (1) 9-1-097:103, and (1) 9-1-126:110. The Area of Potential Effect (APE) is the same as the project area, owned by the City and County of Honolulu. The proposed project includes 4,225 linear feet (LF) of open trenching, extending along Renton Road from the Ka Makana Aliʻi mall to Park Row. The project also includes two proposed staging areas on undeveloped land along Renton Road. One proposed staging area is located southeast of Leialoalo Street and Paionia Street within TMK (1) 9-1-126:014. A second area is approximately 600 feet northeast of the proposed Park Row point of connection, directly south of Renton Place within TMK: (1) 9-1-126:018.

The proposed project includes installation of an R-1 recycled water main providing water to the Ewa Villages area, which currently receives water from the Ewa Villages Golf Course irrigation pond. With the proposed main, the Ewa Villages area would instead receive R-1 water directly from the BWS system. The project includes installation of a 12-inch and 8-inch PVC recycled water main, which will connect to the existing 16-inch R-1 West water main near the Ka Makana Aliʻi mall, at the southern extent of the project area. The new main will be installed along an open unpaved area directly adjacent and north of the Oahu Railway and Land Company (OR&L) rail tracks and right-of-way. Continuing parallel along Renton Rd., the recycled water main will then cross Kapolei Parkway under the existing Renton Road Bridge, connecting to the existing line at the intersection of Renton Road and Park Row within TMK (1) 9-1-097:103.

The purpose of the literature review and field inspection is to research land-use history and identify any potential artifacts or cultural deposits present on the ground surface of the project area. This study is not an archaeological inventory survey (AIS), however, this report was written using standards outlined within Hawaiʻi Administrative Rules (HAR) 13-276 (Rules Governing Standards for Archaeological Inventory Surveys and Reports) and is intended to assist with historic preservation efforts for the proposed project.

The project area extends through the ʻEwa Sugar Plantation Villages Historic District (State Inventory of Historic Places [SIHP] #50-80-12-9786), listed on the Hawaiʻi Register of Historic Places (State Register). A historic streetlight (SIHP #50-80-12-7133), previously documented by Mooney and Cleghorn (2010), was observed within Varona Village adjacent to the north side of Renton Road. Additionally, the Oahu Railway & Land Company (OR&L) Right-of-Way (ROW) (SIHP #50-80-12-9714, National Register [NR] Reference #75000621) and OR&L Railroad Baseyard (SIHP #50-80-12-7387) are located adjacent to the southern portion of the project area. The ʻEwa Plain Battlefield (SIHP #50-80-12-5127, NR #16000273) is located approximately 230 feet (70 meters) to the south. This study finds that the proposed project will not affect the integrity of these significant historic properties. The pedestrian survey for this study did not discover any new historic properties and no significant cultural materials were identified. It is very likely that any pre-contact (pre-1778 AD) traditional Hawaiian surface features and/or subsurface cultural deposits that may have existed in the area at one time have been destroyed by historic modifications conducted throughout the vicinity.

It is recommended that structures within the ‘Ewa Sugar Plantation Historic District (SIHP # -9786), including the historic streetlight (SIHP # -7133), and adjacent OR&L infrastructure be avoided during construction of the proposed waterline project. If these historic properties are avoided, as is proposed, then this study finds the project will have “no historic properties affected”.

It is further recommended that the proposed waterline project proceed under an archaeological monitoring program in accordance with HAR 13-279 (Rules Governing Standards for Archaeological Monitoring Studies). The recommendation for monitoring is to record project stratigraphy and document any potentially significant surface artifacts and/or subsurface deposits and artifacts that may be encountered within the project area, including but not limited to items associated with plantation-era habitation and/or use of the OR&L railroad.

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Introduction

1.1 Project Background

At the request of HHF Planners, Honua Consulting conducted this literature review and field inspection for the Ewa Villages R-1 Water Main project located in Honouliuli Ahupua‘a, ‘Ewa District, on the island of O‘ahu, Tax Map Key’s (TMK’s): (1) 9-1-016:142, (1) 9-1-017:111, (1) 9-1-017:112, (1) 9-1-017:113, (1) 9-1-017:103, (1) 9-1-095:163, (1) 9-1-097:103, and (1) 9-1-126:110. The Area of Potential Effect (APE) is the same as the project area and owned by the City and County of Honolulu. The proposed project includes 4,225 linear feet (LF) of open trenching, extending along Renton Road from the Ka Makana Ali‘i mall to Park Row. The project also includes two proposed staging areas on undeveloped land along Renton Road. One proposed staging area is located southeast of Leialoalo Street and Paionia Street within TMK (1) 9-1-126:014. A second area is approximately 600 feet northeast of the proposed Park Row point of connection, directly south of Renton Place within TMK: (1) 9-1-126:018. The project area is shown on a United States Geological Survey (USGS) map (Figure 1), an aerial photo (Figure 2), and a Tax Map Key (TMK) (Figure 3). The width of the proposed project area was approximated to account for any necessary amendments to project plans.

The proposed project includes installation of an R-1 recycled water main providing water to the Ewa Villages area, which currently receives water from the Ewa Villages Golf Course irrigation pond. With the proposed main, the Ewa Villages area would instead receive R-1 water directly from the BWS system. The project includes installation of a 12-inch and 8-inch PVC recycled water main, which will connect to the existing 16-inch R-1 West water main on Renton Rd. near the Ka Makana Ali‘i mall, at the southwestern extent of the project area. The new main will be installed along an open unpaved area directly adjacent to and north of the existing Oahu Railway & Land Company (OR&L) Right-of-Way (ROW) (SIHP #50-80-12-9714, National Register [NR] Reference #75000621) and the Hawai‘i Railway Society’s (HRS) Rolling Stock and Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387), listed on the Hawai‘i Register of Historic Places (State Register). Continuing parallel along Renton Rd., the recycled water main will then cross Kapolei Parkway under the existing Renton Road Bridge connecting, to the existing line at the intersection of Renton Road and Park Row within TMK (1) 9-1-097:103. The project area extends through the ‘Ewa Sugar Plantation Villages Historic District (SIHP #50-80-12-9786), listed on the State Register. State and National Register sites located within, adjacent, and very near to the current project area are shown on Figure 4. Preliminary construction plans are also provided as Figure 5 and Figure 6.

The purpose of the literature review and field inspection was to determine the land-use history of the project area and to identify any potential artifacts, architecture, or cultural deposits present on the ground surface of the property. Fieldwork for this project was performed under the archaeological permit number 19-22 issued to Honua Consulting by the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), in accordance with Hawai‘i Administrative Rules (HAR) Chapter 13-282 (Rules Governing Permits for Archaeological Work). This study is not an archaeological inventory survey (AIS), however, this report was written using standards outlined within HAR 13-276 (Rules Governing Standards for Archaeological Inventory Surveys and Reports) and is intended to assist with historic preservation efforts for the proposed waterline project.

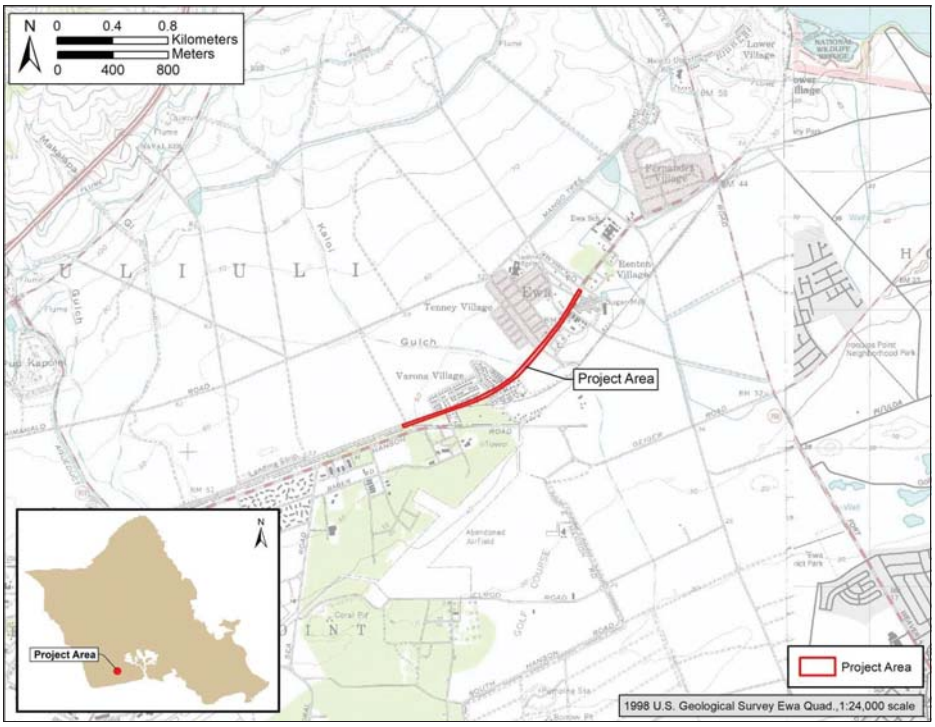

Figure 1. Portion of 1998 'Ewa U.S. Geological Survey (USGS) Topographic Quadrangle Map showing the project area

Figure 2. Aerial photo showing the location of the project area (USGS Orthoimagery 2011)

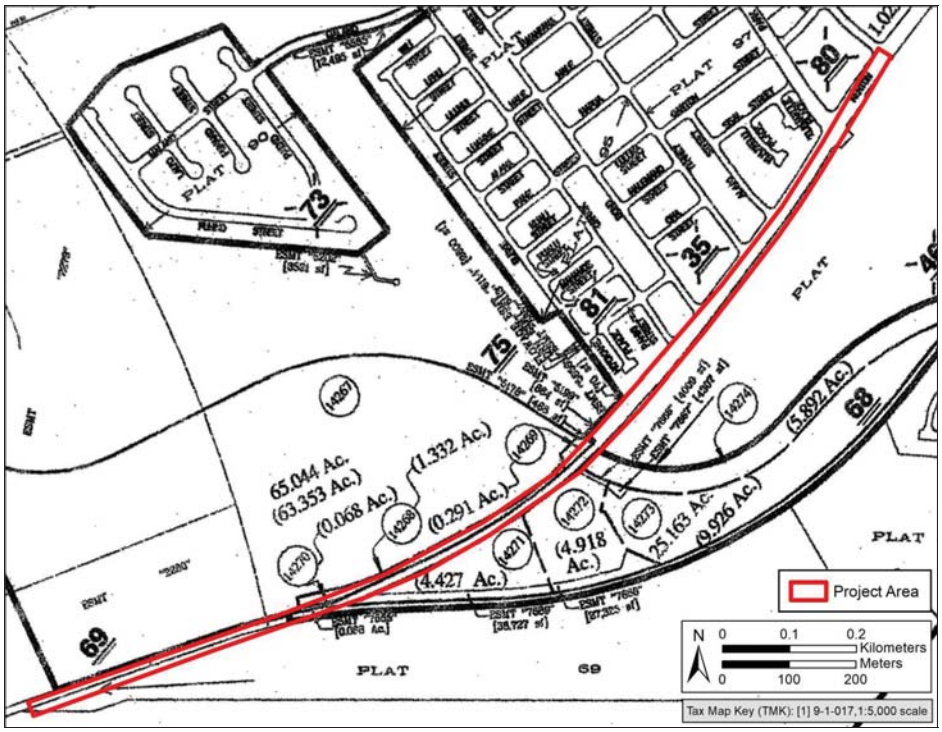

Figure 3. Tax Map Key (TMK) [1] 9-1-017 showing the project area

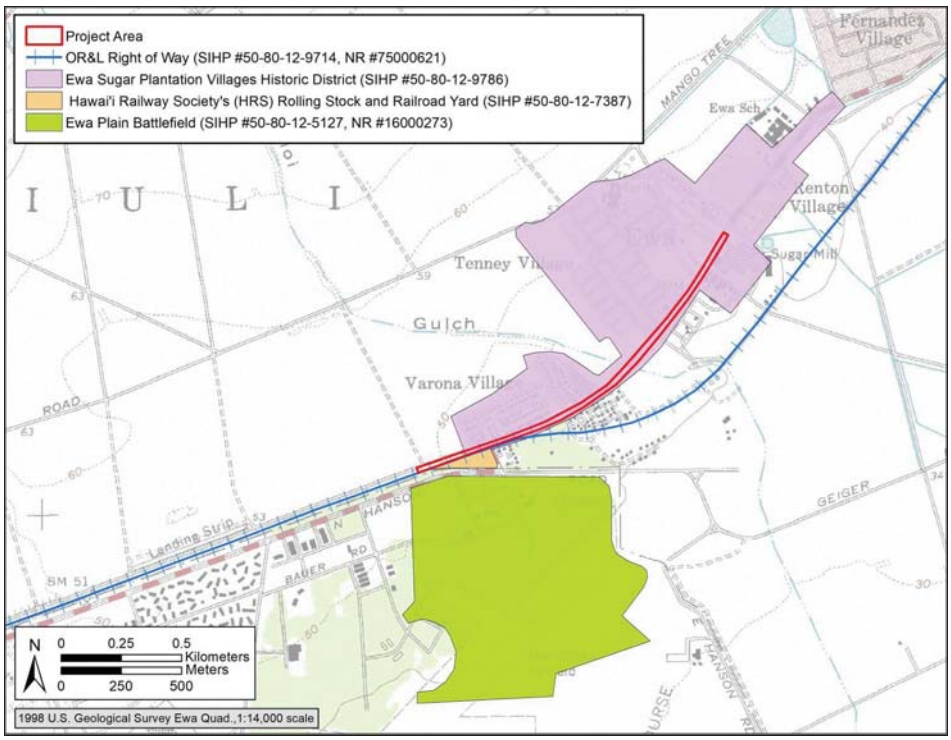

Figure 4. Portion of a 1998 'Ewa USGS showing State and National Register sites within, adjacent, and very near to the project area

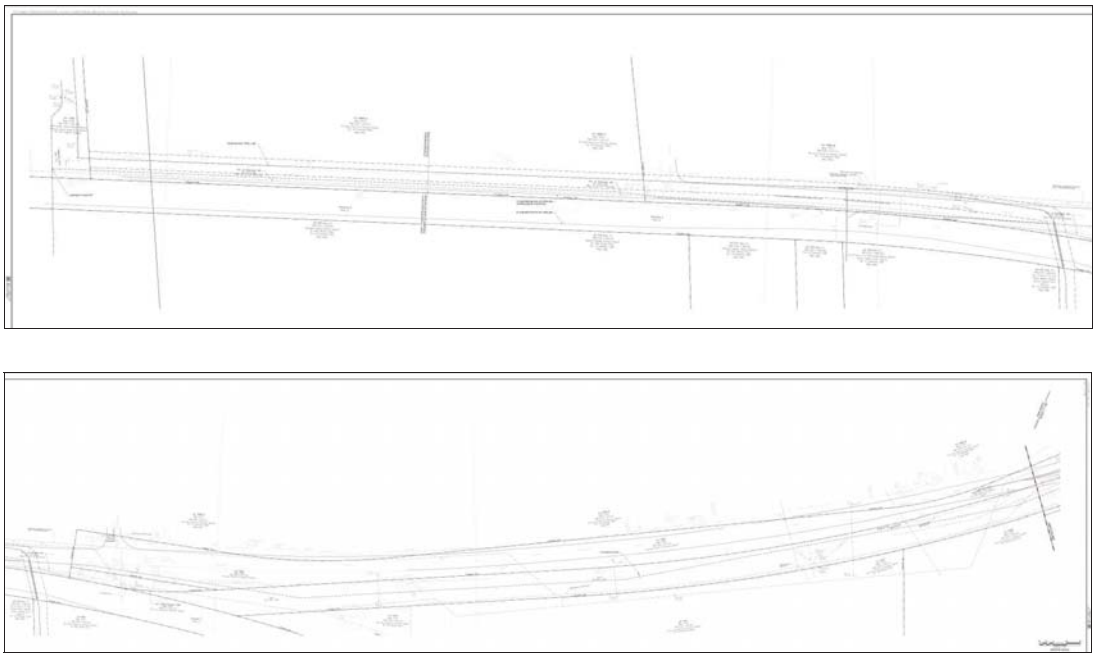

Figure 5. Preliminary construction plan showing the southern half of the project area (south extent, top) (provided by client)

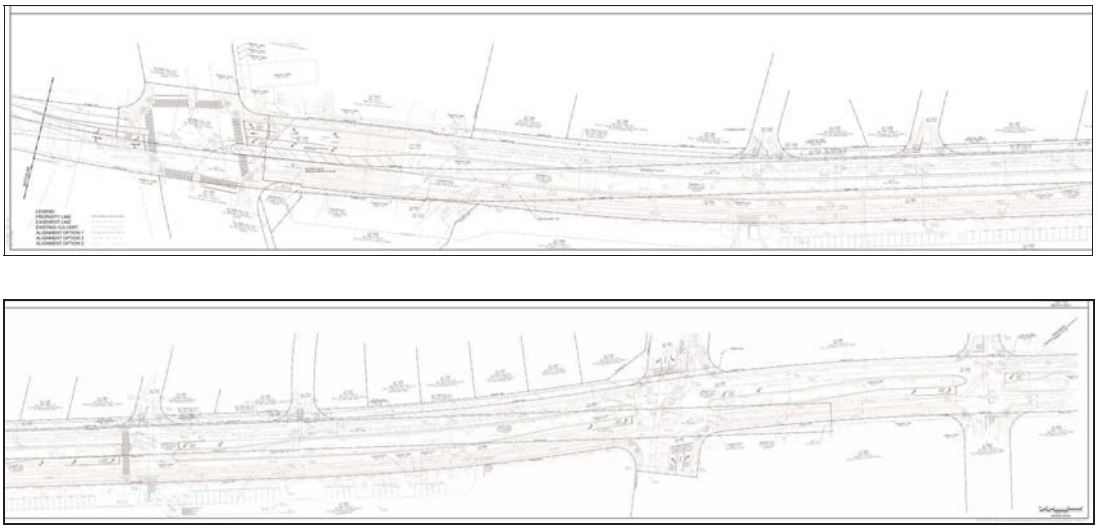

Figure 6. Preliminary construction plan showing the northern half of the project area (north extent, bottom) (provided by client)

1.2 Environmental Setting

1.2.1 Natural Environment

The project area is situated on the west side of O‘ahu Island, located within Honouliuli Ahupua‘a, ‘Ewa District. The project area ranges from approximately 40 ft to 55 ft (12.1 m to 16.8 m) above mean sea level (amsl) and is located approximately 2.0 miles north (3,219 m) of the southern coast of O‘ahu. The mean annual rainfall in this area measures approximately 21.5 inches with prevailing winds from the northeast at annual average speeds of 15 mph (Giambelluca et al. 2013). Predominant vegetation observed within the project area is associated with residential landscaping and consists of introduced grasses and trees.

Inland mountainous areas on the west side of O‘ahu are composed of volcanic substrate of the Wai‘anae volcanic series. Coastal zones are largely made of calcareous limestone formed during episodes of rising and lowering sea levels that have occurred several times in the distant past. In midlands between the mountains and the coast, where the current project area is located, alluvial soil from the mountains has eroded over the low-lying limestone creating the ‘Ewa Plains. According to the U.S. Department of Agriculture (USDA) soil survey data, there are two soil types within the project area (Foote et al. 1972) (Figure 7). Soils within the project area are associated with irrigated sugarcane cultivation and have been highly impacted by historic and modern activities.

The soil within the southern half of the project area is largely comprised of Mamala cobbly silty clay loam, ranging from 0-12% slopes (MnC). The Mamala soil series consists of shallow, well-drained soils along the coastal plains which formed from alluvium deposited over coral limestone and consolidated calcareous sand (Foote et al. 1972:93). This soil type has moderate permeability, very slow to medium runoff, and slight to moderate erosion hazard. This type of soil is used for sugarcane, truck crops, orchards, and pasture. Natural vegetation on this soil type includes kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), bristly foxtail (*Setaria parviflora*), and swollen fingergrass (*Chloris barbata*).

Soils in the northern half of the project area are comprised of Honouliuli clay, ranging from 0-2% slope (HxA). The Honouliuli series consists of deep, well-drained soils on coastal plains which formed in alluvium weathered from basic igneous rock (Foote et al. 1972:43). This soil type has moderately slow permeability, slow runoff, and no more than slight erosion hazard. Typically, this type of soil is used for sugarcane, truck crops, orchards and pasture. Natural vegetation on this soil type includes kiawe, koa haole, fingergrass (*Digitaria* sp.), bristly foxtail, and bermudagrass (*Cynodon dactylon*).

1.2.2 Built Environment

The built environment of the project area includes Renton Rd., which is asphalt paved throughout the project area except the very southern extent, which is gravel. Renton Rd. is an old plantation-era roadway which now serves the Ewa Villages community. Along the southern extent of the project area, the newly constructed Ka Makana Ali‘i Mall (2016) is located to the northwest and OR&L railroad tracks and railroad yard (SIHP # -9714, NR #75000621) run along the south side of Renton Rd. Residential housing, part of the ‘Ewa Sugar Plantation Villages (SIHP # -9786), is situated along both sides of Renton Rd. in the southern portion of the project

area and along the west side of the road in the northern portion. In the northern portion of the project area, street lights and sidewalks run adjacent to the roadway and ‘Ewa Mahiko Park lies to the east. ‘Ewa Mahiko Park is the site of the old ‘Ewa Sugar Company mill. The park was recently completed (2011) and includes outdoor sporting fields and indoor sporting facilities within existing large plantation-era buildings. The project area is bisected by a relatively new (circa 2007) section of Kapolei Parkway, that provides as a major corridor through the larger town of Kapolei.

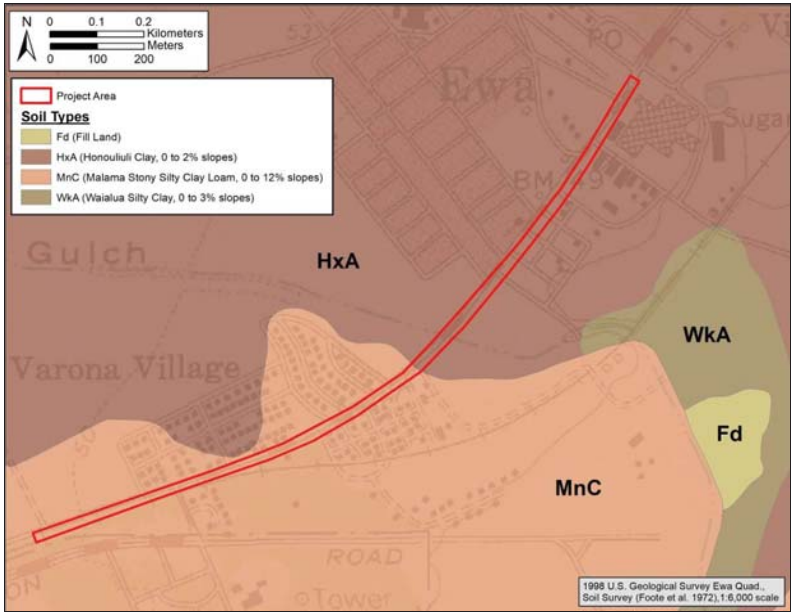

Figure 7. Portion of a 1998 ‘Ewa USGS Topographic Quadrangle Map with Soil Series Overlay showing anticipated soils within the project area (Foote et al. 1972)

Traditional and Historic Background

Background research for the literature review was conducted using materials obtained from the State Historic Preservation Division (SHPD) library in Kapolei and the Honua Consulting LLC. report library. On-line materials consulted include the Ulukau Electronic Hawaiian Database (www.ulukau.com, Soehren 2002-2010), Papakilo Database (www.papakilodatabase.com), the State Library on-line (http://www.librarieshawaii.org/ Serials/databases.html), and Waihona ʻAina Mahele database (http://www.waihona.com). Hawaiian terms and place names were translated using the on-line Hawaiian Dictionary (Nā Puke Wehewehe ʻŌlelo Hawaiʻi) (www.wehewehe.com) and Place Names of Hawaii (Pukui et al. 1974). Historic maps were obtained from the State Archives, State of Hawaiʻi Land Survey Division website (http://ags.hawaii.gov/survey/map-search/), UH-Mānoa Maps, Aerial Photographs, and GIS (MAGIS) website (http://guides.library.manoa.hawaii.edu/magis). Maps were geo-referenced for this report using ArcGIS 10.3. GIS is not 100% precise and historic maps were created with inherent flaws; therefore, geo-referenced maps should be understood to have some built-in inaccuracy.

1.3 Place Names and Moʻolelo

The history of Hawaiʻi is recorded in oral tradition as told through moʻolelo (traditional stories, legends, mythology) as well as through early historic accounts, historic maps and land records. The following research summarizes myths associated with the area and describes how the land has been utilized over time. The presented background research places the study area within a regional context and provides information for indicating potential historic properties that may exist in the project area. As shown herein, the area is important in terms of traditional Hawaiian culture, plantation-era history, and military use.

The project area is located in the ahupuaʻa (traditional land division) of Honouliuli (translated as "dark bay"), in the moku (district) of ʻEwa ("crooked") (Pukui et al. 1974:28, 51). The translation of Honouliuli as "dark bay" likely refers to the nature of West Loch (west side of Pearl Harbor or Puʻuloa) (Pukui et al. 1974). Honouliuli Ahupuaʻa is the largest and western-most ahupuaʻa in ʻEwa. Honouliuli contains uka (upland), waena (middle), and kahakai (sea/beach) lands, which provided diverse subsistence resources including coastal fishponds, taro planting on the ʻEwa Plain, and forest resources. The western boundary of the ahupuaʻa follows the ridgeline from Palikea ("white cliff") in the Waiʻanae Mountain Range to the coast at Piliokahe ("clinging to Kahe") (Pukui et al. 1974:177, 185). The eastern boundary of the ahupuaʻa terminates at the West Loch of Puʻuloa ("long hill") or Pearl Harbor (Pukui et al. 1974:200-201).

Honouliuli is associated with several traditional stories affiliated with the volcano goddess Pele, her family, and the pig-man, demigod Kamapuaʻa. Other legends of the area include the Legend of Lepeamoa the chicken-girl of Pālama (lama wood enclosure), and the Legend of the Wandering Souls. Honouliuli and the ʻEwa Plains have retained many traditional place names. Table 1 lists traditional place names discussed in this report.

Table 1. Table Listing Place Names in Honouliuli Ahupuaʻa referenced in this report

Place Names	Translation	Description	References
ʻEwa	crooked	district, plantation town	Pukui et al. 1974:28
Honouliuli	dark bay	land division, village, forest reserve, gulch	Pukui et al. 1974:51
Kalaeloa	the long point	old name for Barber's Point	Pukui et al. 1974:72
Kaupeʻa	crisscross or interwoven	Honouliuli plains	Pukui and Elbert 1986:13
Pālama	lama wood enclosure		Pukui et al. 1974:176
Puʻu o Kapolei	hill of Kapolei (beloved Kapo [sister of Pele])	southeast slope of Waiʻanae Range	Pukui et al. 1974:89
Puʻu Makakilo	observing eyes	crater, land division, gulch	Pukui et al. 1974:140
Puʻu Pālailai	the young lai fish	gulch and puʻu (hill)	Pukui et al. 1974:176
Puʻuloa	long hill	land section, camp, village, salt works, area east of Pearl Harbor, old name for Pearl Harbor	Pukui et al. 1974:200-201
Palikea	white cliff	peak above Lualualei in Waiʻanae Range	Pukui et al. 1974:177
Piliokahe	clinging to Kahe	Land section in Waiʻanae	Pukui et al. 1974:185
Waiʻanae	mullet water	Mountain range, district, land division, town, valley, homesteads	Pukui et al. 1974:220

1.3.1 The Legend of Lepeamoa

Lepeamoa, the chicken-girl of Pālama, was the kupua (demigod) daughter of the high chief of Keahua ("the mound") on Kauaʻi (Beckwith 1970, Pukui et al. 1974:100). Keahua was exiled to a remote mountain called Kawaikini ("the multitudinous water") (Beckwith 1970, Pukui et al. 1974:98). At Kawaikini, Kauhao ("the scooping"), wife of Keahua and daughter of the chiefess Kapālama of Oʻahu, gave birth to a child in the form of an egg. The egg was wrapped in tapa (bark cloth) and sweet-smelling plants until it hatched into Lepeamoa. Lepeamoa was brought up by her grandparents Kapālama and Honouliuli, which became names of ahupuaʻa (Beckwith 1970:429).

1.3.2 Puʻu o Kapolei

Puʻu o Kapolei is a hill in Honouliuli where several gods, goddesses, and legendary figures were associated. The hill was the resting place of Hiʻiaka (sister of the volcano goddess Pele) and Lohiau

(Pele's lover), after Hiʻiaka returned from Kauai with Lohiau (Fornander 1998, Vol. V, Part 1:188, note 6). The hill was also the place where chief Nihooleki, originally named Keahaikiaholeha, one of the greatest fisherman in Waiʻanae, took a wife before being killed during a fishing trip (Fornander 1916-1917, Vol. IV, Part 1). Additionally, Puʻu o Kapolei was the location where Kamapuaʻa (pig-god), established his grandmother as queen after conquering most of Oʻahu from King ʻOlopana (Pukui et al. 1974:203; Sterling and Summers 1978:33; Kawaharada 2001). Sterling and Summers (1978:34) state:

> Kamapuaa subsequently conquered most of the island of Oahu, and, installing his grandmother [Kamaunuaniho] as queen, took her to Puuokapolei, the lesser of the two hillocks forming the southeastern spur of the Waianae mountain range, and made her establish her court there. This was to compel the people who were to pay tribute to being all the necessities of life from a distance, to show his absolute power over all.
>
> Puukapolei is some little distance from Sisal, towards Waianae, and is as desolate a spot as could be picked out on the whole island. It is almost equally distant from the sea, from which came the fish supplies; from the taro and potato patches of ʻEwa, and from the mountain ravines containing the banana and sugar cane plantation.
>
> A very short time ago the foundation of Kamaunuaniho's house could still be seen at Puuokapolei; also the remains of the stone wall surrounding her home. It has even been said that her grave could then be identified, but since the extension of cane and sisal planting to the base of Puuokapolei, it is possible that the stones may have been removed for wall-making. (Emma Metcalf Nakuina 1904, cited in Sterling and Summers 1978:34)

Puʻu o Kapolei was often associated with the creation of the seasons. Hawaiian historian Samuel Kamakau was noted in Sterling and Summers as stating the following:

> When the sun reached the equator and (began to) move northward, it set right over (the islet of) Kaʻula and it moved on and set over Kawaihoa; and the Makaliʻi season when the sun set (kau) from Kaʻula to Kawaihoa was called Kau, and the Kau season was also called after the resting place of Kane (Kaulana a Kane). When it set (again) at Kauʻula and turned south the season was called Hoʻoilo. In the same way, the people of Oahu reckoned from the time when the sun set over Puʻuokapolei until it set in the hollow of Mahinaona and called this period Kau, and when it move south again from Puʻuokapolei and it grew cold and the time came when young sprouts started, the season was called from their generation (oilo) the season of Hoʻoilo. There were therefore two seasons, the season of Makaliʻi and the season of Hoʻoilo. (Kamakua n.d, cited in Sterling and Summer 1978:34)

Therefore, Puʻu o Kapolei was an important feature of the Hawaiian landscape. This hill is clearly visible from the current project area.

1.3.3 The Legend of the Wandering Souls

There are three spirit realms (ao) for the spirits of the dead: ao ku ʻEwa, the realm of the homeless souls; au ʻaumakua, the realm of the ancestral real; and ke ao o Milu, the realm of Milu (the underworld). Ao kuʻEwa, also known as ao ʻauwana (the realm of the wandering souls), was where a man who has no rightful place in the ʻaumakua (family god) realm will wander. "On the plains of Kaupeʻa, beside Puʻuloa, wandering souls would go to catch moths and spiders" (Kamakau 1964:49; Sterling and Summers 1978:44). The souls were said to wander the wiliwili grove (*Erythrina sandwicensis*) from Kaupeʻa to Kānehili (Kamakau 1964:47; Sterling and Summers 1978:44). This places the plains of Kaupeʻa between Kānehili, an inhospitable, open kula (pasture) and Puʻuloa, which is in the general vicinity of the project area.

1.4 Traditional Background

Traditionally, ʻEwa and the districts of Waiʻanae and Waialua were ruled by chiefs and kings of the Maweke-Kumuhonua (Beckwith 1970, Fornander 1996). For a time, the royal center of ʻEwa was at Lihue in the uplands of Honouliuli. From the 1500s to 1700s, there were several political power shifts including the defeat of the ʻEwa chief by Peleioholani, a son of Kualiʻi, around 1740 AD. In 1778, Kahana who was from the ʻEwa line of chiefs, but who was raised in Kahekili's Maui court, took control of Oʻahu and ʻEwa, until King Kamehameha unified the islands around 1810 AD. Following Kamehameha's conquering of Oʻahu, at least two of his chiefs lived in Puʻuloa, and later, Liholiho (Kamehameha II) built a house in Puʻuloa (Kamakau 1961:255).

Background research indicates traditional settlements in Honouliuli were situated near irrigated taro fields located along West Loch and were concentrated around small marshes and wet sinks found throughout an otherwise semi-barren landscape. The wide coastal zone was dependent on mixed marine exploitation and agricultural cultivation. A network of established trails provided routes from the coast around West Loch through the Honouliuli lowlands to Puʻu o Kapolei, the Waiʻanae coast, and other parts of Oʻahu (ʻĪʻī 1959). The trail system was a major route joining coastal resources with inland areas. Several of these trails can be seen on the 1825 Malden map (Figure 8).

1.5 Late-18th Century

Early written accounts of the ʻEwa Plain describe the area as unpopular. When the English officer of the Royal Navy, Captain George Vancouver, anchored off the coast in 1796, he observed "this tract of land was of some extent but did not seem to be populous, nor to possess any great degree of natural fertility; although we were told that, at a little distance from the sea, the soil is rich, and all necessaries of life are abundantly produced" (cited in Sterling and Summers 1978:36). An 1825 map illustrated by Lieutenant Malden, labels the area as "low uncultivated plain" (Figure 8). These early historic accounts suggest the current project area was not a heavily populated area during the early post-contact time period.

1.6 19th and 20th Centuries

During the early 19th century, the traditional Hawaiian population was in decline due to disease and migration to more populated areas. This opened the land for new pursuits. In the mid-to late-1800s, the landscape of ʻEwa greatly changed as the uplands became heavily utilized to harvest

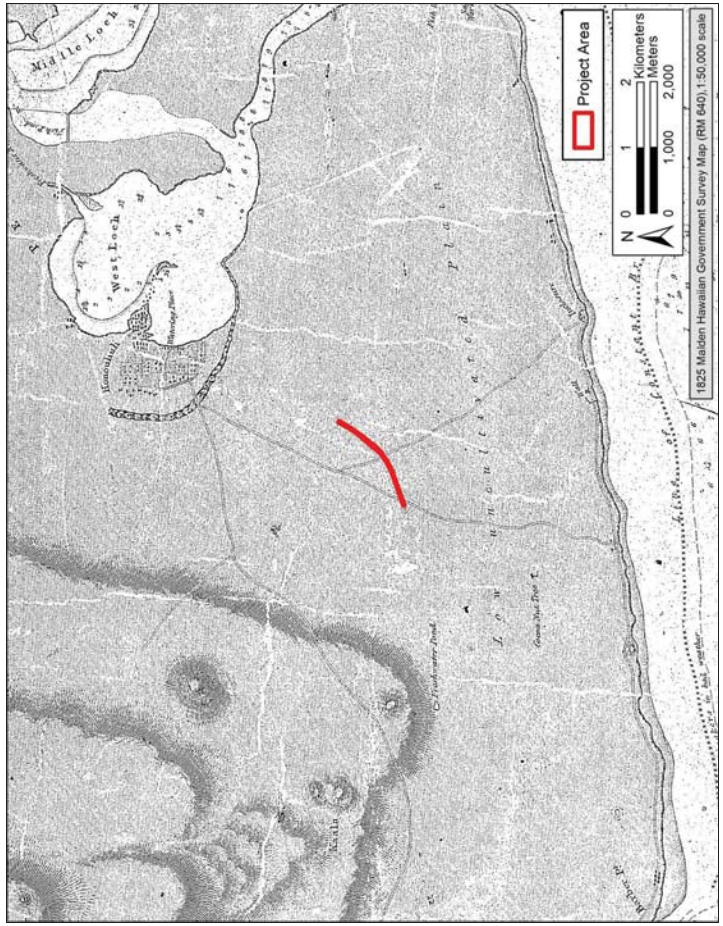

Figure 8. 1825 Malden map of the "South Coast of Oahu" showing the project area (Registered Map [RM] 640)

sandalwood, and the lowlands were utilized for cattle ranching. Cattle ranching was so predominant that by this period, the ʻEwa Plain held an estimated population of 12,000 heads of cattle (Cuddihy and Stones 1990:59). Exotic plants began being cultivated to support commercial ventures, which also dramatically altered the landscape.

1.6.1 The Great Māhele

In the years between 1847 and 1855, land was divided under the Great Māhele. Lands were given to the Crown (the occupant of the throne), government, konohiki (headman of an ahupuaʻa), and hoaʻāina (native tenants). Kuleana (right or privilege) Land Commission Awards (LCAs) were awarded to natives who actively lived and worked their lands. LCAs can be researched to provide information on how the land was utilized and its contents. Ninety-eight (98) kuleana LCAs were granted in Honouliuli Ahupuaʻa. The majority of the LCAs were concentrated in areas containing water resources near Puʻuloa. Land claims included references to alahele (trails), ʻauwai (irrigation channel), kahakai (beach or shoreline), kihāpai (garden), kula (field), loʻi (irrigated field), various types of ponds and fishponds, and walls and house sites (HCF 2012). Resources cultivated and grown on the lands were recorded, including kalo (taro, *Colocasia esculenta*), ʻuala (sweet potato, *Ipomoea batatas*), ʻulu (breadfruit tree, *Artocarpus altilis*), ulu niu (coconut grove, *Cocos nucifera*), hala (*Pandanus tectorius*), kou (*Cordia subcordata*), ʻakaʻakai (bulrushes, *Schoenoplectus lacustris*), and paʻakai (salt) and kula ālialia (salt beds). No kuleana claims were made within the current project area; therefore, little information on land use prior to its historic use is known.

In January of 1848, LCA 11216 (Royal Patent [RP] 6071), to Mikahela Keʻahi-Kuni Kekauʻōnohi, was awarded and consisted of all unclaimed lands throughout Honouliuli Ahupuaʻa, including the current project area. Mikahela Keʻahi-Kuni Kekauʻōnohi was the granddaughter of Kamehameha I, niece of Kamehameha III, daughter of Wahinepiʻo (sister of Kalanimoku), and wife of Aarona Kealiiahonui (son of the last sovereign king of Kauaʻi Island). Kekaʻōnohi acquired a total of 43,250 acres from her mother, Wahinepiʻo, who had been awarded Honouliuli Ahupuaʻa after the unification of Oʻahu by Kamehameha I. Upon the death of her husband Aaron Kealiiahonui, she married Chief Levi Haʻalelea. After her death in 1851, her properties were transferred to her husband.

In 1863, the owners of the kuleana lands deeded their lands back to Chief Haʻalelea to pay off debts owed to him (Frierson 1972:12). Upon his death, the deed was transferred over to his surviving wife, Anadelia Amoe. Anadelia Amoe deeded the entire ahupuaʻa to John H. Coney. John Coney rented lands to James Dowsett and John Meek in 1871 for cattle ranching. In 1877, he sold the entire ahupuaʻa to John Campbell for approximately $95,000 (Indices 1929). Approximately 10,000 acres were converted for cattle ranching and agriculture. By 1879, artesian wells were installed for irrigation. Shortly thereafter, Benjamin Franklin Dillingham developed a partnership with Campbell and W.R. Castle to create the Ewa Plantation Company. By 1889, Campbell also leased several acres to Benjamin Dillingham for the Oahu Railway and Land Company (OR&L).

1.6.2 Ewa Plantation Company

The Ewa Plantation Company was in operation from 1890-1970 and included the entirety of the current project area (Kaukali and Subica 2010). Artesian wells were built to tap underground water supplies and as a means to generate more soil deposition. To create more arable land in the

lowlands, ditches were installed from the lower slopes of the mountain ranges to the lowlands (Frierson 1972).

In the early 1900s, the Ewa Plantation Company grew to encompass most of the eastern half of Honouliuli Ahupuaʻa, including the current project area. The Ewa Plantation Company was noted for its output per cultivated acre. The plantation used a Lahaina variety of cane until the early 1900s, when manager and pioneer cane planter, George F. Renton, developed the H-109 variety which increased yields (Kaukali and Subica 2010:50). The Renton family, including George Renton Jr. and James Lewis Renton, managed the mill through the early 1900s.

Growth of the sugar industry introduced more demand for residential development to house the increasing numbers of immigrant workers in the fields. Between the 1890s and 1940s, more than 1,200 residences in eight distinct villages were built to house workers of the Ewa Sugar Plantation. "In the 1890s the plantation built 72 dwellings; in 1910s,536; in the teens 132; in the 1920s, 285; in the 1930s, 168; and in the 1940s only 35. Today, 275 houses remain" (Moy 1995:5). Only four villages remain, Renton, Tenney, Varona, and Fernandez. "Each village had its own architectural and landscaping character with physical separation formerly by cane field, now open fields" (Ibid). Assigning of housing was described as follows:

> For the best workmen, and for those that had the record of the longest residence on the property, Ewa supplied a house with a front veranda, two bedrooms, living room, back screened porch with connected lanai to a detached kitchen and dining room. Each was supplied with a separate washhouse, toilet and bath. As a general rule these houses were given to laborers who had been on the property for over ten years. (Kaukali and Subica 2010:50)

Sugar plantations were commonplace in Hawaiʻi during this time period. However, Ewa Plantation Company was known as the Pride of Hawaiʻi.

> Sugar plantations had a pivotal role in Hawaiʻi's history. They were the main economic engines that fueled Hawaii's change from subsistence agriculture to a commodity-based system. Sugar plantations 'were the ruling force behind Hawaii's economy for over 110 years.' They altered the landscapes with large areas of sugar can plantings, and by the construction of the mills to process this crop and of the villages to house the workers. The importation of labor for sugar plantations is the main reason for the multi-ethnic make-up of Hawaii's current population. Ewa Plantation Company's significance was due to its large size, long period of operation, high number of intact structures, and role as a model plantation in terms of living conditions and benefits to workers. The contrast with the plantations in the southern United States, which evolved from a history of slavery, was emphasized because 'of the notable strides Ewa Plantation made towards fair and just treatment of its workers.' The Industrial Center of the Ewa Plantation Company grew around the nucleus of the sugar mill building. Today, even though the mill building is gone, the complex is often called the Ewa Sugar Mill…The history of the buildings in the mill area is complex. The term and the plan for the 'Industrial Center' date from 1938. Before that, the arrangement of industrial structures around the mill was decided on a building-by-building basis. (HABS 1933 cited at Library of Congress n.d.)

Buildings of the Ewa Plantation Company mill site were constructed from 1889 through 1995. Initial construction ranged from 1889-1902, with subsequent work in 1956, 1985, and 1995 (Library of Congress n.d.). A 1919 Sanborn Fire Insurance map, shows the layout of the Ewa Plantation Company sugar mill, which is now the location of 'Ewa Mahiko Park (Figure 9). The Sanborn map includes the OR&L Plantation Rail Yard (R.Y.), nearby Pipe and Sheet Metal Shop, a General Office, Machine Shop, a large building including Electrical Supplies, a Cane Conveyer, Roller Mill, Centrifugals, Crystalizers, Settling Tanks, Juice Heaters & Vacuum Pans, Evaporators, Sugar Bagging, Mud Presses and a Fuel Room, a building with Mill Supply Pumps, an Ice Factory, and Soda Water Bottling, as well as a Social Hall, a Church, structures labeled as Warehouses, BLSM & Carpr. Shop, Molasses and Mascuite Tanks, Auto garages, tool sheds, a Cistern, Steam Turbine, Locomotive House, and more. The caption on the figure states that the mill had a "capacity [of] 250 tons in 24 hours. Season Dec-Aug" (see Figure 9). The Ewa Plantation Company was incorporated into the Oʻahu Sugar Company in 1970 and was in operation until the 1990s.

In 1995, Tenney Village, Varona Village, and Renton Village were placed on the Hawaiʻi Register of Historic Places (State Register) as the 'Ewa Sugar Plantation Villages Historic District or Ewa Villages (SIHP # 50-80-12-9786). The majority of the current project lies within this historic district. It should be noted that although Fernandez Village is currently existing, it was renovated in the 1970s without guidance and lost much of its integrity, becoming ineligible for the State or National Registers (Moy 1995). Contributing sites of the 'Ewa Sugar Plantation Villages Historic District includes mill buildings constructed between the 1890s-1950s, the plantation management office (1935), the 'Ewa Shopping Basket (1935) or plantation store, the plantation manager's house (1925), three additional managers' houses (1923), single men's quarters (1924), Renton Village (1907-1924) also referred to as "Haole Camp", Tenney Village (1923-26, expanded in late 1930s) also referred to as "Japanese Camp", Varona Village (1933, expanded 1957) also called "Filipino Camp", a Japanese Clubhouse referred to as "J" Club (1935, renovations 1991-1992), the 'Ewa Plantation Cemetery, an Artesian Well Marker (commemorates the first well site established in 1879), and the OR&L Right-of-Way (1889). Additional sites found to contribute to the historic district, but not owned by the City and County of Honolulu, include the 'Ewa Immaculate Conception Catholic Church, Parish Hall & Priest's Home (c. 1926), the 'Ewa Community Church (1937, addition 1956), and the 'Ewa Sotoshuji Church and Social Hall (1949) (Moy 1995). A 1927 USGS shows housing, the OR&L railroad, and plantation infrastructure within and surrounding the project area (Figure 10). A 1953 USGS shows the project area extends through Varona Village and Tenney Village (Figure 11). A 1977 aerial photograph shows the visual setting of the site after incorporation by the Oʻahu Sugar Company (Figure 12).

The 'Ewa Sugar Plantation Villages was determined eligible under Criteria a (associated with events that have made a significant contribution to the broad patterns of Hawaiʻi's history) and c (embodies 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) (Moy 1995:3).

1.6.3 Oahu Railway and Land Company (OR&L)

The OR&L railway was pioneered by Benjamin Franklin Dillingham. Beginning in 1889, the OR&L laid rail throughout the west side of Oʻahu, stretching from Honolulu through the 'Ewa Plains any beyond. The railroad reached the Ewa Sugar Plantation in 1892, the line reached the

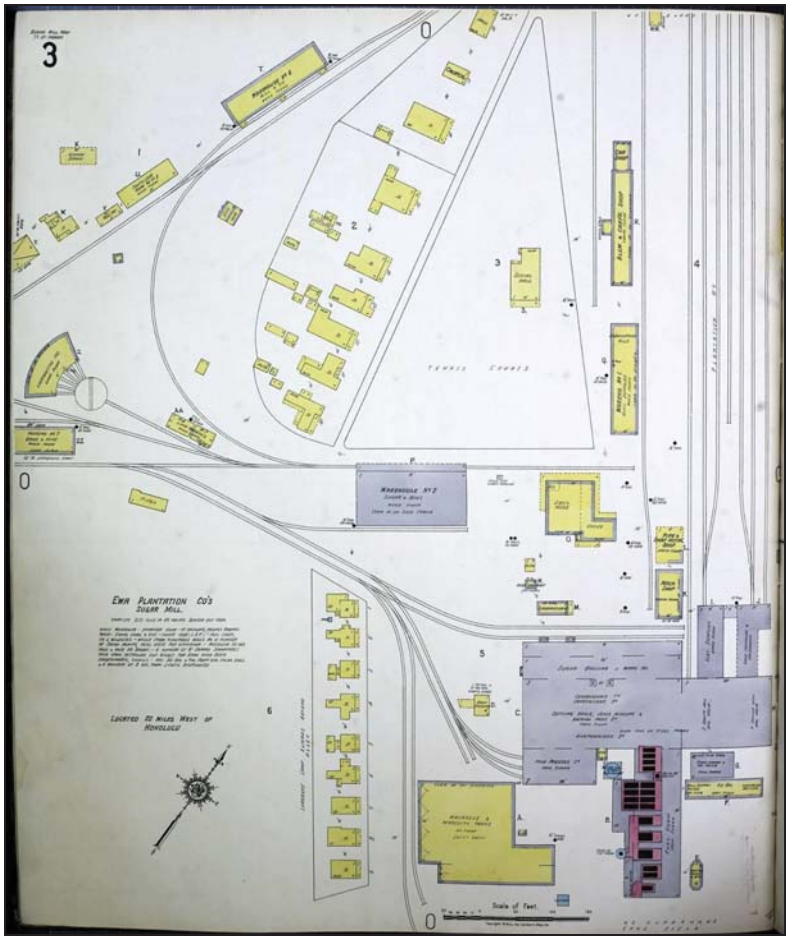

Figure 9. 1919 Sanborn Fire Insurance Map of the Ewa Plantation Company Sugar Mill located at the current ‘Ewa Mahiko Park (Sanborn Map Company 1919)

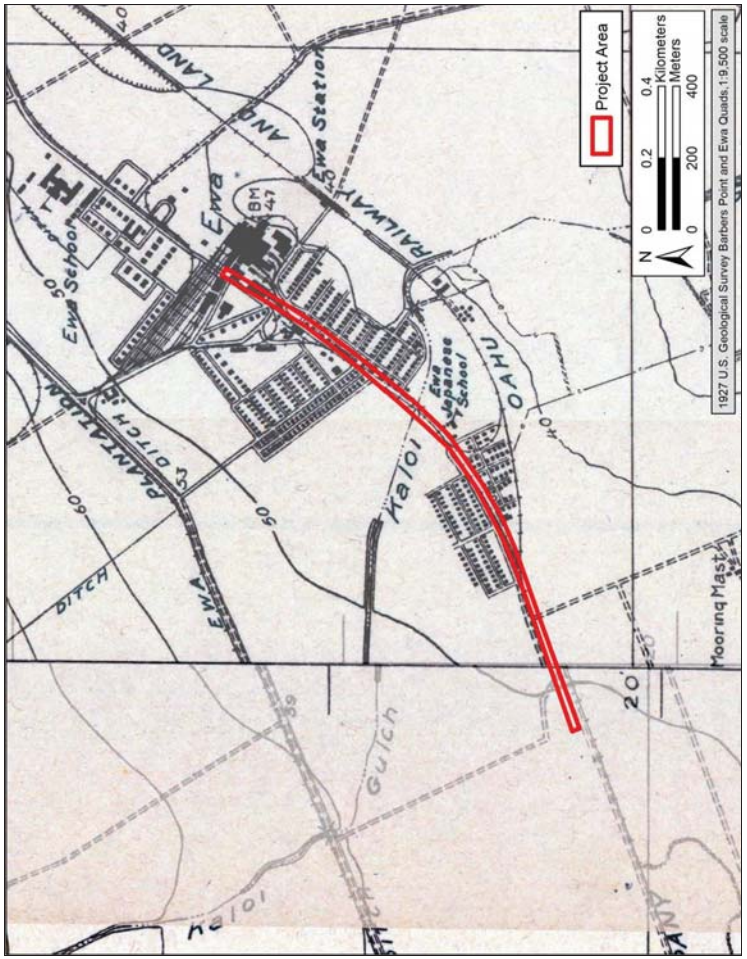

Figure 10. Portion of 1927 Barbers Point and ‘Ewa USGS showing the project area

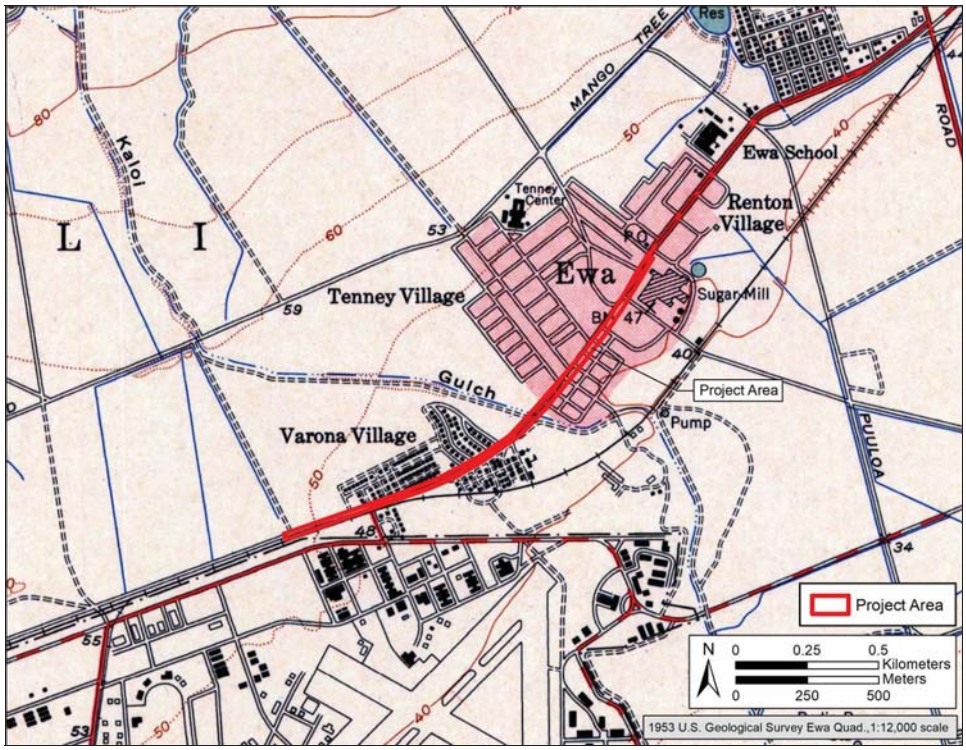

Figure 11. Portion of a 1953 'Ewa USGS showing the project area

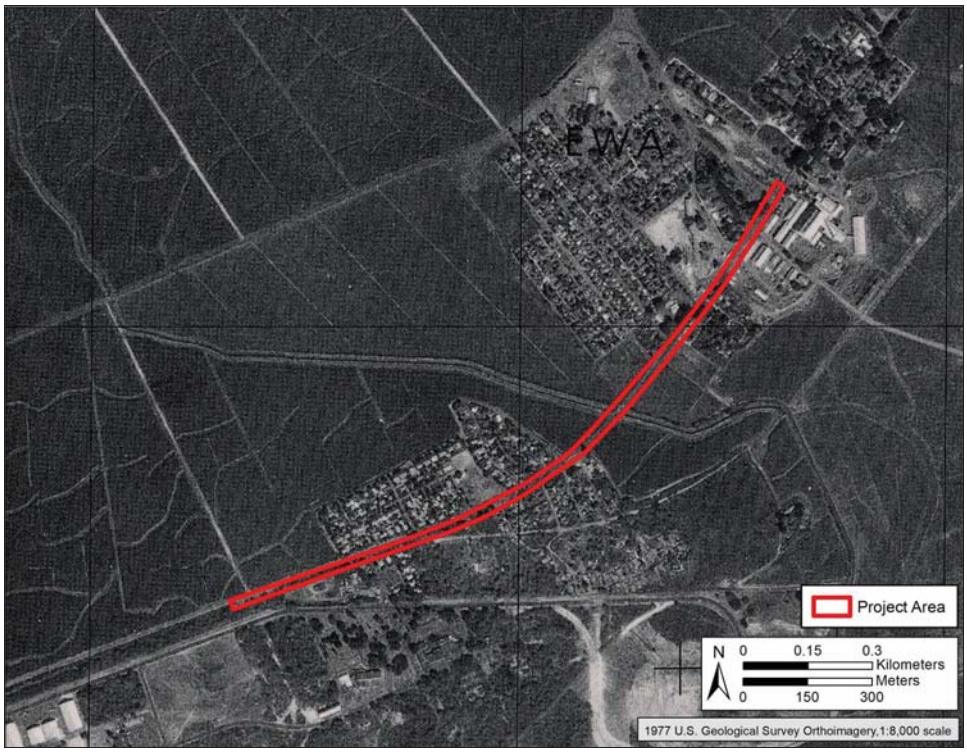

Figure 12. 1977 USGS Orthophoto aerial photograph, 'Ewa and Schofield Barracks quadrangles, showing the project area

Waianae Plantation in 1895, the Waialua Mill in 1898, Kahuku by 1899, and Wahiawa by 1906 (Rewick 2012). A total of 175 miles of track was laid for the railroad, with a tremendous effect on the economic development of O‘ahu and Hawai‘i (Cummins 1974a, Knaus 1983). A portion of the OR&L railroad is adjacent to the southern extent of the current project area.

From 1890 to 1892, the Ranch Department of the OR&L constructed plantation flumes and cultivated sisal (*Agave sisalana*). The Hawaiian Fibre Company was established in 1898 and extended within the limits of Naval Air Station Barbers Point (NASBP), south of the current project area. To attract more business, Dillingham leased all of his property below 200 feet in elevation to the O‘ahu Sugar Company and William Castle who in turn, sublet to the Ewa Plantation Company for sugar cane cultivation (Frierson 1972:15).

The railroad was initially designed for use as a passenger train and to cart agricultural goods to Honolulu (Hungerford 1963, Treiber 2005). It was constructed adjacent to sugar mills and military bases. During WWII, the U.S. military took over use of the OR&L tracks to transport materials and personnel throughout the island.

> Oahu Railway’s finest hour began the minute bombs were dropped on Pearl Harbor. At once it was an important agency in prosecution of the war and operations went on a day-and-night basis. For months locomotives ran with-out lights, then with blackout headlights visible as warnings but given no light for engine crews. Troop trains, workers’ trains, supply trains, ammunition trains—all shuttled constantly until it looked as though traffic saturation would be reached, yet it was not. In the year before war’s outbreak the passenger total had been under a million. In 1942 it exploded to 2,365,601 and in 1943 rose to 2,642,516. (Hungerford 1963:33)

In 1943, the OR&L included 26 locomotives, 52 passenger coaches, 6 combination coaches, 1 parlor car, 3 mail cars, 2 gasoline motor cars, and 1,359 freight cars (Hungerford 1963:34). Following the war, there was a decline in passenger use with the popularity of automobiles on the rise and other misfortunes, including a tidal wave which destroyed the tracks along the west coast of O‘ahu. OR&L passenger service ended in 1947, and much of the track was dismantled. However, a large section of the OR&L track and right-of-way was sold to the U.S. Navy, extending 30 miles from the west limits of Pearl Harbor Reservation to a Lualualei ammunition depot (Hungerford 1963). The track was used to transport munitions until 1968 (Trieber 2005).

The OR&L Right-of-Way (ROW) was listed on the State and National Registers in 1975 (SIHP #50-80-12-9714, NR #75000621) (Cummins 1974a). The OR&L ROW includes the longest stretch of narrow-gauge railroad track in Hawai‘i, extending 15 miles from West Loch in Honouliuli to the west side of O‘ahu in Nanakuli (Cummins 1974a:2, Rewick 2012:3). The ROW is 40 feet wide consisting of a raised roadbed of mixed materials in good condition.

The OR&L ROW and Hawaiian Railway Society’s (HRS) ‘Ewa Railroad Yard (OR&L Railroad Baseyard), located immediately south of the current project area, was nominated to the State Register in 2012 and is designated at SIHP #50-80-12-7387 (Rewick 2012). The HRS ‘Ewa Rail Yard contains collections and is a location for research, preservation, conservation, restoration, and maintenance of OR&L engines, boxcars, flatcars, coaches, cane cars, hand-operated track inspection car, artifacts, and memorabilia. The facility also serves as an operating depot for public train rides. The HRS moved to this location in 1974, the site is not an original location for the OR&L baseyard. The ‘Ewa Railroad Yard is makai (seaward) of the OR&L ROW and contains

“five narrow gauge siding tracks and one bypass track connected by railroad switches to the right-of-way. It is the replacement facility for the original railroad support facility (including roundhouse) that was located in Iwilei in Honolulu but which was demolished and then subdivided in the late 1950s-early 1960s” (Rewick 2012:3).

The Railroad Yard includes several train cars that are listed on the State and National Registers, including locomotives #6 (“Kailua”, built 1889) and #12 (built 1912) and the #64 Dillingham parlor car (built 1924) (Railway Rolling Stock, SIHP #50-80-08-9761 [State Register]), and the Waialua Agricultural Company locomotive #6 (“WaCo 6”, SIHP #50-80-08-9708, NR #74000719). WaCo 6 is the only locomotive designed and built in Hawai‘i and the only fully operational and restored Hawaiian sugar plantation locomotive in the world (Cummins 1974b, HHF 2016).

The OR&L ROW and HRS ‘Ewa Railroad Yard (SIHP # -7387), the Railway Rolling Stock (SIHP # -9761), and the Waialua Agricultural Company locomotive #6 (SIHP # -9708, NR #74000719) were all deemed eligible for the State and National Registers under Criteria A (associated with events that have made a significant contribution to the broad patterns of Hawai‘i’s history) (Cohn 1992:3, Cummins 1974b, Rewick 2012:12). According to the National Register nomination form for the Waialua Agricultural company locomotive #6, it was also recommended eligible under Criteria C (embodies distinctive characteristics of a type, period, method of construction, or work of a master).

1.6.4 Military Development of ‘Ewa

1.6.4.1 ‘Ewa Plain Battlefield

In the 1920s, the U.S. Navy leased 206 acres of land on the ‘Ewa Plains from the Campbell Estate and a Honolulu contractor was hired by the Navy to clear the land to build a Mooring Mast and Emergency Landing Field (Ewa Mooring Mast Field or ‘Ewa Field) for dirigibles (Helber Hastert & Fee 2008). This facility was used until the early 1930s and then was dismantled and became part of the ‘Ewa Marine Corps Air Station at Barbers Point (MCAS ‘Ewa) (Tuggle et al. 1997). The airfield formed a large “X” and was nearly finished in 1941 when it was bombed by Japanese invaders, beginning the U.S. involvement in WWII.

On December 7, 1941, the MCAS ‘Ewa was one of the first military targets that were bombed by the Japanese in Hawai‘i (Frye and Resnick 2013). Numerous aircraft were destroyed; however, other facilities of MCAS ‘Ewa were largely unharmed (U.S. Navy, BuDocks 1947:139, cited in Helber Hastert & Fee 2008). The Battle of the ‘Ewa Plain includes ‘Ewa Field, Ewa Villages, and ‘Ewa Beach. During and after the battle, military and civilians worked together closely to fight, defend, recover, and rebuild their community (Frye and Resnick 2013:7).

The ‘Ewa Plain Battlefield became a State and National Register site in 2016 (SIHP #50-80-12-5127, NR #16000273). The boundary covers approximately 180 acres, restricted to the lands of the former Ewa Mooring Mast Field, where the most intense air-to-ground assaults on the landscape was conducted and the location of defining features that possess the highest level of integrity. The site includes:

> portions of Ewa Field that retain physical features and characteristics dating to 1941. This includes intact portions of the landscape such as airfield/runways, swimming

pool, foundations, open fields, and transportation arteries, present during the attack" (Frye and Resnick 2013:7).

A 2,000 feet long spur of the OR&L railway extended to the airfield.

The ʻEwa Plain Battlefield and contributing resources were divided into three main components: aviation facilities, camp area (north side of airfield), and other resources (Frye and Resnick 2013:13). Existing aviation facilities include runways, a warm-up platform, and parking apron with visible displays of Japanese aircraft gun fire and burning of aircrafts. The camp area included the living quarters, mess halls, latrines, boiler room, recreation areas, offices, swimming pool, fuel tanks, storage facilities, parking lots, roads, landscaped areas, flagpole, and a spur of the OR&L railway (Frye and Resnick 2013:15-18). Existing camp infrastructure includes concrete slab foundations, concrete cradles used to secure fuel tanks, a subsurface fuel tank, a swimming pool with surrounding deck/walkway, a parking lot, a flagpole base, and a berm associated with a spur of the OR&L with railroad ties apparent but tracks removed. Existing infrastructure considered "Other Resources" include a remnant storage building and road networks.

The ʻEwa Plain Battlefield was determined eligible under Criteria A (associated with events that have made a significant contribution to the broad patterns of Hawaiʻi's history) and D (have yielded or may be likely to yield, information important in history or prehistory) (Frye and Resnick 2013:28). The site is approximately 230 feet (70 meters) south of the southern end of the current project area.

1.6.4.2 Barbers Point

Between 1921 and 1944, the U.S. Military acquired an additional 3,500 acres of land from the Campbell Estate and constructed the Barbers Point Military Reservation (Battery Barbers Point) as a training area, which included multiple locations including Camp Malakole Military Reservation (Honouliuli Military Reservation) and Gilbert Military Reservation. Fort Barrette (Kapolei Military Reservation and Battery Hatch) was built on top of Puʻu o Kapolei as a coastal defense station. Fire control stations were established on top of Puʻu Makakilo (Fire Control Station A) and Puʻu Pālailai (Fire Control Station B), as well as Mooring Mast Field, which was an auxiliary airfield for the Marine Corps Air Station and the Naval Air Station at Barbers Point (NASBP) (Tuggle et al. 1997).

After WWII, during the Cold War building period, activities increased at NASBP and it became famous for its Navy patrol squadrons, including Rainbow Fleet and Pineapple Airlines (Helber Hastert & Fee 2008). NASBP was used as the main Pacific Air Station responsible for all Pacific Naval air operations (Tuggle et al. 1997). In 1949, the MCAS ʻEwa was absorbed into the NASBP and all marine activities moved to Kāneʻohe.

In 1965, the formal U.S. Coast Guard Air Station Barbers Point was established. Several of the recreational facilities were erected to serve the base's diverse roles, including a larger airplane parking apron, residential communities, a golf course, and beach cabins along Nimitz Beach (Tuggle et al. 1997). The NASBP base played a role in both Desert Shield and Desert Storm. NASBP reached a maximum size of 3,679 acres before it closed in 1999 (Helber Hastert & Fee 2008). The base is now referred to as the traditional place name, Kalaeloa, and includes only 1,166 acres of land in five noncontiguous areas.

Since the deactivation of NASBP, the State Department of Defense (DOD), Department of Transportation (DOT), Department of Hawaiian Home Lands (DHHL), and the University of Hawai'i have acquired several acres of land in the area. The airfield was reopened in 1999 as a state regional airport and is now referred to as both Kalaeloa Airport and John Rodgers Field. The airport is used by the U.S. Coast Guard (Air Station Barbers Point), Hawaii Community College Flight Program, Hawaiʻi National Guard, and the general aviation community. The airport also serves as the base for HC-130 "Hercules" long-range surveillance aircraft, HH-65 short-range recovery helicopter, search and rescue, and emergency response operations (USCG 2016).

Previous Archaeology

The following section includes brief written descriptions of previous archaeological studies that have been conducted within the project area and within a 1-1.5 mile (5,280-7,920 ft) radius of the current project area. This information is presented in order to identify existing historic sites within and in the surrounding vicinity of the project area and potential sites that may be encountered during construction of the proposed waterline. Multiple archaeological studies have been conducted in the area, documenting several sites (Figure 13, Figure 14 and Table 2). Documented site types include plantation-era villages, structures, deposits, railroad infrastructure, and a WWII battlefield.

The project area extends through the ‘Ewa Sugar Plantation Villages Historic District (SIHP # 50-80-12-9786). Two additional significant sites are located immediately south of the project area, including the OR&L Right-of-Way (ROW) (SIHP #50-80-12-9714, NR #75000621) and the OR&L ROW and Hawaiian Railway Society’s (HRS) ‘Ewa Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387). Within the HRS ‘Ewa Railroad Yard are several train cars that are listed on the State and National Registers (Railway Rolling Stock [SIHP #50-80-08-9761] and Waialua Agricultural Company locomotive #6 [SIHP #50-80-08-9708, NR #74000719]). In addition, the ‘Ewa Plain Battlefield (SIHP #50-80-12-5127, NR #16000273) is located approximately 230 feet to the south of the project area.

The following section describes previous archaeological studies within and in the near vicinity of the project area. Archaeological studies are presented in chronological order.

1.7 McAllister 1933

The earliest investigation of Honouliuli and the ‘Ewa Plains was conducted by J. G. McAllister in 1933 during his island-wide survey of O‘ahu. McAllister (1933) noted multiple heiau (traditional places of worship) in the uplands of Honouliuli, including Pu‘u Kapolei Heiau (Site 138) and the ‘Ewa Coral Plain (Site 146). The current project area is located on the ‘Ewa Coral Plain (Site 146). The site was described as:

> Site 146. Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near the Puuloa Salt Works, belongs to the ranching period of about 75 years ago. It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population here. (McAllister 1933, cited in Sterling and Summers 1978:36)

1.8 Hammatt and Shideler 1990

In 1990, Cultural Surveys Hawaii, Inc. (CSH) conducted an archaeological inventory survey (AIS) of the West Loch Bluffs, a 546-acre area (Hammatt and Shideler 1990). Five sites were documented including 3 pipe features (SIHP #50-80-12-4344, Features A-C), a stone-faced railroad berm (SIHP #50-80-12-4345), the northern pumping station (SIHP #50-80-12-4346), central pumping station (SIHP #50-80-12-4347), and southern pumping station (SIHP #50-80-

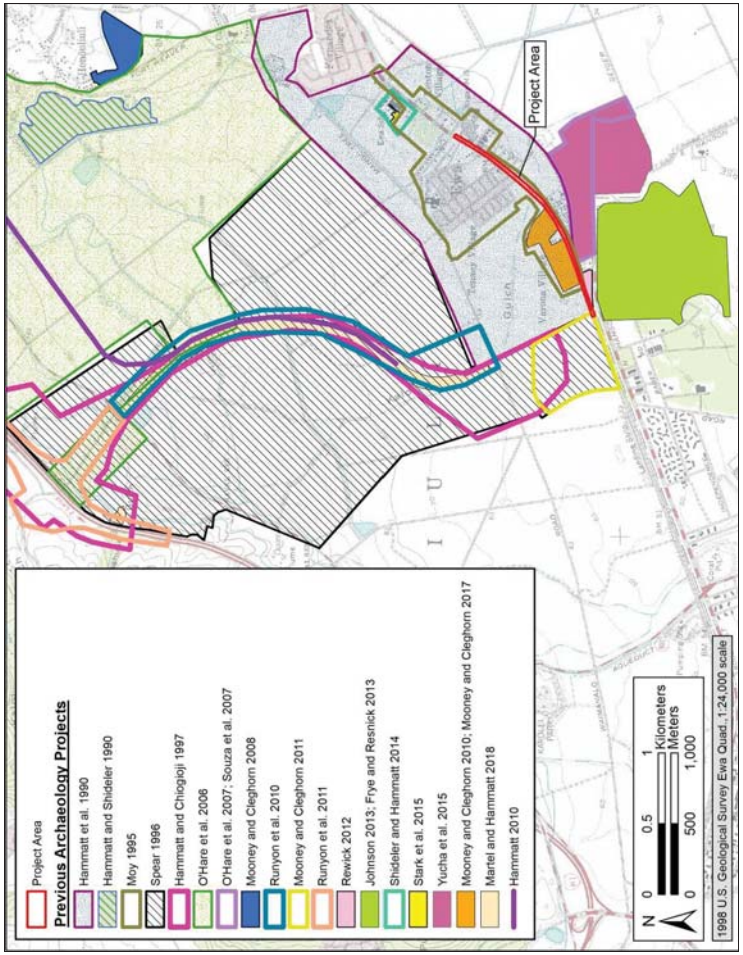

Figure 13. Portion of a 1998 ‘Ewa USGS topographic quadrangle, showing previous archaeological studies in the vicinity of the project area

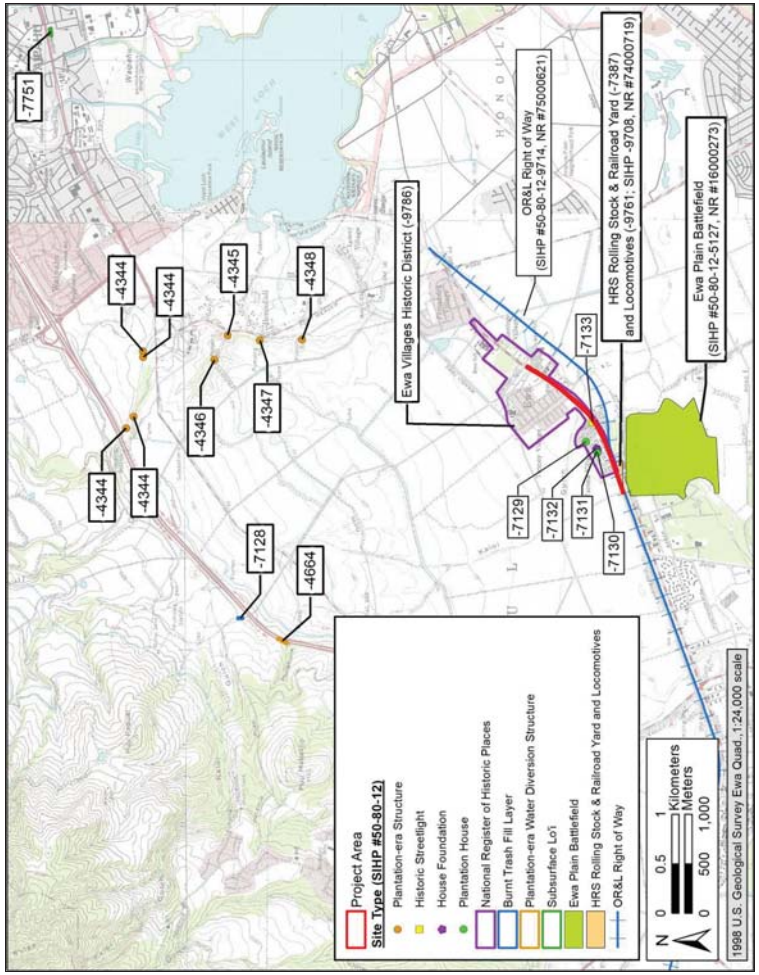

Figure 14. Portion of a 1998 USGS showing previously documented sites adjacent to and within the vicinity of the project area

Table 2. Table Listing Previous Archaeological Studies in the Vicinity of the Project Area

Author(s)	Type of Study	Location	Findings
McAllister 1933	Reconnaissance	Island-Wide	'Ewa Coral Plain (Site 146) (not on Figure 13 and Figure 14)
Hammatt and Shideler 1990	Archaeological Inventory Survey (AIS)	West Loch Bluffs (approx. 5,700 ft/ 1 mile north of project area)	5 sites documented, 3 pipe features (SIHP #50-80-12-4344, Features A-C, not shown on Figure 14), a stone-faced railroad berm (SIHP #50-80-12-4345), northern pumping station (SIHP #50-80-12-4346), central pumping station (SIHP #50-80-12-4347), and southern pumping station (SIHP #50-80-12-4348)
Hammatt et al. 1990	Reconnaissance Survey	'Ewa Villages (**within project area**)	Identified features of 'Ewa Sugar Plantation Villages (SIHP 50-80-12-9786) including Renton Village and mill, Tenney Village, Varona Village, remnants of Mill Village, remnants of Middle Village, remnants of C Village, a plantation cemetery, Reservoir #1, the 'Ewa Depot, a Buddhist temple, and the 'Ewa Japanese School
Moy 1995	National Register of Historic Places Registration Form	'Ewa Villages **(within project area)**	'Ewa Sugar Plantation Villages (SIHP 50-80-12-9786), public district consisting of 287 contributing resources including 285 domestic and agricultural buildings, 1 processing site, and 1 commercial complex used by plantation workers from 1890 to 1957
Spear 1996	Reconnaissance Survey and Assessment	H.F.D.C-East Kapolei Development Project (approx. 200 ft/ 0.04 miles west of project area)	No historic properties documented

Author(s)	Type of Study	Location	Findings
Hammatt and Chiogioji 1997	Reconnaissance Survey	North-South Rd. (approx. 600 ft/ 0.1 miles northwest of the project area)	No historic properties documented
O'Hare et al. 2006	AIS	East Kapolei Development Project (approx. 3,000 ft/ 0.57 miles northwest of project area)	Five sites previously identified by Hammatt et al. (1990) re-assessed, plantation infrastructure (SIHP #50-80-12-4344, Features A-G [Fea. D-G shown on Figure 14]), a stone-faced railroad berm (SIHP #50-80-12-4345), northern pumping station (SIHP #50-80-12-4346), central pumping station (SIHP #50-80-12-4347), and southern pumping station (SIHP #50-80-12-4348) were revisited and documented
O'Hare et al. 2007, Souza et al. 2007	Archaeological Assessment; Cultural Impact Assessment	'Ewa Industrial Park (approx. 200 ft/ 0.04 miles south of project area)	No historic properties documented
Mooney and Cleghorn 2008	Archaeological Assessment	Two parcel development between Fort Weaver Rd. and Old Fort Weaver Road (approx. 6,500 ft/ 1.2 miles northeast of project area)	No historic properties documented
Hammatt 2010	AIS	Honolulu High-Capacity Transit Corridor Project (approx. 5,000 ft/ 0.9 miles north of project area)	sub-surface lo'i deposit (SIHP #50-80-09-7751) documented near the Waipahu Transit Center

Author(s)	Type of Study	Location	Findings
Mooney and Cleghorn 2010	AIS	Varona Village (adjacent to north side of project area)	Five newly-identified structures of 'Ewa Sugar Plantation Villages (SIHP # -9786), including historic plantation houses (SIHP #50-80-12-7129 and -7130), a house foundations (SIHP #50-80-12-7131 and -7132), and a historic streetlight (SIHP #50-80-12-7133)
Runyon et al. 2010	Archaeological Monitoring Report (AMR)	North-South Rd., Phase IB (approx. 1,500 ft/ 0.3 miles north of project area)	No historic properties documented
Mooney and Cleghorn 2011	Archaeological Assessment	Ka Makana Ali'i (approx. 250 ft/ 0.05 miles to west of project area)	No historic properties documented
Runyon et al. 2011	AMR	North-South Road, Phase IC (approx. 11,100 ft/ 2.1 miles north of project area)	burnt trash fill layer (SIHP #50-80-12-7128) with plantation-era artifacts and a previously documented concrete plantation-era water diversion structure containing two sluice gates (SIHP #50-80-14-4664)
Rewick 2012	National Register of Historic Places Registration Form	Hawaiian Railway Society (adjacent to south side of project area)	OR&L ROW and Hawaiian Railway Society's (HRS) 'Ewa Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387)
Johnson 2013, Frye and Resnick 2013	Reconnaissance and Geophysical Survey; State and National Register Nomination	Marine Corps Air Station ('Ewa Field) (230 ft/ 0.04 miles to south of project area)	'Ewa Plain Battlefield (SIHP #50-80-12-5127, NR #16000273) finding foundation of an armory, officers barracks, and storage building, over 500 ft of charred but intact OR&L railway ties without rails, a swimming pool and adjacent pavement, a subsurface fuel tank, and a subsurface latrine

Author(s)	Type of Study	Location	Findings
Shideler and Hammatt 2014	Archaeological Literature Review and Field Inspection	‘Ewa Elementary School (560 ft/ 0.1 miles northeast of project area)	‘Ewa Villages Historic District (SIHP #50-80-12-9786)
Stark et al. 2015	Archaeological Survey and Assessment	‘Ewa Elementary School (840 ft/ 0.16 miles north of project area)	‘Ewa Villages Historic District (SIHP #50-80-12-9786)
Yucha et al. 2015	Archaeological Assessment	Honouliuli Wastewater Treatment Plant (approx. 200 ft/ 0.04 miles south of project area)	No historic properties documented
Mooney and Cleghorn 2017	AMR	Varona Village (adjacent to north side of project area)	45 plantation-era houses of Varona Village, part of the ‘Ewa Villages Historic District (SIHP # -9786), several historic artifacts such as glass bottles, bottle fragments, rusted metal machine or automotive parts, and residential building materials were observed in disturbed contexts and fill sediments
Martel and Hammatt 2018	Archaeological Lit Review and Field Inspection	Kualaka‘i Parkway (formerly North-South Rd) (approx. 1,500 ft/ 0.3 miles north of project area)	Remnants of plantation-era infrastructure (SIHP # 50-80-12-4664) previously observed within northwest portion of project area (Runyon et al. 2011)

12-4348). Additionally, four areas of historical importance were discussed, including LCA’s in Honouliuli Taro Lands (post 1890 AD), Kapalani Catholic Church (c. 1840-1890), PipeLine Village (c. 1890-1931), and Drivers and Stable Villages (c. 1900-1931).

1.9 Hammatt et al. 1990

In 1990, CSH conducted an archaeological reconnaissance survey of the ‘Ewa Villages (Hammatt et al. 1990). The study included surface survey of 616 acres. Several features were identified including Renton Village, Tenney Village, Varona Village, remnants of three additional former plantation villages named C Village, Mill Village, and Middle Village (a Korean Village), and other plantation-era infrastructure including a plantation cemetery, ‘Ewa Depot, Buddhist temple, ‘Ewa Japanese School, a reservoir (Reservoir #1), and sugar cane fields (Figure 15). The study recommended additional study for the remains of a Roundhouse, long store, and community bathhouse (furo). The possibility of intact significant features was noted for Renton, Tenney, and Varona Villages and it was recommended that appurtenances of the OR&L ROW be avoided. No pre-contact traditional Hawaiian features or any other features pre-dating use of the area by the ‘Ewa Plantation were observed. Archaeological monitoring was recommended for any future development of the area.

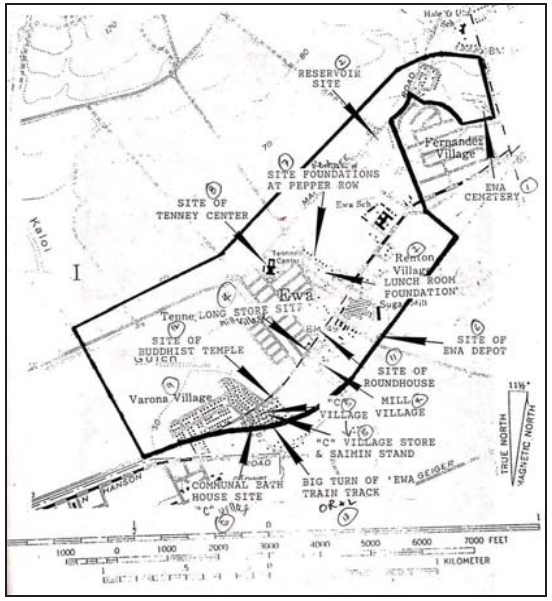

Figure 15. Map Provided within Hammatt et al. (1990:19) showing significant features of their study within Ewa Villages

1.10 Moy 1995

In 1995, the ‘Ewa Sugar Plantation Villages (SIHP 50-80-12-9786) were nominated for the National Register of Historic Places (Moy 1995). A public district was designated consisting of 287 contributing historic resources, including 285 domestic and agricultural buildings, one processing site, one commercial complex utilized by plantation workers from 1890 to 1957. Contributing sites of the ‘Ewa Sugar Plantation Villages Historic District includes mill buildings, the plantation management office (1935), the ‘Ewa Shopping Basket (1935) or plantation store, the plantation manager’s house (1925), three additional managers’ houses (1923), single men’s quarters (1924), Renton Village (1907-1924) also referred to as “Haole Camp”, Tenney Village (1923-26, expanded in late 1930s) also referred to as “Japanese Camp”, Varona Village (1933, expanded 1957) also called “Filipino Camp”, a Japanese Clubhouse referred to as “J” Club (1935, renovations 1991-1992), the ‘Ewa Plantation Cemetery, an Artesian Well Marker (commemorates the first well site established in 1879), and the OR&L Right-of-Way (1889). Additional sites found to contribute to the historic district, but not owned by the City and County of Honolulu, include the ‘Ewa Immaculate Conception Catholic Church, Parish Hall & Priest’s Home (c. 1926), the ‘Ewa Community Church (1937, addition 1956), and the ‘Ewa Sotoshuji Church and Social Hall (1949).

1.11 Spear 1996

In 1996, Scientific Consultant Services (SCS) conducted an archaeological reconnaissance survey and assessment for the H.F.D.C.-East Kapolei Development Project (Spear 1996). No historic properties were documented, and due to such prolonged sugarcane production in the past, SCS recommended no further archaeological investigation was necessary.

1.12 Hammatt and Chiogioji 1997

In 1997, CSH conducted an archaeological reconnaissance survey over a 14,730-foot long corridor that would connect the makai (seaward) portion of ‘Ewa to the H-1 Freeway (North-South Road) (Hammatt and Chiogioji 1997). The entire project area was previously used for sugar cultivation and there were no significant archaeological finds encountered. CSH recommended no further archaeological investigation, however SHPD did request archaeological monitoring during construction of the North-South Road.

1.13 O’Hare et al. 2006

In 2006, CSH conducted an archaeological inventory survey for the East Kapolei Project (O’Hare et al. 2006). The survey re-assessed five sites previously identified by Hammatt et al. (1990) and associated with the plantation-era, including plantation infrastructure (SIHP #50-80-12-4344, Features A-C), a stone-faced railroad berm (SIHP #50-80-12-4345), a northern pumping station (SIHP #50-80-12-4346), central pumping station (SIHP #50-80-12-4347), and southern pumping station (SIHP #50-80-12-4348). Four additional features of SIHP # -4344 (Features D-G) were documented, including two linear walls (D and E) along the Koko Head bank of Honouliuli stream, a stone-faced berm (F) perpendicular to the stream, and a concrete ditch and masonry catchment basement (G) on the ‘Ewa bank of Honouliuli gulch.

The project also included excavation of 19 backhoe trenches located within areas previously determined during the Hammatt and Shideler (1990) study, including LCA’s in Honouliuli Taro Lands (post 1890 AD), Kapalani Catholic Church (c. 1840-1890), PipeLine Village (c. 1890-1931), and Drivers and Stable Villages (c. 1900-1931). Five trenches were placed within potential LCA locations finding only historic debris, such as fragments of limestone mortar, asphalt, slag, and charcoal lenses likely associated with the nearby OR&L railroad berm (SIHP # -4345). Seven trenches were excavated within the Roman Catholic Churchyard with no significant findings. Six trenches were excavated within the former location of PipeLine Village finding only frequent concrete fragments. One trench was located within the Drivers and Stable Villages encountering a subsurface asphalt layer of unknown origin or function. Although these four areas were not assigned site numbers and no significant subsurface remains were found during testing, the study recommended on-call/on-site monitoring for any future development in those areas.

1.14 O’Hare et al. 2007, Souza et al. 2007

In 2007, CSH conducted an archaeological assessment (O’Hare et al. 2007) and Cultural Impact Assessment (CIA) (Souza et al. 2007) for the ‘Ewa Industrial Park (TMK 9-1-069:033). The project included approximately 48 acres of land and was bordered by the OR&L tracks to the north. The project area was surveyed on foot and found to have been previously heavily disturbed by agricultural use, bulldozing, and modern use. No historic properties were documented during the assessment and no further work was recommended for the parcel.

1.15 Mooney and Cleghorn 2008

In 2008, Pacific Legacy, Inc. conducted an archaeological assessment for the proposed development of two parcels between Fort Weaver Road and Old Fort Weaver Road (TMK: [1] 9-1-17:010 & 041) (Mooney and Cleghorn 2008). The investigation included surface survey and backhoe excavation of 14 trenches, extending to a maximum depth of 1.8 meters (6 ft). The project area was found to be covered in 0.9-1.5 meters (3-5 ft) of construction fill overlying natural terrestrial soils. No further archaeological work was recommended. However, it was recommended that in the case of encountering limestone bedrock or filled and buried sinkholes, they should be archaeologically investigated.

1.16 Hammatt 2010

In 2010, CSH conducted an AIS for the Honolulu High-Capacity Transit Corridor Project (Hammatt 2010). The project area spanned 7.4 miles, including a 6.8 mile segment extending from the North-South Rd to the Pearl Highlands Station, followed by 0.6 miles to Waimano Home Rd in Pearl City. The project included 156 acres which was surveyed and 92 backhoe excavations were conducted. Only one site was documented consisting of a sub-surface lo‘i deposit (SIHP #50-80-09-7751) found near the Waipahu Transit Center. A data recovery program was recommended for the area near the entrance to the Waipahu Transit Center Station.

1.17 Mooney and Cleghorn 2010

In 2010, Pacific Legacy completed an AIS of Varona Village, adjacent to the north side of the current project area (Mooney and Cleghorn 2010). The project included approximately 22 acres

and was located within the ‘Ewa Sugar Plantations Historic District (SIHP # -9786). The study recorded five newly-identified structures within Varona Village, including two historic plantation houses (SIHP #50-80-12-7129 and -7130), two house foundations (SIHP #50-80-12-7131 and -7132), and a historic streetlight (SIHP #50-80-12-7133). This report was not found at the SHPD library in Kapolei, therefore, only limited information of this study is known.

1.18 Runyon et al. 2010

In 2010, CSH conducted an archaeological monitoring for the North-South Road, Phase IB (Runyon et al. 2010). The project included the extent of North-South Rd from Farrington Highway to Mango Tree Rd. No historic properties were observed.

1.19 Mooney and Cleghorn 2011

In 2011, Pacific Legacy completed an archaeological assessment for the Ka Makana Ali‘i development, just west of the current project area (Mooney and Cleghorn 2011). A total of 62 backhoe trenches were excavated throughout the project area. No archaeological resource were encountered. This report was not found at the SHPD library in Kapolei, therefore, only limited information of this study is known.

1.20 Runyon et al. 2011

In 2011, CSH conducted an archaeological monitoring for the North-South Road, Phase IC (Runyon et al. 2011). The project included the intersection of North-South Rd and H-1 and extended to Farrington Highway, encompassing 125 acres. Two historic properties were documented including a burnt trash fill layer (SIHP # 50-80-12-7128) used in construction of Palehua Rd and containing 113 plantation-era artifacts dating to the early 1900s and a previously documented concrete plantation-era water diversion structure containing two sluice gates (SIHP # 50-80-14-4664).

1.21 Rewick 2012

In 2012, the OR&L ROW and Hawaiian Railway Society’s (HRS) ‘Ewa Railroad Yard (OR&L Railroad Baseyard), located adjacent to the south side of the current project area, was nominated to the State Register (SIHP #50-80-12-7387) (Rewick 2012). The HRS ‘Ewa Rail Yard contains collections and is a location for research, preservation, conservation, restoration, and maintenance of OR&L engines, boxcars, flatcars, coaches, cane cars, hand-operated track inspection car, artifacts, and memorabilia. The facility also serves as an operating depot for public train rides. The HRS moved to this location in 1974, the site is not an original location for the OR&L baseyard.

The Railroad Yard includes several train cars that are listed on the State and National Registers, including locomotives #6 (“Kailua”, built 1889) and #12 (built 1912) and the #64 Dillingham parlor car (built 1924) (Railway Rolling Stock, SIHP #50-80-08-9761 [State Register]), and the Waialua Agricultural Company locomotive #6 (“WaCo 6”, SIHP #50-80-08-9708, NR #74000719). WaCo 6 is the only locomotive designed and built in Hawai‘i and the only fully operational and restored Hawaiian sugar plantation locomotive in the world (Cummins 1974b, HHF 2016).

1.22 Johnson 2013, Frye and Resnick 2013

In 2013, a reconnaissance and geophysical survey at the Marine Corps Air Station (‘Ewa Field) was conducted (Johnson 2013). Ground penetrating radar, magnetometry, and metal detection were utilized to identify features at the airfield which were present during the Japanese attack of WWII on December 7, 1941. The study investigated the ‘Ewa Plain Battlefield (SIHP #50-80-12-5127, NR #16000273) finding foundations of an armory, officers barracks, and storage building, over 500 ft of charred but intact OR&L railway ties without rails, a swimming pool and adjacent pavement, a subsurface fuel tank, and a subsurface latrine. Several additional features were searched for but not found including evidence of enlisted barracks, a flagpole, water lines, a dispensary, the end of an original coral runway, the mooring mast, a compass rose, a magazine, and an ammunitions dump. The ‘Ewa Plain Battlefield was nominated to the State and National Register in 2013 (Frye and Resnick 2013).

1.23 Shideler and Hammatt 2014

In 2014, CSH conducted an archaeological literature review and field inspection for the ‘Ewa Elementary School classroom buildings project (TMKs: [1] 9- 1-017:002 [por.], 9-1- 017:037 [por.], and 9- 1-101:999 [por.]) (Shideler and Hammatt 2014). The project area was located within the Ewa Villages Historic District (SIHP #50-80-12-9786). No other historic properties were observed during the field inspection. CSH stated that encountering burials or cultural deposits would be unlikely.

1.24 Stark et al. 2015

In 2015, CSH conducted an archaeological survey and assessment for the ‘Ewa Elementary School Building E (TMK: [1] 9- 1-017:002 [por.]) (Stark et al. 2015). The project was conducted in preparation for construction of a proposed classroom building. The project area was located within the Ewa Villages Historic District (SIHP # -9786). Although some historic artifacts such as a bent spoon, a broken plate, a bullet, and nails were documented, the items were noted as not concentrated and not intrinsically associated with any new historic property. CSH stated that no historic properties would be impacted by the project and no further work was necessary.

1.25 Yucha et al. 2015

In 2015, CSH conducted an archaeological assessment for the Honouliuli Wastewater Treatment Plant (WWTP) Secondary Treatment and Facilities Project (TMK: [1] 9-1- 013:007) (Yucha et al. 2015). A surface survey of the approximately 100-acre parcel was conducted. The OR&L was observed bordering the north side of the property. Only modern wastewater infrastructure and modern agricultural structures were observed. No historic properties were identified within the project area and no further archeological work was recommended.

1.26 Mooney and Cleghorn 2017

In 2017, Pacific Legacy Inc. conducted an AMR for sewage system upgrades at Varona Village (TMK: [1] 9-1-17:069) (Mooney and Cleghorn 2017). The project was located within the ‘Ewa Villages District (SIHP # -9786). Varona Village consists of approximately 45 plantation-era houses with associated outbuildings and garden areas. Twenty-eight septic systems were

installed. Several historic artifacts such as glass bottles and bottle fragments, rusted metal machine or automotive parts, and residential building materials were observed within disturbed contexts or fill sediments. Also observed, were a few sinkholes, however, no traditional Hawaiian features or artifacts were encountered within them. Various historic and modern faunal remains were also observed.

1.27 Martel and Hammatt 2018

In 2018, CSH conducted an archaeological literature review and field inspection for the Kualakaʻi Parkway (formerly the North-South Rd.) 16-Inch R-1 Transmission Main Project (TMKs: [1] 9-1- 017:096 Kualakaʻi Parkway ROW, Farrington Highway ROW, and [1] 9-1-018:008) (Martel and Hammatt 2018). The project area was divided into Components 1 and 2, with Component 1 extending mauka (inland) of Farrington Highway and Component 2 makai (seaward). Within Component 1, remnants of plantation-era infrastructure (SIHP # 50-80-12-4664, previously identified by Runyon et al. 2011) were found, including newly identified plantation irrigation features. No historic properties were observed within the Component 2 portion. The study noted that newly identified portions of SIHP # -4664 that would be impacted, were not fully documented and had not reached their information potential. The study recommended consultation with the SHPD to determine the future course of action.

Archaeological Field Inspection

Fieldwork for this project was conducted on April 11, 2019 by Frederick LaChance, B.A and Radha Martin B.A. under the general supervision of Rosanna Thurman, M.A. (principal investigator). Fieldwork required approximately 8 person-hours to complete. Fieldwork for this project was performed under the archaeological permit number 19-22, issued to Honua Consulting by the SHPD/DLNR in accordance with HAR Chapter 13-282.

1.28 Methodology

The archaeological field inspection consisted of a 100% pedestrian inspection of the project area. The pedestrian survey consisted of walking a northeast/southwest transect along both sides of Renton Road (Figure 16). A visual inspection of the ground surface and soil exposures was conducted in order to identify potential surface architecture remnants, artifacts, and/or exposed cultural deposits. A hand-held Garmin GPSmap 62 device was used to record survey tracks. The Garmin maintained an accuracy ranging between 3-7 meters (9.8-23 ft). The project area is located along the Renton Road corridor which is level and paved, providing excellent ground visibility.

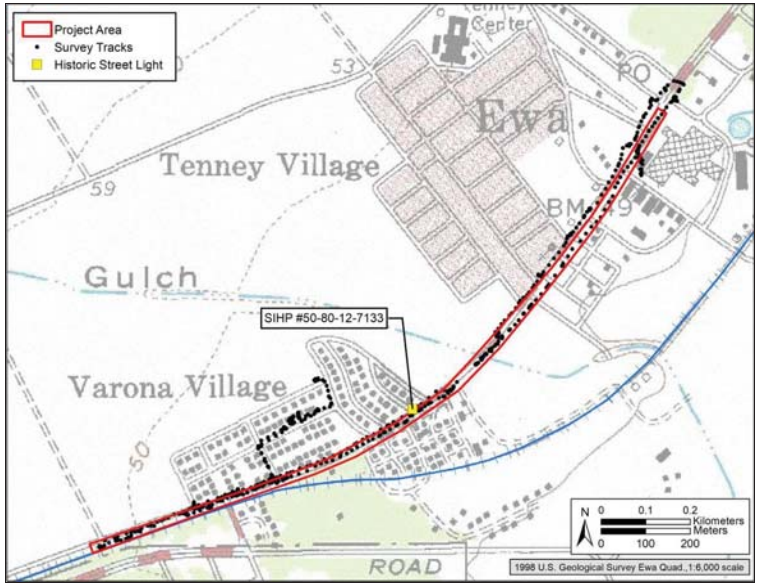

Figure 16. Portion of a 1998 ʻEwa USGS showing survey tracks, the location of a historic streetlight (SIHP # -7133), and proposed project waterline alignments

1.29 Pedestrian Survey Results

The pedestrian survey for this study covered both sides of Renton Rd. Adjacent to Renton Rd in the southern portion of the project area, the area was dominated by the historic plantation-era Varona Village (part of the ‘Ewa Sugar Plantation Villages, SIHP #50-80-12-9786 [State Register site]) and infrastructure associated with the OR&L to the south (OR&L ROW, SIHP # -9714, NR #75000621) (Figure 17 and Figure 18). Additionally, a historic streetlight within Varona Village (Figure 19) was observed on the north side of Renton Rd and was previously designated as SIHP # -7133 by Mooney and Cleghorn (2010) (Figure 20). The central portion of the project area included the Renton Road/Kapolei Parkway intersection (Figure 21) and the modernized Renton Road Bridge (Figure 22). Adjacent to Renton Rd in the northern portion of the project area, were residences of the historic plantation-era Tenney Village and ‘Ewa Mahiko Park to the east (Figure 23). Figure 24 shows the historic AMFAC Agribusiness building located within ‘Ewa Mahiko Park. The survey found that the entire project area has been heavily modified by historic and modern development with no evidence of pre-Contact land use remaining on the surface. No surface artifacts were observed and no new historic properties were identified during this survey. Historic properties located adjacent to the project area will be avoided and should not be affected by the proposed waterline project.

1.29.1 Historic Properties Observed During the Pedestrian Survey

The current project area is situated within the ‘Ewa Plantation Village Historic District (SIHP # -9786), which was placed on the State Register in 1995 (only residential district in Hawai‘i). The district was determined eligible under criteria a (associated with events significant to Hawai‘i’s history) and c (embodies distinctive characteristics of a type, period, or method of construction) (Moy 1995:3). Many of the homes in the district are considered architecturally significant, representing sugar plantation-era construction and design. The historic district encompasses all but the most western extent of the project area. Therefore, several historic properties in the immediate vicinity, particularly directly north of the project area, are part of the ‘Ewa Plantation Historic District (SIHP # -9786). These historic properties comprise residences and structures of Varona and Tenney Villages. Photo-documentation of several additional previously-identified sites within Varona Village are included in this study due to their inclusion in the ‘Ewa Plantation Historic District (SIHP # -9786) and close proximity to the project area (Appendix A, Figure 26 and Figure 27).

Historic properties related to the OR&L were also observed during this study due to their close proximity adjacent to the south extent of the project area. Sites include the OR&L ROW (SIHP # -9714, NR #75000621) and HRS ‘Ewa Railroad Yard (SIHP # -7387) (Appendix A, Figure 28. Photo of the OR&L ROW and Hawaiian Railway Society’s (HRS) ‘Ewa Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387), view to east). Within the railroad yard are several train cars that are listed on the State and National Registers, including the OR&L rolling stock (SIHP # -9761) and Waialua Agricultural Company locomotive #6 (“WaCo 6”, SIHP # -9708, NR #74000719). None of the OR&L historic properties will be affected by the current project.

Figure 17. Photo showing the western extent of the project area adjacent to OR&L infrastructure (OR&L ROW, SIHP #50-80-12-9714, NR #75000621) (on left), view to southwest

Figure 18. Photo showing the project area (to the left), the OR&L ROW (center) (SIHP # -9714, NR #75000621), and the HRS ‘Ewa Railroad Yard (right) (SIHP #50-80-12-7387), view to southwest

Figure 19. Photo showing the Varona Village bus stop area, located adjacent to the western portion of the project area, view to southeast

Figure 20. Photo showing SIHP #50-80-12-7133 (streetlight) adjacent to north side of Renton Rd, view to northeast

Figure 21. Photo showing the intersection of Renton Rd and Kapolei Parkway, located within the central portion of the project area, view to northeast

Figure 22. Photo showing the Renton Road Bridge, located near the central portion of the project area, view to the northeast

Figure 23. Photo showing ‘Ewa Mahiko Park, located adjacent to the eastern extent of the project area, view to east

Figure 24. Photo showing the AMFAC Agribusiness building, located in ‘Ewa Mahiko Park, view to south

Summary

This Literature Review and Field Inspection is for the Ewa Villages R-1 Water Main project located in Honouliuli Ahupuaʻa, ‘Ewa District, Island of Oʻahu TMK’S: [1] 9-1-017:103, 112, and 113, and 9-1-016:142. The Area of Potential Effect (APE) is the same as the project area and is owned by the City and County of Honolulu. The proposed project extends along Renton Road from the Ka Makana Aliʻi mall to ‘Ewa Mahiko Park. The proposed project includes 4,225 LF of open trenching installation including a 12-inch recycled water main providing water to the Ewa Villages area, which currently receives water from the Ewa Villages Golf Course irrigation pond.

Early historical accounts and Hawaiian legends of Honouliuli Ahupuaʻa indicate wide-spread pre-Contact habitation of the region, including Hawaiian aliʻi occupation. Marine resources were plentiful, irrigated lowlands were suitable for wetland taro cultivation, and forest resources were found along the lower mountain slopes. No LCAs were found within the project area. Historic background research revealed that the entire project area was heavily modified by sugarcane cultivation and residential development.

The project area extends through the ‘Ewa Sugar Plantation Villages Historic District (SIHP # -9786), listed on the State Register. Several previous archaeological studies have been conducted within the historic district with only surface findings of plantation-era houses, foundations, and structures, no significant sub-surface findings have been recorded (Hammatt et al. 1990, Mooney and Cleghorn 2010, Mooney and Cleghorn 2017). Adjacent to the project area, a historic street light (SIHP # -7133) was documented along the north side of Renton Rd (Mooney and Cleghorn 2010). Additionally, the OR&L ROW (SIHP # -9714, NR #75000621) and HRS ‘Ewa Railroad Yard (SIHP # -7387) are located adjacent to a southern portion of the project area. Table 3 lists all State and National Register sites within, adjacent, and within close proximity of the project area. Figure 25 shows the project area, location of the historic streetlight (SIHP # -7133), and State and National Register sites within and adjacent to the project area. This study finds that the proposed project will not affect the integrity of any of the identified significant historic properties located within, adjacent, or near to the project area.

The pedestrian survey for this study did not discover any new historic properties and no significant cultural materials were identified within the project area. It is very likely that any pre-contact (pre-1778 AD), traditional Hawaiian surface features and/or subsurface cultural deposits that may have existed in the area at one time were destroyed by historic modifications conducted throughout the vicinity.

The conducted archaeological investigation is not an archaeological inventory survey (AIS), however, this report was intended to be written using standards outlined within HAR 13-276 for AIS studies and is intended to assist with historic preservation efforts for the proposed waterline project.

Table 3. Table Listing State and National Register sites Within, Adjacent, and Near to the Current Project Area, Eligibility Criteria, and Location

Site	Description	Eligibility[1] and Listing	Location
‘Ewa Sugar Plantation Villages Historic District (SIHP # 50-80-12-9786)	Tenney Village, Varona Village, and Renton Village	a and c (State Register)	Within the project area
Streetlight within Varona Village (SIHP #50-80-12-7133)	Varona Village street light	same as ‘Ewa Sugar Plantation Villages Historic District	Adjacent to north side of Renton Rd, within/adjacent to the project area
OR&L Right-of-Way (SIHP #50-80-12-9714, NR #75000621)	Railway track from Honouliuli to Nanakuli	A (State & National Register)	Adjacent to south side of project area
OR&L ROW and Hawaiian Railway Society’s (HRS) ‘Ewa Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387)	Research and conservation facility, operating depot, baseyard for significant train cars	a (State Register)	Adjacent to south side of project area
Railway Rolling Stock (SIHP #50-80-08-9761)	locomotive #6 (“Kailua”, built 1889), locomotive #12 (built 1912), and #64 Dillingham parlor car (built 1924)	a (State Register)	To south of project area, located within OR&L ROW and HRS ‘Ewa Railroad Yard (SIHP # -7387)
Waialua Agricultural Company locomotive #6 (“WaCo 6”, SIHP #50-80-08-9708, NR #74000719)	Waialua Agricultural Company locomotive #6	A and C (State & National Register)	To south of project, within OR&L ROW and HRS ‘Ewa Railroad Yard (SIHP # -7387)
‘Ewa Plain Battlefield (SIHP #50-80-12-5127, NR #16000273)	‘Ewa Mooring Mast Field, Marine Corps Air Station	A and D (State and National Register)	Approx. 230 feet to the south of the project area

[1] National Register criteria for evaluation includes integrity of location, design, setting, materials, workmanship, feeling, and association and: 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. State of Hawai‘i includes one additional significance criteria: e.) have an important value to the native Hawaiian people or to another ethnic group of that state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events, or oral accounts—these associations being important to the group’s history and cultural identity.

1.30 Recommendations

It is recommended that structures within the ‘Ewa Sugar Plantation Historic District (SIHP # -9786), including the historic streetlight (SIHP # -7133), and adjacent OR&L infrastructure be avoided during construction of the proposed waterline project. If these historic properties are avoided, as is proposed, then this study finds the project will have “no historic properties affected”.

It is further recommended that the proposed waterline project proceed under an archaeological monitoring program in accordance with HAR 13-279. The recommendation for monitoring is to record project stratigraphy and document any potentially significant surface artifacts and/or subsurface deposits and artifacts that may be encountered within the project area.

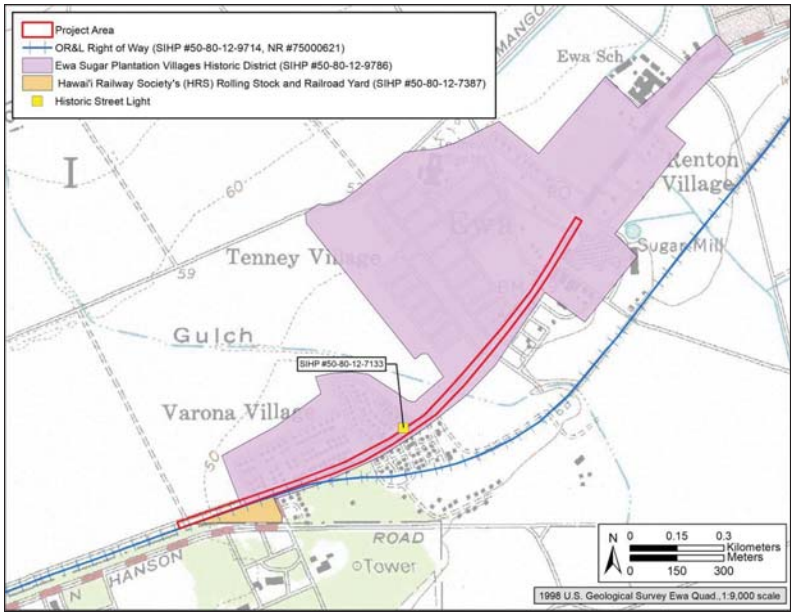

Figure 25. Portion of a 1998 ‘Ewa USGS showing the project area, historic streetlight (SIHP # -7133), and State and National Register sites within and adjacent to the project area

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Appendix A Additional Historic Properties Near the Current Project Area

Figure 26. Photo showing SIHP #50-80-12-7130 (plantation-era house, top) and SIHP #50-80-12-7129 (plantation-era house, bottom), views to northwest (top) and southeast (bottom) (within Varona Village, not adjacent to current project area)

Figure 27. Photo showing SIHP #50-80-12-7132 (plantation-era house foundation, top) and SIHP #50-80-12-7131 (plantation-era house foundation, bottom), views to northwest (top) and north (bottom) (within Varona Village, not adjacent to current project area)

Figure 28. Photo of the OR&L ROW and Hawaiian Railway Society's (HRS) 'Ewa Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387), view to east

APPENDIX D

Cultural Impact Assessment
Prepared by Honua Consulting, Inc.

Cultural Impact Assessment Report for ʻEwa Villages R-1 Water Main Replacement
Honouliuli Ahupuaʻa, ʻEwa District, Oʻahu Island
TMKs: [1] 9-1-016:142, [1] 9-1-017:111, [1] 9-1-017:112, [1] 9-1-017:113, [1] 9-1-017:103, [1] 9-1-095:163, [1] 9-1-097:103, and [1] 9-1-126:110

Prepared for

HHF PLANNERS
places for people

Prepared by

HONUA CONSULTING

August 2019

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Note on Hawaiian language usage

In keeping with other Hawaiian scholars, we do not italicize Hawaiian words. Hawaiian is both the native language of the pae ʻāina of Hawaiʻi and an official language of the State of Hawaiʻi. Some authors will leave Hawaiian words italicized if part of a quote; we do not. In the narrative, we use diacritical markings to assist our readers, except in direct quotes, in which we keep the markings used in the original text. We provide translations contextually when appropriate.

Front Cover Credit

State Historic Preservation Division.
n.d. Historic Photo of ʻEwa Villages on Renton Road, SHPD Survey of Ewa Villages. Available online at: https://dlnr.hawaii.gov/shpd/slider/shpd-survey-of-ewa-villages/

Acknowledgements

The authors would like to express their deepest gratitude to the interviewees who participated in this assessment. Mahalo nui to Kumu Hula Mikiala Lidstone and Hoakalei Cultural Foundation Executive Director Ku'uwainani Eaton, both of whom took time to share their mana'o on the project area, surrounding areas, and thoughts on the project itself. Their knowledge and experience provided invaluable guidance in the development of this assessment.

Executive Summary

At the request of HHF Planners, Honua Consulting is preparing a Cultural Impact Assessment (CIA) of the proposed installation of a 12-inch (reduced 8-inch at 'Ewa Mahiko Park past the blow-off area) R-1 (recycled) water main along Renton Road to support an Environmental Assessment (EA) being completed for the City and County of Honolulu Department of Facility Maintenance (DFM). The Honouliuli Water Recycling Facility (HWRF) produces R-1 and R-O (reverse osmosis) quality recycled water, providing approximately 10 million gallons of R-1 water for golf courses, parks and landscaping needs within the 'Ewa and Kapolei area as well as approximately 2 million gallons of R-O water for industrial purposes each day. The 'Ewa Villages area, which currently receives water from the 'Ewa Villages Golf Course irrigation pond, will be provided R-1 water directly from the Honolulu Board of Water Supply (HBWS) system with this proposed project. HHF Planners is seeking to minimize environmental and cultural impacts by carefully inventorying the natural and cultural environment and avoiding any significant archaeological sites, cultural resources, and sensitive species.

Research in preparation of this report consisted of a thorough search of Hawaiian language documents including, but not limited to, the Bishop Museum mele index and Bishop Museum archival documents, such as the Hawaiian language archival caché. All Hawaiian language documents were reviewed by Hawaiian language experts for relevant information that could be included in the report. Documents considered relevant to this analysis are included herein and translations are provided when appropriate to the discussion. Summaries of interviews and information on other oral testimonies are also provided.

Based on the information gathered and the assessment of the resources conducted, the project is not anticipated to have any adverse impact on cultural resoures, traditions, customs, or practices.

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Abbreviations and Acronyms

A.B.C.F.M.: American Board of Christian Foreign Missions
AIS: Archaeological Inventory Survey
AMR: Archaeological Monitoring Report
AMSL: Above Mean Sea Level
APE: Area of Potential Effect
BMP: Best Management Practice
CIA: Cultural Impact Assessment
DFM: City and County of Honolulu Department of Facility Maintenance
EA: Environmental Assessment
Fd: Fill Land
HAR: Hawaii Administrative Rules
HBWS: Honolulu Board of Water Supply
HRS: Hawaii Revised Statutes
HWRF: Honouliuli Water Recycling Facility
HxA: Honouliuli Clay
LF: Linear Feet
MnC: Mamala Stony Silty Clay Loam
OR&L: O'ahu Railway & Land Company
PVC: Polyvinyl Chloride
R-1: Recycled
R-O: Reverse Osmosis
ROI: Range of Influence
ROW: Right of Way
SIHP: State Inventory of Historic Places
SLH: Session Laws of Hawai'i
TMK: Tax Map Key
USGS: United States Geological Survey
WkA: Waialua Silty Clay

I. Project Description

At the request of HHF Planners, Honua Consulting is preparing a Cultural Impact Assessment (CIA) of the proposed installation of a 12-inch (reduced 8-inch at 'Ewa Mahiko Park past the blow-off area) R-1 water main along Renton Road to support an Environmental Assessment (EA) being completed for the City and County of Honolulu Department of Facility Maintenance (DFM). The Honouliuli Water Recycling Facility (HWRF) produces R-1 and R-O (reverse osmosis) quality recycled water, providing approximately 10 million gallons of R-1 water for golf courses, parks and landscaping needs within the 'Ewa and Kapolei area as well as approximately 2 million gallons of R-O water for industrial purposes each day. The 'Ewa Villages area, which currently receives R-1 water from the 'Ewa Villages Golf Course irrigation pond, will be provided with R-1 water directly from the Honolulu Board of Water Supply (HBWS) system with this proposed project.

This project includes installation of 4,225 linear feet (LF) of 12-inch Polyvinyl Chloride (PVC) recycled water main along Renton Road from Ka Makana Ali'i to Park Row (Figure 1). This new water main will connect to the existing 16-inch PVC R-1 West water main near Ka Makana Ali'i north of the O'ahu Railway & Land Company (OR&L) tracks and right-of-way (ROW) (Figure 2). The new main will initially be installed along an open unpaved area directly adjacent to the rail tracks, continuing parallel along Renton Road. The recycled water main will then cross Kapolei Parkway under the existing Renton Road bridge, connecting to the existing line at the intersection of Renton Road and Park Row within TMK [1] 9-1-097:103. This proposed water main will cross a concrete drainage culvert near the intersection of Kapolei Parkway and Renton Road (Figure 3). The area of potential effect (APE) includes the 4,225 LF of open trenching, extending from Ka Makana Ali'i to Park Row, and is owned by the City and County of Honolulu.

Two possible staging areas are on undeveloped land along Renton Road: one is southeast of Leialoalo Street and Paionia Street within TMK [1] 9-1-126:014, and the second is approximately 600 feet northeast of the proposed Park Row point of connection, directly south of Renton Place within TMK [1] 9-1-126:018.

The properties surrounding the project area are mostly residential or open land. The City Land Use Ordinance has zoned the land parcels as R-5, Residential District and AG-1, Restricted Agriculture District. The project area also has a US FEMA Flood Designation D, undetermined flood hazard, and Designation X, area of minimal flood hazard. The project area is within the parcels located at TMKs: [1] 9-1-016:142, [1] 9-1-017:111, [1] 9-1-017:112, [1] 9-1-017:113, [1] 9-1-017:103, [1] 9-1-095:163, [1] 9-1-097:103, and [1] 9-1-126:110.

Figure 1. Aerial photo showing the location of the project area (USGS Orthoimagery, 2011)

Figure 2. Connection to Existing 16-inch R-1 Water Main (Credit: HBWS)

Figure 3. Aerial view of possible blow-off location (Credit: HBWS)

There have been numerous archaeological studies within a 1-1.5 mile radius of the current project area. Table 1 provides information that may identify possible historic sites within the project area prior to and during the construction of the waterline, while Figure 4 displays the previously documented sites within and in the vicinity of the project area.

Table 1. Previous Archaeological Studies in the Vicinity of the Project Area

Author(s)	Type of Study	Location	Findings
McAllister, 1933	Reconnaissance	Island-Wide	‘Ewa Coral Plain (Site 146) (not in Figure 4)
Hammatt and Shideler, 1990	Archaeological Inventory Survey (AIS)	West Loch Bluffs (approx. 5,700 ft / 1 mile north of project area)	5 sites documented, 3 pipe features (SIHP #50-80-12-4344, Features A-C), a stone-faced railroad berm (SIHP #50-80-12-4345), northern pumping station (SIHP #50-80-12-4346), central pumping station (SIHP #50-80-12-4347), and southern pumping station (SIHP #50-80-12-4348)
Hammatt et al., 1990	Reconnaissance Survey	‘Ewa Villages (**within project area**)	Identified features of ‘Ewa Sugar Plantation Villages (SIHP #50-80-12-9786) including Renton Village and mill, Tenney Village, Varona Village, remnants of Mill Village, remnants of Middle Village, remnants of C Village, a plantation cemetery, Reservoir #1, the ‘Ewa Depot, a Buddhist temple, and the ‘Ewa Japanese School

Author(s)	Type of Study	Location	Findings
Moy, 1995	National Register of Historic Places Registration Form	‘Ewa Villages **(within project area)**	‘Ewa Sugar Plantation Villages (SIHP #50-80-12-9786), public district consisting of 287 contributing resources including 285 domestic and agricultural buildings, 1 processing site, and 1 commercial complex used by plantation workers from 1890 to 1957
Spear, 1996	Reconnaissance Survey and Assessment	H.F.D.C-East Kapolei Development Project (approx. 200 ft / 0.04 miles west of project area)	No historic properties documented
Hammatt and Chiogioji, 1997	Reconnaissance Survey	North-South Rd. (approx. 600 ft / 0.1 miles northwest of the project area)	No historic properties documented
O’Hare et al., 2006	AIS	East Kapolei Development Project (approx. 3,000 ft / 0.57 miles northwest of project area)	Five sites previously identified by Hammatt et al. (1990) re-assessed, plantation infrastructure (SIHP #50-80-12-4344, Features A-G), a stone-faced railroad berm (SIHP #50-80-12-4345), northern pumping station (SIHP #50-80-12-4346), central pumping station (SIHP #50-80-12-4347), and southern pumping station (SIHP #50-80-12-4348) were revisited and documented
O’Hare et al., 2007; Souza et al., 2007	Archaeological Assessment; CIA	‘Ewa Industrial Park (approx. 200 ft / 0.04 miles south of project area)	No historic properties documented

Author(s)	Type of Study	Location	Findings
Mooney and Cleghorn, 2008	Archaeological Assessment	Two parcel development between Fort Weaver Rd. and Old Fort Weaver Road (approx. 6,500 ft / 1.2 miles northeast of project area)	No historic properties documented
Hammatt, 2010	AIS	Honolulu High-Capacity Transit Corridor Project (approx. 5,000 ft / 0.9 miles north of project area)	Sub-surface lo'i deposit (SIHP #50-80-09-7751) documented near the Waipahu Transit Center
Mooney and Cleghorn, 2010	AIS	Varona Village (adjacent to north side of project area)	Five newly-identified structures of 'Ewa Sugar Plantation Villages (SIHP # -9786), including historic plantation houses (SIHP #50-80-12-7129 and -7130), a house foundation (SIHP #50-80-12-7131 and -7132), and a historic streetlight (SIHP #50-80-12-7133)
Runyon et al., 2010	Archaeological Monitoring Report (AMR)	North-South Rd., Phase IB (approx. 1,500 ft / 0.3 miles north of project area)	No historic properties documented
Mooney and Cleghorn, 2011	Archaeological Assessment	Ka Makana Ali'i (approx. 250 ft / 0.05 miles to west of project area)	No historic properties documented

Author(s)	Type of Study	Location	Findings
Runyon et al., 2011	AMR	North-South Road, Phase IC (approx. 11,100 ft / 2.1 miles north of project area)	Burnt trash fill layer (SIHP #50-80-12-7128) with plantation-era artifacts and a previously documented concrete plantation-era water diversion structure containing two sluice gates (SIHP #50-80-14-4664)
Rewick, 2012	National Register of Historic Places Registration Form	Hawaiian Railway Society (adjacent to south side of project area)	OR&L ROW and Hawaiian Railway Society's (HRS) 'Ewa Railroad Yard (OR&L Railroad Baseyard) (SIHP #50-80-12-7387)
Johnson, 2013; Frye and Resnick, 2013	Reconnaissance and Geophysical Survey; State and National Register Nomination	Marine Corps Air Station ('Ewa Field) (230 ft / 0.04 miles to south of project area)	'Ewa Plain Battlefield (SIHP #50-80-12-5127, NR #16000273) finding foundation of an armory, officers' barracks, and storage building, over 500 ft of charred but intact OR&L railway ties without rails, a swimming pool and adjacent pavement, a subsurface fuel tank, and a subsurface latrine
Shideler and Hammatt, 2014	Archaeological Literature Review and Field Inspection	'Ewa Elementary School (560 ft / 0.1 miles northeast of project area)	'Ewa Villages Historic District (SIHP #50-80-12-9786)
Stark et al., 2015	Archaeological Survey and Assessment	'Ewa Elementary School (840 ft / 0.16 miles north of project area)	'Ewa Villages Historic District (SIHP #50-80-12-9786)
Yucha et al., 2015	Archaeological Assessment	Honouliuli Wastewater Treatment Plant (approx. 200 ft / 0.04 miles south of project area)	No historic properties documented

Author(s)	Type of Study	Location	Findings
Mooney and Cleghorn, 2017	AMR	Varona Village (adjacent to north side of project area)	45 plantation-era houses of Varona Village, part of the 'Ewa Villages Historic District (SIHP # -9786), several historic artifacts such as glass bottles, bottle fragments, rusted metal machine or automotive parts, and residential building materials were observed in disturbed contexts and fill sediments
Martel and Hammatt, 2018	Archaeological Lit Review and Field Inspection	Kualaka'i Parkway (formerly North-South Rd) (approx. 1,500 ft/ 0.3 miles north of project area)	Remnants of plantation-era infrastructure (SIHP #50-80-12-4664) previously observed within northwest portion of project area (Runyon et al., 2011)

Honua Consulting is also conducting an Archaeological Literature Review and Field Inspection for this project to determine the land-use history of the project area and to identify any potential artifacts, architecture, or cultural deposits present on the ground surface of the property. The report prepared in conjuction with this study provides in-depth analysis of past archaeological studies, while this CIA provides the summary of these studies. The archaeological field inspection consisted of a 100% pedestrian survey of accessible portions of the project area and APE with visual inspection of the ground surface, cut-banks and soil exposures for surface architecutre, artifacts and cultural deposits. This pedestrian survey showed that the entire APE has been heavily modified by historic and modern development with no evidence of pre-Contact land use remaining on the surface; no new historic properties nor significant cultural materials were identified within the APE.

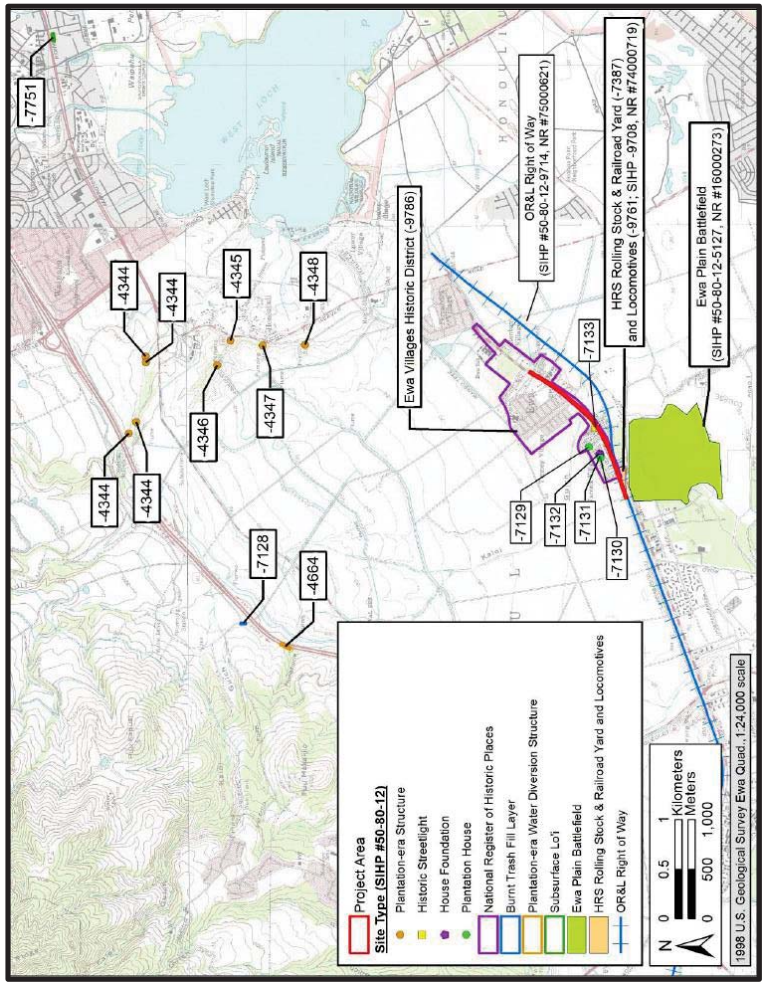

Figure 4. Previously documented sites adjacent to and within the vicinity of the project area (USGS, 1998)

II. Need for a Cultural Impact Assessment

A. Regulatory Background

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to protect and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups. To assist decision makers in the protection of cultural resources, Chapter 343, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HAR) § 11-200 rules for the environmental impact assessment process require project proponents to assess proposed actions for their potential impacts to cultural properties, practices, and beliefs.

This process was clarified by the Act 50, Session Laws of Hawai'i (SLH) 2000. Act 50 recognized the importance of protecting Native Hawaiian cultural resources and required that Environmental Impact Statements include the disclosure of the effects of a proposed action on the cultural practices of the community and state, and the Native Hawaiian community in particular. Specifically, the Environmental Council suggested the CIAs should include information relating to practices and beliefs of a particular cultural or ethnic group or groups. Such information may be obtained through public scoping, community meetings, ethnographic interviews, and oral histories.

It is also important to note that while similar in their areas of studies, archaeological surveys and CIAs are concerned with distinct and different foci. Archaeological studies are primarily concerned with historic properties and tangible heritage, whereas cultural impact assessments look at cultural practices and beliefs, which can be associated with a specific location, but also often intangible in nature.

B. Compliance

The State and its agencies have an obligation to preserve and protect Native Hawaiians'

customarily and traditionally exercised rights to the extent feasible.[1] State law further recognizes that the cultural landscapes provide living and valuable cultural resources where Native Hawaiians have and continue to exercise traditional and customary practices, including hunting, fishing, gathering, and religious practices. In *Ka Pa'akai*, the Hawai'i Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. This is accomplished through:

1) The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.
2) The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and
3) The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

The CIA was prepared under HRS Chapter 343 and Act 50 HSL 2000. The appropriate information concerning Honouliuli ahupua'a has been collected, focusing on areas near or adjacent to the project area. A thorough analysis of this project and potential impacts to cultural resources, historical resources, and archaeological sites is included in this assessment.

The present analyses of archival documents, oral traditions (chants, mele (songs), and/or hula), and Hawaiian language sources including books, manuscripts, and newspaper articles, are focused on identifying recorded cultural and archaeological resources present on the landscape, including: Hawaiian and non-Hawaiian place names; landscape features (ridges, gulches, cinder cones); archaeological features (kuleana parcel walls, house platforms,

[1] Article XII, Section 7 of the Hawai'i State Constitution, Ka Pa'akai O Ka 'Āina v. Land Use Commission, 94 Haw. 31 [2000](Ka Pa'akai), Act 50 HSL 2000.

shrines, heiau (places of worship), etc.); culturally significant areas (viewsheds, unmodified areas where gathering practices and/or rituals were performed); and significant biocultural resources. The information gathered through research helped to focus interview questions on specific features and elements within the project area.

Interviews with lineal and cultural descendants are instrumental in procuring information about the project area's transformation through time and changing uses. Interviews were conducted with recognized cultural experts and summaries of those interviews are included herein.

The EA for which this CIA was written in support will provide an overview of cultural and historic resources in the project area using thorough literature review, community and cultural practitioner consultation, and high-level, project-specific surveys. The EA will focus on identifying areas in which disturbance should be avoided or minimized to reduce impacts to historic properties or culturally important features. The paramount goal is to prevent impacts through avoidance of sensitive areas and mitigating for impacts only if avoidance is not possible.

Environmental factors potentially influencing the distribution of historic properties will also be evaluated in the EA. The resulting data will be analyzed to develop a general settlement pattern model for the area that helps estimate the likely types and distribution of historic properties. The potential significance and required treatment of expected historic properties will also be summarized. The goal of this work is to develop recommendations to assist with future infrastructure planning that minimizes adverse effects upon historic properties.

The Range of Influence (ROI) for impacts to cultural resources and historic properties includes the project area and localized surroundings. This CIA also reviews some of the resources primarily covered by the EA and Archaeological Literature Review and Field Inspection. It primarily researches and reviews the range of biocultural resources identified through historical documents, traditional knowledge, information found in the Hawaiian

language historical caché, and oral histories and knowledge collected from experts and cultural practitioners and experts.

C. Methodology

The approach to developing the CIA is as follows:

I. Gather Best Information Available

   A. Gather historic cultural information from stories and other oral histories about the affected area to provide cultural foundation for the report;
   B. Inventory as much information as can be identified about as many known cultural, historic, and natural resources, including previous archaeological inventory surveys, CIAs, etc. that may have been completed for the possible range of areas; and
   C. Update the information with interviews with cultural or lineal descendants or other knowledgeable cultural practitioners.

II. Identify Potential Impacts to Cultural Resources

III. Develop Reasonable Mitigation Measures to Reduce Potential Impacts

   A. Involve the community and cultural experts in developing culturally appropriate mitigation measures; and
   B. Develop specific Best Management Practices (BMPs), if any are required, for conducting the project in a culturally appropriate and/or sensitive manner as to mitigate and/or reduce any impacts to cultural practices and/or resources.

In ancient times, named localities served a variety of functions, telling people about: (1) places where the gods walked the earth and changed the lives of people for good or worse; (2) heiau or other features of ceremonial importance; (3) triangulation points such as ko'a (ceremonial markers) for fishing grounds and fishing sites; (4) residences and burial sites; (5) areas of planting; (6) water sources; (7) trails and trail side resting places (o'io'ina), such as a rock shelter or tree shaded spot; (8) the sources of particular natural

resources/resource collections areas, or any number of other features; or (9) notable events which occurred at a given area. Through place names, knowledge of the past and places of significance were handed down across countless generations.

The 58 place names that follow below are a sampling of nearly 200 named localities that stand out as being significant indicators of cultural attachment for locations in Honouliuli ahupuaʻa (Table 2). Most of the names were identified—and their origins rooted—in ancient traditions; others were recorded through historical accounts such as in claims of the Māhele ʻĀina (Land Division) of 1848 or in other descriptions of land and land use.

Table 2. Selected Place Names of Honouliuli Ahupuaʻa

Inoa ʻĀina	Description
ʻAihonu	A named locality. Cited with project area claims of the Māhele.
Haʻalelenui	A land area. Cited with project area claims of the Māhele.
Haleʻauʻau	An upland region between Puʻukuʻua and Kānehoa. Cited in the tradition of Hiʻiaka-i-ka-poli-o-Pele.
Hanakāhi (Lae o Halakāhi)	Puʻuloa/Honouliuli. Site named for a man who resided at this place, and who called upon the unknown gods, making offerings and asking for their blessings in his livelihood as a fisherman. Kāne and Kanaloa heard his prayers and visited him, granting his request because of his faithfulness to them. They built fishponds at Keanapuaʻa, Kepoʻokala, and at Kapākule for him. Kapākule, near the shores of Keahi, was the best formed of the ponds and fed Hanakāhi's family and later generations of ʻEwa residents for hundreds of years (*Ka Loea Kalaiaina*, 1899). The fishery boundary of Hanakāhi (Halakāhi) was disputed with Hālawa.
Hilo-one	A coastal area famed in mele from the tradition of Hiʻiaka-i-ka-poli-o-Pele.

Inoa ʻĀina	Description
Hoakalei	A coastal spring famed in mele from the tradition of Hiʻiaka-i-ka-poli-o-Pele.
Honouliuli	Ahupuaʻa. In one tradition, Honouliuli is named for a chief of the same name, who was the husband of Kapālama. They were the parents of Lepeamoa and Kauilani, two heroes in ancient tradition. Numerous claims cited in the Māhele, though the awarded claims were generally in the "taro lands" section of Honouliuli (see Register Map No. 630) in a watered area shoreward of the proposed rail alignment corridor. In traditional times, the land area known as Puʻuloa was an ʻili of Honouliuli, though it was sold as a separate land during the time of the Māhele. All native tenant claims made for kuleana at Puʻuloa were given up by the claimants. "Large terrace areas are shown on the U.S. Geological survey map of Oahu (1917) bordering West Loch of Pearl Harbor, the indication being that these are still under cultivation. I am told that taro is still grown here. This is evidently what is referred to as ʻEwa taro lands.' Of the Honouliuli coral plains McAllister (44, site 146) says: '...It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them'" (Handy, 1940:82).
Hopenui	A land area. Cited with project area claims of the Māhele.
Kahāhāpū	A named locality. Cited in project area claims of the Māhele.

Inoa ʻĀina	Description
Kaihuopalaʻai	An ʻili and fishery. Cited in claims of the Māhele. This place was famed in ancient times for its ʻanae (mullet). Kaʻulu and ʻApokaʻa (a husband and wife; also named localities) were the parents of two human children and two supernatural children, Kaihuopalaʻai (a son) and Kaihukuʻuna (a daughter). When Kaihuopalaʻai matured, he married Kaʻōhai. To Kaihuopalaʻai and Kaʻōhai were born Pūhi Lo Laumeki (a son) and Kapapapūhi (a daughter). Their story is told in the traditions of Ka ʻAnae o Kaihuopalaʻai and Makanikeʻoe.
Kalaeokāne	An area disputed between the people of Honouliuli and Waikele. Site of the ancient village, Kupaliʻi (Boundary Commission testimonies). The name translates as "The point of Kāne," and may be suggested to be associated with the tradition of a visit by the gods Kāne and Kanaloa to the region. Cited in the tradition of Maihea.
Kaloʻi	Kaloʻi (Kaloi) is a traditional name used at several areas in Honouliuli Ahupuaʻa that are all connected by a series of gulches from the uplands near the 2,200 foot elevation to the shore. Following the ethno-historical record, the names Kaloʻi, Kaloʻi iki, Kaloʻi liʻiliʻi and Kaloʻi loa follow from the uplands to the taro land region of Honouliuli, with the latter names being cited in L.C.A. Helu 901, 1570, and 1713.
Kamalua	A land area. Cited with project area claims of the Māhele.
Kamaʻomaʻo	Honouliuli (see also Nāwahineokamaʻomaʻo). An area on the kula lands within view of Puʻu o Kapolei, and associated with Kaupeʻa. Named for a supernatural woman who dwelt in the area. The flat land plains of wandering spirits (also see Kaupeʻa). Cited in the tradition of Hiʻiaka-i-ka-poli-Pele and in historical narratives.

Inoa ʻĀina	Description
Kamoʻoiki	An ʻili. Cited with project area claims of the Māhele.
Kānehili	Honouliuli/Puʻuloa. An open kula land, noted in tradition for its association with Kaupeʻa and as a place of wandering spirits. An inhospitable zone. Cited in the tradition of Hiʻiaka-i-ka-poli-o-Pele and in historical narratives.
Kānehoa	A mountain pass, famed in traditional lore and mele. Noted for its growth of kupukupu ferns, and the wind, Waikōloa, which blows from the mountains to the sea. Cited in the traditions of Hiʻiaka-i-ka-poli-o-Pele and in historical narratives.
Kaʻolina (Koʻolina)	An ancient village site on the western shore, between Lae Loa and Pili o Kahe. Cited in the tradition of Hiʻiaka-i-ka-poli-o-Pele and historical narratives.
Kapākule	Puʻuloa-Honouliuli. A fishpond/fish trap on the inner shore of Puʻuloa (across from Hālawa), made by the gods Kāne and Kanaloa for the benefit of Hanakāhi, who faithfully worshipped them. Cited in the tradition of Maihea.
Kapapapūhi (Kapapaapūhi)	Honouliuli-Hōʻaeʻae boundary zone. A small point on the shore between these two ahupuaʻa. Also the name of a fishery for Honouliuli. Kapapaapūhi was named for the daughter of Kaihuopalaʻai and Kaʻōhai, whose history is told in the traditions of Makanikeʻoe and Pūhi o Laumeki.
Kaʻulu	Hōʻaeʻae-Honouliuli boundary zone. An ancient village site, known as "Coneyville" in historic times–named for John H. Coney, who was married to Ami, sister of Amoe Haʻaleleʻa, from who he purchased the ahupuaʻa of Honouliuli (Boundary Commission testimonies, 1873). Reportedly named for the chief, Ka-ʻulu-hua-i-ka-hāpapa (Pukui et al., 1974:93).

Inoa ʻĀina	Description
Kaupeʻa	An area noted as the wandering place of the spirits of the dead, who are seeking their way to another realm. An uninhabited plain with wiliwili (*Erythrina*) trees and ʻōhai (*Sesbania tomentosa*) plants, and associated with Kānehili and Leiolono. From Kaupeʻa one may see Leiolono where unclaimed spirits are lost on never ending darkness.
Keahi	Puʻuloa-Honouliuli. An ancient village site named for a beautiful woman who once lived there. For a time, Kamapuaʻa also lived at Keahi. In the tradition of Kaihuopalaʻai, Keahi and Mokuoʻeō (an island in the sea fronting Moanalua) were named as companions (*Ka Loea Kalaiaina*, 1899; claims of the Māhele).
Keahumoa	Kula on the inland slopes of ʻEwa, within which is found Kunia, and continuing up to Līhuʻe on one side; bounded by Kīpapa on the other side. The area was once extensively cultivated with native crops, planted originally by Kaʻōpele. The fields could be seen when looking makai from the mountain pass at Pōhākea. Cited in the traditions of Hiʻiaka-i-ka-poli-o-Pele and Kalelealuakā. There is also situated at Keahumoa, two famous māla ʻuala (sweet potato fields) which bear the name, Nāmakaokapāoʻo. Pūaliʻi was killed here, later a king of Oʻahu and his warriors were also killed here. Cited in the tradition, "Kaao no Namakaokapaoo" (1918).
Keoneae	A place situated along the old trail between Honouliuli and Waiʻanae, on the Puʻuloa side of Puʻuokapolei.
Kohepalaoa	Puʻuloa-Honouliuli. An ʻili and fishpond. Cited in claims of the Māhele and in historic narratives of Puʻuloa.

Inoa ʻĀina	Description
Kuaiʻōpelu	An ʻili. Cited with project area claims of the Māhele.
Kualakaʻi	An ancient village site situated on the western shore. Cited in native traditions and claims of the Māhele.
Kumuhau	An ʻili. Cited with project area claims of the Māhele.
Kumumamo	Honouliuli coastal plains. Cited in historical mele.
Kunia	An upland ʻili. Part of the larger Keahumoa plains and site of a battle in the time of Kūaliʻi.
Kupaka	A former village site in the ʻili of Puʻuloa, situated on the ocean fronting shore of Honouliuli, west of Keahi, and marked on historical maps with a stone wall complex. Cited in historical accounts and oral history interviews.
Kupaliʻi	A village site at Kaleokāne. The area disputed between the people of Honouliuli and Waikele; "…in assessing the ancient tax, putting houses on the line so as to evade both…" (Honouliuli Boundary Commission testimonies, 1873).
Lae o Kahuka	Puʻuloa-Honouliuli. A point marked by a large pile of stones along the inner shore of Ke awa lau o Puʻuloa.
Laeloa (Kalaeloa)	A low point of land now known as "Barber's Point." Cited in several traditions and historical accounts.
Līhuʻe	An upland plain and lower mountain region. Waikōloa is a strong wind of Līhuʻe that blows from the uplands to the lowlands (cited in Nakuina, 1901). Mauʻunēnē is a light breeze that blows down the slopes of Līhuʻe to the lowlands of ʻEwa (*Ka Loea Kalaiaina*, 1899).
Manawaiʻelelu	Honouliuli, Hōʻaeʻae and Waikele boundary junction zone. A gulch near Poliwai and site of an ancient hōlua track (Boundary Commission testimonies).

Inoa ʻĀina	Description
Mokumeha	Named for a son of Kaihuopalaʻai and Kaʻōhai, the brother of Laumeki. Cited in the tradition of Pūhi o Laumeki. Cited in claims of the Māhele.
Moʻokapu	Honouliuli-Waikele boundary zone. An ancient path which leads into Waiʻanae uka (Boundary Commission testimonies, 1873).
Nāmakaokapāoʻo	An area of māla ʻuala situated on the plain of Keahumoa, a short distance below Kīpapa. Named for a youth who once lived nearby. Cited in the tradition, "Kaao no Namakaokapaoo" (1918).
Nāwahineokamaʻomaʻo	Honouliuli (see also Kamaʻomaʻo). An area on the kula lands named for a companion of Puʻu o Kapolei. Cited in the tradition of Hiʻiaka-i-ka-poli-o-Pele.
Pālāʻau	An ʻili. Cited with project area claims of the Māhele.
Papio	An area in the bay fronting Honouliuli where the chiefess of the same name was killed in an act of anger by the shark-goddess, Kaʻahupāhau. Koihala, Kaʻahupāhau's human attendant, was insulted by Papio and asked that she be killed. The site is also referred to as "Kanahunaopapio." The coral body form of Kaʻahupāhau is also found near this site (*Home Rula Repubalika*, Mar. 15, 1902).
Pau-kuʻu-loa "Aole i pau kuʻu loa"	Waikele-Honouliuli. A near shore land and fishery (below Hōʻaeʻae), fronting Ulemoku (Boundary Commission testimonies, 1873). The source of naming this place is found in the tradition of Puʻukuʻua (*Ka Loea Kalaiaina*, 1899).

Inoa ʻĀina	Description
Peʻekāua	Situated on the plain between Puʻuokapolei and Waimānalo. A place famed in the tradition of Hiʻiaka's journey across ʻEwa. Peʻekaua is found on the mauka side of the trail, where there is a large rock standing on the plain. Cited in the tradition of Hiʻiaka-i-ka-poli-o-Pele.
Piliokahe	The boundary marker between Honouliuli, ʻEwa, and Nānākuli of the Waiʻanae District. The boundary was made during the journey of Kāne and Kanaloa across ʻEwa. During their game of ulu-maika, the boundaries were set by where the stone stopped rolling. Cited in traditions and historical accounts.
Pōhākea	A famed mountain pass over which an ancient trail between Honouliuli and Waiʻanae crossed. Noted in several native traditions for its commanding view plane to the lowlands and noted places of the ʻEwa District. One branch of the trail to Pōhākea passed near Puʻuokapolei. Cited in the traditions of Kāne, Kanaloa and Hiʻiaka-i-ka-poli-o-Pele.
Pōhaku Mokomoko	A stone on the shore marking the boundary between Honouliuli and Hōʻaeʻae, situated along the side of the government road (Boundary Commission testimonies, 1875).
Pōhakupalahalaha	A "well known rock along the trail" between Honouliuli and Hōʻaeʻae (Boundary Commission testimonies, 1873).
Poʻohilo	An ʻili. Named from events following a battle in the Kīpapa-Waikakalaua region, in ca. 1400s, in which the head of Hilo (an invading chief) was placed on a stake at this site and displayed. A named locality cited in project area claims of the Māhele.

Inoa ʻĀina	Description
Poupouwela	An ʻili, a stream and spring site. One of the loʻi kalo lands of Honouliuli. Cited in historical land records.
Puʻukuʻua	A hill of the inland region of Honouliuli. A place where chiefs once lived and a battle field. It is said that the place named "Pau kuʻu loa" originated from a practice of the people here at Puʻukuʻua. Kāne and Kanaloa, tired of working, set aside their work here to return to Kahiki (*Ka Loea Kalaiaina*, 1899).
Puʻuloa	This land was traditionally an ʻili of Honouliuli and marked the entrance to Ke awa lau o Puʻuloa (The many bays of Puʻuloa – Pearl Harbor, Pearl River or Wai Momi). The waters of Puʻuloa were protected by the shark goddess Kaʻahupāhau, her brother, Kahiʻukā, and the little shark god Ka-ʻehu-iki-manō-o-Puʻuloa.
Puʻu-o-Kapo-lei	This hill was named for the goddess Kapo, an elder sister of Pele. It was also the home of the supernatural grandmother of the demigod, Kamapuaʻa (Kahiolo, 1861); a storied hill on the plains of Honouliuli (*Ka Loea Kalaiaina*, 1899). S.M. Kamakau recorded the tradition that Puʻu o Kapolei was used by the people of Oʻahu to mark the seasons of the year. When the sun set over the hill, it was Kau (summer). When the sun moved south, setting beyond the hill, it was Hoʻoilo (winter) (Kamakau, 1976:14). The old government road passed behind this puʻu. Puʻukuʻua is viewed further inland from this hill. The plains around this region were covered with sugarcane by the late 1890s. A heiau once situated on this hill and a rock shelter were destroyed in the early 1900s (McAllister, 1933:108, Site 138).

Inoa ʻĀina	Description
Puʻu Pālailai	A hill situated north west of Puʻu o Kapolei. Pālailai is cited in mele recorded in the tradition of Hiʻiaka-i-ka-poli-o-Pele.
Waimānalo	An ʻili. This is one of the "wai" (watered lands) granted to priests of the Lono class, by the demigod, Kamapuaʻa. During the time of Kākuhihewa (King of Oʻahu, ca. 1500s), Waimānalo was home of a priest named Nāpuaikamaʻo. It was this priest who traveled to Koʻolina, where Kākuhihewa was waiting and foretold that Kalelealuakā would gain victory in the battles being brought to Oʻahu's shores. Cited in claims of the Māhele.
Waipōuli	A cave situated about five miles below Nāmakaokapāoʻo and the Keahumoa plain. The place where the head of Pūaliʻi was thrown after he was killed. The cave was used for a time as a shelter to hide Pōkaʻī, mother of Nāmakaokapāoʻo. Cited in the tradition "Kaao no Namakaokapaoo" (1918).
Wanue	An area near the Kapapapūhi region of the Honouliuli shore line, named for a relative of Kaihuopalaʻai (cited in Manu, 1895).

III. Description of Project Area

The project area is located in the ahupuaʻa of Honouliui within the moku of ʻEwa. In one tradition, Honouliuli is named for a chief of the same name, who was the husband of Kapālama. They were the parents of Lepeamoa and Kauilani, two heroes in ancient tradition (Westervelt, 1915). In traditional times, the land area known as Puʻuloa was an ʻili of Honouliuli, though it was sold as a separate land during the time of the Māhele. All native tenant claims made for kuleana at Puʻuloa were given up by the claimants.

A. Ahupuaʻa of Honouliuli: Boundary Commission Description

Following the Māhele ʻĀina, there was a growing movement to fence off the land areas and control access to resources that native tenants had traditionally used. In the 1860s, foreign land owners and business interests petitioned the Crown to have the boundaries of their respective lands, which became the foundation for plantation and ranching interests, settled. In 1862, the King appointed a Commission of Boundaries (the Boundary Commission) and tasked them with collecting traditional knowledge of place, land boundaries, customary practices, and deciding the most equitable boundaries for each ahupuaʻa that had been awarded to Aliʻi, Konohiki, and foreigners during the Māhele.

The commission proceedings were conducted under the courts and as formal actions under law. As the commissioners on the various islands undertook their work, the kingdom hired or contracted surveyors to begin the surveys. In 1874, the commissioners were authorized to certify the boundaries for lands brought before them (Alexander, 1891:117-118).

Records from the ʻEwa District were recorded between 1868 and 1904, with the proceeding from Honouliuli being held between 1873 and 1874. The records include testimonies of elder kamaʻāina who were either recipients of kuleana in the Māhele or were the direct descendants of the original fee-simple title holders. The narratives that follow include several types of documentation such as the preliminary requests for establishing the boundaries, letters from the surveyors in the field, excerpts from surveyor's field books

(Register Books), the record of testimonies given by native residents of the lands, and the entire record of the Commission in certifying the boundaries of each ahupuaʻa. The resulting documentation offers descriptions of the land extending from ocean fisheries to the mountain peaks, traditional and customary practices, land use, changes in the landscape witnessed over the informants' lifetime, and various cultural features.

The native witnesses usually spoke in Hawaiian; in some instances, their testimony was translated into English and transcribed as the proceedings occurred. Other testimonies were transcribed in Hawaiian but have now been translated for inclusion in this study.

The Boundary Commission proceedings documented many traditional place names and features along the boundaries of the ahupuaʻa, with locations extending from the sea (including fishponds and fisheries) to the mountain peaks. These names demonstrate Hawaiian familiarity with the resources, topography, sites and features of the entire ahupuaʻa. Coulter observed that Hawaiians had place names for all manner of feature, ranging from "outstanding cliffs" to what he described as "trivial land marks" (1931:10). History tells us that named locations were significant in past times: "Names would not have been given to [or remembered if they were] mere worthless pieces of topography" (Handy et al., 1972:412).

In ancient times, named localities signified that a variety of uses and functions occurred, including:

(1) Triangulation points such as koʻa (land markers for fishing grounds and specific offshore fishing localities);
(2) Residences; areas of planting;
(3) Water sources;
(4) Trails and trail-side resting places (oʻioʻina), such as a rock shelter or tree shaded spot;
(5) Heiau or other features of ceremonial importance;
(6) May have been the source of a particular natural resource or any number of

other features; or

(7) The names may record a particular event or practice (e.g., use for burials, the making of koʻi or adzes, or designation as a fishery) that occurred in a given area.

Place names called out by witnesses before the commissioners have been compiled and are cited below. A number of the place names remain in use on maps or among some residents, while others are no longer in use. Of particular note are several place names and their associated narratives which document wahi pana (storied or sacred places) on the traditional landscape. The place names cited in the Honouliuli Boundary Proceedings include:

Apokaa	Keahi Pouhala	Mookapu
Auiole Manawahua	Koolina	Nanakuli
Ekahanui Gulch	Kualakai	Panau
Hanohano	Kupalii	Papapuhi (Kapapapuhi)
Homaikaia	Lae o Halakahi	Pili o Kahe (Pili o Kahi)
Hoaeae	Lae o Kahuka	Pohaku Palahalaha
Kahakai	Laeloa	Pookela
Kahapapa	Laeokane (Kalaeokane)	Puu Kuua
Kalanimua	Lihue	Puuloa
Kapuna	Manawaielelu	Waieli (Kawaieli)
Kauela (Keoneula)	Mauna Kapu	Waikakalaua
Kaulu (Coneyville)	Miki	Waimanalo

B. Physical Environment

ʻEwa moku consists of 12 ahupuaʻa, listed from easternmost to westernmost: Hālawa, ʻAiea, Kalauao, Waimalu, Waiau, Waimano, Mānana (Iki and Uka), Waiʻawa, Waipiʻo, Waikele, Hōʻaeʻae, and Honouliuli (Figure 5). The project area was observed to be predominantly comprised of introduced grasses and trees during the pedestrian survey as a result of

residential landscaping; the proposed project will have no impact on endangered or native species.

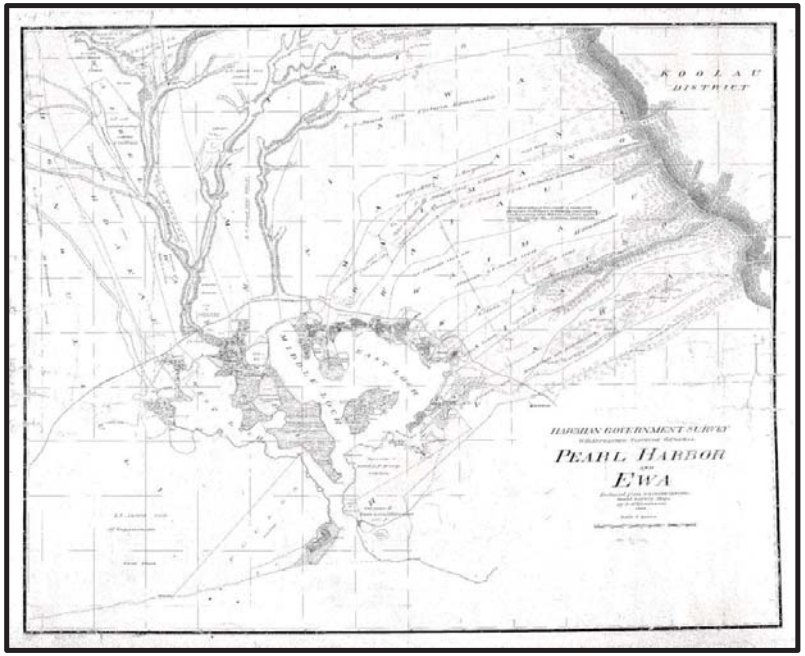

Figure 5. Map of Ahupuaʻa in the ʻEwa Moku (Hawaiian Government Survey, Registered Map No. 1739 by S.M. Kanakanui, 1894)

The APE ranges from approximately 40 to 55 feet (12.1 to 16.8 meters) above mean sea level (AMSL) and extends approximately 2 miles north (3,219 meters) from the southern Oʻahu coast. The annual high temperature is 84°F (28.9°C) and the annual low temperature is 67.6°F (19.8°C), with an average temperature of 75.8°F (24.3°C) (U.S. Climate Data, 2019). Annual precipitation is low at 17.91 inches (454.9 mm) compared to the state average of 63.7 inches (1,618 mm), with prevailing winds from the northeast at annual average speeds of 15

mph (U.S. Climate Data, 2019).

Soils within, and in proximinty to, the project area include Fill Land (Fd), Honouliuli Clay (HxA), 0 to 2% slopes, Mamala Stony Silty Clay Loam (MnC), 0 to 12% slopes, and Waialua Silty Clay (WkA), 0 to 3% slopes (Foote et al., 1972; Figure 6). The soils within the project area are associated with irrigated sugarcane cultivation and have been highly impacted by historic and modern activites.

The soils in the southern portion of the project area is largely comprised of MnC. The Mamala soil series consist of shallow, well-drained soils along the coastal plains which formed from alluvium deposited over coral limestone and consolidated calcareous sand (Foote et al., 1972:93). This soil type has moderate permeability, very slow to medium runoff, and slight to moderate erosion hazard. The Mamala soil series is primarily used for sugarcane, truck crops, orchards, and pasture; natural vegetation includes kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), bristly foxtail (*Setaria parviflora*), and swollen fingergrass (*Chloris barbata*).

The soils in the northern portion of the project area is largely comprised of HxA. The Honouliuli series consists of deep, well-drained soils on coastal plains which formed in alluvium weathered from basic igneous rocks (Foote et al., 1972:43). The soil type has moderately slow permeability, slow runoff, and no more than slight erosion hazard. The Honouliuli soil series is primarily used for sugarcane, truck crops, orchards, and pasture; natural vegetation includes kiawe, koa haole, fingergrass (*Digitaria* sp.), bristly foxtail, and bermudagrass (*Cynodon dactylon*).

The built environment in the vicinity of the APE includes the O'ahu Railway base yard near the southwestern portion of the APE, a plantation-era residential area with previously documented historic properties (houses, foundations, and a lamp post) immediately northeast of the base yard, Kapolei Parkway and Renton Road Bridge in the central portion of the APE, 'Ewa Mahiko Park in the eastern portion of the APE, and 'Ewa Villages subdivision in the northeast.

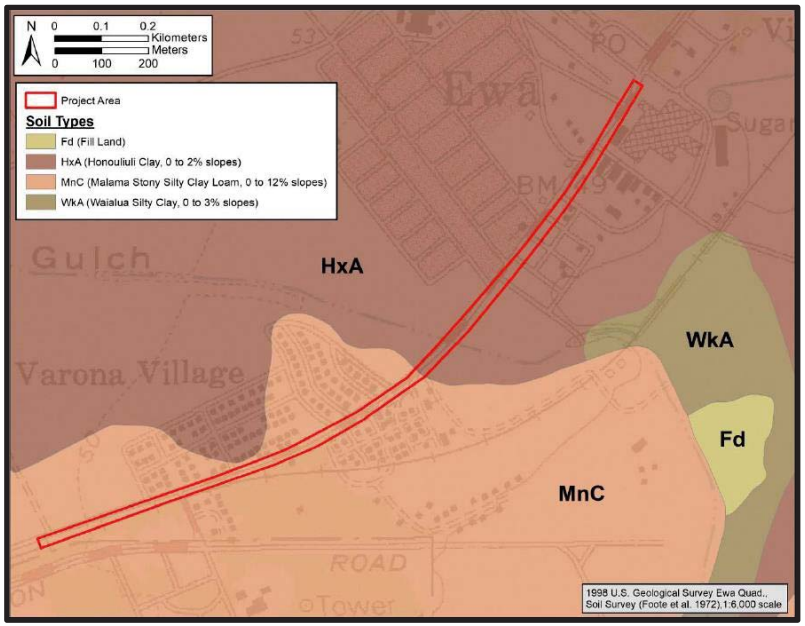

Figure 6. Portion of a 1998 'Ewa USGS Topographic Quadrangle Map with Soil Series Overlay showing anticipated soils within the Project Area and APE (Foote et al., 1972)

C. Biocultural Environment

To employ the Hawaiian landscape perspective and emphasize the symbiosis of natural and cultural resources, Honua Consulting uses the term 'biocultural' to refer to natural and cultural resources, with additional sub-classifications by attributes.

Honua Consulting employs three broad terms that are both well-defined and flexible enough to be used to place traditional cultural areas/properties, naturally occurring non-modified features, archaeological features, and other areas of cultural significance within a specific

spatial-temporal framework. Hawaiian epistemology categorizes ecological regions much like non-indigenous science categorizes different ecosystems in biomes. Hawaiian ecological regions are referred to as wao (realms). While numerous wao exist, focus is placed on the wao most important to this assessment:

> **Wao kānaka**: the region, usually from coast to inland plain (exclusive of inland forests), characterized by permanent human occupation, active resource management, and resource modification. This is observable through the presence of archaeological features indicating permanent occupation, including large concentrations of house lot complexes, religious complexes, and fishponds.
>
> **Wao kele**: the inland forest region, including rain-belt forests, characterized by large-scale subsistence systems, active resource management, and resource modification. This is observable through the presence of agriculture-related archaeological features, fewer heiau than the wao kānaka region, and smaller concentrations of house lots.
>
> **Wao akua**: the distant realm inhabited by the gods and demigods, this area was kapu and the general populous only entered the realm with reverence. Wao akua can include the mountains, mountain tops, and ridges of entire islands and/or regions where clouds settle upon the land (thus at varying elevational zones depending on district and region).

A brief further discussion of environmental zones and traditional Hawaiian land management practices is necessary to understand the tangible and intangible aspects of the Hawaiian landscape. Additionally, it is important to point out once again that in the Hawaiian landscape, all natural and cultural resources are interrelated and culturally significant. Natural unaltered landscape features such as rocky outcrops, cinder cones, intermittent streams, or an open plain can carry as much significance as a planted grove of wauke (*Broussonetia papyrifera*) or a boulder-lined ʻauwai (canal).

Maly presents a narrative of traditional Hawaiian land management strategies and the different environmental zones recorded in *Ka Hoku o Hawaii* (September 21, 1916):

> Hawaiian customs and practices demonstrate the belief that all portions of the land and environment are related, like members of an extended family, each environmental zone was named, and their individual attributes were known. Acknowledging the relationship of one environmental zone (wao) to another, is rooted in traditional land management practices and values. Just as place names tell us that areas are of cultural importance, the occurrence of a Hawaiian nomenclature for environmental zones also tells us that there was an intimate relationship between Hawaiians and their environment.
>
> The native tradition of Ka-Miki provides readers with a detailed account of Hawaiian land divisions and environmental zones. While competing in a riddling contest at the court of the chief, Palikū-a-Kīkoʻokoʻo, the hero, Ka-Miki sparred with Pīnaʻau, the foremost riddler of the district of Hilo Palikū (northern Hilo). The riddles covered topics describing regions from the mountain tips to the depths of the ocean, and descriptions of kalo (taro growth), the ala loa (trail systems), and nā mea lawaiʻa (fishing practices). As the contest unfolded, it was seen that each of the competitors were well matched. In one of the riddles, Ka-Miki described the various regions of the island of Hawaii, extending from the mountain to the sea. Ka-Miki then told his opponent, that if he could rise to the challenge of answering the riddle, his knowledge could be compared to one who has ascended to the summit of the "mauna o Paliahu" (mountain of Poliʻahu, or Mauna Kea) (in *Ka Hoku o Hawaii*, September 21, 1916).
>
> Through one of the riddles [the] reader learn[s] about the traditional wao or regions of land, districts, and land divisions of the administrators who kept peace upon the land. The environmental zones include:

> 1 – Ke kuahiwi; 2 – Ke kualono; 3 – Ke kaumauna; 4 – Ke ku(a)hea; 5 – Ke kaolo; 6 – Ka wao; 7 – Ka wau maʻu kele; 8 – Ka wao kele; 9 – Ka wao akua; 10 – Ka wao lāʻau; 11 – Ka wao kānaka; 12 – Ka ʻamaʻu; 13 – Ka ʻāpaʻa; 14 – Ka paheʻe; 15 – Ke kula; 16 – Ka ʻilima; 17 – Ka puʻeone; 18 – Ka poʻina nalu; 19 – Ke kai kohola; 20 – Ke kai ʻele; 21 – Ke kai uli; 22 – Ke kai pualena; 23 – Kai Pōpolohua-a-Kāne-i-Tahiti.
>
> 1 – The mountain; 2 – The region near the mountain top; 3 – The mountain top; 4 – The misty ridge; 5 – The trail ways; 6 – The inland regions; 7 and 8 – The rain belt regions; 9 – The distant area inhabited by gods; 10 – The forested region; 11 – The region of people below; 12 – The place of ʻamaʻu (fern upland agricultural zone); 13 – The arid plains; 14 – The place of wet land planting; 15 – The plain or open country; 16 – The place of ʻilima growth (a seaward, and generally arid section of the kula; 17 – The dunes; 18 – The place covered by waves (shoreline); 19 – The shallow sea (shoreline reef flats); 20 – The dark sea; 21 – The deep blue-green sea; 22 – The yellow (sun-reflecting sea on the horizon); and 23 – The deep purplish black sea of Kāne at Tahiti (Maly, 2001:3).

The large ʻEwa moku once encompassed both seaward and high interior plains, the Koʻolau mountain range's deep leeward valleys, and the coastal region of the Waiʻanae range, but this area has been since been diminished due to political redivisioning (Handy et al., 1972). Handy and Handy describe the climate and features of ʻEwa:

> The salient feature of ʻEwa…is its spacious coastal plain, surrounding the deep bays ("lochs") of Pearl Harbor, which are actually the drowned seaward valleys of ʻEwa's main streams, Waikele and Waipiʻo.
>
> …These bays offered the most favorable locality in all the Hawaiian Islands for the building of fishponds and fish traps into which deep-sea fish came on the inflow of tidal waters.

> The lowland, bisected by ample streams, were ideal terrain for the cultivation of irrigated taro. The hinterland consisted of deep valleys running far back into the Koʻolau range. Between the valleys were ridges, with steep sides, but a very gradual increase of altitude. The lower parts of the valley sides were excellent for the culture of yams and bananas. Farther inland grew the ʻawa for which the area was famous. The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the wao, or upland jungle, than was the case on the windward coast. Yet the wao here was more extensive, giving greater opportunity to forage for wild foods in famine time.
>
> The people needed this resource because ʻEwa, particularly its western part, got very little rain in the summer months when the trade winds dropped their moisture in the interior. Stream water for irrigation, however, was always abundant. In the summer, compared with the windward coast, ʻEwa was considerably hotter in the daytime, and warmer at night, often rather windless (1972: 469-470).

Based on the descriptions of ʻEwa's climate and the various wao in the Hawaiian landscape, it can be determined that the large ʻEwa moku is not contained to a singular wao. The general vicinity of the project area would be considered "ka paheʻe" (the place of wet land planting), "ke kula" (the plain or open country), and "ka ʻilima" (the place of ʻilima growth). The high volume of kalo cultivation in ʻEwa supports the "ka paheʻe" designation; ʻEwa was famously known for producing the rare and delicious kai variety of kalo, which was described as so delicious that "anyone who married a native of ʻEwa would come and settle there and would never leave" (Handy et al., 1972:471). The vast coastal plains surrounding the bays of Pearl Harbor support the "ke kula" designation.

As determined by the Botanical Assessment, there are ʻilima (*Sida fallax*) growing at the western portions of the project area (LeGrande, 2019). Locations of ʻilima growth are known as wao ʻilima, so it can be determined that the project area is in the wao "ka ʻilima." The wao

‘ilima is typically a seaward and arid section of the plain, which is the typical climate found in the ‘Ewa Villages and its immediate vicinity.

Honouliuli ahupuaʻa is associated with many moʻolelo (traditions and histories), as the following sections will illustrate. Honouliuli is especially affiliated with Pele, the volcano goddess and Kamapuaʻa (the pig man demigod). Hiʻiakaikapoliopele, Pele’s sister and the goddess of medicine in Pele’s family, was known to have used ‘ilima in some of her healings (Pukui, 1983:272); it is interesting to note that moʻolelo about Hiʻiaka are prevalent in Honouliuli ahupuaʻa, as will be demonstrated in the following section.

IV. Existing Resources

A. He Māhelehele o Nā Moʻolelo (Excerpts of Traditional Accounts)

The following narratives focus on some of the notable traditions and history of Honouliuli ahupuaʻa. In following the history of the land from the period of early Hawaiian residency to the modern day, accounts from neighboring ahupuaʻa, larger regions, and even cross-island are cited as they connect people, storied places, and land use beyond the boundaries of Honouliuli. In Hawaiian moʻolelo are found expressions of native beliefs, customs, practices and history. The Hawaiian landscape itself is storied; each place name is associated with a tradition ranging from the presence and interactions between gods and people, to documenting an event or characteristics of a given place. Unfortunately, today, many of those moʻolelo have been lost. Through the moʻolelo that have survived we are able to glimpse the history of the land and people of Honouliuli ahupuaʻa (Figure 7).

The narratives are generally organized chronologically by time period or events, such as when the gods walked the land, touching the lives of the people, or when chiefs engaged in conflicts on the land. It will be noted that in a number of instances, wahi pana were named in the traditions as a means of commemorating notable events in history. Underlining is used throughout the texts to identify notable place names or references in the quoted narratives as a means of highlighting history of place.

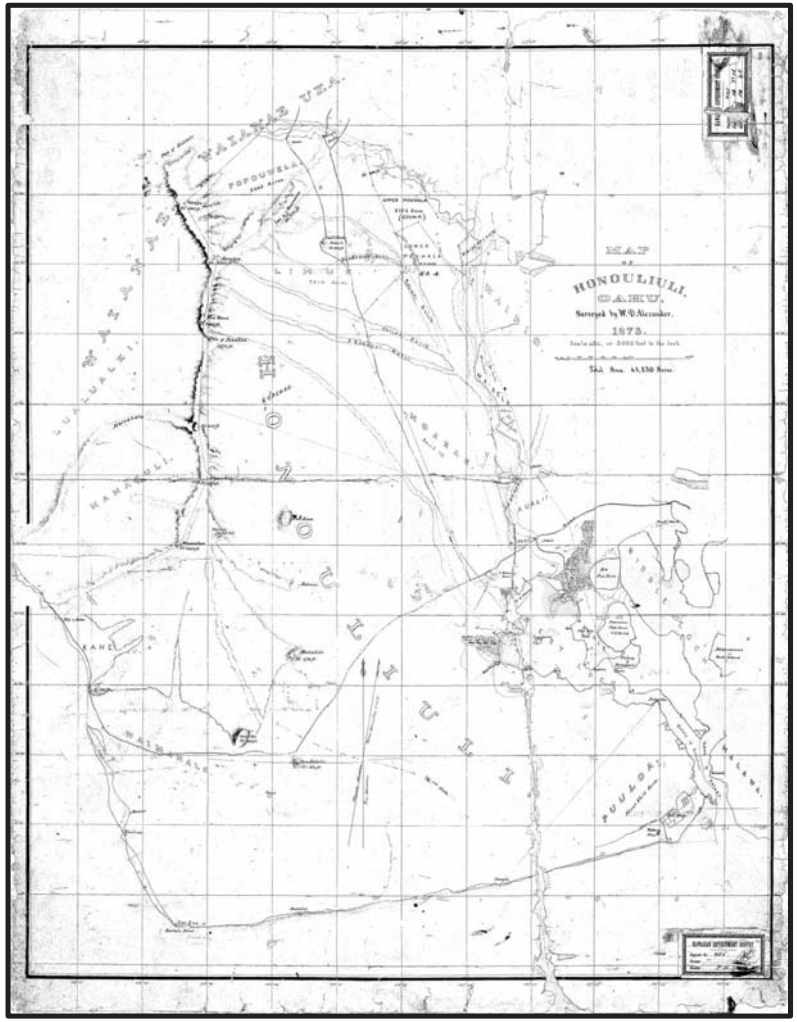

Figure 7. Map of Honouliuli (Hawaiian Government Survey, Registered Map No. 405 by W.D. Alexander, 1873)

1. He Wahi Kaao a me Kekahi Mele Pu (A Little Story and Some Chants) Traditions of Hiʻiaka-i-ka-poli-o-Pele

The epic tradition of the goddess Pele and her youngest sister, Hiʻiaka-i-ka-poli-o-Pele (Hiʻiaka), spans the entire Hawaiian Archipelago and beyond to Kahiki, the ancestral home of the gods. The tradition is the source of many descriptions of places, place names, beliefs, traditional knowledge and customary practices. As in the account below, "He Wahi Kaao a me kekahi Mele pu" (1860), portions of the tradition were also cited in excerpts to remind people of various facets of knowledge that was recorded in the larger account. Of particular interest in the narratives below are references to Hiʻiaka's travels on Oʻahu and descriptions of various places in the 'Ewa and Kona districts. There is also an important reference to the goddess "Kiha," a moʻo (water-spirit) whose mana (power) was called upon in the making of chiefs and whose form was a part of the circuit gods who traveled around the island in the Makahiki celebrations. The name Kiha is commemorated in the place name Ka-puka-o-Kiha in Kalauao Ahupuaʻa.

Ka Hae Hawaii

He wahi kaao a me kekahi mele pu.

Iulai 4, 1860 (aoao 60)

O Lohiau me Kaleiopaoa, he mau kanaka no Kauai, o Haena ko laua wahi noho; Ua launa kino wailua wale o Pele me Lohiau, ua ku a aloha loa o Pele ia Lohiau: no ka nui o kona makemake kenaʻku la oia ia Hiiaka e kii ia Lohiauipo i Haena a loaa. Eia ka laua Berita, "e kii oe ia Lohiau a loaa mai me oe a laa iaʻu, Oia ka aoao 1. Eia hoi ka ka aoao elua, e malama oe i kuu aikane ia Hopoe, a hoi mai au;" alaila, hele o Hiiaka i Kauai.

A hiki o Hiiaka me Wahineomao i Haena, ua make o Lohiau, lapaau oia a ola, hoi mai lakou a ekolu o Lohiau, me Wahineomao, a me Hiiaka, a hiki i Oahu, pae o Hiiaka mauka o Waianae, ma ka waa no o Lohiau a me Wahineomao, a hiki i Puuloa. Ia hele ana o Hiiaka mauka, a hiki oia maluna o Pohakea, i nanaʻku

ka hana ua make o Hopoe, e ami mai ana i ke kai, alaila hu mai la ke aloha o Hiiaka no ke aikane ana.

A hiki ma Puuloa, kau hou lakou ma ka waa, a hiki i Mamala, halawai me Peleula ma e heenalu ana, hoi lakou i uka i ka hale, hookipa maikai ia po, lealea lakou ia po, he Kilu ka hana ilaila i ike ai o Hiiaka i ka lea o Lohiau.

Haalele ia Honolulu, hiki lakou i Molokai, noho i ke kaha o Palaau, a make i ka make a ka pololi, lohe mai lakou he hale komo ko Olepau ke alii o Maui, manao aku hoi e ola ka pololi ilaila, i ua la nei i komo ai ka hale o Olepau hiki lakou a ekolu ilaila. I ka ike ana mai o Waihinalo ka wahine a Olepau, ua maopopo iaʻku kona ano, he ano pi.

Hoohuli ae la, oia ia Olepau iluna ke alo, hukihuki i ka umiumi. Alaila hapai ae la o Hiiaka i keia mele, a pane aku ia Waihinalo.

Mehameha kanaka ole ka hoi Puuomoeawa--e,
O Kaupea i ka aina kanaka ole,
A kulou anei e uwe ana—
E kala ka uwe he keiki makua ole.

(He mau mele kike ana keia wahi, aole nae i loaa iaʻu aka makemake nae o Olepau e ike ia lakou a ekolu aole nae e hiki.) Ua ninau mai o Hiiaka ia Waihinalo i ka wahine a Olepau, Ia wai Maui?

Hai mai o Waihinalo ia Olepau.
O Kalani keʻlii Kauhilonohonua,
O Kamakea kahiko a Kiha,
O Kiha nui lulu moku,
O Kaulahea nui o ka lani--e;
Ia Maui--a.

Hai mai o Hiiaka, ua makeia. Haha ae ka oe la! O olo ka pihe i ke aumoe, Owawa ka pihe i ke kakahiaka, o ka haka maia a Olepau, ua pau i ka ai ia e ka wahine. Ua make o Olepau, o Olepau Aloha.

Hoole mai o Waihinalo wahine a Kapoipoi, aole e make kuu alii ia oe, ke hai mai nei na kua wahine oia nei. O Walinuu ma laua o Walimaanoanoa, o Papa o Hoohokukalani, e hoole mai ana, aole e make.

Pane mai o Hiiaka i ka hua o ka make.
Ua make ke lii nona nei moku,
He puaa kau ko Molokai,---
He ilio kohekohe Lanai,
He pale ka aaka o Kahaloa,
He puoa kai Molokini,
Huli kaele o na Hono,
Paiauma wale na aina,
Oho ki kepakepa na moku,
Uwe ka wahine, uwe ka hanehane,
Uwe ka leoleo i ke kula, i ke pili la i Kamaomao,
Ia kaa kumakena ia o Maui--e;
Make Olepau, o Olepau aloha.

Pau na mele a laua i paio ai. Iloko o ka Hale komo o Olepau o Kapo, he hoahanau no Hiiaka. Ike oia aole hookipaia kona hoahanau; ku ae la oia a hoi i kona hale, hoolale oia ia Puanui kana kane i mea ai kahu i paha, o Luau. Ua makaukau ka hale o Kapo i na mea ai; (E hoi mai ana o Hiiaka ma a waena o ke Alanui; ua loohia ia o Olepau e ka mai, a aneane e pilikia; Hoounaia ke kanaka e kii ia Hiiaka, me ka puaa pu, hoolohe mai o Hiiaka e alala aku ana ka puaa, ia wa, ua hoaa loa ia ke kanaka me ka puaa, ua ninau ke kanaka ia Hiiaka, ua hoohokaia: pela ko laua loaa ole ana, a hiki lakou ma ka Hale o Kapo, ua makaukau, ua pau i ka ai; a hiki i ke aumoe make iho la o Olepau, nona ka mea i manaoia.)

B. Kalaiohauola. Wailua, Kauai, Iulai 4, 1860.

Summary — A Little Story and Some Chants

Hiʻiaka and her companion Wahineʻōmaʻo traveled to Hāʻena, Kauaʻi and returned Lohiʻauipo, Pele's mortal lover to life. Hiʻiaka, Wahineʻōmaʻo and Lohiʻau then departed from Kauaʻi on their journey to the island of Hawaiʻi where Lohiʻau would be reunited with Pele. Arriving at Waiʻanae, Hiʻiaka went overland, instructing Lohiʻau Wahineʻōmaʻo to continue by canoe, where she would later rejoin them at Puʻuloa.

Hiʻiaka walked inland and passed over the summit of Pōhākea, from where she looked to Hawaiʻi and saw her beloved friend, Hōpoe dancing on the shore. She then descended (across Honouliuli), and arrived at Puʻuloa where she boarded their canoe and traveled on to Māmala and then met with the chiefess Peleʻula (for whom the place in Honolulu is named). They then traveled by canoe on to Molokaʻi and then to Maui…

While on Maui, Hiʻiaka chanted a mele in which she described certain places where she had traveled. One of the lines returns to the plains of Honouliuli in which she said:

"O Kaupea i ka aina kanaka ole…"
(Kaupeʻa is a land without people…)

2. He Moolelo Kaao no Hiiakaikapoliopele…
(A Hawaiian Tradition of Hiʻiaka who is Held in the Bosom of Pele…)

Between 1860 and 1928, several important Hawaiian language publications provided variations in telling of the Pele and Hiʻiaka epic tradition. The narratives cited below were published in the Hawaiian newspaper *Ka Hoku o Hawaii* from September 18, 1924 to July 17, 1928 through the partnership of Julia Keonaona, Steven L. Desha Sr., Isaac Kihe, and others. They artfully retold this tradition, embellishing it with descriptions of places and events in

history, thus bringing the knowledge of place forward to later generations.

The following excerpts offer important details pertaining to wahi pana, traditional and customary practices and the naming of places visited by Hiʻiaka as she traveled into and across lands of the Honouliuli ahupuaʻa.

Ka Hoku o Hawaii
He Moolelo Kaao no Hiiakaikapoliopele…

January 18, 1927 (page 1)

Seeing the beauty of Kaʻala, Hiʻiaka chanted:

Beloved is the dew of Kaʻala,
That dew which bears the fragrance of the nene grasses,
[fragrant dew which] Kissed the natives of Puʻuloa,
One searches far for love...

January 25, 1927 (page 1)

…As Hiʻiaka and her companions prepared to depart from Pōkaʻī, she told Lohiʻau and Wahineʻōmaʻo, that they would travel by canoe, while she would travel for a while over land. They would meet again at Kou [Honolulu], and she instructed them "As you travel, you will arrive at a place where a point juts out into the sea. That will be Laeloa [Barbers Point]; do not land there. Continue your journey forward, and as you continue your journey, you will see a place where the ocean lies calmly within the land. That will be ʻEwa; do not land there. Continue your journey and you will reach a place where the mouth [of the land] opens to the sea (hamama ana ka waha i ke kai). That is Puʻuloa, do not land there either. That is the entry way to ʻEwa… The travelers then parted and began their journeys.

February 8, 1927 (page 1)

Hiʻiaka continued to the uplands along the trail which passes through Waiʻanae. Now the trail upon which Hiʻiaka chose to travel, is the trail which passes through the heights of Pōhākea. Hiʻiaka passed along the kula of Māʻili, and then turned to look at the uplands. She saw the dazzling light of the sun on the uplands of Lualualei and Hiʻiaka chanted:

The sun is hot!
The sun is hot!
The heat of the sun is on the plain of Lualualei
The sun chews it up entirely…

Hiʻiaka then continued her ascent on the trail in the stifling heat of the sun, and she chanted:

The path is at Waikonene,
Ascending at Kamoaʻula,
The heat of the sun is upon the breast,
ʻĪlio is born upon the back of Pūhāmaloʻo,
The nāulu winds rage,
Breaking the stream, but the breast of Pūhāwai is quiet,
The kaiaulu breeze seems to fight and rebel against the people,
Striking and causing the noses to rage,
The mucus flows freely,
In the hot sun of Lualualei.

From the heights of Pōhākea, Hiʻiaka looked to the shores of ʻEwa, where she saw a group of women making their way to the sea. The women were going down to gather pāpaʻi [crabs] and limu [seaweeds], and to gather the mahamoe, ʻōkupe [both edible bivalves], and such things as could be obtained

along the shore of that land. Hiʻiaka then began to chant about those ladies:

The Kehau breeze is there below Waiʻōpua,
Bearing the fragrance of the kupukupu ferns across the plain,
The coolness is laid upon the grasses,
A coolness laid upon the sea of ʻEwa,
ʻEwa is made cold [unfriendly]
because of the fish which hushes voices,
Be silent in that breeze.

Hiʻiaka saw the women moving ahead to the shoreline, just like the cold Waikoloa wind that blew from the uplands of this place. And this was why Hiʻiaka had chanted to them. Hiʻiaka then turned towards the canoe on which her companion and the man [Lohiʻau] were traveling. They were paddling and were no longer talking, for Hiʻiaka had admonished them, warning—

ʻEwa is made cold because of the fish
that hushes voices,
Be silent!

Now, the famous fish of ʻEwa in those days when the wind blew because of conversations, was the pipi [pearl oyster]. Only when it was very calm could one go to catch the pipi. If anyone spoke while going to get the pipi, the breeze would cause rippling on the water's surface, and the pipi would be hidden from sight.[2] In this way, Hiʻiaka had instructed Wahineʻōmaʻo and Lohiʻau to be quiet like the women of ʻEwa who were going fishing. If one spoke, the angry winds would blow and bring misfortune...

[2] It was believed that talking would cause a breeze to blow that would, in turn, frighten the pipi (see Pukui, 1983).

February 15, 1927 (page 1)

...Turning her gaze towards the island of Hawai'i, she could see the flames of Pele in the lehua forest of Hōpoe, and she chanted out—

Beautiful is Pālailai, sacred assembly of the woman,
I set up the drum of the sacred voice,
The voice of the ocean is what I hear,
The natives hear it
[The stormy ocean of Waialua, could reportedly by heard in 'Ewa],
The birds drink the water caught in the noni leaves,
The billowy clouds pass in the calm,
The fires of Hawai'i rise above me…

…Hi'iaka then departed Pōhākea, descending to the plain of Keahumoa [in the uplands between Waipi'o and Honouliuli]. It was at this place that she saw several women gathering the blossoms of the ma'o [*Gossypium tomentosum*, an endemic yellow-flowered hibiscus that grows on the dry land plains] with which to string garlands for themselves. She then saw them sit down and begin to string and complete the garlands for themselves, so that they could adorn their necks. These women adorned themselves in the mao garlands and were really quite beautiful. Hi'iaka then felt her own neck, for she was without a lei. Hi'iaka then thought about what to say to the women regarding the garlands with which they had adorned themselves. She then thought within herself, I am going to ask them for a lei that they had been burdened with making. If they have aloha for me, then there is no kindness which they shall not have, but if they deny me, so it will be. Hi'iaka then offered a chant to the women who had strung their garlands upon the plain which is burned by the sun.

The plain of Keahumoa wears the ma'o blossoms as its lei
Adorning the women who string garlands in the wild

It is like the lehua blossoms of Hōpoe
Lehua blossoms upon which the sun beats down
On the nodding koai'a flowers of the cliff
On the rooftops of the houses at 'Āpuku
Rising in the presence of the cliff of Pu'uku'ua
The land is indeed a chief
Man is indeed a slave
I am indeed a slave to aloha—love
It is love which invites us two—come
I come–

Then one of the women answered her in a kindly manner, "Wait stranger, before you go on your way, here is your lei." It is true what you have said, "He kauwa ke kanaka na ke aloha, a na ke aloha no e kono, ao ka naue holookoa no ia o ke kino." (Man is a slave of love or compassion, and it is aloha which beckons to us and moves us to come forth). The woman then moved forward and placed her lei upon Hi'iaka, and the other women did the same as well. The women then saw the true beauty of Hi'iaka and they urged her to join them for a meal at their home on the shore of 'Ewa.

Hi'iaka then spoke to them, "I am not hungry, for your kindness has satisfied me. Here are the words which I share with you—In your dwelling, if one of you should meet with trouble, or if one of the people for whom you have aloha is in need, offer the chant which I offered to you, asking without shame for garlands that you had made. The chant is a prayer for the passing of troubles from you or your loved ones. Now come and kiss me, and I will depart from this long open plain."

The women stepped forward to kiss Hi'iaka, and as they rubbed noses each one of them remembered the chant which Hi'iaka offered when she asked for their garlands of ma'o. Thus this chant became a prayer for those women in

their days of trouble. Hiʻiaka then departed from those women who strung garlands of maʻo on the plain and traveled towards the shore of ʻEwa, towards Puʻuloa. Turning towards the ocean of Honouliuli, Hiʻiaka saw the expanse of Leinono[3] and she said within herself:

Say! I have not forgotten you Leinono, though perhaps you think I am no good because I don't know you. Therefore, I call to you Leinono with this chant:

Bright eye, the rising sun,
Companion that travels arm-in-arm with the expanse of ʻEwa,
The Amu wind that causes dust to mound up,
Is the first born of the Moaʻe wind,
A child that is embraced by the ʻEwa-loa [expanse of Ewa],
Hail Leinono,
Our companion.

Finishing her chant, Hiʻiaka then turned and saw her companion and Lohiʻau paddling their canoe. And her love welled up for her traveling companions. It was also then, that Hiʻiaka came to understand that Lohiʻau would be killed by Pele when they reached Hawaiʻi. Hiʻiaka then turned and continued her journey along the path that crossed this unpeopled plain. While walking along, she saw two women who were busy stringing garlands of ʻilima blossoms. The women were sitting alongside the trail upon which Hiʻiaka was traveling. Now when these two women saw Hiʻiaka, one said to the other, "Say, this is Hiʻiaka who is descending along the path, we must depart with haste, lest she kill us."

The two women hastily departed, and reached a stone that was situated along the side of the trail which continued on to Waiʻanae. It was at this stone that the two women transformed themselves into their supernatural moʻo [lizard]

[3] Leinono, also written as Leilono (Kamakau, 1870b).

forms.

One of the lizards then went and hid in a little space on the stone, and the other went nearby. One moʻo said to her companion moʻo…

February 22, 1927 (page 1)

…"It is fortunate that we have hidden ourselves at this place, so that we may escape being killed by Hiʻiaka." Now from ancient times till recently, the place at which this stone was situated, was called "Peʻe-kāua" [We two hidden]. Now that the road has been made, the stone at which these two moʻo wahine [lizard women] has been destroyed.

When Hiʻiaka saw that these two women had fled and taken their moʻo forms to hide on the stone along the trail, she chanted out to them:

Greetings to you two women of the plain,
It is a barren plain in the sun,
Where the sun bears forcefully down,
Having gone to hide,
We two are hidden at Peʻe-kāua,
Aloha to you two,
Here I am traveling on.

Hiʻiaka then continued walking towards the shore. Hearing Hiʻiaka's chant of affection, these two moʻo women said to one another, "Say, this is truly remarkable, for we will not die, but have been saved by Hiʻiaka. She has given us her aloha as she descends in the heat of the sun, and so it is that we shall remain upon this plain."

Descending to the flat lands of Honouliuli, Hiʻiaka then turned and looked at

Puʻuokapolei and Nāwahineokamaʻomaʻo who dwelt there in the shelter of the growth of the ʻōhai [*Sesbania tomentosa*], upon the hill, and where they were comfortably refreshed by the blowing breezes. Hiʻiaka then said, "Puʻuokapolei and Nāwahineokamaʻomaʻo, do not forget me, lest you two go and talk behind my back and without my knowing, so here is my chant of greeting to you:"

Greetings to you two o Puʻuokapolei and companion
O Nāwahineokamaʻomaʻo
Set there, and dwelling
In the shade of the ʻōhai
Stringing garlands of kukui in the day,
Adorning yourselves in the garlands of the maʻomaʻo
Kaunaʻoa [*Cuscuta sandwichiana*] is the lei of the shores of Kaʻōlino[4]
There is joy in traveling.

When Hiʻiaka finished her chant, Puʻuokapolei said, "Greetings. Love to you, o Hiʻiaka! So it is that you pass by without visiting the two of us. Lo, we have no food with which to host you. Indeed, the eyes roll dizzily with hunger. So you do not visit us two elderly women who have cultivated the barren and desolate plain. We have planted the ʻuala shoots, that have sprouted and grown, and have been dedicated to you, our lord. Thus as you travel by, pull the potatoes and make a fire in the imu, so there will be relief from the hunger. For we have no food, we have no fish, and no blanket to keep us warm. We have but one kapa [covering], it is the pilipiliʻula [the grass *Chrysopogon aciculatus*]. When it blossoms, we go and gather the grass and plait it into coverings for us. But in the time when the grasses dry, and none is left on the plain, we two are left to live without clothing. The cold breeze blows in the night, the Kehau and Waikōloa, the cold does not remain though, and when the grasses of the land

[4] Kaolino (the brightness) appears to be a variation of Koolina (interpretively translated as joyous).

which give us warmth, begin to grow again, our nakedness is covered, and we are a little better off than the flowers of the maʻo. It is because we are left without our covering of the pilipiliʻula grass, that many people have come to say, "Waiho wale iho ka mauu o Kaiona" [Kaiona is left exposed by the grasses; (Nothing is left to the imagination)]. Aloha to you, and aloha be with you in your travels o Hiʻiaka-i-ka-poli-o-Pele, our lord.

Hiʻiaka then turned and continued her walk in the stifling heat of the sun on the plain of Puuokapolei. Hiiaka saw a mao blossom as she descended, and she picked it in the heat of the sun and chanted out Kona is made dizzy in the long days of Makaliʻi [in the summer]:

The wiliwili [*Erythrina*] trees sway, then comes the calm,
The birds of Kānehili endure,
The sun is exceedingly hot on Puʻuokapolei,
The maʻo growth is stunted on the seaward plain,
The nohu [*Tribulus cistoides*] flowers
  are like a halakea [kapa] covering
The puaʻula [young kūmū] fish seem
  to flash along the shores of Kaupeʻa
A companion [is the] Nāulu wind,
It is a traveling companion for me.

When Hiʻiaka finished her chant, she continued toward the shore, and looking to the ocean, she saw the canoe of her friend and Lohiʻau, and chanted:

My man on the many harbored sea of Puʻuloa,
As seen from the plain of Peʻekāua,
Let us dwell upon the ʻōhai covered shore,
Where the noni blossoms are twisted together,
Descending along Kānehili

I am winding along

Hiʻiaka then turned and looked back to Puʻukuʻua, Kānehoa, and Haleʻauʻau and said, "Do not forget me Puʻukuʻua mā [and companions]. And so you do not think that I will forget you, here is a chant of endearment for you:"

It is I who travel along the shore of Puʻuloa,
Where the ʻōhai is at Kaupeʻa,
In the awe-inspiring sun,
It is seen,
It has been seen by me,
At the mountain cliffs,
Puʻukuʻua at Haleʻauʻau,
The sprouting of the kukui growth,
Dancing in the sun of Kānehoa,
Love to you my companions.

…Upon finishing her chant, Hiʻiaka continued down the trail and arrived at Kualakaʻi. At Kualakaʻi, the trail took her to a spring of cool water. Looking into the spring, she saw her reflection shining brightly upon the water's surface. Hiʻiaka also saw two lehua trees [*Metrosideros polymorpha*] growing on each side of the spring. Now these two lehua trees were completely covered with blossoms. She then picked the lehua blossoms of these two trees and made garlands for herself.

Hiʻiaka fashioned four strands to her lei, she then removed the garlands of maʻo which she had received when descending from Pōhākea, and set them aside.

She then took the garlands which she had made, and adorned herself with them. Hiʻiaka then heard the voice calling out from the area of Kānehili:

Hiʻiaka is the woman
Who picked the flowers of Hoʻākalei,
And with a needle strung and made them into
four garlands, the sectioned lei of the woman,
O my younger sibling.
My younger sibling who came from the place
where the dusty wind rises from below
Overturned in the sea of Hilo-one,
The aloha is for Hilo,
Love for the lei.

That place, Hilo-one, which is mentioned in the mele, is situated on the northern side of Kualakaʻi, towards Kalaeloa. And the name of the spring in which Hiʻiaka looked and saw her reflection was Hoʻākalei [reflection of a lei]. It was at this place that Hiʻiaka saw the two lehua trees growing, from which she picked the blossoms too make her four garlands.

Hearing the chant, Hiʻiaka turned toward where it had come from, and saw her older sister Kapo looking at her. Kapo had arrived at Oʻahu from Maui, where she was teaching the practices of the hula. Seeing Kapo, Hiʻiaka cried out with affection for her older sister…

March 1, 1927 (page 1)

So, it is you o Waialua-iki,
Of the sun darkened cliff of Uli,
Liawahine has gone traveling,
O woman that stands calling from the cliff,
I am adorned with a lei,
Yes, I am wearing garlands of the misty-centered lehua blossoms,
The lehua that grows along the water's edge at Hoʻākalei,

My lehua of Hilo-one,
On the shores of Kaʻōlina and Kaupeʻa,
I am adorned.

The reason that Hiʻiaka presented this chant to her elder sister Kapo, saying, "kui pua lei, o Hoakalei" [stringing flower garlands of Hoʻākalei] was because in her chant, Kapo had inquired about Hiʻiaka's picking the flowers from the spring of Hoʻākalei and making them into four garlands for herself… As it is seen in this mele, Hilo-one is on Oʻahu, there at Kualakaʻi, near Kalaeloa.

Thus it is understood that through traditions like this, we are given direction in knowing about the names of various places of the ancient people, and which are no longer known in this time… Hiʻiaka then continued her journey toward the shore of Puʻuloa, and she thought about the words that she had earlier spoken to Wahineʻōmaʻo and Lohiʻau, and she chanted:

I will not travel to the shore of Kaupeʻa,
To Kaupeʻa where the ʻōhai of Kānehili are found,
I will turn away…

…Hiʻiaka then arrived at a place where many people were gathered together, and she overheard them talking about preparations for a journey to Kou, which is the old name for Honolulu. The people were preparing to go to the court of the chiefess Peleʻula, who was hosting kilu[5] games…

March 8, 1927 (page 1)

…Learning of the contest that was to be held at Kou, Hiʻiaka had reservations about having Lohiʻau stop at the court of the chiefess Peleʻula. So she chanted,

[5] Kilu is a Hawaiian game in which a gourd or halved coconut shell is tossed at an opponent's pob (something like horseshoes). The individual who successfully hit the pob that he or she had selected was the winner and could claim a kiss or some other favor from the opponent (see Malo, 1951:216).

calling to Lohiʻau, telling him to bring the canoe to shore at Puʻuloa. When Hiʻiaka chanted, everyone became quiet, because they were awed by the beauty of her chanting voice. One of the women in the group then called to Hiʻiaka, "You are a stranger to us in appearance, but your chant indicates that you are very familiar with this shore, how is that so?" Hiʻiaka confirmed that she was indeed a visitor, and yet familiar with the places of this land. She then said, "Ua maikai no kau noi e ke kamaaina maikai, aka, i Kou hoi e hui aku ai na maka" [You have asked a good question, kind native, but, it is at Kou, that all the faces (eyes) shall meet].

Thus it is seen that when Hiʻiaka responded to the woman of Puʻuloa, that this famous saying of the people of Oʻahu came about, "Hui aku na maka i Kou" [The faces shall meet at Kou]… Now, Lohiʻau had heard the chant of Hiʻiaka, and he drew the canoe to the shore. When Hiʻiaka boarded the canoe, she bid farewell to the people of Puʻuloa and said, "Hui aku o na maka i Kou" [We will meet again].

They then directed their canoe seaward, and went out of opening of Puʻuloa. Hiʻiaka turned and looked towards the land where she saw the dwelling places of Kinimakalehua, Leinono, and Keālia. She called out to them, "So you do not forget me, here is a chant for you" —

Reddish yellow are the rains of Kinimakalehua,
Leinono is the companion above, and Puʻuloa is shoreward,
The journey across the expansive sands of ʻEwa has been made arm-in-arm,
I am at ʻEwa, I greet you o Leinono, We are all companions

In this chant of Hiʻiaka, she spoke the famous saying that is the pride of the descendants of ʻEwa; "Ke one kui-lima laula o Ewa" [The sands of ʻEwa, across which everyone joined hand-in-hand]. These words of Hiʻiaka are a famous

saying of this land to this day. As the canoe continued toward Kou, passing the land of Kalihi, Hiʻiaka looked again towards Leinono and Keālia, and she chanted:

Hail to you o Leinono, o Kinimakalehua, o Keālia who is below, aloha,
Here is the supplication, the offering, of the one who has traveled by.
It is a voice or song, only a voice—

She then turned forward and the canoe arrived at Nuʻuanu…

3. He Moolelo no Kamapuaa (A Tradition of Kamapuaʻa)

S.W. Kahiolo contributed the tradition of Kamapuaʻa to the native newspaper *Ka Hae Hawaii* in 1861. This is the earliest detailed account of Kamapuaʻa, a multi-formed deity of traditional significance on Oʻahu and all the major islands of the Hawaiian group. Kamapuaʻa is a part of the Lono god-force and possessed many kino lau (body forms), representing both human and various facets of nature. He was born in pig-form to Hina (mother) and Kahikiʻula (father) at Kaluanui in the Koʻolau loa district of Oʻahu.

Excerpts from Kahiolo's "He Moolelo no Kamapuaa" provide details on places of traditional cultural significance in the ʻEwa District. This moʻolelo offers traditions associated with the naming of, or traditional importance and uses of, localities from Honouliuli to Moanalua. Waimānalo, Waikele, Waipiʻo, Waiawa, Waimano, Waimalu, Puʻuokapolei, Keanapuaʻa, Puʻuloa, Moanalua, Waipahu, and Kuolohele are named in the following excerpts.

Ka Hae Hawaii
He Moolelo no Kamapuaa.

July 10, 1861 (page 60)

…When the chief Olopana was killed, the island of Oʻahu became Kamapuaʻa's. He then fetched his people (who he had hidden) from above Kaliuwaʻa and

brought them down, and they then returned to their lands. The priest (Lonoawohi) asked Kamapuaʻa if he could be given some lands for his own as well. He asked, "Perhaps the water lands might be mine." Kamapuaʻa agreed. This was something like a riddle that the lands which have the word "water" [wai] in their names would be his, like: Waialua, Waianae, Waimanalo, Waikele, Waipio, Waiawa, Waimano, Waimalu, Waikiki, Waialae, Wailupe, Waimanalo 2, Waiheʻe, Waiahole and etc.

The parents of Kamapuaʻa (Hina and Kahikiʻula) thought that this amount of land was too great, and they criticized Kamapuaʻa for agreeing to it. But his elder siblings and grandmother did not criticize him, agreeing to the priest's request. The remainder of the lands went to Kamapuaʻa's family…

[Following a journey to Hawaiʻi, where Kamapuaʻa fought with Pele, he returned to Oʻahu. Upon arriving at Oʻahu, Kamapuaʻa learned that the island was under the rule of another chief, that his parents had been chased to Kauaʻi, and that his favorite brother Kekeleiaiku had been killed. The following excerpts include accounts describing sites and activities in ʻEwa.]

August 7, 1861 (page 76)

…Kamapuaʻa walked to Keanapuaʻa, on the shore at Hālawa, and he slept there. When he woke up from his sleep, he urinated in the sea, and that is why the fish of Puʻuloa have a strong smell to them, so say the uninformed.

From there, he went to Honouliuli and saw his grandmother, Kamauluaniho, sitting along the side of a taro pond field. She was looking with desire to the lands below, where some of the men of the king were working and wishing that they would leave even a little bit of taro behind for her to eat. Kamapuaʻa then went and stood next to her and greeted her. She replied, greeting him, but did not recognize him as her grandson. He then asked her why she was sitting

there. She told him, "I am looking to the lowlands, where the men of the chief are working, and wishing that they would leave a little behind so that I may have some food." Kamapuaʻa then said to his grandmother, "How did you live before?"

She answered, "What is it to you? My grandchildren have died, one in a battle with Pele, another buried, and one on Kauaʻi." This is how she spoke, not understanding that the one before here was her own grandson. Kamapuaʻa then answered, "I am going to get some food for me." She asked, "Where will you get your food?" He told her, "I will go and perhaps ask for some, and maybe they will give me some of their food."

August 14, 1861 (page 80)

Kamapuaʻa went and said to one of the men who was pulling taro, "Let the two of us pull taro for us." The man agreed, and the two of them pulled taro, some for the man and some for Kamapuaʻa. Kamapuaʻa pulled a large quantity and then carried it up to his grandmother. Because of the large load that he carried, Kamauluaniho suspected that the man was indeed her own grandson, Kamapuaʻa. She chanted a name song to Kamapuaʻa and he chanted to her as well. Together, they carried the taro to the house she shared with another old woman, at Puʻuokapolei. Setting down their bundles of taro, Kamauluaniho placed Kamapuaʻa on her lap and wept over him. The two were joined by the other old woman and she was introduced to Kamapuaʻa, who she thought had been lost. Preparations were made for a meal, and Kamapuaʻa and the old woman went out to her garden to collect sweet potatoes. They then returned to the house and ate…

August 21, 1861 (page 84) – August 28, 1861 (page 88)

…Kamapuaʻa went to Nuʻuanu and performed a ceremony, bringing his brother, Kekeleiaiku, back to life. He then traveled to Kou where he killed the

chiefs and people who had killed his brother and forced his family into their lives of despair… Returning from Kou, Kamapuaʻa met his friend Kuolohele and the two of them walked from Moanalua. They reached Waiawa and continued on to Waipahu. Standing on the edge of the stream there, Kuolohele went to bath in the stream. Kamapuaʻa noticed that Kuolohele had a large lump [puʻu] on his back. Picking up a stone, Kamapuaʻa struck the lump on Kuolohele's back.

Kuolohele cried out, thinking that he was about to be killed. Kamapuaʻa reassured him that he was not going to die, but that instead, he would be healed. He then instructed Kuolohele to touch his back. In doing so, Kuolohele found that the lump was gone.

Kamapuaʻa then picked up the stone and set it on the cliff-side. That stone remains there at this time, and it is a stone which many travelers visit [the stone is named Kuolohele]… Kuolohele and Kamapuaʻa continued traveling together for a short distance, until Kuolohele reached his destination. Kamapuaʻa continued to **Puʻuokapolei**, where he met with his grandmother and brother. He told them what had transpired, and he then set off for Kauaʻi, to bring his parents back to Oʻahu…

4. He Kaao no Pikoiakaalala (The Tradition of Pīkoiakaʻalalā)

The tradition of Pīkoi-a-ka-ʻalalā (Pīkoi-son-of-the-crow) was printed in the Hawaiian language newspaper *Ka Nupepa Kuokoa* between December 16, 1865 and March 10, 1866 and was contributed by S.M. Kaui.

Pīkoi-a-ka-ʻalalā was born to ʻAlalā and Koukou on the island of Kauaʻi and his family were kūpua (beings with supernatural powers and multiple body-forms). Pīkoi-a-ka-ʻalalā possessed exceptional sight and excelled in the Hawaiian art of pana pua (shooting with bow and arrow). In the tradition of Pīkoi-a-ka-ʻalalā, many localities throughout the islands are

named for places where he competed in matches with archers, shooting ʻiole (rats) and manu (birds) from great distances. The tradition is set in the late 1500s when Keawe-nui-a-ʻUmi is the king of Hawaiʻi Island.

> ***Ka Nupepa Kuokoa***
> **He Kaao no Pikoiakaalala.**
>
> **December 23, 1865 (page 1)**
>
> [While describing Pīkoiakaʻalalā' s travels around Oʻahu, readers are told]:
>
> …The districts of Oʻahu are thus known… The land from Piliokahe to Kapukakī makes up the district of ʻEwa…

5. Moolelo no Puapualenalena (The Tradition of Puapualenalena)

Puapualenalena was a supernatural dog who lived during the time of Hakau, the half-brother of Hawaiʻi's ʻUmi-a-Līloa (ca. AD 1525). His primary residence and adventures occurred on Hawaiʻi, but he also traveled across the islands. While on Oʻahu, the heights of Pōhākea where the mountain trail descends into Honouliuli were mentioned. From there he traveled to the shore of Puʻuloa.

> ***Ka Nupepa Kuokoa***
> **He Kaao no Pikoiakaalala.**
>
> **February 24, 1866 (page 1)**
>
> …While sailing from Kauaʻi, Puapualenalena and his companions reached the Waiʻanae coast. Puapualenalena leapt to shore and traveled across the land to Pōhākea from where he looked upon the lands of ʻEwa and Waialua… He then went down to the shore of Puʻuloa where the canoes had landed and joined the travelers to continue the journey to Hawaiʻi…

6. Ka Amaama o Kaihuopalaai (Tradition of the Mullet of Kaihuopalaʻai)

One of the famous traditions of Honouliuli centers on the importance of the ahupuaʻa as the source of the ʻanae holo, the annual mullet migration around the island of Oʻahu. The tradition was originally published in 1866 under the title "Ka Amaama o Kaihuopalaai" (*Ke Au Okoa*, September 17, 1866, page 3). In 1896 it was published again under the title "He Moolelo Kaao no ka Puhi o Laumeki" in a major account that cited numerous locations, resources and residents of the Honouliuli ahupuaʻa. Both traditions are cited below; the earlier one is provided in the original Hawaiian language as it sets the foundation for the more detailed account of 1896.

> ***Ke Au Okoa***
> **Ka Amaama o Kaihuopalaai.**
>
> **Kepakemapa 17, 1866 (aoao 3)**
>
> Ma ka auina la o ka Poalua o ka pule i hala iho nei, ua olioli makou i ka ike anaʻku i ka lehulehu e hoi ae ana me na puolo anae, he ewalu, a he umi o ka hapawalu. Ua hauoli nui no ko ke kulanakauhale nei i keia mea, ka hoea hou ana mai o ka anae holo, a ua iho nui ka lehulehu e kuai, a o ko makou Hale Pai holookoa nei no hoi kahi i iho pu i ka makeke e kuai ia ai. He wa no aia iloko o ka makahikiki e holo mau ai keia i-a. O Kapapaapuhi ma Ewa, a me Kaipapau ma Koolauloa, oia na wahi i oleloia e kahiko, na wahi hoolulu ia o ua i-a nei, he anae. O kona home mau nae o Kapapaapuhi.
>
> Eia malalo nei he wahi kaao mai kekahi elemakule mai, e pili ana i ka ano o ke kaapuni ana o ka anae a puni keia mokupuni.
>
> He Kaao no Kaanae.
>
> Aia ma Kapapaapuhi, ma Ewa, kahi i noho ai kekahi ohana nui. Na ka makuakane o keia ohana kekahi kaikamahine maikai, a na makua i aloha nui

ai. Ua oi ae paha ke aloha o na makua i keia kaikamahine mamua o na keiki e ae. Ua pii ae ua kaikamahine, a aneane paha he umikumamalima ona mau makahiki, hoohaumia ia iho la oia e kekahi mea. I ka ike ia ana o ke ano hoohaumia ia o ua kaikamahine nei e na makua, ninau aku la na makua ia ia me ke ano e hai mai la hoi ke keiki i ka hua o ka lokomaikai; aohe nae wahi mea a hai mai. Huna eleele loa nohoi ke kaikamahine.

Ninau pinepione aku la na makua e hai mai, aohe wahi mea a hai mai; a no keia mea, kipaku haalele aku la na makua me ka hoohuakaeo, a i aku i ke kaikamahine, "O hele e imi i kau loaa, a mai manao mai oe he hale!" Ku ae la ua kaikamahine nei o ka hupe o na waimaka, haalele iho la oia i ka ohana.

Hele aku la keia a hiki i Kaipapau, makemake ia mai la keia e kekahi kanaka, no ko ia nei ano wahine ui no hoi paha, a *hoao* ia ae la laua nei he kane a he wahine, a noho iho la ia he wahine no ka pali hauliuli. O ka hana nui a ua kane nei o ka mahiai i kela makahiki keia makahiki. Oi mahi ai aku ua kanaka nei a piha ka aina i ka ai, ka uala, ka maia, ke ko, a me kela mea keia mea. I ka piha ana o ka aina i kela mea ai keia mea ai, a i kekahi la, olelo mai la ke kane i ka wahine, "Kanu aku nei kaua i ka aina a piha i ka ai, a me kela mea keia mea, a eia la auanei i hea ka inai e pono ai o keia ai!"

Kulou ka wahine ilalo, a pane mai la, "Ua i-a! Ina ke mau la no ke aloha o kuu mau makua iaʻu, alaila ka hoi loaa ka inai o ka ai a kaua i luhi ai. Hele no ka hoi oe la, a hala mai ke Ahupuaa mea la, o mea ia, a hele aku no oe. Pela no ka hoi oe e hele ai, a hiki oe i ka aina e kapa ia ana la o Ewa, alaila, ninau iho no oe ia Kapapaapuhi. Aia ka hoi ilaila koʻu nui kahi i noho ai. Hele no oe la, a ilaila, kolea iho oe i oʻu mau makua; a i ninau mai ia oe i kau huakai ea, alaila, hai aku oe he i-a kau huakai i hiki aku ai ilaila. I haawi ia mai anei oe i ka ia iloko o ka hale, mai lawe anei oe. Olelo aku oe i ka ia iloko o ke kai." Ae mai la ua kanaka nei.

He anahulu mahope iho, kaapuni iho la ua kanaka nei, e hele ana i ka hale pa leo he makuahonowai. Ninau hele aku la no hoi keia a hiki wale i ua aina hanau nei o ka wahine, a hai ia mai la no hoi keia i ka hale, kahi i noho ai o kona mau makuahonowai. Hele aku la no hoi keia a hiki ilaila, kolea iho la. Uwe mai la ka ohana holookoa, me he mea la o ke kaikamahine okoa no, ua hoi aku. Uwe iho la a pau, hiowai a luana iho la, ninau mai ka makuahonowai kane, "Kau huakai o ka hiki ana mai?" Olelo aku no hoi keia, "I hoouna ia mai nei au i i-a." "Ae," wahi a ka makuahonowai; "eia ae no ka i-a la, he umi halau i piha, a hoi [l]awe ia i elima." Hai aku la no hoi keia, e like me ka olelo a ka wahine, o ka ia iloko o ke kai. Kulou ihoʻla ka makuahonowai ilalo a pau, olelo mai la, "O ka i-a ia, lawe ia, aia a hoi oe lawe pu me ka ia!"

He mau la mahope mai, hoi mai la ua kanaka nei, a Kapuukolo i Honolulu nei moe, a i ala ae ka hana o ka hiamoe i kakahiaka ae, e kuu mai ana kanaka i ka anae. Manao iho la keia, he i-a no la no ia wahi, noho ilaila ai i-a. Pela aku ana a hiki i ka Luahole i Waikiki. Mai laila aku keia a Maunalua, o ka hana no ka na kanaka o ke kuu i ka i-a. Pela wale a hiki keia i Kaipapau i ke ahiahi o kekahi la, a i ala ae ka hana a ka wahine a nana aku i ke kai e ula mai ana ke kai i ka i-a, a i aku keia i ke kane, "Ai aka i-a au i hele aku nei." Akahi no keia a hoomanao ae, o ka ia no ka ia e kuu mau ia ana ma na wahi a pau ana e moe ai.

O keia iho la ka ke kumu i holo ai a puni keia moku, pela la ka olelo a kahiko, aka, pela paha, aole paha, he anoninoni loa ko makou mau manao ma ia mea, e like me ka kahiko e olelo nei.

7. He Moolelo Kaao Hawaii no ka Puhi o Laumeki (A Tradition of Pūhi Laumeki [A Deified Eel] and how the 'Anae-holo came to Travel around Oʻahu)

"He Moolelo Kaao Hawaii no ka Puhi o Laumeki, Ka Mea I Like Me Ka Ilio Puaapualenalena" was published in *Nupepa Ka Oiaio* between November 8, 1895 and February 14, 1896. The moʻolelo was submitted to the paper by native historian, Moses Manu. The moʻolelo

primarily focuses on wahi pana and features associated with the lands of ʻEwa, Oʻahu, recounting events associated with the birth and deification of an eel (pūhi) guardian of fisheries and his siblings, among whom was Mokumeha. The narratives include important descriptions of Honouliuli as the source of the ʻanae holo and fisheries around the island of Oʻahu. The following installments are summaries, not direct translations of these primary resource documents.

Nupepa Ka Oiaio

November 8, 1895 (page 4)

…It is perhaps not unusual for the Hawaiian people to see this type of long fish, an eel, about all the shores and points, and in the rough seas, and shallow reefs and coral beds of the sea. There is not only one type of eel that is written about, but numerous ones that were named, describing their character and the type of skin which they had. In the ancient times of our ancestors, some of the people of old, worshipped eels as Gods, and restrictions were placed upon certain types of eels. There are many traditions pertaining to eels. It is for this fish that the famous saying "An eel of the sea caverns, whose chin sags."[6]

Indeed, this is the fish that was desired by Keinohoʻomanawanui, the eels of the fishpond of Hanaloa, when he was living with his friend, Kalelealuaka, above Kahalepōʻai at Waipiʻo uka, when Kākuhihewa was the king of Oʻahu. It was necessary for us to speak of the stories above, as we now begin our tradition.

It is said in this account of Laumeki, that his true form was that of an eel. His island was Oʻahu, the district was ʻEwa, Honouliuli was the land. Within this land division, in its sheltered bay, there is a place called Kaihuopalaai. It is the

[6] ʻŌlelo Noʻeau #1545, "Ka pūhi o ke ale, ahu ke ʻolo." According to Pukui, this ʻōlelo noʻeau is an expression that was used to describe a prosperous person (1983:167).

place of the ʻanae, which are known about Honolulu, and asked for by the people, with great desire.

Kaihuopalaʻai was human by birth, but he was also a kūpua [dual-formed being], who was born at Honouliuli. His youngest sister was known by the name of Kaihukuʻuna. In the days that her body matured and filled out, she and some of her elders left ʻEwa and went to dwell in the uplands of Lāʻiemaloʻo, at Koʻolauloa, where she met her husband. The place known by the name Kaihukuʻuna, at Lāʻiemaloʻo, is the boundary of the lands to which the ʻanae of Honouliuli travel.

At the time that Kaihukuʻuna was separated from her elder brother and parents, Kaihuopalaʻai had matured and was well known for his fine features, and his red-hued cheeks. He was known as the favorite of his parents and all the family. There was a young woman, who like Kaihuopalaʻai, was also favored by her family. Her name was Kaʻōhai, and she lived at the place where the coconut grove which stands at the estuary of Waikele and Waipiʻo. Thus, these two fine children of the land of the fish that quiet voices [ka ia hamau leo], that is ʻEwa, were married in the traditional manner.

In their youth, the two lived as husband and wife in peace. And after a time, Kaʻōhai showed signs of carrying a child. This brought great joy to the parents and elders of these two youth. When the time came for Kaʻōhai to give birth, her child was born, a beautiful daughter, who also had the same red-hued nature as her father. While Kaʻōhai was cleaning the child and caring for the afterbirth, she looked carefully at her daughter and saw a deep red-spotted mark that looked like an eel, encircling the infant. Everyone was looking at the mark, contemplating its meaning, and Kaʻōhai was once again taken with birth pains. It was then understood that perhaps there would be a twin born as well. But when the birth occurred, an eel was seen moving about in the blood, on the side of Kaʻōhai's thigh. This greatly frightened the family and attendants,

they fled, taking the child who had been born in a human-form, with them. Kaihuopalaʻai also separated himself from his wife. Kaʻōhai remained with the blood stains upon her, and no one was left to help her.

It was the eel which had been born to her, that helped to clean Kaʻōhai. He worked like a human, and Kaʻōhai looked at the fish child which had been born to her, and she could find no reason to criticize or revile him. Kaʻōhai then called to her husband, Kaihuopalaʻai, telling not to be afraid, and he returned. They both realized the wondrous nature of this child and cared for him at a good place, in the calm bay of Honouliuli. The named this eel child, Laumeki, and his elder sister, born in human-form, was named Kapapūhi. This eel became a cherished child, and was cared for as a God. Laumeki, the one who had been consecrated, asked that the first-born, his sister, also be cared for in the same manner, and a great affection was shared between the children born from the loins of one mother.

November 15, 1895 (page 4)

Thus, it is told in this tradition, that this is the eel Laumeki. It is he who caused the ʻanae to remain at Honouliuli, and why they are known as "Ka Anae o Kaihuopalaai" [The mullet of Kaihuopalaʻa]. With the passing of time, the forms of this eel changed. At one time, he was red with spots, like the eel called pūhi Paka, at other times he was like the Laumilo eel.

A while after the birth of Laumeki, another child was born to Kaʻōhai, a son. He was named Mokumeha, and he was given to Wanue, an elder relative of Kaihuopalaʻai's, to be raised. There are at Honouliuli, Ewa, places named for all of these people. The natives of that land are familiar with these places. For this Wanue, it is recalled in a song:

The thoughts are set upon the sea at Wanue,

I am cold in the task done here…

…The eel-child Laumeki, followed the fish around in the expanse of the sea, and on the waves of this place. This was a work of love and care, done for his parents and family, that they would have no difficulties. In those days, this eel lived in the sea at a place where a stone islet is seen in the bay of Honouliuli, and he would not eat the fish which passed before him. He did these things for his parents and sister Kapapapūhi.

Laumeki was very watchful of his family, protecting them from sharks, barracudas, and the long billed marlin of the sea which entered into the sheltered bay of Honouliuli, the land of his birth. Because of his nature, Laumeki did many wondrous things. It was Laumeki who trapped the Pūhilala that had lived out in the sea, in the pond of Hanaloa. This Pūhilala was the one who bragged about his deeds, and when he was trapped his eyes glowed red like the flames of and earthen oven.

It is perhaps worthy here, my readers that we leave Laumeki and speak of Mokumeha and his journey around Oʻahu. At the time when the sun rested atop the head [describing Mokumeha's maturity], and his fine features developed. He was very distinguished looking. At that time, he determined to travel around the island of Oʻahu. He asked his parents and guardian permission, and it was agreed that he could make the journey.

Mokumeha departed from Honouliuli and traveled to Waiʻanae, and then went on to Lāʻiemaloʻo, at Koʻolauloa, the place where the youngest sister of his father dwelt. She [Kaihukuʻuna] was pounding kapa with her beater and thinking about her elder brother. She rose and went to the door of her house and saw a youth walking along the trail. Seeing the youth, her thoughts returned once again to her brother Kaihuopalaʻai and his wife Kaʻōhai. The features of this youth in every way, looked like those of his father, and upon

seeing him, tears welled up in Kaihukuʻuna's eyes. She called to the youth inquiring about his journey, and he responded, answering each of the questions. The moment the youth said the name of his parents, and the land from which he came, Kaihukuʻuna wept and greeted her nephew in the custom of the people of old.

This greatly startled her husband who was out in the cultivated gardens tending to his crops. He thought that perhaps one of his own family members had arrived at the house. When he reached their house, he saw the strange youth and he quickly went to prepare food for their guest. In no time, everything was prepared, and he then went to his wife asking her to stop her crying, and invite the visitor to eat of the food that had been prepared. He told his wife, "Then, the talking and crying can resume." She agreed and they sat down together and ate, and had a pleasant time talking.

Kaihukuʻuna then asked Mokumeha about the nature of his trip, and he explained that he was traveling around Oʻahu on a sight-seeing trip. Kaihukuʻuna told him, "It is wonderful that we have met you and can host you here." She then asked him to consider staying with her and her husband at Lāʻiemaloʻo, where all of his needs would be met. "We have plenty of food and if you desire a wife, we can arrange that as well." Mokumeha declined the invitation, explaining his desire to continue the journey and then return to Honouliuli.

November 22, 1895 (page 4)

Now it is true that at this place, Laiemaloo, there was grown great quantities of plant foods, but the one thing that it was lacking was fish. Mokumeha, his aunt, and her husband, Pueo, spoke about this, and it was determined that Pueo should go to Ewa. Mokumeha instructed him to seek out Kaihuopalaai, Kaohai, Kapapaapuhi, and Laumeki, and to ask for fish. He told them that

"Laumeki will be able to lead the fish to you here at Laiemaloo."

Pueo departed for Honouliuli [various sites and features are described along the way]… and he met with Kaihuopalaʻai. Kaihuopalaʻai's love for his sister welled up within him, and it was agreed that fish would be given to her and her family. But rather than sending fish home with Pueo in a calabash—fish which would be quickly consumed, causing Pueo to continually need to make the journey between Lāʻiemaloʻo and Honouliuli—Kaihuopalaʻai said that he would "give the fish year round."

November 29, 1895 (page 4)

When Kaihuopalaai finished speaking, Pueo exclaimed, "This is just what your son said you would do!" Kaihuopalaai and Pueo then went to the house of Kapapapūhi, who, when she learned that Pueo was her uncle, leapt up and greeted him. They discussed the request for fish, and ate while speaking further. Kaihuopalaʻai then asked, "Where do you come from?" Pueo answered, "Lāʻiemaloʻo," and he described the land to her.

The next day, Kapapapūhi and Pueo went on a canoe out to the stone islet where Laumeki lived. They took with them food, and as they drew near the stone, the water turned choppy like the water of the stormy winter season. The head of Laumeki rose out of his pit and remained on the surface of the water. Kapapapūhi offered him the ʻawa and food she had brought with her. This eel was cared for just as a chief was cared for. When he had eaten his food and was satisfied, he rested on the surface. Kapapapūhi explained to Pueo that he too would need to care for and feed Laumeki, in order to obtain the fish he needed. Kapapapūhi then called out to Laumeki, "Here is an elder of ours, tomorrow you will go with him and take the fish of our parents with you."

December 6, 1895 (page 4)

…The next day, Pueo rose while it was still dark, and the stars, Aea, Kapawa and Kauopae were still in the heavens. He prepared the foods needed for Laumeki, and prepared the canoes. He and his wife's family and attendants then went towards Laumeki's house, where he was resting. When Laumeki saw the canoes coming toward him from Lae o Kahuka, he rose up before them. Together, they passed Kapākule, the place where the sharks were placed in ancient times as play things of the natives of Puʻuloa. When the canoes and people aboard reached the place where the waves of Keaʻaliʻi break, Laumeki cared for them, to ensure that no harm would befall them. This place is right at the entrance of Puʻuloa.

As the rays of the sun scattered out upon the water's surface, the people on the canoes saw the red-hues upon the water and upon those who paddled the double-hulled canoes. Pueo then saw something reflecting red, beyond the paddlers, and below the water's surface. Pueo realized that it was Laumeki with the ʻanae fish. The ʻanae traveled with Laumeki outside of Kumumau, and past Āhua. They continued on past the Harbor of Kalihi at Kahakaʻaulana, with the fish being urged on, by the people back at Kalaekao, Puʻuloa, and Laumeki was at the front, leading the fish at Māmala… They continued on around Kawaihoa, Makapuʻu, and traveled passed Koʻolaupoko, and on past Laniloa at Lāʻiemaloʻo, Koʻolauloa…

December 27, 1895 (page 4)

…This is how the mullet came to regularly travel between the place called Kaihukuʻuna at Lāʻiemaloʻo and Honouliuli at ʻEwa…

January 10, 1896 (page 1) and January 17, 1896 (page 1)

…Mokumeha and Laumeki returned to Honouliuli, and Mokumeha offered a prayer chant to his elder brother:

O eel,
O Laumeki,
Who passed before the point,
Dwelling in the pit,
Eel of the cavern,
You of the kauila (body) form,
That is the form of the Laumilo,
Your wooden body,
It is Laumeki.
Amen, it is freed…

…While Laumeki was resting at Honouliuli, Mokumeha set off once again to visit various locations around the island of Oʻahu. He bid aloha to his family and walked across the broad plain of ʻEwa. He arrived at Kapūkakī, which is the boundary of the land of the streaked seas, that land in the calm, reddened by the dirt carried upon the wind. This is where ʻEwa ends and Kona begins…

8. He Kaao no Kauilani (A Tradition of Kauʻilani)

The tradition of Kauʻilani spans various islands of the Hawaiian Archipelago and follows the children of chiefly parents with a godly lineage. The parents of Kauʻilani and Lepeamoa were Keāhua and Kauhao, both of whose names are commemorated as places in the Mānana-Waimano vicinity of ʻEwa. Kauhao's parents were Honouliuli (k.) and Kapālama (w.); the lands which are known by those names honor them. The daughter, Lepeamoa, was born in a supernatural form possessed of both nature and human body-forms. She participated in histories of great importance during the reign of Kākuhihewa as king of Oʻahu. This account, published in *Ka Nupepa Kuokoa* between September 18, 1869 and October 30, 1869, was submitted by S. Kapohu and offers richer details to place, practices and history than those cited later by Westervelt (1915:204-245) and Beckwith (1970:428-429). The Hawaiian language resources have been summarized rather than directly translated.

Ka Nupepa Kuokoa

September 18, 1869 (page 1)

Kauʻilani was the son of Keāhua (k) and Kauhao (w), and he was the younger brother of Lepeamoa (w). The family resided at Wailua Kauaʻi, where Keāhua was the high chief. Kauʻilani was descended from high chiefs of Kahiki and Hawaiʻi, and both Kauʻilani and his elder sister, Lepeamoa, were possessed of supernatural powers.

The elders of Kauhao were Kapālama (w) and Honouliuli (k), and the lands on which they lived are now named for them. When Lepeamoa was born, she was born in the form of a hen's egg. Discerning the supernatural nature of her granddaughter, Kapālama and Honouliuli sailed to Kauaʻi on their canoe, Pōhakuokauaʻi, and retrieved the egg. With the egg, they then returned to Kapālama, where they cared for the egg until it hatched. While sailing from Kauaʻi to Oʻahu, the canoe passed by Pōkaʻī, Waiʻanae, and sailed along the fine shore of Kualakaʻi, ʻEwa. From there, they sailed to the many harbored bay of Puʻuloa, and entered into the opening of Puʻuloa where they landed their canoe on the side of the bay. From there, they traveled along the plain to Kapālama…

[The story continues, describing the care given to the egg-grandchild, Lepeamoa. When she hatched, she was in the form of a beautiful bird with many brightly colored feathers.]

September 25, 1869 (page 1)

After Lepeamoa was taken to Oahu, her younger brother, Kauilani was born. He was taken and reared by his paternal grandparents, Laukaʻieʻie [k] and Kaniaʻula [w], in the uplands of Wailua. Kauʻilani was bathed in a sacred pool, which caused him to mature quickly, and his grandparents instructed him in various skills and forms of Hawaiian combat. During this time, a god Akua-

pehu-ʻale rise up and fought against Keāhua and his people, capturing them and holding them prisoner. Following the instructions of his grandparents, Kauʻilani fought against the god, and vanquished him, returning the rule of Kauaʻi to Keāhua…

October 9, 1869 (page 4)

After the battle, Kauʻilani and his father were reunited, and in this way, the youth learned that he had a sister who was being raised on Oʻahu, by the elders of Kauhao. Kauʻilani determined to go and seek out his sister, and Kauhao instructed him about the lands he would pass and how he would know his sister.

She told him that he must sail from Wailua and along the coast of Waiʻanae, and along the shore of Puʻuloa, where he would find a landing and the path to Kapālama. Before his departure, Kauhao also gave Kauʻilani a supernatural spear named Koawī Koawā, which would help him along his journey, and lead him to his elders on Oʻahu.

Departing from Wailua, Kauʻilani traveled to the shore at Nukoliʻi. He threw the spear, and then took off after it, across Kaʻieʻiewaho channel, sailing to Oʻahu. In his canoe, Kauʻilani passed the coast line of Waiʻanae, and he then drew near the shore of Kualakaʻi where the spear had landed. While Kauʻilani was traveling from Kauaʻi to Oʻahu, two sisters, Kamalulena and Keawalau, who had been surfing at Kualakaʻi, returned to the shore and found the spear. Seeing the spear, and recognizing its excellent quality, the sisters hid it, seeing no man who could claim it.

Shortly thereafter, Kauʻilani passed the coast of Waiʻanae and landed on the shore of Kualakaʻi to retrieve his spear. Upon landing, Kauʻilani saw the two sisters and noted that his spear was nowhere to be seen. Kauʻilani inquired of

the sisters if they had seen the spear, which they denied. Kauʻilani discerned that they were lying, and told them so, and he then called out to his traveling companion, the spear, Koawī Koawā. The spear answered from where the sisters had hidden it, and Kauʻilani picked it up and threw it again. It landed near the entry way to Puʻuloa.

October 23, 1869 (page 4)

Arriving where the spear landed, the spear then told Kauʻilani to climb a wiliwili tree that was growing nearby. From there, he would see a rainbow at the shore, and a person picking limpets, octopus, and other things. That person would be Lepeamoa, Kauʻilani's sister. Kauʻilani climbed the wiliwili tree and saw a red patch of a rainbow upon the water near the shore. He asked Koawī Koawā about this, and learned that it was the rainbow shroud of his sister, who was in her bird form near the shore…

9. Ka Moolelo o Kalelealuaka (The Tradition of Kalelealuaka)

The tradition of Kalelealuakā touches on places throughout the Hawaiian Islands. Kalelealuakā and his father, Kaʻōpele, possessed supernatural attributes and their story describes several places in Honouliuli and the larger ʻEwa District. The tradition was published in *Ka Nupepa Kuokoa* and was submitted by J.W.K. Kaualilinoe between April 9, 1870 and June 4, 1870. The original account offers a richer narrative of places and practices than those cited Fornander (Vol. IV, 1916:464-471) and Beckwith (1970:415-418). There are several wahi pana named in the tradition with descriptions of place and how the names were given.

Ka Nupepa Kuokoa

April 9, 1870 (page 1) and April 23, 1870 (page 1)

Kaʻōpele (k) and Makalani (w) were the parents of Kalelealuaka (k). Kalelealuaka was born on Kauaʻi, the native land of his mother. His father had

been born at Waipiʻo, Hawaiʻi, and possessed certain supernatural powers. Kaʻōpele was a great cultivator of the land, and he is credited with the planting of large fields on Hawaiʻi, Maui, Oʻahu, and Kauaʻi. On Oʻahu, it was at Kapapakōlea in Moanalua, and at Līhuʻe (Honouliuli), in the district of ʻEwa that Kaʻōpele had cultivated large tracts of land. While Kaʻōpele worked the land with great speed, he was also overcome by a deep sleep that lasted for six months at a time. On many occasions, it was thought that Kaʻōpele had died, and then he would reawaken and resume his tilling of the land. When Makalani became pregnant, Kaʻōpele gave her certain items to identify the child as his own, and shortly before giving birth, Kaʻōpele went to sleep.

April 30, 1870 (page 1)

Kalelealuaka was born and grew quickly. When Kaʻōpele woke up from his sleep, he instructed his son in various techniques of fighting, and Kalelealuaka became known as an exceptional warrior, who moved so swiftly, that no one could even see him… One day, when looking out across the ocean, Kalelealuaka saw a land in the distance, and he inquired of Kaʻōpele, "What land is that?" Kaʻōpele told him that is was "Kaʻena on the island of Oʻahu. Kalelealuaka then asked, "What is the village that is there beyond the point?" Kaʻōpele answered, telling him that it was "Waiʻanae." When Kalelealuaka expressed a desire to travel and see that land more closely, Kaʻōpele made a canoe for his son to travel on.

When preparations were being made for Kalelealuaka's departure, he befriended a youth named Kaluhe, and it was agreed that Kaluhe would travel with Kalelealuaka. When everything was made ready, Kaʻōpele told Kalelealuaka:

Sail until you reach the point outside of the village of Waiʻanae, then travel across the plain to a place where there is a pool of water. That will be the pool

of Lualualei. They you will ascend the pass of Pōhākea, from where you will see the flat lands spread out before you. You may also see the expansive cultivated fields of Keahumoe which I planted before coming to Kaua'i…

May 7, 1870 (page 4)

Kalelealuaka and Kaluhe sailed to O'ahu and passed the heiau of Kānepūniu and landed on the shore. There Kalelealuaka was met by a group of youth who were surfing. One of the youth inquired about the journey of the two travelers, and one asked if he might accompany Kalelealuaka and his companion. Kalelealuaka agreed, and the group walked across the plain and found the pool of Lualualei. From there, they then ascended the mountain, to the pass at Pōhākea, from where they looked out across the broad flat lands of Keahumoe. Descending the slope, they found a large banana patch that had been planted by Ka'ōpele.

Kalelealuaka then shot his supernatural arrow, and it flew down slope, passing the plains of Pu'unahawele and Kekua'ōlelo, and it landed at Kekuapō'ai, awaiting Kalelealuaka's arrival. This was at Waipi'o, above 'Ewa. The people of the area saw the flight of the arrow, and cried out "Ka pua lele hoi e!" ["How the arrow flies!"] That is why the place is called "Lele-pua" [Flying-arrow], to this day…

Kalelealuaka stayed in the uplands above Lelepua, at Kahalepō'ai, and asked his companions to go and fetch the arrow. He also told them to gather some clumps of 'awa and sedges for straining it. The two companions went and arrived at the edge of the stream called Kaniukūlou, where they saw some women bathing. They asked, "Have you perhaps seen our arrow?" The women denied having seen it, hoping that they might keep it for themselves. Because they had found it and greatly admired its beauty. Sensing that they were lying, Kaluhe called out to the arrow, and it leapt from the place at which it had been

hidden, into his hands. The women were frightened by this, and fled away.

Kaluhe and his companion left the stream and arrived at a large house with clumps of 'awa planted all about it. Looking around, they found no one in the house or in the surrounding lands, so they began to gather some of the 'awa. While picking the 'awa, they heard a voice call out to them, "Set aside that which you have taken, or I shall return." Startled by this command, they dropped the 'awa and fled, returning to Kalelealuaka, and describing the house, its surroundings, and events to him. They noted that the house was an excellent one, and only lacked sleeping mats inside.

Kalelealuaka had them gather rolled sleeping mats and kapa and they then traveled to the house. Entering the house, they found that all was in order, and they prepared food, ate, and drank 'awa, with no other voices calling to them. The next day, Kalelealuaka arose, and he and his companions planted large fields with various crops. The field planted by Kalelealuaka extended from the uplands of Kahalepō'ai to the lowlands of Pu'unahawele. When the work was completed they returned to the house and prepared pōpolo, 'āheahea, and 'inamona as their food. These were the only things which presently grew around the house that could be eaten until their own gardens matured. While they were eating, The youth from O'ahu, ate with great haste and ferocity, and Kalelealuaka called to him, urging him to eat with patience. Because of this, the youth from O'ahu, came to be called "Keinohoomanawanui."

One of the problems in living in the uplands was that there were plenty of plant foods to be had, but there was no fish. One day, while preparing their food, Keinohoomanawanui was making 'inamona (kukui nut relish). When he struck a broiled kukui nut, the shell flew up and struck him in the eye, blinding him in that eye. Kalelealuaka then took up the task of preparing the food…

May 14, 1870 (page 1)

Kalelealuaka told Keinohoʻomanawanui, "I will prepare that food which we two desire." Keinohoʻomanawanui said, "That which I desire are the sweet potatoes of the planted fields below, and the eels of the pond at Hanaloa." Kalelealuaka told Keinohoʻomanawanui, that "in time, you will have your desire." Now these foods were the property of the king Kākuhihewa, and they were kapu to all but him and his people. Kalelealuaka told Keinohoʻomanawanui, "Tomorrow, Kākuhihewa and his people will arrive here in the uplands of Waipiʻo, to gather wood with which to make new houses in the lowlands."

Now while Kalelealuaka and Keinohoʻomanawanui were discussing these things, Kākuhihewa himself had come to the uplands to gather some of the ʻawa that grew at Kahauone. Seeing the large house in which Kalelealuaka and his companions dwelled, he quietly drew near and overheard the conversation, curious about who these men were. He set a wooden image in the ground near the house to mark the area, and then departed, returning to Puʻuloa. Kākuhihewa thought about what he had heard, and the bold remarks that they would soon eat the favored eels of Hanaloa. Kākuhihewa spoke of this with his advisors and war leaders, some of whom suggested that a party go to the uplands to kill the impertinent youth.

Instead, Kākuhihewa sent to Waimānalo [ʻEwa] for his priest, Nāpuaikamao. Nāpuaikamao traveled to Koʻolina where Kākuhihewa was staying, and listened to the words of his chief, describing the youth and their conversation. Nāpuaikamao thought about their words, and the symbolism of the desire for the eels of Hanaloa, and discerned that one of the youth was the great warrior, Kalelealuaka, of Kauaʻi. Now at this time, Kākuhihewa was at war with a chief named Kūaliʻi, the two kings seeking to rule all of Oʻahu. Nāpuaikamao told Kākuhihewa, that it was Kalelealuaka who would bring victory to his side, and

that he should prepare a house for the youth and allow them to fulfill their desires.

Kākuhihewa agreed, and ordered preparations to be made. He then had his counselor, Maliuhaʻaino go to the uplands of Waipiʻo and invite Kalelealuaka and his companions to the shore…

May 21, 1870 (page 1)

Maliuhaʻaino arrived before the youth, and following a discussion, it was agreed that they would meet with Kākuhihewa… Descending to the coast, they passed the plain of Puʻunahawele. They then passed below Puʻukuʻua which is near the mountain ridge, and descended to the shore of Puʻuloa. Kalelealuaka and his companions were shown the houses and foods that had been prepared for them, and they took up residence at Puʻuloa…

[During this time, the identity of Kalelealuaka remained hidden from Kākuhihewa and his people. Because the king had heard Keinohoʻomanawanui speaking about his desire for the eels of Hanaloa, and because Keinohoʻomanawanui told people that he had been blinded in one eye by a spear, it was assumed that Keinohoʻomanawanui was the great warrior that they sought.]

With the passing of several periods of ten days [anahulu], a messenger from the king, Kūaliʻi, arrived bearing the message that Kūaliʻi challenged Kākuhihewa to a battle on the field at Kanalua [Kauālua], in Moanalua… The warriors met, and a great battle took place in which the champion of Kūaliʻi was killed. It was thought that Keinohoʻomanawanui [mistaken as being Kalelealuaka] had secured the victory for Kākuhihewa… During this battle, Kalelealuaka had stayed behind at Puʻuloa, and after the battle began, ran secretly with great speed to the battle ground, and killed Kūaliʻi's champion…

May 28, 1870 (page 1)

At each of the subsequent battles between the warriors of Kākuhihewa and Kūali‘i, Keinoho‘omanawanui was credited with, and accepted the honor of having defeated Kūali‘i’s champions. Because Kalelealuaka moved so swiftly, no one even saw him enter the battle field. Kalelealuaka had stayed behind at Pu‘uloa, and secretly entered into the battle, killing Kūali‘i’s champions, and taking their capes and feather helmets, with which he returned to Pu‘uloa, hiding the items in his house.

June 4, 1870 (page 4)

At the last battle between Kākuhihewa and Kūali‘i’s champions, the forces met near Waolani, and Kalelealuaka killed all of the warriors of Kūali‘i. Great honor was to be bestowed upon Keinoho‘omanawanui, but Kalelealuaka arrived before the assemblage and claimed the privilege. Kalelealuaka accused Keinoho‘omanawanui of deception, and challenged him to a fight to prove it. As quickly as the battle began, Keinoho‘omanawanui was killed, and Kalelealuaka took his head to Maliuha‘aino.

Seeing that all of his warriors had been killed, Kūali‘i, thought that his life too was forfeit, but Kalelealuaka invited him to live under Kākuhihewa, to which Kūali‘i agreed. The head of Keinoho‘omanawanui was taken to Pu‘uloa and then set atop an ‘a‘ā hillock above Kalauao… Kalelealuaka, Kākuhihewa and Kūali‘i, and their people lived out their days in peace…

10. Na Wahi Pana o Ewa i Hoonalowaleia i Keia Wa a Hiki Ole ke Ikeia (Storied Places of ‘Ewa, That are now Lost and Cannot be Seen)

Between June 3, 1899 and January 13, 1900, the Hawaiian newspaper *Ka Loea Kalaiaina* published a series of articles titled “Na Wahi Pana o Ewa i Hoonalowaleia i Keia Wa a Hiki Ole ke Ikeia,” which can be translated to “The noted places of ‘Ewa that have been forgotten at this time and can no longer be seen.” The author of the series is not identified, but it is a

rich resource of traditions, named places and history of the district. Excerpts pertaining to Honouliuli as published in various issues are presented below. A careful review of the original Hawaiian texts has been made and the translations compiled with reference to notes developed by Mary Kawena Pukui.

Ka Loea Kalaiaina

Na Wahi Pana o Ewa i Hoonalowaleia i Keia Wa a Hiki Ole ke Ikeia

Ianuali 13, 1900 (aoao 1)

Aia no i keia aina kekahi puu kaulana o Puuokapolei, i keia wahi i noho ai o Kamauluaniho me kana moopuna me Kekeleaiku, kaikuaana o Kamapuaa. Mahope iho oko lakou haalele ana ia Kaliuwaa Kaluanui Koolauloa. Aole nae au e kamailio iki ae a e hoi au no Puuokaplei.

Ina e hele ana kamahele ma ke alanui aupuni no Waianae, aia a haalele ia Honoulluli ke kulanakauhale o ke Gula, e loaa mua mai ana ia ia ke kula o Puuainako, a hala ia, hele mai o Keoneae, alaila, pii aku no i ka piina o ka Puuokapolei, a ilaila, haliu ae oe a nana makai o ke alanui aupuni e ku ana ua wahi puu ala ia, oia hoi o Puuokapolei, na keia wahi puu i alai ia Ewa, ke huliaku hoi oe ma kela

January 13, 1900 (page 1)

[Honouliuli] There is on the land a famous hill, Puuokapolei. It was at this place that Kamauluaniho lived with her grandson, Kekeleaiku, the older brother of Kamapuaa. This was after they left Kaliuwaa, Kaluanui at Koolauloa. I did not speak much earlier about it so I will return to Puuokapolei.

If a traveler should go along the government road to Waianae when he leaves Honouliuli, the city of Gold, he will first come to the plain of Puuainako (Mounds of cane debris), and passing from there, arrive at Keoneae (The fine soil or cinder), and then from there shall go straight the ascent to Puuokapolei (Hill of Kapolei). Then when you look around, towards the shore side of the government road, this is the hill. It is

aoao o Waimanalo pau kou ike ana ia hope nei, hele aku he mau hoalu liilii a holo aku oe he kula, o keia kula, oia ke kula o Pukaua [Puʻukaua], aia mauka io ke alanui e ike ai oe he pohaku nui e ku ana i ke kula. Eia kahi moolelo i kaulana ai kela kula.

Puuokapolei. When you go to the side towards Waimanalo, you see no more of the sight back here. This hill shields/blocks Ewa from view. When you are done, you go down a little on the plain. This plain is the kula of Puukaua. It is there above the government road that you will see a large stone situated on the plain. Here is a famous story of this plain land.

He wahi luahine kupua, a i ole ia he mau luahine hooehaa, he mau wahi luahine hahapaiea paha, no laua o Puukaua; ia laua i kai o Kualakai i ka lawaia i ke ahiahl, i kai no laua a i ka lawaia a wanaao hoi mai. Eia ka laua mau wahi iʻa, he Aama ua iʻa, he Pipipl ua iʻa, a me na ano iʻa like ole apau e loaa aku ana i ko laua nei mau lima. Ia laua nei e hoi ana i ke kula mai kahakai mai, me ko laua manao ana la e hiki poeleele aku ana la laua i kauhale, aole nae pela. Ua halawai laua me ka maka paa, oiai, laua e hookokoke aku ana i ua kula ala, ua malamalama loa ae la,a ua hiki ke ike ia aku na kanaka ke hele ae, a eia no nae laua nei ma kai o ke alanui e hoi nei, a no ko laua nei

There were some supernatural women, or peculiar women who possessed strange powers, they were of Puukaua; they would regularly go down to the shore of Kualakai to go fishing in the eveing. The would stay at the shore fishing until early morning. Here are the things they would catch, Aama crabs, pipipi shellfish, and all manner of fish, whatever they could catch with their hands. As they were returning to the plain from the shore and thinking of getting home before morning came, that it would still be dark. But it was not so. They met a blind person as they were getting close to the plain and it was getting light, and they could be seen by the people that were

makau o ike ia laua e na kanaka.

traveling by. They were still on the shoreward side of the trail, and they were afraid of being seen by people.

Ia wa ua hoomaka mai la laua e holo, oia holo ko laua nei, oia lele, a hina a palaha eia no nae, ala no holo no, a helelei aku la ka Aama a me ka limu, aohe nae he nana ia iho. Aia ka pono o ke kaa aku mauka o ke alanui, eia nae ua pale pono, oiai, ua ao loa ae la. I kela wa olelo aku la kahi luahine i kahi luahine o laua:

They then started running, and as they ran, they lept, fell and sprawled out, and their Aama, and limu all scattered about, but they took no care. Then one old woman said to the other of them:

"E pee kaua, o ike ia mai auanei kaua e na kanaka?" a o ko laua nei pee iho la no ia. Lilo koke ae la ko laua kino i kino pohaku. A oia ke kaulana o keia kula i keia kino pohaku a hiki loa mai i keia wa.

"Let us hide, unless were be seen by the people." And so they hid. Their bodies were then turned into a stone body. Their stone body is one of the famous things on this plain to the present day.

O keia ka pau ana o ko laua moolelo. O ke kaahele malahini ana a hiki ia kula, aole no he hewa ke alawa ae mauka o ke alanui i ike ia laua i ke ku mai a i ke kula.

This is the end of their story. So when one visits the plain, there is nothing wrong with glancing above th etrail to see them standing there on the plain.

E nee mai kakou i Puuokapolei. O keia pu kekahi puu kaulana loa i ka wa kahiko. Mai keia puu mai i haku

Let us go on to Puu-o-Kapolei. This was one of the most famous hills in ancient times. It is from this hill that

ia ai kekahi mele i kamaaina i ka poe lealea o ka wa kahiko, ua haku ia apuni Oahu nei, a ma ia mele e oli ai ka poe Pukaula a me ka poe Ukeke laau, ka poe kimo pohaku, hua Noni, hua kukui paha.	chant was composed by the natives, and those who were skilled in the games of olden times. It was composed to go around the Oahu. It was with this chant that the people who played pukaula (a guessing game) and those who played the wooden ukeke (a native bow string instrument), and those who juggeled stones, noni fruit or kukui nuts.
Ua helu ia ka inoa o keia mele ma kainoa o ka aina, a oia ka'u e panee aku nei imua o ka poe aole i loaa a paa naau i neia mele. E like me na mele kahiko i loaa ole i kekahi poe, a loaa hoi kahi i kekahi poe:	This was a chant to recount land names, and I present it before the people, who may not have it memorized. It is like the old chants that are not known by some people, though it is familiar to other people [the chant is presented in a riddle stylem, stating a question and answering it by speaking the place name]:
E Kawelo e, e Kawelo — e	O Kawelo, o Kawelo — e
E Kawelo mainui o Puuokapolei	Kawelo with the large genitals, of Puu-o-Kapolei.
O Puuokapolei—	It is Puuokapolei.
Uliuli ka Poi a kaua e ai nei –	The poi that we eat dark —
O Honouliuli	It is Honouliuli
Aeae ono—a Paakai e hoaeae	Fine and delicious is the salt of Hoaeae
O Hoaeaee	It is Hoaeae

Pikele, Pikele ka i'a e Waikele—	Tiny and numerous are the fish of Waikele —
O Waikele	It is Waikele
Ka Hale pio ka hua moa —	A House arched like an egg —
O Waipio	It is Waipio
E ku a ai kaua i ka Ia loko awa —	Stop and eat of the awa fish —
O Waiawa	It is Waiawa
Mai hoomanana ia kua —	Let us not spread out the limbs —
O Manana	It is Manana
Kini kahawi he lau he mano —	Many streams, hundreds and thousands —
O Waimano	It is Waimano
Ko ia kaua e ke au —	We two are drawn in by the currents
O Waiau	It is Waiau
Kukui malumalu o kaaua [kaua] —	We two are in the shade of the kukui trees —
O Waimalu	It is Waimalu
E ala kaua ua ao —	Let us get up for it is day —
O Kalauao	It is Kalauao
E kipa kaua e ai —	Let be hosted to eat —
O Aiea	It is Aiea
Mai hao halawa ia kaua —	We two were almost plundered —
O Halawa	It is Halawa
E hoi kaua e noho i ka lua —	Let us two go and dwell in a pit —
O Moanalua	It is Moanalua
Hooipoipo hau kaua —	We make love in the hau —
O Kahauiki	It is Kahauiki
E pii kaua i ka lama —	Let us go up to the lama trees —
O Kapalama	It is Kapalama
E nunu a haawe kaua —	Let us two make a bundle and carry

	it—
O Honolulu	Honolulu
Kiki kuoha ilaila —	Spurting there —
O Waikiki	It is Waikiki
Kike ka hua a kaalae —	Cracked is the egg of the mud hen
O Waialae	It is Waialae
He wahine hoolupe keia —	This is a woman who flies a kite —
O Wailupe	It is Wailupe
Mauna kuu hoa i ka lua —	My companion bruised in a pit —
O Maunalua	It is Maunalua
He wahine heekoko keia —	This is menstruating woman —
O Koko	It is Koko
Puo ka lau o ka niu —	Gathered are the leaves of the coconut
O Niu	It is Niu
Pauma na waa i ke kai —	Plying the canoes in the sea —
O Hanauma	It is Hanauma
He wahine makapuu keia —	A pop-eyed woman is she
O Makapuu	It is Makapuu.

E na hoa e kala mai oukou iaʻu. O keia ae la kahi i paa iaʻu o keia mele, a he mea nui no hoi i na hanaua hou, ka loaa ole ana o na mea kahiko…	My friends, pardon me for this is. This is that is known to me of the chant. This may be an important thing for the new generation who may not receive the things of old.
E waiho kakou i na wahi pana o Honoluliuli i koe aku a hiki i ka kupono.	Let us not leave the other storied places of Honouliuli until a time when it appropriate.
E nee mai ana kakou i Hoaeae, aia	We are now moving to Hoaeae, Waihi

ilaila o Waihi a aia no ma ia wahi i ka huli e nana iho ana i ke alahao he wahi Owawa, ua pili loa i ke alahao. Oia kahi i make ai o ka Moi Oahu nei, oia o Kahahana.	is there. This place is found by looking down towards the rail line, is it a gulch adjoining the railway track. It is the place where the King of Oahu, Kahahana, died.
Ua olelo ia o Kahahana he keiki hookama na Kahekili, ke alii o Maui, a i ole he keiki no paha na Kahekili. O ka nohoalii ana o Kahahana he nohoalii ino, he hookuli, a hoopale i na olelo ao a ke kahuna, na kakaolelo, a me na kuhikuhi puuone…	It is said that Kahahana was an adopted son of Kahekili, the King of Maui, or perhaps the own son of Kahekili. The rule of Kahahana was an evil rule. He ignored and rebuked the advise of his priests, counselors, and those who interpreted the nature of the land…

11. Ka Moolelo Hawaii – O kekahi mau mea i manao nui ia o ke kupapau (Hawaiian History – Some Things which are of Importance Pertaining to the Dead)

Care for the dead (kupapaʻu), respect of the graves (ilina) and traditions associated with the spirit after death are subjects of great significance to Hawaiians – past and present. In his history of the Hawaiian people, Samuel M. Kamakau shares a collection of traditions and practices pertaining to the dead and identifies some of the places of importance in these practices. These narratives are of particular importance to lands and specific wahi pana of Honouliuli and are connected across the landscape to Moanalua.

Ke Au Okoa
O kekahi mau mea i manao nui ia o ke kupapau.

ʻOkakopa 6, 1870 (aoao 1, helu 43)

…Hookahi anahuna kaulana ma Oahu. O Pohukaina ka inoa, aia ma ka pali o

Kanehoalani mawaena of Kualoa a me Kaaawa, aia ka puka i manao ia ma ka pali o Kaoio e huli la i Kaaawa, a o ka lua o ka puka, aia ma ka punawai o Kaahuula-punawai. He anahuna alii keia, a he nui ka waiwai huna iloko a me na'lii kahiko. O Hailikulamanu, oia kekahi puka, aia a kokoke makai o ke ana Koluana i Moanalua, aia ma Kalihi, ma Puiwa, oia na puka ekolu o Pohukaina ma Kona, a o Waipahu ma Ewa, aia ma Kahuku i Koolauloa kekahi puka, a o kauhuhu o kaupaku o keia hale anahuna, oia no ka mauna o Konahuanui a iho i Kahuku. Ua olelo ia ma ka moolelo a kanaka, ua nui ka poe i komo iloko me na ihoiho kukui, mai Kona aku nei a puka i Kahuku…

A maloko o keia anahuna, he mau halokowai, he mau muliwai a mau kahawai, ua hana kinohinohi ia, a ma kauwahi aku, he mau aina palahalaha...

Na uhane mahope o ka make ana o ke kino.

…O ke ao kuewa; a o ke ao auana kekahi inoa; I ka make ana o ke kanaka kuleana ole, ua auana kuewa hele kona uhane me ka lalau hele i ka nahelehele, a ua hele wale i [Kamaomao], a i ka wiliwili o Kaupea, a hiki kona uhane i Leilono, aia malaila ka Uluolaiowalo; a i loaa ole kona uhane aumakua i maa mau ia ia, a aumakua kokua hoi, alaila, e lele kona uhane ma ka lala ulu popopo a haule ilalo lilo i ka po pau ole i o Milu la…

O Leiolono; Oia kekahi wahi e make ai na uhane i ka po pau ole. Aia o Leiolono kokoke i ka pohaku o Kapukaki a ma nae aku, e kupono ana i puu hoilina kupapau o Aliamanu, a huli i ka aoao akau o Hokupaa, aia ma ke kapaluna o ke alanui kahiko, aia he hapapa pahoehoe pohaku, aia maluna he wahi ponaha, he alua paha kapuai ke anapuni, oia ka puka e iho ai ilalo, o ka nuu ia o Papa-ia-Leka he ao aumakua ia wahi, aia ma ka puka e iho ai o ka puka o Leiolono, he ulu o Leiwalo, elua lala ma ka hikna kekahi a ma ke komohana kekahi, he mau lala ulu hoopunipuni keia, a o kekahi lala niu, he lala e lele ai i ka po pauole, a o ka lua o ka lala ulu, aia a kokua ia mai e ka uhane aumakua kokua, alaila, e

ike auanie maia ao aumakua, i na kupuna i olelo ia o Wakea a me ka huina kupuna a pau, a me ko ke ao holookoa e hele nei, i ka lakou huakai; a o kekahi hapa, aia ma kela lala ulu hoopunipuni i ka po pauole. O ka palena o Leilono, o Kapapa-kolea ka palena hikina, he peelua nui launa ke kiai hikina o Koleana; a o Napeha ka palena komohana, a he moo ke kiai malaila, a i makai i keia mau kiai, alaila hoi hou i hope, a i kokua hou ia e na uhane aumakua, alaila, ua hou, a ua alakai ia i ke ao aumakua.

A i makau i ka peelua e alai ana i ke alanui mai kela aoao mai o Alia, kiei ke poo ma ka pali o Kapakolea, alaila makau ke uhane a auwana, a pili aoao ma ke kahawai ma ka hale hana ili, aole he alanui aupuni mamua, aka, he alanui kamaaina no Kauhilaele, a ua oleloia aia a komo ka auwana maloko o na palena, he make wale no kona uhane, a o ke lele i ka po pau ole; aka, ua oleloia ua ola mai no kekahi poe uhane auwana ke loaa i na uhane aumakua kokua, a o ka poe kokuaole, e make no i ka po pauole, a i o Milu la. Aia ma ke kula o Kaupea, ma ke kaha o Puuloa, e hele ai na uhane auwana e poipoi pulelehua, a e poipoi nanana, oiai aole e hele loa na uhane auwana i na wahi i olelo ia mamua, a i loaa paha i na uhane aumakua e poipoi nanana ana, a ua hoopakeleia, a o ka poe uhane kokua ole, he poe uhane haukae lakou, a mai ka wiliwili i Kaupea, i Kanehili, he nui no na wahi i oleloia ma keia inoa. O Kaleia-a-kauhane [Ka-leina-a-ka-uhane], a me ka Ulu o Leiwalo, aia ma Hawaii, ma Maui, ma Molokai, ma Lanai, ma Kauai a me Niihau, hookahi no moolelo like no keia mau wahi…

Translation — Hawaiian History:
Some things which are of importance pertaining to the dead.

There is only one famous hiding cave [ana huna] on Oahu. It is Pohukaina. The opening on Kalaeoka'o'io that faces toward Ka'a'awa is believed to be in the pali of Kanehoalani, between Kualoa and Ka'a'awa, and the second opening is at the spring Ka'ahu'ula-punawai. This is a burial cave for chiefs, and much wealth was hidden away there with the chiefs of old. On the Kona side of the

island the cave had three openings, one at Hailikulamanu—near the lower side of the cave of Keleana in Moanalua—another in Kalihi, and another in Pu‘iwa. There was an opening at Waipahu, in Ewa, and another at Kahuku in Ko‘olauloa. The mountain peak of Konahuanui was the highest point of the ridgepole of this burial cave house, which sloped down toward Kahuku. Many stories tell of people going into it with kukui-nut torches in Kona and coming out at Kahuku. Within this cave are pools of water, streams, creeks, and decorations by the hand of man (hana kinohinohi‘ia), and in some places there is level land (Kamakau, 1964:38).

The leina a ka ‘uhane on Oahu was close to the cape of Ka‘ena, on its right (or north, ‘akau) side, as it turns toward Waialua, and near the cutoff (alanui ‘oki) that goes down to Keaoku‘uku‘u. The boundaries of this leina a ka ‘uhane, it is said, were Kaho‘iho‘ina-Wakea, a little below Kakahe‘e, and the leaping place (kawa-kai) of Kilauea at Keawa‘ula. At these places would be found helpful ‘aumakua souls who might bring back the spirit and restore life to the body, or if not, might welcome it to the realm of the ‘aumakua. Places within the boundaries mentioned were where souls went to death in the po pau ‘ole, endless night.

Leilono at Moanalua, Oahu, was close to the rock Kapukaki and easterly of it (a ma ka na‘e aku), directly in line with the burial mound of Aliamanu and facing toward the right side of the North Star (a huli i ka ‘ao‘ao ‘akau o ka Hokupa‘a). On the bank above the old trail there was a flat bed of pahoehoe lava, and on it there was a circular place about two feet in circumference. This was the entrance to go down; this was the topmost height (nu‘u) of Kapapaialaka, a place in the ‘aumakua realm. Here at the entrance, ka puka o Leilono, was a breadfruit tree of Leiwalo, he ‘ulu o Leiwalo. It had two branches, one on the east side and one on the west.

These branches were deceiving. From one of them, the soul leaped into the po

pau ‘ole; if he climbed the other, it would bring aid from helpful ‘aumakua (‘aumakua kokua). From that branch the soul would see the ‘aumakua realm and the ancestors spoken of, Wakea and all the rest, and those of the entire world who had traveled on this same journey.

The boundaries of Leilono were, Kapapakolea on the east, [with] a huge caterpillar (pe‘elua nui) called Koleana as its eastern watchman, and the pool Napeha on the west, with a mo‘o the watchman there. If the soul was afraid of these watchmen and retreated, it was urged on by the ‘aumakua spirits, then it would go forward again and be guided to the ‘aumakua realm. If a soul coming from the Alia (Aliapa‘akai) side was afraid of the caterpillar, whose head peered over the hill Kapapakolea, and who blocked the way, it would wander about close to the stream by the harness shop. This was not the government road (alanui aupuni) of former times, but was a trail customarily used by “those of Kauhila‘ele” [figuratively, the common people; the la‘ele, old taro leaves, as contrasted with the liko, the new and choicer leaves—that is, the chiefs]. It was said that if a [page 48] wandering soul entered within these boundaries it would die by leaping into the po pau ‘ole; but if they were found by helpful ‘aumakua souls, some wandering souls were saved. Those who had no such help perished in the po pau ‘ole of Milu.

On the plain of Kaupe‘a beside Pu‘uloa, wandering souls could go to catch moths (pulelehua) and spiders (nanana). However, wandering souls would not go far in the places mentioned earlier before they would be found catching spiders by ‘aumakua souls, and be helped to escape. Those souls who had no such help were indeed friendless (he po‘e ‘uhane hauka‘e lakou), and there were many who were called by this name, po‘e ‘uhane hauka‘e.

There were Leina-a-ka-‘uhane and ‘Ulu-o-Leiwalo on Hawaii, Maui, Molokai, Lanai, Kauai, and Niihau as well as on Oahu. The traditions about these places were the same. They were where spirits were divided (mahele ana) to go into

the realm of wandering spirits, the ao kuewa or ao ʻauwana; or to the ancestral spirit realm, the ao ʻaumakua; or to the realm of endless night, the po pau ʻole.

The places said to be for wandering spirits were: Kamaʻomaʻo for Maui; Uhana [Mahana] at Kahokunui for Lanai; Maʻohelaia for Molokai; Mana for Kauai; Halaliʻi for Niihau; in addition to Kaupeʻa for Oahu. In these places the friendless souls (ʻuhane makamaka ʻole) wandered (Kamakau, 1964:48-49, M.K. Pukui, translator).

12. Alahula Puʻuloa, he Alahele na Kaʻahupāhau (The Swimming Trails of Puʻuloa [Pearl Harbor], are the Trails Traveled by Kaʻahupāhau)

In 1870, Kamakau wrote about several practices and beliefs pertaining to manō (sharks) in ancient life. One practice of note in the Puʻuloa region was the practice of transforming deceased family members into manō as ʻaumākua (family gods/guardians). These family ʻaumākua would help their relatives when in danger on the sea—if a canoe capsized or a man-eating shark was threatening attack. Hawaiians also worked with and tamed manō so that one could ride them like a horse, steering them to where one wished to go (S.M. Kamakau, 1976). Kupuna Mary Kawena Pukui shared that there were two basic classes of sharks — manō kānaka (sharks with human affiliations) and manō iʻa (wild sharks of the sea–man eaters). The manō kānaka were revered and cared for, while the manō iʻa were at times hunted and killed following ceremonial observances (M.K. Pukui, pers. comm., 1976). The practice of chiefs hunting sharks using the flesh of defeated enemies or sacrificial victims as kūpalu manō (shark fishing chum) and of commoners using rotted fish as kūpalu manō are further described in several historical narratives.

Ke Awalau o Puʻuloa (the many bays of Puʻuloa) are famed in traditional and historical accounts of manō. The traditions center around the several deified sharks, foremost of whom is the goddess, Kaʻahupāhau, then followed several others, including but not limited to Kahiʻukā, Kūhaimoana, Komoawa, Kaʻehuikimanōopuʻuloa, Keliʻikau-o-Kaʻū (Kealiikauaokaʻū) and Mikololou. With the exception of Mikololou, all these shark gods were

friendly to people, and dedicated to keeping manō iʻa out of the Puʻuloa-ʻEwa waters, and protecting people.

Traditions of Ke Awalau o Puʻuloa tell us that one of the most important kānāwai (laws) governing manō was that they would not attack humans. This kānāwai was created by the shark gods themselves. Kamakau wrote about the establishment of this kānāwai stating that:

> Oahu was made a kapu land by this kanawai placed by [the shark gods] Kanehunamoku and Kamohoaliʻi. But their sister Kaʻahupahau broke the law and devoured the chiefess Papio. She was taken and "tried" (hoʻokolokolo) at Ulukaʻa [the realm of these gods], but she escaped the punishment of death. It was her woman kahu who paid the penalty of the law because it was her fault—she reviled Papio. The trouble arose over a papahi lei of ʻilima flowers which belonged to Kaʻahupahau that her kahu was wearing. [The kahu refused to give it to Papio, and] Papio said, "I am going bathing, but when I come back you shall be burned with fire." But Kaʻahupahau devoured Papio before she could carry out her threat, and she was punished for this. That is how Puʻuloa became a [safe] thoroughfare (alahula). After her confinement ended several years later, Kaʻahupahau was very weak. She went on a sightseeing trip, got into trouble, and was almost killed. But she received great help from Kupiapia and Laukahiʻu, sons of Kuhaimoana, and when their enemies were all slain, the kanawai was firmly established. This law—that no shark must bite or attempt to eat a person in Oahu waters—is well known from Puʻuloa to the Ewas. Anyone who doubts my words must be a malihini there. Only in recent times have sharks been known to bite people in Oahu waters or to have devoured them; it was not so in old times (Kamakau, 1964:73, M.K. Pukui, translator).

Several place names commemorate the shark gods of Puʻuloa. Among them are three recorded in the *Saturday Press* of December 29, 1883 (page 6):

> **Keaalii** A cave in the sea at the entrance to Puuloa harbor, and known by the natives to have been formerly the home of a large shark

called Komoawa, who has been generally credited as the watchman on guard at the entrance of Kaaahupahau's waters. The latter's royal cave-dwelling was in the Honouliuli lagoon.

Kuhia loko Waiawa. Named for one of the attendants/purveyors of the shark goddess, Kaahupahau.

Kuhia waho Waiawa. Named for one of the attendants/purveyors of the shark goddess, Kaahupahau.

Nahu-Papio or Ka-nahuna-Papio (The biting or shredding of Papio) (*Ka Loea Kalaiaina*, 1899-1900), is found along the shore of the Waipiʻo Peninsula, south east of Hōmaikaiʻa or Walker Bay (Register Map No. 322) (Figure 8). This place name identifies the location where Kaʻahupāhau killed Papio.

The role of Kaʻahupāhau as a goddess and guardian in the waters of the Puʻuloa bays remains alive in the minds of natives in the ʻEwa District. Her brother Kahiʻukā (The smiting tail) is also remembered and it is said that with his great tail, Kahiʻukā was responsible for destroying any foreign sharks "that offended his sister" Kaʻahupāhau (Pukui, 1943:57-58). His cave is reported in several locations, including Drydock No. 1, between Mokuʻumeʻume and Keanapuaʻa, and another in the Waiawa Estuary. The cave, destroyed in the construction of Drydock No. 1, was once his home.

Another locational reference to a cave, and the home of Kaʻahupāhau, is found in the cartographic records of the Kingdom, cited on Register Map No. 322 (J. Lidgate/Lydgate, surveyor, 1873). On the map, the cave is dentified as "Shark's Den" along the Honouliuli shoreline of the West Loch, a short distance inland from the old boundary wall between the ʻili of Puʻuloa and the larger ahupuaʻa of Honouliuli. These storied places are a part of the fabric of Hawaiian history and breathe life into the traditions of old.

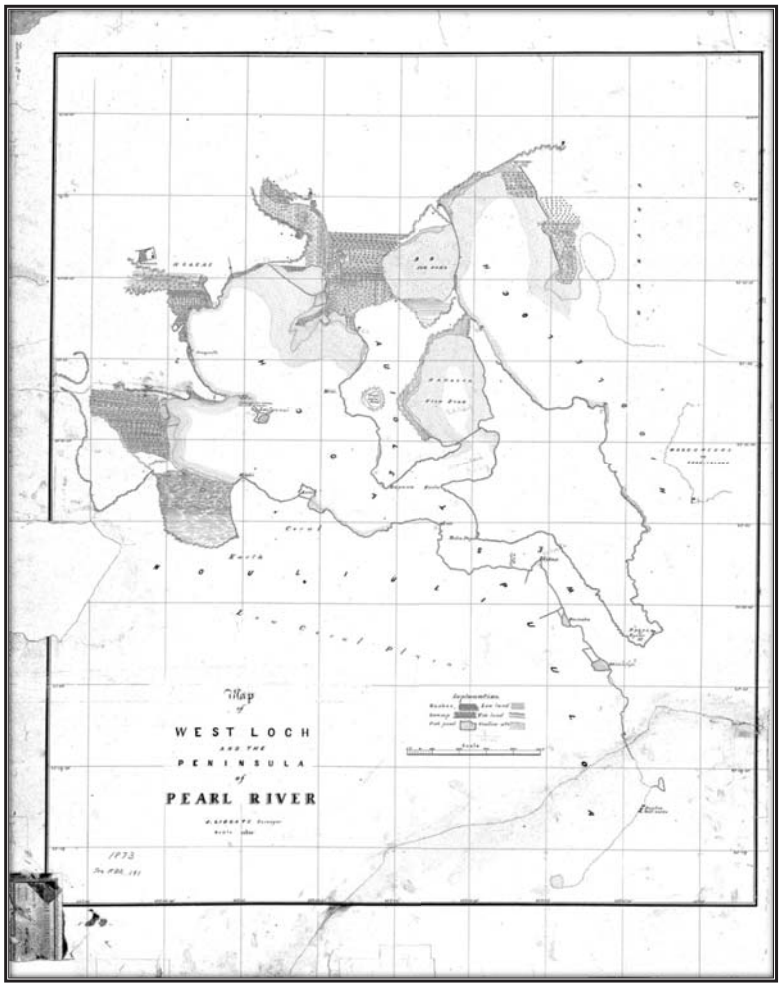

Figure 8. Map of the West Loch and the Peninsula of Pearl River (Hawaiian Government Survey, Registered Map No. 322 by J. Lidgate, 1873)

In addition to the traditions of Ka'ahupāhau, two other accounts center around the nature of sharks in the 'Ewa District and battles that were fought to kill offending sharks. In the early 1820s, members of the Protestant mission station traveled to the 'Ewa District and learned something about the shark gods of Pu'uloa.

Hiram Bingham accompanied King Kamehameha II (Liholiho), the royal family and attendants to 'Ewa in 1823, where they stayed near the shore of Pu'uloa. During the visit, the King and party, along with Bingham, visited the dwelling place of a noted shark god. The name of the god was not recorded in Bingham's journal, though one must infer that it was either the goddess Ka'ahupāhau or her brother, Kahi'ukā. Bingham wrote:

> I one day accompanied the King [Liholiho] and others by boat to see the reputed habitation of a Hawaiian deity, on the bank of the lagoon of Ewa. It was a cavern or fissure in a rock, chiefly under water, where, as some then affirmed, a god, once in human form, taking the form of a shark, had his subterraqueous abode. Sharks were regarded by the Hawaiians as gods capable of being influenced by prayers and sacrifices, either to kill those who hate and despise them or to spare those who respect and worship them. It had been held that, when a mother gave her offspring to a shark, the spirit of the child dwelt in it, and the shark becoming an akua, would afterwards recognize and befriend the mother on meeting her, though ready to devour others… (Bingham, 1969:177)

Later in January 1825, Elisha Loomis also traveled to 'Ewa and stayed along the Pu'uloa shore (Loomis Journals, Jan. 18, 1823, in Westervelt, 1937). During his visit, Loomis learned the name of the shark goddess who protected the waters of the Pearl Harbor region and also reported hearing about a war between the good sharks and those who sought to eat human flesh. It will be noted that due to his limited Hawaiian language skills, Loomis apparently transposed she for "he" in his journal.

> After supper I conversed with them a long time on the subject of religion…

> during the conversation one of them mentioned that in former times there dwelt at Puuloa a famous shark named Ahupahau. He had a house in the hole of a rock. He was one their gods. On one occasion a strong shark 3 or 4 fathoms long came into the channel to make war upon the sharks and upon the natives that dwelt there. Ahupahau immediately communicated to the natives information advising them to get a net out and secure him. They took the hint and spread their nets, and in a little time the stranger was captured.

Loomis's reference to a "war" between an invading shark coincides with the traditions of Ka-'ehu-iki-manō-o-Pu'uloa (Uaua, 1870-1871), Mikololou and Keali'ikauaoka'ū (*Home Rula Repubalika*, 1902), in which battles between sharks are fought in order to protect the people of the 'Ewa region from attacks by manō i'a.

J.S. Emerson presented a paper titled "The Lesser Hawaiian Gods" before the Hawaiian Historical Society on April 7, 1892. In this report are details of Ka'ahupāhau, Kahi'ukā and Mikololou in the history of 'Ewa and the waters of Pu'uloa:

> One reason for the affection shown to the shark aumakua was the fact that so many of them claimed human parentage, and were related by ties of kinship to their kahus. Such was the case with Kaahupahau and her brother Kahi'uka, the two famous shark-gods of the Ewa Lagoon on this island. Their birth and childhood differed in no essential features from that of other Hawaiian children up to the time when, leaving the home of their parents, they wandered away one day and mysteriously disappeared. After a fruitless search, their parents were informed that they had been transformed into sharks. As such, they became special objects of worship for the people of the districts of Ewa and Waianae, with whom they maintained pleasant relations, and were henceforth regarded as their friends and benefactors. After a time the man-eating shark, Mikololou, from the coast of the island of Maui, paid them a visit and enjoyed their hospitality until he reproached them for not providing him with his favorite human flesh. This they indignantly refused to

give, whereupon, in spite of their protest, he made a raid [page 10] on his own account upon the natives, and secured one or more of their number to satisfy his appetite. Kaahupahau and her brother promptly gave warning to their friends on shore of the character of this monster that had invaded their waters. To ensure his destruction they invited their unsuspecting guest to a feast made in his honor at their favorite resort up the Waipahu river. Here they fed him sumptuously, and at length stupefied him with the unusual amount of awa which they supplied him. While he was in this condition, their friends, who had come in great numbers from the surrounding country, were directed to close up the Waipahu river, which empties into the Ewa Lagoon, with their fish nets, brought for the purpose, while they attacked him in the rear. In his attempt to escape to the open sea he broke through one net after another, but was finally entangled and secured. His body was then dragged by the victorious people on shore and burned to ashes, but a certain dog got hold of his tongue, and, after eating a portion, dropped the remainder into the river. The spirit of the man-eater revived again, and, as a tongue, now restored and alive, made his way to the coasts of Maui and Hawaii, pleading with the sharks of those waters for vengeance upon the sharks of the Ewa Lagoon. They meantime secured the aid of Kuhaimoana and other notable sharks from the islands of Kaula, Niihau, Kauai, and Oahu. A grand sight it was to the numerous spectators on the shore when these mighty hosts joined in combat and began the great shark-war. It was a contest of gods and heroes whose exploits and deeds of valor have long been the theme of the bards of the Hawaiian Islands… [I]n the first great battle the friends and allies of the cruel man-eater were touted by the superior force of their opponents, which the good Kaahupahau and her brother long continued to enjoy the affectionate worship of their grateful people. It is said that she is now dead, while her brother Kahiʻuka still lived in his old cave in the sea, where he was visited from time to time by his faithful kahu, Kimona, now deceased. Sometimes Kimona missed his fish nets, when he was pretty sure to find that Kahiʻuka had carried them to a place of safety, to preserve them from destruction by hostile sharks (Emerson, 1892:10-11).

Mary Kawena Pukui wrote about visits she made to ʻEwa and the Puʻuloa region in 1907. She observed that the name "Kaʻahupāhau" could be translated as "Cloak well cared for;" her place in the history of the land is commemorated in the saying, "Alahula Puʻuloa he alahele na Kaʻahupahau, Everywhere in Puʻuloa is the trail of Kaʻahupahau" (Pukui, 1943:57).

13. He Moolelo Hawaii – No na Aumakua Moo
(Hawaiian History – About the Moʻo Guardians/Ancestral Gods)

This excerpt from "A History of Hawaiʻi" introduces the moʻo (water spirit) goddess, Kānekuaʻana. It was to her that the heiau waihau (heiau specifically for moʻo spirits) were established along the Puʻuloa lochs to ensure the abundance of various fisheries, particularly the pipi, nahawele, mahamoe and other bivalve species for which ʻEwa's inland fisheries were famed. Among the kapu (restrictions) of Kānekuaʻana was that fisher-people needed to be very quiet when going to sea to gather the pipi (pearl oysters) and bivalves. The slightest voice would cause the wind to blow, thus making the pipi and other bivalves sink deep into the sands where they would be difficult to find.

It is because of this kapu associated with Kānekuaʻana that the famous saying of ʻEwa, "ka i-a hamau leo o Ewa," came into being.

Ka Nupepa Kuoakoa
No Na Aumanua Moo – About the Moo Guardians/Ancestral Gods

He Moolelo Hawaii (Mokuna VII.)	Hawaiian History (Chapter VII)
Mei 20, 1893 (aoao 1)	**May 20, 1893 (page 1)**
…Kanekuaana ko Ewa moo kiai, hilinai nui ko Ewa poe kamaaina iaia, mai Halawa a Honouliuli. Ina e pilikia i ka ia, hoeu like na kanaka i	…Kānekuaʻana is the moʻo [water spirit] guardian of ʻEwa; many of the natives of ʻEwa, from Hālawa to Honouliuli followed [believed] in her. If there was

na waihau e pili ana iaia, a o ka ho-a no ia o ke ahi e hoala i ka pomaikai o ka aiona. O ka Pipi ka ia kaulana o Ewa. Aole e hala na mahina eono e ku ai ka lala hau ua piha ka aina i ka Pipi, mai Namakaohalawa a na pali o Honouliuli, mai na kua-pa o uka a na pa akule [Pākule]; mai ka hohonu a ka papa nahawele o kula; mai kaliawa a ka pohaku ona loko a pela aku.

trouble with the fishing, the people dedicated her temple [Waihau] with the lighting of a fire to bring about blessings upon the land. The pipi [pearl oyster] is the famous fish of ʻEwa. Before six months would pass the hau branches would take hold, and the land would be filled with the pipi, from Nā-maka-o-Hālawa to Honouliuli, from the inland pond walls to the Pā-akule. From the depths to the nahawele reefs and flats. From the channel inlet to the stone-lined ponds, and so forth.

Aia maloko o ka io o ka Pipi momi nani, e like ka nunui me ka onohi ia; he onohinohi keokeo kekahi, ua kapaia he muhee kea; onohinohi ulaula kekahi me he anuenue la, he muhee makoko ia. He liilii a nunui kekahi; a he waiwai kumukuai nui ko ia mea.

There is within the flesh of the pipi a beautiful pearl, its size is similar to the eyeball of a fish. Some are like the shiny white of an eye, and are called mūheʻe kea. Others are shiny red, like a rainbow, and are called mūheʻe mākoko. Some are small and others are larger, and they are highly valued.

O ka Opaehuna a Opaekala kekahi ia; paapu mailoko o ke kai a na loko kua-pa a no loko puuone.

The ʻōpae huna and ʻōpae kala [types of shrimps] are other fish, that are in the sea, the walled ponds, and dune banked ponds.

O ka nehu pala kekahi ia; piha mai ka nuku o Puuloa a uka o na Ewa, pela me na nuku awalau a pau; no

The nehu pala is another fish which fills the waters from the entrance of Puʻuloa to the coastal flats of ʻEwa. It is the same

laila ka olelo ia ana:

with all of the lochs (awalau). This is why the saying is told:

"He kai puhi nehu puhi lala
Ke kai o Ewa—e.
E noho i ka lai o Ewanui—
A Laakona—a."

"Nehu appear to be blown upon the sea, causing the water to shine
It is the sea of ʻEwa,
Dwelling in the calm of great ʻEwa, of Laʻakona"

He Mahamoe kekahi ia kaulana, a he Okupe a mau ia e ae no kekahi. A ina i ike ia keia mau ia a pau alaila, eia ka olelo a na pulapula:

The mahamoe is another famous fish, and the ʻōkupe, another, and there are others. And if all these fish are seen there, here are the words of the natives of the land:

"Hoi mai nei ua luahine nei mai na kukulu mai o Kahiki; noho mai la paha a aloha i na moomoo ana."

"The old woman (Kānekuaʻana) has returned from the foundations of Kahiki; she dwells here perhaps for the love of her descendants…"

O lakou no kekahi i hai mai i ke ano o na pae aina o Kahiki a me na aina e ae i ike ole ia…

They are the ones spoken of coming from the Kahiki and the other lands which have not been seen…

…O Hauwahine, he kiai ia no na loko o Kawainui a me Kaelepulu. O Laukupu ko Moanalua; he malama lakou i ka pomaikaʻi, e pale ana i na pilikia maluna o ke kina a me ka ohana…

…Hauwahine is the guardian of the ponds of Kawainui and Kaelepulu. Laukupu is of Moanalua; it is they who tend to the blessings, protecting the lands and people from trouble…

14. He Moolelo Kaao Hawaii no Laukaieie… (A Hawaiian Tradition of Laukaʻieʻie…)

Hawaiian historian Moses (Mose) Manu penned several lengthy traditions for *Nupepa Ka Oiaio*, in which he included detailed accounts of a wide range of practices, including those associated with fisheries and deified guardians of the ocean and fresh water fisheries. This account, "He Moolelo Kaao Hawaii no Laukaieie…," was published between January 5, 1894 and September 13, 1895. The tradition is a rich and complex account with island-wide place name references and details for Honouliuli and the larger ʻEwa District. The tradition also includes descriptions of fisheries and aquatic resources, history, and mele, interspersed with accounts from other traditions and references to nineteenth century events.

The following excerpts of Manu's account were translated by Maly and include an overview of the moʻolelo while referencing narratives which recount the travels of Makanikeʻoe, one of the main figures in the account. During his travels, Makanikeʻoe sought out caves and tunnels that served as underground trails. Through the description of his travels, we learn about some of the wahi pana and resources of the lands through which he traveled.

The following accounts, describing places of the ʻEwa District and neighboring lands, are excerpted from the longer narratives which describe the travels of Laukaʻieʻie, her younger brother Makanikeʻoe, and their companions. The lei momi (pearl garlands) of ʻEwa were described while Laukaʻieʻie and her companions were at Kaʻana, Molokaʻi:

> **March 9, 1894 (page 4)**
>
> Leiomanu (a youth of Kaʻala, Oʻahu) gave Kaʻana of Molokaʻi, and Kawelonaakalāilehua, the prized lei momi of ʻEwa as gifts. The characteristics of these pearls (momi) included those with a fine yellowish tint, others had bumps like diamonds, and some were bluish-yellow. There were many types of pearls, and they were once regularly seen in the sheltered bays of ʻEwa at Oʻahu. They came from the Pipi (oysters), and the pearls were found near the edges of the Pipi shell. They were a thing greatly cherished by the chiefs of old and worn in lei (necklaces). This is why it is said:

> My fish which quiets the voices,
> You mustn't speak or the wind will blow.

This is the famous thing of ʻEwa, where the fish quiet the voices, to these new times.[7] This is the type of lei which had been given to the aliʻi of Lehua, the island which snatches the sun…

> **April 19, 1895 (page 1)**
>
> …Laukaʻieʻie and her companions, Hinahelelani and Koʻiahi arrived at Honouliuli and were greeted by the natives of that land. Koʻiahi, a chiefess from Mākua, Waiʻanae, was related to Kahoʻonani (w), ʻUlalena (w), and Kauakiʻowao (k), the aliʻi of Honouliuli. It is for these aliʻi that the chant is sung:
>
> Kahoʻonani resides upon the plain,
> ʻUlalena is completely surrounded by the Kauakiʻowao rains…
>
> While they were being hosted at the house of these natives, they saw the beginnings of a red-hued rainbow form near the shore and knew that Kauakiʻowao, the elder brother of the two beautiful sisters, was crossing the flat lands, drawing near to house. When he arrived, Hinahelelani asked Koʻiahi to invite Kauakiʻowao to accompany them on their journey to Kauaʻi… The party departed from the residence at Honouliuli and traveled to Puʻuokapolei, where the met the young maidens Nāwahineokamaʻo and Peʻekāua, the beauties who dwelt upon the lowlands of Puʻuloa. These two maidens accompanied the travelers to Waimānalo and Kaiona, for which the song writer of the late chiefess Bernice Pauahi Bishop wrote:
>
> Respond o woman,

[7] Tradition has it that the pipi (mother of pearl oysters) were very sensitive to any sounds and those who were noisy would scare the shellfish into hiding. Thus, when going to catch pipi and other similar oysters, no one spoke (see Pukui, 1983 No.'s 493, 1357 & 1377).

Who travels the plain of Kaiona,
Pursuing the mirages,
On the plain covered with ʻōhai blossoms.

Thus, all these beautiful residents of the land of Honouliuli were gathered together, by the famous beauty of Waiʻanae (Koʻiahi), who is there on the resonating and fine sands of Mākua…

April 26, 1895 (page 1)

…While Laukaʻieʻie and her companions were traveling through Waiʻanae, Makanikeʻoe was following behind. Having landed on the shores of Māmala, he then traveled to Kahakaʻaulana and the landing at Kalihi. He then looked down along the glistening sands and waters where the mullet are found, outside of Keāhua, at the place called Keawakalai. There he saw a crevasse open in the sea. In this place, were sleeping many sharks and turtles, almost as if under the sand. Makanikeʻoe quickly entered into the cave with the turtles and sharks, to see them more closely. Because of his great speed, they didn't know that he had entered their house. Makanikeʻoe crawled along one of the crevasses in the sea, and going beneath the land, he exited out at Āliapaʻakai, at the place called Manawainuikeoʻo. That is the entrance of the sea into that great salt water pond of Moanaluaʻ…

Let the author explain here, that this channel was first made when Pele traveled along the islands making craters here and there. This crater is something like the crater of Kauhakō, at Kalaupapa, Molokaʻi.

By this little explanation my readers, you may also know that the remaining crater is there above Āliamanu, the hiding cave of the chief Kahahana, his companion, Alapaʻi, and his beautiful wife, Kekuapoʻi. He (Kahahana) is the one who killed the priest Kaʻōpulupulu and his son Kahulupue, at Waiʻanae. This is

how the famous words of the priest came to be spoken:

Strive for the sea my son,
for from the sea shall come (others of) another land.

And this cave has been given the name "Pililua" from the time of the death of the chief Kahahana.

Pililua, the two of you shall go to ʻEwa,
You are like a canoe,
Pulled by the rope,
To the cliff of Keālia,
At Kamaʻomaʻo,
There at Kinimakalehua.

After seeing these places, Makanikeʻoe then went to the top of Leilono, one of the deity of ancient times. There is a pit dug there in which the foul smelling bodies of the dead and the defiled matter of the dead are thrown.

Makanikeʻoe left that place and went to a place that was covered with something like a rough pahoehoe surface, below the present-day 5 mile marker on the road at Kapūkakī. There he saw the spirit of a woman moving swiftly over a portion of the pāhoehoe. Makanikeʻoe recognized that this was a spirit form rather than that of a living woman, and he felt compassion for her. He then saw that there was a deep pit there, filled with the spirits of dead people, swaying back and forth, and crying out, with moaning and wailing. This is the pit which in ancient traditions is called Kaleinaakaʻuhane. The spirits of the dead go there and can only be freed if their ʻaumakua (ancestral family god) fetches them. They might even be returned back to life again…

Now you may be wondering my readers, what was the name of this woman

that Makanikeʻoe took up in his hands. Well the writer will tell you the name of this beautiful young woman of Kaiʻahāmauleo o ʻEwa-nui-a-Laʻakona [The fish that quiets the voice of Great-ʻEwa-of-Laʻakona], it was Kawailiʻulā. She was a native of two lands of ʻEwa, Waiau and Waimano. And it is for this woman that Kawailiʻulā, between the 9 and 10 mile markers from Waiau and Mānana 2nd is named; it is near the present-day court house of ʻEwa…

At this place, Kaleinaakaʻuhane, hundreds and thousands of spirits have been lost…

May 3, 1895 (page 1)

…Makanikeʻoe then went to the uplands, atop the cliffs and ridges of Koʻolau, where he looked down and chanted:

Beautiful is Hālawa in the Waʻahila rains,
Which visits also, the heights of Aiea,
The heat and warmth travels across the plain of Kalauao.

It is true, that he then went to Kalauao, where he saw the pool of Kahuawai. He turned to the uplands and saw the source of the water coming out of the earth, near the top of the cliff of Waimalu. The source of this water, from where it flows, cannot be easily seen because it comes out from the ground in an area where there are many deep holes hidden on the side of the cliff of Waimano. It is from one of these pits that the water flows. It is also at one of these places that the body of David Malo[8] was laid to rest.

This place, between Waiau and Waimano, called Waipuhia, is the place of Kawailiʻulā, who was brought back to life at Kaleinaakaʻuhane, at Kapūkakī…

[8] This is not David Malo of Lahaina Luna, but a namesake, who was also a historian and active church member.

Kawailiʻulā invited Makanikeʻoe to her home where food was prepared, the ʻanae (mullet) from the pond of Welokā and the famous foods of the land. Kawailiʻulā invited Makanikeʻoe to stay with her, but he declined, explaining that his elder sister and her companions were waiting for him at Waiʻanae… Kawailiʻulā bid farewell to Makanikeʻoe and he disappeared from sight, born by the wind, Moaʻekū of ʻEwa.

Makanikeʻoe then traveled to Mānana, now the 10 mile marked, and the place where the court house of ʻEwa stands. This is the place where ʻOulu, the famous warrior of Kahekili, king of Maui, was surrounded by warriors who thought to take him prisoner. It is there that ʻOulu fought like the eel, Palahūwana, and with great strength and skill, overcame those who fought against him. The place where this fight occurred is called Kaoinaomakaiʻoulu to this day.

Makanikeʻoe then followed the trail to a place where he saw a large gathering of youth along the trail, at the place called Nāpōhakuhelu. The activity of the children at this place was the shooting of arrows, something that was always done by the youth of those times.

There was among this gathering of youth from Waiawa, a handsome boy named Kanukuokamanu (not to be confused with a place of the same name in Hilo, Hawaii). His place of residence was on the shoreward side of the government road, a place something like a hillock from where one can look to the estuary of Waiawa. It is about at the ten and a half mile point, and the place is known by the name of this youth today.

When Makanikeʻoe arrived at the place where the youth were playing, he was saddened at seeing the young boy crying. This was because the older children had taken all the arrows, and left none for the younger child to play with. Makanikeʻoe took the young boy away from the group to a place off to the side. He told the boy "Stop crying and I will give you an arrow of your own. This

arrow will fly farther than any of the arrow of your friends." Makanikeʻoe then gave the boy an arrow like none other he'd seen.

Now Kanukuokamanu was the son of the chief of Waiawa…When he returned to the group of other children who were still playing, he prepared to compete as well. He chanted first to his arrow:

Kaʻailehua flies,
Kaʻiniki flies,
Ahuahu flies…

May 8, 1895 (page 1)

Kanukuokamanu shot his arrow and it flew beyond all the other arrows of the competitors. It flew all the way to "the end of the nose of the pig" at Waimano, and then returned to the youth who had shot it…

Makanikeʻoe then departed and was lost from sight. Looking seaward, Makanikeʻoe saw the fin of a shark passing by, in front of a stone in the estuary of Waiawa, on the west side of Kanukuokamanu, next to Piliaumoa. Seeing the shark, Makanikeʻoe drew nearer and he saw that it was Kahiʻukā, a native of this estuary. His cave was comfortably situated on the side of the stone. Kahiʻukā was a good shark, and in his story, he is the guardian of Mānana and Waiawa.

The author has met a man at Mānana who was known by the name, Kahiʻukā. He learned the traditions of this shark in his youth, and was taken by this shark for a period of time, and returned again to the land in good health. The man has since died, but his daughter is still alive, and his story is an amazing one.

After seeing the house of this hero of the sea [Kahiʻukā], Makanikeʻoe turned

and walked along the place where the waters flow from the land at Piliaumoa, Mokaʻalina, Pānaio, Kapuaihalulu, Kapāpaʻu, and Manuea. The trail then turned and went to the top of Hāʻupu, where the foundation of the Luakini [Church] of ʻEwa was later situated. Near there, was a large pond in which awa [milkfish], ʻanae [mullet], and āholehole [*Kuhlia sanvicensis*] fish were found.

Oh readers, let the author explain something here. At the time Lūʻau came from Maui to dwell on Oʻahu, he arrived at Waiawa, ʻEwa. He saw some men thatching dried ti leaves on the Luakini [Church] that was being built there. Lūʻau asked some people, "Who is the one that is having this important house built?" They answered, "Kānepāiki." Lūʻau then stated, "The house shall not be finished to its ridge pole before the one who is having it built dies." The people asked, "Why?" Lūʻau answered, "The house is atop the Heiau [temple] and the fishpond is below, it is because the waters [life and wealth] are flowing out from this place. [So too shall the life flow out.]" These words of Lūʻau were true, the Luakini of Waiawa was not completed before Kānepāiki died. His body was buried in the uplands of Waimalu.

These were the words of Lūʻau. The one who discerned the nature of the land [kuhikuhi puʻuone], in the time of the King Kauikeaouli K. III. And his descendants are still living at Kanaio, Honuaʻula, Maui…

From this place, Makanikeʻoe then turned and looked to the calm waters of Kuhia Loko and Kuhia Waho. He went to the ponds and saw water bubbling out, and in the pond were many fish of the sea. It was of this pond, that Kāne and Kanaloa spoke, while in Kahiki, as heard by the prophet Makuakaumana, who crossed the sea and traveled to Hawaiʻi:

The mullet are at Kuhia-loko,
The seaweed is at Kuhia-waho,
The salt is at Nīnauele,

The nehu pala are at Muliwai
The lone coconut tree stands at Hape,
The taro leaves are at Mokaʻalika,
The water is at Kaʻaimalu,
The ʻawa is gathered at Kalāhikiola.
Behold the land.

All of these places named by the gods can be seen, extending from the sea of Waiawa, to Halalena at Waiawa uka.

From this place, Makanikeʻoe then went to a large deep spring which flows from waters beneath Waipiʻo and Waiawa. At a place where the priests discard their offerings. He then came upon another spring at the entrance of the estuary of Waiawa. The trail then turned towards Palea and Pipiloa, where there grew groves of kou and hau in ancient times, and it was the residence of the rulers of Oʻahu. This is the place where the king of Oʻahu, Kūaliʻi-a-Kauakahiakahoʻowaha, found his first wife, Kawelaokauhuki, who was of the uplands of Waimano. It is this Kūaliʻi who built the long house called Makanaʻole, on the inland plains of Mānana 2nd. It is near the place now called Kūlanakauhale Momi [Pearl City].

Makanikeʻoe then traveled to the fishponds of Hanaloa and ʻEo, the great ponds of ʻEwa. It is for these ponds that the lines of the song say:

The water of ʻEo is not fetched,
It is the sea of Hanaloa that ripples forth.

At this pond, Makanikeʻoe saw a deep crevasse and inside, there was a giant eel sleeping. The name Hanaloa was given because of the great amount of work that was done by the chief and the people in carrying the stones with which to surround the crevasse and build the pond wall. Thus the pond was built. And

it is a famous pond for it is rich with fish, and for the eels which Keinohoʻomanawanui desired to eat.

From the pond, Makanikeʻoe then walked to a place where there were several small points of land, near where Pāpio was bitten and where the sea enters Honouliuli. He noticed how very calm the surface of the water was here, but he also saw that it was agitated in its depths. Looking more closely, he saw in the depths some very large fish, as if guarding the entrance to the harbor. One of these two large fish was like a marlin with a long bill and rows of teeth. The other one was a barracuda whose teeth protruded out of both side of its mouth. These two fish of the bays of ʻEwa, had ears with which to hear. They leapt in the ocean like flying fish, and are spoken of in some of the traditions of Hawaii.

The marlin is the one, who with his sharp bill, divided the waters that enter into ʻEwa. Thus, Makanikeʻoe understood the nature of these fish, and what their work was. They were the guardians of the place. It is true also, that in a short while Makanikeʻoe saw a procession of many sharks arrive. There was in this group, the famous chiefess, Kaʻahupāhau, of Puʻuloa, and the messengers of the king shark [Kamohoaliʻi] of Kahoʻolawe. She was taking them on a tour and to drink the waters of Waipahu and Waiʻāhualele, and to drink the awa from Kahauone, in Waipiʻo uka…

Makanikeʻoe then turned again to the place where Pāpio had been bitten as a result of her asking for the ʻilima garlands of the old woman, Koihala. This is what the old woman told Pāpio:

The beautiful girl asks,
That the garlands of the old woman be given to her.
Heed my words dirt of the dog, dirt of the pig,
String your own garland and let it wilt.

Makanikeʻoe then departed from this place, turning to the plain of Puʻuloa. He passed many pits in this place where the bones of men have been left. He then followed the trail to the of the breadfruit tree, Leiwalo, at Honouliuli. This is the breadfruit tree of the expert sailor, Kahaʻi (Kaʻuluakahaʻi), so told in his story.

There are also many pits in which were planted sugarcane and bananas, and planting mounds. He also saw manu ʻōʻō (honey creepers) sipping the nectar of noni blossoms. There were also two ducks that had gone into a pit, and with a great strength, they were trying to push a stone over, to hide the pit. This Makanikeʻoe knew what the ducks were trying to do. They wanted to hide a spring of water which flowed underground there. It is this spring which in calm times could be heard, but not found by the people who passed through this area. It was a secret spring, known only to certain native residents of the area, and its name is recorded in the last line of the song:

The ʻōʻū is the joyful bird of Kaupeʻa,
The joyful voiced ʻōʻō is of Puʻuloa,
Softening the blossoms of the wiliwili,
Drinking the drops of nectar from the noni,
The birds drink and pass time,
The eyes cast about seeking,
The water of the natives,
The eyes seek the water of Kaiona.

This hidden spring, known only to the natives, was not hidden to Makanikeʻoe. From there, Makanikeʻoe then turned back towards Honouliuli and saw the pit of the native eel, Kapapaʻapuhi, the elder of Laumeki, whose stone-form body is there at the base of Kaʻuiki, Hāna, Maui. He was an eel of Oʻahu who traveled to Hāna where he stayed and was turned into stone.

There is also at this place, Kaihuopalaʻai, where the ʻanae (mullet) begin their journey from Honouliuli to Kaihukuʻuna at Lāʻiemaloʻo, Koʻolauloa.

Seeing this pit, Makanikeʻoe swiftly ran back to Waipahu, where he looked at the source of the water, where it came out of the earth, and flowed to the estuary of Waikele. Makanikeʻoe dove into the water to determine its hidden source. He swam underground, and first arrived at Kahuaiki, at Waipiʻo, for which the song is sung:

Return to the coolness of Waipiʻo,
The cold water of Kahuaiki…

He then dove under and came out on the plain of Puʻunahawele, that barren and peopleless plain. There he saw the source of the water of Kahuaiki. It is near a hidden stone [shaped like a hook pendant] and close to Kekuaʻōlelo, along the trail which ascends straight up to Waipiʻo uka. Makanikeʻoe then turned and followed the water path, and with great strength, he arrived at Kawaipūʻolo, at Waialua. There, he saw the pool of Laniwahine in the famous pond of ʻUkoʻa. He then quickly went from Waialua to Kawela, and from there, to Punahoʻolapa, a deep spring on the plain of Kahuku. There he found the water source that the kapa anvil fell into and was carried to Waipahu, at ʻEwa. Makanikeʻoe the crawled along another path and arrived at Punamano, also at Kahuku…

[Makanikeʻoe continued his journey through the various springs of Oʻahu, until he rejoined his sister and companions at Waiʻanae. The group then continued on their journey to Kauaʻi…]

15. He Moolelo Kaao Hawaii no Keliikau o Kau
(A Hawaiian Tradition of Keliikau o Kau)

Keliʻikau-o-Kaʻū was a shark god who traveled to Puʻuloa, ʻEwa from the island of Hawaiʻi. The tradition appears only in the short-run Hawaiian language newspaper *Home Rula Repubalika* and is incomplete. The following narratives are different in relation to the events and their outcome than those found in more widely reported narratives. There is no specific reference to the source of the account, and only two articles in the series are available. These narratives offer some details on named localities and events that are of significance in the history of Puʻuloa at Honouliuli.

Home Rula Repubalika
He Moolelo Kaao Hawaii no Keliikau o Kau.

January 6, 1902 (pages 7-8) & March 15, 1902 (page 7)

Summary — A Hawaiian Tradition of Keliʻikau-o-Kaʻū

Keliʻikau-o-Kaʻū was born to his mother as the result of her relationship with the spirit form of Kalani, a king of the sharks. He was a favorite of Kalani, and transformed into a shark, whose body was almost three fathoms long.

At this point in our story, we now look to another mysterious formed shark, and his death at the entrance of Puʻuloa at ʻEwa. His name was Mikololou, it was him who was killed at Puʻuloa, and this is why Keliʻikau-o-Kaʻū went there. The background of this shark, Mikololou is given in the traditions Kāneialehia, and Pāpaʻi and Paukūpahu of Puna, Hawaiʻi. Kāneialehia, protected the lands from Leleiwi and Makaokū, near the low islet of Mokuola, and all the way to Makahanaloa of Hilo Palikū. Under the law of Kāneialehia, it was forbidden to kill any human. Kāneialehia saw swimming past the cliffs, and discerned Mikololou's nature as an spirit-transformed shark, he also recognized that Mikololou was a man-eater.

Kāneialehia decided to take Mikololou as an attendant, perhaps even as a foster-son, and to teach him how to live under the law of not killing humans…

[We know from various accounts, as cited earlier in this section of the study, that Mikololou departed from Hawaiʻi, in the company of other man-eaters, and traveled to Puʻuloa, where he was eventually killed by Kaʻahupāhau, Kahiʻukā and the people of ʻEwa. Based on other accounts, Mikololou was restored to life, and returned to Hawaiʻi, where he enlisted the aid of Keliʻikau-o-Kaʻū and other sharks to avenge his treatment by the sharks and people of Puʻuloa. The issues of the paper with this portion of the tradition are missing, and the account is picked up again on March 15, 1902.]

Keliʻikau-o-Kaʻū fought with and killed Kaʻahupāhau, and it is because of this event, that the famous saying, "Mehameha Puʻuloa, ua make o Kaʻahupāhau" (Puʻuloa is alone, for Kaʻahupāhau is dead), came about. Keliʻikau-o-Kaʻū assumed various body forms he possessed and attacked Kaʻahupāhau from within, and outside her body. Kaʻahupāhau went in spirit form to her attendant, Koihala, calling to her, saying that she was dying. Upon her death, Keliʻikau-o-Kaʻū called out to Kamoana and Kahiʻukā, taunting them. He then proceeded to swim through Puʻuloa, biting and tearing at the native sharks of the region, throwing their bodies up onto the dry land from Kalaekao, Kapuaʻikāula, Keanapuaʻa, Kamokuʻumeʻume, Aiea, Kalauao, Waimalu, Waiau, Waimano, the two lands of Mānana, Waiawa, Hanapōuli, Waipiʻo, Waikele, Hōʻaeʻae, Honouliuli, Kalaeokahuka, Kanahunaopāpio, Kepoʻokala and Puʻuloa.

Keliʻikau-o-Kaʻū destroyed all the sharks of ʻEwa, and the stench rose upon the land. Thus came about the saying, "Puʻuloa is alone, for Kaʻahupāhau is dead." Upon her death, Kaʻahupāhau's body became a coral formation near the place called Pāpio, and that place is still seen on the side of Honouliuli to this day.

Following the death of Kaʻahupāhau in this war between the sharks, the shark

> chiefs of both sides met in council and agreed to no further wars should be fought between them…

It should be noted here, the elder kamaʻāina of the ʻEwa District still claim that Kaʻahupāhau was seen and cared for during their lifetime.

16. Kaao no Namakaokapaoo (Tradition of Nāmakaokapāoʻo [Eyes of the Goby Fish])

There are several traditions pertaining to a youth named Nāmakaokapāoʻo that have been published in the Hawaiian language newspapers, with lengthy accounts in print between the 1877 to 1917. The March 1877 account, published in the newspaper, *Ka Lahui Hawaii*, references the sweet potato fields of Nāmakaokapāoʻo, observing that Nāmakaokapāoʻo was the skilled fighter of the cliffs of Līhuʻe.

Later accounts of the tradition provide detailed narratives of events on Maui and Kauaʻi, with passing, poetic references to Oʻahu, Hawaiʻi, Niʻihau, and other locations. It is in Abraham Fornander's "Collection of Hawaiian Antiquities" (Vol. V, 1918:274-283) that we find events in the life and deeds of Nāmakaokapāoʻo taking place on Oʻahu. A summary of the Oʻahu version of the tradition of Nāmakaokapāoʻo follows below and cites several names and features of the ʻEwa District:

> Nāmakaokapāoʻo was born at Hōʻaeʻae. His father was named Kaʻuluakāhaʻi (descended from gods of Kahiki) and his mother was Pōkaʻī. After Pōkaʻī became pregnant, Kaʻuluakāhaʻi traveled to Kahiki. Thus, when Pōkaʻī gave birth to Nāmakaokapāoʻo, the two of them lived with little to sustain them. One day, Pūaliʻi, a man who lived in the uplands at Keahumoa, situated just below Kīpapa, went to the shore of Līhuʻe to fish. While on his way, he passed the place where Pōkaʻī and Nāmakaokapāoʻo lived. Seeing Pōkaʻī, Pūaliʻi fell in love with her, and asked her to be his wife. Agreeing, Pōkaʻī and Nāmakaokapāoʻo went to live at Keahumoa. There, Pūaliʻi tended two large māla ʻuala [fields of sweet potatoes].

> In his work, Pūaliʻi had made an oath that none of the potatoes would be eaten until he had made an offering of an ulua fish, and then eaten of the produce first, himself. When the māla were ready to harvest, Pūaliʻi went down to Līhuʻe to catch his ulua. While Pūaliʻi was on the shore fishing, Nāmakaokapāoʻo and a group of his friends went to the māla ʻuala and pulled up all the potatoes and began to cook them. Pūaliʻi returned, saw what had been done, and went with a large koʻilipi [stone adze] to kill the boy. As the koʻilipi fell, Nāmakaokapāoʻo offered a prayer to his deified ancestors, and the adze turned and cut off Pūaliʻi's head.
>
> "Nāmakaokapāoʻo picked up Pūaliʻi's head and threw it towards Waipōuli, a cave situated on the beach at Honouliuli [a distance of about five miles]" (Fornander, 1918:278).[9]

The māla ʻuala where this occurred have been called "Nāmakaokapāoʻo" since that time, and are found on the plains of Keahumoa.

Word of this event reached Amau, king of Oʻahu, who was dwelling at Waikīkī. The king wanted to challenge the youth, and proceeded to Keahumoa for the contest. Learning of this, Nāmakaokapāoʻo went to his mother and took her down to a cave situated at Waipōuli, where he hid her for a while. He then returned to Keahumoa and met with Amau and his warriors and killed them all. Nāmakaokapāoʻo then established his mother, Pōkaʻī, as ruler over Oʻahu.

17. Kaʻuluakāhaʻi (The Breadfruit Tree of Kāhaʻi) at Kūalakaʻi

As cited in the tradition of Nāmakaokapāoʻo, Kaʻuluakāhaʻi was the true father of Nāmakaokapāoʻo. In Fornander's account, following his victory over the king of Oʻahu,

[9] While the exact location of the cave named Waipōuli is not known in the present-day, the narrative provides readers with several reference points that help us determine that it is not in the area of the rail corridor. The location being five miles makai and on the shore from the Keahumoa-Kīpapa vicinity would place Waipōuli near the Honouliuli-Hōʻaeʻae boundary, and likely near the shoreward ʻili of Līhuʻe (cf. oral history interview with Shad Kāne dated August 26, 2011).

Nāmakaokapāoʻo traveled to Kūalakaʻi where a supernatural breadfruit tree grew in a sink hole-cave, in which had been hidden the royal gifts left to him by his father. Retrieving the items from Kūalakaʻi, Nāmakaokapāoʻo then traveled to Hawaiʻi:

> After the complete possession of Oahu by Namakaokapaoo, he was desirous of visiting Hawaii for observation. He then went and got a small gourd wherein to place his garments which his father had left him. This gourd was deposited at Kualakai, where a breadfruit tree is standing to this day. This is the breadfruit impersonation of his father, Kahaiulu. When the real person went home the breadfruit tree remained, being in the supernatural state.
>
> Inside of the gourd was a garment, a girdle and a royal cloak (feather cloak). After he had obtained the gourd he journeyed on till he reached Hanauma, in Maunalua. There he found a canoe which was preparing to sail for Hawaii… (Fornander, Vol. V 1918:278)

18. He Wānana — A Prophecy and the Death of Kahanana

Puʻuloa at Honouliuli has a significant place in the traditions of Oʻahu, based on events which took place between 1825 to 1785. As a part of his plan to take control of Oʻahu, Kahekili, then king of the Maui group of islands, tricked his nephew, Kahahana, King of Oʻahu, into killing his high priest, Kaʻōpulupulu. Kahekili had raised Kahahana and he desired to make Oʻahu a part of his kingdom. It was Kaʻōpulupulu who instructed Kahahana and warned him against certain actions proposed by Kahekili. In January 1862, J.H. Kanepuu, a frequent contributer of island history to native newspapers, penned one of the earliest native accounts pertaining to the death of Kaʻōpulupulu and his son Kahulupuʻe and the prophecy uttered at their deaths.

Ka Hoku o ka Pakipika

Ianuari 23, 1862 (aoao 2)

…Ua hooko mai ke Akua ia wanana ma o Kaopulupulu la, kekahi kaula mana Oahu nei, e haawi mua ana no i ka aina no na mamo a Sapeta, penei kana olelo i kana keiki, i nui ke aho a make i ke kai, no ke kai ka hoi ua aina, aia la, lilo ka aina ia kai. Mai kai mai no o Kahekili maluna mai o ka waa, a pae ana i Oahu nei, kaua me Kahahana, a holo o Kahahana i ka nahelehele, lilo ka aina ia kai. Mai kai mai no o Kamehameha, a kaua me Kalanikupule ma Nuuanu nei, a hee o Kalanikupule, lilo ka aina ia kai. Mai kai mai nei no ka haole maluna mai nei o ka moku a noho ana i uka nei, he oluolu wale no ka lakou la hana ana mai i na'lii o kakou, aohe i eha ka ili, lilo no ia lakou la na hooponopono aupuni, na aina, na kuleana ma ka hoolimalima, ma ke kuai, ma ka hoaie i kahi awelu lole, i ka rama, ia mea ae ia mea ae, ua lilo ia lakou la, o kau no ia o ka hoaa aku ma ka palekai.

January 23, 1862 (page 2)

God has fulfilled the prophecy of Kaʻōpulupulu, one of the powerful prophets of Oʻahu—giving the land to the descendants of Japheth [cf. Genesis 9:27]—who spoke thus to his son, "Strive to die in the sea, for those of another land shall come from across sea, and the land shall belong to them from across the ocean." Kahekili came from across the sea on a canoe and landed on Oʻahu. He then engaged in war with Kahahana, who fled to the forests. Thus the land was taken by the sea. Kamehameha then came from across the sea and engaged in war with Kalanikūpule at Nuʻuanu. Kalanikūpule was defeated, and the land was taken by the sea. Then the foreigners came from the across the sea on ships and now reside on the land. Their deeds for our chiefs were kindly, and they took on the work of setting the nations right, the land, the properties and leasing, selling, creating debt for new clothing, rum, this thing and that, it is all thiers now. And built up on a breakwater… [Maly, translator]

S.M. Kamakau (1867) elaborated that about eight years into Kahahana's reign as king of Oʻahu, Kahekili succeeded in tricking Kahahana into killing Kaʻōpulupulu.

Kahahana ordered that Kaʻōpulupulu and his son, Kahulupuʻe to be brought before him at Waiʻanae. The call was made from Puʻukāhea [Hill of calling]. Upon the summons, Kaʻōpulupulu prayed to his gods and discerned that he and his son would be killed once in the presence of the chief. Arriving at the place now called Nānākuli, Kaʻōpulupulu called out to Kahahana who looked at him, but made as if he didn't hear the call [nānā kuli]. Kaʻopulupulu then knew for certain that he and his son were to be killed, and he told Kahulupuʻe:

> "I nui ke aho a moe i ke kai! No ke kai ka hoi ua aina!"
> Strive to lie down in the ocean! For our revenge will come from other lands across the sea (Kamakau, 1867).

Kahulupuʻe ran into the water near Puʻuohulu where he was killed. Kaʻōpulupulu continued his flight across the Honouliuli plain to the shore of Puʻuloa, where he was then killed (Kamakau, 1867). Kamakau also wrote about the last years of Kahahana's life and his death at the command of Kahekili, placed by some native writers at Hōʻaeʻae:

> For two years and six months Ka-hahana and his wife and Ka-hahana's friend, Alapaʻi, hid in the mountains and were fed and clothed by the commoners, who had compassion upon them. Thus, were the misdeeds of Ka-hahana justly repaid. They were finally betrayed by Ke-ku-manoha', father of Ka-lani-moku and half brother of Ke-kua-poʻi, Haʻaloʻu being the mother of both. Their last place of hiding was near Wailele at Waikele in 'Ewa. Alapaʻi said to Ka-hahana, "Let us kill our wife and then we shall be able to escape." Ka-hahana was more merciful, perhaps because he could not endure to lose Ke-kua-poʻi, who was an incomparable beauty. He said, "Why kill our wife who has been so faithful a companion to us while we have dodged death in cold and wet, wandering here in the mountains, in the thickets of Wahiawa, in this ocean of Kaʻieʻiea? Perhaps she can persuade her kinsmen to help us some day." Learning that Ke-ku-manohaʻ was at Waikele and Ka-lani-ku-pule and Koa-lau-kani at Kapapapuhi [on the Hōʻaeʻae-Waikele boundary], Ke-kua-poʻi made herself

> known to her brother, hoping that he would save them all three for her sake. "Where are Ka-hahana and his friend?" asked her brother. "Will you spare us three?" asked the woman. "Why should you die? are we not all chiefs?" he answered; but his words were false; he intended to give up his brother-in-law to Ka-hekili. Alapaʻi urged, "O heavenly one! let us flee. We shall die if we stay here; only Ke-kua-poʻi will be saved." "If Kekua-poʻi is saved, we shall be also." "You will not be saved; you are a chief, a ruler by descent." Then Ke-ku-manohaʻ sent men to Ka-hekili at Waikiki to tell him that Ka-hahana was at Waikele. Ka-hekili ordered him to be killed and brought to Waikiki and he sent double canoes to Halaulani at Waipiʻo in 'Ewa. Ke-ku-manohaʻ killed Ka-hahana and his friend Alapaʻi, wrapped them in coconut leaves, placed them on the platform of the canoes, and took them to Kahekili at Waikiki… (Kamakau, 1961:136-137)

The words of Kaʻōpulupulu's prophecy remained fresh in the minds of elder kamaʻāina through time and was often the subject of writings. As noted above in the account of Kānepuʻu (1862), many considered that the priest's words were fulfilled a short time later with the arrival of Kahekili and his forces on the shores of Oʻahu. This was followed by the arrival of foreigners, Hawaiians' loss of their land and kingdom, and military control over a large area of the 'Ewa District.

In 1900, the native leadership of the Independent Hawaiian party conducted a tour of Oʻahu to advocate for restoration of Queen Liliʻuokalani to the throne. David Kaluokalani, president of Hui Kalaiʻāina, spoke to district residents while in Waiʻanae, recalling the power of the prophecy. His talk was described in *The Pacific Commercial Advertiser* (1900a:5). While some facts differ from the earlier account, the connection between events is significant:

> Kalauokalani waxed reminiscent in his speech at Waianae and referred to an incident of the early days of Oahu which he said was applicable to the present situation of affairs as the natives were concerned with relation to their political status. He referred to the time when Kahahana was chief of the island

> of Oahu. There was then living in Waianae a famous kahuna named Kaopulupulu whose son Kahulupue had committed a crime for which he fled the district. When he was being closely pursued the old kahuna called after his son, saying: "My child, bear up until you reach the water, for when you touch the water, then the land shall belong to those who come over the sea."
>
> The speaker said this prophecy had been fulfilled, and had culminated in the overthrow of the monarchy. He appealed to the people to rectify the evil which the old kahuna had brought upon them.

Similar recollections of the meaning and fulfillment of Kaʻōpulupulu's prophecy were shared by Samuel Hoapili Lono (1973, pers. comm.) and Sister Thelma Genevieve (Dowsett) Parish (1997, pers. com.).

Native historian Moke Manu wrote further on these events in 1907. Following his defeat at the hands of Kahekili in ca. 1783, Kahahana went into hiding in the ʻEwa District. In 1785, while Kahahana was at Honouliuli, Kahekili sent his warriors to kill him and they landed their canoes at Kūpahu at the estuary of Hanapouli. The warriors killed the Oʻahu chief on the plains of Hōʻaeʻae (west of Waipiʻo) and brought his body back to Hālaulani at Waipiʻo. From there the body was taken to be offered on a temple in Waikīkī (Thrum, 1907b:213-214).

B. Historical Accounts of the Changing Landscape of Honouliuli and ʻEwa

There are thousands of historical accounts in both Hawaiian and English language that describe the region of Honouliuli. The narratives in this section of the manuscript were penned by native Hawaiians, foreign visitors and residents, and include some of the earliest accounts describing the Honouliuli vicinity following western contact. The narratives provide an overview of: (1) changes in the landscape; (2) the decreasing Hawaiian presence; (3) loss of wahi pana and noted places; (4) development of ranching and plantation business interests in the region; (5) concerns about United States control over Pearl Harbor and

"Reciprocity;" (6) the changing make-up of the communities; and (7) travel on the land. The narratives are generally cited chronologically, by period or activities being described.

1. Kamaʻāina and Visitors Descriptions – Travel in Honouliuli and the Larger ʻEwa Moku

The historical record shares a wide range of descriptions of the Honouliuli landscape, life of the people, and expressions of aloha for place—the cultural attachment—shared by Hawaiians in their living environment. The narratives below were found in Hawaiian and English language sources and reflect both native and foreign experiences and observations on the land. The texts include some of the earliest descriptions of the native communities shortly after Western contact; provide descriptions of travel across the ʻEwa District (as well as the evolving trail and road systems); include mele describing the cultural landscape; and cite first-hand accounts of the challenges faced by native residents and loss of access and title to the land. The excerpts of articles help to understand how quickly change came to the land and lifeways of the people.

a. Sites and Trails of the ʻEwa District (1800-1811)

John Papa ʻĪʻī, one of the preeminent native Hawaiian historians, was born at Kūmelewai, Waipiʻo in ʻEwa in 1800. Raised as an attendant to the Kamehameha heirs, he was privy to many facets of early history, practices and events during his life. In the 1860s, ʻĪʻī published a history under the title, "Na Hunahuna o ka Moolelo Hawaii," translated by Mary Kawena Pukui under the title of "Fragments of Hawaiian History" (1959). Based on the translations, Paul Rockwood produced a map of the trail routes and several locations identified by ʻĪʻī in his narratives (Figure 9).

> **Trails from Honolulu to ʻEwa**
>
> …Let us turn to look at the trail going to Ewa from Kikihale, up to Leleo, to Koiuiu and on to Keoneula. There were no houses there, only a plain. It was there that the boy Ii and his attendants, coming from Ewa, met with the god Kaili and its attendants who were going to Hoaeae… [page 95]

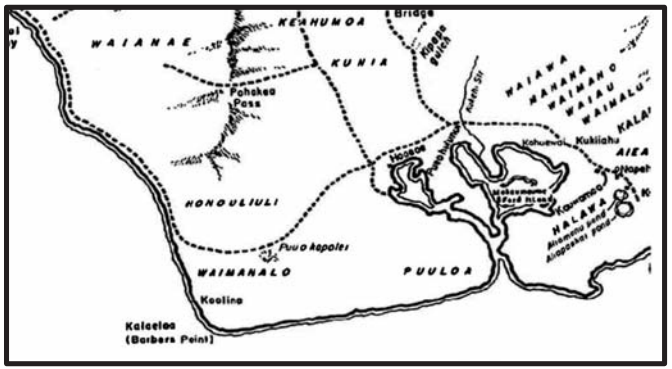

Figure 9. Portion of Map of Trails of Leeward Oʻahu (Paul Rockwood, based on description by Papa ʻĪʻī, 1959: 96)

The trail went down to the stream and up again, then went above the taro patches of Waiau, up to a maika field, to Waimano, to Manana, and to Waiawa; then to the stream of Kukehi and up to two other maika fields, Pueohulunui and Haupuu. At Pueohulunui was the place where a trail branched off to go to Waialua and down to Honouliuli and on to Waianae. As mentioned before, there were three trails to Waianae, one by way of Puu o Kapolei, another by way of Pohakea, and the third by way of Kolekole.

From Kunia the trail went to the plain of Keahumoa, on to Maunauna, and along Paupauwela, which met with the trails from Wahiawa and Waialua. The trail continued to the west of Mahu, to Malamanui, and up to Kolekole, from where one can look down to Pokai and Waianaeuka. There was a long cliff trail called Elou from Kalena and Haleauau on the east side of Kaala coming down to Waianae. There was also a trail called Kumaipo which went up and then down Makahauka… [page 97]

Entering the ʻEwa District from Waiʻanae uka

There the trail met with the one from Kolekole and continued on to the stream of Waikakalaua, Piliamoʻo, the plain of Punaluʻu, to a rise, then down to Kīpapa and to Kekualele [Kekuaolelo]. A trail ran from this main trail to Kalakoa, Oʻahunui, and other places much visited, such as Kūkaniloko. From there it extended to the digging place of Kahalo, then went below to Paʻūpalai, thence to Lelepua, and to Kahalepōʻai, where the legendary characters Kalelealuaka and Keinohoʻomanawanui lived. Then it reached Kekuaolelo, the stone in which the niho palaoa was hidden, then went on to Puʻunahawele and Pueohulunui, where it met with the Waialua trail.

All of these places mentioned had large populations. The land was rich, and there were many trees in olden times. Who has "closed" these places today? We do not know enough to say, "It was so-and-so." But there would be commercial wealth in the trees of these mountains if they were fenced off from animals. So it is with the planting places of every poor person. The person who manages these mountains and valleys could become prosperous. [page 99]

b. Honouliuli Trails Cited on Malden's Map of 1825 (Visit of 1794)

As a part of the Vancouver expedition, cartographer, Lt. C.R. Malden, prepared a map of a portion of Oʻahu, which also covered the Honouliuli – Puʻuloa region (Figure 10). Malden's map was published in 1825 (Register Map No's 437 & 640) and provides the earliest cartographic record of the Honouliuli region. The map depicts several clusters of houses, fish weirs, and fishponds in the Honouliuli/Puʻuloa area. Being recorded during the early period of western contact, the map is believed to represent the basic pre-contact coastal settlement pattern of Honouliuli and vicinity. Even though the map and visit is of an early date, given the rapid decline of the native population just after western contact, it is likely that the pre-contact population would have been higher and settlement denser than indicated by Malden.

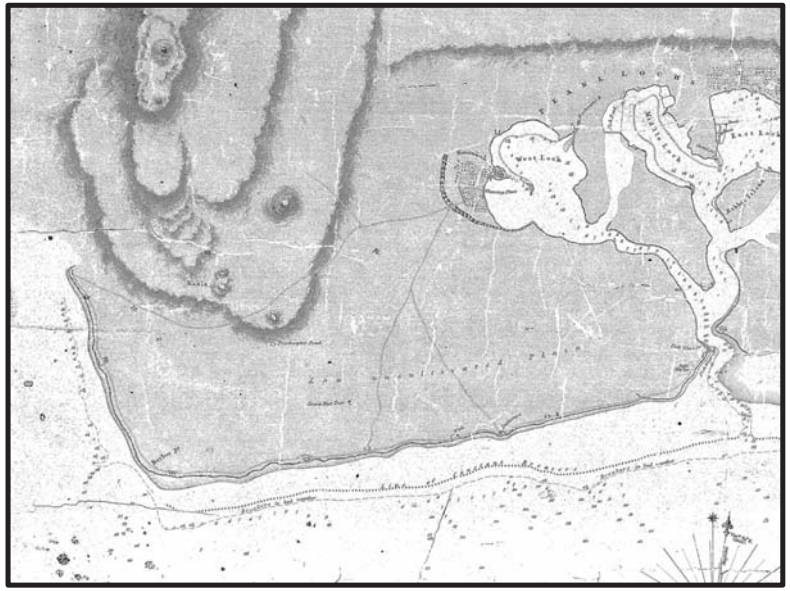

Figure 10. Portion of Map of Trails and Landscape of the Honouliuli Region ca. 1793 (Registered Map No. 437 by Malden, 1825)

c. Tours Made around O'ahu in 1826 & 1828

In 1820, the first contingent of Protestant missionaries associated with the American Board of Christian Foreign Missions (A.B.C.F.M.) arrived in the Hawaiian Islands. The Honolulu station became the focal point of the missionary's operations, with sub-stations on the major islands in the largest population centers. Periodically, the Honolulu station managers traveled around O'ahu to inspect the work progress in the outlying stations, including church work, educational endeavors, and facilities to support the foreign missionaries' living situation. Levi Chamberlain (1828) toured O'ahu in 1826 and 1828, writing fairly detailed descriptions of the districts he visited, including lands of the Honouliuli-Moanalua region. Excerpts of Chamberlain's original handwritten notes are provided below (digitized from the A.B.C.F.M. archives at Harvard, by Kumu Pono Associates LLC in 2004).

September 12, 1828
Levi Chamberlain to Rufus Anderson
A description of two trips made around the island of O'ahu, one in 1826, the other in early 1828 to examine the schools on O'ahu, and determine progress in education of the natives.
(Typed from a copy of the original handwritten letter in the collection of the A.B.C.F.M., Houghton Library, Harvard – Reel 794)

About two years ago I performed a tour around this island, and I have recently made another. It was my intention to give you a brief account of my first tour, but I could not find time to do it while the scenes that passed under my observation and the events that transpired were fresh to my mind & retained their hold upon my feelings.

I propose now to give you a history of my last tour, and in doing it I may refer to my minutes of the former tour… [page 1]

[Departing from the Wai'anae District, Chamberlain wrote]:
…The food by which the inhabitants are supplied, is cultivated in the vallies, which open among the mountains two or three miles from the shore.

It was quite dark when were reached Waimanalo [western Honouliuli], and our arriving at the school house in which we expected to put up, we were disappointed to find it deserted; and [page 28] it was infested with fleas that we feared we could not make ourselves comfortable in it. Some of the people of the place gathered around us, & we besought them to afford us accommodations in some of their houses. One man whose house stood nearest us and who was, I believe, the head man of the place, readily offered us his, and immediately began to put things in order for our accommodations; he did what he could to make us comfortable, and, as the house was small, vacated it entirely for our use.

Saturday Feb. 9th. I enjoyed comfortable repose during the night and awaked refreshed. I arose and united with my attendants in singing a hymn, and offering a tribute of thanksgiving to God for his care & unfailing kindness. After breakfast a few scholars assembled in front of the house. I examined them and to one of them I gave a catechism and a Sermon on the mount.

Their teacher was absent, and I exhorted them not, on that account, to neglect instructions, but to give more attention to it, to assemble on the Sabbath, and learn the catechism, and repeat passages from the word of God. At 10 minutes before 8 o'ck, after thanking our kind host for his attention to us, we set out for the next district. In consequence of the recent heavy rains the roads were very muddy, & the travelling very bad. We had met with nothing like it in any part of our previous journey travelling. After walking three hours & most of the time in mud, we reached Honouliuli in the district of Ewa. A school of 22 scholars had assembled which I examined. The head man, Kawaa, very kindly entertained me, caused a fowl to be cooked and some kalo to be nicely prepared, and furnished the native with a liberal supply of fish and poi. He invited [page 29] me to stop and spend the Sabbath with him; but as his house was small, and our company had now become large by the accession of the teachers & their attendants who separated from us at Waialua and had crossed the inland and had put up at this place, I thought it best to decline his offer. But feeling desirous that religious worship should be conducted here on the morrow, I recommended that the party who had crossed the island should spend the Sabbath here, while we who had travelled round the shore, should proceed to the next considerable settlement, and make arrangements for spending the Sabbath.

Having expressed to Kawaa my thanks for his kindness, I set forwards with my attendants, and between the hours for three & four o'ck P.M. arrived at Waikele. Towards evening I attended to the examination of two schools, which met in front of the house where I had put up, At the close of the examination I

gave information that religious worship would be conducted in the same place on the morrow & requested that all the people of the place should be informed & invited to attend. [page 30]

d. 'Ewa Described in Notes of a Tour Around O'ahu (1839)

In 1839, E.O. Hall and a group from the mission in Honolulu, traversed the island of O'ahu, visiting various localities. His notes from the journey were published in Volume II, No. I of *The Hawaiian Spectator* under the title "Notes of a Tour around Oahu" (1839). Hall's narratives include descriptions of places visited, changes in agricultural endeavors and living conditions, with notes from Honouliuli ahupua'a and neighboring lands.

…The objects of the tour were, principally, to become better acquainted with the people, by seeing them at their own houses; and, by being cut off from the English language for a time, to acquire of the people among whom I expect to spend the remainder of my days…

As the journey from Honolulu to Ewa, or Pearl River, is so frequently made, it will be unnecessary to dwell on that part of the route… [page 95] The rest of the way to Ewa presents little of interest to the traveler. There are however several beautiful spots, where the eye will rest with delight, when the blessing of civilization and Christianity shall have through around them the comforts of other lands; and systematic agricultural pursuits have covered the field with golden harvests, and filled the lap of the cultivator with the prolific bounties of a beneficent Providence. Ewa is a place of little interest to the tourist except in a moral point of view. In this respect, however; its inhabitants, about 3,500 in number, may be regarded with peculiar pleasure by the philanthropist and Christian; for their improvement in morals, and consequently civilization, during the past four years is very striking. And the attention they are beginning to bestow upon their persons, children, houses, yards, etc., in the immediate vicinity of the missionary establishment is far better evidence on the subject of missionary influence, than any other that can be obtained. [page

97]

> Rising before the dawn, we left the low ground of the river, just as the natives were assembling in great numbers to spend their accustomed hour in the worship of Jehovah; and as we wound slowly up the hill which we have to ascend on leaving the quiet and secluded residence of the missionary, and cast our eyes around on the many interesting objects immediately about us; and looked still farther back on the distant city of Honolulu on which the sun was just shining as he rose in all his majesty above the high range of Konahuanui, the beauty of the scene and the quiet and peace of the hour, called up in the mind meditations of the most pleasing character. Lifeless, indeed, must by the heart that does not vibrate in unison with nature at such hours, and whose better sympathies are not called out in moments like these.
>
> Passing all the villages, at one or two of which we stopped, we crossed the barren, desolate plain, at the termination of what is Barber's point; and after passing round the south-east termination of the mountain range of Kaala, and traversing a barren tract of ten or twelve miles, we arrived at the most considerable settlement in Waianae, called Pukahea [Puukahea]… (Hall, 1839:98)

e. United States Exploring Expedition Trip Through the 'Ewa District (1840-1841)

In the period between 1840 and 1841, Commander Charles Wilkes of the United States Exploring Expedition toured the Hawaiian Islands (Wilkes, 1970). During the month of July 1840, Wilkes and other members of his party toured the Kona and 'Ewa Districts on O'ahu. Notes complied by Wilkes from the various exploration trips provide descriptions of the 'Ewa-Honouliuli region. Through these narratives, we learn about cultivation of the land, the abundant flow of water from springs and streams, use of fishponds, various marine and forest resources, the making of salt, and the continued decline of the native Hawaiian population. In 1835, the population of the 'Ewa District was given as 3,423, while in 1841,

Wilkes provided the number at 2,792 (Wilkes, 1970:82), a decline of 631 people in a five-year period.

> [Traveling in the company of Reverend J. Emerson, Wilkes reported that his men departed from Waialua, crossed Wai'anae uka and]… proceeded on their way to Honolulu, across the plain between the two ranges of mountains. This plain, in the rainy season, affords abundance of food for cattle in three or four kinds of grasses, and is, as I have before remarked, susceptible of extensive cultivation by irrigation from the several streams that traverse it. The largest of the streams is the Ewa. Scraggy bushes of sandalwood and other shrubs are now scattered over a soil fit for the cultivation of sugar-cane and indigo. [page 79]
>
> At Ewa they were kindly received by the Reverend Mr. Bishop and lady, who have charge of the station. The district of Ewa commences about seven miles to the west of Honolulu, and extends twenty miles along the south shore, or from the hill in the vicinity of the Salt Lake to beyond Laeloa or Barber's Point. There are no chiefs or any persons of distinction residing in the district; the people are labourers or Kanakas, and the landholders reside near the king at Lahaina, or at Honolulu. The taxes and occasional levies without any outlay have hitherto kept them poor.
>
> In this district is a large inlet of the sea, into which the river Ewa empties; at the entrance of this inlet is the village of Laeloa: the whole is known by the name of Pearl River or harbor, from the circumstance that the pearl oyster is found here; and it is the only place in these islands where it occurs.
>
> The inlet has somewhat the appearance of a lagoon that has been partly filled up by alluvial deposits. At the request of the king, we made a survey of it: the depth of water at its mouth was found to be only fifteen feet; but after passing this coral bar, which is four hundred feet wide, the depth of water becomes

ample for large ships, and the basin is sufficiently extensive to accommodate any number of vessels. If the water upon the bar should be deepened, which I doubt not can be effected, it would afford the best and most capacious harbor in the Pacific. As yet there is no necessity for such an operation, for the port of Honolulu is sufficient for all the present wants of the islands, and the trade that frequents them.

Pearl-River Harbour affords an abundant supply of fine fish. Two species of clams are procured here, called by the natives okupe and olepe. Mr. Drayton, who went to Pearl River for the purpose of examining its shores, and obtaining shells, reported that he found a large bed of fossil oyster-shells, extending into the bank in a bed from one to four feet wide, and half a mile in length: they were found cemented together with soft limestone and a reddish sand, and were so numerous that there was scarcely enough of the cement between to hold them together. The dredging was unsuccessful, a small spotted Venus being the only shell that was obtained, although it was the general belief, among both the foreign and native inhabitants, that it would have produced an abundant reward for the trouble… [page 80]

This district, unlike others of the island, is watered by copious and excellent springs, that gush out at the foot of the mountains. From these run streams sufficient for working sugar-mills. In consequence of this supply, the district never suffers from drought, and the taro-patches are well supplied with water by the same means.

The soil on the sides of the hills is a hard red clay, deemed useless except for pasturage. Here and there in the valleys passing through these hills and in the low grounds, is found a soil capable of producing all the varieties of tropical vegetation.

There is every indication that an elevation of the island has taken place: the

flat land is now fifty or sixty feet above the level of the ocean, and the upper rock has the appearance of calcareous sandstone. The latter lies on the bed of lava, part of which is above, but a greater portion below the ocean level. There are above this rock and on the plain behind some horizontal beds of sea-worn pebbles. It seems remarkable, however, that although this upper rock will effervesce with acids, yet all attempts that have been made to convert it into lime have failed. It has been put into the same kiln with the present reef coral, and while the latter produced good lime, the former came out unchanged,--a pretty conclusive proof that it is not coral rock, as it appeared to be. As this rock will be treated of in the Geological Report, I shall refer the reader to it for further information… (Wilkes, 1970:81)

f. Hookahi Po i Lihue (A Night at Līhuʻe) – 1876

In the narratives below, Kalakini, a resident of Kalihi, shares with readers of the newspaper, *Ka Lahui Hawaii*, a description of his trip to Honouliuli and the uplands of Līhuʻe. Kalakini mentions the potential of development in the ʻEwa District should the Reciprocity Treaty (with the opening of Puʻuloa to American ships) be passed, and the possible economic benefit to the Hawaiian Islands. The visit took Kalakini to the Meek family ranch estate at Līhuʻe in Honouliuli, and he refers to several notes places in the region through place names and mele.

Ka Lahui Hawaii
Hookahi po i Lihue.

Pepeluali 3, 1876 (aoao 3)

E Ka Lahui Hawaii; Aloha oe:—
He wahi kanaenae iki keia e waiho aku nei i kou ahonui palena ole, a nau ia e lawe aku iwaena o kou lahui, ke hiki.

I kekahi la o na pule i aui ae nei, i ke kupono ana o ka wati i ka hora 10, e hele ana he huakai makaikai ma na kula akea o Lihue, me he mea la i ka hoomaopopo iho, ua hiki aku ka huina i ka eiwa a umi paha. I ka ike aku a ka

mea e kakau nei i keia mau kula, aohe wahi a ka manao e hoohalahala ai. He mau wahi oi loa no na hanai holoholona ana ma keia mau mokupuni, a maluna aku o keia ke holo ke Kuikahi Panailike, aohe wahi e ae a na Hui Kalepa nui o kakou nei e manao ai i mau mahina ko e like me keia. Aka, me ka nui no paha o na lilo e wehe ia ai ka nuku kaulana o Puuloa i hiki ai ke komo na moku nui, ke ole e kuhihewa ka mea kakau, me he mea la, he mau makahiki helu wale no paha, e hoihoi ia no na poho ke holopono na hana.

No Na Awawa a me na Alu.

O Kipapa oia kekahi o na awawa nui a akea aʻu i ike ai ma keia ala, a he malihini no hoi au i ka hele ana ma keia mau wahi. He awawa maloo loa keia, a me he mea la paha i ka wa hooilo e ike ia ai he wahi wai malaila, i ka nana ana aku, ua piha pono i na holoholona, e ai ana, e moe ana, iluna kekahi i ka nihinihi, ilalo kekahi i ke apoopoo, a me na alu. I ko makou kau ana ma kela aoao o keia awawa, ua koe aku makou ekolu wale no, ua huli mai la e nana ia hope, aohe maalo kanaka, o na bipi kupelu o ia kula i hoomaopopo ole mai ia makou ka mea ikea e nuu ana i na mauu i paa mau i na kehau waikoloa oia kula uliuli.

Ku iho la makou no kekahi mau minute a nana aku la ia mua, a pela hoi mahope, a ike iho la ua loihi kahi i hele ia, a eia no hoi kekahi, o ko makou wahi pailata, aia aku la oia me ka poe mahope. I keia manawa ua hiki i ka hora 2, a ke hakumakuma mai la no hoi na ao ua, a o na kauhale kokoke imua o ko makou mau alo; oia no na hale noho kuahiwi o ka makua Capt. John Meek, i hala aku la ma kela aoao, iloko o kona mau la kanikoo. I keia wa, ua kuka iho la makou no ka pono o ka hoi ana ihope, a no ka hele ana imua, ia manawa, ua hooholo koke iho la makou no ke kipa ana i na hale i kokoke imua o ko makou mau alo, a o Lihue ka ihu o na lio. I keia wa a makou e holo nei maluna o ko makou mau lio, o ko makou kokookolu he wahi opio, nona ka leo e hoopuiwa mau ana ia maua i na wa a pau, ma ka uwa me ka akena ana, no ka ikaika me ka holo o kona wahi lio uuku, i oi ae ka mamua o ko maua, a pela io no i kaʻu nana iho, ua ano nawaliwali io no ko maua mau lio, ua hilinai ia no paha ia, no ke nui o

ko mau kino, a me ka loa o kahi i hele ia.

Ka Hoea Ana i Kauhale.

He hapalua mile paha hiki aku makou i na hale, no ka nui makewai o koʻu mau hoa, ua kipa koke aku la laua malalo o kekahi alu i eli ia he punawai, a i makaukau no hoi i ka bakeke e huki ai, ua kahea mai la laua iaʻu. A aole nae oʻu wahi mea a hoomaopopoʻku. Auau loa aku la koʻu lio, me ka manao e hiki koke i kauhale, a e ike paha i kekahi mea i launa a i kamaaina hoi. A i koʻu kaalo ana ae mamua iho o na hale, pae ana he leo, a o keia leo, no kekahi wahine aʻu i ano kamaaina iki iaʻu mamua, me ka peahi pu mai, ia wa ua komo mai ka hoomanao iaʻu no keia mau wahi lalani:

Pa kahea a ke Koolauwahine o Puakei—e
He pua lau kona na ka moe e aloha ai,
Oia aloha la e hoi hou iho,
I kaulele no ka po i hala ae nei.

Iloko o ka eleu, a me ka hiki wawe o ke kamaaina wahine; a kahea ae la ia he mau kanaka elua, na laua i miki aku e malama i kuu lio. Aohe no hoi i upu iho, ua hoea mai koʻu mau hoa, a ua apo koke ia mai la makou e ke kamaaina wahine i piha i ke aloha akea me ke ahonui. A nona ko makou mahalo piha, ma ke ano o kana hookipa ana, he makamaka heahea oiaio oia, a he ano lede maoli, a hoomaopopo ae la au o ka wahine mare oia a Mr. Richard Meek, kekahi o na ona o ia kulanakauhale, na kula akea a me na kuahiwi kualono. O na mea i oi aku ke kamaaina ia makou, oia no o Thomas Meek me kona kaikaina nona ka inoa maluna ae, he mau kanaka hoi i ikeia no ke ano akahai a hookipa oluolu i ka poe e kipa aku ana ma ko laua home.

A iloko o ka lokomaikai palena ole o na Keonimana no laua keia wahi, ua oluolu loa laua i ke noi ana mai ia makou e moe ilaila ia po, a ua ae koke ia keia noi, a no ke ano nawaliwali no hoi kekahi o ko makou mau lio, nolaila, ua holo lea loa

ke noi. Ua nanea iho la ia koena o ka manawa, a hiki i ka makaukau ana no ka paina ahiahi, ia wa, ua ku like mai na kamaaina iluna e hoomakaukau ia, a i koʻu nana ana iho i na mea o ka papaaina, ua komo koke mai la iaʻu ka pololi, a hoomanao ae la au i na lalani malalo iho:

Me he lamalama la ka pua lena o ke koolau,
I ka pala luhi ehu ma kauka o ka Ako.

Ua ai, ua honuu, a ua inu a piha, aole au e poina iki ana i na hoowehiwehi hanohano ana a na keiki lalawai o ia uka iloko o ka hapa hope o koʻu mau makahiki e hele nei, no laua koʻu aloha a nui loa. Ua ano powehiwehi iho la i ka wa i pau ai ko makou paina ana. Ia wa puka aku la mawaho o ka hale, e ike i ke Aliiwahine hoomalamalama o ka po e pahola ana i kona nani maluna o na papalina o ka honua. A ia wa no hoi au i ike maka iho ai i ke kololio ana mai a ka welau makani kehau, ke hele la au a maeele, i ka ua mea o ke anu e, ke "Hao la na kepa ka hau o Lihue."

I keia wa, ke ke mai la ke ahiuhiu makani mai na oawawa mai, me ka halihali pu mai hoi i ke ala kupaoa launahele, a me ke onaona o ka mauu nene, o ia uka aloha aʻu e hoomanao ai i keia mau lalani:

"Paoa Lihue i ke ala o ke Kupukupu,
I ke ala o ka mauu pua nene,
I honia e Kokoloea a Malamanui,
Maewa ke oho o ke Kaunoa i ka la."

Aole no hoi au e poina ana ma keia i ka haawi ana i ka mahalo ia Keoni Miki Liilii, i kona akamai luaole ma ka hookani ana i ke Guitar, (Ki-ka,) ua like no ia me ka ipo malalo o na kohaihai o kekahi po mahina konane like me keia. Ua hoalo ia ka manawa ma na nanea ana o keia ano, a hiki wale i ka wa i hoalii iho ai ka hiamoe i na maka, ua hoi aku la makou e moe.

A ma ke kakahiaka ae o kekahi la, ua ala ae la, a mahope o ka aina kakahiaka, ua hoomakaukau iho la makou no ka hoi ana mai. Ua paa ko koʻu mau kokoolua lio, a o koʻu ahi lio, ke noke ia mai la i ka homalimali ia, a aohe wahi mea a maliu mai, me he mea la ua

Makemake wale aku no ia i kanahele,
Ua hiaai wale aku no i ka lehua.

Ke puiwa la kela, ke owala ʻla. Me ka leo nui ka hoaʻloha Thomas Meek i kahea ae ai i na Paniolo ona, ia wa no hoi makou i ike aku ai i ka eleu nui, me ka hikiwawe i ohi mai ai na keiki o ia nahele, me na kaula ili pakahi ma ko lakou mau lima, a me he mea la aole i elua minute mahope iho ua hihipea ka a-i o ua lio nei oʻu i na kaula i lele mai ma o a maanei. He wa pokole loa mahope o keia, ua kau like ae la makou maluna o na lio, me ka hawi ana i na aloha lulu-lima i na makamaka oiaio o ia uka ano iuiu i paa mau i ka ohu.

A pela iho la i hoalo ia ai he manawa pokole o ka mea nana i kakau keia, mawaena o na hoaʻloha, me ka haalele aku i ko laila mau kaiaulu. Me ka Mahalo i ka Lunahooponopono a me na Keiki o ka Hale Pai.

Kalakini.
Kalihi, Honolulu, Dek. 15, 1875.

Summary — A night at Līhuʻe

…One day, a few weeks past, a trip was made to Līhuʻe to understand events. Upon seeing the plains, the writer found nothing to criticize. There are many excellent grazing lands upon these islands, and if the Reciprocity Treaty moves forward, there is no place else that the Merchants Association is looking at that would be like the lands here for fields of sugar cane. But it is only to give the opening of the famous enter of Puʻuloa so that large ship may enter. Unless the

writer is mistaken it will be a number of years for the completion of this work.

The Valleys and the Ravines.

Kīpapa is one of the large, wide valleys that I saw on this road and I was unfamiliar with travel in these places. This is a dry ravine, though perhaps during the winter water may flow. Upon looking there, it was seen that it was filled with livestock, eating and lying down. Reaching the other side, we found on the plains green grasses moistened by the Waikōloa dew.

At 2 o'clock, we arrived at the mountain home of Capt. John Meek, who had passed on to the other side in his old age. We then continued on to Līhuʻe.

Arriving at the Residence.

Going on about a half mile we arrived at the house, and because of the thirst of my companions, they went on down to a ravine where there have been dug a spring. I then heard the greeting of a voice from the house, coming from a woman with whom I was somewhat familiar. Two men came out and took my horse as she greeted us. This lady was the wife of Mr. Richard Meek, one of the owners of this house of the broad plains on the mountain slopes. We were also greeted by his older brother, Thomas Meek…

After eating dinner, we went outside and I saw the wisps of the wind born dew descending. It was becoming dark and cold in the rains, as said, "The spurs of Līhuʻe dig in with cold." Then a wild wind came down from the gullies, bearing with it the fragrance of the forests and grasses. There is remembered the lines of this song:

"Līhuʻe is scented with the fragrance of the kupukupu fern,
By the fragrance of the flowering nēnē grass,
Kissing Kokōlea and Mālamanui,
As the kaunaʻoa strands turn in the sun."

The next day we arose, had breakfast, and made prepared for our return journey. Thomas Meek called his cowboys, our horses were prepared, and in a short time we were making our way by to town…

Kalakini.
Kalihi, Honolulu. Dec. 15, 1875.

g. An Itinerary of the Hawaiian Islands (1880) with A Description of the Principal Towns and Places of Interest (Developments in Honouliuli and the 'Ewa District)

George Bowser, compiler and editor of "The Hawaiian Kingdom Statistical and Commercial Directory and Tourists Guide" (1880) documented various statistics and places of interest throughout the Hawaiian Islands. The following excerpts from Bowser's publication provide descriptions of the communities and development in Honouliuli. Entering the 'Ewa District from Waiʻanae, Bowser reported:

…My next halting place after leaving Nanakuli, was at Honouliuli, at Mr. James Campbell's. This gentleman owns, also, the Kahuku ranch, on the extreme north point of the Island, of which I have already spoken. The Honouliuli ranch is an extensive property. The main road runs through it for about twelve miles, and the general breadth is seldom less than four miles. The surveyed area is 43,250 acres. One large tract of this land is perfectly level, with the exception of a few acres near the center, where there is a knoll of rising ground.

From Mr. Campbell's veranda, looking eastward, you have one of the most splendid sights imaginable. Below the house there are two lochs, or lagoons, covered with water fowl, and celebrated for their plentiful supply of fish, chiefly mullet. In the far distance, some twenty miles away, you can see the range of mountains which form the backbone of the island. It was on the northeastern side of the mountains that the earlier part of my ride was taken. The chain runs from Mr. Campbell's place at Kahuku, away to the easternmost point of the island. The soil at Honouliuli is good, and, with the aid of irrigation,

will grow anything. In the meantime, it is wholly pasture land, but the means of irrigation have recently been secured by Mr. Campbell, who has sunk an artesian well to the depth of 273 feet. This well has delivered a continuous stream of water equal to 2,400 gallons per hour, ever since the supply from which the present flow comes, was struck on the 22d of September, 1879. Besides Mr. Campbell's residence, which is pleasantly situated and surrounded with ornamental and shade trees, there are at Honouliuli two churches and a school house, with a little village of native huts.

Leaving Mr. Campbell's, I came next at Waipio, at which place resides Mr. W. G. Needham, the District Judge for the districts of Ewa and Waianae. Here, also, is his courthouse, and near it a considerable village. The neighborhood is celebrated for its fish-ponds and rice plantations which extend for many miles around the Lochs through which the stream—best known under its English name as the Pearl River—finds its way to the sea… [page 495]

2. Honouliuli Ranching and Land Development (1830-1900)

Grazing of small herds of cattle, and eventually larger ranching operations began developing in Honouliuli by the 1830s. Initially, native tenants and a few foreign residents vied for access to the land. By the 1860s, few native residents could compete and individuals like Isaac and Daniel Montgomery, John Meek, James Dowsett and James Campbell came to control the majority of the land in Honouliuli. The consolidation of land title set the foundation for radical changes in the landscape, led to problems with access to the Honouliuli fisheries, and changed the makeup of Honouliuli's population. The articles in this section of the study focus on the large estates and ranching endeavors in Honouliuli (Figure 11). The consolidation of title under James Campbell in 1877 led to the formation of serious business endeavors. In 1879, Campbell had dug the first artesian well in Hawai'i. With a reliable water source, initiatives like "Honouliuli Colonization Land and Trust Company" and large-scale plantation programs was within reach at Honouliuli and neighboring lands, where a few people controlled nearly all of the land. The following narratives document the relationship

between Honouliuli business interests with those of other locations in the 'Ewa District and in the larger development plans on the island.

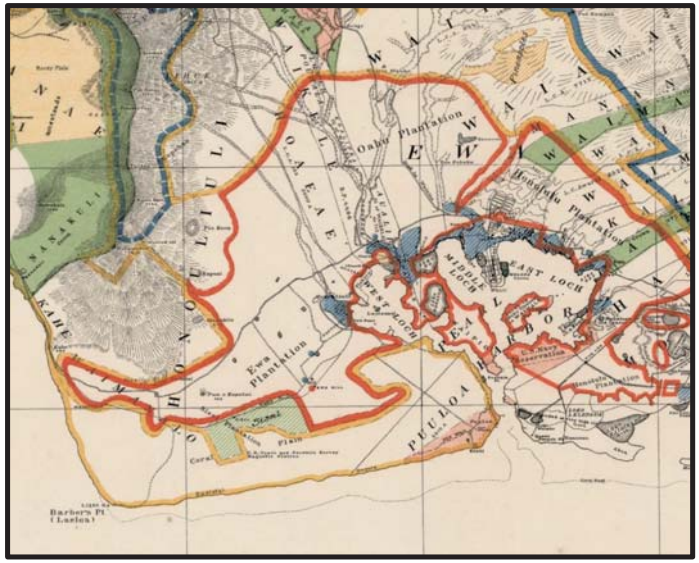

Figure 11. Portion of the Island of O'ahu (W.E. Wall, 1902)

Yellow lines depict grazing lands, orange lines depict sugar plantations, green areas depict sisal plantations.

a. Agricultural Development Potential (1868)

In 1868, *The Pacific Commercial Advertiser* published an article filled with details of a journey from Honolulu through the 'Ewa District to Honouliuli and beyond. The unidentified author describes places and features passed along the old government road and speaks at length about the potential for agricultural development throughout the district, urging businessmen to take action and end waste of the land resource.

The Pacific Commercial Advertiser

Kaala Mountains, January 1868.

Ride to Ewa.

January 18, 1868 (page 1)

…We galloped out of King Street on the excellent road that leads in the direction of Ewa. This is decidedly the best highway leading from Honolulu, as far as the Kalihi bridge. It is macadamized with coral, broad, graded, convex enough for the water to flow to either side, and is compact and durable…

Beyond Kalihi, the cactus and yellow-flowered mimosa, which filled the air with its delicious fragrance…Descending a hill which was the terminus of an ancient volcanic wave of tufa, we enter the romantic valley of Moanalua. The bright waters were murmuring over a pebbly bed between green and fertile banks, where there were some evidences of cultivation. Our road wound up the valley for some distance, past substantial farm-houses, quietly nestled between hills, where we left the valley meandering away with Arcadian beauty among the green wooded mountains to the right, and ascended the volcanic ridge. On the summit of the ridge to the left were several piles of stone rising like rude obelisks, that were surrounded with superstitious traditions of the past. There mark the descent, the jumping of place, to Kapapakolea, or the infernal regions of Oahu. We rode to the summit of the ridge below the weird piles, and stood on the sheer brink of a precipice that overlooked the Hawaiian Lake Avernus [Āliamanu].Far below, having the base of the dark volcanic cliff, in the cavern of an extinct crater, a gloomy lake was sleeping in a green meadow pastured by cattle…

As a dark cloud swept over the scene, it gave it that impress of awe and grandeur that created in the Hawaiian mind the idea of its being the place of descent to the regions of the dead. One of the native legends bears… An

enamored youth in ages long past, lost the lady of his love, and he determined to seek her among the shadows of the dead. He made the descent , found the shade of his beloved… by trick he outwitted Milu, the prince of the realm of darkness, and returned to the upper world with her spirit, which was restored to her body and the lived a life of bliss in the Eden of the Islands. The Hawaiian idea of the immortality of the soul, before the intercourse with the Europeans, was more brilliant and spiritual than that of the Jews, and most of the civilized nations of antiquity…

The Hawaiian Avernus is a fresh water lake; but beyond it to the south-east, also in the crater of an extinct volcano, nearer the sea, is a larger lake of salt water, called Kealia, [Āliapaʻakai] which it is said rises and falls with the tide, showing a subterranean oceanic connections. The view above these lakes from the ridge is beautiful, extending over mountain, vale and ocean. Away to the west and north-west extended the green undulating and wide plain of Ewa, bounced by the Kaala or Waianae range of mountains, over which was spread a gossamer veil of clouds, which gave a softened beauty to the scene, and contrasted the brighter emerald of the grassy glades with the deeper variegated green of the wood-lands. The bright bay of Ewa, or Pearl River, lay before us, spread around its verdant islands, extending deep into the plain, and affording excellent inland navigation for miles. What a magnificent site for a city—a commercial emporium of the Pacific—on its shores!

The narrow entrance that leads into the bay is shallow, but the coral bar is short, and can be dredged and deepened at no considerable expense so as to admit the largest vessels. When once inside, the harbor is land-locked, secure and capacious enough to furnish anchorage for all the ships engage in the commerce of the Pacific. There is not only one, but many harbors and anchorages. The purest spring water gushes in abundance from the bold shores, and two limpid, never-failing streams from the mountains pour their bright waters into the bay. Then there are the Waiawa and Waikele, furnishing

water enough to supply the largest metropolis…

We descended the ridge rapidly, passed the ravine of Halawa, and over an elevated table land into the bright fairy-like valley of Waimalu, where a Roman catholic church and the sugar mill and plantation of Mr. Williams are situated [at Waholoa]. On over the table land we galloped, descended into another valley where a bright stream was winding its way, and some neat cottages and *hale pilis* appeared to the right and left of the road, with some evidence of cultivation around. The sugar plantation of Mr. McColgan was passed to the left of the road. It is immediately on the margin of the bay, where several large springs gush out of the bluff near the sugar mill. We paused not, but continued on to where two cyclopean rocks formed a gate-way leading to the left of the road, where a few rods ride brought us to the hospitable residence of Victor, near the murmuring shores of the bay. We were cordially received, enjoyed his hospitality in the form a most excellent roast beef, fresh butter, the best French bread and cool spring water…

The neighborhood appeared populous, several respectable cottages and farm-houses were around, and it had the appearance of a village. There was much evidence of cultivation. We saw corn and beans flourishing as finely as in any of the States of the West, and we do not know why cotton would not do as well… No irrigation is resorted to for cultivating the corn and beans. They derive sufficient moisture from the soil and atmosphere, and where these products grow, cotton will generally succeed. We passed the cattle ranch of Messrs. Bernard & Raymond [Mānana], and by the local District Judge's, over fine lands, and forded the bright dashing waters of the Waiawa, a perennial mountain stream that waters a beautiful and well cultivated valley. We rode slowly on out of the valley over the plain for the purpose of admiring the excellent corn and cotton lands which lie between this stream and the Waikele. There are several thousand acres lying waste and idle, that could be made to produce and annual income of thousands of dollars? Why is this? and why such

a want of enterprise and knowledge of the agricultural interests of the Islands? We passed by the old residence of the late Wm. Hunt [in the 'ili of Pāpa'a] on a conspicuous elevation, saw two beautiful springs that gushed out of the cliff in waterfalls, crossed the Waikele Bridge and the narrow valley of the stream, where many deserted taro patches appeared, and the cocoanut palms seemed to droop over the desolation around. We ascended the bluff beyond by a hedge of Mexican-like cactus, and were attracted to a mound on the left that appeared like a miniature Cholula. We rode upon its summit and enjoyed the view. It is one of the most beautiful and rural in the islands. Although thirteen miles distant, Honolulu appeared almost at our feet; every outline of the coast, plain and mountain was distinct and clear; the rolling, green plain of Ewa between the grand ridges of mountains, the windings of the bright bay and the great blue sea, with several sails in the distance, completed a scene of beauty. But a short ride by a long an new stone wall brought us to Hoaeae, the *ranch* or cattle station of James Robinson, Esq., where we were kindly welcomed by his *mayordomo*, or head man, Mr. Patrick Curran… He kindly welcomed us, gave us the best of cheer, and ascertaining that we wished to for ride the mountains, prepared to furnish us with fresh horses…

We had a few glorious showers in the evening, but when these passed away, the setting sun peered gloomily through the hazy clouds, and we walked down to the shores of the bay. On either hand were evidences of former populations, in deserted and dried up taro patches, the foundations of ruined buildings, piles of shells near them, like those of the pre-historic races on the shored of the Baltic, and over all, the ancient and decaying cocoa palms appeared like melancholy monuments, drooping over this scene of desolation. We were informed that before the era of the small-pox in 1853, there were twenty-five native houses in the little valley between Patrick's residence and the bay. Now there are none—a sad evidence of the withering away of the native population…

[Rising the next morning and traveling the uplands of Honouliuli, it was reported:]
Thousands of acres of the best cotton lands extended on either hand, and few wandering cattle seemed all the enjoyed any profit from it. We crossed several deep ravines in the ascending plain and came to a the green rounded foot hills where the wiliwili and kukui trees first made their appearance in the ravines. We ascended the grassy foot hills by winding cattle paths, and when we arrived the region of the koa, we discovered a flock of about sixty turkeys in a glade… The koa forest was young and low… Higher up the mountain we discovered signs of wild hogs, and on a lofty ridge in the midst of a koa forest we came upon a "bee tree," in the form of a hollow koa that had been blown down by some wrathful tempest, but was yet green and flourishing…

The scenery as we ascended the mountain benches opened out grandly. From the summit of the loftiest ridge of Kaala mountain more than half of Oahu can be taken in at a glance; eastward beyond Diamond Head; northward to the summit of the eastern mountains; the plain of Ewa, from wave to wave and mountain to mountain…We have never witnessed a more lovely place than that of Ewa and the peninsular plain that extends along the sea form the southeastern terminus of the Kaala mountains to the [Puʻuloa] Salt Works at Ewa bay…

b. Leases and Grazing Rights in Honouliuli

In the 1870s, a dispute arose over the trespass of cattle between J.H. Coney, who owned the ʻili of Kaulu in Honouliuli, and J.I. Dowsett, who owned the ʻili of Puʻuloa in the same ahupuaʻa. Dowsett also held leasehold rights to larger tracts of Honouliuli. Results of the court proceedings were published in *The Hawaiian Gazette* and contain summaries of the leases and grazing rights in the ahupuaʻa.

The Hawaiian Gazette

Honouliuli Land Case – Coney v. Dowsett before the Supreme Court

Wednesday, January 17, 1877.
Supreme Court of the Hawaiian Islands. October Term, 1876.
John H. Coney vs. Jas. I. Dowsett.
Opinion of A. Francis Judd.

January 17, 1877 (page 4)

This is an action in which $10,000 are claimed as damages for the trespass of the defendant's cattle upon the land "Honouliuli" in Ewa Oahu, the property of the plaintiff, since Oct. 16th, 1875.

The jury returned a verdict for the plaintiff of $200, and a motion is made to set aside this verdict and grant a new trial on the ground that the jury must have mistaken or disregarded the instructions of the court on the effect of certain leases under which the defendant justified, or that the jury misunderstood the evidence.

The first lease in question is dated March 3d, 1846, and running for twenty-five years from the 1st of February of that year, expired on the 1st of February, 1871. It demises to John Meek and his heirs, the kula land at Lihue, and the privilege that his cattle should be undisturbed at Honouliuli, if they should go there.

The second lease is dated 13th of July, 1851, and leases to John Meek and his heirs and assigns the land called Waimanalo, at Honouliuli, particularly as follows: The kula and the kuahiwi and the rights appertaining thereto, and the Poalimas, the river with all the rights appertaining thereto. It gives the boundaries as follows: On the mauka side the lands previously leased to John Meek, that is, the kula of Lihue and the kula of Honouliuli; on the makai sides Nanakuli and the Koolina. This lease expired on the 5th of July, 1876.

The third lease is dated the 16th of February. 1853, and it being for twenty-five years, does not expire until the 16th of February, 1878. By this lease there is conveyed to John Meek, his heirs and assigns, all the remaining portions of the lessor's kula land at Honouliuli: this being explained as follows: All parts of this kula land not included in the previous leases made between A. Keliiahonui, M. Kekauonohi and Jno. Meek for that land called Lihue, on the 3rd of March, 1846, and another lease between J. H. L. Haalelea and John Meek, of all that land called Waimanalo, on the 15th of July, 1851, the rents of these two lands shall continue and their lease, until the expiration thereof. they are not included in this lease. Before considering the reservations, which are made at length and with considerable particularity.

Let us go on to the fourth lease, which is dated the 1st of February, 1871, and which conveys all of that certain piece of parcel of land situated in the Ahupuaa of Honouliuli, district of Ewa, island of Oahu, known as the Ili of Lihue, for seven years, and which will not expire until the 1st of February, 1878.

The plaintiff claims that lease No. 1 conveyed not only Lihue but a portion of the kula of Honouliuli, and builds up an argument in sup- of this from the words of description of Waimanalo, above given, in which the mauka boundary of Waimanalo is stated to be the kula of Lihue and the kula of Honouliuli, and that the portion of Honouliuli conveyed by the first lease and not included in the third lease, was not covered by the fourth lease, which was a lease of the Ili of Lihue only. The plaintiff claims that as there was abundant evidence that the defendant's cattle pastured upon this tract of land within the dates in which this trespass is laid, the award of the jury of $200 is far from excessive and should be sustained. But can this position of the plaintiff be sustained?

The first lease conveyed only Lihue, the lessor covenanted in addition that the lessee's cattle should be undisturbed on Honouliuli, if they went there. This

does not lease any portion of Honouliuli outside of Lihue, but only protected the lessee from being held liable for trespass if his cattle strayed on Honouliuli. This view is strengthened by the wording of lease No. 3, made in 1853, which shows the interpretation put by the parties on their previous leases after seven years of dealings with each other as landlord and tenant. This lease No. 3 distinctly says that the lease of 1846 was for that land called Lihue, and that the lease of 1851 was for that land called Waimanalo. Now, as this lease No. 3 conveyed all parts of the kula of Honouliuli, not included in leases No. 1 and 2, it conveys all of Honouliuli except Lihue and Waimanalo and the reservations.

…The reservations in lease No. 3 are as follows: "These are the places reserved to the party of the first part; the fish ponds in said kula land, having fish in them, and two lots intended to be enclosed hereafter: also Mokumeha adjoining the enclosed taro lands: and also that piece between Kualakai and C. W. Vincent's lot; that places known as Ka pa Uhi is also reserved; the sea fishery and its rights are also reserved, similar to the Waimanalo sea-right reservation; also the Pa aina at Honouliuli and the said enclosure: and also the cultivatable land at Poupouwela; all of which are reserved and not included in this lease, but John Meek's cattle shall not be molested should they go on to these places reserved if not fenced in with a fence sufficient to prevent cattle from trespassing. Poupouwela will still remain as in times gone by, and is not intended to be fenced in as its situation is good, not needing a fence. The tabued woods of the mountains of the lands mentioned in this lease are also reserved to the party of the first part, but he, John Meek, can take said tabued wood for his own use, as much as he wishes, but not to dispose of to other parties."

…As regards Poupouwela, its aina mahiai is reserved. This is translated cultivated or cultivatable land. Whichever rendering is taken there is no evidence that Dowsett's cattle trespassed upon either the cultivated land or the land capable of cultivation in Poupouwela. The evidence was confined to

the statement that the cattle driven from Waimanalo between the 11th and 18th of July were driven from Lihue to water at Poupouwela and back again, but there was no evidence that this water was in the limits of the aina mahiai. I am of the opinion, though the jury were not so instructed, that no trespass could be maintained even on the aina mahiai of Poupouwela, as the clause in reference to immunity from trespassing applies to it, and the lessor disavows his intention of fencing it, as the situation of the land did not require it. The legal inference from this is, that he took the risk of cattle trespassing on it, though unfenced…

A. Francis Judd,
Justice Supreme Court.
L. McCully and E. Preston for plaintiff. A. S. Hartwell and W. C. Jones for defendant.

Honolulu, Oct. 23, 1876.

John H. Coney vs. James I. Dowsett.
On Exceptions to the Decision of Mr. Justice Judd.

Present: Chief Justice Allen, Justices Harris and Judd.

The question upon which the opinion of the fall court is desired, is the construction of the leases on file in the case.

The arguments of the counsel for the plaintiff are exceedingly ingenious, and we have given them full consideration. We have likewise reviewed and weighed the opinion given by Mr. Justice Judd, which is excepted to and we concur in that opinion fully, seeing no reason for altering, amending or expanding it.

The jury will be instructed in accordance with this opinion, in case a new trial is proceeded with.

Elisha H. Allen,
Chas. C. Harris,
A. Francis Judd.
E. Preston and L. McCully for plaintiff, A. S. Hartwell and W. c Jones for defendant.
Honolulu, Dec. 29, 1876

c. Honouliuli Ranch

The Daily Bulletin
Honouliuli Ranch

August 14, 1885 (page 6)

Viewing the Ranches.
…If observation is anything, and scientists say it is everything, these hills and glades go to prove that a least the island of Oahu has been perverted from its original purpose in the economy of nature, and that "someone had blundered." inasmuch as large areas of its best lands are devoted to the sustenance of the cow, the ox and the goat, the people to shift for themselves as best they can about the docks and street corners of Honolulu. Where cultivation appears, it proves an unmistakably grand success. Wherever improvements break up the soil, the soil gives manifold returns. Coming over the brow of one of the hills, an immense structure appears in the distance. It reminds the observer of the bridges over some of the mountain gorges on the line of the Union and Central Pacific railroads. It turns out to be Robinson's irrigating flume, running along on trestle work over a wide gorge at the bottom of which is the Waipahu stream and spring. The road leads down towards the water, and passes under the highest part of the trestle bridge, the flume at the roadway being

apparently about eighty feet overhead. Right by the road is a big pump for raising the water to the flume. It is brought by this conduit to Robinson's banana plantation, covering about fifty acres of land at Ulalena. There is an opinion among the natives that this Waipahu stream has subterranean connection with Kahuku. In support of this theory the story goes that a woman at Kahuku accidentally let a tapa stick fall into the water, and all efforts to recover it proved futile, but some time afterwards being at Ewa, she saw her lost tapa stick and accused the possessor of having stolen it, but the alleged pilferer was acquitted on proving that the stick had been picked up in the Waipahu stream. The "fourth estate" cavalcade passes on, and after anther hour's equestrianism, that by this time is beginning to be more painful than romantic to some members of the party, the Honouliuli ranch is reached, horses are taken care of, the pressgang, professor and all, are shown to well furnished apartments, and every man is hospitably directed to make himself perfectly at home. A sumptuous dinner soon follows, the soup and fowl are excellent, and the fish, a fine Papiopioulua, is simply magnificent. In next letter, you will have an attempted account of a two days' ride over the great Honouliuli ranch, covering a tract of about 43,000 acres.

The Hawaiian Gazette
Honouliuli Ranch.

August 19, 1885 (page 2)

With a good horse and agreeable companions the ride from Honolulu to Mr. Campbell's ranch at Honouliuli a very pleasant undertaking, and so it proved to a party of gentlemen of the press and others who made the journey on Monday last.

To a traveler who has not been over the ground for some seven or eight years, considerable changes are observable, chiefly in the direction of increased

farming and cultivation. The extent of rice and banana land is much enlarged, and Mr. Mark Robinson's flume and pumping engine at Ulalena is a remarkable piece of work. Though apparently of the slightest conceivable scantling it stood through the late gale without injury. This flume irrigates over 200 acres of land fit for banana, watermelons and a variety of produce and of which 35 acres are in bearing.

Of Honouliuli itself there is a great deal to be said. Mr. Campbell's estate contains about 13,250 acres and has been in his hands for eight years. During this time he has put up 30 miles of fencing of which 20 miles are of wire and 10 miles of batten. The estate is thus completed enclosed; either by fence, by the impenetrable ridges of the Waianae Mountains, by the water front of Pearl Harbor or by the open ocean, Hon. J. I. Dowsett's place at Puuloa cuts off a corner stretching from Pearl River to the seabeach behind. There is little of any of this land which is not capable of being made productive in one form or another. At present it only carried 5500 head of cattle, and one rides along the foot-hills of the Waianae range and the plain below through miles of manienie grass above fetlock deep, only sprinkled here and there with high bred cattle in splendid condition. Occasionally one comes to a batch of some acres of mimosa bush and sometime of blue weed. Again on the high plateau on the western terminal slope of the mountains large batches of Spanish clover, kukaepuaa are amongst the prevalent manienie.

On taking possession of the property, Mr. Campbell found it heavily overstocked and wholly unfenced. Buying out the Kahuku property on the north side he caused to be removed 32,300 head of cattle, reserved Kahuku for breeding purposes, and after letting the land rest for twelve months, gradually raised the stock on the two estates to the present figure, viz, about 5300 on Honouliuli and 3300 on Kahuku.

The young stock are driven from the last named place to the Eastern, or Lehue

[Lihuʻe] end of the former, and so onwards till they reach the fattening ground of some 15,000 acres, towards Manikuli [Nanakuli] and thence is an easy drive to the slaughter house on the Pearl Harbor, whence the carcasses are carried by steamer to the Capital, thus avoiding the deterioration inseparable from long drives to market.

Among the ravines and narrow valleys between the span of the main mountain range towards the Leilehua boundary, are evident traces of extensive taro grounds, sufficient proof that there at least, abundant supply of water has formerly been available. Though the great bulk of the land from Honouliuli to the "big tree" is available at present for cattle runs only, there seems to be no reason why, at reasonable expense a good portion of this might not be irrigated for dairy, grape, vegetable and many other marketable produce.

A well at Kunia, 400 feet above the sea and sunk 50 feet brings water to within twelve feet of the surface, except during long droughts, while an Artesian well (Waianiani) about fourteen feet above sea level has yielded 2,400 gallons an hour since it was sunk in 1879. The water front on Pearl Harbor affords on one side promising bathing places, while the whole area of the sheltered harbor offers unrivalled opportunities for yacht sailing. The rice grounds are in the hands of the Chinese, who pay a low rental for the first seven years, which are nearly expiring, but they are desirous of renewing for another seven years at a considerable advance. Fishing rights, lime and building stone are also valuable considerations.

The soil almost throughout this estate is the rich red volcanic mould familiar in these island, its depth is shown by the numerous cracks and slopes, and its fertility by the spontaneous growth which covers it.

At present the Campbell estates send an average of six carcasses per diem to Honolulu being rather more than one third of the consumption. The cattle are

all in prime condition, and judging from the large areas on which mere traces of cattle are now visible and the immense amount of available feed, this quantity could be readily increased by 50 per cent. Without distressing the land. No doubt a large portion of this land is available for cultivation by small freeholders; how much, can only be ascertained by experiments in the way of raising and distributing water, especially between Honouliuli and Lihue. The questions of market and ready access thereto, may be left for the present to await further information based on actual experiments.

At the ranch itself Mr. Cecil Brown did the honors in most hospitable style, and rode each day with the party ready to lead the way over the country and afford every information asked for, and to him members of the party are indebted for a pleasant trip.

Daily Bulletin
Honouliuli Ranch.

August 31, 1885 (pages 2-3)

Tuesday, Aug. 11th.
[riding in from Waialua, across Waiʻanae Uka]
…Passing on, the party soon reach the Kunia windmill, drawing from a well about thirty feet deep a continuous stream of water. The elevation at this point it estimated to be about 450 feet above sea level. The Kukui windmill is about as good an indicator as can be that these lands may one day be dotted over with the habitations of an industrious agricultural population. If one windmill draws a continuous stream of water from a depth of not more than thirty feet at this elevation, it may reasonably be inferred that a water supply for purposes of settlement can be had at other points as well as here.

The next halting place is in the umbrageous shade of The Big Trees at Lihue.

There are two gigantic kukui trees standing about ten feet apart, on the top of a high hill, like sentinels keeping guard over the surrounding country. As every object of note must have a legend, that of The Big Trees is that a native has his six by two resting place under each tree. Several visitors in years gone by have carved their names on the bark, thus leaving to the kukui trees the sacred trust of bearing their names, as the years roll on, higher and higher in view of all who pass this way, in proof of the fact that they had at least made their mark in the world. Nearby is a dilapidated old building, once the residence of Captain John Meek. With reference to the capabilities of the soil it is related that Captain Meek raised oats and corn here in his time.

A few miles further on, another halt is called at a magnificent stream, and right by is a fine dairy kept by a Portuguese. It need hardly be said that every milk drinker in the party had his wants supplied to his own satisfaction and the credit of the ranchman's cows. The outward bound ride at length comes to an end at the Papowela [Poupouwela] stream and well. Here, a hole was bored years ago with hand tools, and, as the water did not come at the time, the pipe was plugged. Six months after the plug was taken out, the water flowed and has flowed on ever since.

The order rings along the line, "Back to the ranch house." The march back is close along the line of the Leilehua Ranch. About half way down the home stretch, the ride is mostly over level ground. A gallop of a mile or so over a rich carpet of verdure, then a slow march down a steep bank and across a ravine under clusters of kukui nuts, and up the opposite bank, then off again on another steeple chase (all but the steeple), over another ravine, and so on for five or six miles. Occasionally we pass a drove of cattle, so rolling fat that their sleek coats glisten in the sun. The ilima plain traversed in the morning is again entered, though on a different trail, and at half past one, P.M., a rather sore, but much delighted party of the wise men of Honolulu are luxuriating, in the bath room, on the breezy verandahs and at the sumptuous dinner table of the

Honouliuli ranch house.

Wednesday, Aug. 12th.

This was the second day's riding over the Honouliuli Ranch, and a more exciting and romantic excursion could hardly have been made. The start was made, as before, from the ranch house, and lay over a part of the wide flat traversed yesterday, and which, as before stated is well covered with the ilima, indigo and other shrubbery much relished by cattle. The shrubbery, I omitted to mention yesterday, is richly supplemented by an undergrowth of manienie grass. The route this morning is to the mountains. The climbing begins. Looking forward and upward at an angle of about 40 degrees to a height of some 800 feet, the first peak to be scaled [Pōhākea] is in full view. The prospect is not a comfortable one to the ranch horses. They face the acclivity, however, with commendable equine determination, pawing their way with sure-footed care up the slope, through heavy grasses growing knee-high. The whole slope is heavily coated with manienie and native grasses, and some Spanish clover, and is well dotted over with trees, chiefly the kukui. After reaching the top of the first peak, the trail winds down, corkscrew fashion, through heavy verdure and under the umbrageous shades of large wide spreading trees into a deep ravine, out of which there is another corkscrew trail up on to the next peak and reaching a little farther into the clouds. Parts of the trail just gone over runs along the margins of immense gulches into which the rider looks down over precipitous descents of some nine or ten hundred feet through the dense foliage of trees that have somehow got rooted in the sides of the declivities, so that they suggest the idea of an aerial vegetation. The prospect up these mountain sides and through these ravines, is grandly picturesque. These exhibitions of mountain scenery grow upon the view. The first hour among them extorts expressions of wonder and admiration. Passing on, their majestic grandeur repeats itself in ever increasing variety. The faithful horses climb almost perpendicular ascents over the rugged natural stairways, and again descend similar hard places, with equal care and safety. "Jerry" proved himself

an able and reliable steed. "Sooner," by the way, had been discarded, as deficient in intellect and understanding, and unfit for the service of the Bulletin, But "Jerry" is an intelligent big bay, wanting neither whip nor spur, but always knowing just where to go, and regulating his paces with infallible correctness, whether on the slow march over rough and rugged ways, or on a streaking gallop over pieces of smoother roadway. Midday finds the whole party on the highest point, but one, of the Waianae. The scene at this point is grand. It is magnificent. It is stupendous. We stand here on the rim of an immense basin scooped out of the mountain, with the seaward side broken out. This vast cavity is about a quarter of a mile wide, with almost perpendicular walls a thousand feet high. Beyond the basin northward, the mountains shoot up skyward in collossal isolated cones. Spreading out in the spacious concave of the western horizon, are the deep blue waters of the great Pacific Ocean, the "boundless, vast, illimitable waste of waters." The Nuuanu Pali, with all its grandeur, is surpassed by this exhibition of nature's wonders in the Waianae. All these mountain elevations, with their deep broad gulches are valuable, from the utilitarian standpoint as they are from the romantic and sentimental. Herds of splendid cattle are seen feeding on the slopes and in the valleys. The cavalcade moves on down the seaward side of the mountain, in view of thousands of acres of flat land lying along the seashore. These seaward paddocks are pointed out as the territories that will be in order for the explorations of tomorrow…

Thursday, Aug. 13th.

[Returning to 'Ewa via the low land trail] …The trail leads over coral which is evidently upheaval. Up through every crevice and around every boulder, big and little, there are thick growths of pili, makuekue, pualele (milk weed), manienie, kukaepuaa and other native grasses. At one place, a cavity in the rocks contains luxuriant growths of breadfruit, bananas, sugar-cane, and numbers of wiliwili trees, with their exceptionally pretty red seeds. The natives say when these seeds are ripe and red, there are plenty sharks off

Puuloa. On the lower part of this land among the rocks, fine clumps of algaroba trees appear in different stages of development. All these trees have grown up within about six years. The large progeny of baby algarobas whose frowsy heads appear here and there over the plains, if not nipped by cattle would evidently evolve, within a very few years, a race of sylvan giants. Cattle kept off, and the natural propagation of these fine trees assisted by some planting, there is here the possibility of a big bonanza in a ten thousand acre forest within ten miles of the city of Honolulu. As pasture land this portion of the rand is unsurpassable in richness. It is the part of Honouliuli designated the fatting paddock. Cattle intended for the slaughter house are brought here to have the "gilt edge" finish put on them. About six head are slaughtered every day for the Honolulu market and forwarded by the steamer Kapiolani. The ranch is capable of supplying a much larger daily quota of beeves, but the demand is limited, and the ranch is of course stocked considerably short of its capacity. There are at present on it some 5,500 head all told. But if the grasses, and other plants in their present condition, mean anything, they indicate enough and to spare for herds numbering twice five thousand.

A fact deserving of special note is the improved breeds with which the ranch is almost wholly stocked. Durhams, Herefords, Jerseys, Ayrshires and Holsteins are pointed out. And, really, it needs not the eye of a connoisseur or a grazier to notice that the animals are no "square piles of bones built on four uprights of the same;" for no one can view them roaming in herds over the mountains, scattered in squadrons over the plains or massed in closer order around the reservoir on the fatting paddock without noticing many of the points of superiority characteristic of the several varieties of improved stock…

d. Honouliuli's Great Land Colonization Scheme (1885)

The Daily Honolulu Press

Great Land Colonization Scheme, Island of Oahu, Hawaiian Islands.

October 31, 1885 (page 2)

A property of 115,750 acres offered for sale to a joint stock company, which will sell the same as suitable for sugar, rice, grazing, homestead, dairy, fruit and other purposes.

63,250 acres in fee simple and 52,500 acres held under lease, at present carrying between 12,000 and 15,000 head of cattle and 250 horses and mules.

A large area of this property is suitable, according to locality, for Sugar, Rice, Vinyards, Fruit Orchards, and small Homesteads, the remainder being fine mountain side grazing ground.

Under the proposed arrangements of the Company to be formed an exceptional opportunity is offered for acquiring homesteads, by a system of deferred or gradual payment as may be agreed upon; the whole being within easy reach of Honolulu, the capital city and principal port, with a steadily growing market.

Climate.

The climate is pre-eminently healthy, the North-east trades sweeping across the island for the greater part of the year.

While there are no available registers barometer, thermometer or rainfall for this particular district, there is no reason to question their strict analogy with that of the Nuuanu Valley, in the same island, and in which Honolulu and its suburbs are situated, where the rainfall amounts to 33.28 inches per annum from a minimum of 0.94 in March to a maximum of 3.43 in December; but these figures relating only to the lower levels in and about Honolulu do not by any means represent the rainfall on the Waianae Mountains, which is very much heavier.

Thus the temperature may be said to range from 68 to 85 Fahr., varied of course by situation, elevation above the sea, accessibility to trade winds, etc..

Honouliuli Ranch.

Containing [43,250] acres in fee simple. This land is favorably situated, having direct communication with Honolulu by water, distance 10 miles, or by land by a good road, distance 17 miles, the latter offering singular facili- for an inexpensive railway track.

The water route to Honouliuli is from Honolulu harbor skirting the reef to Pearl harbor, a magnificent inlet of the Ocean protected by a reef or bar with 11 to 13 feet, but inside with from 20 fathoms to 3 fathoms of land-locked, protected anchorage, fit for all classes of coasters and yachts. On the west arm of this harbor Honouliuli has a frontage of no less than five miles, all steep-too, with from three to twenty fathoms in front of it. The whole fishing rights of this west arm are part of the property.

Honouliuli Ranch is bounded by the sea and Pearl River on two sides, and extends in a westerly direction to the divide of the Waianae Mountains which form a natural boundary so well defined and so difficult to pass as to render fencing on this line unnecessary. But where Honouliuli adjoins the neighboring properties, it is securely fenced. There are twenty miles of five-wire fence with redwood posts, and ten miles batten fence, all in good order and erected within the last seven years.

Stretching from Pearl harbor and skirting the base of Waianae mountains southward and eastward is a plain of about 7,000 acres of rich alluvial soil, eminently suitable—the upper portions for sugar and the lower for rice lands. Of these latter, from 3,000 to 4,000 acres may be irrigated by artesian wells, the elevation above high water mark being between 12 and 35 feet. One well sunk in this district in 1881, to a depth of 186 feet, has yielded unceasingly

2,400 gallons per hour since completion.

On the eastern slopes, among the foot hills of the Waianae mountains, are over 10,000 acres of land, suitable for small farms, vineyards, orchards, &c. several perennial spring, flow through these valleys and ravines, and the extensive traces of taro culture show that in the hands of the old natives there was no lack of water.

Wells have been sunk at elevations from 400 to 700 feet above the sea level. Water was found at from 30 to 60 feet below the surface. One is a flowing well; on the other a windmill suffices to raise drinking water for surrounding herds.

The ravines of the Waianae slope are narrow and readily lend themselves to favoring the construction of storage dams for purposes of irrigation.

The Waianae mountains attract or precipitate a sufficient rainfall in ordinary seasons for the maintenance of the present heavily-grassed condition of the slopes, and due attention to the forestry will enable them to carry more numerous herds of cattle than those which now fatten hock-deep on the Manienie or Bermuda grass.

The lower and more open slopes are suitable for dairy, poultry or fruit raising. They are within easy reach of the main road to Honolulu, and when peopled must soon invite the construction of a railway to the capital.

The Sugar cane and Rice land of this property is valued at from $100 to $200 an acre, and may be taken up in large or small tracts at these figures; the grazing, farm and fruit lands are valued at from $10 to $50 per acre. It is at present intended to offer some 10,000 acres of first-class agricultural land for sale, upon convenient terms, at $50 an acre for colonization purposes, for resident and improving occupants…

General Remarks.

[Author references the additional ranching operations of the Kawailoa and Waimea Ranches which contain 72,500 acres of land]. The Honouliuli property is distant about twelve miles, but is connected with them by an excellent road. These properties have at present 66 miles of good fencing. The land is well grassed with a fair proportion of timber throughout. Livestock of all kinds thrive and fatten on the pastures, and by increasing the number of enclosed paddocks and working the combined estates systematically the number of cattle and horses on the land might be largely increased.

The number of cattle, 12,000 to 15,000. Now on these estates has been already mentioned, also 250 head of horse stock and mules, together valued at $312,000. The horned cattle are bred from "Hereford" and "Short-horn Durham" imported for these estates, and they thrive and fatten without any stall feeding or housing.

The horse stock is exceptionally good, one sire, "Shenandoah," having won over $20,000 as a two-year-old in the United States. There are also three trotting stallions, two of which cost $1,000 each, and there are unbroken colts and fillies from these sires, some four or five years old, which may be readily broken for saddle or harness.

These properties, if united, would give the proposed company a controlling interest in the Honolulu market, for produce of all kinds, with a steadily increasing demand; to which the contracts recently entered into by the Pacific and Oceanic Steamship Companies may prove a valuable stimulant. Indeed it is possible to create a trade with San Francisco for carcasses of beef and mutton carried in refrigerating chambers by the Oceanic Steamships.

The income from these estates at present, including leases, is $70,000 a year. Moderate calculations show that these figures might be nearly quadrupled.

The fishing rights on Pearl harbor pertaining to the Honouliuli estate, now leased for a short term at $1,700, can be rented at $2,500 on the expiration of the present lease.

A limestone quarry on the Honouliuli property at present pays a small annual rent, and a royalty on the lime produced. The entire demand for this kingdom may be supplied from this quarry, instead of, as hitherto, importing lime from California. The builders of Honolulu consider this lime superior in quality and preferable to the Californian lime. There is also a fine limestone quarry on Kahuku Ranch.

The five mile frontage on Pearl harbor spoken of suggests a town site for a summer resort there, the facilities for yachting and boating being unsurpassed, while the climate is all that can be desired.

A vast variety of fruit or timber trees grow with extraordinary rapidity. The whole Eucalyptus family, the algarroba or locust tree (pseudo-acacia), the tamarind, "alligator pear," guava, bread fruit, &c. Citrus fruits especially thrive without care or cultivation. Many ornamental woods known as koa, kou, ʻōhiʻa, &c., grow well. India-rubber (caoutchouc), quinine (cinchona), and perhaps above all the ramie will flourish, each in its suitable locality, which may be found on these estates.

Proposed plan for forming a Joint Stock Company to purchase, sub-let, sell or work these Estates.

It is proposed to form a Joint Stock Company to buy the properties described below, both freehold and leasehold, to divide them for purchase or lease on convenient terms, and to work the unsold or unleased portions for the benefit of the shareholders.

Property consisting of–

63,250 acres in fee…	$ 822,250
Capitalized value of leased land, 52,500 acres…	$ 65,750
15,000 head cattle at twenty dollars each…	$ 300,000
260 head horses, &c…	$ 12,000
	$1,200,000

The Company's stock to consist of-

12,000 shares of $100 each…	$1,200,000
8,000 of said shares, par value $100 each…	$ 800,000

To be offered for sale and

4,000 of said shares, par value $100 each…	$ 400,000

To be held by the promoters of the Company, viz., Jas. Campbell Esq., owner of the Honouliuli and Kahuku estate; Jno. H. Paty Esq., of Messrs. Bishop & Co., Bankers, principal owner of Kawailoa and Waimea estates; M. Dickson Esq., and J. G. Spencer Esq., part owners of Kawailoa and Waimea ranch; Mr. B. F. Dillingham, President Pacific Hardware Co.

As soon as 8,000 shares of the capital stock have been subscribed for by responsible persons, the Company will be incorporated and the stock issued.

Receipts from the sale of the stocks will be paid over to the owners of the properties. Deeds, leases, and bill of sale of landed property and of live sock to be placed in the lands of the officers of the Company appointed to receive them.

The following gentlemen have consented to accept office: President, James Campbell. Vice-President, J. H. Paty. Secretary and Treasurer, Godfrey Brown.

The following gentlemen have consented to be nominated for Directors: James Campbell, J. H. Paty, S. G. Wilder, A. J. Cartwright, W. F. Allen, S. B. Dole, W. Austin Whiting, W. R. Castle, B. F. Dillingham. General Manager, B. F. Dillingham, Sub-Manager, M. Dickson.

The Daily Honolulu Press
Local News.

November 19, 1885 (page 3)

The Hawaiian Colonization Land and Trust Company have issued a preliminary prospectus setting forth the merits of the Honouliuli, Kahuku, and Kawailoa and Waimea ranches. The introduction to the prospectus contains the following clause: "The object and purpose of this company shall be to purchase the land and leases herein-after described, also other desirable property in the Kingdom which may be offered for sale or lease upon favorable terms, and sell or sub-lease them for colonization purposes, in lots or parcels to suit purchasers, and upon terms which will make it not only possible but convenient for those with very limited means, to gain a 'foot hold' in this country," Occasion will be taken here-after to review the scheme at greater length.

The Daily Honolulu Press
The Colonization Scheme.

November 30, 1885 (page 2)

Governments are the natural guardians of the people; therefore to protect the rights of an individual is no less the duty of their rulers than it is their duty to foster schemes for the development of the country's natural resources. While it would be impracticable in most instances for a Government to become a party to a corporation, yet it can give protection and add support to its

subjects, who are its direct agents for the improvement and development of the country at large. But development is a basis for security, and increased security means financial protection, and financial investment always assumes that the Government is a natural guardian under whom both capital and industry can rest secure and increase without molestation.

It follows that all reasonable projects for developing the resources of these Islands should be furthered and protected by this Government. It is the duty of every citizen to aid in bringing about such a state of reciprocal interests. Such a chance is now offered both Government and citizens in a scheme for the colonization and development of the Island of Oahu by a *bona fide* joint stock company, known and existing under the style and name of the Hawaiian Colonization Land and Trust Company. The men whose names figure in the preliminary prospectus of the company preclude any doubt as to the sterling worth and merit of this enterprise.

It is proposed by this company to buy up some of the great landed estates of these Islands, the present scheme embracing the Honouliuli ranch containing about 45,000 acres of land, the Kahuku ranch containing about 25,000 acres and the Kawailoa and Waimea ranches containing about 45,000 acres of surveyed and unsurveyed land. The company proposes to sub-let, sell or work these estates on terms the most favorable to settlers, as will be seen by perusing the preliminary prospectus heretofore published in the Press, as well as in pamphlet form for general distribution.

Some of the main points connected with the situation and resources of these ranches may be briefly summed up as follows: The different properties are easy of access either by land or water; they are all fertile valley lands or fine uplands for grazing; all the properties are well watered by springs, artesian wells and natural water sheds with easy constructed reservoirs; they are all well stocked, well grassed, well wooded and well fruited; they contain

excellent fishing possibilities which may be practically developed into an immense source of revenue; these different ranches are capable, according to locality, of producing sugar and rice, vineyards and fruit orchards, and are also suitable for small farms or larger grazing tracts.

One of the main things to be taken into consideration, in the present offer of the company, is, that each and every one of the properties embraced in the scheme is at the present time *a paying property*. Another feature to be looked at is, that no matter how poor a man may be he can enter upon the land offered and by his own labor and enterprise can not only make a living but can lay by enough money to purchase in a few years, on the installment plan, the homestead upon which he lives, thereby rendering himself and his family independent.

The scheme is a gigantic one but it is backed by men of sterling moral and financial worth, who will use every endeavor to carry it through to a successful consummation. Embracing as it does an estate containing 63,250 acres of land in fee simple and 52,500 acres of leasehold land, it is a scheme that necessarily calls for foreign immigration and home support. What one man may do for the development of these Islands has already been seen and appreciated by many; what an organized company of our best citizens can do, with the proper support from the Government, will by far eclipse any instance of private enterprise and will open up and develop the resources of Hawaii until public debts will not only be a thing of the past, but "Money to Lend" will be posted in every doorway from the Government building to the confines of Chinatown.

The Daily Bulletin

Prospective Returns of the Colonization Scheme.

December 17, 1885 (page 2)

A communicated article in a contemporary presents some of the sources of profit to investors, and advantages to settlers, held in prospect by the promoters of the "Hawaiian Colonization, Land and Trust Company." For the information of our readers we summarize the leading facts. The Honouliuli territory, of which the company has the refusal, contains 17,000 acres of land suitable for growing sugar cane. Of this amount 7,000 acres are comprised in a plain requiring artificial irrigation. To effect that object artesian wells are proposed for the portion lying at an elevation not exceeding thirty-five feet above sea-level, and a series of dams, in a natural gulch, for higher levels. Both means are proved feasible beyond any reasonable doubt, by the complete success attending their adoption, under similar conditions and in contiguous areas. Their estimated cost, for this company's purpose, is $125,000. When the land is furnished with watering facilities, it is assumed that at least from 2,500 to 5,000 acres will be occupied by responsible cultivators of sugar cane. The cane would be raised on shares, in the proportion of, say, five-eighths to the planter and three-eighths to the company. Milling facilities, with transportation of cane to mill and sugar to place of shipment, should be provided by the company, while the planters should do the harvesting and loading. Four tons to the acre is the very lowest estimate of the soil's productiveness, but experience dictates a higher figure by two or three tons. Taking the smallest amount of both land and yield, however, we have 2,500 acres producing an aggregate of 10,000 tons of sugar. Of this the company's share would be 3,750 tons, worth, at present value, $375,000 net. As to the cost of accomplishing the result just given, the author of the article herein drawn upon presents the following statement:-

Cost of 30-ton mill, say…	$150,000
Cost water supply for mills and dams…	$125,000
Cost tramway and cars for trains porting cane and sugar, say…	$ 25,000
Total estimate outlay…	$300,000

On this estimated outlay of $300,000, which he explains, is a liberal one, the following reductions are allowed: -

Interest at 9 percent…	$ 27,000
Wear and tear on mill and tramway, and repairs to dams, say…	$ 28,000
Current expenses, taxes, Insurance, etc…	$ 75,000
Total annual expense…	$130,000

Ultimate results are thus deduced from these figures: "If this amount for annual outlay under every legitimate head of expenditure be deducted from $375,000, the value of a season's sugar crop, there is left a balance of $245,000 and interest of 9 percent on investment. This is calculated on the basis of existing prices. But suppose that the price of sugar should drop 40 per cent., or 3 cents per pound, as an extreme limit, which is very unlikely, there would be $150,000 to write off the value of the sugar crop, reducing the $375,000 estimate to $225,000. Now, deducting from this sum of $225,000 the estimated expenditure of $130,000, there would remain a net profit of $95,000 and interest at 9 per cent. on the investment, making a total income on the investment of $122,000 per annum."

It is asserted that most, if not all, of the ten thousand acres to be devoted to colonization is good rich soil. Extending from Pearl Harbor to the foothills of the Waianae mountains, the area gradually reaches an elevation of about 1,000 feet. A large proportion of the land may be irrigated by storing water as above mentioned, but, besides that recourse and artesian wells, water is obtainable at many points from springs and similar favors of nature. Being in the most elevated region of Oahu, the rainfall of the area is very large, and it is anticipated, upon the strength of wellknown natural law, that, once under cultivation, more humid conditions still would be induced.

Already over forty applications for lands have been received by the provisional

company, the aggregate amount applied for exceeding two thousand acres. The applicants, some of whom are long residents in the country, are confident of being able to make a fair living from products they can raise for even the local market. By raising sugar on shares with the company, the owner of five acres, it is estimated, is assured of a net income of from $1,000 to $1,500 a year, besides minor sources of living that an agricultural holding affords. This would indeed, be a princely existence to many millions of people throughout the globe, "who," as the correspondent says, "toil unceasingly six months of the year to exist the remaining six."

Besides the foregoing inducements to settlers, it is intimated that persons disposed to engage in stock-raising can be accommodated with lands of the company, by purchase or lease, with the opportunity of buying a high class of stock now subsisting on the property. The company would even "cut up and dispose of the whole property on very favorable terms to a desirable class of bona fide settlers."

e. Honouliuli Water Development

The Hawaiian Gazette
Honouliuli Ranch
A Very Large Reservoir to be Constructed to Hold a Million and a Half Gallons of Water.

November 18, 1890 (page 10)

Mr. H. M. von Holt, superintendent of ranches for the O. R. & L. Co., is having constructed on the Honouliuli ranch, about five miles from the new Ewa plantation works, a storage reservoir which when completed and full of water will be about 1250 feet long by 150 feet wide, and have a depth of water at the dam of 15 feet. A trench or puddle dam was dug through the fall of the gulch to a depth of from 3 feet on the ends to 7 feet in the center, where a hard pan,

impervious to water, was found. This was then filled up with earth only, and packed down and over this the dam of earth is being built. When completed it will be about 50 feet wide on the middle bottom, sloping upwards to a width of 10 feet on top, 160 feet across the gulch and 17 feet high. The dam is situated on one of the large plains extending from the easterly slopes of the Waianae mountains, while deep ravines on either side of the plateau will prevent any chance of mountain freshets. Two gulches stating from zero on the plain about half a mile from the mountains and a quarter of a mile apart run nearly parallel for about a mile, where they join, running out to the plain again at zero. The dam is a quarter of a mile below the junction of the gulches, and the reservoir when filled with water, as it is hoped by the winter rains, will be backed up as far as this junction. The reservoir will be fenced off and water led into troughs below the dam through a two-inch pipe, so that the stock can have clean and clear water. The survey plans and detail of work were furnished by Mr. G. C. Allardt, civil engineer, who returned on Monday afternoon from inspecting the progress of the work. A gang of twenty Chinese are doing the labor, and are encamped near the works, at a spring of water. After the heavy rains of the beginning of the year, the water seeping out from the clay beds in both gulches continues to flow quite a stream until the middle of June. This supply, together with what storm water may fall on the plains, and flow into the gulches, will be utilized to fill the reservoir, a waste way being provided for the overflow. Mr. Allardt estimates the reservoir when full to hold 1,500,000 gallons of water, which once full will no doubt be sufficient to stand an eighteen months drought, allowing for evaporation and stock purposes.

3. Plantations and Oahu Railway & Land Company Development

While ranching remained a part of Honouliuli's history through the middle 1900s, the development of the 'Ewa Plantation Company took over as the major revenue generator and source of the major changes on the land (Figure 12). Thousands of acres were cleared for sugar fields, work force populations were developed, housing and commercial interests

grew, and traditional cultural resources were erased from the landscape. Sugar cultivation dominated the Honouliuli ahupua'a through the 1970s.

Figure 12. Map of the 'Ewa Plantation Fields (1939)

James Campbell purchased the ahupua'a of Honouliuli in 1877 (Liber 52:201-201). He continued the ranch operations of his predecessors, and sought ways to develop further business opportunities on the land. In July 1879, James Campbell contracted with John Ashley to drill a well near his ranch house. The well was successful and resulted in the first artesian well in the Hawaiian Islands, which remained in use through 1939 when it was capped. When it was determined that water supplies could be relied upon, planning for large scale commercial agriculture began on the Honouliuli plain.

In 1885-1886, James Campbell entered into an agreement with Benjamin Franklin Dillingham to implement a "great land colonization scheme" for Honouliuli (Thrum, 1886:73). It was their goal to offer small tracts of land for agricultural and homestead uses.

It was reported that "a large area of this property is suitable, according to locality, for Sugar, Rice, Vineyards, Fruit Orchards and Small Homesteads, the remainder being fine mountain side grazing ground" (Thrum, 1886:73). There was little interest in the land scheme at the time, but within a few years, Dillingham was developing the O'ahu Railway and Land Company. By 1889 the rail system ran from the Honolulu Harbor to Mānana, ending near the old 'Ewa Court House (Whitney, 1890:155).

On January 29, 1890, the 'Ewa Sugar Plantation Company was chartered, and operations set in motion. The region that had formerly been described as a "veritable desert," grew "into a full-fledged sugar venture" (Conde and Best, 1973:278). Within the year, 5,000 acres of land had been put into cultivation for the 'Ewa Plantation (Whitney, 1890:159). In June 1890, it was announced that the OR&L operations had been extended to the 'Ewa Mill. Local papers reported:

> The first carload of freight to 'Ewa Plantation went over the Oahu Railway Y Land Co.'s line yesterday (*The Pacific Commercial Advertiser*, 1890b).
>
> On Wednesday last the track of the Ewa railway was completed to the harbor front, so that the first train reached the wharf, and several car loads of bananas were placed in scows and put on board the Australia (*The Pacific Commercial Advertiser*, 1890a).

By 1895 the tracks were extended through Honouliuli to Wai'anae. The railway facilitated the continued development of the sugar plantations, ranching, and successive developments throughout the 'Ewa District up until 1947 (Conde and Best, 1978:279-280, 315-316).

The plantation operators recognized the agricultural potential of the coral plain. For a few years during the early part of this century, 'Ewa Plantation undertook a land reclamation project. In order to put some of this wasteland into cultivation, they devised a complex system of drainage ditches running from the lower slopes of the Wai'anae Range to the coral plain. Before the rainy season, men plowed the slopes so as to induce erosion. When the

heavy rains began, great quantities of soil were carried down into the drainage ditches and onto the coral plain. While the modern-day promotion of sedimentation is contrary to wise use of resources, the experiment was considered successful and approximately 373 acres of coral wasteland were "reclaimed" (Immisch, 1964:70).

As early as the 1860s, visitors to the region were describing a land ripe for commercial agriculture. A series of articles published between the 1880s to 1910 provide a history of the changing landscape, evolution of the plantation, and the diversification of the population. Selections from those articles follow below.

> ***The Daily Bulletin***
> **Development of Water at Honouliuli**
> **Water Prospects of the Colonization Lands.**
>
> **April 8, 1886 (page 4)**
>
> A few weeks ago the writer was one of a party of explorers, to examine the prospects of irrigation on the lands proposed to be developed by the Oahu Colonization Company. The particular occasion was a request from Messrs. John Fowler & Co., a large manufacturing firm of London and Leeds, to Mr. A. M. Sproull, B. E., their practical engineer and correspondent in these Islands, to report on the water prospects of those lands. Since Mr. Sproull's arrival in this kingdom about five years ago, that firm has supplied a good deal of sugar making machinery to plantations here, and has also acquired a financial interest in some of them. It is gratifying to have such an influential and wealthy firm, so far away as England, manifesting a practical interest in the colonization scheme, the success of which implies a vast increase in the productive resources of this country. What Mr. Sproull's report will be time may show; but, so far as the unprofessional eye of the Bulletin could judge, the feasibility of ample irrigation of the lands, at a cost not disproportionate to the certain returns, is assured. This conclusion is reached from evidence that may

be summarized briefly: 1, Water has been obtained wherever a hole has been bored in the dryest of the different properties; 2, the best and widest stretches of soil are below elevations where steady streams have been obtained; 3, Water in great abundance has been procured on other properties, where the conditions do not appear to have been any more favorable than on the colonization lands; In one case, at least, it is demonstrated that the storage of water in mountain gulches is an available resort to a certain extent.

Incidentally the expedition gave an opportunity of inspecting, at close range, other features of the colonization scheme than the one under particular investigation. One fact made prominent was that, as an investment, the scheme offers immediate returns from the stock raising branch of the enterprise. Indeed, there seems no necessity for diminishing the scale on which this is conducted, while thousands of acres are being reclaimed for sugar, rice and other cultivation. Also, it seems feasible, by turning water on some now desert stretches that will not be fit for agriculture for a long time to come, to create fresh pastures for herds, thus releasing lands now necessary for their sustenance, on the grassy foothill slopes, for a variety of agricultural operations by prospective settlers. Enough was seen to convince anybody that fruit-growing could be successfully prosecuted over a very large aggregate of ground, in rough and diversified sections, where ordinary agriculture would be attended with more or less difficulty.

A brief report of the expedition referred to, which is given below, will, we think, bear out the generalizations contained in the foregoing. As the lands have been previously described in detail by another member of our staff, in connection with a larger expedition, this narrative only requires to be a brief sketch, as much the record of a very agreeable few days' outing as anything else.

About 4 o'clock in the afternoon of March 9th, an equipage provided and driven

by Mr. B. F. Dillingham, chief promoter of the Oahu Colonization Company, rattled up the Ewa road bound for Honouliuli Ranch. It was a strong but not too heavy wagon, drawn by a large, well-fed span of mares, thoroughly trained roadsters. With an ample commissariat and light baggage, as befits an outing of the sort contemplated, and three passengers, the vehicle was snugly but not uncomfortably laden. Between the enthusiastic colonizer, the critical Bachelor or Engineering, and the journalist—supposed always to be on the seat for information on the public's account—it may be imagined that not much of the works of either nature or art within the range of vision escaped notice and discussion by the way. This road—as everybody in Honolulu ought to know—affords one of the pleasantest drives in all the kingdom. The views of the city and harbor from Palama and Kalihi are superb pictures, while the scenery all the way to Pearl Harbor is full of majesty, with snatches of beautiful, but quiet—very quiet—pastoral vales and slopes. Health itself blows on us in the cool, pure mountain breezes: the road for the most part is easy; therefore, this stage of our journey may well be described as delightful. Branching off the main road a few miles from the ranch, a remarkable object looms up over the track. It is an immense piece of trestle-work, gossamer-like in the lightness of its material, but towering up, over the deepest part of the gulch it crosses, some 40 or 50 feet, and stretching away more than half a mile. This elaborate piece of engineering is on the property of Mr. Mark P. Robinson, carrying irrigation pipe from a pump over a steep hill to extensive banana fields. That soil is rich and promising of large returns, indeed, which justifies much costly works of irrigation as this. Shortly after sundown, the young moon lighting the now rather rugged way, Mr. James Campbell's group of houses, local headquarters of the Honouliuli Ranch, is reached. After exhausting his lungs in vain on a tin horn in calling Charlie, our conductor, with the assistance of his guests, proceeds to get up a hot supper. His eminent success in that respect, if allowed as a token of his ability as "chief cook" of the colonization scheme, would leave no doubt of that project doing more than anything else to fulfill his Majesty's motto, "Increase the nation."

Early the next morning the much-wasted Charlie, the head driver of the ranch, a very active native man, had horses ready for a ride over the property. A short distance from the house a flowing excavated well was encountered, its troughs surrounded with cattle. Cantering off over very even ground, the slaughterhouse on the margin of Pearl Harbor is shortly reached and its unrivalled natural facilities for shipping are observed. A pipe line leads to a well dug through ragged coral, a little distance off, which, at an elevation of 20 feet, shows water 15 feet from the surface, which is pumped by one of the patent windmills supplied by the Pacific Hardware Co. Then, to horse again, and after going through large enclosed paddocks with a capacity of thousands of cattle, we ride for several miles over rich, alluvial soil, apparently of great depth. This part of the estate consists of almost imperceptible slopes from the foothills of the Waianae Mountains, divided at intervals by light gulches. Here and there are the beds of small lakes or large pools, now dry but affording evidence of large volumes running to waste from watersheds above in the rainy season.

After resting a few minutes, while Mr. Sproull takes bearing and notes on his map, on a knob 400 feet above the sea, we head or the top of the mountains. On a high but even slope, beside a vast gulch, a herd of wild goats is seen ahead, and Charlie is after them in a moment with his lasso. He makes a splendidly exciting chase, down and up the precipitous banks, and wheeling like lightning when the goats double on him. It was no use, however; the frisky creatures went through the flying snare and would not be caught. Onward and upward, now, the sure-footed cattle-driving horses are urged, and still it is "Excelsior." Inclines so steep are surmounted, ridges overlooking such awful depths are traversed, and a path so rugged in some places is climbed or descended as on stairs, that nobody who faces the difficulties for the first time would think it possible to get over them on horseback until he was the guide ahead actually performing the varied feats—or rather letting the horse do them. Once the writer's horse stopped at a descent of about four feet at one step, over bare

rocks, with a slope of about 45 degrees beyond, and both sides of the path tumbling down through the trees a thousand feet at an angle of 70. It looked prudent to get off, and horse and rider each choose his own way of climbing down. But the reckless brigands below shouted, "Let the reins loose and hit the horse." Not without apprehension this injunction was followed: the animal carefully felt for the notch beneath with his forefeet, then with a lurch brought down his posterior limbs, the saddle creaked and groaned, its bands giving a crack—the descent was made. We reached an altitude of 4,320 feet before returning by an equally difficult way to the plain. The scenery away up there was sublime in lofty peaks, awful gorges, and gaping notches: while beautiful with the foliage of a profuse growth of trees on the mountain sides, and bright green herbage away down in the valleys. Cattle swarmed out of the woods in countless number in answer to the peculiar "whoophoo" of the cowboy. They were rolling fat on the teeming rank grass and rich browsing. Going back over the plain we come to a well sunk over 300 feet at an elevation of 60 feet, in which the water is 20 feet from the surface. There is an engine and piping on the spot, but not in working order.

Next morning the road is taken for Waialua, the wagon having a smooth thoroughfare for several miles before getting off Honouliuli, traversing a magnificent stretch of heavily grassed land, containing hundreds more of well-favored cattle of good breed. At an elevation of 800 feet is a windmill, at the food of the mountain, placed on a dug well 30 feet deep, in which there is 15 feet of water. Just on the border of Honouliuli ranch, close to Hon. C. H. Judd's ranch, at an elevation of 1,000 feet, is a flowing artesian well 80 feet deep, from which a perennial stream flows through a gulch presenting very favorable conditions for storing unlimited supplies of the essential element. It should be mentioned that we had been traveling all morning on the edge of gulches leading from the watershed, which would lend themselves easily and cheaply to a system of water storage. At the main road, the saddles were taken again for a three or four miles' jaunt, to take a view of the Kaukoanahua and

neighboring gulches, the one named being the source of the Waialua river. There could be vast reservoirs made almost anywhere here, and judging by the rain clouds bathing the distant mountain summits water would not be wanting to fill them. [Author then described Waialua headquarters of the Kawailoa and Waimea ranches.]

The Daily Bulletin

Narrative of a Visit by Teachers to Ewa via the Oahu Railroad and Land Company Train Line – Development Described.

July 23, 1890 (page 4)

Teachers' Excursion.

The national school bell rang at the depot of the O. R and L. Co., at ten o'clock Saturday morning and thereupon came hurrying and scurrying from all parts of the city, dominies and school marms galore, to the trysting place. Five passenger coaches with the band car in the rear were pulled up alongside the platform. At sharp ten, the Royal Hawaiian band struck up a merry air, the engine gave the usual screech and the train moved out leaving nothing but vain regrets for all "passengers aboard who had been left behind." A more highly delighted crowed than filled the coaches could hardly be imagined. As the train went rolling through the rice fields, the clatter of the wheels, the easy rocking of the coaches and the mountain breezes playing through the open windows, recalled to many present some pleasing recollections of home lands beyond the sea. At Pearl City a stop of twenty minutes gave groups of excursionists the opportunity of strolling through the streets and avenues of the Ewa metropolis. Whether any of them located corner lots for themselves deponent saith not. "All aboard" was called again, and the party was run through to Honouliuli, where track laying has been carried forward to within about a quart of a mile of the great artesian wells which have already solved the "water problem" of the colonization scheme. Four wells have been sunk and the fifth

is in progress. Most of the excursion party having gathered round, the fourth well was uncapped for their entertainment. A volume of water came rushing up through the ten-inch pipe from a depth of 450 feet, with a force that drove the column about a foot above the mouth of the pipe. Hard by, the brick layers are at work on the foundation of a building in which pumping machinery will be fixed with a capacity of raising six million gallons of water per day and delivering it over the adjacent bluff to irrigate the new plantation. The water is clear as crystal and has a barely perceptible brackish taste. On the return trip, a halt was called at Manana for refreshments. A splendid collation was provided in the grand pavilion, Mr. Johnson of the Hamilton House, caterer. In quantity, quality and variety, the bill of fare was first class. "Mine host" of the day, the Hon C. R. Bishop, personally supervised the serving of the large company and seemed to possess the facility of being everywhere at the same time seeing that no guest's timidity should prevent his wants being fully satisfied. After lunch, the teachers were grouped in the grove and photographed by Mr. J. A. Gonsalves and other operators. The assembly next came to order with the Inspector General standing under a big tree as chairman, when a resolution was read: "That the hearty thanks of all the teachers present are hereby tendered the Hon. C. R. Bishop, President of the Board of Education, for this delightful excursion and entertainment." The motion passed with a strong unanimous "aye," backed by three cheers and a tiger. The Hon. President responded in brief and cordial terms: "Ladies and gentlemen, if you have enjoyed the day as much as I have, I am satisfied." Then followed a return to the pavilion where the band struck up terpsichorean music, a large number of the guests took the floor and whirled through the mazes of the dance until the foot of the locomotive announced that it was time to return to town. The afternoon train from Honolulu, just arrived, let down one passenger and thereupon the fine physique of the Hon. Secretary of the Board of Education was seen moving toward the pavilion. The "late Mr. Smith" expressed himself well pleased on hearing about the fun that office duties had prevented his sharing. At 3:30 P. M., the train arrived back at the depot,

whence the excursionists disperse, all very grateful to the Honorable President of the Board for his kindness in providing them with such an exceedingly pleasant wind up of the past year's work.

a. Development of the 'Ewa Sugar Plantation and O'ahu Railway & Land Company

Henry M. Whitney's "Tourists' Guide…" provides an overview of sugar plantation development in Honouliuli and the larger 'Ewa District in 1890. At the time of writing, the OR&L had just opened with train service passing from Honolulu to the 'Ewa Court House (remaining track routes were laid shortly thereafter). With the development of the rail system, businesses began immediately expanding as rail access made the job of freight and livestock transport an easy task and the 'Ewa Plantation incorporated. Whitney's description of the inaugural service on November 15, 1889 (coinciding with King Kalākaua's birthday) and subsequent trips provides a description of the Pearl Harbor regions, documenting the continued change in the 'Ewa landscape, and the planned development of "Pearl City," setting the foundation for new homes and business opportunities.

Another part of the rail development focused on the wharf at Iwilei, by which crops, livestock and goods could be easily transported from the field to ships for transport across the sea.

Oahu Railway and Land Co.

The story of its origin.

…Within the past year Hawaii has started in the footsteps of America by projecting a railroad around the island of Oahu, and actually perfecting, within the period from April 1st, 1889, to January 1st, 1890, a well-equipped railroad in running order, extending from Honolulu along the southern shore of the island to a temporary terminus at Ewa Court House, a distance of twelve miles. It was five years ago that Mr. B. F. Dillingham advanced the idea of building a steam railroad that should carry freight and passengers, and conduct business on the most improved American methods. A hundred men told him his scheme was infeasible where one offered encouragement. He believed he was right,

and so put forth every endeavor to secure a franchise, which was granted to him only after vigorous legislative opposition to the measure. The incorporation of the Oahu Railway and Land Company with a capital stock of $700,000 was the next step in the venture, but not an easy one by any means, as home capitalists were timid at that time, and few would believe that the soil of Oahu was worth developing to the extent of Mr. Dillingham's plans. A small number of gentlemen, notable among whom was Hon. Mark P. Robinson, came forward at the right time and purchased enough stock and bonds to set the enterprise on foot. With all the disadvantages that remoteness from the manufacturing centers of America offered, [page 155] Mr. Dillingham undertook the contract of building and equipping the railroad. Rails were ordered in Germany, locomotives and cars in America, and ties in the home market; rights of way were amicably secured, surveyors defined the line of road, and grading commenced. The work was prosecuted with the utmost speed consistent with stability and safety, and there was hardly a day's delay from the time grading commenced, in the spring of 1889, till September 4th following, when the first steam passenger train, loaded with excursionists, left the Honolulu terminus, and covered a distance of half a mile. It was the initial train, and the day was Mr. Dillingham's birthday, a period he had designated when he secured his franchise, exactly twelve months before, as the natal day of steam passenger traffic on Oahu. The little excursion was a success, as far as it went. On November 15th, his Majesty's birthday, the formal opening of the road took place. Trains ran to Halawa and back all day, carrying the public free. Following this event, which marked a significant epoch in the commercial history of this kingdom, the Oahu Railway & Land Company opened the doors of their commodious offices in the King Street depot for business.

Developing the Country.

Simultaneous with the commencement of business was the acquisition, by the O. R. & L. Co., of a fifty-year lease of the Honouliuli and Kahuku Ranch's 60,000 acres, and the purchase of 10,000 head of cattle running thereon. This vast

area, hitherto utilized as a stock range, is, under the manipulation of the railroad people, becoming one of the garden spots of the Kingdom. Two new corporations of sugar planters,—the Ewa plantation and Kahuku plantation—capitalized at $500,000 each, have each secured from the railroad leases of from 5,000 to 10,000 acres for sugar cultivation. Cane is now growing on a part of the lands. These two great agricultural enterprises, the direct outgrowth of the railroad movement, confer valuable pecuniary benefits on the business men and mechanics of Honolulu. Artesian wells, yielding a bounteous flow of water, supply the means of irrigation, and make possible in that section of the island what almost everyone but the promoter of the railroad formerly believed to be impossible—the culture of sugar cane on a large scale. This abundance of water, which is obtained by the mere sinking of wells, has stimulated [page 156] other agricultural pursuits on the railroad's lands. Ever since the day traffic was begun, the railroad people have been pushing forward in their good mission of banding the island with iron rails… [page 157]

Colonization.

It is patent to every resident of this Kingdom who is acquainted with Mr. Dillingham that his pet scheme is the industrial development of these islands through colonization. The railroad signalized the advancement of the scheme. It is now the purpose of the railroad company to bring out thrifty people from Europe and America who will take up land, cultivate the same, and establish their homes thereon. The railroad makes colonization possible, and is in itself an invitation to ranchers to engage in the different pursuits that are especially adapted to this soil and climate… [page 158]

The Ewa Plantation.

One of the direct results of the railroad enterprise is Ewa Plantation, now an accomplished fact. Over 5,000 acres of land have been leased, and a company organized with the following efficient officers, who are all experienced sugar men, thoroughly versed in all the ins and outs of sugar production on these

islands: C. M. Cooke, President; J. B. Castle, Vice-President; E. D. Tenney, Secretary; J. B. Atherton, Treasurer; J. H. Paty, Auditor. The foregoing five officers constitute the Board of Directors. Castle & Cooke are agents, and William J. Lowrie is Manager. He has had a large experience as manager on plantations on Maui, and brings to this work the energy and business capacity that are needed. Sixty-five acres are planted with seed cane. The best of Lahaina top-seed is being used, which is considered much the best. Sixty men are now employed. Flumes have been constructed connecting with those from Mark Robinson's pumping works, which were already in operation when the company took possession. The young cane show a marvelous growth for this season of the year. This seed will plant six hundred acres, and that area will be seeded for the first crop, the planting to begin in August, 1890, and next year it is expected that one thousand acres will be planted. The best Fowler & Son's steam plows have been ordered from Scotland. The McCandless Bros. are already at work putting down artesian wells, and expect to have six wells in operation during 1890. The wells are ten inches in diameter, which is somewhat larger than is usual in this country. Carpenters are at work building laborers' houses, etc. A Baldwin locomotive, cars, rails, etc., are already ordered for the transportation of the cane. The pumping plant will be of the latest designs and the best patterns made. Five hundred workmen will be employed, and the planting of the first crop will be pushed forward as rapidly as possible. [page 165]

Abundant water supply.

One peculiarity of the Ewa Plantation which receives the unqualified endorsement of the manager is the source of the water supply. The main dependence will be artesian wells, and as the water does not naturally rise to the required height, the cost of pumping must be taken into account, but notwithstanding that it is claimed to be the best, inasmuch as water can be had in sufficient quantities when it is most needed, which is not the case when the supply is from mountain streams; for when those streams are lowest is the

particular time of the y ear when the most water is needed. Another thing in favor of the Ewa Plantation is the fact that one account of its low altitude and the corresponding warmth of its soils a crop of cane can be matured there in from six weeks to two months less time than in some places where cane is successfully raise on these islands.

From what we have learned from all sources we have greater faith than ever in the success of both the Oahu Railway and Land Company and the Ewa Plantation (Whitney 1890:155-166).

b. Development of Water Resources at Honouliuli

The Hawaiian Gazette

Ewa's Pumps Graphically Described, Giving Their Cost and Capacity.

September 1, 1891 (page 2)

On Wednesday a party of business men were enabled through the kindness of the O. R. & L. Co. and the plantation agents, to take a run down to the Ewa plantation. The mill which was made the first objective point, has already been described in these columns. It is being rapidly pushed on to completion, and will be ready long before the cane is. The whole party devoted itself principally to the examination of the pumps which are to put the water on the fields.

There are twenty-two ten-inch wells on the Ewa plantation, and three large pumping stations. The smallest of these pumps is used to raise the water from two finely flowing wells and is now watering 180 acres of cane. The pump if worked twenty-two hours a day will raise from four to five million gallons of water sixty-eight feet. This is fifty per cent more than the average daily water consumption of Honolulu. The whole plant cost $22,000 which includes building and foundation, piping and a small reservoir. The furnace consumes about two long tons of coal for each day of twenty-two hours, and the coal can

be laid down at the furnace doors for about $7 per ton. If this single pump—the smallest in the plantation were transplanted from Ewa to Honolulu, the water famine would be over, and people might water their gardens "twenty-five hours in the day."

The above pump like all those on the Ewa plantation is the product of the Blake Manufacturing Co. It runs very smoothly, so smoothly that even the engineer one day forgot in a moment of absent-mindedness, that the powerful and noiseless engine was in motion. He got in the way—just with one finger—and did not notice the collision until he saw his finger—lying in the dripping pan!

Pumping Station No. 3 is now in process of construction, and, when complete, will be one of the "sights" of this island. There will be nothing to beat it on this side of the Rocky Mountains. Two large pumps will lift the water from twelve artesian wells—one to a height of 137 feet, the other to a height of 167 feet above sea level. Deducting 32 feet, the height of the natural flow, we have a straight lift in the two pumps of 105 and 135 feet respectively. The ordinary capacity of these pumps is, together, twenty million gallons per day, but they have a maximum capacity of about ten millions more. Yet the ordinary daily consumption of coal will probably not exceed seven tons. This very moderate consumption of coal will be due in a great part to the use of tubular boilers which, it is claimed will furnish about twice as much steam per pound of coal as the best boilers of any other pattern. These climax tubular boilers were made at the Clombrok Steam Boiler Works in Brooklyn, N. Y. The whole work of preparing the foundation and erecting the pumps is under the personal supervision of Mr. Bunge, a courteous gentleman as well as a skillful mechanic, who has been sent here by the Blake Manufacturing Company for this special purpose.

The total cost of this great pumping station, including the wells and the piping will be in the neighborhood of $100,000.

The total capacity of the twenty-two artesian wells, with the four pumps working at their maximum capacity, will probably be not far from fifty million gallons per day. This is an astonishing figure, but it gives only a correct idea of the power of these splendid pumps. There will be water enough to irrigate, if necessary, 4,000 acres of cane, and at the ordinary working capacity of the pumps, there will be abundance of water for 3,000 acres. Enough water will flow in the once thirsty deserts of Honouliuli to supply a city of 200,000 people.

After doing more than justice to an exceedingly bountiful and generous repast, the party rode through the cane fields to convince themselves by personal inspection of the magnificent condition of the crop.

The condition of the plantation is a highly gratifying one and its prospects bright, even with sugar at the present low price. Everything which a favorable situation, a surpassingly fertile soil and appliances of the most approved efficiency can do for any plantation, nature and man have done for Ewa. The wells have not been in the smallest degree affected by the severe drought of the passing summer.

The plantation has passed the experimental stage, and the stockholders may lay, as a flattering unction to their souls, the observation of one of Honouliuli's leading business men—an observation made after careful personal inspection: "The plantation appears to be very carefully managed. Everything seems to have been thought out beforehand."

c. 'Ewa Plantation, An Overview of the New Plantation Operations and Railroad Access

Little more than a year after the debut of the OR&L, the new 'Ewa Planation Mill at Honouliuli was up and running and major changes were under way in land use, population makeup, and cultural landscape depletion.

The Hawaiian Gazette

Ewa Plantation.

Visited by a Number of Representative Sugar Men

A Brief Description Of The New Mill

Excursion Over the Oahu Railway and Land Co.'s Line

November 3, 1891 (page 4)

At a quarter to nine on Saturday morning a party of about five and twenty gentlemen started by train for Ewa Plantation and Mill, at the invitation of Mr. J. N. S. Williams, manager of the Union Iron Works, to whom was assigned the contract for the whole machinery of the mill.

Amongst the invited guests were Senhor Canavarro, the Portuguese commissioner, Messrs. W. G. Irwin, Jos. Marsden, H. M. Whitney, H. T. Waterhouse, F. A Schaefer, F. M. Swanzy, Austin, Chas. Cooke, Bowen, W. O. Smith, Holdsworth, Mist, May, Evans, Frear, J. O. Carter, Kluegel, and the Bulletin and Advertiser representatives, all interested in the sugar business of the country. Mr. Robert Moore, the superintendent of the Union Iron Works, was there too, and neither last nor least Mr. Dillingham, whose indefatigable energy has rendered possible such an undertaking as this which the party went to see.

Stopping for a minute at Moanalua the group was joined by Hon. S. M. Damon, and the train ran on to the Peninsula junction of the Pearl City station, where a few minutes were spent looking at the work going on for an ornamental fish pond for the coming city.

Thence the train ran on to the Ewa station, where the company alighted and, passing through the large general store of the plantation, entered the mill building, a large business-like erection, walls and roof being all of corrugated

iron, and here they were met by Mr. Lowrie, the manager, and Messrs. Kopke and Hughes, engineers, who showed the visitors through the works and answered the numerous questions put by observers in search of information.

To go through the mill and describe briefly the processes from the field to the sugar room, we begin with the spot where the cane is brought from the fields and passed direct into the cutting or slicing engine, which was running at full speed.

From here the cane now reduced to shreds is carried by an endless chain of rakes up an incline to the upper story of the building, where it is distributed by a series of hoppers into the diffusion battery of 28 huge vertical cells each of which will take 2 tons of sliced cane. Here it is treated with hot water and the necessary proportion of lime and passed on to the quadruple effect and then to the vacuum pans, one of the 10 tons capacity with 7 coils of steam pipe, the other with 20 tons capacity and 9 coils. After this the sugar descends to the 16 centrifugals where it is dried, the residuum being led into the tank from whence it is passed away as fertilizer.

Meanwhile the chips or slices of cane deprived of 97 per cent of their saccharine qualities, are dropped through the opening base of each diffusion cell on to another moving platform or endless chain, which takes them to a 4-roller mill which was running on Saturday where the water they may contain is thoroughly expressed and they become fit for fuel for the furnaces.

There are 6 boilers all leading into the same steam pipe whence the whole machinery is worked.

A chimney 110 feet high which took 125,000 bricks in its construction affords ample draught.

This, though it may be a mere sketch of a great industrial undertaking, may serve to show the work in outline of one of the newest as well as the greatest of the enterprises of our sugar men. Barons if you like—we hope that they may soon vindicate their title.

From the upper windows of the mill one looks over hundreds of acres of waving cane and other hundreds of acres all of virgin soil only awaiting the plow and the planter to be tuned to a like account.

The red volcanic soil enriched by centuries of neglected vegetation only needs invitation to produce whatever the ingenuity of man can demand from it. The three well-stations of the company will yield, it is estimated, 33,000,000 gallons of water a day, and it is not in hands which will waste it.

After viewing the mill in self-assorted groups, the visitors sat down to a pleasant lunch of salads and sandwiches, coffee and effervescent drinks, at tables presided over by Messrs. Dillingham, Williams and Lowrie, while Messrs. More and Hughes kept the waiters up to the mark and saw that their guests wanted for nothing.

Soon after noon the party started homeward-bound from Ewa, and stopping for a time at Pearl City Station were able to be present at the opening of the first store in Pearl City itself.

Thence the train ran on to Honolulu, reaching it in time to clear the 2:15 p.m. passenger train just ready to start out.

Many hearty handshakings did Mr. Williams receive as his guests left the train with earnest congratulations on the admirable way in which he and his coadjutors, Mr. More and their staff, had carried to success one of the greatest enterprises ever undertaken in these islands.

All of which would have been impracticable but for Dillingham and his railway!

The weather was delightful and the whole excursion most enjoyable.

The Hawaiian Star

Labor Contracts at the Ewa Plantation Company

Cooperative Labor. How It May Supersede Contract Methods.

A Way Out for Sugar Men – How the New Method Works at Ewa Plantation.

April 22, 1893 (page 5)

One way, and perhaps the best, to settle the cane planting question without contract labor, is to run the big sugar farms on the co-operative plan. This method has been tried at Ewa plantation with a measure of success which out to lead Hawaiian growers generally, as the opportunity comes, to give it a fair trial.

The details of the co-operative plan as it has been developed at Ewa are as follows:

This Agreement, made this…day of…189…, by and between the Ewa Plantation Company, a corporation, of the first part, hereinafter called the employer, and…, of the second part, hereinafter called the planter, witnesseth:

That in consideration of the promises, terms and covenants herein below set forth from either party to the other moving, the said employer does hereby promise, covenant and agree to admit the planter as an agricultural laborer and share planter upon the Ewa Plantation, at Honouliuli, on the Island of Oahu and in furtherance of said object does hereby agree:

I. To give to the said above named planter for cultivation on the profit sharing system, as hereinbelow set forth…of that section of land now plowed and furrowed on the Ewa Plantation amounting to about…acres, and described in plantation map as follows: … and also to advance not to exceed…dollars ($...) for each month of service for food and other necessary uses of the planter which amount shall be returned by the planter without interest as hereinafter set forth.

II. The employer agrees: to furnish, without charge, lodgings sufficient for the planter, and also fuel for domestic use, which shall be cut and gathered by said planter for himself at such place as the employer shall designate; also tools for irrigating purposes shall be furnished in the first instance, after that all tools shall be furnished by the planter; also seed cane; also water in the main plantation ditches for irrigation, but taking water therefrom to the cane fields shall be done by the planter, and the water so furnished shall be used economically and without waste for each irrigation. Also, to place movable tracks through the fields at a distance of not over four hundred (400) feet apart.

And the planter on his own behalf, covenants and agrees in consideration aforesaid, to go to the Ewa plantation, on the island of Oahu, and there to labor in accordance with the terms of this agreement, to wit:

III. With such other planters as may be designated by the employer to cut and load the seed, prepare the land, make level ditches, put in gates and boxes, plant, irrigate, and cultivate in the best manner to maturity, and, when so required by the employer, to cut and deliver the cane to be so cultivated upon the cars of the employer whenever deemed necessary by the employer. In cutting, it shall be cut close to the ground and topped clean, and care shall be taken not to load any dead or sour cane upon the cars, and all unsound cane so loaded shall be separated at the cane carrier, weighed and deducted from the

sound cane, and all expenses connected with separating and weighing such unsound cane, shall be charged to and deducted from the planter's share. All of the cane to be stripped at least twice, and in heavy places three times whenever so directed by the employer; and all roads and ditches running through said fields to be kept clean and free from weeds.

IV. It is likewise hereby agreed that all work, labor and service to be performed by the planter under this agreement, shall be subject to the supervision, and shall be done to the satisfaction of the employer in all cases; and if it shall seem necessary to employ extra labor to do the work satisfactorily, the employer shall so employ extra labor, and all costs of same shall be charged to and deducted from planter's share with interest at the rate of nine per cent, per annum, except such extra labor as may be necessary in cutting and loading seed, planting and first watering, making level ditches and putting in gates and boxes for which the planter shall be charged $. . . per acre to be returned without interest; and the planter shall always be subject to the supervision or order of the employer.

V. For all labor performed under the terms of this agreement in cultivating and harvesting cane upon the land set off to said planter, he shall be paid at the rate of . . . per ton of two thousand (2,000) pounds of cane on all of the cane produced upon the land cultivated by himself in common with others as aforesaid, such proportionate part as his labor bears to the entire amount of labor expended upon such premises by the planters, averaging the same between the total number of such planters.

VI. From the proceeds of his labor, as set forth in the last article, he shall return to the employer the advances set for in articles No. 1 and 4 afore said as therein set forth.

VII. This agreement may be terminated at any time by the employer, and upon

two months' notice by the planter, the planter being entitled upon such settlement, to wages at the rate of . . . dollars per month for the term of his service rendered deducting there-from the advances as aforesaid under Articles No. 1 and 4.

VIII. In case of the death of the planter during the term of this agreement, the estate shall be entitled to an immediate settlement at the rate of . . . dollars ($. . .) per month, deducting advances as aforesaid; or settlement may be deferred until the crop is harvested and then it shall be made upon the terms hereof for the proportionate time given by said planter hereunder. In case of accident to or sickness of said planter whereby he is prevented from performing the labor under this agreement, if he shall not supply labor in place of his own, the employer shall do so and a proportionate amount of said planter's share under this agreement shall be deducted for the time lost.

IX. The planter, together with his co-workers, shall have the right to inspect the weighing of their cane at any time.

X. This agreement shall terminate and be at an end when the last cane upon the fields to be cultivated hereunder, shall have been placed upon the cars and weighed, and settlement shall be made in full not later than one week thereafter.

In witness whereof, the said employer has caused the execution of these presents, by the attachment of its corporate seal together with the names and seals of its President and Treasurer, and the said planter has hereunto set his hand and seal the day and year first aforesaid.

Signature of Planter. . . .
Ewa Plantation Co…

The Hawaiian Gazette

Honouliuli Water Resources Capable of Supplying Honolulu

Water Wanted.

August 17, 1894 (page 4)

The water famine has brought down on the heads of the Government anathemas from all quarters. It must be confessed that these anathemas are not altogether undeserved. The Government has been somewhat dilatory in providing against the recurrence of the annual water famine. With the improvidence which is supposed to be the peculiar characteristic of the aboriginal race, they have enjoyed the moisture when wet, and folded their hands in a fatalistic apathy, when dry.

The curse of the Honolulu water works system has been the infatuation of the rulers with reservoirs and rain water. The study of elaborate maps and estimates and calculations has turned the head of one Government after another, and the result has been that, while Ministers were lapped in gorgeous visions of chains of reservoirs stringing Nuuanu Valley, and costing, fortunately only on paper, fabulous sums, the town has gone dry. Now, a pump has been ordered, and it is to be hoped that the long-tried and deeply discredited mud pond system will yield to a more rational plan.

The wells of Ewa have been flowing for four years, and its pumps have poured out upon the thirsty plains of Honouliuli enough water daily to supply the wants of a city as large as San Francisco. With this example at the very door, what possible excuse can there be for any more water famines?

A tenth part of the power in the great pumps at Ewa, applied to a group of two or three artesian wells, will insure to Honolulu an abundant supply of pure, fresh water in the driest days of August no less than in the midst of the winter

rains. The problem is a simple one, and there is no reason why there should ever be another water famine in Honolulu.

d. Huakai Makaikai a na Poe Kakau Nupepa i ke Alahao Hou
(A Site Seeing Journey of the Newspaper Publishers on the New Railroad)

The following 1895 article shares an account of the journey made by newspaper staff, landowners, rail executives, and dignitaries on the newly opened extension of the OR&L track to Pōkaʻī in Waiʻanae. While passing through the ʻEwa District, the author (editor, W.H. Kapu) references several traditions of noted places seen along the way.

Ka Makaainana

O.R. & L. Co.

Huakai Makaikai a na Poe Kakau Nupepa i ke Alahao Hou

Iulai 8, 1895 (aoao 1)

E like hoi me ka mea i hoike mua ia, pela no hoi ia i hooko ia ae ai i kakahiaka Poalua iho la, hora 9:30. Ua akoakoa ae na poe kakau nupepa ma ke kahu kikowaena o ka Hui Alahao a Aina Oahu mamua ae o ka manawa i hoikeia maluna ae, a i ka hora 9:40 nae hoi i haalele iho ai ia Kuwili, no ka ulu niu o Pokai ka pahuhopu, kahi hoi i makaukau o ka hooloihi ana aku o ke alahao, e hoopuni aku ai paha hoi ia Oahu nei ma keia mua aku, no ka lio hao e holo ai.

Malalo iho na lala o ka Papapai i holo aku F.J. Testa (Hoke), Puuku o ka Ka Makaainana nei; J. Nawahi, Aloha Aina; J.E. Buki, Ka Leo o ka Lahui; a me D.M. Punini o ka Oiaio; J.U. Kawainui, Kuoka, i kokuaia e G.P. Kamauoha, luna makaainana hoopili wale; Bihopa Wilisi no ka nupepa ekalesia oili hapaha, S.E. Bihopa, Hoa'loha; W.R. Farinetona, Pi Ki Adavataisa a me Kekake; G.C. Keniona, Kuokoa namu; E. Tause, Hoku; J.M. Vivasa. A Senetinela; G. Manasona, Buletina Ahiahi; J.D. Haine, Ka Hawaiiana; J.D. Setaka, Ka Manawa; L.P. Linekona, nupepa ekalesia oili malama a ka Rev. A. Makinikoki; Ho Fona, Nu Hou Pake; C.

Iakanama, Manawa Pake; H.M. Wini, nupepa malama a na poe mahiko; F. Godefere, aohe ana nupepa, aka he hoa kamaaina oia no ia oihana. Aohe mea o na nupepa Kepani i hiki ae, a me he la, o keia paha kekahi akoakoa nui loa ana o na poe o ka Papapai, koe nae hoi ke ano laulea like nui ole ae. A mawaho ae hoi, ua kau aku ma ke ano ohua o Hope Makai Nui Kelekona o Waianae a me kana wahine. O ke Ana aina Nui o ka Hui a me ka mea paa aelike no ka hoomoe alahao ana kekahi i kaa pu me na poe kakau nupepa.

Mai ka hoomaka ana aku e holo a hoea hou mai iluna nei, ua nana, malama, a hoomaopopo ia na mea a pau e Luna Nui F.C. Samita, a ua hookeleia hoi ka enegini mahu e ka Wiliki Nui H.D. Robata. I ka haalele ana iho ia Honolulu nei a mahope koke iho, ua hoolawaia mai kela a me keia me ua po-ke pua Pake poni a ulaula, a ma hope iho me na kika a me na mea inu mama. Hora 10:[0]9 i kaalo loa aku ai ia Kulanakauhale Momi me ka hoomaha ole, a ku i ka halewiliko o Ewa i ka hora 10:25, a aole no i loihi loa iho hoomau aku la i ke kamoe ana no ke kaha o Waianae, kahi i kaulana i ka moolelo o Kamapuaa, a me Kaopulupulu i ke au o Kahahana ka Moi o Oahu nei, a pela no hoi me Hiiaka-i-ka-Poli-o Pele, ma kana huakai imi kane, ia Lohiau.

Ua like ka holo ana o ke kaa mahope iho o ka haalele ana i ka halewili me he "kai nehe i ka iliili," a e "pahee ana i ka welowelo," hookahi no hana, he hoolai wale no, i ka maikai a iliwai like o ke alanui a i ka laula ae paha hoi kahi o ke alahao. I ka hoea ana aku hoi keia i kahi papaakea o ke ala, i awili pu ia me ka lepo, aohe puehu a koe mai o ka lepo, a poino na maka o na poe ma ke kaa hamama mahope. Maika na mea ma ke ala i ka ikena aku a na maka, koe no ka uliuli mai o na pohaku on na pali. Komo aku la i Waimanalo, he ulu kiawe ma o a maanei, a aole i liuliu iho puka ana i ka aekai, ae waihoa hamama mai ana ka uliuli o ka moana i ka loa a me ka laula, a aohe nani aku a koe mai o ia wahi o ke ala. A hoea i Piliokahi, he wahi pa pohaku kahiko, a ilaila la, wahi a kamaaina, pale mai o Ewa a pale aku o Waianae, a e waiho lahalaha mai ana hoi mauka ae na awawa hanai holoholona o Nanakuli a me Mikilua…

…A pau no hou ka ai ana, ua hele hou aku kela a me keia e makaikai hou i ka halewili a me kahi mau wahi e ae…a haalele aku ke kaa ia Waianae i ka hora 2. Ma ke ala hou, ua ku ma ka halewili o Honouliuli e kali ai no ke kaa iho aku. A mai laila mai hoi, aohe no i holo nui loa mai, no ka ike e ia ana mai nae paha hoi kahi o kekahi kaa mamua i ke kamahele kaa ma Waiau, a nolaila, ua ku pokole ma Kalauao, a hoohiki loa iluna nei he mau minute mahope iho o ka hora 4…

Translation Summary:
A Site Seeing Journey of the Newspaper Publishers on the New Railroad.

At 9:30 on Tuesday morning, newspaper editors and others gathered at the Honolulu station of the Oʻahu Railway & Land Company. At 9:40 we departed on our trip past Kūwili on our way to the end of the route now at the Pōkaʻī in the coconut grove.

Having left Honolulu by 10:09 drew near to Pearl City, and then reached the ʻEwa Sugar Mill at 10:25. We continued on our path [through Honouliuli] before us towards the shore of Waiʻanae, passing the place made famous in the traditions of Kamapuaʻa and Kaʻōpulupulu in the time of Kahanana, king of Oʻahu; also, in the tradition of Hiʻiaka-i-ka-poli-Pele, in her journey to fetch Lohiʻau…We entered into Waimānalo, where the kiawe trees grew here and there, and passed along the seashore, arriving at Piliokahi, where there is an ancient stone wall. This was pointed out by a native as being the boundary between ʻEwa and Waiʻanae…

Reaching our destination, we ate and then left Waiʻanae at 2 o'clock, traveling along the new track to the mill at Honouliuli where we waited for the passing of another train. From there, it was not long until we traveled to Waiau, then a short time to Kalauao, returning [to Honolulu] at 4 o'clock.

4. Additional Business Ventures in Honouliuli Ahupuaʻa

a. Paʻakai (Salt Making)

The making of paʻakai (sea salt) was one of the significant traditional practices associated with the coastal lands of Honouliuli. There are a number of Māhele claims by native tenants of the larger Puʻuloa land division for salt making sites. The formation of a salt works business at Puʻuloa led to continuing residency along the Pākule, Keahi and Kupaka shoreline leading towards Oneʻula. The Puʻuloa Salt Works was in operation from the 1840s to the early 1900s. The narratives below provide an overview of the modern business venture.

Daily Alta California
Puuloa Salt Works Advertisement

July 1, 1852 (page 4)

Puuloa Salt Works—Sandwich Islands. These extensive works are situated at the mouth of Pearl river, Island of Oahu, within ten miles of Honolulu, and has the largest and safest harbor on the entire group of Islands. The entrance is half a mile wide, easily distinguished, with 12 feet of water over the bar at low tide. These works are capable of supplying the entire Pacific Ocean with the article of salt.

Shippers and masters of vessels may procure entire cargoes or smaller quantities of the above article, in bulk, matt bags or barrels at the works, or delivered on board their vessels in the harbor of Honolulu, by applying to:

C.W. Vincent, Honolulu,
Corner of Mauna Kea and King Streets.

The following advertisements were published announcing the availability of ocean salt made at Puʻuloa:

Ka Hae Hawaii

Ka Paakai o Puuloa.	**The Salt of Puuloa.**
Iulai 25, 1860	**July 25, 1860**
Mai ka wa kahiko mai ua ikea na kanaka maoli i ka hana ana o ka paakai; he mea ia e mikomiko ai ka ai; he mea kalepa no hoi; aoela one maikai loa ka paakai o Hawaii nei, aole pono loa ka hipi a me ka puaa i kopiia i keia paakai; ina e waiho liuliu, pilau no.	From ancient time, the natives have known about and made salt; it is that with which food is seasoned, and is also an item of trade; but the salt of Hawaii is not very good, it is not the best for salting beef and salting pork. If it is left for long, it spoils.
I keia manawa nae, ua hanaia ka paakai ma Puuloa a maikai loa, kaawale na mea awaawa oloko; a ua loaa hoi ka wili e wali ai e like me ka palaoa, a e like hoi me ka paakai no na aina e mai; nolaila, ua makemake loa ia ka paakai o Puuloa i keia wa; he mea lawe i ka aina e, a he mea no hoi e waiwai ka aina.	But at this time, salt is made at Puuloa, and it is very good. The bitterness has been removed from within; a mill has been gotten and the salt mixed like flour, and like the salt of other lands; therefore, at this time, the salt of Puuloa is greatly desired. It is taken to other lands and it is a thing that brings prosperity to the land.

Honolulu Star Bulletin
Salt Works at Honouliuli Branching Out Into Shaker Salt Manufacture
Salt Works on Oahu to Branch Out Into Shaker Salt Field

March 11, 1922 (page 11)

Following a policy of doing its share towards making the Hawaiian islands self-supporting—productive of all necessities of life possible—an industry few

know exists on Oahu is being brought rapidly to a standard equal to the highest achieved by mainland plants.

By a limpid lagoon, just beyond Pearl Harbor where crystal waters are not contaminated by infusion of foreign substances, the Honouliuli salt works has been developing under the eyes of Honolulu yet few have seen.

Machinery is being installed now to take the industry out of its swaddling clothes—to graduate it from its infant drudgery of feeding ice-cream freezers and supplying demand for crystal and rock salt, into what is known in the trade as the shaker salt field.

Now the word shaker means, in the parlance of salt, something which will shake out of a shaker. So it is a step forward from ice cream freezers to the table.

The plant, producing crude salt is turning out some 55 tons weekly eight months of the year. The other four month overcast skies and rains minimize production. The product is largely due to the care taken in filling the tanks, which are washed, scrubbed and drained before pure sea waters are pumped in. The tanks are of cement. The element of dust and dirt eliminated by the scrubbing makes the product marketable for cruder uses immediately. A fleet of motor trucks is supplying island consumers.

The new machinery will convert part of this crude output into salt for table and kitchen uses, shaker and bag salt. The demand for coarser salt will not be slighted in expanding to enter the shaker salt filed. It is the intention of the men who have brought the industry into being, to increase its capacity as the consumption increases.

Photo 1. Puʻuloa Salt Works (USGS-Mendenhall Collection, No. mwc00802, 1909)

The new machinery is designed to shatter the crystals and process the salt so that, in the moist climate of the island coasts, it will not cake—in fact it is the intention of the company to produce a Hawaiian product that will compare on all points with the imported article, with the added feature of ocean freight eliminated.

Expert supply surveys have been conducted in the island from time to time to determine just what imports are necessary to make up the difference between local production of any food article and demands of consumers. It is estimated that the salt works, when under full swing, would be able to eliminate this item from freight lists. The plant is on a branch of the railway. The new unit of the plant will be in operation before summer.

b. Architectural Supplies

Traditional Hawaiian architecture relied on stone or coral cobbles (readily available sources on the coral flats of Honouliuli), wood, and thatch materials. Foreign residents wanted more durable materials for houses and other structures. Although lumber and supplies were shipped in, the native stone and coral were used in the construction of a wide range of buildings. By 1820, sources of lime for construction were developed at various locations on the islands, and Honouliuli was one of these sources of material. As the plantation developed, lime produced from the coral plains was also used by plantations as a soil conditioner (Charvet-Pond and Davis, 1992).

c. Sisal Cultivation

Sugar was not the only crop on the Honouliuli landscape. The fiber plant sisal (*Agave sisalana*) was also planted in the ahupuaʻa, with a large track around Puʻuokapolei down to the in the Kalaeloa vicinity (see Figure 11). In February 1899, *The Hawaiian Gazette* reported that 75 acres had been planted, with intentions on planting 3,000 acres on land that had been leased from James Campbell.

> ***The Hawaiian Gazette***
> **On a Sisal Farm – New Enterprise on Land Near Ewa Plantation. The Production of Hemp. Progress Made by the Hawaiian Fibre Company – Outlook for First Crop is Good.**
>
> **February 21, 1899 (page 2)**
>
> Twenty mile west of Honolulu there is today an infant industry, comparatively unknown, which at no very distant date will probably take a leading rank in the industries of the Islands.
>
> Last April a company was formed, with Cecil Grown, president; Mark Robinson, vice president; W. C. Weedon, secretary and treasurer; A.H. Turner, manager. The object of the Hawaiian Fibre Co., as it was termed, was the

> cultivation and manufacture of all fibres. Sisal was the class of fibre principally thought of.
>
> Now possibly everybody does not know what sisal is. Sisal is a fibre of the Agave family which flourished chiefly in Yucatan and the Bahama Islands.
>
> The Hawaiian Fibre Co., upon its organization, leased from Jas. Campbell 3000 acres of land for the purpose of the cultivation of sisal. This tract of land is twenty miles west of Honolulu, being two mile beyond Ewa Mill and ten mile from Pearl City. It extends some distance mauka of the railroad track and on the other side clear to the sea.
>
> It has not been many years since the first sisal plant was imported here with a view of another possible industry. Joseph Marsden imported a number form the Bahamas about five years ago and they were planted on a small piece of land this side [east] of Pearl City, where is a pond for one-half of the year and dried mud curing the other half. They did not thrive, and it was thought they needed more water, as much as sugar cane. Some were taken up and planted on one edge of Ewa plantation, near the railroad track by Mr. Lowrie. This lot forms the nursery for the present company.
>
> Sisal is a peculiar plant. It will thrive and flourish where nothing else will live; where even a mountain goat could not live, sisal will grow like a green bay tree; when it get into soil that is rich and has depth, and where something else might possibly grow, it immediately declines and loses strength. It does not depend on the soil for nourishment. Given plenty of heat and sunlight a little moisture now and then, a stretch of rocky land and you have your model site for the cultivation of sisal.
>
> The tract selected by the Hawaiian Fibre Co. is admirably suited for the purposes desired. It is rough, rocky and about as useless looking a place of

ground as one could find. It is not to be thought of in connection with sugar.

Today about seventy-five acres of land are under sisal cultivation. The plant on an average is about three feet in circumference, that is the bulb itself, and has no roots to speak of. The branches or fronds from which the hemp is extracted, grow to a height of from three and a half to five and a half feet, tapering off to a small needle like barb, and in all direction and angles.

The perpendicular fronds are never taken. The are not ripe. As they ripen, they fall toward the ground and then they are ready to be cut and turned into hemp.

While the plant has no roots to speak of, it throws out numerous suckers, or feeders, in all directions, which turn into small plants. These take the life of the mother plant and are cut off. The small plants are used as nursery stock. It take about three years for a plant to mature. From thirty-five to forty fronds can be cut from one plant twice a year, with an average weight of one and a half pounds to the green frond. Take five percent of this amount and you have the amount of pure fibber obtained from one plant in a year.

The company has cleared and planted about seventy-five acres of land. A comfortable home for the manager has been built. Everything is well conducted and prosperous looking.

The main difficulty is to obtain the fibre from the plant. Extensive machinery is necessary, but the management intends to put up the machinery in time to reduce the first crop, which they expect to take off in about two years.

This is one of the new businesses of the Islands. The hemp industry is confined to a few places. It now seems that it will not be long before these island will take a leading, if not the leading place in the hemp industry.

Specimens of hemp which have been worked out by hand can be seen at this office.

In 1900, it was reported that 1,000 acres of Honouliuli were currently under cultivation, the goal being to make locally sourced sugar bags and other fiber products. *The Honolulu Republican* of July 28, 1900, reported:

The Honolulu Republican
Sisal Fiber Plant Successfully Grown – Three Thousand Acre Farm Near Pearl City – Talk of a Factory Plant – Annual Cost of Sugar Bags an Incentive to Manufacturing.
Rumor That the Great Oakland, California, Jute Machinery May Be Moved Over Here.

July 28, 1900 (page 5)

Hawaii now expends nearly half a million dollars annually for jute bags, all of which ought to be manufactured here. The Republican is pleased to be able to say that the foundation has been laid for the establishment of works for the manufacture of sugar sacks, cordage and other products from fiber. The firm to carry out this work is the Hawaiian Fiber Company, Limited, which has a 3000-acre farm two miles west of the Ewa plantation…

The officers of this company are: Cecil Brown, president; M.P. Robinson, vice-president; W.C. Weedon, secretary and treasurer; and W G. Ashley auditor. B. F. Dillingham and other prominent businessmen, as well as the Ewa plantation, are largely interested in the company, which is experimenting with sisal, a fibrous plant well adapted to this climate and barren and unproductive lands of the Islands.

The Hawaiian Fiber Company planted 1000 of its 3000 acres which it secured

from the railroad company. Six hundred acres are fenced in with a stone wall built from stone taken from the land. Three hundred and two acres are cleared; 80,000 plants, or 215 acres, have been planted, and a manager's house, and comfortable quarters for the laborers have been built. A well has been sank and a good supply of water has been obtained. The work of clearing ground, laying out walks and erecting permanent stone fences is being pushed. The farm, or plantation, is called "Sisal Farm," after the name of the plant.

Sisal belongs to the aloes family. It is a desert plant and can be raised profitably on rough, rocky, coral flats, where a plow cannot be used—land unsuited and worthless for sugar growing or anything else. It can be grown without irrigation, although the fronds of the plant, from which the cordage is made, might be larger and plumper if the plants were irrigated. During the late dry and hot weather the 215 acres set to the plants have grown surprisingly well. Scarcely a plant was lost. It takes from two and a half to three years for the plants to mature from the suckers. From plants two and a half years old sisal fiber four feet in length has been obtained. The fiber was made by hand, and specimens of it were sent to experts on the mainland, who pronounced it unexcelled in quality by any sisal fiber grown elsewhere.

Sisal is different from Manila hemp. It is superior to hemp for marine or naval cordage. Two years ago prepared liber brought in the market from 3 to 3 ¼ cents: now it fetches from 6 ¾ to 8 ¼ cents a pound. The cutting of plants after they reach their growth occurs twice a year. When the lower fronds obtain a horizontal position they are ready for cutting. From sixteen to thirty fronds are taken from each plant. The process of poling continues for five to seven years. Each frond makes a separate fiber. After the fronds are cut the pulp is extracted and the fiber is washed and baled for the market. Here plants are set from nine to eleven feet apart. In Bermuda, they are set much closer. The fronds of the plants must not touch each other. There is a hard, thorn spike, sharp as a needle, on the end of each frond, and if they come in contact they

scar and bruise and materially and injuriously affect the fiber. The company believes that this industry will become one of the most profitable industries of the Islands. Land valueless for any purpose can be utilized in growing sisal; the cost of production is nominal and no irrigation is necessary in its cultivation. There are many thousands of acres of land in the group that will grow sisal and nothing else.

The Hawaiian Fiber Company has now, reached a better than the experimental stage. The ability to grow sisal has been fully demonstrated, and the company is now considering the advisability of erecting a plant for the manufacture of the fiber. Persons who have given the subject study predict great things from this industry…

"…Sisal comes from the Bahamas and will grow here on any old worthless lands" Mr. Taylor [Commissioner of Agriculture Forestry] said:

The Importance of this industry is shown by the fact that the sugar industry alone consumes 4,800,000 bags at a cost of not less than $384,00. It is estimated that the crop for this year will reach 300,000 tons, requiring sixteen bags to a ton, at a cost of 8 cents a bag.

In 1903, the *Sunday Advertiser* published an article providing more details on the sisal plantation in Honouliui, and identified the OR&L station situated near the mill site by the name "Sisal." The article also included two photographs of the Honouliuli sisal mill and a plantation field.

The Sunday Advertiser
Sisal One of Coming Island Industries. The Work of Building up the New Idea.

January 25, 1903 (page 3)

"Bermuda sisal" they call it, although the best authorities assert that it is native to the Everglades of Florida, and it contains within its sword-shaped leaves something of the future of Greater Hawaii.

B.F. Dillingham, president of the Oahu Railway, took a party in his special car down over the road yesterday to Sisal station, just on the far side of the Ewa plantation, to see the beginning of the sisal industry in the Islands. It is but a beginning, although a most promising one. The special, leaving the city station at half past one in the afternoon, ran down fast through a rarely beautiful country—all the country hereabouts is beautiful—until the station for Oahu sugar plantation was reached, the station under the picturesque cocoanut tress that has been made famous because no amateur with a kodak has ever been known to pass it by without a shot.

The party was shown over the Oahu sugar mill first, and, although most of them were old residents of the Islands, some were there who had never seen the golden wealth of the land turned out as it is turned out there. Then a busy little plantation locomotive came along, puffing, and took the special car out over the plantation roads to one of the big pumping plants, where from 15,000,000 to 18,000,000 gallons of water are raised every day to the top of a bluff over 400 feet high, and to another station where the big steam pump has been sunk into the earth to meet the rising artesian water and that was a thing many of the party had not seen before.

The plantation locomotive went off about its regular business after that, and the special went whirling across the level land skirting Pearl Harbor, past the little Chinese rice fields and the great broad fields of waving cane, like oceans rustling with life, to Sisal. Presently the road led into a region of what seemed to be century plants, thousands and thousands of them standing stark upright in their thorny dignity, set out in straight rows and topping the weeds that they seemed to set themselves above as something exclusive and apart in the line

Photo 2. Drying Yard at the Sisal Company's Mill

of vegetation. And that was the sisal. Those spiny leaves, crushed for the fiber in them and dried, are worth just 8 ½ cents a pound in the market of San Francisco, and there is demand for all that can be produced. That is why the sisal holds in its heart a part of the future of Greater Hawaii, and probably a large part.

The sisal plantation and the small mill upon it are in charge of Superintendent A. B. Turner, and he is a man who knows his business and talks intelligently upon it. The little mill, the first of many large ones of the future, perhaps, was crushing the cut leaves of the plant, which were delivered at the door in carefully tied bundles of fifty by Japanese laborers. Each leaf went into the jaws of the crusher just as it came from the field. It came out in the form of bundles of glossy greenish fiber which out to hang on lines with thousands of its fellow, until the sun had bleached it white, when it would be spread on the ground for further bleaching, to finally gathered and baled, as hay is baled, in which form it will go to the ends of the earth to be made into ropes and cordage and binding twine and all the things for which tough giber is used in the hurry of

modern life. For the sisal fiber is one of the toughest that is known, and ropes made from it might well be used to hold a weight for a man's life.

Photo 3. Workers Cutting Plants on the Sisal Plantation

"The sisal matures to the cutting stage in from three and a half to four years," said Superintendent Turner, explaining the plant and the process to Mr. Dillingham's guests yesterday. "The plant grows from six to fifteen years before it flowers, as the century plant does. It is one of the aloes. After it flowers it dies, but it gives birth to many bulbs in flowering, and has produced much fiber before it reached the stage of uselessness. We begin cutting it at the age of from three and a half to four years. Then, once we begin, the plant yields constantly. All the leaved are not taken at once, you understand. We take only those leaves from each plant that have reached the proper length, and then the remaining leaves on that plant take a straighter form until the time comes to cut that plant again. Thus, when a plant begins to yield fibre it keeps on producing until it dies. There is a constant succession of crops from i, and no cessation in the yield, because there are always plants in the cutting stage. A producing plantation produces all the time, and the men go about from plant

to plant, always brining on a crop.

"The sisal has the further recommendation that it grows on land that is too poor to produce sugar. In fact, sisal does not do best on land that is too rich. The fiber is too coarse, the growth being rank. We have 600 acres in this plantation, that plants being set out about 580 to the acre. I figure that we have about 200,000 mother plants, and about one million coming on from bulbs and sprouts. So that we can replace all our plants that dies as fast as they succumb to age. Also, eventually we will have lots of plants to sell. We are getting, as the plants stand now, about 1,000 pounds of fiber to the acre, which is good for a second crop. We will produce, this year, 100 tons of fiber, and will double that next. At the present price of fiver, the income should come not far from $18,000. Our mill has a capacity of 2,000 pounds daily, but is now handling only between 1,200 and 1,500 pounds per day.

"And we have solved the labor problem, incidentally, in this industry. At least, we have scored a point that will aid in its solution so far as we are concerned. The sisal fiber can be cut and left lying in the field for six months, and it makes as good, clean fiber at the end of that time as when first cut. It is a pretty strong strike that would outlast that. Also, a peculiarity of the sisal is that when the mother plant flowers, all the suckers from it send up flower stalks, no matter what their age. So these must be taken up if they are to be saved."

In the party taken out by Mr. Dillingham yesterday were A. B. Wood, W. W. Hall, W. G. Cooper, E. E. Paxton, John F. Bowler, J. O. Carter, M.P. Robinson, Isaac Dillingham, Dan Logan, Albert Raas, and T. C. Miller and ex-Governor John E. Osborne of Wyoming.

In 1904, *The Pacific Commercial Advertiser* reported that "Five years ago the land near Barber's Point was so dry and 'waste' that it was good for nothing but 'bee pasture' during the few rainy month of the year. Last year it yielded a crop of sisal that paid a profit of twenty-

five per cent or more" (*The Pacific Commercial Advertiser*, 1904).

While there was great interest in the sisal industry, by the 1920s, new manmade fibers were replacing locally grown sisal, which required large amounts of water for processing. This, added with the military condemnation of lands in around Pearl Harbor, led to the demise of the business.

5. Condemnation and Military Base Development by the United States

While it is described as a "free-trade agreement" between Hawai'i and the United States, King Kalākaua was pushed into the agreement, officially enforced on September 9, 1876. The agreement granted the U.S. Navy the exclusive right to develop Pearl Harbor in exchange for the United States approving a Reciprocity Treaty with Hawai'i, allowing Hawaiian sugar to enter the U.S. duty-free (Kuykendall, 1967). Following the treaty, the United States took no significant action on the harbor development. In 1888 it was reported that there were efforts to purchase the Waipi'o Peninsula from the 'I'i Estate (*The Hawaiian Gazette*, 1888:5). Following the overthrow of the Hawaiian Monarchy and subsequent annexation of Hawai'i to the United States in 1898, more serious actions were engaged. These actions were in part due to conditions in the Philippines where the Spanish American War was underway. In 1899 Lieutenant Pond, Commander of the Navy ship *Iroquois*, conducted a survey of island harbors, including Pearl Harbor (*Evening Bulletin*, 1899:1). In 1900, a Bill was written for the United States Congress to construct a naval Station at Pearl Harbor (*The Hawaiian Gazette*, 1900:6).

a. Huikau, Pohihihi ke Kuikahi Panai Like me ka uku Kaulele o Puuloa (Confusing and Bewildering, the Reciprocity Treaty with its Interest Charge of Pearl Harbor)

The move by business men—many, the children of missionaries and other foreigners who had taken up residency in the Hawaiian Kingdom—to develop sugar plantations led to the movement towards "reciprocity." The sugar growers sought a way to compete with southern sugar growers in the United States; through the Reciprocity Treaty which took effect on September 9, 1876, the Hawai'i sugar growers were able to export their sugar and rice crops

with relief from taxation on foreign imports. The treaty also set the foundation for American development of Pearl Harbor as a Pacific Base of military operations. In 1887, the re-negotiation of the treaty was forced upon King Kalākaua through the "Bayonet Constitution" (cf. Kuykendall, 1967).

In the article below, Hawaiian historian Samuel M. Kamakau questioned the move towards the Kingdom relinquishing control of Pu'uloa (Pearl Harbor) to the United States.

> ***Ko Hawaii Ponoi***
> **Huikau, Pohihihi ke Kuikahi Panai Like me ka uku Kaulele o Puuloa.**
>
> **August 20, 1876 (page 3)**
>
> …About Ewa. Ewa and it's many bays are surrounded by land on most sides. The entrance to the Harbor is at Puuloa. Its narrowest point is between Kapuaikaula and Kapakule. It is perhaps a little more or less than a furlong across. The rise (submerged hillock) outside of the entrance is Keaalii. There is a shallow place there, approximately 9 to 10 feet deep.
>
> Here is a description: From Keaalii to the mound at the entrance of Puuloa harbor, there is a channel on the west, near Kapakule. Then [it runs] from Kapakule to Kepookala. From Kepookala one turns towards the estuary of Kaihuopalaai, and Kapapapuhi is on the west side. That is the branch of the estuary of Honouliuli. Amoe Haalelea is the chiefess, landlord of this section of the estuary, and the lesser landlords, who control the fishing boats.
>
> From Keaalii and the channel to Kapakule, and to the east, to the tip of Mokuumeume, is the estuary channel of Komoawa. This branch of the estuary is now called the Halawa Branch. There are two titled landlords here, their highnesses Queen Emma and Ruth Keelikolani.
>
> From Kepookala, along the sheltered western side of Mokuumeume, along the

Halawa branch, and along the point of Paauau to Kalaehopu, Kupahu, and Halaulani; this branch of the estuary is called Waipio and Waiawa. The titled land lords of this section of the estuary are Malaea Ii and the relatives of Ruth Keelikolani. This is an expansive place, not filled with thousands of boats and more, from the point of Pipiloa to Mokuumeume, and from there to Halawa. Turning north are the lands of along the sheltered bays of Manana, Waimano, Waiau, Waimalu, Kalauao, and Aiea. Waimalu is the land division to which Mokuumeume belongs.

What right does the government have in giving Puuloa and Ewa as payment for the Reciprocity Treaty? I know of no right that the government has…

b. Overview of Government Use of Land in Coastal Honouliuli

The following entry details the land acquisition plans of the United States, including securing the land on the "west side of channel," being Pu'uloa. The article which is an informative read on the time—even with the errors in assumptions which came later—follows:

The Pacific Commercial Advertiser
A Naval Station.
Report on Pearl Harbor's Advantages.

June 27, 1900 (pages 1 & 3)
The following is a report of the Board of Naval Officers convened last march for the purpose of examining into the best locations for a naval station at Pearl Harbor, as presented to the chairman of the committee of naval affairs of the House of Representatives by the Secretary of the Navy:

Navy Department,
Washington, March 31, 1900…

…Pearl Harbor can be successfully defended, rendering its anchorages safe from outside attach, and that it possesses a comparatively large deep-water anchorage, capable of expansion, if needed. And it should also be borne in mind that it is the only defensible harbor within the entire Hawaiian group.

The board has, with careful consideration, approached the subject of improvement and reached its conclusions, keeping ever in mind the present and prospective needs of our country in this part of the world. The great expansion of American interests in the waters of the Pacific, as a result of recent events, has caused each point considered to be weighed carefully from every standpoint.

8. The board proceeds to answer the questions submitted by the Department's order, as follows:

(a) What land Is it necessary and desirable to acquire In order to establish a naval station in Pearl Harbor, having in view the present and prospective needs of such a station.

The board recommends that for the purpose of establishing a naval station in Pearl Harbor, having in view the present and prospective needs of such a station, that the Government acquire the portion of the body of land shown on plan No. 1, accompanying, as Waipio peninsula, extending from the narrow neck marked with a blue line to the southernmost point of the peninsula, comprising to low water mark, about 820 acres: also the body of land shown on plan No. 1. As Mokuumeume or Ford's Island, comprising to low-water mark about 371 acres, inclining the adjacent islets and the Intervening shoal water.

9. The board is of opinion that under the general term naval station must be included the following: Dry docks, work and repair shops, a coaling station of

large capacity with sheds, coal pockets chutes, and sheltered anchorages or berthing space for tugs. lighters, etc., extensive grounds for marine barracks parade grounds, and a still larger area for drilling large bodies of sailors or marines, to which must be added ample camping ground for any naval force that might be rendezvoused here in time of war. Considerable space will be needed for hospital accommodations with surrounding ground. Ample space, suitably selected, must be set apart for magazine purposes. All the above mentioned must be capable of expansion as our future naval needs may demand.

10. In selecting the two plots of ground above mentioned for naval purposes careful consideration has given to the present commercial needs with possible great expansion, and there has been left free for commerce the entire main shore tine within the entrance, several miles in extent, and situated where it is most likely to be of the greatest use. It may also be stated that of the two bodies of land decided upon as required for naval purposes, the Waipio peninsula was from personal observation chosen by Rear Admirals Irwin and Miller and Commanders Nichols and Merry in past years, but the present developments had not then been reached, and the board is of opinion that the area recommended by it is not in excess of Government needs, present and prospective. The Waipio peninsula lands recommended are from ten to thirty feet high and covered with algaroba trees. The thin alluvial soil is reported to be incapable of growing sugar cane except in certain spots "of small area, and then only by copious irrigation."

To take this land would, therefore, cause little or no detriment to agricultural interests. For naval purposes this peninsula presents many advantages. Deep water channels surround it on nearly all sides, making it almost an island. It is, therefore, practically isolated from the mainland, and yet is connected with it by a narrow neck, assuring easy communication. The shores are clear of reefs, and bold water is found close to the shore line, thus minimizing the expense of

probable wharf and dock construction and affording ample wharfage for a fleet of large and small vessels. The West Loch and Walker Bay [Waipi'o] would afford excellent shelter and anchorage for small vessels, while the middle channel and loch would give good anchorage for the largest ships.

The prevailing winds in this locality are from northeast to east, making the eastern shore of the peninsula a weather shore. The winds are never so strong, however, but that fairly smooth water exists at all times. The "konas," strong southerly and westerly gales, are said to occur at times in January and February, lasting from a few hours to two or three days, but never attaining a violence which would make anchorage in the harbor unsafe. The Oahu Railroad passes the head of the peninsula, and only a short spur would be required to reach the site of a dockyard over perfectly feasible ground. The neck of the peninsula, just above the sites recommended by Rear Admirals Irwin and Miller for a dry dock, are narrow enough to make it possible to locate repair shops and store houses near the probable dock site, convenient to vessels at the docks or anchorages on either side.

Ford's Island is chosen because of its proximity to deep water anchorages of the greatest area for large ships, and being an island, it is peculiarly available for barracks for a strong force of marines and as sites for magazine, hospital and coaling docks. Its shores, like those of Waipio Peninsula, are for the most part easily accessible for large ships in going alongside wharves, which latter can be constructed at small expense. Its leeward or westward shore is particularly suitable for the location of coal storage houses and coaling wharves or piers. Good potable water in sufficient quantity for all the above purposes is reported to have been found on this island by sinking an artesian well, and from the fact that great quantities of fresh water have been found on the northern part of Waipio

Peninsula and on the lands surrounding the harbor there is no reason to doubt that an all sufficient amount can be obtained by the same means on the lower or main part of the peninsula. Water options are held, furthermore, by the present owners of the Waipio lands for the supply of water for irrigation purposes.

11. "(b.) What land is it necessary and desirable to acquire for defensive purposes of the harbor, channel and station?"

"(c) What land, if any, is it necessary and desirable to acquire from private parties to obtain the requisite facilities of ingress and egress?"

The board is of opinion that for clear explanation the queries under b and c can best be answered under one heading, and in so doing invites attention to plan No. 1, whereon is shown, below the Waipio Peninsula and at the entrance proper to the harbor, a certain body of land embraced on each side of the channel by a blue dotted line extending down the channel, thence eastward and westward, respectively, to a fixed point on the shore line. These two tracts of land the board recommends be selected for defensive purposes of the harbor, channel and station, and also for securing requisite facilities for ingress and egress.

12. The land lying along the line of the channel is selected in order to prevent any possibility of interference with the ultimate channel of navigation, which may in the future extend from shore to shore in this part of the narrow pathway. The wide areas nearer the shore line are Intended for the emplacement of batteries to guard the entrance, to keep an enemy at a distance from the shipping within, for covering the mine fields, etc. The total area thus recommended to be acquired comprises about 690 acres. It may not be necessary that the acquisition of any of this area should in anyway interfere with or cause the removal of any existing private improved properties lying

within the boundaries; but the board desires to call attention to the very great importance of the Government acquiring an absolute title to the same and of holding it in fee simple forever. This done, permission may be granted for improvement, subject to war necessities as to their removal or destruction without damage to the Government, as is done within the reservation of Fortress Monroe.

13. For the purpose of securing easy and convenient access to all of the above land recommended to be purchased for Governmental use the board recommends that sufficient right of way, not less than 100 feet in width, should also be purchased for Government use, extending from the naval station to such [page 1] public roads and railroad as may be considered most desirable.

14. "(d) What are the best methods for acquiring the above-mentioned land?"

The board recommends that all of the above-mentioned lands be acquired by condemnation under the law of eminent domain of the civil laws of the Hawaiian Islands, a copy of which is appended, marked "C."

…23. Regarding the value of the lands recommended to be acquired. —From the data placed before the board in the shape of reports, assessed values of land as given by the assessor in 1899, records of options offered, and taking into consideration the Hawaiian law of eminent domain, the board is of the following values should obtain:

- Waipio Peninsula, about 820 acres, assessed at $25,000 in 1898, and adding 20 per cent..... $30,000
- Ford's Island, about 370 acres, assessed at $20,000 in 1898, and adding 20 per cent 24,000

- Land on east side of channel, about 305 acres, at $20 per acre, plus 20 per cent [Hālawa].....7,320
- Land on west side of the channel, about 385 acres, at $50 per acre, plus 20 per cent [Pu'uloa].....23,100

Total $82,420

No accurate estimate can be made at this time of the amount of damages, if any, done to adjoining property through the condemnation of these lands, nor as to the value of fishing or riparian rights, or for the amount necessary to secure a right of way to highways and railroad, through lack of definite data bearing on these subjects. For these objects as well as to pay for improvements at present on some of the land recommended for purchase, it is thought that at least $150,000 should be made available for acquiring ownership and for all rights and damages… [page 3]

The early Navy activities centered around development of a coaling and repair station for naval ships. Dillingham's Hawaiian Dredging Construction Company was awarded the contract to dredge the channel in 1901. In 1908, additional funding was released by Congress to deepen the channel and construct a dry dock and various support facilities (*The Hawaiian Gazette*, 1908:2) (Figure 13).

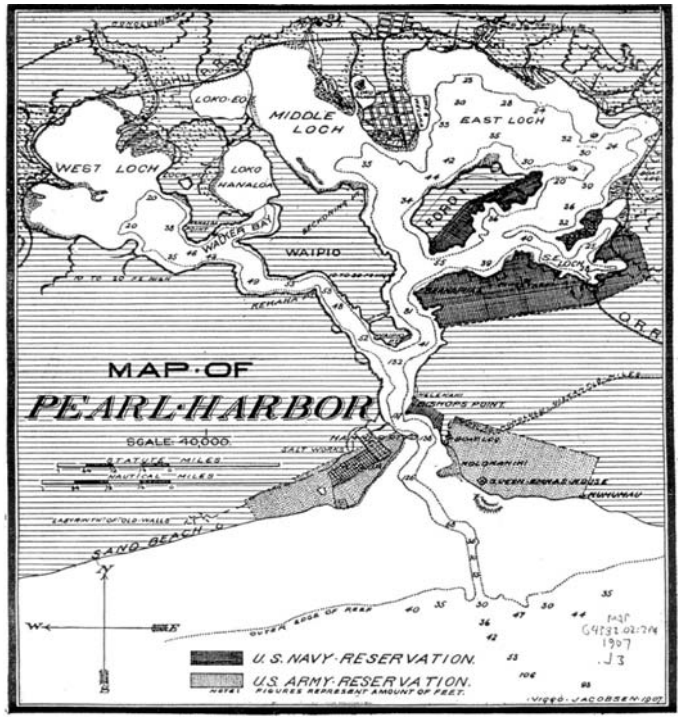

Figure 13. Map of Pearl Harbor (Hawaii State Archives, Map No. 416, 1907)

The Barbers Point Lighthouse, one of the first government structures in the area, was established by the Hawaiian Government in 1888 (Thrum, 1889:89). In 1937, emergency funds of the United States were used to construct c. 18 miles of road in the Barbers Point area. In late 1939 and early 1940, the U.S. Navy acquired over 3,500 acres of land from the Campbell Estate and built the first military installation in Honouliuli, the 'Ewa Marine Corps Air Station, Barbers Point. World War II accelerated the pace of construction at the Naval Air Station and it was already being heavily used before its completion on April 15, 1942. It was

reported that by October of 1947, the Station had the largest landing mat in the Pacific and takeoffs averaged 1,500 planes daily during World War II (Kelly, 1985:175).

During World War II, the military also found use for the OR&L railway system; in 1944, the plantation manager reported:

> We have continued to haul large quantities of ammunition over our railroad tracks and are continuing to supply the Armed Forces with buildings and electricity (Conde and Best, 1973:282).

The U.S. military did not engage in serious planning to develop Pearl Harbor until 1899, following the 1898 annexation of Hawaiʻi to the United States. Dredging of the harbor entrance and inlet began in 1901 and the U.S.S. *Iroquois* was the first naval ship to enter the harbor—it is for this naval vessel that the Puʻuloa point is now called "Iroquois Point." That same year, condemnation proceedings of lands along the harbor shoreline were also initiated. These lands included Hālawa side of the Pearl Harbor entrance (including Kuāhua Island), Ford Island, Bishop Point, and sections of the ʻili of Puʻuloa and Waipiʻo Peninsula. In 1909, a new dredging contract for the inner lochs and construction of a massive drydock began. On December 14, 1911, dredging was officially completed on the interior lochs, and the flagship U.S.S. *California* steamed into the harbor.

On February 17, 1913, disaster struck when Drydock No. 1 collapsed and four years of work were lost. Native families of the ʻEwa District attributed the disaster to the shark god Kahiʻukā (the smiting tail). Engineers attributed the collapse to unstable earth and adjusted their plans, reengaging in construction of the drydock, which was completed in 1919.

The major facilities of the naval base and submarine base were constructed between 1910 and 1918. In 1921, a second stage of coastal defense began with the development of Fort Weaver in the Puʻuloa area, where gun embankments were installed and a larger section of land was integrated into the naval reservation. In the 1930s, lands of the Campbell Estate in Honouliuli were developed into naval magazine facilities. Similar development was initiated

at Waikele and Kīpapa Gulch. An Army coastal defense battery was built at Puʻuokapolei and shoreward of that Army and Marine training facilities, including an air field, were being constructed.

Following World War II, new heavy vehicles were being manufactured and use of the trains for hauling was becoming obsolete. In 1947, the plantation manager's report observed "For over fifty years we have depended upon the reliable and efficient service of the Oʻahu Railway & Land Co to transport our sugar, molasses and supplies. We regret it has been necessary for them to terminate this service at the end of 1947" (Conde and Best, 1973:315).

The last load of sugar cane came in by rail from the fields on November 14, 1950. In an entry under "Harvesting," the Oʻahu Sugar Company manager noted that by the end of 1951, "transportation of the entire crop from field to factory was done for the first time, the railroad being eliminated" (Conde and Best, 1973:316).

Today, the United States Military manages some 14 land areas in the ʻEwa District. These include:

- NAS Barbers Point. Honouliuli
- Iroquois Point/Puʻuloa Housing. Honouliuli
- NAVMAGPH West Loch. Honouliuli, Waikele
- NAVMAGPH Waikele (Waikākalaua-Kīpapa Gulch junction). Honouliuli, Waikele, Waipiʻo
- Ewa Drum Storage facility (between Pearl City & Waipahū). Waipiʻo, Waiawa
- Pearl City Housing. Waiawa, Mānana, Waimano
- Mānana Housing (Pearl City). Mānana
- PHNC, Ford Island (East Loch). Mokuʻumeʻume. Waimalu, Kalauao
- McGrew Point Housing. Kalauao
- PHNC Naval Shipyard. Hālawa
- PHNC Submarine Based. Hālawa

- Hālawa Housing. Hālawa
- Red Hill Housing and Storage. Hālawa and Moanalua
- PWC Moanalua Housing (Moanalua – Makalapa). Moanalua

C. Historic Sites

1. Puʻuokapolei

Puʻuokapolei is a hill in Honouliuli where several gods, goddesses, and legendary figures were associated. The hill was the resting place of Hiʻiakaikapoliopele (Hiʻiaka), the sister of the volcano goddess Pele, and Lohiʻau, Pele's lover, after Hiʻiaka returned from Kauaʻi with Lohiʻau (Fornander, 1919 Vol. V: 188, note 6). The hill was also the location where Kamapuaʻa established his grandmother as queen after conquering most of Oʻahu from King ʻOlopana (Pukui et al., 1974:203; Sterling and Summers, 1978:33).

Native historian Samuel M. Kamakau penned hundreds of articles as letters and in serial form, in which he documented Hawaiian history through traditions, personal experience and in observations of the history unfolding around him. On February 10, 1870, Kamakau explained the history and reckoning of periods of time through the ancient Hawaiian year. In this account, he shares that Puʻuokapolei and Mahinaona on the kula lands of Honouliuli were the markers of the changing seasons. The original Hawaiian texts follow, with a new translation adapted from the translation of Mary Kawena Pukui (Kamakau, 1976:14).

Ke Au Okoa
Ka Moolelo Hawaii. Na S.M. Kamakau. Helu 17.
No ka mahele ana i na wa o ka makahiki.

Feberuari 10, 1870 (aoao 1)
…O ka poe helu a hooponopono i na malama o ka makahiki, o ko Oahu poe kilohoku a me ko Kauai ka poe akamai loa i ka hooponopono ana, a me ka mahele pono ana i ke ano o ka la, o ka mahina a me na hoku, a me ka papa hulihouna o ka aina, a me na hoku, a ua kapa ia ia poe o ka poe kuhikuhi

puuone, a me poe kilo hoku holo moana, a o ka poe helu e noho ona ma Waimea i Kauai.

I ke kupono ana o ka la ma ke alanui polohiwa a Kane, a nee ka la i ka akau a paupono ka la i Kaula, a nee ka la a kau i Kawaihoa, a no ke kau ana o ka la ma Kaula a kau i Kawaihoa, a nolaila i kapaia aku ai kekahi inoa o Makalii o ke Kau, a no Kaulana a Kane kekahi ikapaia aku ao o ke Kau, a no ke kau ana o ka la i Kaula a nee ka la i ka hema, a ua kapaia o ke Kau Hooilo, a pela ko Oahu poe helu, no ke kau ana o ka la i Puuokapolei, a kau ka [la] i ke kawaha o Mahinaona, ua kapa ia o ke Kau, a mai Puuokapolei a nee ka la i ka hema, a no ke kau o ka la i ka hema, a no ka hiki ana mai o ke anu, a no ka hoolio ana o ke kupu o na oliko o na mea ulu he oilo ia, ua kapaia ke kau o ka hooilo, a nolaila, elua no kau o ka makahiki. O ke Kau Makalii, a o ke kau Hooilo…

Translation
…Of the people who kept administered the accounting of the seasons of the year, those observers of the heavens from Oahu and Kauai were extremely knowledgeable in reckoning, and the correct division of the character of the sun, the moon, and the stars, also in the study of the earth and stars. These people were known as the experts in diserning the nature of the land, the navigators and observers of the stars. They were the observers who went and resided at Waimea, Kauai.

When the sun reached ke alanui polohiwa a Kane (the equator), and the sun traveled to north and stopped right over the islet of Kaula, moving above Kawaihoa, it was then known by the names "Makalii o ke Kau" or "Kaulana a Kane," others called it "Kau," for the setting of the sun at Kaula. When it moved to the south, it was called Kau Hooilo. When the observers of Oahu saw the sun above Puuokapolei, the sun set above the mouth of Mahinaona, it was called Kau. When the sun moved south, and set in the south; when the cold arrived, and the sprouting of the shoots and reddning buds of growing things sprouted,

> it was called Kau o ka Hooilo. Therefore there were two seasons in the year, the Makalii (summer) season, and the Hooilo (winter) season…

Later in Kamakau's series on Hawaiian history, he described traditions associated with care for the dead (kupapaʻu), respect of the graves (ilina), and traditions associated with the spirit after death, all subjects that are of great significance to Hawaiians. In the account, he identified some of the places of importance in these practices. The narratives are of particular importance to lands and specific wahi pana of Honouliuli, and also connected to places that span the ʻEwa District, all the way to Moanalua.

Puʻuokapolei is an important feature of the Honouliuli landscape and is clearly visible from the current APE, but the project is not expected to have an adverse impact on the historic hill.

2. ʻEwa Sugar Plantation Villages

The current APE is situated within the ʻEwa Sugar Plantation Villages (SIHP #50-80-12-9786), which was placed on the Hawaiʻi register of Historic Places in 1995 and is the only residential district listed in Hawaiʻi. The historic district encompasses all but the western extent of the APE. Several historic properties in the immediate vicinity (directly north of the APE) are part of the ʻEwa Sugar Plantation Villages, including sites associated with Varona Village, which is the most western village part of the Historic District. The residential development currently consists of approximately 45 plantation-era houses in various states of repair. Several houses are abandoned and many have been torn down. Previously documented historic properties in the village include two dilapidated houses (SIHP # -7129 and -7130), two concrete house foundations (SIHP # -7131 and -7132), and a partially intact historic streetlamp (SIHP # -7133). The streetlamp is located on the north side of Renton Road, adjacent to the APE. These sites are not located directly within the APE and are not expected to be affected by the project; the historic streetlam will be avoided and should not be affected by the proposed project.

3. ʻEwa Plain Battlefield

The ʻEwa Plain Battlefield (SIHP # 50-80-12-8025) is located approximately 230 feet south of the project area and was listed on the National Register of Historic Places (#16000273) on May 23, 2016. The Battle of ʻEwa Plain occured on December 7, 1941 as part of the surprise attack by the Imperial Japanese Navy on Pearl Harbor. According to the Registration Form, the battlefield "retains sufficient architectural, archeological, and/or landscape integrity to convey its historic significance. This includes retaining its integrity of location, setting, design, and association" (Frye and Resnick, 2013). The battlefield shows evidence of its association with battle by the "presence of aircraft burn areas and strafing marks (cannon/machine gunfire) from Japanese aircraft on the former warm-up platform and there is the likelihood of spent bullets from the attack imbedded in the original pavement of the other attack areas" (Frye and Resnick, 2013). The ʻEwa Plain Battlefield is representative of an extremely important event in Hawaiʻi's (and the United States') history, but the project is not expected to have an adverse effect on the historic site as it is outside of the APE.

4. Heiau

Several early writers undertook surveys of cultural sites and heiau on Oʻahu. In the *Hawaiian Annual and Almanac* (Thrum, 1907a), it was reported that a heiau had been located on or near Puʻuokapolei. Thrum observed "heiau on Kapolei hill, ʻEwa - Size and class unknown. Its walls thrown down for fencing" (1907a:46).

In the early 1930s, J.G. McAllister undertook an archaeological-ethnographic survey on the island of Oʻahu for the Bishop Museum. Regarding the heiau at Puʻu o Kapolei, McAllister (1933) reported:

> Puʻu Kapolei Heiau (Destroyed) Site 138, on Puʻu Kapolei hill. The stones from the heiau supplied the rock crusher which was located on the side of this elevation, which is about 100 feet away on the sea side. There was formerly a large rock shelter on the sea side where Kamapuaʻa is said to have lived with his grandmother (McAllister, 1933:108).

5. ʻEwa Coral Plains

McAllister also summarized how the coral plains of Honouliului may have been used in earlier times:

> Site 146. Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near Puuloa Salt Works, belongs to the ranching period of about 75 years ago. It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population here (McAllister, 1933:109).

D. Natural Resources

1. Flora

In the Botanical Assessment conducted within the project area, numerous foreign and invasive plant species were discovered. The assessment reported that the project area is characterized as a weedy grass land with scattered trees. 56 total species were recorded during the survey, 54 of which are introduced and two of which are indigenous. The dominant plant species recorded are non-native, including opiuma (*Pithecellobium dulce*), kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), buffelgrass (*Cenchrus ciliaris*), Guinea grass (*Panicum maximum*), castor bean (*Ricinus communis*), common sandbur (*Cenchrus echinatus*), and Australian saltbush (*Atriplex semibaccata*). The indigenous plant species discovered near the project area include ʻuhaloa (*Waltheria indica*) and a few ʻilima (*Sida fallax*) at the western end near Ka Makana Aliʻi (LeGrande, 2019). Neither ʻuhaloa nor ʻilima are currently identified as of environmental or conservation concern.

ʻUhaloa is primarily a medicinal plant. The leaves, stems and roots were pounded, strained and used as a gargle for sore throats, which is a practice that continues today (Abbott, 1992). ʻUhaloa was also combined with other plants to create a tonic for young and older children,

and seldom adults (Krauss, 1993). Canoe builders would also occasionally add the sap of ʻuhaloa to a concoction of kukui root, ʻakoko, and banana inflorescence to create a paint that would stain the hull (Krauss, 1993). This native weed remains abundant throughout the Hawaiian Islands, and is still treasured as a natural and safe tonic for bodily ailments today.

ʻIlima is a small to large native shrub that flowers in varying colors, including yellow, orange, green or red, and grows from near sea level to more than 6,000 feet. The flowers are roughly an inch across and are five-parted, growing solitary or in twos or threes together (Krauss, 1993); the flowers are very delicate and once picked, only last one day. The ʻilima flower is primarily used to create lei, namely the kuʻi (sewn, joined) style, and is highly valued and prized. It takes 1,000 flowers to produce a single lei in the kuʻi style and the flowers are picked early in the morning when still unopened; these lei were once reserved only for royalty (Krauss, 1993). Maʻo (*Abutilon grandifolium*) fruit, when green and soft, are used to form the ends of the ʻilima lei. Lei makers may also use the calyx of the ʻilima flower itself to form these ends on the lei. Additionally, the flowers are also used for medicinal purposes. In lāʻau lapaʻau, ʻilima is used to make kanakamaikaʻi, which can be used as a mild laxative for babies. In 1923, the Territorial Legislature named the ʻilima the flower of Oʻahu and it is referenced in numerous songs and chants (Pukui and Elbert, 1986).

2. Fauna

An avifaunal field survey was conducted within the project area and a total of 629 individual birds were recorded during point counts, representing 22 species and 13 separate families. The only native species recorded during the survey was the kōlea or Pacific Golden-Plover (*Pluvialis fulva*) which is an indigenous migratory shorebird. No other native seabirds or land birds were discovered, although the native pueo (*Asio flammeus sandwichensis*) and several seabird species have the potential to overfly the site on occassion. The remaining 21 species are alien or feral (David, 2019).

The kōlea is commonly found throughout Hawaiʻi and is not threatened or endangered. The kōlea is a shorebird indigenous to the Hawaiian Islands. This long-distance travelling plover winters on the Main Hawaiian Islands from August through April, then migrates to Siberia

and western Alaska to breed from April through early August (Mitchell et al., 2005). In the winter, kōlea resides on a variety of habitats including crop fields, coastal salt marshes, beaches, pastures, and grassy areas on both urban and undeveloped lands, so the project area can be ideal for the kōlea's habitat needs.

Kōlea, among other birds, play an important role in many myths:

> Birds are notably potential gods or spirit beings. In the machinery of romance migratory birds or those which nest in high cliffs are messengers for the high chiefs in the story. Thus plover (kōlea), wandering tattler (ʻūlili), tropic bird (koaʻe), turnstone (ʻakekeke) are sent by the divine chiefs of the story, generally in pairs, to act as scouts or to carry messages from island to island. The plover, accompanied by the tattler, remains in Hawaii or flies on south from August until the following May or June, when it migrates to Alaska for nesting, leaving behind immature birds and cripples (Beckwitch, 1970:90).

The role of kōlea as messangers to the gods and divine chiefs is further outlined in the Kana moʻolelo, where the kōlea and ulili are sent by the Molokaʻi chief Kapepeʻekauila to reconnoiter before battle (Beckwith, 1970:464).

Beckwith further explains the cultural importance of kōlea in the myth of Kolea-moku, "a man of ancient days who was taught the medicinal arts by the gods and was himself deified after death and worshipped in the heiau at Kailua"[10] (Beckwith, 1970:119). Beckwith clarifies that Kolea-moku may be another name for the ʻaumākua (family gods) of kōlea birds that are elsewhere referred to as Kumukahi, who "was able to take the form of a man or of a kolea bird at will" (Beckwith, 1970:120). One moʻolelo details the bird hunter Kumu-hana recklessly killing the kōlea for sport, to which his neighbor, who worships Kumukahi, warns about the sacrilege. Kumu-hana does not heed his neighbor's warning, so Kumu-hana is attacked by a flock of plover, "who enter his house and peck and scratch him to death. The

[10] This heiau referred to by Beckwith is believed to be located in Kailua, Kona on Hawaiʻi Island rather than the Kailua that lies in the Koʻolaupoko District of Oʻahu.

place where he lived is called Ai-a-kolea to this day" (Beckwith, 1970:137-138).

Although the kōlea has the potential to occur within the project area, its extremely large range and population size prevents it from entering Vulnerable status. Kōlea are protected under the Migratory Bird Treaty Act, which prohibits the taking, possessing, importing, exporting, transporting, selling, purchasing, bartering or any such offers of parts, nests or eggs of any bird listed under the Act.

A mammalian field survey was conducted concurrently with the avifaunal survey and only three terrestrial mammalian species were detected over the course of the survey: dogs (*Canis familiaris*), Indian mongoose (*Herpestes auropunctatus*), and cats (*Felis catus*). The sole endemic terrestrial mammal species of Oʻahu is the Hawaiian hoary bat (*Lasiurus cinereus semotus*) or ʻōpeʻapeʻa, and this species was not detected during the survey (David, 2019).

3. Other Environmental Features

a. Rain Names

Akana and Gonzalez in *Hānau Ka Ua: Hawaiian Rain Names* explain the significance of the wind and rain in Native Hawaiian culture:

> In the mind… of our Hawaiian kūpuna [ancestors], every being and every thing in the universe was born. Our kūpuna respected nature because we, as kānaka, are related to all that surrounds us – to plants and creatures, to rocks and sea, to sky and earth, and to natural phenomena, including rain and wind. This worldview is evident in a birth chant for Queen Emma, "Hānau ke aliʻi, hānau ka ua me ka makani" (The chiefess was born, the rain and wind, too, were born). Our kūpuna had an intimate relationship with the elements. They were keen observers of their environment, with all of its life-giving and life-taking forces. They had a nuanced understanding of the rains of their home. They knew that one place could have several different rains, and that each rain was distinguishable from another. They knew when a particular rain would fall, its

color, duration, intensity, the path it would take, the sound it made on the trees, the scent it carried, and the effect it had on people (Akana and Gonzalez, 2015:xv).

To the Native Hawaiians, no two rains are ever the same. Rain can be distinguished based on its intensity, the way it falls, and its duration, among other things. The following are a collection of rains that occur within Wailuku moku. Moʻolelo, ʻōlelo noʻeau (traditional sayings), mele, oli (chants), etc., associated with the particular rain name are also provided to give insight into the importance and cultural significance that the different types of rains have to the Native Hawaiian people.

i. Waʻahila Rain

Waʻahila rain is associated with Nuʻuanu, Oʻahu and is also found on other parts of Oʻahu, including ʻEwa. Waʻahila is also the name of a wind and ridge between Mānoa and Pālolo.

Rain of Hālawa, Oʻahu

No laila, ʻo mākou o ka Ahahui Hooikaika Kristiano holoʻokoʻa o ka ua Waʻahila o Hālawa, ʻEwa, ma o ko mākou kōmike lā, ke komo pū aku nei e kaʻana pū i nā ʻīnea o kēia mau lā ʻehaʻeha me nā mākua i hoʻonele ʻia i ka lei ʻole, ka ʻohana a me nā pilikana me ke kau nui aku i maluhia mai ko kākou puʻuhonua a me ka ikaika mai.

Therefore, we, on behalf of the entire Ahahui Hooikaika Kristiano of the Waʻahila rain of Hālawa, ʻEwa, through our committee, join in sharing the hardships of these tragic days with the parents, family, and relatives who have been deprived of their children, with hopes for peace and strength from our refuge.

From a message of condolence from members of the Christian Endeavor Society. Note: "Puʻuhonua" or "refuge" probably refers to Jesus Christ (Akana and Gonzalez,

2015:272).

Nani Hālawa i ka ua Waʻahila *Hālawa is beautiful in the Waʻahila rain*
Ke kīpū maila i luna o ʻAiea *Remaining above ʻAiea*

From George M. K. Aekai o Kuloloia's response to a name, or riddle, printed in the newspaper *Kuokoa Home Rula* (Akana and Gonzalez, 2015:272).

ii. Kuahina Rain

Kuahine or Tuahine is the rain primarily associated with Mānoa, Oʻahu. However, it is also found in other parts of Oʻahu, including ʻEwa.

Rain of Kahui, Central Oʻahu

He aha lā ka mea lena i uka o Kahui?
He Kuahine lāua me ke Kiʻowao

What is expanding in the uplands of Kahui?
The Kuahine and the Kiʻowao.

From a mele inoa, or name chant, for chiefs (Akana and Gonzalez, 2015:114).

The Kiʻowao is a cool mountain rain that also brings wind and fog with it. Kahui, the place name mentioned in the mele inoa above, is located in Kalauao, ʻEwa.

iii. Nāulu Rain

Nāulu is a sudden shower that is associated with places throughout Hawaiʻi, including Kaupeʻa, ʻEwa. Nāulu is also the name of a shower cloud and a wind. In Hawaiian epistemology, sudden showers are associated with the akua Lono, whose domain is that of agriculture.

Rain of Kaupeʻa, Oʻahu

ʻAʻole au e hele i ke kaha o Kaupeʻa	*I shall not tread Kaupeʻa's expanse*
Kēlā kaha kūpā koili a ka lā i ke kula	*That stretch where the sun beats down on the plain*
Ua kūpono aʻela ka lā i ka piko o Wākea	*The sun is right overhead, at the navel of Wākea*
Ola i ke ahe a ka makani māunuunu	*I am spared by the Māunuunu wind*
I ka hapahapai mai a ka makani ʻAoʻaoa	*By the uplifting ʻAoʻaoa breeze*
Ke koi lā i ke ao o ka Nāulu e hanini i ka wai	*Urging the Nāulu storm clouds to pour down their waters*
Ola ihola nā kupa kamaʻāina i ka wai a ka ʻōpua	*The natives here survive on water from the clouds*
Ke halihali aʻela nā ʻōpua i ke awa lau	*Which billowing clouds carry along to the branching lochs*

From a mele by Hiʻiakaikapoliopele as she traveled over the hot stretch of land near Puʻuloa, Oʻahu (Akana and Gonzalez, 2015:195).

b. Wind Names

According to ancient Hawaiian legend, the descendants of Laʻamaomao, the wind god, used his gourd to control the winds and cause the demise of their enemies. Pākaʻa and his son Kūapākaʻa, Lʻamaomao's descendants, control the winds by chanting the wind name, which recalls that particular wind from the gourd; each wind name is associated with an ahupuaʻa or place. Pākaʻa passed on his knowledge of the wind names and gourd to Kūapākaʻa, who called on all of the winds to destroy the canoe fleet of Pākaʻa's enemies in the Kaiwi Channel separating Oʻahu and Molokaʻi.

The following is an excerpt from the chant naming the winds of Oʻahu, focusing particularly

on the wind names of ʻEwa:

Moaʻe-ku is of ʻEwaloa,
Kēhau is of Waiʻōpua,
Waikōloa is of Līhuʻe,
Kona is of Puʻuokapolei,
Māunuunu is of Puʻuloa… (Nakuina, 1901)

According to this account, Moaʻe kū, Kona, and Māunuunu are the winds typically found in the ʻEwa moku, particularly Honouliuli. Moaʻe kū is considered to be a foreign wind that blows from another land (He makani mai Kahiki mai). Moaʻe are trade winds and the Moaʻe kū is considered to be a very strong trade wind. Kona is the name of the wind associated with Puʻuokapolei and this a famous leeward wind. Māunuunu is the name of a strong, blustering wind typically associated with Waiʻalae and Puʻuloa.

In the epic tale, "Ka Moʻolelo o Hiʻiakaikapoliopele," Hiʻiaka offers a mele while traveling through the hot plains of Kaupeʻa in ʻEwa:

ʻAʻole au e hele i ke kaha o Kaupeʻa	*I shall not tread Kaupeʻa's expanse*
Kēlā kaha kūpā koili a ka lā i ke kula	*That stretch where the sun beats down on the plain*
Ua kūpono aʻela ka lā i ka piko o Wākea	*The sun is right overhead, at the navel of Wākea*
Ola i ke ahe a ka makani māunuunu	*I am spared by the Māunuunu wind*
I ka hapahapai mai a ka makani ʻAoʻaoa	*By the uplifting ʻAoʻaoa breeze*
Ke koi lā i ke ao o ka Nāulu e hanini i ka wai	*Urging the Nāulu storm clouds to pour down their waters*
Ola ihola nā kupa kamaʻāina i ka wai a ka ʻōpua	*The natives here survive on water from the clouds*

Ke halihali aʻela nā ʻōpua i ke awa lau *Which billowing clouds carry along to the branching lochs*
(Akana and Gonzalez, 2015)

This mele mentions the Māunuunu wind and the ʻAoʻaoa breeze which spare her from the intense heat of the Kaupeʻa plains in ʻEwa. ʻAoʻaoa, or ʻaoa, is references as a sea breeze.

E. Intangible Cultural Resources

It is important to note that Honua Consulting's unique methodology divides cultural resources into two categories: biocultural resources and built environment resources. We define biocultural resources as elements that exist naturally in Hawaiʻi without human contact. These resources and their significance can be shown, proven, and observed through oral histories and literature. We define built environment resources as elements that exist through human interaction with biocultural resources whose existence and history can be defined, examined, and proven through anthropological and archaeological observation. Utilizing this methodology is critical in the preparation of a CIA as many resources, such as those related to akua (Hawaiian gods), do not necessarily result in material evidence, but nonetheless are significant to members of the Native Hawaiian community.

Hawaiian culture views natural and cultural resources as being one and the same: without the resources provided by nature, cultural resources could and would not be procured. From a Hawaiian perspective, all natural and cultural resources are interrelated, and all natural and cultural resources are culturally significant. Kepā Maly, ethnographer and Hawaiian language scholar, points out, "In any culturally sensitive discussion on land use in Hawaii, one must understand that Hawaiian culture evolved in close partnership with its natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture ends and nature begins" (Maly, 2001:1).

1. ʻŌlelo Noʻeau

ʻŌlelo noʻeau are another source of cultural information about the area. ʻŌlelo noʻeau literally

means "wise saying," and they encompass a wide variety of literary techniques and multiple layers of meaning common in the Hawaiian language. Considered to be the highest form of cultural expression in old Hawaiʻi, ʻōlelo noʻeau bring us closer to understanding the everyday thoughts, customs, and lives of those that created them.

The ʻōlelo noʻeau presented here relate to Honouliuli, Puʻuloa, and the larger moku, ʻEwa. These ʻōlelo noʻeau are found in Pukui's *ʻŌlelo Noʻeau: Hawaiian Proverbs & Poetical Sayings* (1983). The number preceding each saying is provided.

80 ʻĀina koi ʻula i ka lepo.
Land reddened by the rising dust.
Said of ʻEwa, Oʻahu.

105 Alahula Puʻuloa, he alahele na Kaʻahupāhau.
Everywhere in Puʻuloa is the trail of Kaʻahupāhau.
Said of a person who goes everywhere, looking, peering, seeing all, or of a person familiar with every nook and corner of a place. Kaʻahupāhau is the shark goddess of Puʻuloa (Pearl Harbor) who guarded the people from being molested by sharks. She moved about, constantly watching.

123 Anu o ʻEwa i ka iʻa hāmau leo e. E hāmau!
ʻEwa is made cold by the fish that silences the voice. Hush!
A warning to keep still. First uttered by Hiʻiaka to her friend Wahineʻomaʻo to warn her not to speak to Lohiʻau while they were in a canoe near ʻEwa.

274 E hāmau o makani mai auaneʻi.
Hush, lest the wind arise.
Hold your silence or trouble will come to us. When the people went to gather pearl oysters at Puʻuloa, they did so in silence, for they believed that if they spoke, a gust of wind would ripple the water and the pysters would vanish.

493 Haunāele ʻEwa i ka Moaʻe.

ʻEwa is disturbed by the Moaʻe wind.

Used about something disturbing, like a violent argument. When the people of ʻEwa went to gather *pipi* (pearl oyster), they did so in silence, for if the spoke, the Moaʻe breeze would suddenly blow across the water, rippling it, and the oysters would disappear.

1014 Hoʻahewa na niuhi ia Kaʻahupāhau.

The man-eating sharks blamed Kaʻahupāhau.

Evil-doers blame the person who safeguards the rights of others. Kaʻahupāhau was the guardian shark goddess of Puʻuloa (Pearl Harbor) who drove out or destroyed all the man-eating sharks.

1023 Hoʻi aku la ka ʻōpua i ke awa lau o Puʻuloa.

The horizon cloud has gone back to the lochs of Puʻuloa.

He has gone home to stay, like the horizon clouds that settle in their customary places.

1126 Huhui na ʻōpua i Awalau.

The clouds met at Pearl Harbor.

Said of the mating of two people.

1330 Ka iʻa hali a ka makani.

The fish fetched by the wind.

The *ʻanaeholo*, a fish that travels from Honouliuli, where it breeds, to Kaipāpaʻu on the windward side of Oʻahu. It then turns about and returns to its original home. It is driven closer to shore when the wind is strong.

1331 Ka iʻa hāmau leo o ʻEwa.

The fish of ʻEwa that silences the voice.

The pearl oyster, which has to be gathered in silence.

1686 Ke awa lau o Puʻuloa.

The many-harbored sea of Puʻuloa.

Puʻuloa is an early name for Pearl Harbor.

1698 Ke hoʻi aʻe la ka ʻōpua i Awalau.

The rain clouds are returning to Awalau.

Said of a return to the source.

1721 Ke kai heʻe nehu o ʻEwa.

The sea where the nehu *come in schools to ʻEwa.*

Nehu (anchovy) come by the millions into Pearl Harbor. They are used as bait for fishing, or eaten dried or fresh.

2152 Mehameha wale no o Puʻuloa, i ka hele a Kaʻahupāhau.

Puʻuloa became lonely when Kaʻahupāhau went away.

The home is lonely when a loved one has gone. Kaʻahupāhau, guardian shark of Puʻuloa (Pearl Harbor), was dearly loved by the people.

2. Mele

Honua Consulting completed a search of mele written about the ahupuaʻa of Honouliuli and its moku of ʻEwa.[11] Maui historian Inez Ashdown wrote in 1976 about the importance of mele:

> The natives of Hawaiʻi Neʻi saw the Creator in everything and the Haku Mele or Music Masters delighted in presenting the chants and songs, mele and oli, to inspire the people. Such mele tell of God's assistant spirits which, to the imaginative natives, represented the winds, rains, and so on. Each spirit of creation was depicted as male or female and was given a personality and a

[11] It should be noted that there are numerous mele about the larger ʻEwa area that have not been included in this assessment as they did not yield information closely associated with the project area.

name indicative of purpose. Hence the name of the volcanic action creating and cleansing the earth. She is beautiful, alluring, desirable. She also is unpredictable because she is tempermental and usually full of fiery emotions. She is an old woman asking help when she lies to test mortals, and woe betide anyone who is rude or inconsiderate of this form of an older person to whom respect and Aloha must be given (Ashdown, 1976:3).

a. Paʻahana

The following is a traditional mele and hula that tells the story of a young girl mistreated by her stepmother. She ran away from home to the hills above Waihawā where she lived on river shrimp and guava until she was found by a cowboy. She was taken to Mānana, the present site of Pearl City, located within the moku of ʻEwa (Elbert and Mahoe, 1970).

Paʻahana (Busy) – Traditional

He inoa kēia nō Paʻahana	This is a name song for Paʻahana
Kaikamahine noho kuahiwi	The girl who lived in the hills
Mele he inoa no Paʻahana	Namesong for Paʻahana
Naʻu i noho aku ia wao kele	I lived in the rain forests in
Ia uka ʻiuʻiu Waiawā	The distant uplands of Waiawā
Mele he inoa no Paʻahana	Namesong for Paʻahana
ʻŌpae ʻoehaʻa o ke kahawai	Clawed shrimps of the streams and
ʻO ka hua o ke kuawa kaʻu ʻai ia	Guava fruits my food
Mele he inoa no Paʻahana	Namesong for Paʻahana
Mai kuhi mai ʻoe ka makuahine	Don't think about the mother
A he pono kēia e noho nei	I live here and am glad
Mele he inoa no Paʻahana	Namesong for Paʻahana

ʻO kahi muʻumuʻu pili i ka ʻili	A single muʻumuʻu clings to my skin
ʻO ka lau lāʻī koʻu kapa ia	My blankets are ti leaves
Mele he inoa no Paʻahana	Namesong for Paʻahana
Pīlali kukui kau lāʻau	Kukui gum on the trees
Lau o ke pili koʻu hale ia	And pili grass my home
Mele he inoa no Paʻahana	Namesong for Paʻahana
I hume iho au ma ka pūhaka	I bind my loins
I nalo iho hoʻi kahi hilahila	And hide my private parts
Mele he inoa no Paʻahana	Namesong for Paʻahana
I hoʻi iho hoʻi au e peʻe	I came and hid but was
ʻIke ʻē ʻia mai e ka ʻenemi	Seen by the enemy
Mele he inoa no Paʻahana	Namesong for Paʻahana
Lawe ʻia aku au a i Mānana	I was taken to Mānana
Mākaʻikaʻi ʻia e ka malihini	And visited by strangers
Mele he inoa no Paʻahana	Namesong for Paʻahana
Haʻina ʻia mai ana ka puana	Tell the refrain
He mele he inoa no Paʻahana	A song, a name for Paʻahana
Mele he inoa no Paʻahana	Namesong for Paʻahana

b. Pāʻauʻau Hula

This mele was written by John U. Iosepa (lyrics) and Charles King (music) and dedicated to Hon. John F. Colburn, cousin of Lahilahi Webb, whose home was called Pāʻauʻau in remembrance of the pool in ʻEwa. Kūliaikanuʻu is the motto of Queen Kapiʻolani and the name of Mrs. Colburn. According to scholar Mary Kawena Pukui, the "neck lei" referred to in Verse 8, Stanza 2 means a "beloved child" (King, 1942).

Pāʻauʻau Hula – by John U. Iosepa (Words) and Charles King (Music)

Aia i ka iʻa ha mau leo	There, where the silent fish is found
Ka ʻiʻini, ka haliʻa, ka haʻupu ʻana ka	The desire, the interest, the remembrance
Haʻupu aʻe ana ka manaʻo e ʻike	I yearn once more to see
E ʻike i ka nani o Pāʻauʻau o, Pāʻauʻau	To see the beauty of Pāʻauʻau, of Pāʻauʻau
E ʻauʻau ia wai kamahaʻo	To bathe in that wondrous pool
Ia wai hoʻoheno a ka malihini	The pool that delights visitors
Malihini hoʻi kuʻu ʻike ia ʻoe	I was a stranger when I first saw it
Kamaʻāina no naʻe i ke aloha	But became acquainted through friendliness
ʻO mai ka wahine nona ka lei	Answer, o lady whose lei song this is
Kūliaikanuʻu e ō mai	Kūliaikanuʻu, answer
A Pāʻauʻau au ʻike i ka nani	At Pāʻauʻau I saw the beauty
Ka waiho kāhela mai i ka laʻi	Lying before me in the calm
I laila hoʻolaʻi ai nā manu la	There the birds paused
Mikiʻala i ka nani o nā pua	Enthralled by the beauty of the flowers
He ua no ʻoe ua ona ia	You are a very attractive flower
He lei ʻāʻī no ke kūpuna	A neck lei for your ancestors
Haʻina ʻia mai ana ka puana	This is the end of our song
Kūlia ka wahine noho i ke kapu	Kūlia is a woman who swells with kapu

c. Pāʻauʻau Waltz

The following mele, written by John U. Iosepa, is also dedicated to Pāʻauʻau in reference to the home and pond on the Pearl City peninsula. "Moaʻe," which appears in Verse 1, Stanza 2, is the ancient name for the trade winds; "iʻa hāmau leo" (Stanza 4) was the way ancient Hawaiians searched for and harvested oysters (King, 1923).

Pāʻauʻau Waltz – by John U. Iosepa

Haʻaheo Pāʻauʻau i ka nani	Proud is Pāʻauʻau in its beauty
Kilikila i ka pai a ka Moaʻe	Majestic is the stirring of the trade winds
E walea ana paha i ka ʻolu	Delighting in the pleasant comfort
I ka hoʻoheno a ka iʻa hāmau leo	Cherished for the pearl oyster sought in silence
Pau ʻole koʻu hoʻohihi	My delight is boundless
I ka nani o Pāʻauʻau	For the beauty of Pāʻauʻau
Na wai e ʻole ka ʻiʻini	Who would not be desirous
Ua noho a kupa i laila	Having lived as a familiar of that place
Uluwehi wale ia home	That home is verdant and lush
Makaʻala i ke kai o Pōlea	Surrounded by the sea of Pōlea
Hoʻolale aʻe ana e ike i ka nani	Urging one to witness the beauty
O Pāʻauʻau	Of Pāʻauʻau

d. Pūpū o ʻEwa

This final mele was written in honor of ʻEwa by an unknown composer. The mele was described in Elbert and Mahoe's *Nā Mele o Hawaiʻi Nei*:

> …[it] is said to have been composed as part of a fund-raising campaign for the Ka-hiku-o-ka-lani Church (the seventh of the kings) at Pearl City. Ka-lā-kaua, the seventh monarch, for whom the church was named, helped build it.
>
> The "news of the land" is the discovery of pearl oysters at Puʻu-loa, the Hawaiian name for Pearl Harbor. Ka-ʻahu-pāhau is the shark goddess who protected Pearl Harbor. Kaʻala, in the Wai-ʻanae range, is the highest mountain on Oahu. Polea is a place at ʻEwa. In the chorus, *nuʻa* and *naue* are sometimes replaced by *nuku* (mouth) and *lawe* (bring) (1970:87-88).

Pūpū o ʻEwa (Shells of ʻEwa) – Traditional

Hui:	**Chorus:**
Pūpū (aʻo ʻEwa) i ka nuʻa (nā kānaka)	Shells of ʻEwa throngs of people
E naue mai (a e ʻike)	Coming to learn
I ka mea hou (o ka ʻāina)	The news of the land
Ahe ʻāina (ua kaulana)	A land famous
Mai nā kūpuna mai	From the ancient times
Alahula Puʻuloa he ala hele nō	All of Puʻuloa, the path trod upon by
Kaʻahupāhau, (Kaʻahupāhau)	Kaʻahupāhau
Alahula Puʻuloa he ala hele nō	All of Puʻuloa, the path trod upon by
Kaʻahupāhau, Kaʻahupāhau	Kaʻahupāhau
Nani Kaʻala hemolele i ka mālie	Beautiful Kaʻala, sublime in the calm
Kuahiwi kaulana aʻo ʻEwa	Famous mountain of ʻEwa
E kiʻi ana i ka makani o ka ʻāina	That fetches the wind of the land
Hea ka Moaʻe eia au e ke aloha	The tradewind calls, "here I am, beloved"
Kilakila ʻo Polea noho i ka ʻolu	Majestic Polea in the coolness
Ia home hoʻohihi a ka malihini	Home delighted to visitors

E walea ana i ka ʻolu o ke kiawe	Relaxing in the coolness of the kiawe
I ka pā kolonahe a ke Kiu	And the soft blowing of the Kiu wind

e. ʻO Wau e Hele i ke Kaha o Puʻuloa

This mele was offered by Hiʻiakaikapoliopele as she traveled through Puʻuloa in the story of Hiʻiakaikapoliopele. This chant is used today by different organizations in ʻEwa in order to honor the traditions and places of Puʻuloa (*Ka Hoku o Hawaii*, 1927; translated by Kepā Maly).

O wau e hele i ke kaha o Puuloa	It is I who travel across the lowlands of Puʻuloa,
I ka ohai o Kaupea la	Where the ʻōhai plants grow at Kaupeʻa.
I ka la hoanoano-e, ua ike	A day of solitude, when one sees,
Ua ike aku la ka hoi au	I have indeed seen,
I ke kuahiwi mauna pali	The mountains and the cliff sides
O Puukuua i Halehau	Of Puʻukuʻua at Halehau
O ke oho o ke kukui ehu	With the reddish budding leaves of kukui trees
I haa i ka la o Kanehoa	Dancing in the sun of Kānehoa
Aloha wale na hoa-e	Aloha to you, my companions.

F. Cultural Practices

1. Na Ala Hele (Traditional Trails)

a. The Path Traveled by Kamehameha I from Honolulu to Puʻuloa

When Kahekili died in ca. 1794, his son Kalanikūpule succeeded in rule. By May 1795, however, Kamehameha I and his forces invaded Oʻahu and killed Kalanikūpule, taking control of all the islands except for Kauaʻi and Niʻihau (Chronology in *The Friend*, January 1878). The article below, published in 1883, describes events around a visit of Kamehameha I to Puʻuloa.

The Daily Bulletin

Treason & Magnanimity, An anecdote of Kamehameha the Great.

September 3, 1883 (page 2)

When Kamehameha conquered Oahu though he had firmly established himself all the chiefs had not reconciled themselves to his rule. Kamehameha however adopted the plan of making the women chiefs and not allowing their husbands to receive the taxes. He also selected the handsomest and smartest women as spies who used to report to him all that went on in their districts. One of these female spies reported to him that the chiefs of *Ewa*, *Waianae*, and *Waialua*, were conspiring against him and were to meet on a given night at *Puuloa* (Pearl River), then the favorite spot with the chiefs of those districts, to finally settle on their plans.

Kamehameha was then living at *Pulaholaho*, afterwards known as Charlton Square, the block now bounded by Merchant, Kaahumanu, Queen, and Nuuanu Street. It was then supper-time and he excused himself from supper and, taking his famous spear of peculiar make, *Ka ihe o Kamehameha*, the like of which no other Hawaiian had, he started off striking across the harbor at *Kapuukolo* (near Emmes boat-building establishment,) to *Koholaloa*, along a fishpond wall to *Kulaokaiwiula*, (the plains near Kalihi), then swimming the *Kalihi* passage and wading till he came to *Ahua* (the sand beach below *Moanalua*), then to the Pearl River and swimming across to *Puuloa*, He thus made a bee-line from E. to W. over land and sea alone without a single attendant. Nothing stopped him. Here he went from *halau* to *halau*, (the *halau* is a large meeting house), until he came to the place where all the Chiefs were inside plotting treason against him. After listening long enough to learn all their plans he stuck his spear point downwards, in the sand about 4 feet from the door and returned as he came alone.

When the chiefs awoke next morning and went out they saw the spear. Said they, "The great chief has been here. Here is his spear. He knows all." So in accordance with the ancient Hawaiian custom of those who feared for their lives, they went to Honolulu and crawled in on their hands and knees into the presence of Kamehameha saying "*E ola au*." (Let me live.) And Kamehameha granted their prayer and had the satisfaction of knowing ever after that they were faithful to him.

2. Fishing Traditions

a. Fishing Right of Honouliuli in Pearl Loch

The following is excerpted from the Boundary Commission testimonies regarding the boundaries of the Honouliuli and Hōʻaeʻae ahupuaʻa (Volume 1, 1873-1874). This passage details the Fishing Right within Honouliuli.

For reasons set forth at large in the record of the Commissioner, the Fishing Right is not awarded in the body of the Certificate of boundaries, but the finding of the Commissioner on the testimony presented, as well as by the assent of parties adjacent and in interest is set forth in this Supplement as follows, to wit.

The Fishing Right of Honouliuli covers the whole of "West Loch," with the reservation to Hoaeae, Waikele (Exhibit the Ili of Auiole) and Waipio of the fishing opposite each to where the water is "chin deep" to a man, say five and one half feet deep, also cutting off the bight or inlet where the boundary of Waipio and Waikele cuts across from to **Kaulu** constituting the "Fishery of **Hoomakaia**." The channel at the entrance of the Loch, as far up as **Pookela** point is divided equally between Honouliuli & Halawa.

Note: The map of survey presented [page 250] by the petitioner is the one

executed by Prof. W.D. Alexander in the year 1873, and the award made conforms to said map.

In witness whereof I have hereunto set my hand at Honolulu, this 22d day of January A.D. 1874.

Lawrence McCully
Commissioner of Boundaries, Oahu.

Honolulu, November 5th 1874
The petitioner in this case further asking that "Puuloa" a part or ili of this land, sold from it to Isaac Montgomery be included in this certificate and the proofs for this purpose being already of record, and this original certificate not yet issued.

I do hereby supplement the same, as follows

viz. Instead of Course 31 as above, read thus
31. Oneula to Puuloa trig Station, at windmill N. 69° 41' E. 18720 ft; thence along shore to stone pillar at Kahuka N. 22° 20' W. 10010 ft.

Area of Puuloa 2610 acres
Total area of Honouliuli 43,250 acres

Lawrence McCully
Comr. of Boundaries. [page 251]

Hōʻaeʻae Ahupuaʻa (with Honouliuli)
[From boundary of Honouliuli]
1. The boundary between this land and Hoaeae was first surveyed by J. Metcalf May 29, 1848, and the "Kula" of Hoaeae was awarded to L. Rees by this survey.

See Award 193, Volume 1, p. 536.

…Fishery of Hoaeae. The testimony of the kamaainas is that the fishery extends to the depth of a man's chin, opposite this land. Mr. Robinson & Mr. Coney agree to this and that outside of that the fishery belongs to Honouliuli. The award of Hoaeae does not include the Kai. The makai, cultivated part of Hoaeae and the Kai or fishery were granted to Namauu by R.P. 4490 for M. Kekuanaoa. The survey by A. Bishop is not copied into the R. Patent; the Patent being without metes & bounds. [page 244]

The red line indicating the fishery of Hoaeae, conforms to Mr. Bishop's survey, and is agreed to by Mr. Robinson as representing their rights of fishing… [page 245]

[From Boundary of Waikele]

Ap. 1 – he aina Kalo me ke kula ma Apokaa.
Aia i ke kihi Komohana o keia aina pili ana me "**Hoaeae**", ma ka 4 o na pohaku e waiho lalani ana ma kahakai ua hoailona mua ia pea X. Alaila e kuhikuhi i ka palena kai hema 66°3/4 Hikina e au iho ana i kai ma **Aole i pau kuu loa** me ka palena kai o Honouliuli a hiki i kahi i kapa ia o **Pau Kuu Loa** e pili ana me ka palena kai o Honouliuli. Alaila, ma kela pohaku X, Akau Kom. kaulahao ma Hoaeae a hiki i ka **poh. Moko-moko**

Par. 1. – a Taro land on the flats of Apokaa.
The Western corner of this land is there adjoining with "Hoaeae," where four stones form a line situated on the shore, with the first boundary marked X. Then the boundaries are pointed out from the shoreline South 66 º 3/4 East jutting out in the fishery of Honouliuli to the place called Pau Kuu Loa, adjoining with the shore boundary of Honouliuli. Then from that stone marked X, North West xx chains along Hoaeae to the stone

ma ke alanui Aupuni. … [page 156]

Mokomoko along the Government road…

b. Honouliuli-Puʻuloa Fisheries

The fisheries—those along the shore of the open ocean and in Keawalau o Puʻuloa (now Pearl Harbor) and along the shoreline—were among the highly valued resources of Honouliuli Ahupuaʻa. With the transition in land tenure and land use that occurred following 1848, native residents of Honouliuli were steadily denied access to the traditional fisheries. Conflicts arose between Hawaiians seeking to maintain customary practices and the restricted access imposed by new land owners.

i. Poino! (Distress!) – Hawaiians Denied Access to the Honouliuli-Puʻuloa Fisheries

Mose, a native of Honouliuli, presented a public account of the distress that he, Isaaka and Makahanohano endured in being denied access to the shore along Ke Awalau o Puʻuloa by a foreign tenant of the land, and ask the King if this action was authorized by him.

Ka Hae Hawaii

Nowemapa 25, 1857 (aoao 139)

E ka Hae Hawaii e. Aloha oe:— Ka mea e holo ana ma na kihi eha o ke aupuni Hawaii, he hoa kuili oe o ka poe imi noonoo, he ipo manuahi oe o ka poe ike. He wahi mea kaʻu e hai aku nei ia oe, a nau ia e hai aku i ka poe imi noonoo a pau o ke aupuni Hawaii.

Eia ua wahi mea la. Ia makou i hoomaka ai e holo maluna o ka waapa mai Honouliuli aku a hiki i kahi i kapaia o Keawalau o Puuloa, pa mai la kahi makani ma kai mai, he maunuunu ko ke kaha, he olauniu ko Waikiki, he kukalahale ko Honolulu, hoohuli pono ae la makou i ka ihu o ka waapa me ka manao e holo aku i Honolulu i ke kuai ia, loaa iho la makou i ka poino. Eia no ia, ninau mai la kekahi haole ia makou, o Aigate kona inoa, Owai keia waapa? Hai aku la makou,

O makou no. Ninau hou kela ia makou, Owai ka inoa? Hai hou aku la makou, O Mose, Isaaka, Makahanohano. Pane hou mai kela ia makou, Go way; be off kanaka. O ke kani koke mai la no ia o ka pu, a pee iho la makou i ka waha o ka waapa, helelei iho la ka lu iluna o makou, kani hou mai la ka pu, helelei hou iho la ka lu. Kena aku la au i koʻu mau hoa e hoe aku i ka waapa, aka, aole e hiki; no ka mea, ua loaa makou i ka pilikia; aka, no ka ikaika ana mai o ka makani ma kai mai, huki pono mai la makou i ke kaula, pei mai la i ka pei, poho aku la ka pea i ka makani, o ka holo aku la no ia o makou, a pakele makou i keia pilikia.

E! nani ke aloha o ko kakou Haku i ka lani, ka mea kokua i ka poe poino, nana no i hoopakele mai ia makou mai loko mai o keia popilikia.

Ninau.
Ina ua ae ia e ka Moi a me kona lalo iho, a i ole ia, e na makaainana paha e noho ana malalo iho o ka Moi, kona ki wale ana aku i kela kanaka keia kanaka, alaila ua pono; aka, ina aole, e hiki no iaʻu ke hoopii e like me ke kanawai o ka aina.

Mose.
Honouliuli, Ewa, 18 Nov., 1857

Summary – Poino! (Distress)

We departed from Honouliuli in our boat and arrived at the place called Keawalau o Puʻuloa, when a wind arose from the shore. It was the māunuunu of the coastal region — the ʻōlauniu is of Waikīkī, and the kūkalahale is of Honolulu. We turned the bow of our boat, intending to go to Honolulu to sell our fish, that is when we ran into trouble. A foreigner came up to us and asked whose boat is this, his name was Isaac[12]. We told him it was ours. He then asked our names and we told him, Mose, Isaaka and Makahanohano. He then

[12] Isaac Montgomery purchased the ʻili of Puʻuloa from chiefess M. Kekauʻōnohi in 1849. Later in 1858, Levi Haʻalelea brought suit against Daniel Montgomery (brother of Isaac) in the matter of fishery rights at Honouliuli (Hawaiian Supreme Court Report, 1857-1865:62).

told us, "Go away, be off, Hawaiians. He then shot at us, and we quickly tried to hide in the bow of our boat. We tried to push off, but because of the wind from the sea, we had a difficult time. We finally got the sail up and we were able to get away from the trouble.

Say, the love of our Lord is beautiful, the one who helps those in need, and who rescues us from our troubles.

Question.
Did the King agree to this being done by those below him, or not. The commoners live below the King, and it is he who determines what is right for each man. I will seek to prosecute this pursuant to the law of the land.

Mose.
Honouliuli, 'Ewa. Nov. 18, 1857.

ii. Supreme Court Proceedings (1858)

The Puuloa Fishery of Honouliuli
Supreme Court—In Banco
January Term—1858
Levi Haalelea vs. Daniel Montgomery

By the laws of 1839, as subsequently amended by the organic acts of 1846, the entire fishing ground, lying between low water mark and the outer edge of the coral reef, or kuanalu, along the seaward front of an ahupuaa of land, is the private property of the landlord or konohiki, subject always to certain piscatorial rights of the tenants or hoaainas.

The defendant's brother having received from the konohiki a conveyance of a portion of land of the ahupuaa of Honouliuli, by metes and bounds, but not

including any portion of the fishing ground adjacent; it was held, that he acquired a common right of piscary as a tenant or occupant of the ahupuaa, appurtenant to the land purchased, and subject always to the rights of the grantor.

It would not have been in the power of the landlord to grant an exclusive right of fishery in the fishing ground, adjoining the land in question, and it [page 62] was doubtful said landlord could, convey her rights therein, so as to divide the fishery into two or more parts. without infringing on the rights of the tenants.

Where the exact legal signification of the terms of a deed could not be expressed in Hawaiian without great deal of difficulty, recourse was had to the English original.

Justice Robertson delivered the decision of the Court as follows:

The plaintiff brings his action for the purpose, of determining certain rights of fishery, now in dispute between him and the defendant, and also to recover damages from the defendant for having prohibited and prevented the plaintiff and his people, and others occupying certain lands under him, from taking fish on the fishing ground lying to seaward of defendant's land, at Puuloa, on this island.

It appears, from the evidence presented to the Court, that the land now held by the defendant, is a portion of the large ahupuaa of "Honouliuli," and was purchased, in the year 1849, by defendant's brother, Isaac Montgomery, from the late high chief, M. Kekauonohi, then a widow, who died in the year 1851, leaving the land of "Honouliuli," together with other property by will, to her second husband, the plaintiff in this action. The conveyance from M. Kekauonohi to Isaac Montgomery, was executed in the Hawaiian and English languages, and reads as follows in English:

"Warranty Deed.

Know all men, by these presents, that I, Kekauonohi, of Honolulu, Island of Oahu, for and in consideration of the sum of eleven thousand dollars, to me this day paid in hand by Isaac Montgomery, also of Honolulu, Island of Oahu, the receipt of which is hereby acknowledged, do grant, bargain, sell, and by these presents convey unto him, the said Isaac Montgomery, and to his heirs, executors, administrators and assigns, forever, all that certain lot of land, situated in the Island of Oahu, aforesaid, and described as follows:

Commencing at mauka north corner or point of this land at place called Lae Kekaa, at bend of Pearl River, and running along edge of Pearl River, makai side, taking in three fish ponds called Pamoku, Okiokilipi and Paakule to open sea, thence following [page 63] along the edge of the sea (reserving all the reef in front) to end of stone wall by sea, in land called Kupaka, at the makai west comer of this land, thence running north 25º E. 283, direct to place of commencement, including an area of acres 2,244 as per plot hereto annexed.

"To have and to hold, the above conveyed premises and all the tenements and hereditaments situate thereon, with this my covenant and warranty and lawful seizers, unto the said Isaac Montgomery, his-heirs, executors and administrators and assigns forever.

"In witness whereof, the said party, Kekauonohi, has hereunto set her hand and seal at Honolulu, this 7th day of September, A.D. 1849.

"M. Kekauonhi. [L. S.]
Executed in the presence of Frank Manini."

It is admitted that defendant is now the owner of the property, originally conveyed to his brother by the foregoing deed. The Court also understood the

defendant to admit that he had prohibited the plaintiff and his people from taking fish on the place in controversy. And it is admitted by the plaintiff that, from and after the execution of the deed by M. Kekauonohi, she withdrew her Luna from Puuloa, and ceased to take or taboo any fish on the reef opposite defendant's land, up to the time of her death, and that, until recently, Haalelea never asserted, any right or claim to take fish on said reef.

Upon this state of facts, the defendant claims to have, under a proper construction of the conveyance before recited, and the statutes of this Kingdom, an exclusive right of piscary, in the fishing ground lying opposite the land embraced in the deed; and the plaintiff on his part, claims the same exclusive right for himself and his tenants living on "Honouliuli" as against the defendant and all others living on the land covered by the conveyance, or in other words, that the defendant did not acquire by his purchase, a right to take fish anywhere outside of the boundaries of the land conveyed to him, and that the people living on that land after the date of the deed, ceased to be tenants of the Ahupuaa of "Honouliuli," and so lost their rights to piscary, under the laws of the land.

In order to a right decision of this controversy it would seem [page 64] to be necessary in the first place, to ascertain and define what were the rights of piscary possessed by M. Kekauonohi, as Konohiki of the Ahupuaa of "Honouliuli," at the time she made the conveyance, to Isaac Montgomery. To do this it is unnecessary to inquire what were the respective rights of piscary enjoyed by the Konohiki and the common people, in ancient times, became since the year 1839 those rights have been regulated and defined by written laws,

At page thirty-six of the English version of the old laws, will be found an enactment on this subject, which commences in the following words: "His Majesty the King, hereby takes the fishing grounds from those who now

possess them, from Hawaii to Kauai, and gives one portion of them to the common people, another portion to the landlords, and a portion he reserves to himself.

These are the fishing grounds which His Majesty the King takes and gives to the people: the fishing grounds without the coral reef, viz: the Kilohee grounds, the Luhee ground, the Malolo ground, together with the ocean beyond.

But the fishing grounds from the coral reefs to the sea beach are for the landlords, and for the tenants of their several lands, but not for others."

This is the point at which the existing piscatory regulations of the Kingdom had their commencement, and since which, ancient custom ceased to govern the subject. His Majesty Kamehameha III, as supreme lord of the islands, and having in himself the allodium of all the lands in the Kingdom, did at that time, with the concurrence of the Chiefs, resume the possession of all the fishing grounds within his dominions, for the purpose of making a new distribution thereof, and of regulating the respective rights of all parties interested therein, according to written law.

The fishing rights of both the Konohikis and the hoaainas were defined and regulated by the law of 1839, which was at different times amended in some particulars, until the passage of the organic Acts in 1846, when those rights were again defined by article 5th, of chapter 6th, part first, of the Act to organize the Executive Departments. (See 1st Vol. Stat. Laws, pp. 90 to 92, Secs. 1 to 7.)

The part of the law to which it is [page 65] necessary to have reference more particularly in the present case, reads as follows:

"Section 2. The fishing grounds from the reefs, and where there happen to be

no reefs from the distance of one geographical mile from the beach at low water mark, shall in law be considered the private property of the landlords whose lands, by ancient regulation, belong to the same, in the possession of which private fisheries, the said landlords shall not be molested except to the extent of the reservations and prohibitions hereinafter set forth.

"Section 3. The landholders shall be considered in law to hold said private fisheries for the equal use of themselves and of the tenants on their respective lands; and the tenants shall be at liberty to use the fisheries of the landlords, subject to the restrictions in this article imposed."

The four succeeding sections of this law, which we deem it unnecessary to cite at length, define and guard the rights of the konohikis, in relation to their reserved or tabooed fish, and contain certain provisions to protect the rights of the tenants or hoaainas, from unjust restrictions and exactions.

Under this statute, as we, understand it, the entire fishing ground, lying between low water mark and the outer edge of the coral reef, (or Kuanalu, as it is called in the Hawaiian version) along the seaward front of the Ahupuaa of "Honouliuli," was private property of M. Kekauonohi, possessed and held by her as such, subject to the piscatorial rights of the tenants living on that Ahupuaa. On this ground she had a common right of piscary with the tenants of "Honouliuli," or she was at liberty, if she saw fit, to taboo or set apart annually, one particular species of fish for her own private benefit, as provided in section 4th, or in lieu of this, she might on consultation with the tenants, as provided in section 7th, make an arrangement whereby she would be entitled to receive one third part of all the fish caught on the ground.

Such were the rights of M. Kekauonohi in the premises at the time when she executed the deed to Isaac Montgomery, and the next question is, what portion, if any, of those rights did she thereby convey to him, or did he, by

operation of law, acquire any rights of piscary on the ground in question, upon receiving that conveyance? [page 66]

It is contended, on the part of the defendant, that by a fair construction of the descriptive part of the deed, it must be held to extend to deep water at the outer edge of the reef, thereby including all that part of the Konohiki's fishing ground lying opposite to the land conveyed to Isaac Montgomery. It is said that the expression, "to open sea," must be understood to mean, "to deep water outside of the reef," in contradistinction to the shallow water upon the reef, between the breakers and low water mark, and that the expression, "following along edge of sea," means following along the edge of deep water, outside of the reef. If this is correct, then unquestionably, the grantor conveyed away all her right and title to the fishing grounds, as well as to the dry land. But it seems very clear that this construction cannot stand without falsifying the obvious meaning of the descriptive language which follows. For if "open sea" means the deep water outside of the reef, and "edge of the sea" means the edge of such deep water, the stone wall which is described as being by sea, in land called Kupaka, must have extended out to the seaward edge of the reef, a proposition which has not been asserted in argument, and which, on reference to the plan annexed to the deed, appears to be conclusively negative. So the expression "reserving all the reef in front," would seem to be inconsistent with the idea that the line ran along the outer edge of the reef, for in that case there would be no reef in front of the line. That the line ran along the inside of the coral reef, seems to us clear from the language used in the Hawaiian version of' the deed, which reads as follows: "Aole nae e hookomo ana i ka papa koa mawaho." We should translate this expression, "not including, however, the coral reef outside." Again, the last line of the survey is described as running from the end of the stone wall, north 25 º east, by compass, 283 chains, to the place of commencement, and it is not pretended that this line extended out to the outer edge of the reef. If such is the case, it is a fact that could be readily ascertained by measurement. But the surveyor's plan clearly indicates the

reverse. It is very evident, then, that no part of the fishing ground is included within the surveyed metes and bounds of the property conveyed to Isaac Montgomery. [page 67]

But, it is argued by defendants. counsel, that M. Kekauonohi's right of piscary in the fishing ground in question, passed to Montgomery as an appurtenance to the land, by virtue of the clause which, in the Hawaiian version of the deed, reads thus: "A me na mea paa a pau e waiho ana maluna iho, a me na mea e pili pono ana," and in the English version, thus: "And the tenements and hereditaments situate thereon." It is said that the words, "a me na mea e pili pono ana," are sufficiently broad in their signification to carry everything appurtenant to the land embraced In the conveyance, and that the Court ought to regard the Hawaiian version of the deed as controlling, wherever their appears a difference between that and the English for two reasons: First—Because the grantor herself was a native, and a person of intelligence, and must, therefore, be presumed, to have intended to convey whatever would pass under the words of the deed, as expressed in her own language; and, secondly, because the Court has decided in several previous cases that, in construing the statutes of the Kingdom, which are enacted in both languages, wherever an irreconcilable difference exists between the two versions, the Hawaiian must govern. On the other hand, it is argued that the grantee, who is an Englishman, received the deed in both languages, thus accepting the English version as the exact counterpart of the Hawaiian; and that, therefore, he and, those claiming under him, should be bound by the English version; that the deed in both versions form but one instrument, and that if the language of: the one is altogether inconsistent with that of the other, which, however, is not conceded, the proper course would . be to declare the instrument void for uncertainty.

This involves a question of considerable magnitude, the decision of which may affect the rights and interests of many individuals throughout, the Kingdom.

After careful reflection upon the point, we are of the opinion that it would be both unsafe and unreasonable, for the Court to hold that the Hawaiian, and not the English version, should control in this instance, if the difference contended for by the defendant does really exist, which, we think, is not clear. It is true this Court has repeatedly ruled, as stated by the defendant, that, in the case of an, irreconcilable difference between the Hawaiian and [page 68] English versions of a statute, the former shall control (See Metcalf vs. Kahai, 1st Haw. Rep., p. 225; Hardy vs. Ruggles et als., ibid, o. 255.) But it seems to us that the same considerations which constrained the Court so to decide in that case, do not exist in the present instance. The deed before us, with the exception of those parts of it which are descriptive, consists of a printed formula, in the two languages, which has been extensively used here, in dealings between natives and foreigners, since the enactment of laws requiring conveyances of real estate to be made in writing. The English version of this formula is, of course, the original, and the Hawaiian merely a translation. There do not exist in the Hawaiian language, two words which would exactly represent the two English words tenements and hereditaments. The exact legal signification of those terms could not be expressed in Hawaiian without great difficulty, and therefore words, which if used in some other connection, or under other circumstances would convey a widely different meaning, have, when used in the printed formula of conveyance now before us, been accepted by the general consent of natives and foreigners using such formula, as meaning precisely the same things, and neither more or less than those two legal terms. So far then as purely legal phraseology, or words or technical import, are concerned, it would seem to us both unsafe and unreasonable, to hold that the Hawaiian translation, and not the English original, should govern, when a question arises. upon the construction of any part of the deed, where such legal or technical language is used. Such a course would unbar the door to endless litigation and fraud, and involve our courts in a maze of uncertainty.

It is contended, further, on the part of the defense, that the conduct of the

grantor, in withdrawing her luna from Puuloa, at the time of her execution of the conveyance, and in subsequently, up to the time of her death, forbearing to take or taboo any fish on the reef opposite the land sold to Montgomery, and the like forbearance on the part of the plaintiff, for several years, afterwards, are strong evidence in favor of the defendant, and facts from which it may be fairly inferred that M. Kekauonohi intended to grant away tile fishing ground, or, at least, all her rights in the fishery. To this it is replied, that such a [page 69] grant cannot be inferred from circumstances, or from the conduct of the grantor, but must be found, if at all, in the express language of the deed.

As to the fact of her withdrawing her luna from Puuloa, after the sale of that land to Isaac Montgomery, we consider it a natural consequence of the sale, and of slight significance as to any bearing it may be supposed to have upon the disputed question of the fishery. If, however, there was any doubt as to the grantor's intentions, arising from the use of unusual or ambiguous language, then, the fact of her subsequent forbearance to take or taboo fish; upon the place in question, might be regarded as evidence tending to sustain the construction contended for by the defendant. But, it is clear to our minds, for the reasons already stated in remarking upon the descriptive part of the deed, that she did not intend to include therein, or to convey thereby, any part of the fishing ground to Montgomery; nor did she convey to him her individual rights of piscary, under the words, "tenements and hereditaments situate thereon."

None of the rights of piscary possessed by M. Kekauonohi as owner of the fishery, could have passed as a mere appurtenance to the piece of land conveyed to Isaac Montgomery. She could have transferred the fishery, or her right therein, only by an express grant, eo nomine. Had she made a deed even of the whole Ahupuaa, by metes' and bounds, not including the fishery, nor expressly naming it in the conveyance, it is doubtful if either the fishery or her right therein would have passed to the grantee.

Again, if the grantor had conveyed the fishery, or her individual rights therein, by name, to Isaac Montgomery, that would not have conferred upon him the exclusive right which is now set up by the defendant, because M. Kekauonohi herself was not possessed of an exclusive right. It may even be doubted whether she could have conveyed away the portion of the fishing ground lying opposite to Puuloa, ·or her special rights therein, so as to divide the fishery, without infringing on the rights of the tenants living on "Honouliuli." Certainly if her grantee had tabooed one kind of fish, on his part of the ground, while she tabooed another kind upon the other part, the rights [page 70] of the tenants would have been violated. And if she could have divided the fishing ground into two parts she could have divided into twenty, and so have rendered the rights of the tenants worthless.

But, while we are clearly of the opinion that M. Kekauonohi did not convey any part of the fishing ground, or of her individual rights therein, to Isaac Montgomery, we are also of opinion that, when he received a conveyance of a portion of the Ahupuaa of "Honouliuli," he acquired along with it a common right of piscary in the fishing ground adjacent. That is to say, he became, for the purposes of the law, governing this subject, a tenant of the Ahupuaa, and as such entitled to take fish in the sea adjoining. We understand the word tenant, as used in this connection, to have lost its ancient restricted meaning, and to be almost synonymous, at the present time, with the word occupant, or occupier, and, that every person occupying lawfully, any part of "Honouliuli," is a tenant within the meaning of the law. Those persons who formerly lived as tenants under the Konohikis but who have acquired fee simple title to their kuleanas, under the operation of the Land Commission, continue to enjoy the same rights of piscary that they had as hoaainas under the old system. (See Joint Resolution on the subject of rights in lands, etc., Vol. 2, Statute Laws, p. 70.) If any person who has acquired & kuleana on the Ahupuaa of "Honouliuli," should sell and convey his land, or even a part of it, to another, a common right of piscary would pass to the grantee, as an appurtenance to the land. In that

case it would not be necessary, we apprehend, to mention the right of piscary in the conveyance—it would pass as an incident. (See Kent's Com., Vol. 4, p. 517; Comyns's Digest, Vol. 4, title Grant E. 11.) Here, we think, is the great distinction between the rights of the Konohiki, and those of the tenant or occupant, for, while the former holds the fishery as his private property, the latter has only a right of piscary therein, as an incident to his tenancy. This marked distinction in their respective rights must create a corresponding difference in regard to the transfer of those rights.

As the conveyance, by the owner of a kuleana, of a part of his land to another, would create such a tenancy in the grantee [page 71] as would entitle him to a common right of piscary, so, in our opinion, the conveyance to Isaac Montgomery, by M. Kekauonohi, of a part of the Ahupuaa, created such a tenancy, as carries with it, as an appurtenance thereto, under our laws, a common right of piscary; subject, always, to the rights of the grantor, and her legal representatives.

No specific damage having been proved by the plaintiff we think he is only entitled to recover nominal damages.

Let judgment be entered for the plaintiff, as of the last day of term, in the sum of five dollars damages, together with the costs of suit.

A. B. Bates, Esq., for the plaintiff.
J. Montgomery, Esq., for the .defendant.
January, 1858. [page 72]

Ka Hae Hawaii
Olelo Hooholo a ka Ahakiekie. O Levi Haalelea kue Daniel Montgomery.

Apelila 14, 1858 (aoao 6)

Hoakaka ae la ka Lunakanawai o Robertson i ka manao hooholo o ka Aha, penei:

Ke hoopii mai nei o Haalelea, i mea e maopopo ai ke kuleana o ka honu ia ana i hoopaapaaia e ka mea kue e D. Montgomery, a e loaa paha ia ia kona poino no kona hoole ia aole make hopu ia ma kauwahi o Montgomery, ma Puuloa i Oahu nei.

Mamuli o ka hoike ana, o ka aina o D. Montgomery, ka mea kue, he wahi apana ia o ka ahupuaa o "Honouliuli," a ua kuaiia e Isaac Montgomery ke kaikuana o ka mea kue, i ka makahiki 1849, no M. Kekauonohi mai, ia manawa, he wahine kane make oia. a mahope iho, i ka makahiki 1851, make oia, me ka waiho ana i ka aina o "Honouliuli" a me na waiwai e ae i kana kane mare hou a oia ka mea hoopii ma keia hookolokolo ana, O ka palapala hoolilo aina a M. Kekauonohi ia lsaac Montgomery, ua kakauia ma na olelo Hawaii a me ka Beritania, a o Frank Manini ka hoike.

Eia na mea i aeia e na aoao elua:

Ua aeia o D. Montgomery, oia ka mea nona ka aina i keia wa e noho nei.

Ua ae mai hoi o D. Montgomery, ua hookapu oia ia Haalelea a me kona poe, aole make hopu i ka ia ma kahi i hoopaapaaia.

Ua ae mai noi o Haalelea, mai ka wa i kakauia'i ka palapala hoolilo aina e M. Kekauonohi, ua pau ka noho ana o kona luna ma Puuloa, a hooki hoi i ka lawaia a e hookapu ia ma ke kohola e ku pono ana i ka aina o D . Montgomery , a make o M. Kekauonohi. a o Haalelea hoi, aole oia i hoike mai i kona manao e hopu i ka ia ma ia wahi, a i keia manawa iho nei.

A mamuli o keia mau mea, manao ae la o D. Montgomery ia ia ponoi wale iho no ke kuleana hopu ia ma kahi e ku pono ana i kona aina. A manao ae la hoi o Haalelea ia ia ponoi wale iho no a me kona poe e noho ana ma "Honouliuli" ke kuleana e hopu ia ma ia wahi; no ka mea, i kona manao, aole i loaa ia D. Montgomery ke kuleani hopu ia mawaho ae o na mokuna o ka aina ana i kuai ai me Kekauonohi.

I ko kakou hoomaopopo ana i ka mea nona ka pono a me ke kuleana o ka hopu ia ana. he pono ke heluhelu i ke kanawai.

Ma ka aoao 36 o ka buke Kanawai mua, olelo Beritania, penei ke kakauia ana: "Ke lawe nei ka Moi o ke Alii nui i na wahi ia noloko ae o ka lima o ka poe i loaa, mai Hawaii a Kauai, a. Ke haawi hou aku i kekahi hapa na na kanaka, a i kekahi hapa na na konohiki, a i kekahi apa hoi nana ponoi no.

Eia na wahi ia a ka Moi e haawi nei na na kanaka, o na wahi mawaho ae o ka Puukoa, penei, o na wahi Kilohee, o na wahi Luhee o na wahi Malolo, a me ka moana mawaho ae.

A o na wahi ia mawaena ae o ka Puukoa a me ke kahakai, na na konohiki ia a me na kanaka o ko lakou aina aole no na mea e ae."

A mai ia wa mai o ke kuleana hopu ia o ka wa kahiko, ua pau i keia manawa he kanawai i kakauia.

Ma ke kanawai o ka makahiki 1839, o ke kuleana o na konohiki a me na hoaaina ua hooponoponoia ma kauwahi, a pela no a hiki i ka makahiki 1846, a malaila ua hooponopono hou ia. E nana i ka buke mua aoao 90 a hiki 92. pauku 1 a hiki 7. Eia na pauku pili pono:

"PAUKU 2 O na wah ia, no na puukoa aku, a ina aohe puukoa, hookahi no mile

no ke kahakai aku, ma ke hapawai, oia no ke kuleana ponoi no o na konohiki no na ka aina e pili ana ma ke ano kahiko, aole e mea ia i na konoliiki i ko lakou kuleana hopu ia, aia mamuli o na kanawai e kau ia mahope.

"PAUKU 3. I ka mamio o ke kanawai, no na konohiki no ka hopu ia ana no lakou iho a me na hoaaina ma ko lakou aina iho; a e hopu no na hoaaina i ka ia o na konohiki malalo nae o na mea i oleloia ma keia kanawai."

Mamuli o keia kanawai, o na wahi hopu ia a pau, e moe ana mawaena o kahakai a me kuanalu makai aku o ka ahupuaa o "Honouliuli," oia no ke kuleana ponoi o M Kekauonohi, nona no malalo nae o na kuleana o na hoaaina e noho ana ma ia ahapuaa

Oia na kuleana o M. Kekauonohi i kona wa i kekauia'i ka palapala hoolilo aina ia Isaac Montgomery; a eia ka ninau ua loaa anei ia ia, ia L Montgomery, kahi kuleana hopu ia ma ia wahi, i kela palapala hoolilo aina?

Ma ka aoao o ka mea kue, o D. Montgomery, manao oia e holo ana kona aina a i ke kai hohonu mawaho ae o ka papakoa e hookomo ana i kauwahi ia a pau o ke konohiki e kupono ana i ka aina i lilo ia Isaac Montgomery. Ua oleloia, okoa ke kai hohonu, okoa hoi ke kai papau mawaena o ke kuanalu a me kahakai. Aka, ua maopopo aia ka mokuna oia aoao, aia no maloko ae o ka papakoa; no ka mea, penei ka olelo ana: "aole nae e hookomo ana i ka papakoa mawaho." Nolaila, ua maopopo ia makou aole i komo kauwahi hopu ia iloko o ka aina i ana ia a i hooliloia ia Isaac Montgomery.

A olelo mai la ka loio o D. Montgomery. Ua lilo ae la ke kuleana ia o M. Kekauonohi ia D. Montgomery me he mea apana la o ka aina ma keia olelo ana, a me na mea paa a pau e waiho ana. maluna iho, a me na mea e pili pono ana, aka, a ko'u manao, aole e pili pono kela mau huaolelo i kauwahi o ke kai.

Ua olelo ia hoi, o ka hoopau ana o M Kekauonohi i kona luna ma Puuloa i ka wa i lilo ai ka aina a hiki i ka manawa i make ai, aole i hopu i ka ia, ma ka puu koa kupono i ka aina i lilo ia Montgomery, a pela no kana kane o Haalelea no kekahi mau makahiki, oia na mea e maopopo ai ka manao o M. Kekauonohi, a o kona manao ia e hoolilo loa aku i kela wahi ia, a i kona kuleana a pau iloko olaila. Aka, aole e pono ke manao wale aku ma ia mea, i ole e kakauia ma ka palapala hoolilo, aole e maopopo.

Aole i lilo kekahi kuleana ia o M. Kekauonohi me he mea apana la o ka aina i kuai ia ia Isaac Montgonery. Ma ka olelo maoli wale no i lilo ai. Ina paha ma ka palapala hoolilo, i hoohlilo ai oia i ka ahupuaa a pau ma na mokuna i anaia a puni me ke komo olelo kauwahi ia ma ka olelo, aohe maopopo ka lilo ana o kauwahi ia a o kona kuleana malaila.

I ko makou manao, aole i hoolilo o M Kekauonohi i kekahi apana o kahi ia, a i kekahi o kona kuleana ponoi ia Isaac Montgomery; a eia hoi ko makou manao, i ka wa i loaa'i ia I. Monthomerv ke kuleana o kauwahi o ka ahupuaa o "Honouliuli," ua loaa ia ia no hoi kekahi kuleana hopu ia me he hoaaina la, e like me na kanaka e ae e noho ana ma ia ahupuaa. (E nana i na Olelo ae Like, Vol 2, Statute Laws, pahe 70).

No ka maopopo ole o ka poino i loaa ia Haalelea, nolaila, o ka poino i manao wale ia ka pono.

E hooholoia na ka mea hoopii ke ko i ka la hope o ke kau hookolokolo. Elima dala ka poino me ke koina.

A. B. Bates, loio no L. Haalelea.
J. Montgomery, loio no D. Montgomery.

V. Oral Records, Interviews and Consultations

Based on expertise and recommendations from members of the community, information from two interviews are included in this study: president and executive director of the Ulu A'e Learning Center, Kumu Hula Miki'ala Lidstone, and acting president of the Hoakalei Cultural Foundation, Ku'uwainani Eaton.

Interviewed individuals include those with lineal and cultural ties to the area of the 'Ewa Villages and its surrounding area with regard to regional biocultural resources, potential impacts to these biocultural resources, and mitigation measures to minimize and/or avoid these impacts.

A summary of each interview has been completed and will be sent first to the individual interviewed for review. Upon approval from the interviewee, it will be submitted for inclusion in this CIA, which is part of the full EA. Consent to participate in the assessment is obtained from each individual included herein. Consent is obtained verbally or in writing and kept on file with Honua Consulting.

The interviewees, all cultural experts in various fields, provided a rich body of information about the project area and larger geographic extent. All information provided by the interviewees was followed up on with extensive research and incorporated throughout the body of the assessment, with particular emphasis on integrating the information provided in the interviews into the impact assessment and recommendations.

A. Interview with Kumu Hula Miki'ala Lidstone

Date of interview: June 14, 2019
Interviewee: Kumu Hula Mikiala Lidstone
Interviewer: Julie Au
Location: Waimānalo, Honouliuli, 'Ewa, O'ahu

1. Biography

Miki'ala Lidstone was born in Nānākuli, O'ahu and raised in Kailua, O'ahu. She now resides in Honouliuli in 'Ewa. She is the President and Executive Director of the Ulu A'e Learning Center, located in Kapolei, and she is also the Kumu Hula of her own hālau, Hālau 'o Kaululaua'e. Miki'ala has done numerous work that focuses on developing non-school hour programs in Honouliuli that help youth develop a sense of place and belonging. The Ulu A'e Learning Center also faciliates family and kupuna workshops. She strongly believes in place-based education and that all people should have endless opportunities to strengthen their relationship to the 'āina. Miki'ala also spearheads efforts to steward and bring awareness to Pu'uokapolei.

2. Overview

Miki'ala is familiar with the project area. She explains that most of the work she does through the Ulu A'e Learning Center takes place more towards the ocean or the mountains, and not so much in this central location. In her opinion, there are no natural or cultural resources that could be at risk of being impacted by the proposed project.

3. General Discussion

Miki'ala briefly touched on the changing landscape of 'Ewa including the lands that make up the project area, noting that it has gone through many changes over time. The project area was formerly sugar lands and is now mostly made up of residential areas and golf courses. She commented on how sugar displaced many of the cultural markers that the land once held. The plantation era and the development that has followed makes it difficult to reveal what

might have been covered up. She discussed how ‘Ewa has such a rich history and although so much of it has been lost, some it may still be there under the surface. Mikiʻala shared that she was able to take a large piece of coral from the Honouliuli Water Treatment Facility many years ago, which is now located at Puʻuokapolei. As they were doing construction on the site, she noticed a large and beautiful piece of coral that had been dug up and she asked if she could have it. The construction crew said yes and even delivered the coral to Puʻuokapolei.

4. Biocultural Resources

Mikiʻala was not aware of any cultural resources, customs, or practices that take place within the project area. She noted that the cultural sites located nearest to the proposed project are the Kalaeloa Heritage Park and the Hoakalei Foundation site, but they are still a distance away. She was not aware of any natural resources that might be impacted by the proposed project.

5. Impacts

Mikiʻala mentioned that recycled water often has a high salinity and can actually kill plants and greenery. She also noted that if the blow out area is to be located within the park then there is the risk of children playing in the recycled water, which is unsafe. Using recycled water in sprinkler systems throughout the park also creates the risk of children playing in recycled water. She mentioned that if there is a possibility that wind might blow recycled water into the residential areas, this could also impact their landscaping and homes.

6. Mitigation Measures

Mikiʻala suggested that if recycled water is used for landscaping, ensure it will not kill the grass and plant life. Monitoring the salinity levels might be neccessary. She also recommended labeling all watering systems to indicate that they utilize recycled water and to take measures to prevent children and animals from playing in the water. The blow out area should be restricted from children and people in the park. Mikiʻala noted that it might be best to notify nearby residents of the proposed water main construction and the use of recycled water near their homes. Mikiʻala also recommended having an archaeologist or

practitioner on site for monitoring during the installation of the water main in the event that anything of natural or cultural significance is found during construction. Observation and monitoring could be valuable for this project.

B. Interview with Kuʻuwainani Eaton

Date of interview: June 14, 2019
Interviewee: Kuʻuwainani Eaton
Interviewer: Julie Au
Location: Honouliuli, ‘Ewa, Oʻahu

This oral history interview was conducted in ʻōlelo Hawaiʻi and has been summarized in English.

1. Biography

Kuʻuwainani Alohalani Eaton is a second grade teacher at the Kula Kaiapuni (Hawaiian language emersion school) in Waiau. She is from Kupaku, Puʻuloa in ‘Ewa where she still resides today. Kuʻuwainani is the current president of the Hoakalei Cultural Foundation located in ‘Ewa. The Hoakalei Cultural Foundation was established in 2006 to ensure stewardship of the land and cultural heritage of the ‘Ewa Plain. The Foundation provides oversight of work to make archaeological sites within the Hoakalei Resort accessible to the community and creates partnerships with schools and other groups to pass on knowledge from one generation to the next. The foundation was founded by Kuʻuwainani’s grandmother, Kupuna Arline Wainaha Kuuleialoha Brede Eaton and Kupuna Mary Kaipo Malama Serrao. Hoakalei is home to three preservation areas: the Kauhale, Ahu, and Kuapapa preserves. The Kauhale preserve includes a federally protected Wetland Preservation Area, which provides nesting grounds for endangered native birds.

2. Overview

Kuʻuwainani is familiar with the project area and explains that she was born and raised in Puʻuloa, so most of her knowledge of the places surrounding the project area comes from her father. She shared the names and stories of certain kupuna from the area and recommends

keeping the residents and community members informed on the nature of the project before construction begins.

3. General Discussion

Ku‘uwainani was told by her father that in his day, ‘Ewa was considered one place and Pu‘uloa was considered to be a totally separate place, as there was nothing between the two areas to connect them. Up until Ku‘uwainani was 10 years old, the only thing that lay between Pu‘uloa and ‘Ewa was sugar cane plantation lands. Ku‘uwainani shared that the name of the sugar cane plantation supervisor in the project area was a Hawaiian man named Ka‘imiloa, which is the origin of Ka‘imiloa Elementary school’s name. It was rare for Hawaiians to serve as supervisors during the plantation era. Clara Ka‘imiloa was his wife and is also family to Ku‘uwainani on her father’s side. Clara’s maiden name was Mainiki and she was a half-sister to Ku‘uwainani’s paternal grandfather, who was an Eaton from Waiohinu. Even though Ku‘uwainani was born and raised in Pu‘uloa, she does have familial connections to ‘Ewa and the project area. Ku‘uwainani also shared about another kupuna who lived near the project area named Kupuna Mundan. She had traditional medicinal and healing knowledge which she used to help Ku‘uwainani’s older brother when he was young and suffering from huli ‘ōpū, a condition in young children resulting in the turning or kinking of the stomach and making it difficult to eat or excrete. When Ku‘uwainani’s mother took her brother to the doctor, he did not believe in such a condition and told her that the boy was lying. Ku‘uwainani’s grandmother told her mother that it was huli ‘ōpū and that Kupuna Mundan in ‘Ewa knew what to do to heal the boy. Ku‘uwainani’s mother took her brother to see Kupuna Mundan and she was able to correct the condition by massaging and binding his stomach over the course of 5 days. Western medicine usually requires surgery to correct this condition, but the traditional knowledge that Kupuna Mundan used was non-invasive and saved her brother. Ku‘uwainani commneted on how the plantation era of ‘Ewa brought people of all ethinic backgrounds and many of them contain traditional ‘ike, like Kupuna Mundan.

4. Biocultural Resources

Ku‘uwainani was not aware of any cultural or natural resources within the project area that might be impacted by the proposed project. She shared that the land was previously used to grow sugar and before that this part of the ‘Ewa plain was not thought to be highly inhabited.

5. Impacts

Ku‘uwainani mentioned the potential impact that the use of recycled water might have on the landscape and the residents in the areas near the project area, noting that they use recycled water at the Hoakalei Foundation and use signage to indicate the nature of the water for the safety of visitors and workers. She also mentioned the issue of water treatment becoming stagnant and smelly; she expressed that this should be avoided for the benefit of park goers and residents in the area.

6. Mitigation Measures

Ku‘uwainani recommended reaching out to the residents living near the proposed project, perhaps someone from the home-owners association, and informing them about the nature of the project and the use of recycled water near their homes and the park in order to keep community members informed before construction begins. She also suggested using signs to indicate the use of recycled water. In order to avoid the issue of residents being surprised about any construction happening near their homes, she suggested keeping all residents and community members well informed on the project plans and dates. She also recommended having a cultural monitor on site during construction in the event that anything of cultural significance is unearthed during the project implementation.

VI. Impact Assessment

A. Impacts to Flora

There is no endangered flora in the area. The impact to flora is additionally covered in the EA and there are no anticipated impacts to rare floral of cultural significance. LeGrande Biological Surveys Inc. determined:

> The survey areas: R-1 water line transect, lay down areas, blow-off area, are all dominated by non-native and weedy plant species and landscaped street trees. The proposed water line project is not expected to having any long-lasting detrimental effects to the vegetation within the project area. No critical habitat is designated within the project area. An area of mapped wetlands is located at the southeastern corner of Kapolei Parkway and Renton Road. It is defined as a Freshwater Forested/Shrub Wetland (PSS3A) by the USFWS National Wetland Inventory (2019). Essentially, it is a concrete basin that is currently used for drainage in the broader region of Kapolei. No changes are assumed to be made to the area for the current project (LeGrande, 2019).

Nonetheless, the project should make an effort to plant native flora in their landscaping to repopulate the area with indigenous, endemic, and native species within the project area.

B. Impacts to Fauna

There is unlikely to be any impacts to candidate, threatened, or endangered fauna over the course of this project based on the avifaunal and mammalian field survey findings. The interviewees did not identify any traditional and customary practices associated with fauna in the project area that would potentially be impacted by the project. The field survey concluded that: 1) seabirds may be potentially impacted by the installation of lights that may disorient them, but the project is not expected to result in deleterious impacts to projected seabirds; 2) the clearing and grubbing phases of the project have the potential to impact pueo

nesting sites, but the project is not expected to negatively impact this species; and 3) the ōpeʻapeʻa may utilize the foliage and trees surrounding the project area, but since the project is not expected to remove any trees or woody vegetation this native bat species would not be negatively impacted (David, 2019).

C. Impacts to Historic Sites

Impacts to historic sites and properties are being assessed by Honua Consulting in a Literature Review and Field Inspection of the project area TMKs: TMKs: [1] 9-1-016:142, [1] 9-1-017:111, [1] 9-1-017:112, [1] 9-1-017:113, [1] 9-1-017:103, [1] 9-1-095:163, [1] 9-1-097:103, and [1] 9-1-126:110. Only one historic property, the ʻEwa Sugar Plantation Villages (SIHP #50-80-12-9786), is located within the APE. Structures within this district, including the historic streetlamp (SIHP # -7133), and adjacent OR&L infrastructure should be avoided during construction of the proposed waterline. The pedestrian survey conducted by Honua Consulting did not discover any new historic properties and no significant cultural materials were identifed within the APE. Additionally, the nearby ʻEwa Plain Battlefield (NRHP #16000273) is outside of the APE and will not be affected by the project.

D. Impacts to Intangible Cultural Resources

Intangible cultural resources refer to those resources without physical form, such as hula or mele. As there are no known or identified cultural practices currently taking place on the property, it is unlikely the proposed project would adversely impact intangible cultural resources on the property or in adjacent areas. Kuʻuwainani Eaton observed that the land was previously used to grow sugar and before that this part of the ʻEwa plain was not thought to be highly inhabited. Puʻuokapolei is nearby, but the project activities are unlikely to have any impact to this wahi pana.

E. Impacts to Cultural Practices

The interviewees did not identify any cultural practices currently taking place in the project

area. The location of closest ongoing cultural practices is Pu'uokapolei, but as this site is outside of the APE, it is unlikely that the project would adversely impact the traditional and customary practices that take place at the pu'u including hula, resource management, and other traditional activites.

F. Cumulative and Indirect Impacts

Adverse cumulative and indirect impacts to cultural resources are often overlooked in CIAs, as they are difficult to assess. Cumulative impacts are cultural impacts that result from the incremental impacts of an activity when added to past, present, and reasonably foreeable future actions and activities. Indirect impacts are impacts on cultural resources which are not a direct result of the project, but a secondary or tertiary result of the project.

Both interviewees identified the potential effects of using recycled water on landscaping efforts, namely the high salinity's impacts to the greenery's lifespan. In actuality, this project will be utilizing R-1 water currently being used for irrigation in the area, so the vegetation will have already developed a tolerance for R-1 water. Additionally, the quality of this R-1 water will be improved with the proposed project because the water will be delivered from the HBWS system fed directly from the HWRF, rather than being delivered from the golf course irrigation pond, which collects pesticides and other pollutants found in run-off.

The land within the APE and its immediate vicinity have been extensively developed, so this project is unlikely to result in any adverse impacts. There are no further anticipated cumulative or indirect cultural impacts to the area.

G. Mitigation and Best Management Practices

Miki'ala Lidstone and Ku'uwainani Eaton both advised that the project post necessary signage to inform the community about the use of recycled water; however, given the current use of inferior quality R-1 water in the vicinity, the proposed project will allow for an improvement in the water quality of the community and its residents. Miki'ala suggested that

children and animals be prevented from playing in the water by restricting access to the blow out area. Both Miki'ala and Ku'uwainani recommeded that nearby residents also be notified about the construction before it begins so that they may be aware of the activities. Additionally, the use of archaeological and/or cultural monitors over the course of the project would alleviate concerns about unearthing anything of cultural significance during construction.

Honua Consulting also has the following recommendations as detailed in the Archaeological Literature Review and Field Inspection (Thurman et al., 2019):

- Structures within the 'Ewa Sugar Plantation District (SIHP # -9786), the historic streetlight (SIHP # -7133), and adjacent OR&L infrastructure be avoided during construction.
- The proposed project proceed under an archaeological monitoring program in accordance with HAR 13-279 (Rules Governing Standards for Archaeological Monitoring Studies); this includes recording project stratigraphy and documenting any potentially significant surface artifacts and/or subsurface deposits and artifacts that may be encountered within the project area.

VII. Conclusion

Contrary to popular practice, it is not the role of the CIA to simply rehash an analysis of historic sites, nor it is the role of the CIA to analyze recreational activities. The role of the CIA is to:

1) Identify valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.
2) Identify the extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and
3) Identify feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

In order to complete a thorough CIA that complies with statutory and case law, it is necessary to consult with Native Hawaiian cultural practitioners and lineal and cultural descendants from the project area and have meaningful dialogues with them that result in data that speaks to the intent of building a strong cultural impact analysis. From thorough interviews and research, data was extrapolated that provides an unprecedented comprehensive look at cultural resources on this ʻāina.

The Honouliuli region is rich with both pre-contact and post-contact histories. While the project is unlikely to have any adverse impact on pre-contact historic properties or Hawaiian cultural practices, the project has an opportunity to enrich the area through interpretive botanical, cultural and historical programs. This study looked comprehensively at all historical records for the region and did not identify any current cultural practices or customs that would potentially be impacted by the project activity. This find was supported by the interviews conducted with cultural practitioners from the area.

Based on this extensive identification effort and thorough analysis, which included interviews with a number of cultural experts and area practitioners, there is a negligible

potential for the project to have a direct, adverse impact on valued cultural, historical, or natural resources in the project area or larger geographic extent. Additionally, there is no potential for the project to have a direct, adverse impact on traditional or customary Native Hawaiian rights in the project area or in the larger geographic extent. Cultural resources that may have once existed in the project area were likely irreparably destroyed by decades of industrial and agricultural use. Any potential for an adverse indirect or cumulative impact in the larger geographic extent can be minimized through the conditions and BMPs recommended herein. These conditions and BMPs constitute feasible action that may be reasonably taken to protect Native Hawaiian rights and cultural rights in the larger geographic extent.

While there are no known cultural resources or cultural practices in the project area, the project should nonetheless embrace all opportunities to honor both the traditional history and modern history of the region, which the local residents take great pride in perpetuating. To this end, the project is urged to work closely with area practitioners and cultural experts, who generously gave their time for this assessment.

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Appendix I: Glossary of Hawaiian Terms

The following list of terms were used frequently throughout this report. All definitions were compiled using Pukui and Elbert's *Hawaiian Dictionary* (1986).

Ahupuaʻa	Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (ahu) of stones surmounted by an image of a pig (puaʻa), or because a pig or orther tribute was laid on the altar as tax to the chief.
ʻĀina	Land, earth.
Akua	1. God, goddess, spirit, ghost. 2. Divine, supernatural, godly.
Aliʻi	1. Chief, chiefess, ruler, monarch. 2. Royal, regal. 3. To act as chief, reign.
ʻAnae	Full-sized ʻamaʻama mullet fish.
ʻAnae holo	The annual mullet migration around the island of Oʻahu.
ʻAumakua	Family or personal gods, deified ancestors who might assume the shape of sharks, owls, hawks, dogs, plants, etc. A symbiotic relationship existed; mortals did not harm or eat them, and the ʻaumakua warned or reprimanded mortals in dreams, visions, and calls.
ʻAumākua	Plural of ʻaumakua.
ʻAuwai	Irrigation ditch, canal.
Hālau	1. Long house, as for canoes or hula instruction; meeting house. 2. Large, numerous; much.
Heiau	Pre-Christian place of worship, shrine. Some heiau were elaborately constructed stone platforms, other simple earth terraces.
Heiau waihau	A heiau where hogs, bananas, and coconuts were sacrificed, but not human beings; a heiau for moʻo spirits.
Hoʻoilo	Winter, rainy season.
Hōlua	Sled, especially the ancient sled used on grassy slopes; the sled course.
Hula	A Polynesian dance form accompanied by chant or song.
ʻIke	To see, know, feel, greet, recognize, perceive, experience, be aware, understand.

ʻIli	Land section, next in importance to ahupuaʻa and usually a subdivision of an ahupuaʻa.
ʻIli kūpono	A nearly independent ʻili land division within an ahupuaʻa, paying tribute to the ruling chief and not to the chief of the ahupuaʻa. Transfer of the ahupuaʻa from one chief to another did not include the ʻili kūpono located within its boundaries.
Ilina	Grave, tomb, sepulcher, cemetery, mausoleum, plot in a cemetery.
ʻIole	Hawaiian rat (*Rattus exulans*); introduced rat, mouse.
Kalo	Taro (*Colocasia esculenta*), a kind of aroid cultivated since ancient times for food, spreading widely from the tropics of the Old World. In Hawaiʻi, taro has been the staple from earliest times to the present, and here its culture developed greatly, including more than 300 forms. All parts of the plant are eaten, its starchy root principally as poi, and its leaves as lūʻau.
Kamaʻāina	1. Native-born, one born in a place, host. 2. Native plant. 3. Acquainted, familiar.
Kānāwai	1. Law, code, rule, statute, act, regulation, ordinance, decree, edict. 2. Legal, to obey a law, to be prohibited, to learn from experience.
Kapu	1. Taboo, prohibition. 2. Special privilege or exemption from ordinary taboo. 3. Sacredness, prohibited, forbidden, sacred, holy, consecrated. 4. No trespassing, keep out.
Kino lau	Many forms taken by a supernatural body, as Pele, who could at will become a flame of fire, a young girl, or an old hag.
Koʻa	1. Fishing ground, usually identified by lining up with marks on shore. 2. Shrine, often consisting of circular piles of coral or stone, built along the shore or by ponds or streams, used in ceremonies as to make fish multiply; also built on bird islands, and used in ceremonies to make birds multiply. 3. Coral, coral head.

Konohiki	Headman of an ahupuaʻa land division under the chief; land or fishing rights under control of the konohiki; such rights are sometimes called konohiki rights.
Kula	Plain, field, open country, pasture.
Kuleana	Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province.
Kumu	Teacher, tutor, manual, primer, model, pattern.
Kumu hula	Hula teacher.
Kūpalu manō	To chum sharks; shark bait (said also of human taboo breakers thrown into the sea).
Kupapaʻu	Corpse, cadaver, dead body, carcass.
Kūpua	Demigod or culture hero, especially a supernatural being possessing several forms.
Kupuna	Grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle.
Kūpuna	Plural of kupuna.
Limu	A general name for all kinds of plants living under water, both fresh and salt, also algae growing in any damp place in the air, as on the ground, on rocks, and on other plants; also mosses, liverworts, lichens.
Loʻi	Irrigated terrace, especially for taro, but also for rice and paddy.
Loko iʻa	Traditional Hawaiian fishpond.
Māhele ʻĀina	Land division.
Māla ʻuala	Sweet potato field.
Mana	Supernatural or divine power.
Manō	Shark.
Manō iʻa	Ordinary shark.
Manō kanaka	Shark thought to be born of a human mother and sired by a shark god, or by a deified person whose spirit possesses a shark or turns into a shark.

Mele	1. Song, anthem, or chant of any kind. 2. Poem, poetry. 3. To sing, chant.
Mele inoa	Name chant, i.e., chant composed in honor of a person, as of a chief.
Moku	1. District, island, islet, section, forest, grove, clump, fragment. 2. To be cut, severed, amputated, broken in two.
Moʻo	Lizard, reptile of any kind, dragon, serpent.
Moʻolelo	Story, tale, myth, history, tradition, literature, legend, journal, log, yard, fable, essay, chronicle, record, article.
Moʻowahine	Female lizard deity.
ʻŌlelo noʻeau	Proverb, wise saying, traditional saying.
Oli	Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill at the end of each phrase; to chant thus.
Pipi	Hawaiian pearl oyster (*Pinctada radiata*); in songs this is known as the iʻa hāmau leo o ʻEwa, ʻEwa's silent sea creature [it was believed that talking would cause a breeze to ripple the water and frighten the pipi].
Poi	The Hawaiian staff of life, made from cooked taro corms, or rarely breadfruit, pounded and thinned with water.
Pueo	Hawaiian short-eared owl (*Asio flammeus sandwichensis*), regarded often as a benevolent ʻaumakua.
Puʻu	Any kind of protuberance from a pimple to a hill: hill, peak, cone, hump, mound, bulge, heap, pile, portion, bulk, mass, quantity, clot, bunch, knob.
ʻUala	The sweet potato (*Ipomoea batatas*), a perennial, wide-spreading vine, with heart-shaped, angled, or lobed leaves and pinkish-lavender flowers. The tuberous roots are a valuable food, and they vary greatly in many ways, as in color and shape.
Wahi pana	A sacred and celebrated/legendary place.
Wai	Water, liquid or liquor of any kind other than sea water.
Wao	1. Realm. 2. A general term for inland region usually forested but not precipitous and often uninhabited.

APPENDIX E

Memorandum of Understanding between HUD Region IX and EPA Region IX (April 2019)

EM
130.6

Memorandum of Understanding
Between
The Department of Housing and Urban Development
Region IX, San Francisco, CA, and
The Environmental Protection Agency, Region IX, San Francisco, CA

I. INTRODUCTION and PURPOSE

This Memorandum of Understanding (MOU) is a record of agreement between the Region IX Offices of the U.S. Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD) concerning EPA review of projects receiving Federal financial assistance and that may affect Region IX sole source aquifers designated pursuant to Section 1424(e) of the Safe Drinking Water Act (PL 93-523). This MOU outlines the steps that will be followed by HUD in determining which projects should be subject to review, and the procedures that will be followed by both agencies in meeting the requirements of Section 1424(e).

Pursuant to Section 1424(e), EPA has designated six (6) aquifers in Region IX (others may be added from time to time) which are the sole or principal source of drinking water for all municipal and private water systems in that watershed, and that if contaminated, would create a significant hazard to public health.

Therefore, per this MOU, no HUD (or HUD grant recipient) commitment for Federal financial assistance and/or Federal insurance may be entered into for any project which EPA predetermines may contaminate the aquifer through its streamflow source and recharge zones so as to create a significant hazard to public health.

The purpose of this MOU is to ensure that each project proposed within an EPA designated sole source aquifer area (see attached maps) that is to receive HUD mortgage insurance or other financial assistance, is designed and constructed in a manner that will not cause contamination of any EPA designated sole source aquifer nor cause a public health hazard in connection with such designated sole source aquifers. In order to achieve this purpose, HUD or HUD Community Development Block Grant recipients (See Section III) will notify EPA of all applications for projects listed in II-A below at the earliest possible date. If an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA) is prepared for any project in the sole source aquifer area, HUD and EPA will coordinate so that the Draft EIS for the project contains EPA's 1424(e) comments.

II. PROJECT IDENTIFICATION

A. The following projects will be referred to EPA for review/comments under Section 1424(e):

Projects that are located within an EPA designated sole source aquifer area for which HUD mortgage insurance or other assistance is requested, and which involve:

1. Agricultural activities including but not limited to land related operations employed in the production, raising, processing and marketing of crops or livestock.

2. Construction of (or addition to) residential, commercial or industrial projects, or public facilities, or land developments, whose sanitation facilities will consist of individual disposal systems (cesspools, septic tanks with leach fields or seepage pits), or community sewerage systems (owned either privately or by a homeowners association), or a proposed (i.e. not yet in place) publicly owned piped sanitary sewer system, the discharge from which will terminate within the watershed of the aquifer.

3. The preparation of an EIS.

4. Existing or proposed industrial projects which manufacture, store, transport, or dispose of toxic chemicals or radioactive materials.

5. Acquisition of a site intended to be used for a sanitary landfill and its operation, or closure of a sanitary landfill.

6. Construction or abandonment of a water well.

7. Facilities which dispose of their waste water in either dry wells, retention ponds, or by other methods not employing a treatment plant.

B. The EPA and HUD mutually agree that activities listed below would not affect water quality in Region IX sole source aquifers, and need not be referred to EPA for evaluation prior to HUD approval:

1. Construction of (or addition to) residential, commercial or industrial projects, or public facilities, or land developments, which will be served by an existing and publicly owned and operated sewerage system and treatment plant which is not subject to a locally or EPA imposed moratorium, except for any development covered in A above.

2. Acquisition, disposition, rehabilitation, reconstruction or modernization of existing projects, buildings, and public facilities.

3. Financial assistance (loans or grants) including refinancing, or provision of mortgage insurance on existing projects, properties, buildings or developments.

4. Public services, preparation of environmental studies or project plans, planning activities, technical assistance and training, payment/repayment or reimbursement of loans or interest.

5. Emergency activities for mitigating an imminent threat to health and safety.

III. COMMUNITY DEVELOPMENT BLOCK GRANT APPLICATIONS

HUD regulations, at 24 CFR Part 58, implement the requirements of section 104(g) of the Housing and Community Development Act of 1974, as amended, and apply to activities and projects funded with HUD assistance, under all Community Development Block Grant (CDBG) and other grant programs. This includes entitlement grants, non-entitlement (i.e. small cities) grants administered by HUD or by States, and grants to Indian tribes.

Pursuant to section 104(g), a grant recipient's assumption of the responsibility for environmental review and decision making, includes such responsibilities under the other provisions of law and authorities specified at 58.5.

Before committing any CDBG or other grant funds (other than for activities exempt under 58.34), the recipient must certify that it has complied with the requirements and obligations which would apply to HUD under the other laws and authorities, including Section 1424(e) of the Safe drinking Water Act of 1974, as amended.

The following procedures shall apply to CDBG applications in addition to those specified in Section IV below:

A. HUD will inform all CDBG recipients, and States which administer the Small Cities Block Grant program, that a 1424(e) review will be required for all projects listed in II-A above.

B. If the recipient submits a Request for Release of Funds (RROF) and certification for a project listed in II-A above, and which EPA has determined will contaminate the sole source aquifer so as to create a hazard to public health and has so advised the recipient in writing, the EPA shall submit an objection to the RROF to HUD (or to the State in the case of a state administered Small Cities Block Grant program) within 15 days from the time EPA receives the Notice of Intent to RROF. In such cases, HUD (or the State) will not release the funds until the matter has been resolved between EPA and the recipient, and HUD (or the State) has been so advised in writing.

C. The environmental requirements for multi-year projects must encompass the entire multi-year scope of activities and be included in the RROF and certification.

IV. REVIEW PROCEDURE

A. Upon receipt of applications by HUD, or prior to submitting a RROF and certification to HUD (or to the State) by a recipient, for projects meeting the criteria in II-A above, the HUD office will send copies of the application, or the recipient will send a brief description of the proposed project (see 2 below), to EPA for its review.

1. EPA shall notify the HUD Office (or the recipient) in writing within 10 calendar days to request additional information it may need to conduct its review.

2. Information needed by EPA normally includes the following and may be submitted concurrently with Item IV-A above:

   (a) Location map identifying project location relative to the sole source aquifer area, and topographic map.

   (b) Description and objective of project activity, including project design, materials to be used, assessment of potential impacts on ground water quality and quantity, and alteration of natural topography and vegetation.

   (c) Names/addresses/telephone numbers of any City, County, State or Federal agencies that are involved.

3. EPA shall have 30 calendar days to review and submit its comments to the HUD Office, or to the recipient. The 30 day period will begin when EPA has received the additional data it may have requested.

4. EPA may request and HUD (or the recipient) may grant additional time for review and comment in exceptional cases. Requests and approvals shall be in writing.

5. HUD (or the recipient) may approve the project if no EPA approval has been received within the normal 30 days or longer agreed-to period.

6. EPA review recommendations shall be sent directly to the HUD Office, or to the recipient, as applicable.

7. When the project reviewed was submitted to EPA by a HUD Field Office, a copy of EPA comments shall also be submitted to:
   HUD Regional Environmental Officer
   San Francisco, CA 94102

B. Each Draft EIS prepared by HUD or by a recipient, for projects within a sole source aquifer area, shall reflect EPA comments.

C. Materials submitted to EPA by HUD or recipients under this Memorandum of Understanding will be addressed to the attention of the Office of Ground Water (W-1-G), EPA Region IX, San Francisco, CA 94105.

D. Local Area Certification (HUD Handbook 4135.1 Rev 2) - If all or part of the geographical boundaries of a certifiable or conditionally certifiable community are within a sole source aquifer area, and residential land developments will meet criteria II.A. 2 above, the HUD office may consult with EPA as part of the certification review process.

E. HUD and EPA will each assign liaison personnel to serve as contact points and to be responsible for maintaining communications as to procedures and activities of their respective agency in Federal Region IX. The liaison personnel are:

HUD: Regional Environmental Officer
San Francisco, CA 94102

EPA: Director, Office of Groundwater,
San Francisco, CA 94105

The liaison personnel, accompanied by appropriate staff, will hold meetings as needed to discuss matters of concern related to Region IX aquifers and this Memorandum of Understanding.

F. The Memorandum of Understanding is subject to revision upon agreement of both parties.

U.S. Department of Housing and Urban Development

Regional Administrator-Regional Housing Commissioner

Date: 1/8/90

U.S. Environmental Protection Agency

Daniel W. McGovern

Regional Administrator

Date: 4.30.90

Source: https://archive.epa.gov/region9/water/archive/web/html/ssa.html

EPA United States Environmental Protection Agency

Pacific Southwest, Region 9

Serving: Arizona, California, Hawaii, Nevada, Pacific Islands, Tribal Nations

Ground Water

Ground Water Quick Finder

- Ground Water Home
- Class V Wells
- Cesspools in Hawaii
- Onsite Sewage Treatment Permits
- Sole Source Aquifer
- Source Water Protection
- Tribal Water Protection
- Underground Injection Wells

Sole Source Aquifer

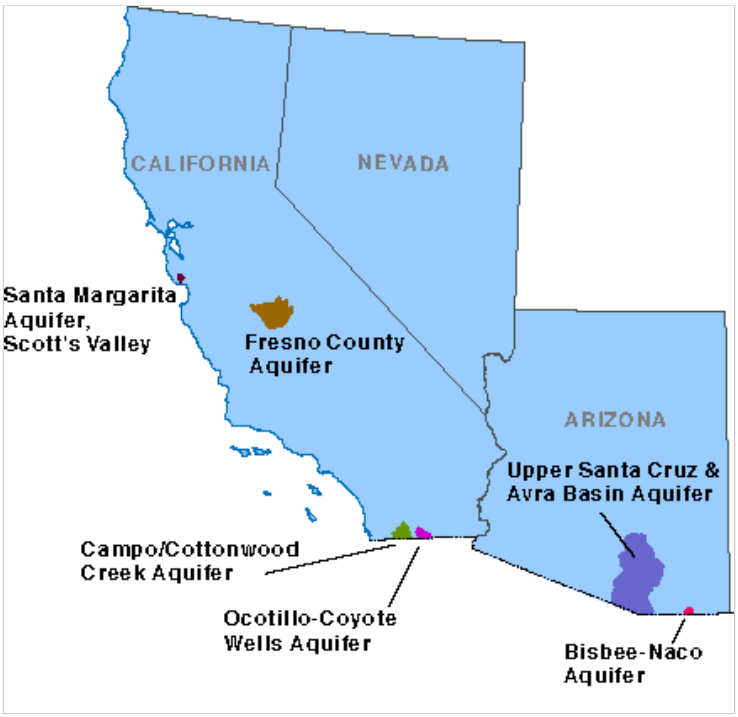
The EPA's Sole Source Aquifer (SSA) Program was established under Section 1424(e) of the Safe Drinking Water Act (SDWA.) Since 1977, it has been used by communities to help prevent contamination of groundwater from federally-funded projects. It has increased public awareness of the vulnerability of groundwater resources. The SSA program allows for EPA environmental review (PDF) (1pg, 34K) of any project which is financially assisted by federal grants or federal loan guarantees. These projects are evaluated to determine whether they have the potential to contaminate a sole source aquifer.

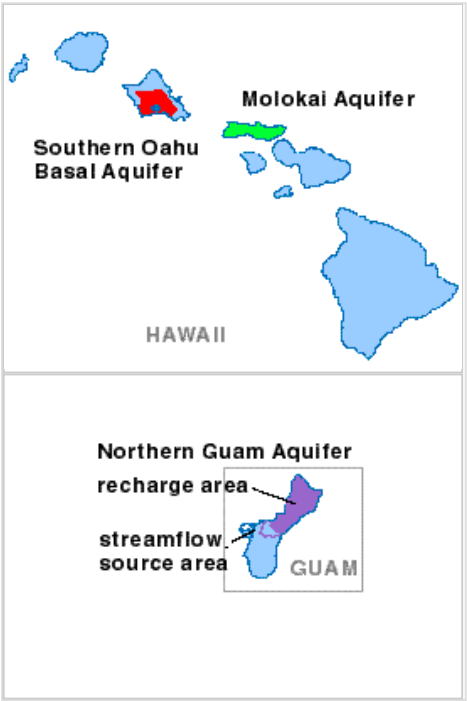
In Region 9, nine sole source aquifers have been designated:

National Links

EPA Ground Water & Drinking Water Home

You will need Adobe Reader to view some of the files on this page. See EPA's PDF page to learn more about PDF, and for a link to the free Adobe Reader.





Maps

Click here for a national layer including all available coverage for Sole Source Aquifers (SSA) that can be used in Geographic Information Systems (GIS)

State	Sole Source Aquifer Name	Federal Reg. Cit	Publ. Date	Map
AZ	Upper Santa Cruz & Avra Basin Aquifer	49 FR 2948	01/24/84	KMZ PDF (1 pg, 1.3M)
AZ	Bisbee-Naco Aquifer	53 FR 38337	09/30/88	KMZ PDF (1 pg, 175K)
CA	Fresno County Aquifer	44 FR 52751	09/10/79	KMZ PDF (1 pg, 1.3M)
CA	Santa Margarita Aquifer, Scotts Valley	50 FR 2023	01/14/85	KMZ PDF (1 pg, 434K)
CA	Campo/Cottonwood Creek	58 FR 31024	05/28/93	KMZ PDF (1 pg, 321K)
CA	Ocotillo-Coyote Wells Aquifer	61 FR 47752	09/10/96	KMZ PDF (1 pg, 337K)
GU	Northern Guam Aquifer System	43 FR 17867	04/26/78	KMZ PDF (1 pg, 400K)

State	Sole Source Aquifer Name	Federal Reg. Cit	Publ. Date	Map
HI	Southern Oahu Basal Aquifer	52 FR 45496	11/30/87	KMZ PDF (1 pg, 716K)
HI	Molokai Aquifer	59 FR 23063	04/20/93	KMZ PDF (1 pg, 146K)

A map of all nationally designated SSAs is also available on the Source Water Protection Publications Database.

For more information, please contact the Ground Water Office at 415-972-3971 or visit the national EPA Sole Source Aquifer Program site.

Outreach Documents

Sole Source Aquifer Fact Sheet (PDF) (1pg, 34K)

For Project Planners: What to submit for EPA review of proposed projects (PDF) (1pg, 34K)

Contact Information

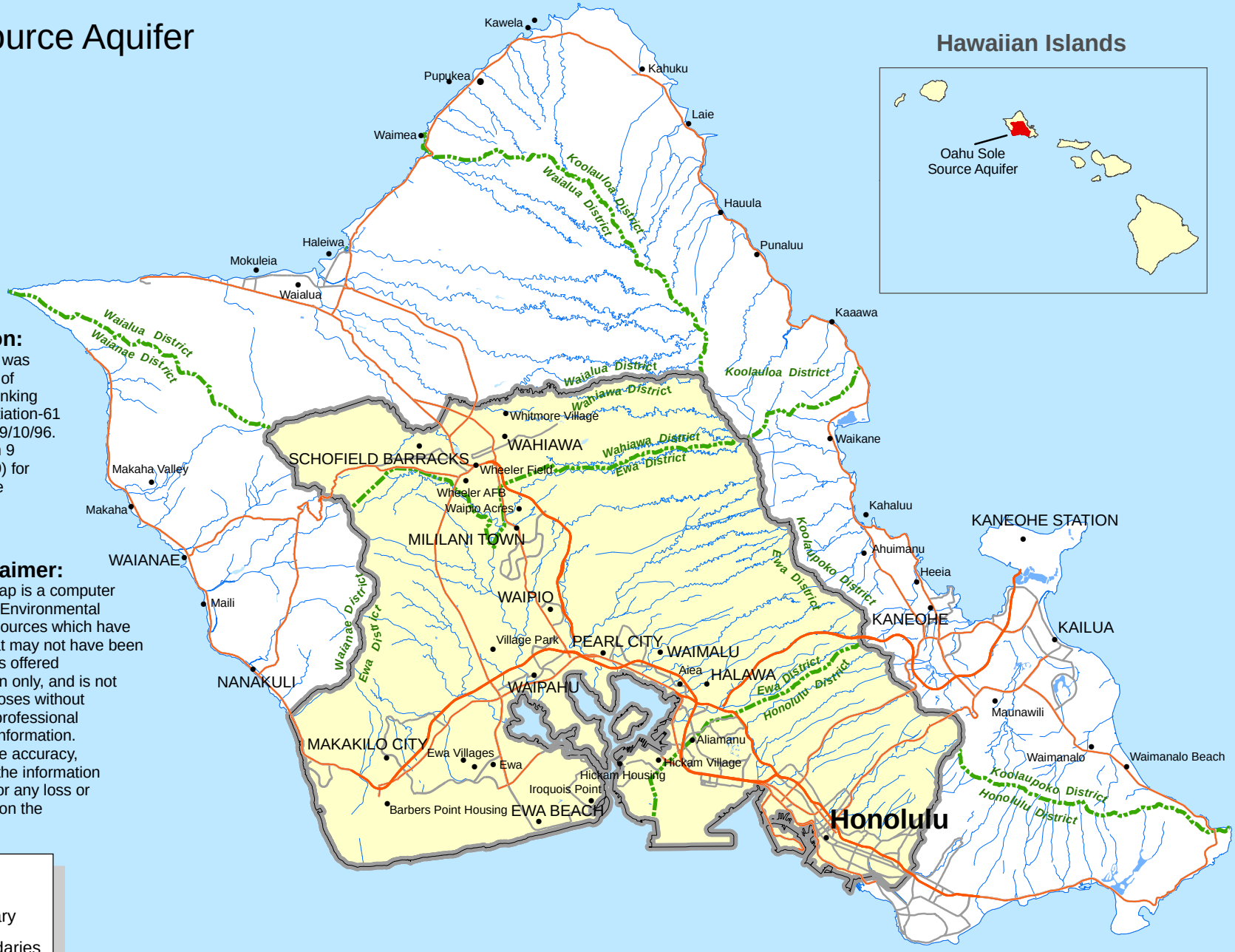
See the Sole Source Aquifer section of the Ground Water contacts page.

Last updated on 9/19/2015

US EPA ARCHIVE DOCUMENT

Oahu Sole Source Aquifer

Designated Area



Notes and Explanation:

The Oahu Sole Source Aquifer was designated under the authority of Section 1424(e) of the Safe Drinking Water Act, Federal Register Citiation-61 FR 47752, Publication Date - 09/10/96. Please contact US EPA Region 9 (Jamelya Curtis, 415-972-3529) for assistance in determining place locations with respect to the project review area.

Map Status and Disclaimer:

Please note that this working map is a computer representation compiled by the Environmental Protection Agency (EPA) from sources which have supplied data or information that may not have been verified by the EPA. This data is offered here as a general representation only, and is not to be used for commercial purposes without verification by an independent professional qualified to verify such data or information. The EPA does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any loss or injury resulting from reliance upon the information shown.

Legend

- Designation Boundary
- Water District Boundaries
- Highways
- Major Roads
- Streams
- Cities & Towns

EPA Region 9 GIS Center

WTR0801656.8 Oct. 2008

APPENDIX F

Draft EA Pre-Assessment Consultation Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

In Reply Refer To:
01EPIF00-2019-TA-0275

April 24, 2019

Ms. Corlyn Orr
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Subject: Ewa Villages R1 Water Main Replacement Project, Renton Road, Ewa, Oahu

Dear Ms. Orr,

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq.*), as amended.

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the '**Occurs In or Near Project Area'** column. Please note this list is not comprehensive and should only be used for general guidance. We have added to the PIFWO website, located at https://www.fws.gov/pacificislands/promo.cfm?id=177175840 recommended conservation measures intended to avoid or minimize adverse effects to these federally protected species and best management practices to minimize and avoid sedimentation and erosion impacts to water quality.

If you are representing a federal action agency, please use the official species list on our web-site for your section 7 consultation. You can find out if your project occurs in or near designated critical habitat here: https://ecos.fws.gov/ipac/.

Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial.

This conclusion requires written concurrence from the Service. If a "may affect, likely to adversely affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a "may affect, not likely to adversely affect" determination for your project. If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

Island Team Manager
Pacific Islands Fish and Wildlife Office

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance, we‘ve marked species that may occur in the vicinity of your project, this list is not comprehensive and should only be used for general guidance.

Scientific Name	**Common Name / Hawaiian Name**	**Federal Status**	**May Occur In Project Area**
Mammals			
Lasiurus cinereus semotus	Hawaiian hoary bat/ ‘ōpe‘ape‘a	E	☒
Reptiles			
Chelonia mydas	Green sea turtle/honu - Central North Pacific DPS	T	☐
Erectmochelys imbricata	Hawksbill sea turtle/ Honu ‘ea	E	☐
Birds			
Anas wyvilliana	Hawaiian duck/ koloa	E	☐
Branta sandvicensis	Hawaiian goose/ nēnē	E	☐
Fulica alai	Hawaiian coot/ ‘alae kea	E	☐
Gallinula galeata sandvicensis	Hawaiian gallinule/ ‘alae ‘ula	E	☐
Himantopus mexicanus knudseni	Hawaiian stilt/ Ae‘o	E	☐
Oceanodroma castro	Band-rumped storm-petrel/ ‘akē‘akē	E	☐
Pterodroma sandwichensis	Hawaiian petrel/ ‘ua‘u	E	☐
Puffinus auricularis newelli	Newell’s shearwater/ ‘a‘o	T	☐
Ardenna pacificus	Wedge-tailed Shearwater/ ‘ua‘u kani	MBTA	☐
Gygis alba	White Tern/ manu-o-kū	MBTA	☐
Buteo solitarius	Hawaiian hawk/ ‘io	E	☐
Insects			
Manduca blackburni	Blackburn’s sphinx moth	E	☐
Megalagrion pacificum	Pacific Hawaiian Damselfly	E	☐
M. xanthomelas	Orangeblack Hawaiian Damselfly	E	☐
M. nigrohamatum nigrolineatum	Blackline Hawaiian Damselfly	E	☐

Plants				
Scientific Name	**Common Name or Hawaiian Name**	**Federal Status**	**Locations**	**May Occur In Project Area**
Abutilon menziesii	Ko‘oloa‘ula	E	O, L, M, H	☐
Achyranthes splendens var. *rotundata*	‘Ewa hinahina	E	O	☒
Bonamia menziesii	No common name	E	K, O, L, M, H	☐
Canavalia pubescens	‘Āwikiwiki	E	Ni, K, L, M	☐
Colubrina oppositifolia	Kauila	E	O, M, H	☐
Cyperus trachysanthos	Pu‘uka‘a	E	K, O	☐
Gouania hillebrandii	No common name	E	Mo, M	☐
Hibiscus brackenridgei	Ma‘o hau hele	E	O, Mo, L, M, H	☐
Ischaemum byrone	Hilo ischaemum	E	K, O, Mo, M, H	☐
Isodendrion pyrifolium	Wahine noho kula	E	O, H	☐
Marsilea villosa	‘Ihi‘ihi	E	Ni, O, Mo	☐
Mezoneuron kavaiense	Uhiuhi	E	O, H	☐
Nothocestrum breviflorum	‘Aiea	E	H	☐
Panicum fauriei var. *carteri*	Carter’s panicgrass	E	Molokini Islet (O), Mo	☐
Panicum niihauense	Lau‘ehu	E	K	☐
Peucedanum sandwicense	Makou	E	K, O, Mo, M	☐
Pleomele (Chrysodracon) hawaiiensis	Halapepe	E	H	☐
Portulaca sclerocarpa	‘Ihi	E	L, H	☐
Portulaca villosa	‘Ihi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	☐
Pritchardia affinis (maideniana)	Loulu	E	H	☐
Pseudognaphalium sandwicensium var. *molokaiense*	‘Ena‘ena	E	Mo, M	☐
Scaevola coriacea	Dwarf naupaka	E	Mo, M	☐
Schenkia (*Centaurium*) *sebaeoides*	‘Āwiwi	E	K, O, Mo, L, M	☐
Sesbania tomentosa	‘Ōhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	☐
Tetramolopium rockii	No common name	T	Mo	☐
Vigna o-wahuensis	No common name	E	Mo, M, L, H, Ka	☐

Location key: O=O‘ahu, K=Kaua‘i, M=Maui, H=Hawai‘i Island, L=Lāna‘i, Mo=Moloka‘i, Ka=Kaho‘olawe, Ni=Ni‘ihau, Le=Lehua

HHF PLANNERS
places for people

October 7, 2019

Mr. Aaron Nadig
Island team Manager
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Services
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

Dear Mr. Nadig:

‘Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, ‘Ewa District, Island of O‘ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 24, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We appreciate the background information describing the compliance requirements for Section 7(a)(2) of the Endangered Species Act. We understand that written concurrence from your agency is required to support determination of effect on federally listed species or designated critical habitat, and we will be initiating informal consultation with your agency to review the findings of recent biological studies.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai‘i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT. GOVERNOR
STATE OF HAWAII

JOBIE M. K. MASAGATANI
CHAIRMAN
HAWAIIAN HOMES COMMISSION

WILLIAM J. AILA, JR.
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

P. O. BOX 1879
HONOLULU, HAWAII 96805

April 23, 2019

Scott Ezer, Principal
HHF Planners
Attn: Ms. Corlyn Orr
733 Bishop Street, Suite 2590
Honolulu, Hawai'i 96813

Aloha Mr. Ezer:

Subject: 'Ewa Villages R1 Water Main Replacement Project Draft Environmental Assessment (DEA) Pre-Assessment Consultation

The Department of Hawaiian Home Lands acknowledges receiving the pre-assessment consultation request on the above-cited project and offers the following comments.

1. As proposed, the installation of the new R1 Water Main is a new alignment along Renton Road rather than a replacement of the existing main located in a different location. The DEA should include an assessment of impacts associated with construction and use of the new main (identified on project location map) and connection points to existing R1 distribution system (not identified on project location map), as well as the impacts associated with the decommissioning of the old main (not identified on project location map.

2. As identified on the project location map, the proposed project is located in the vicinity multiple Department of Hawaiian Home Lands parcels in the Kapolei region. DHHL parcels that have been identified as commercial, community use, or industrial uses in the Oahu Island Plan could potentially utilize reclaimed water. Opportunities to expand reclaimed water customer base should be evaluated in the plan and should include integration of connection points to service future potential customers including DHHL land users. The following DHHL lands are in close proximity to the proposed R1 main:

    a. Proposed project is adjacent to DHHL lands leased to Kapolei Hawaii Property Company, LLC for Ka Makana Ali'i Center (KMA Center Condo Master) (TMK 9-1-016:0142).
    b. Proposed project is approximately 0.5 miles north of DHHL lands proposed for future industrial uses (TMK (1)9-1-013:038).

    c. Proposed project is approximately 0.3 miles south east of DHHL lands currently in commercial or community use or under development for commercial or community use. (TMKs (1)9-1-151:002, 001, 057, and 058)

3. Any actions along Kualaka'i Parkway and Kapolei Parkway could impact DHHL beneficiaries and should be addressed in the DEA.

4. We highly encourage all agencies to consult with Hawaiian Homestead community associations and other (N)native Hawaiian organizations when preparing environmental assessments to better assess potential impacts to cultural and natural resources, access and other rights of Native Hawaiians.

Mahalo for the opportunity to provide comments. If you have any questions, please call Malia Cox, at 620-9485 or contact via email at malia.m.cox@hawaii.gov.

Me ke aloha,

Jobie M. K. Masagatani, Chairman
Hawaiian Homes Commission

HHF PLANNERS
places for people

October 7, 2019

Mr. William J. Aila, Jr, Chairperson
Hawaiian Homes Commission
P.O. Box 1879
Honolulu, Hawai‘i 96805

Dear Ms. Masagatani:

‘Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, ‘Ewa District, Island of O‘ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 23, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project. We appreciate your staff’s efforts to review the project information, and we offer the following responses to each comment.

1. A detailed description of the project, including information about the proposed alignment and connection points, will be included in the Draft EA. Relevant information about the existing R-1 distribution system will also be included.
2. Thank you for identifying the parcels that the Department of Hawaiian Home Lands owns in the vicinity of the project site. While we agree that expanding the reclaimed water service area supports sustainable management of O‘ahu’s water resources, DHHL should consult with the Honolulu Board of Water Supply to plan for future connection points to service future potential customers.
3. Your concern that DHHL beneficiaries may be impacted by the proposed project is understandable. The Draft EA will clearly describe any project-related activities involving Kualaka'i Parkway and Kapolei Parkway, and also identify the potential impacts resulting from the proposed project, if any.
4. Consultations with community groups and stakeholders, including Native Hawaiian organizations and historic interests within the project’s area of potential affect are on-going to ensure that the potential impacts to cultural and natural resources, access and other rights of Native Hawaiians are identified.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai‘i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

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 621
HONOLULU, HAWAII 96809

May 03, 2019

LD 584

HHF Planners, Inc.
ATTN: 'Ewa Villages R1 Water Main Replacement
733 Bishop Street, suite 2590 *via email: colsonorr@hhf.com*
Kapolei, HI 96707

Dear Sirs:

SUBJECT: **'Ewa Villages R1 Water Main Replacement Project**
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu;
TMKs: (1) 9-1-017: 103, 112, 113, and (1) 9-1-016:142

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

Enclosed are comments from DLNR's a) Engineering Division and b) Land Division—Oahu District. Should you have any questions upon receipt, please feel free to contact Barbara Lee, Project Development Specialist, by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

LD 751 p1/

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 621
HONOLULU, HAWAII 96809

'19 MAY 02 PM 02:47 ENGINEERING

RECEIVED
LAND DIVISION
2019 MAY -7 AM 10:35
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

April 25, 2019

MEMORANDUM

FROM

TO:

DLNR Agencies:
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
__Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: **'Ewa Villages R1 Water Main Replacement Project, Draft Environmental Assessment (DEA) Pre-Assessment Consultation**
LOCATION: Renton Road, Honouliuli, 'Ewa District, Island of Oahu; TMKs: (1) 9-1-017:112, 103, 113; (1) 9-1-016:142
APPLICANT: HHF PLANNERS on behalf of the Honolulu Board of Water Supply

Attached hereto, for your review and comment, is information on the above-referenced project.

Please submit any comments to Land Division no later than **May 6, 2019**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed:
Print Name: Carty S. Chang, Chief Engineer
Date: 5/3/19

Attachments
cc: Central Files

LD 751 P2/2

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: 'Ewa Villages R1 Water Main Replacement Project, Draft Environmental Assessment (DEA) Pre-Assessment Consultation
Location: Renton Road, Honouliuli, 'Ewa District, Island of Oahu
TMK(s): (1) 9-1-017:112, 103, 113; (1) 9-1-016:142
Applicant: HHF PLANNERS on behalf of the Honolulu Board of Water Supply

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.hawaiinfip.org/FHAT).

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

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 5/3/19

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 621
HONOLULU, HAWAII 96809

April 25, 2019

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
__Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: **'Ewa Villages R1 Water Main Replacement Project, Draft Environmental Assessment (DEA) Pre-Assessment Consultation**
LOCATION: Renton Road, Honouliuli, 'Ewa District, Island of Oahu; TMKs: (1) 9-1-017:112, 103, 113; (1) 9-1-016:142
APPLICANT: HHF PLANNERS on behalf of the Honolulu Board of Water Supply

Attached hereto, for your review and comment, is information on the above-referenced project.

Please submit any comments to Land Division no later than **May 6, 2019**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

(X) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: _____
Print Name: Patti E. Miyashiro
Date: May 3, 2019

Attachments
cc: Central Files

HHF PLANNERS
places for people

October 7, 2019

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

Dear M. Tsuji:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated May 3, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project. We appreciate your time and effort to review the project information, and offer the following responses to each division's comments.

Engineering Division
According to the Flood Hazard Assessment Tool from the State of Hawai'i website (gis.hawaiinfip.org/FHAT), the project site includes areas in both Flood Hazard Zone X, defined as an area outside the 0.2% annual chance floodplain, and Flood Hazard Zone D, defined as unstudied areas where flood hazards are undetermined, but flooding is possible. The Draft EA will describe flood hazards and the proposed project's compliance with the rules and regulations of the National Flood Insurance Program.

Land Division, O'ahu District
We note that the Land Division does not have any comments or objections at this time.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai'i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

DAVID Y. IGE
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

April 24, 2019

HHF Planners, Inc.
ATTN: Ewa Villages R1 Water Main Replacement
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Dear Mr. Ezer:

Thank you for your submittal requesting comments to the Pre-Assessment Consultation for the Ewa Villages R1 Water Main Replacement Project, Renton Road, Honouliuli.

Project activities shall comply with the following Administrative Rules of the Department of Health:

- Chapter 11-46 Community Noise Control
- Chapter 11-501 Asbestos Requirements
- Chapter 11-503 Fees for Asbestos Removal & Certification
- Chapter 11-504 Asbestos Abatement Certification Program

Should you have any questions, please contact me at (808) 586-4700.

Sincerely,

Jeffrey M. Eckerd
Program Manager
Indoor and Radiological Health Branch

HHF PLANNERS
places for people

October 7, 2019

Mr. Jeffrey M. Eckerd, Program Manager
Indoor and Radiological Health Branch
Department of Health
State of Hawai'i
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Dear Mr. Eckerd:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 24, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We will review the Department of Health Administrative Rules for community noise control (Chapter 11-46) and asbestos (Chapter 11-501, 11-503 and 11-504). Requirements deemed applicable at this stage of planning will be addressed in various sections of the Draft EA.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai'i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

DAVID Y. IGE
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

LUD – 1 9 1 017 112 etc Ewa Villages
R1 Water Main Replacement Project-ID4646

May 21, 2019

Mr. Scot Ezer
Principal
Helber Hastert & Fee Planners
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

Subject: Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, Ewa Beach, Island of Oahu, 96706
TMKs (1) 9-1-017: 112, 9-1-017: 103, 9-1-017: 113, 9-1-016: 142

Thank you for allowing us the opportunity to provide comments for the subject project. The subject project shall comply applicable provisions of Chapter 11-62, Hawaii Administrative Rules, "Wastewater Systems," and the Department's "Reuse Guidelines" dated January 2016.

Please be informed that the proposed wastewater system may have to include design considerations to address any effects associated with the construction of and/or discharges from the wastewater systems to any public trust, Native Hawaiian resources or the exercise of traditional cultural practices.

Should you have any questions, please call Mr. Mark Tomomitsu of my staff at 586-4294.

Sincerely,

SINA PRUDER, P.E., CHIEF
Wastewater Branch

LM/MST:lmj

c: Ms. April Matsumura, DOH-WWB (via email)

HHF PLANNERS
places for people

October 7, 2019

Ms. Sina Pruder, P.E.
Chief, Wastewater Branch
Department of Health
State of Hawai'i
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Dear Ms. Pruder:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated May 21, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We understand that the proposed project is required to comply with the applicable provisions of Chapter 11-62 Hawai'i Administrative Rules, "Wastewater Systems" and the Department of Health's recycled water "Reuse Guidelines" dated January 2016. We also note that potential impacts to any public trust, Native Hawaiian resources or traditional cultural practices from the construction of and/or discharges from the wastewater systems will be described in the Draft EA.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Directors
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

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

IN REPLY REFER TO:
DIR 0336
HWY-CM 2.9759

May 1, 2019

Mr. Scott Ezer
HHF Planners, Inc.
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

Subject: Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation

Based on the information provided, the subject project does not appear to impact a State highway facility. If there is any work in the State Highways Right-of-Way, please advise and provide construction plans for review when available.

Should you have any questions, please call Mr. John Williams, Acting Engineering Program Manager, Construction & Maintenance Branch, Highways Division, at (808) 587-2630 or email at john.williams@hawaii.gov.

Sincerely,

JADE T. BUTAY
Director of Transportation

HHF PLANNERS
places for people

October 7, 2019

Mr. Jade T. Butay, Director
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Butay:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated May 1, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We acknowledge your determination that the proposed project does not appear to impact a State highway facility. The Draft EA will indicate that any work in the State Highways Right-of-Way would require your Department's review and approval.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS 201904240718BE

April 24, 2019

Mr. Scott Ezer
Principal
HHF Planners, Inc.
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Attn.: Ewa Villages R1 Water Main Replacement

Dear Mr. Ezer:

Subject: Pre-Assessment Consultation for a Draft Environmental Assessment – Ewa Villages R-1 Water Replacement Project, Renton Road, Honouliuli, Ewa District, Island of Oahu
TMKs: (1) 9-1-016:142; (1) 9-1-017:103, 112 and 113

Thank you for the opportunity to provide comments on this pre-assessment consultation request in the preparation of a Draft Environmental Assessment (Draft EA) for the Ewa Villages reuse water main replacement project along Renton Road, Honouliuli, Ewa district, Oahu. The pre-consultation request review material was transmitted to our office via letter dated April 3, 2019.

It is our understanding that the Honolulu Board of Water Supply (BWS) is proposing to install a new recycled disinfected wastewater (R-1) distribution line along Renton Road to replace the existing R-1 irrigation system currently used by Ewa Villages. Installation of the new distribution line would allow users in the Ewa Villages area to receive R-1 water directly from the Honouliuli Water Recycling Facility system.

The proposed R-1 line will be approximately one mile of 12-inch and 8-inch pipe running within the City and County of Honolulu's (City) right-of-way on Renton Road between the Ka Makana Ali'i Shopping Center in the west to Park Row in the east. The new R-1 line will be trenched underground on the makai side of Renton Road, under the Kapolei Parkway bridge and aligned near Ewa Mahiko Park, with all work occurring on City-owned property.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Pursuant to Hawaii Administrative Rules (HAR) § 11-200-10(4) – general description of the action's technical, economic, social, and environmental characteristics; this project must demonstrate that it is consistent with a number of state environmental, social, economic goals, and policies. Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Planning Act, provides goals, objectives, policies, planning coordination and implementation, and priority guidelines for growth, development, and the allocation of resources throughout the state.

   The Draft EA should include a discussion on the project's ability to meet all parts of the Hawaii State Planning Act. The analysis should examine consistency with its provisions and clarify where it is in conflict with them. If any of these statutes are not applicable to the project, the analysis should affirmatively state such determination, followed by discussion paragraphs.

2. The coastal zone management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (see HRS § 205A-1).

   HRS Chapter 205A-5(b) requires all state and county agencies to enforce the CZM objectives and policies. As this project is being undertaken by a county agency, the Draft EA should include an assessment as to how the proposed action conforms to each of the goals and objectives as listed in HRS § 205A-2. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. Please consult with the State Department of Health (DOH) Wastewater Branch on the revisions to its water reuse guidelines, as well as the modified recycled water application process. The Draft EA should address the project and its consistency with the DOH Wastewater Branch's recycled water program. This program governs the reuse of recycled water for irrigation purposes, as well as gray water for residential uses.

4. Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; in order to ensure that water and marine resources of Oahu remain protected, the negative effects of stormwater inundation and polluted runoff from the proposed project should be evaluated in the Draft EA. Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, the potential vulnerability of surface water resources, drainage infrastructure currently in place, soil absorption characteristics of the area, and examining the amount of

permeable versus impervious surfaces in the project area. These items should be considered when developing mitigation measures for the protection for surface water resources and the coastal ecosystem, pursuant to HAR § 11-200-10(7).

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

Sincerely,

Leo R. Asuncion
Planning Program Administrator II

HHF PLANNERS
places for people

October 7, 2019

Mr. Leo R. Asuncion
Planning Program Administrator II
Office of Planning, State of Hawai'i
P.O. Box 2359
Honolulu, Hawai'i 96804

Dear Mr. Asuncion:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 24, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project. We appreciate your efforts to review the project information, and offer the following responses to each comment.

1. Hawai'i Administrative Rules (HAR) 11-200-10(4) specifies that an EA shall contain a general description of the action's technical, economic, social and environmental characteristics. The Draft EA will include a section that addresses the project's consistency with the provisions of the Hawai'i State Planning Act (Hawai'i Revised Statutes (HRS) Chapter 226).
2. We acknowledge that HRS Chapter 205A-1 defines the Coastal Zone Management (CZM) area to encompass "all lands in the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea." The Draft EA will include a section that addresses the project's conformance with the objectives and policies in HRS Chapter 205A-2.
3. Thank you for the information about the State Department of Health (DOH) Wastewater Branch's recycled water program, which governs the reuse of recycled water for irrigation purposes and gray water for residential uses. The Draft EA will include a discussion of the project's consistency with the DOH recycled water program
4. We confirm that the Draft EA will identify potential impacts to surface water resources and coastal marine ecosystems that may occur from storm water inundation and polluted runoff resulting from the proposed project. Appropriate mitigation measures, if necessary, would also be identified.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai'i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

April 26, 2019

HHF Planners, Inc.
ATTN: Scott Ezer, Ewa Villages R1 Water Main Replacement
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96816

Dear Mr. Ezer,

SUBJECT: Ewa Villages R1 Water Main Replacement Project Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, Ewa District, Oahu

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any comments at this time.

Should you have any questions, please contact me at 768-8480.

Very truly yours,

Robert J. Kroning, P.E.
Director

RJK:ms(767529)

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October 7, 2019

Mr. Robert J. Kroning, P.E.
Director
Department of Design and Construction
City and County of Honolulu
650 South Beretania Street, 11th Floor
Honolulu, Hawai'i 96813

Dear Mr. Kroning:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 26, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that your department does not have any comments to offer at this time.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,

HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

DEPARTMENT OF ENTERPRISE SERVICES
GOLF COURSE DIVISION • HONOLULU ZOO • NEAL S. BLAISDELL CENTER • WAIKIKI SHELL
CITY AND COUNTY OF HONOLULU
777 WARD AVENUE · HONOLULU, HAWAII 96814-2166
PHONE: (808) 768-5400 • FAX: (808) 768-5433 • INTERNET: www.honolulu.gov/des

KIRK CALDWELL
MAYOR

GUY H. KAULUKUKUI
DIRECTOR

TRACY S. KUBOTA
DEPUTY DIRECTOR

May 1, 2019

Mr. Scott Ezer
Principal
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Mr. Ezer:

Thank you for the opportunity to comment on the Ewa Villages R1 water main replacement project. As you know Ewa Villages Golf Course has been supplying reuse (R1) water to the community for many years. The new R1 water line will alleviate the golf course of having to do so and reduce costs.

I do have concerns about the connections to the golf course irrigation. One concern would be a connection to supply the median/landscape at Kapolei/Kualakai Parkway and the other to Ewa Mahiko Park. Both connections are to the golf course irrigation and not to the subdivision water line.

If there is an opportunity to do a site visit, please contact Garrick K. Iwamuro, Golf Course System Administrator, 768-7201 or giwamuro@honolulu.gov.

Sincerely,

Guy H. Kaulukukui
Director

HHF PLANNERS
places for people

October 7, 2019

Mr. Guy H. Kaulukukui
Director
Department of Enterprise Services
City and County of Honolulu
777 Ward Avenue
Honolulu, Hawai'i 96814-2166

Dear Mr. Kaulukukui:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated May 1, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

The Draft EA will include a general overview of the existing R1 water system that would be replaced by the proposed project. We are aware that separating the 'Ewa Villages common areas from the golf course irrigation system is part of the City's efforts to fulfill requirements pursuant to the 'Ewa Villages Master Plan and redevelopment plans for the area.

Your concern about the irrigation system that supplies the median/landscaped area at the Kapolei Parkway-Kualakai Parkway stretch and 'Ewa Mahiko District Park is being shared with the planning and design team. The intent of the new R1 water line is to provide irrigation water for these public landscaped areas within the 'Ewa Villages service area. The contact information provided for the City's golf course system administrator is also being shared with them.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

2019/ELOG-652 (lii)
1714418

May 15, 2019

Mr. Scott Ezer
Principal
Helber Hastert & Fee, Planners
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

SUBJECT: Draft Environmental Assessment Pre-Consultation
Ewa Villages R1 Water Main Replacement Project
Tax Map Keys 9-1-017: 103, 112, and 113; 9-1-016: 142
Ewa Beach, Oahu, Hawaii

Thank you for your letter dated April 3, 2019, notifying us of an upcoming Draft Environmental Assessment (DEA) for a new R-1 recycled water distribution line along Renton Road to service the Ewa Villages area.

We have the following comments:

1. The DEA should describe how the proposal relates to the policies and guidelines of the Oahu General Plan and the Ewa Development Plan.

2. The DEA should identify if the proposed project is located within the 3.2-foot sea level rise exposure area (3.2 SLR-XA) or its proximity to the 3.2 SLR-XA, which can be viewed online at
http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/.
Because it is an infrastructure project with a possible life-span beyond mid-century, the DEA should also state whether or not the project is located within the projected 6-foot sea level rise inundation area as depicted by the National Oceanic and Atmospheric Administration (NOAA) Sea Level Rise Viewer, available at
https://coast.noaa.gov/slr/#/layer/slr/6/-17572658.81930568/2428305.68026672/10/satellite/none/0.8/2050/interHigh/midAccretion.

It should discuss potential impacts from sea level rise and climate change, as well as mitigation measures, if any.

3. The proposed alignment may require protective measures to ensure the integrity of the existing sewer lines in Renton Road. We will review the construction plans when we receive them.

Should you have further questions, please contact Lisa Imata at 768-8041 or Lin Wong at 768-8018.

Very truly yours,

Dina L. T. Wong
Acting Chief
Planning Division

DLTW:js

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October 7, 2019

Ms. Kathy Sokugawa, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

Dear Ms. Sokugawa:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated May 15, 2019 from Ms. Dina Wong, Planning Division Acting Chief, providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project. We appreciate your staff's efforts to review the project information, and offer the following responses to each comment.

1. A discussion of how the proposed project relates to the policies and guidelines of *the O'ahu General Plan* and the *'Ewa Development Plan* will be included in the Draft EA.
2. The 3.2-foot sea level rise exposure area (3.2 SLR-XA) in relation to the project area will be described in the Draft EA, along with a discussion of the potential impacts from sea level rise and climate change.
3. We appreciate your interest in protecting the integrity of existing sewer lines in Renton Road. The Draft EA will note that construction plans will be reviewed to ensure that existing utility lines are not compromised.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai'i 96813
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DEPARTMENT OF PARKS & RECREATION
CITY AND COUNTY OF HONOLULU
1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone (808) 768-3003 • Fax (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

April 10, 2019

Mr. Scott Ezer, Principal
HHF Planners, Inc.
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

SUBJECT: Pre-Assessment Consultation
Draft Environmental Assessment
Ewa Villages R1 Water Main Replacement Project
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113 and (1) 9-1-016:142

Thank you for the opportunity to review and comment at the Pre-Consultation stage of the Subject Draft Environmental Assessment.

The Department of Parks and Recreation supports the construction of a new R-1 recycled water distribution line along Renton Road directly from the Honouliuli Water Recycling Facility.

Ewa Mahiko District Park is irrigated with R1 water drawn from the Ewa Villages Golf Course irrigation pond. We request that the Environmental Assessment address the importance of how the project will not interrupt R1 water service to the park during construction.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(767746)

HHF PLANNERS
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October 7, 2019

Ms. Michele K. Nekota, Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Dear Ms. Nekota:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 10, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We acknowledge your support for the proposed project. The Draft EA will contain a general description of the proposed improvements, which should address you concerns about providing R1 water service to the 'Ewa Mahiko District Park during construction.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP4/19-767635R

June 19, 2019

Mr. Scott Ezer
Principal
Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

ATTN: Ewa Villages R1 Water Main Replacement

Dear Mr. Ezer:

SUBJECT: Pre-Consultation Draft Environmental Assessment (DEA) for Ewa Villages R1 Water Main Replacement Project, Renton Road, Honouliuli, Ewa District, Island of Oahu, TMKs: (1) 9-1-017:112 & 113, (1) 9-1-017:103, (1) 9-1-016:142

In response to your letter dated April 3, 2019, we have the following comments:

1. **Roadway Jurisdiction**. The DEA should include a map with the project location and adjacent road names and jurisdictions.

2. **Traffic Management Plan (TMP).** A TMP should be prepared for this project that is jointly reviewed and accepted by the Department of Transportation Services (DTS) and the Department of Planning and Permitting. The TMP shall include the following:

   a. A discussion of the traffic impacts that the project may have on any surrounding City roadways and facilities, including short-term impacts during construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

   b. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to

   3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

3. **Roadway, Sidewalk and Crosswalk Closures**. If there are any roadway, sidewalk or crosswalk closures, alternate routes should be provided for vehicles, pedestrians, and bicyclists that are safe and clearly marked.

4. **Vehicle/Pedestrian Crossing**. Any existing pedestrian, bicycle and vehicle access/crossing shall be maintained with the highest safety measures during construction.

5. **Best Management Practice (BMP) Controls**. BMP controls should be included at the construction site to prevent trailing of dirt and debris onto adjacent roadways.

6. **Roadway Damage**. Any damage to the existing roadway and sidewalk area caused by the project should be repaired to current City standards as well as meet Americans with Disabilities Act requirements.

7. **Neighborhood Impacts**. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

8. **Street Usage Permit**. A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Virginia Sosh, of my staff, at 768-5461.

Very truly yours,

Wes Frysztacki
Director

HHF PLANNERS
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October 7, 2019

Ms. Wes Frysztacki, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawai'i 96813

Dear Mr. Frysztacki:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated June 19, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project. We appreciate your department's efforts to review the project information, and offer the following responses to each comment.

Roadway Jurisdiction
A map with the project location and adjacent road names will be provided in the Draft EA. Roadway ownership and jurisdiction will also be discussed in the Draft EA.

Construction-Related Requirements
The Draft EA will address the need to prepare a traffic management plan that addresses construction-related impacts, as well as obtain a street usage permit for any work involving temporary closure of a City street. Additional measures designed to minimize construction-related impacts from road/sidewalk closures and provide safe access for vehicles, pedestrians and bicyclists will also be described. Best management practice (BMP) controls would be implemented during construction to prevent dirt and debris from entering adjacent roadways. Existing roadways and sidewalks damaged by construction would be repaired to their original, pre-construction condition.

Public Notification
We concur that keeping neighboring property owners and the local community apprised of the project during both the planning and construction phases is important. In an effort to maintain positive community relationships, representatives from the City Department of Facility Maintenance and the contractor will provide status briefings to the Neighborhood Board at relevant phases of the project.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,

HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai'i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

April 24, 2019

Mr. Scott Ezer, Principal
Helbert, Hastert & Fee, Planners
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

Subject: Draft Environmental Assessment Preassessment Consultation
Ewa Villages R1 Water Main Replacement Project
Renton Road, Honouliuli, Ewa District, Island of Oahu
Tax Map Keys: 9-1-017: 103, 112, and 113
9-1-016: 142

In response to your letter dated April 3, 2019, regarding the abovementioned subject, the Honolulu Fire Department reviewed the submitted information and determines that there will be no significant impact to fire department services.

Should you have questions, please contact Battalion Chief Wayne Masuda of our Fire Prevention Bureau at 723-7151 or wmasuda@honolulu.gov.

Sincerely,

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:gl

cc: HHF Planners, Inc.

HHF PLANNERS
places for people

October 7, 2019

Mr. Socrates D. Bratakos, Assistant Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, HI 96813-5007

Dear Chief Bratakos:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 24, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We appreciate your time and effort to review the project information. This is to acknowledge your determination that the proposed project will have no significant impact to fire department services.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,

HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

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CHIEF

JOHN D. McCARTHY
JONATHON GREMS
DEPUTY CHIEFS

OUR REFERENCE EO-TS

April 17, 2019

Mr. Scott Ezer, Principal
HHF Planners, Inc.
Attention: Ewa Villages R1 Water Main
Replacement
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

This is in response to your letter of April 3, 2019, requesting comments on the Draft Environmental Assessment consultation for the proposed Ewa Villages R1 Water Main Replacement project.

The Honolulu Police Department (HPD) anticipates short-term impacts to pedestrian and vehicular traffic around the area of the project. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor to facilitate the flow of traffic during the construction phase of the project.

If there are any questions, please call Acting Major Stason Tanaka of District 8 (Kapolei) at 723-8803.

Thank you for the opportunity to review this project.

Sincerely,

ALLAN T. NAGATA
Assistant Chief
Support Services Bureau

Serving and Protecting With Aloha

HHF PLANNERS
places for people

October 7, 2019

Mr. Allan T. Nagata
Assistant Chief, Support Services Bureau
Honolulu Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, Hawai'i 96813

Dear Chief Nagata:

'Ewa Villages R1 Water Main Replacement Project
Draft Environmental Assessment Pre-Assessment Consultation
Renton Road, Honouliuli, 'Ewa District, Island of O'ahu
TMKs: (1) 9-1-017:112, (1) 9-1-017:103, (1) 9-1-017:113, (1) 9-1-016:142

Thank you for the letter dated April 17, 2019 providing comments as part of pre-assessment consultation efforts for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We acknowledge your concern about possible short-term traffic impacts during the construction phase of the project. The Draft EA will include a discussion of possible traffic impacts, as well as traffic management strategies to facilitate the flow of traffic during the construction phase.

Your letter and this response will be included in the Draft EA. We appreciate your participation in this review process, and look forward to any additional comments you may have on the Draft EA. If you need additional information, please contact me by phone at 808-457-3158 or by email at sezer@hhf.com.

Mahalo,
HHF Planners

Scott Ezer
Principal

cc: Ed Manglallan, City Department of Facility Maintenance
Cheryl Tanabe, City Department of Budget and Fiscal Services