April 8, 2020

Keith Kawaoka, Acting Director
Office of Environmental Quality Control
Department of Health, State of Hawai‘i
235 South Beretania Street, Room 702
Honolulu, Hawai‘i 96813

Subject: Final EA and Finding of No Significant Impact, Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015, South Hilo District

Dear Mr. Kawaoka:

Our agency has determined after a review of comments on the Draft EA for the proposed project that there will be no significant impacts in the context of Title 11, Chapter 200 1-13. With this letter, the Hawaii County Department of Parks and Recreation hereby transmits the Final Environmental Assessment and this Finding of no Significant Impact (FEA-FONSI) for publication in the next available edition of the Environmental Notice.

Our consultant Dr. Ron Terry will be utilizing the OEQC online submission platform to provide your office with the required information and files concerning the Final EA, along with a PDF-formatted electronic copy of the Final EA.

Please contact Kevin Sakai, Parks Project Manager of my staff at 961-8939 if you have any questions.

Sincerely,

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates

County of Hawai‘i is an Equal Opportunity Provider and Employer.
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<th><strong>Action Name</strong></th>
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<td><strong>Type of Document/Determination</strong></td>
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| **HRS §343-5(a) Trigger(s)** | (1) Propose the use of state or county lands or the use of state or county funds  
(2) Propose any use within any land classified as a conservation district |
| **Judicial district** | South Hilo, Hawai‘i |
| **Tax Map Key(s) (TMK(s))** | (3)2-8-015:015 |
| **Action type** | Agency |
| **Other required permits and approvals** | Plan Approval and Grubbing/Grading, and Building Permits Conservation District Use Permit Wastewater System Approval |
| **Proposing/determining agency** | Hawaii County Department of Parks and Recreation |
| **Agency contact name** | Kevin Sakai |
| **Agency contact email (for info about the action)** | kevin.sakai@hawaiicounty.gov |
| **Email address or URL for receiving comments** | kevin.sakai@hawaiicounty.gov |
| **Agency contact phone** | (808) 961-8939 |
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Hilo, HI 96720  
United States  
[Map It](#) |
<p>| <strong>Was this submittal prepared by a consultant?</strong> | No |</p>
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<td>10 HINA STREET</td>
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policy are to conserve natural resources and enhance the quality of life. The Proposed Action is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment by improving and expanding recreational opportunities pursuant to the Americans with Disabilities Act. It is thus consistent with all elements of the State’s long-term environmental policies.

4. Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State. The Proposed Action will benefit the social welfare of the community and State by allowing for expanded and socially just recreational use of public property for public benefit.

5. Have a substantial adverse effect on public health. The Proposed Action will promote public health through provision of recreational opportunities for people of all abilities. Wastewater will be disposed of in conformance with State Department of Health regulations.

6. Involve adverse secondary impacts, such as population changes or effects on public facilities. No secondary effects are expected to result from the Proposed Action, which does not expand facilities in such a way as to induce in-migration or unduly affect roads or other public facilities.

7. Involve a substantial degradation of environmental quality. The Proposed Action is minor and environmentally benign and would thus not contribute to environmental degradation with adherence to Best Management Practices.

8. Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions. Although the County Department of Parks and Recreation is steadily improving the accessibility of its facilities through individual projects, they are scattered around the island and would not tend to produce adverse cumulative impacts. Furthermore, the Proposed Action is not related to other non-P&R activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions. The Department of Public Works is seeking to repair the Mamalahoa Highway’s Kolekole Stream Bridge and to address the landslide problems on Old Mamalahoa Highway. If both the park and road projects are underway simultaneously, the additional traffic may require coordination between these County agencies, particularly when heavy equipment or materials are moved on or off the site. The agencies are aware of this and prepared to coordinate as necessary. Noise, dust and sedimentation impacts will be reduced to insubstantial levels through BMPs and will not be accumulate.

9. Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat. The project site supports mostly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna will not occur, with planned restrictions on lighting and the timing of vegetation removal and/or seasonal survey.

10. Have a substantial adverse effect on air or water quality or ambient noise levels. Slight increases in noise and effects to air quality will occur during construction, but they will be temporary and mitigated to non-significant levels. Erosion and sedimentation impacts will be avoided by implementation of Best Management Practices during grading, which will occur in a limited area of the park.

11. Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters. Although the project site is in an area subject to earthquakes, and with minor volcanic seismic risk, the entire Island of Hawai‘i shares this risk, and the Proposed Action is not imprudent to undertake. The proposed improvements would be undertaken within an area that is not a designated floodplain. Some parts of the park have been subject to periodic stream flooding, but it has not seriously affected structures. The proposed continuing land use as a public park is consistent with approved open-space uses and will not adversely affect any floodplain or expose the public to additional hazards. Occasional Tsunami have occurred over the last two centuries; one in 1946 devastated the park’s infrastructure. Maps printed by the Pacific Tsunami Warning Center/Hawai‘i County Civil Defense Agency locate the project site within an area that should be evacuated during a tsunami warning. Warning sirens are present nearby and the area can readily be evacuated in the event of a tsunami or other coastal hazard emergency. The location
of the structures several hundred feet inland from the shoreline at elevations of 10 to 14 feet above sea level provides sufficient resiliency in case of sea level rise.

12. Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies. Although construction inevitably involves changes to the visual environment, no noticeable impacts to views or viewplanes will occur. These minor and temporary scenic impacts would not require mitigation. The Proposed Action essentially will replace or repair existing structures, some of which are dilapidated, with new and attractive facilities. The open space and viewplanes of the site will not be affected. There will be no permanent adverse visual impacts, such as interference with scenic views or insertion of incongruous or clashing visual elements. Only minor exterior security lighting is planned, and it will be shielded to protect dark skies and transiting seabirds.

13. Require substantial energy consumption or emit substantial greenhouse gases. The Proposed Action involves only minor use of energy for construction and operation, and thus minor amounts of greenhouse gases.

Attached documents (signed agency letter & EA/EIS)

- FONSI-Kolekole-Gulch-Park-EA.pdf
- Final-EA-Kolekole-Park-Accessibility-Improvements.pdf

Shapefile

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

Action location map

- Kolekole-Park-TMK.zip

Authorized individual

RON TERRY

Authorization

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

Final Environmental Assessment

TMK (3rd) 2-8-015:015
and right-of-way of Old Mamalahoa Highway
South Hilo District, Hawai‘i Island, State of Hawai‘i

April 2020

Prepared for:
Hawai‘i County
Department of Parks and Recreation
101 Pauahi Street, Suite 6
Hilo, Hawai‘i 96720
FINAL ENVIRONMENTAL ASSESSMENT

Kolekole Gulch Park Accessibility Improvements

TMK (3rd) 2-8-015:015
and right-of-way of Old Mamalahoa Highway
South Hilo District, Hawai‘i Island, State of Hawai‘i

PROPOSING/
APPROVING AGENCY:

County of Hawai‘i
Department of Parks and Recreation
101 Pauahi Street, Suite 6
Hilo, Hawai‘i 96720

CONSULTANT:

Geometrician Associates LLC
P.O. Box 396
Hilo Hawai‘i 96721

CLASS OF ACTION:

Use of County Land, County Funds and Conservation District Land

This document is prepared pursuant to:
The Hawai‘i Environmental Protection Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200.1, Hawai‘i Department of Health Administrative Rules (HAR).
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SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The Hawai‘i County Department of Parks and Recreation (P&R) proposes a project to eliminate architectural barriers at Kolekole Gulch Park. The purpose is to create safe, appropriate and compliant access for all park users while improving the ability to effectively maintain the park. The park site is located within a steep gulch on the south side of Kolekole Stream, makai of Old Mamalahoa Highway, underneat and on the mauka side of the Hawai‘i Belt Highway (State Route 19) bridge. The park has been used for decades for picnics, camping and enjoying Kolekole Stream. The park was closed in 2016 out of an abundance of caution for the public and maintenance staff related to potential lead contamination in the soil, the probable source of which was the adjacent State Department of Transportation’s Kolekole Gulch bridge structure supporting Highway 19. Subsequent testing has determined that lead is present in various locations in the park at varying levels, some exceeding the Department of Health’s Environmental Action Level (EAL), indicating a potential risk to public health. P&R and the Department of Transportation, with the support of the Department of Health, are working to reopen the park on a partial basis after implementing recommended constraints. Plans are currently underway to address the contaminated soil as a component of this project to allow safe, unencumbered and full public use of the park. In addition, minor amounts of asbestos containing material and lead paint at the pavilions and comfort station will require remediation during demolition and park rehabilitation.

Actions include, but may not be limited to, the following: converting the existing restrooms into single-occupant accessible restrooms and upgrading the existing associated septic system; providing a new accessible comfort station with septic system; building one new pavilion, demolishing another, and repairing the remaining pavilions; providing drainage improvements to divert shower runoff from riverbanks; replacing the shower and picnic tables with accessible facilities; addressing drainage problems near pavilions; removing nuisance non-native vegetation that pose a risk to park facilities or users, in consultation with a certified arborist; repaving and improving the stability and integrity of the driveway and parking lot; development of an on-site potable water system and fire protection water system for the park; landscaping improvements; and other appurtenant work.

Because of the limited scale of development and planned mitigation, no impacts to any terrestrial biological resources would occur, and impacts to the stream and ocean and the aquatic resources they support can be avoided through adherence to Best Management Practices. No historic sites are present, and there will be no adverse impacts to cultural resources or practices, which benefit from a park accessible to the public. Traffic impacts during construction will be negligible because of the location on a lightly used road; permanent traffic impacts are unlikely because there will be minor to no expected increase in use relative to historical conditions.

Environmental Assessment, Kolekole Gulch Park Accessibility Improvements
PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS

1.1 Project Description and Location

The Hawai‘i County Department of Parks and Recreation (P&R) proposes a project to eliminate architectural barriers at Kolekole Gulch Park and rehabilitate or rebuild outmoded and dilapidated facilities. The purpose is to create safe, appropriate and compliant access for all park users while improving the ability to effectively maintain the park. The park site is a 5.497-acre property within a steep, lushly vegetated gulch on the south side of Kolekole Stream, makai of Old Mamalahoa Highway, underneath and on the mauka side of the Hawai‘i Belt Highway (State Route 19) bridge (Figures 1-3). The park has been used for decades for picnics, camping and enjoying Kolekole Stream. The park was closed in 2016 out of an abundance of caution for the public and maintenance staff related to potential lead contamination in the soil, the probable source of which was the adjacent State Department of Transportation’s Kolekole Gulch bridge structure supporting Highway 19. Subsequent testing has determined that lead is present in various locations in the park at varying levels, some exceeding the Department of Health’s Environmental Action Level (EAL), indicating a potential risk to public health. P&R and the Department of Transportation, with the support of the Department of Health, are working to reopen the park on a partial basis after implementing recommended constraints. Plans are currently underway to address the contaminated soil as a component of this project to allow safe, unencumbered and full public use of the park. In addition, minor amounts of asbestos containing material and lead paint at the pavilions and comfort station will require remediation during demolition and park rehabilitation.

Actions include, but may not be limited to, the following: converting the existing restrooms into single-occupant accessible restrooms and upgrading the existing associated septic system; providing a new accessible comfort station with septic system; building one new pavilion, demolishing another, and repairing the remaining pavilions; providing drainage improvements to divert shower runoff from riverbanks; replacing shower and picnic tables with accessible facilities; addressing drainage problems near pavilions; removing nuisance non-native vegetation that pose a risk to park facilities or users, in consultation with a certified arborist; repaving and improving the stability and integrity of the driveway and parking lot; development of an on-site potable water system and fire protection water system for the park; landscaping improvements; and other appurtenant work (see Figure 4, Site Plans).

In overview, the Proposed Action involves demolition of the existing non-ADA (Americans with Disabilities Act of 1990, as amended) facilities and improvements, along with actions that will repair, upgrade or build new facilities, including the following:

- Converting the men’s and women’s restrooms into single-occupant accessible restrooms;
- Providing a new multi-user accessible comfort station;
- Constructing two new wastewater passive treatment systems for the comfort stations;
- Building one new pavilion, demolishing another, and repairing and making safety improvements to the remaining ones;
- Providing various accessible parking spaces, walkways and picnic tables;

Page 1

Environmental Assessment, Kolekole Gulch Park Accessibility Improvements
Figure 1. Location Map

Page 2

Environmental Assessment, Kolekole Gulch Park Accessibility Improvements
Figure 2. TMK Map
Figure 3.   Project Site Photos

a.  Current overgrown entrance to park ▲    ▼ b. Main pavilion, side pavilion, and parking
Figure 3. Project Site Photos

c. Kolekole Stream and Bridge ▲ ▼

d. Lawn area and parking
e. Surf break makai of park ▲  ▼ f. View from under bridge back to main lawn and parking
- Replacing the existing shower with a new, modern, accessible shower with drainage improvements to direct runoff away from stream, for water quality and erosion prevention;
- Addressing drainage and mass wasting problems near pavilions;
- Removing nuisance non-native vegetation that may pose a risk to park facilities or users throughout the park site, in consultation with a certified arborist;
- Repaving and improving the stability and integrity of the driveway and parking lot as well as ensuring minimum Fire Department vehicular access for emergency purposes; and
- Developing a new water system utilizing trucked-in water with a 12,000 gallon fire-protection tank and a 5,000-gallon potable water storage tank.
- Remediation of lead contaminated soils.

The Proposed Action has been designed to minimize onsite disturbance to the degree consistent with providing safe and effective implementation of accessible facilities that serve all members of the public. Of the many hundreds of trees on the site, several dozen are expected to require removal.

1.2 Purpose and Need

The overarching purpose of the Proposed Action is to create safe, appropriate and compliant access according to the requirements of the Americans with Disabilities Act for all park users. The project aims to satisfy the County’s obligations of its federally mandated Transition Plan, while retaining and improving the ability to effectively maintain the park and ensuring the long-term serviceability of the park improvements. The Americans with Disabilities Act was signed into law on July 26, 1990, by President George H.W. Bush. The ADA is one of America’s most comprehensive pieces of civil rights legislation, and it prohibits discrimination and guarantees that people with disabilities have the same opportunities as everyone else to participate in the mainstream of American life — to enjoy employment opportunities, to purchase goods and services, and to participate in state and local government programs and services. Modeled after the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, religion, sex, or national origin — and Section 504 of the Rehabilitation Act of 1973 — the ADA is an “equal opportunity” law for people with disabilities.

Without these improvements, the park would not be fully accessible and the County would not be compliant with the federally mandated requirement to bring this park into compliance. Not only would this lead to inconvenience for disabled patrons and the possibility that they would not be able to access many of the park’s facilities, it would likely keep the park closed indefinitely. Further, failure on the County’s part to render this park fully ADA-compliant may obligate the County to renovate another, as yet unidentified nearby park for ADA compliance as a condition of its ADA Transition Plan requirements. Finally, as noted by a neighboring resident in response to early consultation (see D. Goehring letter, Appendix 1a), the closure of this somewhat remote park has been followed by vandalism and theft. To conserve the function and amenities of the park, it is important to undertake the proposed improvements.

1.3 Environmental Assessment Process

This Environmental Assessment (EA) is being conducted in accordance with Chapter 343 of the Hawai‘i Revised Statutes, and Title 11, Chapter 200.1, of the Hawai‘i Administrative Rules. This law and its implementing regulations are the basis for the environmental impact process in the State of Hawai‘i.
According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the anticipated finding that no significant impacts are expected to occur as a result of the Proposed Action; Part 5 lists each criterion and presents the preliminary findings for each made by the Hawai‘i County Department of Parks and Recreation, the proposing and approving agency. If, after considering comments to the Draft EA, the approving agency concludes that no significant impacts would be expected to occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to proceed to other appropriate approval and permit processes. If the agency concludes that significant impacts are expected to occur as a result of the Proposed Action, then an Environmental Impact Statement (EIS) will be prepared.

### 1.4 Public Involvement and Agency Coordination

The following agencies and organizations were consulted by letter during development of the Environmental Assessment.

**State:**
- Department of Land and Natural Resources, Chairperson
- Department of Transportation, Highways Division, Hawai‘i Island District
- Office of Hawaiian Affairs

**County:**
- Civil Defense Agency
- Department of Environmental Management
- Fire Department
- Police Department
- County Council
- Department of Public Works
- Planning Department

**Private:**
- Sierra Club
- Nearby Property Owners: Henderson, TAO Farms, Jason, Shropshire, Burd, Bailey

Responses received are contained in Appendix 1a. Notice of the availability of the Draft EA was published in the February 23, 2020 OEOC Environmental Notice. Appendix 1b contains written comments on the Draft EA and the responses to these comments. Various places in the EA have been modified to reflect input received in the comment letters; additional or modified non-procedural text is denoted by double underlines, as in this paragraph.

### 1.5 Cost and Schedule

Shortly after the EA is complete and necessary permits are obtained, construction will begin and is expected to last about 12 months. The cost of the improvement is estimated at about $2.5 million.
PART 2: ALTERNATIVES

2.1 No Action Alternative

Under the No Action Alternative, the County of Hawai‘i would not make accessibility improvements for the comfort station, pavilions, showers, parking and accessways, and would not improve drainage, mass wasting protection, parking pavement or water supply. The park would not be fully accessible according to the requirements of the Americans with Disabilities Act, leading to inconvenience for disabled patrons and even the possibility that they would not be able to access many of the park’s facilities at all. Based on the current state of the park, without significant improvements, it would not in reality be functional for any users. Furthermore, failure on the County’s part to render this park fully ADA-compliant may obligate the County to renovate another, as yet unidentified nearby park for ADA compliance as a condition of its ADA Transition Plan requirements. Although the benefits and social equity provided by accessible facilities would not occur, there would be no disturbance of the existing ground surface or vegetation. The No Action Alternative provides a basis for comparing the impacts of the proposed project.

2.2 Alternative Locations for Accessible Facilities

The project design and environmental team examined the project site and determined that although there many possible configurations of facilities on this 5.5-acre site, no other layout would be as efficient in terms of three factors: cost and ease of construction, parkgoer convenience, and environmental impacts, particularly stream flooding and ponding from heavy rainfall. As part of the lead-contamination remediation process, P&R considered abandonment of the park, which would enable less costly remediation, but determined that the recreational resource was too valuable and important for the citizens of the County of Hawai‘i to forego re-use. In addition, this would not accomplish compliance with the ADA Transition Plan requirements. Therefore, no alternative sites have been advanced in this Environmental Assessment.
PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The location for the Proposed Action is referred to throughout this EA as the project site (see Figures 1-4). The term project area is used to describe the general environs of this part of the South Hilo District. The project site is bounded by Old Mamalahoa Highway, Kolekole Stream, and the right-of-way under the State Highway Bridge.

3.1 Physical Environment

3.1.1 Climate, Geology, Soils and Geologic Hazards

Environmental Setting

Temperatures are warm year-round at the project site, with slightly cooler winters, and annual rainfall is about 138 inches. Winds are generally trade winds from the east/northeast, often with light downslope land breezes at night (UH Hilo Dept. of Geography 1998; Giambelluca et al. 2013).

There is a scientific consensus that the earth is warming due to manmade increases in greenhouse gases in the atmosphere, according to the United Nations’ Intergovernmental Panel on Climate Change (UH Manoa Sea Grant 2014). Global mean air temperatures are projected to increase by at least 2.7°F by the end of the century. This will be accompanied by the warming of ocean waters, expected to be highest in tropical and subtropical seas of the Northern Hemisphere. Wet and dry season contrasts will increase, and wet tropical areas in particular are likely to experience more frequent and extreme precipitation. For Hawai‘i, where warming air temperatures are already quite apparent, not only is the equable climate at risk but also agriculture, ecosystems, the visitor industry and public health. Guidance to federal agencies for addressing climate change issues in environmental reviews was released in August 2016 by the Council on Environmental Quality (US CEQ 2016). The guidance urged that when addressing climate change, agencies should consider: 1) the potential effects of a proposed action on climate change as indicated by assessing greenhouse gas emissions in a qualitative, or if reasonable, quantitative way; and, 2) the effects of climate change on a proposed action and its environmental impacts. It recommends that agencies consider the short- and long-term effects and benefits in the alternatives and mitigation analysis in terms of climate change effects and resiliency to the effects of a changing climate. Although this guidance has since been withdrawn for political reasons, the State of Hawai‘i in Hawai‘i Revised Statutes §226-109 encourages a similar analysis, and both Act 17 of the 2018 Hawai‘i Legislature and Title 11, Chapter 200.1 now require analysis of sea-level rise and greenhouse gases in environmental impact statements. In terms of climate, it is possible, and even likely, that warmer temperatures and larger and more frequent tropical storms and hurricanes will affect the Hawaiian Islands in the future. In addition, as discussed in Section 3.1.2, accelerating sea level rise is expected.

Geologically, the lava flows that underlie the project site are dated from 65,000 to 250,000 years before the present (BP), and are transitional in chemistry between basic and alkalic (Wolfe and Morris 1996). All lava flows are mantled with a thick layer of volcanic ash derived from Kohala and Mauna Kea volcanoes.
The resulting ash-derived soils were the basis for highly productive farming from early Hawaiian times through the century of sugar cane until today (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey in this area on the northeast flank of Mauna Kea is 8 on a scale of ascending risk 9 to 1 (Heliker 1990). Mauna Kea has erupted several times in the last 10,000 years, most recently about 4,500 years ago. This volcano is considered inactive but not extinct. Zone 8 includes the lower slopes of Mauna Kea. The project area has not been affected by lava flows for the past 10,000 years.

The Island of Hawai‘i experiences high seismic activity and is at risk from major earthquake damage (USGS 2000), especially to structures that are poorly designed or built. In October of 2006, two damaging earthquakes of magnitude 6.7 and 6.0 struck the west side of Hawai‘i Island, and a 6.9-magnitude quake shook Kilauea in May 2018. These earthquakes caused no known damage to the park facilities or road infrastructure in this area. The steep slopes on the southern margin of the park are susceptible to landslides and rockfalls. Minor mass wasting from as recently as August 2018 has involved soil flowing or falling downslope and covering several pavilions and walkways and a portion of the parking lot.

Impacts and Mitigation Measures

Coastal properties and land uses will be subject to increasing stress as a result of climate change. In addition to greater overland flooding, as well as rises in sea level and accompanying coastal erosion and storm surge flooding (discussed in the next section), stronger and more frequent tropical storms may bring increased wind strength. Structures have been designed to account for potentially greater storm winds. The Proposed Action involves only very minor use of energy for construction and operation, and thus minor amounts of greenhouse gases.

Lava flow, seismic hazards and mass wasting conditions per se impose no constraints on the Proposed Action, and the continued utilization of the project site as a park is not imprudent to undertake in terms of geological hazards. Given the need for recreation in the area, the County has determined that it is sensible to ensure that its facilities here are ADA-accessible and upgraded. Project design will take the seismic setting into account, and no mitigation measures are expected to be required. As illustrated in Figure 4, Sheets C102 and 103, in order to protect the structures, CRM rip-rap surface extending up the adjacent slope to stabilize the soil and a swale to capture debris will be built.

3.1.2 Flood Hazard

Existing Environment

Floodplain status for most coastal areas of the island of Hawai‘i has been determined by the Federal Emergency Management Agency (FEMA), which produces the National Flood Insurance Program’s Flood Insurance Rate Maps (FIRM). No flood hazard has been mapped in the Kolekole Park area (http://gis.hawaiinfip.org/FHAT/). Despite this, County staff have noted occasional flooding episodes from high flows in Kolekole Stream and ponding from heavy rains. High waves also may affect the area.
makai of and under the bridge, but all this area is makai of and not part of Kolekole Gulch Park, where flooding from storm waves is not generally an issue.

Several historic tsunami have caused devastation in low-lying coastal areas of the Big Island, and park planning must adapt to this highly damaging, if occasional, hazard. The history of tsunami damage – and reconstruction – at Kolekole Park is discussed extensively in Section 3.2.2, below. To summarize, on April 1, 1946, a tsunami triggered by an earthquake in the Aleutian Islands slammed into the north-facing shores of Hawai’i Island. The railroad bridge at the mouth of Kolekole Stream lost its center span from the massive inundation of water that reached heights of 37 feet in Kolekole and neighboring Hakalau Gulch. Most of the makai portion of what is now the park was leveled and the ball field and rest house disappeared. The park lost its infrastructure and most vegetation except for two coconut trees and did not reopen until over two years later. In 1959, a tree planting ceremony and concert by the Hawai’i County Band were held in honor of two new pavilions at Kolekole Park. On May 23, 1960, another devastating tsunami originating from a massive earthquake in Chile swept Hawai’i Island. The most severe impacts were experienced at the Waiākea peninsula and Hilo Bay. Wave heights between Honomū and Hakalau were on the order of 5 to 9 feet, causing less damage than in 1946. Based on the history of tsunami here, the Pacific Tsunami Warning Center and the Hawai‘i County Civil Defense Agency locate the project site within an area that should be evacuated during a tsunami warning (https://tsunami.coast.noaa.gov/#!/).

Maps in the *Atlas of Natural Hazards in the Hawaiian Coastal Zone* (Fletcher et al 2002) indicate relatively high hazard levels for a variety of coastal hazards along this coastline, particularly high waves, stream flooding, erosion and tsunami. The map for the Honomū area is reproduced as Figure 5.

**Impacts and Mitigation Measures**

The park’s location has inherent flood risk from storms and tsunami. The Proposed Action has been conceived and designed to keep the footprint of structures above 10 feet in elevation in order to maintain a wide setback from the shoreline and avoid potential flooding. Although the park stretches from 125 to 1,300 feet inland from the shoreline, terrain flat enough for park use is restricted to within 700 feet of shoreline. The closest structure to the shoreline is currently a pavilion that is about 400 feet inland. This will be demolished and a new pavilion and comfort station built slightly mauka of this. The design includes shallow drywells and has located structures outside of the lowest elevations of the site to reduce the effects of stream flooding and ponding during extreme weather events. No diversion of water onto other properties will occur.

The National Weather Service of the National Oceanic and Atmospheric Administration operates the Pacific Tsunami Warning Center and Alaska Tsunami Warning Center, which monitors sudden earth movements throughout the Pacific Basin. Tsunamis generated from earth movements on the Pacific Rim, including South America, Japan, California and Alaska, would allow for warning times between 4 and 15 hours, sufficient time for evacuation of Kolekole Gulch Park. Sudden movement along faults close to Hawai‘i are unpredictable, allowing only minutes or perhaps an hour of warning time, and evacuation would be more problematic. Coastal recreational areas in Hawai‘i cannot avoid the tsunami hazard because the entire coast is vulnerable to tsunami. A Civil Defense warning siren is present in close proximity to the park, at the north end of Kolekole Gulch Bridge makai of Highway 19, to provide notice to park users evacuate in case of tsunami or other hazards.
The Proposed Action involves commitment and investment in a continuation of shoreline-dependent recreational use. It is thus important to examine the potential for future sea level rise, which could affect any decisions to commit to such a location.

No one can predict with certainty how high sea levels will rise within 10 years, 20 years or 50 years. An overall global rise in sea level of 3.3 feet by the end of the 21st century was proposed by Fletcher (2010) and others. A 2012 scientific assessment (e.g., Rahmstorf et al 2012) posited 4 feet as a reasonable upper bound. Recent research accounting for the potential for Antarctic melting to contribute more to sea level than generally modeled computes an additional meter (3.3 feet) of sea level rise (DeConto and Pollard 2016). Relative sea-level rise, of course, is a result of the combined water rise and land subsidence. The Island of Hawai‘i is sinking into the Earth’s mantle because of the gravitational, isostatic load of its growing volcanoes. A subsidence rate 0.08-0.12 inches/year) related to isostatic sinking has been determined by submersible studies of drowned reefs off West Hawai‘i (Moore and Fornari 1984).
Not only the magnitude of sea level rise but also the timing is the subject of debate. According to the Hawaiʻi Climate Change Mitigation and Adaptation Commission (HCCMAC) (2017:v):

While the IPCC’s “business as usual” scenario, where GHG emissions continue at the current rate of increase, predicts up to 3.2 feet of global sea level rise by year 2100 (IPCC 2014), recent observations and projections suggest that this magnitude of sea level rise could occur as early as year 2060 under more recently published highest-end scenarios...

The HCCMAC report goes on to state that based on shoreline type, the Island of Hawai‘i is in many senses the least vulnerable of the main Hawaiian Islands to the impacts of sea level rise, but that certain areas – particularly Kona, Puakō, Kapoho and Hilo Bay “....face serious threats. It is estimated that at least 130 existing structures would experience chronic flooding if there were 3.2 feet of sea level rise.”

A sea level rise viewer from the Pacific Island Ocean Observing System (https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/) provides graphic representation of how regions will be affected by sea level rise. In the Kolekole Gulch Park area, a sea level rise of 3.2 feet will create a larger estuary as water rises up the riverbanks, as shown in Figure 6. Because of elevations generally higher than 10 feet, most of the land within the park would not be affected by this magnitude of “still water” rise, or even a rise of double that amount (this is unlike Waikiki, e.g., where a 6-foot rise in sea level would inundate large areas). However, aside from inundation, a rise in sea level also raises the level of attack for coastal erosion, high waves and tsunami. As reported in the online Science Daily based on an article in Scientific Reports (https://www.sciencedaily.com/releases/2018/09/180927164230.htm), a multi-agency group including UH Manoa and DLNR determined that much sea level rise effects will be much more wide reaching. “By including models of dynamical physical processes such as erosion and wave run-up, a team of researchers has determined that land area in Hawai‘i vulnerable to future sea level rise may be double previous estimates.” All the facilities in the park are hundreds of feet back from the shoreline and at sufficient elevation to escape damage from high wave inundation. Damage from tsunami and coastal erosion is much more difficult to predict.

The Department of Parks and Recreation has considered the risk of sea level rise and determined that the uncertain degree and timing of this risk and the long time scenario indicates that it still prudent to construct the project as planned. This would allow the County to realize its benefits for a period of up to many decades, rather than fail to implement it and lose critical functionality at an important recreational site. The location of the structures several hundred feet inland from the shoreline at elevations of 10 to 14 feet above sea level provides sufficient resiliency in case of sea level rise. It is recognized that planning for recreational facilities will require continual “check-ins” on the advance of sea level. A scenario of modest sea level rise might not markedly affect the integrity of the park or its structures. More rapid or extreme rises could place these facilities within a zone where the frequency and severity of flooding led to repeated damage that hindered their utility. Some facilities might someday require relocation to a retreated site, while others may need to be abandoned altogether.
3.1.3 Water Quality

Existing Environment

Two sensitive receiving waters, Kolekole Stream and Estuary and the Pacific Ocean, are adjacent to the project site. No anchialine ponds are present in or near the park. The ocean waters here are classified as “A,” with the second-highest level of water quality goals. Hawai‘i Administrative Rules (HAR) Chapter 11-54 03(c)(2) states that “It is the objective of class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new sewage discharges will be permitted within embayments.” Kolekole is classified as Inland Waters, as Class 2 waters. Chapter 11-54 03(b)(2) states that the objective of class 2 waters is to “…protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new treated sewage discharges shall be permitted within estuaries. No new industrial discharges shall be permitted within estuaries…..”
laws and regulations clearly state that water quality in these coastal and stream waters must be maintained for uses such as fishing, aquatic life, recreation including swimming and surfing, visual quality, and traditional practices.

**Impacts and Mitigation Measures**

Grading, paving and construction activities would occur in an area greater than one acre, and thus will require a National Pollutant Discharge Elimination System (NPDES) permit to ensure that erosion and sedimentation impacts to adjacent waters will be minimized. Plans submitted as part of the application for this permit and a County grading permit will specify practices to minimize the potential for sedimentation, erosion and pollution of coastal waters. The County will ensure that its contractor shall perform all earthwork and grading in conformance with:

- (a) “Storm Drainage Standards,” County of Hawai‘i, October, 1970, and as revised.
- (c) Conditions of an NPDES permit.

Best Management Practices have been included in the design of the Proposed Action:

- The total extent of land disturbance will be minimized. The construction contractor will be limited to the delineated construction work areas within the lot.
- Construction BMPs will be installed to prevent sediment from leaving site.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff.
- Cleared areas will be replanted or otherwise stabilized as soon as possible.
- Structures for sediment control will include grated inlets in the parking area, silt fences, biosock waddles and a stabilized construction entrance.

### 3.1.4 Flora, Fauna and Ecosystems

**Existing Environment**

The natural vegetation of this part of South Hilo was most likely lowland rain forest dominated by ‘ōhi’a (*Metrosideros polymorpha*), uluhe (*Dicranopteris linearis*) and hala (*Pandanus tectorius*) (Gagne and Cuddihy 1990). However, the general landscape of the entire Hāmākua Coast has been radically altered by centuries of agriculture and settlement, and little to no native vegetation remains in most locations. Gulches and sea cliffs continue to have remnant spots with at least some native elements, although even these are generally dominated by non-natives, as at Kolekole, where the valley bottom was cultivated in sugar cane before it became a park. No remnant of natural vegetation is present, and the vegetation is a lawn surrounded by a mixture of ornamental and weedy trees.
Table 1 is a list of species observed on the site by Ron Terry, Ph.D., and Layne Yoshida, B.A. during a November 2018 reconnaissance. Only a few common natives were present. No plant species classified as threatened or endangered (USFWS 2019) was present or would be expected at the park.

The park is dominated by non-native terrestrial fauna as well, although there is some habitat for certain native fauna as well. Typical expected birds include common myna (Acridotheres tristis), northern cardinal (Cardinalis cardinalis), yellow-billed cardinal (Paroaria capitata), spotted dove (Streptopelia chinensis), zebra dove (Geopeelia striata), Japanese white-eye (Zosterops japonicus), saffron finch (Sicalis flaveola), and house finch (Carpodacus mexicanus), most of which were observed during field visits.

The only native birds identified during site visits were one waterbird, the indigenous black-crowned night heron, or ‘auku’u (Nycticorax nycticorax hoactli), and a common migratory shorebird typical of rocky shorelines, the Pacific golden-plover or kolea (Pluvialis fulva). It is likely that there are occasional sightings of the wide-ranging but endangered Hawaiian goose or nēnē (Branta sandwicensis). Other shorebirds and waterbirds might be seen at the park during extended observations, but the endangered Hawaiian duck or koloa maoli (Anas wyvilliana) and the Hawaiian coot or ‘alae ke’oke’o (Fulica alai) are unlikely to be present.

Few native forest birds would be expected to use the project site due to its low elevation, urban context, alien vegetation and lack of adequate forest resources. The one exception is the ‘io or Hawaiian hawk (Buteo solitarius, recently removed from the endangered species list), which soars all over the east side of the island foraging for prey. Hawks require large trees for nesting and are vulnerable during their nesting season from March through September. The biological survey for the park was undertaken outside this period, and although the park does not offer an ideal site for hawk nests because of its setting and vegetation, there are tall trees that conceivably could offer nesting habitat.

Several threatened or endangered seabirds also merit discussion because they utilize terrestrial habitat on the Big Island and may be harmed by common human activities and structures. The Hawaiian petrel or ‘ua’u (Pterodroma sandwichensis), the Hawaiian sub-species of Newell’s shearwater or ‘a’o (Puffinus newelli), and the band-rumped storm-petrel or ‘akē’akē (Oceanodroma castro) have been recorded over-flying many areas on the Island of Hawai‘i between late April and the middle of December each year. The Hawaiian petrel and band-rumped storm-petrel are listed as endangered, and Newell’s shearwater as threatened, under both federal and State of Hawai‘i endangered species statutes. The Hawaiian petrel and band-rumped storm petrel nest at high elevations on Mauna Loa and Mauna Kea and the saddle in between; Newell’s shearwater is known to nest in patches of the native fern uluhe at mid-elevations. Although they may fly over various coastal locations in South Hilo on their way to and from the open ocean, no suitable nesting habitat for any of these seabird species is present at the park. The primary cause of mortality in these species in Hawai‘i is thought to be predation by alien mammalian species at the nesting colonies. Collision with man-made structures is another significant cause. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. Disoriented seabirds may collide with manmade structures and, if not killed outright, become easy targets of predatory mammals.
### Table 1  Plant Species Observed at Kolekole Gulch Park

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Family</th>
<th>Common Name</th>
<th>Life Form</th>
<th>Status</th>
</tr>
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<td><em>Youngia japonica</em></td>
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<td>Oriental hawksbeard</td>
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* A = alien, E = endemic, I = indigenous, PI = Polynesian introduction, End = Federal and State listed Endangered Species

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Environmental Assessment, Kolekole Gulch Park Accessibility Improvements
The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) is often found in alien as well as native vegetation in a variety of locations throughout the island of Hawai‘i. This is the only native land mammal in Hawai‘i. These solitary bats are widely scattered and roost almost undetected in tall shrubs and trees, and they are often seen on the Hāmākua Coast and are certainly occasionally present in the park. They are vulnerable to disturbance during the summer pupping season, when mothers with pups may be unable to flee if the trees they are roosting in are cut or trimmed.

Apart from the Hawaiian hoary bat, all terrestrial mammals that might be found in and near the park – mongooses, rats and mice, as well as feral cats and pigs – are introduced species. None are of conservation concern and all are deleterious to native flora and fauna.

Three species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by federal wildlife agencies, and one was recently delisted. The honu or threatened green sea turtle (*Chelonia mydas*) is seen very frequently on the windward coast of the Big Island feeding on certain species of macroalgae. This species does not nest in the Hawaiian Islands. The endangered honu ‘ea hawksbill turtle (*Eretmochelys imbricata*) is seen much less often but nests at certain remote beaches in the Ka‘u District. The shoreline habitat at Kolekole Gulch Park is not suitable for hawksbill turtle nests. Individuals of the Hawaiian Islands population of koholā or humpback whales (*Megaptera novaeangliae* – recently taken off the endangered species list) winter in the Hawaiian Islands from December to April and are observed in the open ocean waters throughout the State. The ‘ilio holo i ka uaua or Hawaiian monk seal (*Neomonachus schauinslandi*) is an endangered earless seal that is endemic to the waters off of the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. Although they occasionally spend time at some County parks, P&R officials are unaware of any haul-outs at Kolekole.

The Hawai‘i Watershed Atlas ([http://www.hawaiiwatershedatlas.com/ha_hilo.html](http://www.hawaiiwatershedatlas.com/ha_hilo.html)) contains information about the watershed, stream character and biota of Kolekole Stream. This perennial stream is 53.68 miles long. A small estuary is present near the highway bridge. The lower, flatter portion of the stream is only 0.7% of its length. The middle portion occupies 9.4% of the stream’s reach, with an upper area of 32.3% and headwaters of 57.6%. The area of the narrow and steep watershed is 23.2 square miles, with a maximum elevation of 11,316 feet above sea level. The percent of the watershed in the different land use districts is as follows: 33.9% agricultural, 66% conservation, 0% rural, and 0.1% urban. About 29.0% of the watershed is controlled by the State, 34.0% by the federal government, 13.8% by the Office of Hawaiian Affairs, and only 23.2% in private hands. Some 34.0% of the area is in some form of watershed protection for biodiversity. Under various watershed quality criteria, Kolekole Stream ranks roughly in the upper quartile of Hawaiian streams, and it is considered an Outstanding Stream, but not a Potential Heritage Stream, in the Hawai‘i Stream Assessment, and a U.S. Fish and Wildlife Service High Quality Stream.

Surveys of varying intensities and goals were conducted at several locations on Kolekole Stream at various dates between 1967 and 2001. The native ‘o’opu (goby) fishes *Awaous guamensis*, *Eleotris sandwicensis*, *Kuhlia xenura*, *Lentipes concolor*, and *Sicyopterus stimpsoni* have all been recorded, meaning it is highly diverse for goby fauna. Native shrimp or ʻōpae kala‘ole (*Atyoida bisulcata*) and the native prawn *Macrobrachium grandimanus* have also been present, along with native insects, including the damselflies *Megalagrion blackburni*, *Megalagrion hawaiiense*, and unspecified *Megalagrion*, as well as *Telmatogeton* sp. Various introduced species including Louisiana crayfish, guppies, amphipods, a worm, and a number of insects were also among native fauna observed in the stream. No threatened or endangered species were recorded, although it is possible that endangered *Megalagrion* could be present. Based upon existing knowledge of the stream biota, the area was rated as having biotic importance according to the DLNR.
Impacts and Mitigation Measures

The Proposed Action includes removal of nuisance non-native trees and vegetation that pose a hazard to park users, facilities or operations, or neighboring properties. This removal will be determined with the assistance of an ISA-certified arborist and will specifically target albizia, gunpowder and African tulip trees.

Because of the lack of native ecosystems or threatened or endangered terrestrial species on the project site, the Proposed Action would have no adverse impacts to native vegetation or habitat. Measures will be instituted to avoid impacts to Hawaiian hoary bats, Hawaiian hawks and listed seabirds:

- There will be no clearing of woody vegetation taller than 15 feet during the bat pupping season, which runs from June 1 through September 15 each year.
- If landclearing or tree trimming/removal occurs between the months of March and September, inclusive, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian hawk nests are present on or directly adjacent to the park, no land clearing or large tree removal will be allowed until October, when hawk nestlings will have fledged.
- All lighting will be required to be shielded in conformance with the Hawai‘i County Outdoor Lighting Ordinance to reduce the risk that seabirds may be attracted to and then disoriented by the lighting.
- No nighttime construction work is expected, but if any is necessary, it will not be allowed during the seabird-fledging season, which runs from September 15 through December 15 each year.

In terms of water quality and aquatic habitat in both Kolekole Stream and the ocean, it is important to note that the park has existed for almost a hundred years, for most of that time surrounded by sugar cane and bordered by a bridge that shed lead paint. While this environment produced pollution that was likely detrimental to stream and marine life to some degree, the aquatic life in Kolekole Stream has continued to thrive. The park itself has had almost no environmental impact. The improvements at the park are being conducted in such a manner that will further protect water quality in both construction and operation. Operationally, conducting drainage in shallow drywells, with direct piping from buildings and the shower, will improve upon the current situation, where drainage goes directly to the stream. An individual wastewater system will be installed to better treat wastewater. Separately, lead-tainted soil is planned for removal by DOT, and if necessary, coverage. The passage of time has led to the disappearance of sugar cane and reversion of much of watershed to vegetation less affected by chemical agriculture, along with lead cleanup and the standard use of BMPs in construction. Fish habitat is thus much better protected nowadays, and this project will further enhance protection. In addition to the BMPs listed in Section 3.1.2 focused primarily on runoff and sediment, the following construction BMPs to prevent runoff or pollution into the stream or ocean will be undertaken:

- In order to reduce impacts to Kolekole Stream, the shoreline, the marine environment and the organisms these contain, including threatened green sea turtle, the endangered hawksbill turtle, the formerly endangered humpback whale, and the endangered Hawaiian monk seal, a number of measures will be undertaken:
- All construction material and debris will in general be kept 50 feet or more from the edge of Kolekole Stream to avoid entanglement hazards to listed species. Any material closer than 50 feet will be
removed from the construction site unless it is being actively used. All construction debris will be fully removed at the conclusion of work.

- Turbidity and siltation from project-related work will be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse weather conditions.
- No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
- No contamination (trash or debris disposal, non-native species introduction, attraction of non-native pests, etc.) of stream bank or channel habitats will be allowed to result from project-related activities.
- Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during construction will be developed. Absorbent pads and containment booms will be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases. Any under-layer fills used in construction will be protected from erosion with stones (or core-loc units) as soon after placement is practicable.
- Any soil exposed near water as part of construction will be protected from erosion (with plastic sheeting, filler fabric, etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

3.1.5 Air Quality, Noise, and Scenic Resources

Environmental Setting

Human-caused air pollution sources on the Island of Hawai‘i include agriculture (particulates); oil-fired power plants, which emit sulfur dioxide, nitrogen oxides, and particulates; and motor vehicles, which emit carbon monoxide, nitrogen oxides and hydrocarbons (an ozone precursor), as well as smaller amounts of other pollutants. Air quality in the project area is very good and suffers few effects from these sources. However, for over thirty continuous years, volcanic emissions of SO₂ from Kilauea Volcano have converted into particulate sulfate, forming a volcanic haze, locally called vog. While vog has affected the southwest part of the island more heavily, it occasionally becomes an issue in the South Hilo area as well. Since August 2018, when eruption activity at Kilauea ceased, vog has been essentially absent.

Noise levels on the site are low and are derived mainly from passing vehicles on the State Highway bridge. Other generally minor and temporary sources include onsite recreational and landscape maintenance. There are no noise-sensitive receptors such as residences, hospitals, or office buildings near the beach park.

The Hawai‘i County General Plan (Hawai‘i County 2005:7-5) notes regarding scenic resources in South Hilo that:

“The natural beauty of the South Hilo district is dominated by Mauna Kea and Mauna Loa. From various locations in the area, there are magnificent views of the mountains. Hilo Bay provides a picturesque front yard for Hilo. From the bay the land gently slopes upward towards Mauna Kea and Mauna Loa. Throughout the district there are waterfalls, including the famous Akaka Falls and nearby Kahuna Falls, Rainbow Falls, and others.”
Kolekole Gulch is specifically called out as an example of natural beauty. No Exceptional Trees are noted from the site, but the general jungle-like landscape adjacent to a pristine stream with a waterfall tributary across from the park, near a wild, cliffed coastline, is highly scenic, and part of the attraction that draws both residents and visitors.

**Impacts and Mitigation Measures**

With the exception of controlled hazardous material removal during structure demolition discussed in Section 3.1.6, the Proposed Action would not measurably affect air quality, except temporarily and extremely minimally during construction. No mitigation should be required other than standard practices undertaken during paving to mitigate dust.

Noise impacts would occur during construction, which could generate noise exceeding 95 decibels at times, impacting nearby areas. In cases such as here where construction noise is expected to exceed the Department of Health’s (DOH) “maximum permissible” property-line noise levels, contractors are required to obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH will review the proposed activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers. Such measures, when needed, are effective in reducing noise to minimal levels. Due to the lack of sensitive nearby noise receptors, it is unlikely that any such measures would be warranted. No permanent noise impacts would occur.

The Hawai‘i County General Plan calls for preserving the quality of areas endowed with natural beauty and protecting scenic vistas and viewplanes from becoming obstructed. Although construction inevitably involves changes to the visual environment, no noticeable impacts to views or viewplanes will occur. These minor and temporary scenic impacts would not require mitigation. On a permanent basis, the Proposed Action simply replaces existing structures, some of which are dilapidated, with new and attractive facilities. The open space and viewplanes of the site will not be affected. There will be no permanent adverse visual impacts, such as interference with scenic views or insertion of incongruous or clashing visual elements. Only minor exterior security lighting is planned, and it will be shielded to protect dark skies and transiting seabirds.

The University of Hawai‘i’s Institute for Astronomy (IfA) in a comment letter expressed concerns about the lighting associated with the project (see Appendix 1b). IfA reiterated that all lighting must conform with the County ordinance, and further recommended that the minimum possible amount of outdoor lighting should be used, preferably with a motion sensor. They also requested use of blue-deficient lighting such as filtered LED lights or amber LED lights, and no fluorescent lights or high-intensity discharge lamps such as metal halide. Parking and security lighting should have a Correlated Color Temperature (CCT) of 2700 Kelvin.

P&R responded that they appreciated the IfA’s goals of reducing light pollution and are striving to accommodate them as much as possible consistent with keeping its facilities safe and secure. In cases where fixtures located outside the building are fully shielded by the building itself and are thus not required to comply with the ordinance, fixtures which are not fully shielded by the building are specified as LED with less than 2% blue light content as defined by the Code. Such lights include outdoor pole mounted fixtures and wall mounted fixtures. Both products specified are full cutoff in accordance with Table 14-A of the Code. All exterior lights are controlled via photo cell and time clock with user adjustable time parameters. Given the number and design features of the lighting fixtures, no appreciable effect on astronomical observatories would be expected.
3.1.6 Hazardous Substances, Toxic Waste and Hazardous Conditions

Existing Environment - Park Structures and Soil Conditions

As with many parks developed in the 20th century, various legacy building materials used in the construction of the pavilions and restroom are expected to contain hazardous building materials that are no longer utilized in current construction methods. Kolekole Gulch Park’s structures are no exception, and hazardous building materials, including lead paint and asbestos, are present. The risk of exposure to all of these materials tends to increase as buildings deteriorate and undergo normal wear and tear due to weather and other conditions. Some types of contaminants in the materials can accumulate over time as a result of maintenance activities (e.g., lead-based paints being scraped off the exterior of buildings can accumulate and persist in soil adjacent to the buildings). These contaminants are recalcitrant and great handling care is required during building maintenance and demolition activities. Because of the likelihood that historical contamination may be present in soil near the footprint of a structure, hazardous building material surveys frequently include soil sampling around the subject buildings. Hazardous building material surveys performed in 2019 have identified lead paint in the multiple structures at Kolekole Gulch Park and in the subsurface soil around the large pavilion at the park.

In addition to contamination associated with the park structures, growing concern about lead contamination in surface soil in broader areas of the park as a result of historical bridge maintenance activities led to the closure of Kolekole Gulch Park in 2016. Kolekole Stream Bridge, originally constructed as part of the Hilo Railroad Company and rebuilt in 1950 for the Hawai‘i Belt Road, has undergone reoccurring maintenance repainting over the decades. It was not until in 2001 that lead paint was fully removed from the bridge, thereby eliminating future new sources of lead-paint flakes.

Initial soil investigations performed by the State of Hawai‘i Department of Health (HDOH) in early 2016 indicated that lead was present in at least some areas in surface soil under the bridge at concentrations in excess of the HDOH Tier 1 Environmental Action Levels for unrestricted land use. Similar findings, all attributable to lead-based paint used on the bridges, were also associated with other bridges of the same period of construction along the Hamakua coastline.

Investigations of Hazardous Materials

As Kolekole Gulch Park is an important recreational asset to the Big Island community, the State Department of Transportation (HDOT), Highways Division, the State Department of Health (HDOH) and the County Department of Parks and Recreation (P&R) have continued to investigate the nature and extent of the contamination since 2016. A number of studies have been conducted to date, and the HDOH Hazard Evaluation and Emergency Response Office (HEER Office) has prepared a summary fact sheet (file:///C:/Users/rterr/Downloads/KolekoleGulchPark-Fact%20SheetFinal-4-28-17%20(1).pdf).

Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, direct discharge of waste streams to water bodies, mining, erosion, and through deterioration and deposition of lead-based paint (LBP). Ecosystems near point sources of lead demonstrate a wide range of adverse effect including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates. Lead is especially harmful to children who accidentally ingest small amounts of lead-impacted soil or lead containing paint.

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Lead is more harmful to children than adults because it can accumulate and persist in their bodies and young children are more sensitive to its potentially harmful effects.

Appendix 4 includes the fact sheet and the latest two studies of the area, one focused on general hazardous building material issues, which are primarily associated with structures (Lehua Environmental Inc, 2019c) and the other focused on lead contamination under Kolekole Bridge and in the open field areas of the park (EnviroQuest Inc., 2019). This section summarizes the findings of these reports.

Investigations of Park Structures: Lehua Environmental Inc. 2019

Lehua Environmental Inc. (LEI) (2019a; 2019b; 2019c) conducted surveys and sampling that analyzed the actions directly related to the accessibility project, including the demolition, rehabilitation and/or new construction of pavilions, the comfort station, walkway and parking lot. They also examined soil areas near these facilities. The objective of the survey was to identify the existence (if any), extent, and condition of any asbestos-containing material (ACM), lead painted surfaces including lead-containing paint (LCP) and lead-based paint (LBP), arsenic-containing building materials (ArCBM), mercury-containing lamps and polychlorinated biphenyl (PCB)-containing light ballasts. The following provides a summary of findings:

- **Asbestos.** Asbestos was detected only on the roof of Pavilion 4 in the black mastic in the bathroom exhaust pipe seal.
- **Arsenic-Containing Building Materials.** LEI personnel did not identify suspect ArCBM at the project site.
- **Mercury-Containing Lamps/switches and PCB-Containing Light Ballasts.** LEI personnel did not identify any previously unidentified mercury containing lamps/switches and PCB-containing light ballasts at the project site.
- **Lead Paint on Surfaces.** LEI collected 65 paint samples from various surfaces throughout the project site. Paint chip laboratory results indicated that 54 contained detectable concentrations of lead at levels less than 5,000 mg/kg or were identified to have an elevated laboratory detection limit and are considered and/or assumed to be Lead-Containing Paint (LCP). Four of the sampled painted building components contained lead in excess of the EPA/HUD guideline of 5,000 mg/kg and were considered to be Lead-Based Paint (LBP).
- **Total Arsenic in Soil:** Total arsenic was detected in the surface and subsurface soil samples of five of the 10 DUs at concentrations that exceed the relevant EAL for arsenic.
- **Bioavailable Arsenic in Soil:** Because elevated concentrations of arsenic naturally occur in Hawaiian soils, and the legacy of arsenic as a pesticide in sugar cane cultivation can add to this, it is important to consider the bioaccessibility of arsenic as well as its total level. Additional laboratory tests using the original soil samples are performed to measure the bioaccessible arsenic content in the fine fractions the soil (<200 micrometers). It is often the case that the fraction of arsenic that can be metabolized after ingestion is far lower than the total arsenic in a given sample. Environmental regulatory agencies now consider the degree of bioavailability of arsenic and other metal contaminants in risk assessments and remedial action evaluations (USEPA 2007). When the Kolekole Gulch Park soil samples were tested, bioaccessible arsenic concentrations did not exceed the relevant arsenic DOH EAL for unrestricted land use.
• **Lead in Soil:** As discussed above, in initial investigations by HDOT of lead contamination thought to come from the bridge, lead was detected in an area *makai* of the parking lot (DOH 2016). Subsequent investigations by P&R (Lehua Environmental 2019c) of the soil near the three pavilions (Pavilions 2, 6, and 7) on the east slope of the park found lead at concentrations in DU 4 at (230 mg/kg) that exceeded the relevant lead DOH EAL (200 mg/kg) for unrestricted land use. The surface soils in DU 3, overlaying DU4 (subsurface soil from 6 - 12 inches deep), did not exceed 200 mg/kg. The LEI surface soil sampling results in the area between the pavilions were consistent with those of the previous investigation performed by HDOT in this area (Environmental Science International [ESI] 2017b).

• **Chlordane in Soil:** Organochlorine pesticides were not detected in the sampled surface and subsurface soils of the project site at concentrations that exceed the relevant DOH EALs.

Areas near the pavilions with soils found to exceed the Hawai‘i DOH EAL for unrestricted land use for lead in soil would undergo remediation in accordance with a plan being developed, as discussed below.

**Investigations of Lead Associated with Bridge Maintenance Activities: HDOD 2016**

For surface soil impacted by historical bridge maintenance activities, several investigation have been performed. In November 2016, under the oversight of the HEER Office, a response action began for assessment of the lead-impacted soil around Kolekole Stream Bridge and within Kolekole Gulch Park. Initially, multi-increment soil samples were collected from four DUs at a depth of 0 to 3 inches bgs.

Soil sampling and analysis were conducted, and the results showed that lead-impacted soils were present over a large area under and *mauka* of the bridge. The lead levels exceeded environmental action levels (EALs: the level of concentration of a harmful or toxic substance or contaminant that when exceeded is considered sufficient to warrant regulatory or remedial action) established by HDOH for public parks, which are 200 milligrams/kilogram (mg/kg). All DU sample results exceeded 200 mg/kg for lead, varying from 236 mg/kg to 664 mg/kg. The average lead result for the park was 465 mg/kg, exceeding the USEPA screening level of 400 mg/kg for residential levels (HDOH 2017). The presence of lead in soil above the HDOH action level does not necessarily indicate a risk to users of the park. It does, however, indicate that precautions are necessary to minimize exposure as cumulative lead exposure has shown to adversely impact human health.

**Investigations of Lead Associated with Bridge Maintenance Activities: ESI 2017**

Following the first investigation, Kolekole Beach Park users were initially advised to avoid bare soil exposures and maintain good hygiene, including washing hands before eating, and cleaning soil from shoes and personal items prior to leaving the park.

In 2017, ESI prepared a series of reports (2017a; 2017b; 2017c) based on surface soil sampling and analysis and was able to determine the extent of lead-impacted surface soil contamination (0 to 3 inches below ground surface) across most of the park area (Figure 7a). A 2019 investigation by EnviroQuest Inc. (EQI) allowed HDOT and P&R officials to plan the most feasible remedial alternatives. The EQI investigation evaluated subsurface lead concentrations at various depths below decision units (DUs) where lead exceeded HDOH EALs in surface soil based on the ESI sampling (Appendix 4).
For soil sampling, the project site was divided into various DUs based on the planned soil disturbance activities. The purpose was to investigate and the presence of arsenic-, lead- and organochlorinated pesticide-contaminated soil. A total of 22 DUs were delineated in the combined studies. Multi-increment sampling (MIS) soil sampling was conducted so that reproducible data, representative of average background concentrations, could be obtained for use as reference control data. The MIS method is recommended by HDOH and is considered standard practice for evaluating contaminants of potential concern in soil. The results of the soil screen survey were used to determine if these soils may pose a potential health risk to construction workers and the general public during the renovation work at the project site and to determine appropriate soil management and disposal practices. All evaluations were made in the context of DOH EALs for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is less than 150 meters.

The following were the key findings:

- ESI’s 2017 investigation performed in May 2017 at eleven DUs had sample results that varied from 3.5 mg/kg to 530 mg/kg for lead (ESI 2017). The assessment consisted of collecting surface soil sample (0 to 3 inches below ground surface [bgs]) from 21 decision units [DUs] at the site and analyzing the samples for lead. Lead was detected at concentrations ranging from 3.5 to 664 mg/kg. Lead was detected in surface soil (0 to 3 inches bgs) at concentrations above the HDOH HEER Office EALs for unrestricted land use in seven DUs (DUs 1, 2, 3, 4, 10) (ESI, 2017a, 2017c, 2017d). Results of the DUs that exceed 200 mg/kg are shown in Figure 7b.

It is notable that the laboratory results of surface soil DUs samples collected by ESI around the pavilion structures in 2019 did not identify concentrations of lead in excess of 200 mg/kg (ESI, 2017).

Follow-up testing was conducted by EQI to evaluate the lead concentrations at various soil layers, in order to determine the volume of soil that would need to be removed as part of a future remedial action at this site. Sampling was conducted in areas where surface soil was known to be impacted based on previous investigations. In addition to sampling in the same spatial DUs that where surface soil was previously in earlier investigations, vertical DUs were established in EQIs investigation where sampling was conducted in 3-inch deep layers (3 to 6 inches and 6 to nine inches deep). The deepest layer was nine inches thick and extended from 9 to 18 inches below ground surface (EQI 2019).

The levels of contamination for various depths for this study were classified according to EALs for several types of situations: Unrestricted (below 200 mg/kg), Construction/trench worker direct exposure (between 200 and 800 mg/kg), Exceeds construction/trench worker direct exposure (between 800 and 1,000 mg/kg), and Gross contamination (over 1,000 mg/kg) as shown in Figure 7c.

Subsurface areas with lead in excess of 200 mg/kg (residential exposure EAL) and 800 mg/kg (construction/industrial worker exposure EAL) identified in the combined soil investigations (LEI 2019 and EQI 2019) include areas around the pavilion and in several of the same DUs in the greater park that have been identified to have lead-impacted surface soil as shown in Figure 7d.
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Figure 7a. Initial Lead Study Surface Soil Decision Units

Figure 7b. Decision Units with Lead-impacted Surface Soil

Legend
Decision Units with Surface Soil Total Lead > 200 mg/kg
(0-3 inches below ground surface)

Note: mg/kg = milligrams per kilogram
Preliminary estimates of the volumes of material of various levels of contamination in various areas of the park were generated to assist in preliminary planning of appropriate remedial alternatives in the Supplemental Lead Assessment for Kolekole Beach Park (EQI, 2019), as discussed in the mitigation section, below.

Other Potential Sources of Environmental Concern

In terms of other potential hazardous materials or conditions beyond the known hazardous building materials and lead-impacted soil described in the above sections, State databases did not indicate any Underground Storage Tanks (USTs), Leaking Underground Storage Tanks (LUSTs), or records of incidents or releases on the site or in surrounding properties ([https://eha-cloud.doh.hawaii.gov/iheer/#/viewer](https://eha-cloud.doh.hawaii.gov/iheer/#/viewer)).

Although it is unlikely that any additional hazardous, toxic or radioactive waste would be found on the project site, reasonable precautions will be undertaken in the context of construction best management practices to include provisions for the appropriate response and remediation should any such hazardous, toxic, or radioactive material be encountered during the construction phase of the Proposed Action.

To deal with the hazardous materials associated with the park structures, the following actions will be implemented:

- Manage and/or remove and dispose of hazardous and regulated materials in accordance with applicable local, state, and federal regulations, prior to renovation and/or demolition activities that may disturb these materials.
- Remove and dispose of all loose and flaking (poor condition) lead-containing paint and lead-based paint that may be disturbed during renovation and/or demolition activities in accordance with applicable local, state, and federal regulations.
- Spot remove and dispose of lead-containing paint and lead-based paint in areas that have the potential to become airborne or otherwise create dust (i.e. from sanding, drilling, friction, etc.) during renovation and/or demolition activities.
- Any non-friable ACM, which could be crumbled and pulverized during renovation and/or demolition activities, will be removed and disposed of by a qualified asbestos abatement contractor. In addition, the services of a qualified consultant will be obtained to monitor and inspect the removal activities to ensure compliance with applicable Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and Hawaii Occupational Safety and Health (HIOSH) regulations pertaining to the handling of asbestos-containing material.
- Any abatement, renovation and demolition contractor(s) will take appropriate measures to comply with applicable EPA, OSHA and HIOSH regulations pertaining to the handling of asbestos-containing materials, lead paint and lead contaminated soils/dusts and worker protection. Air monitoring for airborne lead, asbestos and arsenic dusts will be conducted by qualified personnel during any lead and asbestos abatement, lead-contaminated soil disturbance and general renovation/demolition activities of areas that were determined to contain these contaminants.
Figure 7c. Vertical Delineation of Lead-impacted Soil Layers Decision Units

Figure 7d. Lead-impacted Subsurface Soil Decision Units
Mitigation Measures

HDOT, P&R and HDOH-HEER are working jointly to prepare and implement an action plan that will address remediation for lead-impacted soil and allow Kolekole Park to be reopened and safely enjoyed. The plan currently being considered consists of a combination of two distinct actions:

1. Removal of lead-contaminated soil in excess of 200 mg/kg, packing with appropriate containment materials for transport, and transporting the soil to an approved landfill for non-hazardous material lead contaminated soil, in accordance with Federal and State rules and regulations. This would likely be West Hawai‘i Sanitary Landfill, which is approved to accept waste with concentrations similar to those identified at Kolekole Gulch Park.

2. Where lead-contaminated soil in excess of 200 mg/kg cannot be completely removed, soil cover will be utilized. In this method, areas are first covered with orange mirafi (geotextile) or black geotextile with caution tape laid at intervals to produce a visible barrier between the clean and impacted soils. Clean fill is then overlaid across the impacted areas at the site to form a layer between 12 inches and 36 inches thick (thicker being more protective of accidental breaching cover). Additionally, a grass turf cover would be maintained to prevent erosion of the clean layer. This method has been approved for use in open spaces by the Hawai‘i Department of Education and HDOH at 18 schools in East Hawai‘i.

At this point, it appears that most of the site will undergo complete removal of contaminated soil, with limited areas (if any) where contaminated soil will be marked and encapsulated. In the end, this will help remediate environmental contamination from the past, result in a park that can safely be utilized by the public and avoid or minimize perpetual soil management obligations on the part of the County and/or State.

Special precautions for lead-impacted soil will be necessary for construction of any new facilities prior to the remediation action. This will be especially true for the individual wastewater treatment systems (IWWTS) (septic and leach field) that will extend makai of the comfort station, as it will involve excavation. This open field area where the IWWTSs are planned is in a DU that has been identified to have lead-impacted soil greater than 200 mg/kg in the 0-3 inches below ground surface (bgs) layer as well as the 3-6 inches bgs layer based on the findings of two previous investigations (ESI, 2017 and EQI, 2019). As this construction may occur before the site is completely remediated as discussed above, it may be necessary to test and deal with the soil before those actions are accomplished.

To minimize the potential for lead-impacted soil contaminating another location during excavation activities, this soil will be managed carefully. This would include stripping off the 0-6 inch soil layer and placing that soil horizon in containment cells made of polyethylene sheeting (20 mil thickness). That soil could potentially be reused depending on the remedial action alternative that HDOT and P&R select to address the lead-impacted soil across the entire site. Alternatively, it could be disposed of at West Hawai‘i Sanitary Landfill and replaced with clean fill. It will be important to coordinate the planned construction activities to ensure that the most efficient method can be achieved for this aspect of the project. HDOH will require that a Preconstruction Exposure Hazard Management Plan (EHMP) be prepared and reviewed prior to the start of the construction project. The EHMP will be specific to the planned construction activities and will provide a description of the known exposure hazards and will outline a plan for
managing the soil to protect the construction workers and the general public during the project for the duration of the project lifecycle. Following the completion of the project, a brief report documenting where the excavated soil was re-used, or disposed of, as well as the results of any soil testing results that may have been performed shall be prepared and submitted to HDOH.

Finally, throughout the site, the following construction-phase and long-term additional practices will also be implemented:

- Dust control practices during soil disturbance activities, containment of temporary soil stockpiles, and monitoring by a designated competent person;
- Use of good general hygiene practices for employees and workers to avoid contaminated soil exposure.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

The Proposed Action would affect and benefit residents of the South Hilo District, Hawai‘i Island in general, and visitors to the Big Island. The immediate project area is between the communities of Honomū and Hakalau/Wailea, which are historic plantation towns.

Table 2 provides information on the population and socioeconomic characteristics of the Honomū Census Designated Place and the County of Hawai‘i from the U.S. 2010 Census of Population. As with nearly all locations in the State, both areas display marked socioeconomic diversity, with no census-classified racial group representing the majority anywhere. Both have some of the highest “Two or More Races” responses of anywhere in the U.S., at more than 29%. However, there are differences, in that Honomū’s population is skewed older, with associated lower average household sizes. Also, Honomū has far fewer housing vacancies, a figure that is higher in the County as a whole that can primarily be attributed to the resort and second homes in West Hawai‘i.

<table>
<thead>
<tr>
<th>Table 2: Selected Socioeconomic Characteristics</th>
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<tr>
<td>Population, 2010</td>
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<td>Population, 2010</td>
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<tr>
<td>Persons under 5 years, percent</td>
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<td>Persons under 18 years, percent</td>
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<td>Persons 65 years and over, percent</td>
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<td>Female persons, percent</td>
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<td>White alone, percent</td>
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<td>Black or African American alone, percent</td>
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<td>American Indian and Alaska Native alone, percent</td>
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<td>Asian alone, percent</td>
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<tr>
<td>Native Hawaiian and Other Pacific Islander alone, percent</td>
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<tr>
<td>Two or More Races, percent</td>
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<tr>
<td>Hispanic or Latino, percent</td>
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<tr>
<td>Vacant housing units</td>
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<tr>
<td>Owner-occupied housing units</td>
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<tr>
<td>Persons per household</td>
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Visitors are also important users at Kolekole Gulch Park. According to the latest summary of State of Hawai‘i-sponsored research, arrivals to Hawai‘i Island were up 13.6 percent to 1,761,489 visitors in 2017, and visitor days were up 10.9 percent from 2016. The average daily census rose 11.2 percent to 35,412 visitors present on any given day, about one-sixth of the resident population. About half (47.9%) of these visitors spent their time exclusively on the island of Hawai‘i. The largest group of visitors to the island of Hawai‘i continued to be from U.S. West (40.3%), followed by U.S. East (26.6%), Japan (10.8%), Canada (5.9%), Other Asia (5.1%), Oceania (3.7%) and Europe (3%). The majority (82.4%) of the visitors came to the State for a vacation. Six out of ten (59.3%) visitors to the island of Hawai‘i stayed in hotels while in the State. Some visitors stayed in condominiums (17.3%), rental homes (13.1%), timeshares (9.9%) and with friends or relatives (9.9%) (HTA 2018). Data indicate that there was a decline from these record 2017 levels in 2018, due mainly to natural disasters including volcanic eruptions, earthquakes and several hurricanes. Visitor numbers are increasing again in 2019. Visitors who travel around the island by car or in tour vans often stop at Honomū to visit Akaka Falls. Some visitors also choose to stop at Kolekole Gulch Park, which is featured in various tour guides. When camping was allowed at the park prior to its closure in 2016, many visitors would camp at the park with permits issued by P&R.

Impacts and Mitigation Measures

The Proposed Action would benefit recreational users, whether residents or visitors, by providing ADA-accessible facilities, including restroom, parking, showers and walkways. Aside from the beneficial impacts parks have, they may also generate minor amounts noise and traffic, attract unwanted activities, and pose a nuisance for very close neighbors. However, in this case, the nearest residents in Hakalau/Wailea would not be adversely affected in any substantial way. The park already exists, and no increase in nuisances would occur as a result of improving ADA accessibility.

3.2.2 Cultural and Historic Resources

A cultural impact assessment of the Proposed Action and an archaeological inventory survey of the property were conducted by ASM Affiliates, Inc. The reports are attached as Appendices 2 and 3, respectively, and are summarized in this section and the one below. Research for the reports included primary fieldwork, consultation of informants, and review of archaeological and ethnographical studies and primary documents including maps and Mahele testimony. In the interest of readability, the summary below does not include all scholarly references; readers interested in extended discussion and sources may consult these appendices. Separately, the Office of Hawaiian Affairs, Councilperson Valerie Poindexter, the Sierra Club and six nearby property owners were also consulted by mail, email, in person, and/or telephone as part of the EA to determine whether they had any information on natural or cultural resources that might be present or affected, and additional research on cultural resources and impacts was conducted.
Historical and Cultural Background

The first inhabitants of Hawai‘i are believed to be settlers who undertook difficult voyages across the open ocean. For many years, researchers proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawai‘i were underway by A. D. 300, but recent work suggests that Polynesians may not have arrived in Hawai‘i until at least A. D. 1000 (Kirch 2012).

The initial inhabitants of Hawai‘i appear to have come from the southern Marquesas Islands and settled initially on the windward side, eventually expanding to leeward areas. Early Hawaiian farmers developed new strategies and tools for their novel environment (Kirch 2012; Pogue 1978). Societal order was maintained by traditional philosophies and the conical clan principle of genealogical seniority (Kirch 2012). Universal Polynesian customs brought from their homeland included the observance of the major gods Kane, Ku, and Lono; the kapu system of law and order; cities of refuge; and the concepts of mana and ‘aumakua (Fornander 1969).

The Development Period, estimated under Kirch’s new concept to be from A. D. 1100 to 1350, saw an evolution of traditional tools, including a variation of the adze (ko‘i), and some new Hawaiian inventions such as the two-piece fishhook and the breadloaf sinker octopus-lure. That was followed by the Expansion Period (A. D. 1350 to 1650), which saw greater social stratification, intensive land modification, and population growth. This period was also the setting for the second major migration to Hawai‘i, this time from Tahiti. Also established during this period was the ahupua‘a, a land-use concept that incorporated all of the eco-zones from the mountains to the shore and beyond. The nominally wedge-shaped ahupua‘a provided a diverse subsistence resource base (Hommon 1986) and added another component to what was already becoming a well-stratified society (Kirch 2012).

As population grew during the following centuries, so too did the reach of inland cultivation in the upland environmental zones, accompanied by political and social stresses. During the Proto-Historic Period (A. D. 1650-1795), wars reflective of a complex and competitive social environment are evidenced by heiau building. During this period, sometime during the reign of Kalaniopu‘u (A. D. 1736-1758), Kamehameha I was born in North Kohala.

Ahupua‘a were ruled by ali‘i ‘ai ahupua‘a or lesser chiefs and managed by a konohiki. Ali‘i and maka‘ainana, or commoners, were not confined to the boundaries of ahupua‘a, as resources were shared when a need was identified. Ahupua‘a were further divided into smaller sections such as ‘ili, mo‘o‘aina, pauku‘aina, kihapai, koele, hakuone and kuakua. The chiefs of these land units have their allegiance to a territorial chief or mo‘i (literally translated as king) (Hommon 1986). Kolekole Gulch is located within the ahupua‘a of Kuhua. The word kuhua has been literally translated by Pukui and Elbert (Pukui and Elbert 1986:174) as “to thicken,” or “to become pasty; to gel.” Kolekole Gulch and Kuhua are celebrated for being the stream of ‘Akaka Falls. Kuhua is part of the traditional moku-o-loko or district of Hilo, within what is now the judicial district of South Hilo. Hilo comprises dozens of ahupua‘a on the eastern windward shores of Hawai‘i Island. As Kahua Ahupua’a encompasses both mauka agricultural and forest resources and makai fisheries, residents were once able to procure nearly all that they needed to sustain their families and contribute to the larger community from within the land division.
Traditionally, the **moku** of Hilo was divided into three ‘*okana* (land divisions) with place names that have their origins in legendary times. The three divisions are (from north to south): Hilo Palikū, Hilo One, and Hilo Hanakahi. Kolekole Gulch Park is within Hilo Palikū or “Hilo of the upright cliff” (Pukui et al. 1974:46), which extends north from the Wailuku River to Kaʻula Gulch (Maly and Maly 2006). In *Pele and Hiʻiaka*, Emerson recounted a *mele* that Hiʻiaka sang while journeying between Hilo and Puna through the forest territory of the *moʻo* Panaʻewa, which mentions the area (1993:32-33):

\[
\begin{align*}
Pau ke aho i ke kahawai lau o Hilo & \quad \text{One’s strength is exhausted, climbing, climbing} \\
He lau ka puʻu, he mano ka ihoana & \quad \text{The countless valleys and ridges of Hilo,} \\
He mano na kahawai o Kulaʻi-po & \quad \text{The streams without number of Ku-laʻi-po,} \\
He wai Honoliʻi, he pali o Kama-eʻe, & \quad \text{The mighty water of Hono-liʻi, the precipice walls of} \\
He pali no Koolau ka Hilo-pali-ku & \quad \text{Kama-eʻe} \\
He pali Wailuku, he one ke hele ia; & \quad \text{And the pali of Koʻolau: Such a land is Hilo-pali-ku.} \\
He one e keʻehia la i Wai-olama. & \quad \text{The banks of Wailuku are walls; the road to its} \\
& \quad \text{crossing but sand;} \\
& \quad \text{Sandy the way at Wai-o-lama.}
\end{align*}
\]

Kepā and Onaona Maly provided additional information about Hilo Palikū in their translation of a legendary account called “*Kaʻao Hoʻoniua Puʻuwai no Ka-Miki*” (“The Heart Stirring Story of Ka-Miki”). This legend was originally published in Hilo’s Hawaiian Language newspaper *Ka Hōku o Hawaiʻi*:

Of Hilo Paliku it is said, one becomes short of breath traveling through Hilo, for there are many (400) hills, many (4,000) areas to descend, and many (40,000) streams, indeed while swimming through the waters of Hilo one becomes out of breath, but one is never out of water at Hilo! (Maly and Maly 2006:13)

Pukui (1983:107) provided a further poetic description of Hilo Palikū in an ‘*olelo no ‘eau* or poetical saying:

\[
\begin{align*}
\text{Hilo iki, pali ‘eleʻele.} \\
\text{Translation: Little Hilo of the dark cliffs.} \\
\text{Interpretation: Hilo-pali-ku, or Hilo-of-the-standing-cliffs, is always green because of the rain and mists.}
\end{align*}
\]

Traditional *moʻolelo* (stories, tales, and myths) associated with ‘Akaka Falls reference large *pōhaku*, or stones, located around the waterfall. According to the following version of the legend published in *Place Names of Hawai‘i* by Pukui et al. (1974:8), when a stone called *Pōhaku-a-Pele* (stone of Pele) is struck by a *lehua-ʻapane* (a red blossom from the ‘*ōhiʻa* tree) branch, the sky darkens and rain falls. Additionally, a large stone located 70 feet upstream from the crest of the waterfall is named *Pōhaku-o-Kāloa* (ibid). Perhaps one of the most famous *moʻolelo* associated with this waterfall concerns a young man from Honomū Ahupuaʻa named ‘Akaka. One version tells of this young man and his two lovers, Lehua and Maile. It is said that after ‘Akaka fell to his death over the falls the two women wept, heartbroken over the loss of their lover. Their tears are said to be seen in a ravine close by until this day, disguised as two smaller waterfalls.
In an excerpt taken from the book, *Ka Lei Ha‘aheo: Beginning Hawaiian* (Hopkins 1992), Edith Kanaka‘ole, a Hawaiian cultural practitioner born in Honomū, tells another version of the story titled “No Ka Wailele ‘o Akaka” (Concerning ‘Akaka Falls). Kanaka‘ole’s story tells of the young man who lived with his grandmother in Honomū. One evening Akaka’s grandmother washed his *malo* and hung it over the fire to dry. The next morning, he woke up, grabbed his *malo* and dressed himself so he could go outside and play with his two friends. As they played, the two girls caught a hint of a pungent burnt aroma that came from ‘Akaka and the girls began teasing him. Completely embarrassed, ‘Akaka ran home, fell into his grandmother’s lap and wept. In total despair, ‘Akaka grabbed his dog and followed the trail up to the waterfall. Standing at the edge of the cascade both ‘Akaka and his dog jumped off the waterfall, plunging to their death below and numinously transformed into *pōhaku* (stones). Brokenhearted upon discovering her grandson and his dog at the bottom of the waterfall, ‘Akaka’s grandmother wept until she too turned into a rock at the crest of the waterfall (ibid.).

As presented in Appendix 2, numerous *moʻolelo* illustrate the traditional history of the area and are replete with references to the unique setting and its resources. One long account makes specific references to the Kolekole area, where the local place names are embodied as supernatural protagonists in epic battles of both *lua* (hand-to-hand combat) and riddling wordplay.

King David Kalākaua (1888:284) described the lands of the northern portion of Hilo as he recounted the tale of ‘Umi-a-Līloa presented in his book, the *Legends and Myths of Hawai‘i*. His description of the region is taken from a time when North Hilo and Hāmākua were in the thick of the commercial sugar industry, where only traces of Hawaiian agriculture remained:

The northeastern coast of the island of Hawaii presents an almost continuous succession of valleys, with intervening uplands rising gently for a few miles, and then more abruptly toward the snows of Mauna Kea and the clouds. The rains are abundant on that side of the island, and the fertile plateau, boldly fronting the sea with a line of cliffs from fifty to a hundred feet in height, is scored at intervals of one or two miles with deep almost impassable gulches, whose waters reach the ocean either through rocky channels worn to the level of the waves, or in cascades leaping from the cliffs and streaking the coast from Hilo to Waipio with lines which seem to be molten silver from the great crucible of Kilauea.

In the time of Liloa, and later, this plateau was thickly populated, and requiring no irrigation, was cultivated from the sea upward to the line of frost. A few *kalo* patches are still seen, and bananas grow, as of old, in secluded spots and along the banks of the ravines; but the broad acres are green with cane, and the whistle of the sugar-mill is heard above the roar of the surf that beats against the rock-bound front of Hamakua.

*Native Planters in Old Hawaii* (Handy et al 1972:538-9) discussed traditional planting areas and methods in the North Hilo area. Irrigated taro was planted in *lo‘i* along streams. Although nearby Hakalau and Honomū Streams are noted as irrigated taro valleys, Kolekole Gulch is not.

Traditional life in Hawai‘i took a sharp turn on January 18, 1778 with the arrival of British Capt. James Cook. During Cook’s return trip to Hawai‘i ten months later, Kamehameha visited Cook aboard his ship.
the Resolution off the east coast of Maui and helped Cook navigate his way to Hawai‘i Island. Cook exchanged gifts with Kalaniopu‘u at Kealakekua Bay the following January. Cook attempted to depart Hawai‘i in February, but his ship immediately sustained damage to a mast in a severe storm off Kohala and returned to Kealakekua, setting the stage for his death on the shores of the bay.

During the Proto-Historic Period there was a continuation of the trend toward intensification of agriculture, ali‘i-controlled aquaculture, settling of upland areas and development of traditional oral history. The Ku cult, luakini heiau and the kapu system were at their peaks, but the influence of Western civilization was being felt in the introduction of trade for profit and a market-system economy.

By 1810, commerce in sandalwood established by Europeans and Americans for Chinese markets was flourishing. Farmers and fishermen were required to toil at logging, which resulted in food shortages and a decline in population. The rampant sandalwood trade led to the first Hawaiian national debt, as promissory notes and levies granted by American traders were enforced by American warships. The assimilation of Western ways continued with the short-lived whaling industry and later, commercial sugarcane, which was more lucrative but carried a heavy environmental price.

Following the death of Kamehameha I in 1819, the customary relaxing of kapu took place. But with the introduction of Christianity shortly thereafter, his successor, Kamehameha II, renounced the traditional religion and ordered that heiau structures either be destroyed or left to deteriorate. The family worship of ‘aumakua images was allowed to continue.

In 1823, British missionary William Ellis and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawai‘i scouting communities in which to establish church centers for the growing Calvinist mission. Ellis recorded observations made during this tour in a journal, including Hilo Palikū:

> The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, with the streams meandering through them into the sea, presented altogether a most agreeable prospect. The coast was bold, and the rocks evidently volcanic. We frequently saw water gushing out of hollows in the face of the rocks, or running in cascades from the top to the bottom (Ellis 1826:316).

Overland travel across the much of the Hilo District remained difficult throughout the early 19th century due to its rugged coastline and many deep gulches. Initial commercial exploitation of these lands was limited to small scale agriculture in areas with coastal access for shipping and receiving goods. The Reverend Titus Coan, who settled at the Hilo Mission Station in 1835, wrote that:

> For many years after our arrival there were no roads, no bridges, and no horses in Hilo, and all my tours were made on foot. . . The path was a simple trail, winding in a serpentine line, going down and up precipices, some of which could only be descended by grasping the shrubs and grasses, and with no little weariness and difficulty and some danger. (Coan 1882:31–32).
By the mid-19th century the first roads had been established along the coast of South Hilo, perhaps following the route of the older path described by Coan (PHRI 1991). These first roads, designed for travel on horses and in carts, were likely developed by land holders, primarily sugar growers, looking to connect their plantation lands. Chester S. Lyman, travelling from Kawaihae to Hilo with the Reverend Titus Coan on June 19, 1846, recorded his trip, which began with a visit to ‘Akaka Falls:

The gulf into which the water falls, is of a circular, or rather semicircular form with perpendicular walls of nearly naked lava rock some 400 or 500 feet high. Except on the face of this horse shoe precipice the two steep sides of the ravine are clothed with a dense mass of wanton vegetation. The stream falls in an unbroken mass of white foam down the face of this precipice into a basin below. Smaller rills were falling from the sides of chasm & such was the force of the wind circulating here that the whole gulf below the falls was filled with spray & mist, so that one approaching near the bottom of the cascade was soon wet to the skin. The Basin into which the water falls is several rods in diameter & the perpendicular height of the falls as measured with a line by Mr Coan is 426 ft. We threw down several stones and found them to occupy from 4¾ to 5¼ seconds in falling, which w[e] give a depth corresponding with Mr Coan’s measurement. (Lyman 1925:81)

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled the area and described the landscape:

The coast to the north of Hilo is slightly peculiar: it is a steep bluff, rising about two hundred feet; this is cut into small breaks here called “gulches,” within which the villages are generally situated, and the natives grow banana and taro. In some places they cultivate small patches of sugarcane, which succeed well (Wilkes 1845).

The Mahele ‘Aina took place in 1848, placing all land in Hawai‘i into three categories: Crown Lands, Government Lands and Konohiki Lands. Ownership rights were “subject to the rights of the native tenants,” or those individuals who lived on the land and worked it for their subsistence and for their chiefs. As a result of the Māhele, Kuhua Ahupua‘a was returned as commutation by Mataio Kekuanāo‘a on behalf of his daughter, Victoria Kamāmalu, and retained as Government Land.

Native tenants could claim and acquire title to kuleana parcels that they lived on or actively farmed at the time of the Māhele. The Kuleana Act of December 21, 1849 provided the framework by which native tenants could apply for and receive fee-simple interest in their kuleana lands from the Land Commission. The Board of Commissioners oversaw the program and administered the lands as Land Commission Awards (LCAw.). No claims were made for kuleana lands within Kuhua Ahupua‘a during the Māhele ‘Āina of 1848.

In conjunction with the Māhele, the King also authorized the issuance of Royal Patent Grants to applicants for tracts of land that were set aside and sold as grants ranging in size from one to fifty acres at a cost of fifty cents per acre. The stated purpose of this program was to enable native tenants, many of whom were not awarded kuleana parcels during the Māhele, to purchase lands of their own. Despite the goal, it provided the mechanism that allowed many foreigners to acquire large tracts of the Government Lands. Kolekole Gulch Park comprises portions of three Land Grant parcels (616:1 and 2, and 2933)
purchase by Kaawa in 1851 and 1863. Details of the grants are discussed in Appendix 2. Of note on accompanying maps were the route of the Old Māmalahoa Highway, the potential location of the Kaawa house (located on the tablelands high above and to the southeast of the park), as well as a ford crossing, indicating a shallow place within Kolekole Stream where one could walk or ride across.

Prior to the 1870s, the cultivation of sugar cane was becoming an important economic activity that also transformed land use in many districts of the Hawaiian Islands. This included the Hāmākua Coast, where population rapidly dropped in the mid-19th century as a result of both epidemics and migration of rural inhabitants to towns and cities. Following the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawai‘i that guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, a number of new sugar plantations incorporated in the Islands.

In 1880, M. Kirchoff & Company, along with C. Brewer & Company, Ltd. as agent, established Honomū Sugar Company on 2,400 acres of land within the South Hilo District, including the land that is now Kolekole Gulch Park (Dorrance and Morgan 2000). The Honomū Sugar Company mill was located on the coast, and the upper region of Honomū was interspersed with small-farm homesteaders. In 1890 the plantation was producing 2,000 tons of sugar yearly. Initially, no Hilo coast plantation had a railroad, so fluming was extensively utilized. The Honomū Sugar Company shipped its product from Honomū Landing to Honolulu via inter-island vessels that anchored offshore, an expensive, laborious and weather-dependent method of shipping cane.

The rise of the sugar industry was closely intertwined with the development of rail transportation, which was the focus of both governmental and private sector planning following the Treaty of Reciprocity. On the Island of Hawai‘i, the first major line to be constructed was in the North Kohala District, which operated as the Hawaiian Railroad Company. The North Kohala line was envisioned as only the first step toward a much larger system connecting the cane fields of Kohala, Hāmākua, and Hilo with Hilo Harbor, the only protected deep-water port on the island. Beginning in 1899, railroad lines began transporting sugar to the harbor for marine transport, and Hilo became an important shipping and railroad hub.

Lorrin A. Thurston, who according to Thrum had “been connected with the enterprise from its initiation” (Thurston 1913:142), wrote an article upon the completion of the railroad from Hilo to Pa‘auilo in May of 1913 entitled “Railroading in Hilo,” which was published in Thrum’s Hawaiian Annual and Almanac for 1914. Thurston reported that the Hilo Railroad Company (HRC) began by laying tracks in 1899 from Waiākea south to ‘Ōla‘a and onwards to Kapoho. The initial distance of twenty-five miles was completed by April 1901. Later that same year, the track was extended along the waterfront of Hilo to the Wailuku River, at the foot of Waianuenue Street (ibid.:143). In 1903, HRC constructed a wharf at Waiākea and completed a branch line connecting it to the waterfront line. The commercial sugar industry provided most of the cargo transported by HRC but suffered a sharp decline between the years of 1904 and 1907, which in turn halted development in Hilo (Thurston 1913).

In response, HRC worked with ‘Ōla‘a Sugar Company to send a representative to Washington D.C. in 1907 to secure funding for the construction of a breakwater that would allow Hilo Bay to accommodate larger ocean-going vessels. Many in Congress opposed the appropriation because of the limited commerce then being transacted through Hilo harbor. The HRC made assurances that if the breakwater were
constructed, a railroad would be built into the country north of Hilo and suitable wharf facilities provided near the breakwater. These assurances had a material effect in securing the appropriation. (ibid.:145). Construction on the breakwater began in 1908 and was still ongoing at the time of Thurston’s writing (ca. 1914); the breakwater was finally completed in 1929. The HRC made good on its pledge, building a new wharf, a one-mile rail extension from Waiakea, and a 50-mile rail extension north to Honoka’a Mill.

The extension to Honoka’a would finally connect the sugar mills of South Hilo, North Hilo, and Hāmākua with Hilo’s protected harbor. Between June 1909 and December 24, 1911, HRC built 12.7 miles of rail extending from Hilo to Hakalau Mill, crossing many deep gulches and valleys along its route. This was followed by the construction of an additional 21 miles of rail that connected Hakalau with Pa‘auilo to the north. The 34-mile segment was known as the “Hamakua Division” (ibid.:146). Thurston described the scenery along the Hamakua Division as follows:

Incidentally, the [rail] road has opened up one of the most remarkable, unique and spectacular scenic routes to be found in any part of the world. It may appear impossible for a railroad to run through a thickly-settled, highly-cultivated country and yet be noted for spectacular scenery. The paradox is explained by the fact that the district lies along the base and on the steep slope of Mauna Kea, the highest mountain in the Pacific. . . The combination of steep grade and heavy rainfall has resulted in excessive erosion, the mountain side being seamed at frequent intervals with deep gulches, in which the streams form innumerable cataracts and waterfalls. . . Some conception of the rugged character of the country can be gained from the fact that in less than 34 miles, there are 211 water openings under the railroad track, ranging from a concrete culvert to steel bridges up to 1006 feet in length and 230 feet high. . . (ibid.147-149)

A 1919 Copy of Survey Furnished (C.S.F.) map (see Figure 20 of Appendix 2) depicts the HCR bridge crossing over Kolekole Stream and the current park. It shows the 200-foot wide right of way extending along the northern flank of Kolekole Gulch to the north of the park. A depot, railroad house lot, and the Old Māmalaha Highway (labeled “Gov’t Main Road) that leads to the park’s entrance are also illustrated on this map. The section of railroad spanning Kolekole Bridge was described by John W. Bains in the article “Around About Hilo” published in a January 1913 edition of the Mid-Pacific Magazine:

After leaving Onomea more broad gorges spanned by steel viaducts are crossed, each unveiling a picture more beautiful than the last, until Kolekole Bridge is reached. Kolekole is not the largest nor the highest of the steel structures, but it spans an estuary of the sea and affords the visitor a long vista of headlands to the south, which stamps it as one of the most attractive of all the bridges. It is just 100 feet in height and from the train the tourist can gaze down on the tops of the cocoa-nut palms reaching up from the valley below. The green combers thunder on the pebble-strewn beach and in the distance dash on the precipitous cliffs, ever changing and ever adding life and variety to the view.

Mile upon mile of sugarcane fields stretch away on both sides of the line, insistent evidence of the magnitude of Hawaii’s most valued product. The quaint and unique method of conveying the cane from the uttermost borders of the fields to the very jaws of the mill rollers by the means of water flumes is to be seen at various points along the line. (Bains 1913:356–357)
Ultimately, the high cost of the Hāmākua Division ruined HRC, and in 1916 it was forced to sell out and reorganize under the name Hawaii Consolidated Railway (HCR). In 1920, HCR attempted to capture a larger piece of the growing tourist business with its adventurous tour dubbed the “Scenic Express.” HCR had long offered service to Glenwood for tourists visiting Kīlauea, but motorbuses now dominated this route. The Hāmākua Coast, by contrast, was not easily accessible by automobile. HCR was therefore able to run passenger coaches profitably along the Hāmākua Division with stops at scenic points.

By 1919, the Honomū Sugar Company encompassed roughly 2,300 acres of land, 1,300 owned outright by the company and 1,000 of which were leasehold. The company’s sugarcane lands extended from 50 to 1,500 feet above sea level, between the neighboring mills of Pepe‘ekeo and Hakalau, including all but the seaward margin of what is now Kolekole Gulch Park. Water was supplied to the fields from diversions in perennial streams including Pāhe‘ehe‘e, Honomū, and Kolekole, through a 9-mile long network of flumes. That same year, a small, independently owned and operated plantation, the Wailea Milling Company, was formed by Tatsuji Kawachi on the northern edge of Kolekole Gulch, directly north of the park. Unlike most of the commercial sugar plantations in Hawai‘i, including the Honomū Sugar Company, the small Wailea Milling Company was independently owned and operated by a Wailea homesteaders’ cooperative who owned over 3,000 acres of land (Lydgate 1919). By 1941, Honomū Sugar Company held 3,027 acres of cane land and production had reached 10,407 tons (Hitch 1992).

The rise of the automobile was a harbinger of doom for the railroad. The rail passenger business declined precipitously in the early decades of the twentieth century. In 1920, 607,220 passengers were carried; by 1930, the number had dropped to 77,894 and continued as the years progressed, with passenger counts dropping as low as 16,681 in 1936 (Best 1978:145–146). As a result, the remaining passenger cars were converted for freight and the meager passenger traffic that persisted was hauled on custom-built railbuses.

The picturesqueness of Kolekole Gulch caught the eye of passengers, journalists and government officials alike. In 1938, although the future park land was still mostly planted in cane, the Honolulu Advertiser noted that as Kolekole Stream was “…perhaps the finest swimming place of the entire island.” County officials had initiated development of a “…road and parking for the swimming facilities [Kolekole Stream] and picnic grounds.” Later that year, a survey was conducted by the Territory of Hawai‘i in anticipation of the acquiring 2,932 acres of land from Honomū Sugar Company for the creation of Kolekole Park. The survey was completed later that year and the deed was officially transferred via Executive Order No. 938 on May 2, 1941. A 1938 Territory of Hawai‘i Survey Map for the park shows the proposed transfer of 1.81 acres of cultivated cane land from the Honomū Sugar Company to the Territory of Hawai‘i (Figure 8). The map shows that cultivated cane land occupied the majority of the proposed park’s footprint, extending along the flat of the gulch floor and the eastern edge of Kolekole Stream. The map also depicts a road (labeled “Present Road”), likely a cane haul road, extending makai from the existing gate along the eastern edge of Kolekole Stream.

On April 1, 1946, a tsunami triggered by an earthquake in the Aleutian Islands slammed into Hawai‘i’s north coast, severely harming the fledgling park and dealing a fatal blow to the already struggling Hawaii Consolidated Railway. Tracks around the Hilo waterfront were entirely washed out and the Hilo Station was wrecked. An entire span of the Wailuku Bridge was torn out and the railroad bridge at the mouth of the Kolekole Stream lost its center span (see Figure 22, 23 and 24 of Appendix 2).
Figure 8. 1938 Territory of Hawai‘i Survey Map for Proposed Kolekole Park and Roadway
Water reached heights of 37 feet in Kolekole and neighboring Hakalau Gulch. The destruction was so severe that the Hawaii Railroad Company filed for abandonment soon thereafter, receiving permission to do so in December of 1946. Despite its destruction, the bridge-laden Hāmākua Division was later appropriated by the Territorial Government, who utilized the abandoned railroad alignment to construct the Hawai‘i Belt Road in the 1950s. Most of the makai portion of what is now the park was leveled and rendered devoid of infrastructure and even vegetation except for two surviving coconut trees. An article in the Honolulu Star Bulletin from April 5, 1946 reported the destruction of a rest house and ball field within Kolekole Park. The park, a favorite recreation spot for the employees of Hakalau Sugar Company, suffered such extreme damage that it did not officially reopen until over two years later.

The heavy damage at the park did not deter the Territory of Hawai‘i from funding further improvements. Following the reopening of Kolekole Park in October 1948, the Territorial Legislature authorized the construction of a pavilion om the following year. Territory of Hawai‘i tax records indicate that the park facilities were developed in four separate building episodes between 1949 and 1966, with the first (shower and lavatory structure) built in 1949.

Five years later in 1954, a 14 by 38-foot restroom building and a 24 by 30-foot pavilion were erected. A violent storm ravaged Hilo later that year, and although heavy seas covered most of the park area with big boulders, the pavilion was not damaged. In 1956, the Territory of Hawai‘i conducted another survey for Kolekole Park and acquired an additional 2.565 acres of land immediately adjacent east and south of the park. Upon completion of the survey, the deed was formally transferred on February 14, 1958 from Pepe‘ekeo Sugar Company to the Territory of Hawai‘i, and the park increased to 5.497 acres, now including a portion of Land Grant 616:2 to Kaawa.

In late December 1959, a tree planting ceremony and concert by the Hawai‘i County Band were to commemorate the construction of two new pavilions at Kolekole Park (Honolulu Star-Bulletin, December 27, 1959: 6). A May 15, 1960 article in the Honolulu Star Bulletin (P. 99) reported that three pavilions were present within the park, two of which were constructed the year before. On May 23, 1960, less than two weeks later, a devastating tsunami once again swept Hawai‘i Island. The most severe impacts were experienced at the Waiākea Peninsula and Hilo Bay. Wave heights at Honomū and Hakalau spanning were between 5 and 9 feet high, causing far less damage than the nearly 40-foot waves of 1946 (Kline 2016). The late Evelyn Kagawa of Hilo recalled the destruction left by the 1960 tsunami on the store (S. Hata Shoten, Ltd.) she and her husband managed on Kamehameha Avenue in downtown Hilo. In an excerpt from an oral history interview conducted by the University of Mānoa’s Center for Oral History in 2000, Kagawa described taking rolls of fabric to Kolekole Gulch to clean and dry them on the grassy lawn:

We did find some material underneath all that mud and debris. The Y. Hata trucks came over and they put them on the back of the trucks, took ‘em out to Kolekole—I don’t know how we got there or why someone decided we should go there—and threw the material in at the top of the river and let it run down and let the water clean it. And then we laid it on the grass, the lawn over there, stretched out and dried it. And people came in to buy ten cents a yard, twenty-five cents a yard. And they bought it too (University of Hawai‘i Center for Oral History 2000:213).
In the years following the 1960 tsunami, Kolekole Park remained a popular spot for picnickers, campers, ball-players, swimmers, and fishermen. Although it is unclear from tax records and historical documentation what specific physical effects this tsunami had on Kolekole Park, the County of Hawai‘i continued to revamp existing facilities and develop new ones. Six months after the tsunami, the Hilo Crescent City Lions Club built a new 25-foot by 2-foot long concrete walkway as a public service and also refurbished eight existing trash cans by painting and stenciling them. In 1966, the County of Hawai‘i completed its final phase of development of park facilities with the addition of a restroom. In 1972, the County Council named the main pavilion constructed during this era the Epy Yadao Pavilion, after a veteran and County Supervisor who was instrumental in funding improvements at the park.

The original shower and lavatory building constructed in 1949 was apparently demolished sometime between 2009 and 2011, based on a review of historical Google Earth™ satellite imagery. The five extant pavilions in Kolekole Park were most likely constructed in 1962, and it is probable that the ancillary features present within the park (e.g. mortared stone barbeque pits, outdoor shower and associated mortared stone wall segment, concrete stairway, poured concrete slabs, and retaining wall) were added to the grassy lawn portion of the park between 1962 and the present day.

In the bigger picture during the late 20th century, the economic foundation of the region was crumbling. In the years following World War II, Honomō Sugar fell under duress due to wage increases and labor scarcity. A pattern of cane field acquisition emerged in the following years in an effort to boost cultivatable acreage and thereby ensure sustainable profitability for the big players in the industry, and in 1946, C. Brewer & Co. acquired controlling interest in Honomō Sugar Company and merged it into the Pepe‘ekoe Sugar Company (Dorrance and Morgan 2000). Nearly two decades later in 1962, Pepe‘ekoe Sugar Company fused with Hakalau Plantation, and in 1973 Hakalau consolidated into Mauna Kea Sugar Company, a non-profit corporation that now held Hakalau in addition to the Honomū, Pepe‘ekoe, Onomea, and Hilo Sugar companies (ibid.). Mauna Kea Sugar Company, which eventually became Mauna Kea Agribusiness, became the third largest in acreage (13,000 acres) on Hawai‘i Island. It continued to operate until 1994 when it phased out sugar production and closed its doors forever, marking the end of commercial sugarcane production in the Hilo area (ibid.).

The loss of commercial sugarcane left the region without an economic mainstay. Since then, ranching and farming of diversified crops varying from silage corn to cacao to mushrooms to tea have come to occupy some of the lands and employ growing numbers of workers. Tourism based on the attractions in and near Honoka‘a and Honomō also provides local jobs. Despite this, it would appear that most residents either commute to Hilo or the west side of the island for jobs, have independent, often web-based businesses, or subsist mostly on retirement or trust income.

For long-time residents, a major issue of this transformation has been maintenance of the shoreline and forest access formerly enjoyed as part of the lifestyle of the plantation community. Hunting and fishing remain important subsistence and social activities that are being jeopardized by deteriorating roads, new fences and gates, and no-trespassing signs. Kolekole Gulch Park has long attracted visitors for its scenic vegetation and open lawn near a towering bridge and a narrow outlet to a wild sea.

Despite changes, there is a feeling of continuity and heritage in this community. In the words of the Hāmākua Community Development Plan (Hawai‘i County Planning Department 2018: 20):

*Environmental Assessment, Kolekole Gulch Park Accessibility Improvements*
The region referred to as Hamakua stretches along north of Hilo along the upright cliffs (Hilo Palikū) to the majestic, historic valley of Waipi‘o and up the slopes to the sacred summit of Mauna Kea. It is against this sweeping, lush green landscape that the people of the Hamakua region have flourished for generations. The region was historically renowned as a powerful religious, economic, and demographic center of Hawai‘i Island and from early times, the region was known for its agriculture. One cannot truly understand Hamakua’s people without appreciating the legacy that agriculture has stamped on this land and its people.

For some, Hamakua is a place where their ancestors flourished for centuries and for others, agricultural employment drew their ancestors to emigrate from foreign lands. Here they raised their children and learned to love the land and sea as their own. Still others have come in search of a simpler way of life, drawn by the beauty of the land and a host of personal stories that testify to the magical attraction that draws people to places where they feel at home. Together, these groups form the modern communities of Hamakua.

Regardless of their background, the people of Hamakua share a deep appreciation for the historical heritage of their small towns and highly value preserving an ‘ohana-centered community that emphasizes quality of life, neighborhood cooperation, and the aloha spirit. The people of Hamakua recognize that their future is tied to the preservation of their way of life and the natural and cultural resources that have sustained them for generations.

Consultation

Gathering input from community members with genealogical ties and long-standing residence in a cultural study area is vital to the process of assessing potential impacts to cultural resources, practices, and beliefs. It is precisely these individuals who ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that may not appear elsewhere in the historical or cultural record of a place.

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with Kolekole Gulch Park, a public notice was submitted to the Office of Hawaiian Affairs (OHA) for publication in their newspaper, *Ka Wai Ola*. The notice was published on February 27, 2019 in the March 2019 issue. As of July 2019, no responses have been received from this public notice. In addition, a concerted effort was made to contact and consult with community members of Kuhua and Honomū, and any individuals who might have knowledge of or concerns about traditional cultural practices associated with the park. This effort was made through email, phone, and mailed letters. In all the initial correspondences to the potential interviewees, ASM staff described the nature of the proposed project, its location, and the nature of the study. ASM staff then followed up with each of the interviewees and conducted an informal interview. The location and the preferred method of communication (in-person or phone) was determined at the request of the interviewee. As part of the interview process, and only with the consent of the interviewees, the in-person interviews were audio recorded for note taking purposes only (audio files are not available). Upon completion of the interview, an interview summary was prepared by ASM staff and emailed to the interviewees for review. All request for edits were completed and approved by the interviewees and the finalized version of the summaries are presented below.
ASM staff received two referrals identified as individuals possessing knowledge related to the general area, Kehaulani Lum and Larry Kimura, both of whom were contacted via email on January 7, 2019. To date no response has been received from Ms. Lum, and Mr. Kimura responded by email that he had no knowledge of the specific area. Another referral was provided for a Honomū resident, Yoriko Ishii, who was contacted by phone on January 16, 2019. She responded that she had no knowledge of the area other than her late husband frequented the area for recreational fishing. On February 13, 2019, ASM staff contacted Albert Nakaji via letter, but Mr. Nakaji declined the invitation for an interview. ASM staff also contacted three other individuals who agreed to interviews, the findings of which are summarized below. Additionally, a summary of findings from a previous Cultural Impact Assessment for the lands of Kuhua and Honomū, completed by Cultural Surveys Hawai‘i between June 2017 and June 2018, are also included below.

**Karl Eschbach.** On January 17, 2019, a phone interview was conducted by Aoloa Santos with Karl Eschbach, a Honomū resident and volunteer at the Hawai‘i Plantation Museum. Mr. Eschbach recently moved to Honomū to help care for his mother who was a Honomū resident for 40 years. Prior to moving to Hawai‘i, he received degrees in sociology and demography and was a professor at the University of Texas. His academic background along with a specific interest in understanding ethnic disparities in health while focusing on migration patterns helped spark his interest in the demography and census of the Honomū area. Through his research, Mr. Eschbach shared that between 1900 and 1940 the departure of many Hawaiian families may have resulted from the introduction of the sugar plantations, which drastically effected the Hawaiian population within this region. Mr. Eschbach was unaware of any traditional cultural practices associated with the Kolekole Park area.

**Derek Kurisu.** On February 8, 2019, Lokelani Brandt and Aoloa Santos interviewed Mr. Kurisu at the KTA grocery store located on Pu‘ainakō Street in Hilo. Mr. Kurisu was born in 1951 and raised in the plantation town of Wailea. When asked about Kolekole Park, he referred to Kolekole as “our stomping grounds” and “second home,” and recalled having gone there on weekends and after school with his friends and family. Mr. Kurisu attended Hakalau Elementary School, then Kalaniana‘ole Elementary and Intermediate School, and later graduated from Hilo High School. While attending Hilo High School, he found work as a bag boy at the renowned Hawai‘i Island establishment, KTA (shortened for K. Taniguchi).

He shared that growing up in a sugar plantation community helped influence his decision to pursue a degree in Agriculture after high school. While attending the University of Hawai‘i at Hilo, Mr. Kurisu continued to work at KTA until he transferred to the University of Hawai‘i at Mānoa (UH Mānoa). There he worked at Times Supermarket for two years and graduated with a degree in Agriculture from UH Mānoa’s College of Tropical Agriculture and Human Resources. Upon receiving his degree, Mr. Kurisu moved back to Hilo and returned to KTA, where he has since been employed for over 40 years and now serves as the Executive Vice President of KTA Super Stores. When asked about his time spent at Kolekole Park, he recalled playing in the Kolekole Stream with his friends, where they often went to gather their favorite ‘o‘o‘pu, the Hawaiian freshwater goby. Mr. Kurisu also recalled catching other species of fish and shrimp including, shrimp, river wī (river snail), mo‘i (threadfish), āholehole (Hawaiian flagtail) and mullet,
Mr. Kurisu’s memories of Kolekole were strongly connected to the people from the plantation camps, who greatly influenced his childhood and life. The plantation lifestyle and his time at Kolekole taught him the importance of community and family. He referred to the plantation community as a “family of families,” and that Kolekole was “the gathering place for community.” Kolekole Park was a popular recreation area frequently visited by his family, friends as well as the extended families from the nearby plantation camps. He remembered attending many family and community functions at Kolekole. He recalled playing baseball on the field, which he identified as the open area near the red-roofed pavilion. Camping at Kolekole was also a favorite pastime, which he often did with his family and friends. He also remembered camping there with the Boy Scouts and considered it a perfect place for scouts to complete certain tasks to earn their badges.

He recollected that Kolekole also taught him about respect for others in the community and for the place. Growing up in an area filled with gulches and streams, he was taught the importance of being aware of his surroundings and environment, sharing that if the mountains were dark, they would not go near the streams or visit the park. In describing some of the cultural activities that took place at the park, Mr. Kurisu pointed out the location of a “kalua pit” (imu), a traditional Hawaiian underground oven. Although Mr. Kurisu could not recall who constructed the imu or when, he did explain that it was a communal imu used to prepare food. He explained that the dense, round river stones found at Kolekole are the preferred type of stones used to make a traditional imu. He recalled people from the community gathering stones from the river for imu.

When asked if he remembered any of the old park structures, Mr. Kurisu recalled that not much had changed and noted seeing the existing park structures and facilities when he was a child. When asked if any of the structures were important to him, he explained that Kolekole Park is special not because of the structures; rather its uniqueness comes from the land, the river, and the environment in which it is situated. Mr. Kurisu spoke about the changing communities of the region, after the closing of the plantation, which he described as changing the feeling of the park. As a child, he remembered always feeling safe at Kolekole, never being harmed or bothered by other park users. Mr. Kurisu has not visited the area recently since the park’s closing but shared
that the last time he visited the area with his children, the feeling he had as a kid while growing up there, “is different.” When asked if he had any additional thoughts on the proposed project, he was happy to see the County making efforts to gather community input and hopes the County will reopen the park so that the families from the area can continue to enjoy Kolekole Gulch Park.

**Rodney Cambra.** Born in Hilo and raised in the community of Pepe‘ekeo, Mr. Cambra currently works for the County of Hawai‘i, Department of Parks and Recreation as the Recreation Director for the Honomū Gym located in the old plantation town of Honomū. During the interview conducted by Lokelani Brandt on February 13, 2019, Mr. Cambra spoke candidly about his experiences at Kolekole and his frustration following the park’s abrupt closure. In reflecting on his time there, Mr. Cambra stated that he “grew up there” and described many childhood experiences at Kolekole. He noted that Kolekole Stream was where he and his brother were taught to swim by their father and where they fished. He also described playing under the Kolekole Bridge. Mr. Cambra also spoke of his excursions in the interior parts of the valley, leaping stone-to-stone up the river where they gathered wild guava. He also recalled observing many other folks fishing, picnicking, and swimming at Kolekole. Growing up during the plantation era, Mr. Cambra explained that Kolekole was an integral part of the plantation community and was used extensively for various community gatherings and parties. He described the annual *kumiai* picnics, where hundreds of people from the nearby plantation communities would gather to socialize, eat, and play. He also described softball games taking place at the park during this annual event. He commented that the park’s unexpected closure has created discontent amongst members of the community, which has been further compounded by the closure of the park at Hakalau. He described that the closure of these two parks has adversely impacted the people of this community as there no place for the community to gather. Mr. Cambra was aware of the lead contamination at Kolekole but opined that many people who grew up during the plantation era do not share the same sentiment or fear about lead contamination. Mr. Cambra hopes that the park can be reopened so that the communities from this area can continue to enjoy Kolekole Gulch Park.

**Summary of Prior Relevant Interviews.** In September 2018, at the request of Department of Hawaiian Home Lands, Cultural Surveys Hawai‘i (CSH) completed a Cultural Impact Assessment, as part of the EA for the Honomū Subsistence Agricultural Homestead Community (Bautista et al. 2018). Between June 2017 to June 2018, CSH staff met with four individuals who participated in a talk-story interview. Unfortunately, one informant passed away during the process and that interview was not included in the assessment. As a result of these consultations, specific cultural practices associated with the subsistence collection of freshwater species from the area’s rives were noted. Such species included the gathering of *ōpae* (shrimp), *hihiwai* (shellfish), and *ʻoʻopu* (goby fish). However, it was noted that traditional subsistence gathering practices have been severely impacted since the sugar plantation era, which limited access to the streams, and also by the introduction of invasive species, which has affected the native fauna populations.

*Archaeological Investigations and Resources*

Previous archaeological studies conducted in the general project area and reviewed in Appendix 3 provided a working model for the types and density of features that the archaeologists would expect on the project site. Studies in the general area found that most pre-Western contact features had been
destroyed or completely obscured by centuries of cane cultivation and road construction. A Catholic
cemetery and several historic railroad and agricultural/industrial features were investigated by other
archaeologists. While no archaeological studies have been undertaken explicitly for Kolekole Gulch Park,
investigations conducted as part of seismic retrofitting resulted in the Kolekole Stream Bridge (Site 50-
10-26-09090) being listed on the State Register of Historic Places (SIHP). The bridge was originally
constructed as part of the Hawai‘i Consolidated Railway in 1911 and later reconstructed in 1950-1953 as
part of the “Seismic Wave Damage Rehabilitation Project”. Considering these prior investigations, and
given the history of tsunami and periodic flooding within Kolekole Gulch, the former commercial
cultivation of sugarcane cultivation, construction activities associated with Kolekole Stream Bridge, and
prior park development, the likelihood of encountering Pre-Western contact or early Historic Period sites
within the park appeared remote. It was considered possible that Historic infrastructure related to
sugarcane cultivation or railroad use would be present, although intensive use of the park made even this
unlikely. With respect to the park itself, some of the existing facilities (e.g., pavilions) may be more than
fifty years old, and if so, need to be assessed for their potential to be considered significant historic
properties under the Hawai‘i Register of Historic Places (HRHP) significance criteria.

Fieldwork was conducted on December 4, 2018 by Matthew Clark, M.A., Genevieve Glennon, B.A.,
Joshua Gastilo, M.A., and Lauren M.U. Kepa’a. Fieldwork consisted of pedestrian survey with 100%
coverage of the project site. The survey crew walked systematic transects across the survey area between
Kolekole Stream and the Old Mamālahoa Highway with spacing between crew members of no more than
15 meters. Visibility of the ground surface for identifying any historic properties that may have been
present was excellent within the lawn area adjacent to the stream, and adequate beneath the more densely
vegetated area along the steep, eastern slope of Kolekole Gulch. The project site area was also
photographed using a Cannon EOS Rebel T6 camera and a Phantom 4 Pro Unmanned Aerial Vehicle
(UAV) operated by a licensed pilot.

No archaeological resources were identified within Kolekole Gulch Park as a result of the archaeological
survey. Field observations of past ground disturbance, combined with the results of prior studies
conducted in the area, indicate that subsurface archaeological resources are unlikely to be encountered in
the areas proposed for park rehabilitation. Historical research indicates that the five existing park
pavilions, and some of the associated ancillary structures within the park, were built shortly after the 1960
tsunami and may be slightly more than 50 years old. These structures, consisting of the cinder block Epy
Yadao Pavilion and four pole structure pavilions, which will be repaired (with one to be demolished and
replaced elsewhere) as part of the planned improvements to Kolekole Park, are not considered significant
historic properties. Although the pavilions and associated park structures post-date the 1960 tsunami, their
presence or construction is in no way directly associated with that event. Furthermore, they are not
directly associated with important persons of Hawai‘i’s past. Architecturally, all of these structures are
nondescript and none embody distinctive characteristics that would make them significant. Moreover, the
information gathered from the archaeological survey indicates that these structures did not play a
significant role in Hawai‘i’s prehistory or history. As a public County of Hawai‘i park facility, Kolekole
Park has been important to locals and tourists alike since its establishment in 1938; however, the existing
structures bear no known direct association to ongoing cultural practices, traditional beliefs, events, or
oral history of native Hawaiians or other ethnic groups. As such, the existing pavilions are not considered
significant under any of the Hawai‘i Register of Historic Places (HRHP) significance criteria, and
therefore no SIHP Site numbers were assigned to them.
Given the negative findings of the pedestrian survey, combined with the review of historical documentary resources, the archaeologists concluded that the proposed accessibility improvements and rehabilitation will not affect any historic properties. The proposed determination of effect for the County of Hawai‘i’s Kolekole Gulch Park project is “no historic properties affected.” No further historic preservation work is recommended for the park facility. The archaeological assessment survey was provided to SHPD for their review and comment on August 6, 2019. By letter of December 27, 2019 (see Appendix 3), SHPD concurred with the project effect determination of “no historic properties affected,” concluding the historic preservation review process. Although no archaeological sites or other historic properties appear to present, in the unlikely event that any unanticipated archaeological resources are unearthed within the project site during the proposed rehabilitation activities, work in the immediate vicinity of those resources will be halted and SHPD will be contacted in compliance with Hawai‘i Administrative Rules 13§13-280.

Cultural Resources and Practices

Information gathered in the Cultural Impact Assessment presented in Appendix 2 demonstrates that Kolekole Gulch Park has its roots in Hawai‘i’s sugar plantation history. From the knowledge collected through the consultation efforts, it is evident that this park was one of very few places in this part of South Hilo where individuals, families, and groups came to practice subsistence fishing, to camp, to conduct religious ceremonies, to celebrate important life events, and to simply recreate. Kolekole Gulch Park is a treasured resource for the South Hilo communities, as it provided a safe space where they could reconnect to the area’s unique geographical landscape and engage in long-standing cultural traditions. Recreation and the practice of traditions helps nurture healthy individuals and fortify familial and communal bonds. The lasting-impacts of the identified cultural traditions and practices remain vibrant in the minds and spirits of the interviewees.

Impacts to and Mitigation for Cultural Resources and Practices

The proposed improvements to Kolekole Gulch Park will not result in any direct adverse impacts to any traditionally valued cultural or historical resources, nor will they impact any traditional cultural practices or beliefs. The closure of the park, especially coupled with the simultaneous closure of Hakalau Beach Park, has vastly reduced access to an important community resource. Conducting the accessibility and facility improvements that are the scope of the Proposed Action mitigates this gap and would be a beneficial cultural impact relative to the status quo. To maximize the historical value of the park, the cultural consultant recommended consideration of interpretive signage within the park, which could include, but not be limited to: narratives featuring traditional moʻolelo and traditional place names associated with Kolekole; descriptions of some of the identified cultural practices including the subsistence collection of freshwater species from the stream; a description of the sugar plantation era use of the park; an overview on the history of Kolekole Stream Bridge; and Kolekole Stream’s association to ‘Akaka Falls.

The Office of Hawaiian Affairs and the State Historic Preservation Division were supplied notice of the Draft EA, which was also be reviewed by agencies and the general public, in order to help verify or correct the findings contained in the CIA and this EA. No party reviewing the Draft EA supplied any additional cultural information relevant to project impacts.
3.3 Infrastructure

3.3.1 Utilities

Utilities at the property are very limited. Electrical power to the site is supplied by Hawai‘i Electric Light Company (HELCO) via its island-wide distribution network. No landline telephone service is present, and the park’s siting in a deep gulch results in no cell phone service at present. No municipal water or wastewater service is available, although a stream fed water line is present.

Where present, water and electrical lines to the restroom and pavilions will be upgraded. The Proposed Action includes developing a new water system utilizing trucked-in water with a 12,000-gallon fire-protection tank and a 5,000-gallon potable water storage tank. However, no water fountains will be provided, and park users will be expected to bring their own drinking water. Two new wastewater passive treatment systems that conform fully with the requirements of the State Department of Health at Chapter 11-62, “Wastewater Systems.” In summary, the Proposed Action of developing accessible park facilities would not have any substantial impact on existing utilities or County services. However, because of the need to dispose of lead-contaminated soil, it is important for P&R and/or the DOT to submit a solid waste profile to the County of Hawai‘i’s landfill operator, Waste Management of Hawai‘i, as soon as practical in conformance with recommendation from the County Department of Environmental Management to determine if the contaminated soils can be disposed of at the West Hawai‘i Sanitary Landfill (WHSL).

3.3.2 Roadways and Traffic

Existing Environment

Kolekole Gulch Park is accessed by a driveway from the Old Mamalahoa Highway (OMH - a County road), which in turn is accessed by a signed turnoff just south of the park on State Highway 19. No turn lanes are present. Storms in 2018 damaged the bridge and caused landslides on the OMH, which led to road closures and subsequent damage assessments. In response to early consultation, a neighboring landowner commented (see D. Goehring letter in Appendix 1a) that “…repair should be completed before the park reopens so there is an alternate access point. The OMH is often closed because of landslides and fallen trees trapping people in the gulch.” As of August 2019, Kolekole Bridge on the OMH and the section of the road between the park and Kaiwiki Homestead Road remain closed.

Impacts and Mitigation Measures

Due to the park’s location, no more than negligible traffic effects during construction are expected. Operationally, no permanent impacts would occur because the Proposed Action would simply provide accessible facilities and not lead to any substantial increase in use. In a letter in response to early consultation of December 11, 2018 (see Appendix 1a for letter), the Hawai‘i County Police Department stated that it did not anticipate any significant impacts to traffic or public safety concerns. The Department of Public Works is currently working on obtaining funding and permits to repair Kolekole Stream Bridge and to address the landslide problems on Old Mamalahoa Highway. When this section of the road is reopened, Kolekole Gulch Park will once again have an alternate access.
3.4 Secondary and Cumulative Impacts

The Proposed Action will not involve any substantial secondary impacts, such as population changes or effects on public facilities. Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. As the park is already existing and is not being expanded in any substantial way by the accessibility improvements, the Proposed Action will have only very limited impacts, all of them temporary and associated with the construction period, such as noise, traffic, dust and potential sedimentation.

Review of SMA permits and Chapter 343 documents in the OEQC Environmental Notice as well as press coverage indicates that there are no substantial projects occurring in this area during the 2019 to 2020 timeframe that might have potential impacts of the same type that might accumulate with those of the Proposed Action. As discussed above, the Department of Public Works is seeking to repair the Mamalahoa Highway’s Kolekole Stream Bridge and to address the landslide problems on Old Mamalahoa Highway. If both the park and road projects are underway simultaneously, the additional traffic may require coordination between these County agencies, particularly when heavy equipment or materials are moved on or off the site. The agencies are aware of this and prepared to coordinate as necessary. Noise, dust and sedimentation impacts will be reduced to insubstantial levels through BMPs and will not accumulate. At this time, there does not appear to be any potential for cumulative impacts and associated additional mitigation other than inter-agency coordination. The Draft EA was made available to a variety of agencies, organizations and neighbors to help check this conclusion.

3.5 Required Permits and Approvals

The following permits and approvals would be required:

- National Pollutant Discharge Elimination System Permit (State DOH)
- Hazardous Material Remediation Plan (State DOH) (potential)
- Grading, Grubbing and Driveway Permits (County DPW)
- Building Permits and Plan Approval (County DPW and Planning)
- Chapter 6e, HRS, determination from State Historic Preservation Division on historic property effects
- Disability and Communication Access Board (DCAB) plan review and approval
- Special Management Area (SMA) Permit/Approval
- Conservation District Use Permit (CDUP) or Site Plan Approval

3.6 Consistency with Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-run growth and development activities. The three themes that express the basic purpose of the Hawai‘i State Plan are individual and family self-sufficiency, social and economic mobility and community or social
well-being. The Proposed Action would promote these goals by reopening a critically important recreational facility and providing, with no substantial adverse environmental or social impacts, accessible recreational facilities in keeping with State and federal laws, thereby enhancing quality-of-life and community and social well-being.

3.6.2 Hawai‘i State Land Use Law and Hawai‘i County Zoning

Hawai‘i State Land Use District. All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The property is in the State Land Use Conservation District (subzones Resource and Limited). The Proposed Action for continuing use of the project site as a park is consistent with intended uses for this Land Use District, given compliance with administrative rules for the Conservation District. This topic is discussed in Section 3.6.6, below.

3.6.3 Hawai‘i County Zoning and Property Designations

According to the Hawai‘i County Planning Department (see letter in Appendix 1a), the project site is zoned A-20a (Agricultural, minimum lot size 20 acres), and a park is a permitted use in this zoning category. No change of zone is required to implement the Proposed Action. However, County zoning does not apply within the State Land Use Conservation District, and any proposed land uses are controlled under Conservation District administrative rules, as discussed in Section 3.6.6, below.

3.6.4 Hawai‘i County General Plan and Hamakua Community Development Plan

The General Plan for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005 (Hawai‘i County Planning Department). The General Plan itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the proposed project are the following Goal and Policies, and Courses of Action of particular chapters of the General Plan:

**RECREATION**

12.2 GOALS

(a) Provide a wide variety of recreational opportunities for the residents and visitors of the County.
(b) Maintain the natural beauty of recreation areas.
(c) Provide a diversity of environments for active and passive pursuits.

12.3 POLICIES

(a) Strive to equitably allocate facility-based parks among the districts relative to population, with public input to determine the locations and types of facilities.
(c) Recreational facilities shall reflect the natural, historic, and cultural character of the area.
(d) The use of land adjoining recreation areas shall be compatible with community values, physical resources, and recreation potential.
(g) Facilities for compatible multiple uses shall be provided.
(h) Provide facilities and a broad recreational program for all age groups, with special considerations for the handicapped, the elderly, and young children.

(i) Coordinate recreational programs and facilities with governmental and private agencies and organizations. Innovative ideas for improving recreational facilities and opportunities shall be considered.

12.4 STANDARDS
(c) Parks for General Use:
- Centered around a major natural asset, such as a sandy beach, a prime forest, or a volcanic feature and includes historic sites whenever feasible.
- Designed to accommodate users from throughout the County.
- Beach parks provide opportunities for swimming/sunbathing, surfing, camping, fishing, boating, nature study, and other pastimes. Every section of the island should be adequately served. Facilities depend on size and intensity of use but should include: restrooms with showers; picnic facilities; a defined tent camping area when allowed; drinking water; adequate parking; pavilions of various sizes; and lifeguard facilities.

Discussion: The Proposed Action provides a Park for General Use with accessible facilities. It satisfies relevant goals, policies, standards and course of action for recreation.

HISTORIC SITES
6.2 GOALS
(a) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawai‘i.
(b) Appropriate access to significant historic sites, buildings, and objects of public interest should be made available.

Discussion: The Proposed Action has involved appropriate survey by professional archaeologists to determine the presence and significance of historic sites. The conclusion that none are present has been reviewed and concurred with by the State Historic Preservation Division. Therefore, the action satisfies relevant goals, policies, and courses of action for historic sites in Hawai‘i County.

NATURAL BEAUTY
7.2 GOALS
(a) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
(b) Protect scenic vistas and view planes from becoming obstructed.
(c) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

7.3 POLICIES
(a) Increase public pedestrian access opportunities to scenic places and vistas.
(d) Access easement to public or private lands that have natural or scenic value shall be provided or acquired for the public.
(h) Protect the views of areas endowed with natural beauty by carefully considering the effects of
proposed construction during all land use reviews.
(i) Do not allow incompatible construction in areas of natural beauty.

As discussed in Section 3.1.5, the General Plan identifies Kolekole Gulch is identified as an area of Natural Beauty on Table 7-3 (Page 7-6).

Discussion: The Proposed Action does not involve adverse impacts to scenic areas or vantages and would not be inconsistent with the natural beauty of the area. Therefore, the action is consistent with relevant goals, policies, and courses of action of the Natural Beauty section of the Hawai‘i County General Plan.

NATURAL RESOURCES
8.2 GOALS
(a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
(b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
(c) Protect and promote the prudent use of Hawaii’s unique, fragile, and significant environmental and natural resources.
(e) Protect and effectively manage Hawaii’s open space, watersheds, shoreline, and natural areas.

8.3 POLICIES
(b) Encourage a program of collection and dissemination of basic data concerning natural resources.
(h) Encourage public and private agencies to manage the natural resources in a manner that avoids or minimizes adverse effects on the environment and depletion of energy and natural resources to the fullest extent.
(i) Encourage an overall conservation ethic in the use of Hawaii’s resources by protecting, preserving, and conserving the critical and significant natural resources of the County of Hawaii.
(u) Ensure that activities authorized or funded by the County do not damage important natural resources.

Discussion: The Proposed Action does not involve destruction of natural resources and is consistent with the goals, standards and policies of the Natural Resources chapter of the Hawai‘i County General Plan.

The Hawai‘i County General Plan Land Use Pattern Allocation Guide (LUPAG). The LUPAG map component of the General Plan is a graphic representation of the Plan’s goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The project site is classified as Conservation in the LUPAG. Continuing use of the project site for a park is consistent with this designation.

Hāmākua Community Development Plan

The Hāmākua Community Development Plan (CDP) planning area encompasses not only the judicial district of Hāmākua, but also that of North Hilo, and a portion of the South Hilo district commonly referred to as Rural South Hilo (Wainaku to Hakalau. It was developed under the framework of the February 2005 County of Hawai‘i General Plan and adopted in 2018 per Ordinance 2018-078. (http://records.hawaiicounty.gov/weblink/DocView.aspx?dbid=1&id=99067&page=1&cr=1).
Community Development Plans are intended to translate broad General Plan Goals, Policies, and Standards into implementation actions as they apply to specific geographical regions around the County. CDPs are also intended to serve as a forum for community input into land-use, delivery of government services and any other matters relating to the planning area.

The Hāmākua CDP has policies relevant to park improvements through its aspirational priorities for natural and cultural resources and community infrastructure:

- Protects coastal areas, agricultural land, and mauka forests from development
- Protects open space, areas with natural beauty, and scenic view planes
- Guides the development of programs to strengthen protections for coastal and agricultural lands as well as open space and view planes
- Preserves historic resources
- Ensures appropriate public access to the shoreline and mauka forests
- Guides collaborative stewardship and enhancement of coastal and forest ecosystems, cultural resources, agricultural lands, public access, and trails
- Supports the preservation of village and town character and guides the enhancement of communities’ unique sense of place

Despite changes, there is a feeling of continuity and heritage in this community. In the words of the draft Hāmākua Community Development Plan (Hawai‘i County Planning Department 2018: 20):

The region referred to as Hamakua stretches along north of Hilo along the upright cliffs (Hilo Paliku) to the majestic, historic valley of Waipi‘o and up the slopes to the sacred summit of Mauna Kea. It is against this sweeping, lush green landscape that the people of the Hamakua region have flourished for generations. The region was historically renowned as a powerful religious, economic, and demographic center of Hawai‘i Island and from early times, the region was known for its agriculture. One cannot truly understand Hamakua’s people without appreciating the legacy that agriculture has stamped on this land and its people.

For some, Hamakua is a place where their ancestors flourished for centuries and for others, agricultural employment drew their ancestors to emigrate from foreign lands. Here they raised their children and learned to love the land and sea as their own. Still others have come in search of a simpler way of life, drawn by the beauty of the land and a host of personal stories that testify to the magical attraction that draws people to places where they feel at home. Together, these groups form the modern communities of Hamakua.

Regardless of their background, the people of Hamakua share a deep appreciation for the historical heritage of their small towns and highly value preserving an ‘ohana-centered community that emphasizes quality of life, neighborhood cooperation, and the aloha spirit. The people of Hamakua recognize that their future is tied to the preservation of their way of life and the natural and cultural resources that have sustained them for generations.

Discussion: According the Hawai‘i County Planning Department’s letter in response to early consultation of December 19, 2018 (see Appendix 1a), “Hamakua Community Development Plan (CDP): Policy 104
directs that the County “seek to combine park facility improvement projects with needed facility improvements (e.g. ADA improvements with facility hardening, etc.).” This project appears to be consistent with this policy by combining needed accessibility improvements with other critical improvements such as wastewater, drainage, hazardous material abatement, and hazardous tree removal.

3.6.5 Special Management Area

The *makai* half of Kolekole Gulch Park is within the Special Management Area (Figure 9). Official rendering of the boundary will require determination by the Planning Department, but it appears that the parking lot, three existing pavilions (one of which will be demolished), the proposed comfort station, the proposed new pavilion, the shower, and the four proposed picnic tables are within the SMA. Public parks, public uses, and structures are allowed in the Special Management Area. After the EA is complete, P&R will coordinate with the Planning Department, and, if appropriate based on the location and nature of the improvements, prepare an SMA Assessment describing the characteristics of the Proposed Action that are relevant to the SMA, the potential impacts on SMA resources, and mitigation measures to avoid or reduce impacts. The following presents and analysis of the Proposed Action’s effect on key SMA resources:

**Recreational Resources.** The proposed accessibility improvements would not in any manner adversely affect any recreational resources, and the Proposed Action expands recreational uses for disabled users of the park. The Proposed Action would not restrict any shoreline uses such as hiking, fishing, or water sports. The Proposed Action would help P&R in its mission to provide adequate, accessible and diverse recreational opportunities.

**Historic Resources.** The Proposed Action has involved appropriate survey by professional archaeologists to determine the presence and significance of historic sites. The conclusion that none are present has been reviewed and concurred with by the State Historic Preservation Division.

**Scenic and Open Space Resources.** The guidelines contained in Rule 9 of the Hawai‘i County Planning Commission Rules (which governs the SMA) express the intent to minimize development that would “substantially interfere with or detract from the line of site toward the sea from the State Highway nearest the coast or from other scenic areas identified in the General Plan.” The proposed improvements would not adversely affect any sight lines or scenic resources in any way. Furthermore, the Proposed Action maintains the quality of scenic and open space resources.

**Coastal Ecosystems.** The nature, location and design of the improvements, along with precautions that will be undertaken during construction, would minimize impacts to coastal biological resources. No coastal ecosystems or threatened or endangered animal or plant species would be affected.

**Economic Uses.** The Proposed Action use would not adversely affect any economic aspects of the coastal zone, and it would positively contribute to the economy by providing safe and accessible facilities for residents and visitors.
Figure 9. Special Management Area Map.

Source: http://histategis.maps.arcgis.com/apps/Viewer/index.html?appid=f30604a60fe64945af7442c7c08174f9
Coastal Hazards. The proposed improvements would be undertaken outside of designated coastal floodplains but in an area of occasional stream flooding. The proposed continuing land use, a public park, is consistent with approved open-space uses and will not adversely affect any floodplain. The park may continue to close during occasional very high water episodes in Kolekole Stream. Maps printed by the Pacific Tsunami Warning Center/Hawai‘i County Civil Defense Agency locate the project site within an area that should be evacuated during a tsunami warning (https://tsunami.coast.noaa.gov/#/). Warning sirens are present at the park site and the area can readily be evacuated in the event of a tsunami or other coastal hazard emergency. No aspect of the Proposed Action would adversely affect the public exposure to coastal hazards. A scenario of modest sea level rise should have no effect on the integrity or utility of the any of the park’s facilities. More rapid or extreme rises could place these facilities within a zone where the frequency and severity of flooding led to repeated damage that hindered their utility. The Department of Parks and Recreation has considered the risk of sea level rise and determined that the uncertain degree and timing of this risk and the long time scenario indicates that it still prudent to construct the project as planned. This would allow the County to realize its benefits for a period of up to many decades, rather than fail to implement it and lose critical functionality at an important recreational site.

In summary, the Proposed Action would benefit and/or not adversely impact Special Management Area resources, including beaches, recreation, native species or ecosystems, historic sites, water quality, and susceptibility to hazards. Minor impacts and mitigation measures are discussed individually in the resource sections of Chapter 3, above. The Proposed Action does not involve any irreversible or irretrievable commitment of resources or any substantial adverse environmental impact that cannot be avoided. In its comment letter on the Draft EA (see Appendix 1b), the Planning Department requested preparation of a SMA Use Permit Assessment Application.

3.6.6 Conservation District Use Permit

The State Land Use District for Kolekole Gulch Park is Conservation. Its subzone designation appears to be split between Resource, in the flatter, useable portion of the park where all facilities are located, and Limited, in the slopes on the southern side of the park (Figure 10). Official determinations of the State Land Use District Boundary and the subzone will be sought from the Land Use Commission and the Office of Conservation and Coastal Lands, respectively, as part of the Conservation District Use Permit (CDUP) process. Regardless of subzone, the Proposed Action potentially fits within several categories of identified uses, per Hawai‘i Administrative Rules (HAR) §13-5-22, including:

P-6 PUBLIC PURPOSE USES, (D-I): Not for profit land uses undertaken in support of a public service by an agency of the county, state, or federal government, or by an independent non-governmental entity, except that an independent non-governmental regulated public utility may be considered to be engaged in a public purpose use. Examples of public purpose uses may include but are not limited to public roads, marinas, harbors, airports, trails, water systems and other utilities, energy generation from renewable resources, communication systems, flood or erosion control projects, recreational facilities, community centers, and other public purpose uses, intended to benefit the public in accordance with public policy and the purpose of the Conservation District.
P-8 STRUCTURES AND LAND USES, EXISTING (A-1) Minor repair, maintenance, and operation to an existing structure, facility, use, land, and equipment, whether it is nonconforming or permitted, that involves mostly cosmetic work or like-to-like replacement of component parts, and that results in negligible change to or impact to land, or a natural and cultural resource.

P-8 STRUCTURES AND LAND USES, EXISTING (B-1) Demolition, removal, or minor alteration of existing structures, facilities, land, and equipment. Any historic property shall be evaluated by the department for historical significance.

P-8 (B-2) Replacement or reconstruction of existing structures and facilities under a previously approved conservation district use permit where the new structure will be located approximately on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced. Reconstruction or replacement of structures and facilities shall be subject to development standards set forth in this chapter, and other requirements as applicable, including but not limited to a county building permit, shoreline setback, and shoreline certification. No enlargement of the structures and facilities is permitted under this section. The provisions of this section will not be applicable upon failure to file an application to replace or reconstruct structures and facilities within two years of the demolition or destruction of structures and facilities.

It is expected that a Conservation District Use Permit (CDUP) or a Site Plan Approval will be necessary for the proposed accessibility improvements. The Draft EA was supplied to the Department of Land and Natural Resources, Office of Conservation and Coastal Lands, to assist in this determination. A reply was not received, and further coordination will be required to determine if a Conservation District Use Application (CDUA) Departmental or Board Permit or an application for a Site Plan Approval will be required.

A CDUA requires a detailed evaluation of the consistency of the Proposed Action with the criteria of the Conservation District permit process. Although such an evaluation is premature, the following individual consistency criteria should be noted:

1. The proposed land use is consistent with the purpose of the Conservation District;

The continuing use of a public park and repair and/or replacement of structures that support this use are in conformance with the purpose of the Conservation District. It is an identified use within the Conservation District. The County has committed to conserve, protect and preserve the natural features on the subject property. The proposed use will not impact natural or cultural resources of the area.

2. The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur;

The objective of the Resource subzone “...is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas.” Parks construction, use and maintenance and repair are identified uses in the Resource subzone under HAR 13-5-22 (various sections). Although active
park uses and structures appear to be confined to the Resource subzone, the same uses are also permitted in the Limited subzone. The proposed park will ensure the sustained use and enjoyment of the natural resources in the project area by providing proper facilities and mitigating potential impacts, as outlined in this EA.

3. The proposed land use complies with provisions and guidelines contained in Chapter 205A, Hawaii Revised Statutes (HRS), entitled "Coastal Zone Management," where applicable;

The park is partly within Special Management Area (SMA). The extent to which park activities will be subject to the requirement for SMA permitting will be determined by the Planning Department, as discussed in Section 3.6.5. In any case, the proposed use would comply with all provisions and guidelines contained in Chapter 205A, Hawai‘i Revised Statutes (HRS), entitled Coastal Zone Management.

4. The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region;
Because of the relatively minor nature of the accessibility improvements and the lack of threatened or endangered plant species or pristine native ecosystems, the proposed park improvements are not likely to cause adverse biological impacts. Impacts to the island wide-ranging Hawaiian hawk and the endangered Hawaiian hoary bat will be avoided through timing of vegetation removal and/or hawk nest survey.

5. The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels;

The proposed accessibility improvements will be minor replacement, additions and modifications to existing uses and will be completely compatible with the locality and existing uses.

6. The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable;

The proposed continued use of the property for a park will help conserve, protect and preserve the natural features of the area.

7. Subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District;

The proposed action does not involve or depend upon subdivision and will not lead to any increase in intensity of use.

8. The proposed land use will not be materially detrimental to the public health, safety and welfare.

The proposed accessibility improvements will not be detrimental to the public health, safety, and welfare.

PART 4: DETERMINATION

Based on the findings below, and upon consideration of comments to the Draft EA, the Hawai‘i County Department of Parks and Recreation has determined that the proposed action will not significantly alter the environment, as impacts will be minimal, and has accordingly issued a Finding of No Significant Impact (FONSI).

PART 5: FINDINGS AND REASONS

Chapter 11-200.1-13, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

(a) In considering the significance of potential environmental effects, agencies shall consider and evaluate the sum of effects of the proposed action on the quality of the environment.

(b) In determining whether an action may have a significant effect on the environment, the agency
shall consider every phase of a proposed action, the expected impacts, and the proposed mitigation measures. In most instances, an action shall be determined to have a significant effect on the environment if it may:

1. *Irrevocably commit a natural, cultural, or historic resource.* No valuable natural or cultural resources would be committed or lost by the Proposed Action, which would not involve adverse effects to significant native species or habitat. An archaeological survey that has been concurred with by SHPD has determined that no historic sites are present on the project site or would be affected. Resources and practices such as forest access, fishing, gathering, hunting, or access to ceremonial sites would not be affected in any way.

2. *Curtail the range of beneficial uses of the environment.* The Proposed Action expands and in no way curtails beneficial uses of the environment for people of all abilities.

3. *Conflict with the State’s environmental policies or long-term environmental goals established by law.* The State’s long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The Proposed Action is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment by improving and expanding recreational opportunities pursuant to the Americans with Disabilities Act. It is thus consistent with all elements of the State’s long-term environmental policies.

4. *Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State.* The Proposed Action will benefit the social welfare of the community and State by allowing for expanded and socially just recreational use of public property for public benefit.

5. *Have a substantial adverse effect on public health.* The Proposed Action will promote public health through provision of recreational opportunities for people of all abilities. Wastewater will be disposed of in conformance with State Department of Health regulations.

6. *Involve adverse secondary impacts, such as population changes or effects on public facilities.* No secondary effects are expected to result from the Proposed Action, which does not expand facilities in such a way as to induce in-migration or unduly affect roads or other public facilities.

7. *Involve a substantial degradation of environmental quality.* The Proposed Action is minor and environmentally benign and would thus not contribute to environmental degradation with adherence to Best Management Practices.

8. *Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions.* Although the County Department of Parks and Recreation is steadily improving the accessibility of its facilities through individual projects, they are scattered around the island and would not tend to produce adverse cumulative impacts. Furthermore, the Proposed Action is not related to other non-P&R activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions. The Department of Public Works is seeking to repair the Mamalahoa Highway’s Kolekole Stream Bridge and to address the landslide problems on Old Mamalahoa Highway. If both the park and road projects are underway simultaneously, the additional
traffic may require coordination between these County agencies, particularly when heavy equipment or materials are moved on or off the site. The agencies are aware of this and prepared to coordinate as necessary. Noise, dust and sedimentation impacts will be reduced to insubstantial levels through BMPs and will not be accumulate.

9. **Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat.** The project site supports mostly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna will not occur, with planned restrictions on lighting and the timing of vegetation removal and/or seasonal survey.

10. **Have a substantial adverse effect on air or water quality or ambient noise levels.** Slight increases in noise and effects to air quality will occur during construction, but they will be temporary and mitigated to non-significant levels. Erosion and sedimentation impacts will be avoided by implementation of Best Management Practices during grading, which will occur in a limited area of the park.

11. **Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.** Although the project site is in an area subject to earthquakes, and with minor volcanic seismic risk, the entire Island of Hawai‘i shares this risk, and the Proposed Action is not imprudent to undertake. The proposed improvements would be undertaken within an area that is not a designated floodplain. Some parts of the park have been subject to periodic stream flooding, but it has not seriously affected structures. The proposed continuing land use as a public park is consistent with approved open-space uses and will not adversely affect any floodplain or expose the public to additional hazards. Occasional tsunami have occurred over the last two centuries; one in 1946 devastated the park’s infrastructure. Maps printed by the Pacific Tsunami Warning Center/Hawai‘i County Civil Defense Agency locate the project site within an area that should be evacuated during a tsunami warning. Warning sirens are present nearby and the area can readily be evacuated in the event of a tsunami or other coastal hazard emergency. The location of the structures several hundred feet inland from the shoreline at elevations of 10 to 14 feet above sea level provides sufficient resiliency in case of sea level rise.

12. **Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies.** Although construction inevitably involves changes to the visual environment, no noticeable impacts to views or viewplanes will occur. These minor and temporary scenic impacts would not require mitigation. The Proposed Action essentially will replace or repair existing structures, some of which are dilapidated, with new and attractive facilities. The open space and viewplanes of the site will not be affected. There will be no permanent adverse visual impacts, such as interference with scenic views or insertion of incongruous or clashing visual elements. Only minor exterior security lighting is planned, and it will be shielded to protect dark skies and transiting seabirds.

13. **Require substantial energy consumption or emit substantial greenhouse gases.** The Proposed Action involves only minor use of energy for construction and operation, and thus minor amounts of greenhouse gases.
REFERENCES


ESI. 2017b. Additional Environmental Assessment, Kolekole Beach Park, Mamalahoa Highway (Route 19), Honomu, Hawaii. ESI Project No. 116046, Draft Report.


Page 74

Environmental Assessment, Kolekole Gulch Park Accessibility Improvements


Hawai‘i County Planning Department. 2005. The General Plan, County of Hawai‘i. Hilo.


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*Environmental Assessment, Kolekole Gulch Park Accessibility Improvements*


University of Hawai‘i at Manoa, Sea Grant College Program. 2014. Climate Change Impacts in Hawai‘i - A summary of climate change and its impacts to Hawai‘i’s ecosystems and communities. UNIHI-SEAGRANT-TT-12-04.

Kolekole Gulch Park Accessibility Improvements

Environmental Assessment

APPENDIX 1a
Comments in Response to Early Consultation
December 11, 2018

Mr. Ron Terry, Principal
Geometrician Associates, LLC
P. O. Box 396
Hilo, HI 96721

Dear Mr. Terry:

SUBJECT: EARLY CONSULTATION FOR ENVIRONMENTAL ASSESSMENT FOR KOLEKOLE GULCH PARK ACCESSIBILITY IMPROVEMENTS, SOUTH HILO, ISLAND OF HAWAI'I; TMK: (3) 2-8-015:015

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

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Gregory M. Esteban, South Hilo Patrol District Commander, at (808)961-2214 or via e-mail at gregory.esteban@hawaiicounty.gov.

Sincerely,

MITCHELL K. KANEHAILUA, JR.
ASSISTANT POLICE CHIEF
AREA I OPERATIONS BUREAU

GE:III/18HQ0377

"Hawai'i County is an Equal Opportunity Provider and Employer"
Via email only: rterry@hawaii.rr.com

Mr. Ron Terry, Principal
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawai‘i 96721

Re: Early Consultation for Environmental Assessment for Kolekole Gulch Park
Accessibility Improvements, South Hilo, Island of Hawai‘i
Tax Map Key No. (3) 2-8-015:015

Dear Mr. Terry:

The Department of Environmental Management’s Solid Waste Division and Wastewater Division have reviewed your December 4, 2018, letter inviting comments on the above project.

The Solid Waste Division (SWD) strongly recommends that a waste profile be submitted to the County of Hawai‘i’s landfill operator, Waste Management of Hawai‘i, as early as possible to determine if the contaminated soils can be disposed of at the West Hawai‘i Sanitary Landfill (WHSL). The South Hilo Sanitary Landfill is nearing its permitted capacity and is currently in the final closure phase. Depending on the schedule of your project, construction and demolition debris (C&D) will need to be hauled and disposed of at the WHSL.

Please contact the SWD for updates as your project moves forward. Thank you for the opportunity to provide comments.

Sincerely,

William A. Kucharski
Director

WK:mef
cc: Gregory Goodale, SWD
Gene Quiamas, SWD

County of Hawai‘i is an Equal Opportunity Provider and Employer
December 19, 2018

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park  
Accessibility Improvements  
Pre-Consultation for Draft Environmental Assessment  
TMK: (3) 2-8-015:015 (por) & immediately surrounding areas, South Hilo, Hawai‘i

This is in response to the request for comments on the Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements.

The land use details for the TMK (3) 2-8-015:015 are as follows:

- County Zoning: AG-20a. LUPAG: Conservation
- State Land Use: Conservation District. Department of Land and Natural Resources has regulatory authority over lands in the Conservation District.
- SMA: Portions of this property are within the Special Management Area
- Kolekole Stream runs along most of the north side of this parcel.

At this early consultation stage of the Environmental Assessment, the Planning Department would like to emphasize the following priorities as addressed in the following plans:

- Hawai‘i County General Plan (2005): Kolekole Gulch is identified as an area of Natural Beauty on Table 7-3 (Page 7-6). Therefore, Policy 7.3(a), “Increase public pedestrian access opportunities to scenic places and vistas” particularly applies to this property, as does Policy 7.3 (h), “protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.”
- Hāmākua Community Development Plan (CDP): Policy 104 directs that the County “seek to combine park facility improvement projects with needed facility improvements (e.g. ADA
improvements with facility hardening, etc.)." This project appears to be consistent with this policy by combining needed accessibility improvements with other critical improvements such as wastewater, drainage, and hazardous tree removal.

We look forward to the Environmental Assessment further identifying the specifics of the scope for this project, all the regulatory permits that will be required (including applicable DLNR permits and the SMA Assessment), and what mitigation measures will be proposed during construction for protecting coastal and stream resources.

Thank you for the opportunity to comment on this early consultation. We have no further comments to offer at this time. However, please provide our department with a copy of the Draft Environmental Assessment for our review and comment. If you have any questions, please refer to LeAna Gloor of this office at (808) 961-8308.

Sincerely,

[Signature]

MICHAEL YEE
Planning Director

LBG:ja
\tcoh33\planning\public\wp\win60\LBG\EA-EIS_REVIEW_COMMENTS\2018-12-17 Early Consult DEA Kolekole Gulch Park.doc
Ron, thanks for providing your letter dated December 4, 2018 for the Kolekole Gulch Park Draft EA. We currently own the two adjacent lots next to Kolekole Beach Park. TMKs: 2-9-003-003 & 39. We have the following concerns and suggestions for your Draft EA:

-Albizia tree removal, Over the past years, we have unsuccessfully tried to get Parks and Rec. to remove these trees that are a threat to the entrance of the park and to our new home under construction. We had two large Albizia trees fall and damage our retaining wall from the park property. Fallen Albizia tress also creates an access point across the river to our property allowing more trespassing. These trees need to be removed. Parks and Rec. seem to be confused and think that these trees are not located on their property but Exec. Order # 938 & 1852 defines this area as County Kolekole Gulch Park.

-Any type of walls or soil reinforcement should not divert Kolekole stream flood water onto our property causing additional erosion to our land.

-25% or more of the park was under water during Hurricane Lanes flooding from Kolekole Stream and water runoff from the Old Mamalahoa Hwy and 19. Steps should be taken to minimize flood damage/landslides to the structures and park land.

-Old Mamalahoa Hwy is closed near the Kawiwiki Homestead Rd due to a drainage/road collapse. This repair should be completed before the park reopens so there is an alternate access point. The Old Mamalahoa road is often closed because of landslides and fallen trees trapping people in the gulch.

-The County should consider bringing in county drinking water. We might be willing to work with the County in sharing our water line that comes from TMK area: 2-9-003-036. This option should be explored in the EA.

-Should also note that the property is state zoned as "Conservation" that will also trigger an EA.

-Since the park closed, there has been a lot of vandalism and theft. Lights and signs stolen, access gate cut in half (two times), water line broken; are just a few issues.

Thanks,
Dawn and Doug Goehring
808-xxx
December 19, 2018

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park  
Accessibility Improvements  
Pre-Consultation for Draft Environmental Assessment  
TMK: (3) 2-8-015:015 (por) & immediately surrounding areas, South Hilo, Hawai‘i

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- County Zoning: AG-20a. LUPAG: Conservation
- State Land Use: Conservation District. Department of Land and Natural Resources has regulatory authority over lands in the Conservation District.
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- Kolekole Stream runs along most of the north side of this parcel.

At this early consultation stage of the Environmental Assessment, the Planning Department would like to emphasize the following priorities as addressed in the following plans:

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- Hāmākua Community Development Plan (CDP): Policy 104 directs that the County “seek to combine park facility improvement projects with needed facility improvements (e.g. ADA
improvements with facility hardening, etc.)." This project appears to be consistent with this policy by combining needed accessibility improvements with other critical improvements such as wastewater, drainage, and hazardous tree removal.

We look forward to the Environmental Assessment further identifying the specifics of the scope for this project, all the regulatory permits that will be required (including applicable DLNR permits and the SMA Assessment), and what mitigation measures will be proposed during construction for protecting coastal and stream resources.

Thank you for the opportunity to comment on this early consultation. We have no further comments to offer at this time. However, please provide our department with a copy of the Draft Environmental Assessment for our review and comment. If you have any questions, please refer to LeAna Gloor of this office at (808) 961-8308.

Sincerely,

MICHAEL YEE
Planning Director

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REF: OCCL:MC

Ron Terry
Geometrician Associates, LLC
PO Box 396
Hilo, HI 96721

Dear Mr. Terry,

SUBJECT: KOLEKOLE GULCH PARK ACCESSIBILITY IMPROVEMENTS
South Hilo, Hawai‘i
TMK (3) 2-8-015:015

The Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) has received your request for comments on the preparation of a draft Environmental Assessment for proposed improvements to Kolekole Gulch Park. The parcel is on State land that was Executive Ordered to the County of Hawai‘i, and lies in the Limited and General Subzones of the State Land Use Conservation District.

The full list of activities is in development. The project is expected to include at a minimum drainage improvements, modifications to the existing comfort stations, removal of invasive trees, and repairs to the existing pavilions.

Based upon our conversation, OCCL understands that the County of Hawai‘i will be the accepting authority for the environmental assessment.

Once a final project plan is ready please consult with our office to determine whether a Conservation District Use Permit (CDUP) would be required.

If you have any questions, please feel free to call staff planner Michael Cain at 587-0048.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
January 7, 2019

Geometrician Associates, LLC
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements located at South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas on behalf of Hawaii County Department of Parks and Recreation

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

At this time, enclosed are comments from the (a) Division of State Parks, (b) Office of Conservation & Coastal Lands, and (c) Land Division – Hawaii District on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at (808) 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files
MEMORANDUM

TO: DLNR Agencies:
_ Div. of Aquatic Resources
_ Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements

LOCATION: South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas

APPLICANT: Geometrician Associates, LLC on behalf of Hawaii County Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by January 4, 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 Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: [Signature]

Print Name: CURT A. COTTRELL

Date: 12.27.18

Attachments
cc: Central Files
December 21, 2018

MEMORANDUM

TO:  DLNR Agencies:
      ___ Div. of Aquatic Resources
      ___ Div. of Boating & Ocean Recreation
      X Engineering Division
      X Div. of Forestry & Wildlife
      X Div. of State Parks
      X Commission on Water Resource Management
      X Office of Conservation & Coastal Lands
      X Land Division – Hawaii District
      X Historic Preservation

FROM:  Russell Y. Tsuji, Land Administrator
SUBJECT:  Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements
LOCATION:  South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas
APPLICANT:  Geometrician Associates, LLC on behalf of Hawaii County Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by January 4, 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 Darlene Nakamura at 587-0417. Thank you.

We have no objections.

We have no comments.

Comments are attached.

Signed:  Michael Can
Print Name:  Michael Can
Date:  12.28.18

Attachments
cc:  Central Files
REF: OCCL:MC

Ron Terry
Geometrician Associates, LLC
PO Box 396
Hilo, HI 96721

Dear Mr. Terry,

SUBJECT: KOLEKOLE GULCH PARK ACCESSIBILITY IMPROVEMENTS
South Hilo, Hawai‘i
TMK (3) 2-8-015:015

The Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) has received your request for comments on the preparation of a draft Environmental Assessment for proposed improvements to Kolekole Gulch Park. The parcel is on State land that was Executive Ordered to the County of Hawai‘i, and lies in the Limited and General Subzones of the State Land Use Conservation District.

The full list of activities is in development. The project is expected to include at a minimum drainage improvements, modifications to the existing comfort stations, removal of invasive trees, and repairs to the existing pavilions.

Based upon our conversation, OCCL understands that the County of Hawai‘i will be the accepting authority for the environmental assessment.

Once a final project plan is ready please consult with our office to determine whether a Conservation District Use Permit (CDUP) would be required.

If you have any questions, please feel free to call staff planner Michael Cain at 587-0048.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

Copy: Land Division
December 21, 2018

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District
- Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements

LOCATION: South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas

APPLICANT: Geometrician Associates, LLC on behalf of Hawaii County Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by January 4, 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 Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: [Signature]
Print Name: Gordon C. Heit
Date: 1-2-19

Attachments
cc: Central Files
January 8, 2019

Geometrician Associates, LLC
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements located at South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas on behalf of Hawaii County Department of Parks and Recreation

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated January 7, 2019, enclosed are comments from the Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at (808) 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files
December 21, 2018

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District
- Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements

LOCATION: South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas

APPLICANT: Geometrician Associates, LLC on behalf of Hawaii County Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by January 4, 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 Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
( x ) Comments are attached.

Signed: /s/ Dean D. Uyeno

Print Name: Acting Deputy Director

Date: January 3, 2019

Attachments
cc: Central Files
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 821
HONOLULU, HAWAI'I 96809

January 3, 2019

TO: Mr. Russell Tsuji, Administrator
    Land Division

FROM: Dean D. Uyeno, Acting Deputy Director

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility
          Improvements

FILE NO.: RFD.5007.8
TMK NO.: (3) 2-8-015:015 and immediately surrounding areas

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

Our comments related to water resources are checked off below.

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

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

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

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

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

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

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

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the
    Landscape Industry Council of Hawaii. These practices can be found online at

9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.

12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a stream channel.

16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

OTHER:

If you have any questions, please contact Dean Uyeno of the Commission staff at 587-0234.
Geometrician Associates, LLC
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements located at South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas on behalf of Hawaii County Department of Parks and Recreation

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated January 7 and 8, 2019, enclosed are comments from the Engineering Division on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at (808) 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files
MEMORANDUM

TO: DLNR Agencies:

Div. of Aquatic Resources
Div. of Boating & Ocean Recreation
Engineering Division
Div. of Forestry & Wildlife
Div. of State Parks
Commission on Water Resource Management
Office of Conservation & Coastal Lands
Land Division – Hawaii District
Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements

LOCATION: South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas

APPLICANT: Geometrician Associates, LLC on behalf of Hawaii County Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by January 4, 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 Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: 
Print Name: Carty S. Chang, Chief Engineer
Date: 1/7/19

Attachments
cc: Central Files
LD/Russell Y. Tsuji
Ref: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements, South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas

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: CARTW S. CHANG, CHIEF ENGINEER
Date: 1/7/19
January 18, 2019

Geometrician Associates, LLC
Attention: Mr. Ron Terry via email: rterry@hawaii.rr.com
P.O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements located at South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas on behalf of Hawaii County Department of Parks and Recreation

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated January 7, 8, and 11, 2019, enclosed are comments from the Division of Forestry & Wildlife on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at (808) 567-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files
December 21, 2018

MEMORANDUM

TO: [Name]

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation for Environmental Assessment for Kolekole Gulch Park Accessibility Improvements

LOCATION: South Hilo, Island of Hawaii; TMK: (3) 2-8-015:015 and immediately surrounding areas

APPLICANT: Geometrician Associates, LLC on behalf of Hawaii County Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by January 4, 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 Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed:

DAVID G. SMITH, Administrator

Print Name:

Date: 1/1/19

Attachments

cc: Central Files
MEMORANDUM

TO: Russell Y. Tsuji, Administrator
    Land Division

FROM: David G. Smith, Administrator

SUBJECT: Re: Early Consult for EA for Kolekole Gulch Park Accessibility Improvements

The Division of Forestry and Wildlife would like to offer the following comments for consideration:

The project activities in development include “removing nuisance non-native trees that may pose a risk to park facilities or users throughout the park site, in consultation with a certified arborist....”

DOFAW strongly supports retention of tree canopy, whenever possible and would suggest having a TRAQ (Tree Risk Assessment Qualification)-certified arborist perform tree risk assessments prior to removal of “hazard” trees. If trees do need to be removed, DOFAW would encourage replacement with appropriate non-invasive canopy trees. Even if no trees are removed, the existing ones should be assessed, and new trees should be planted in consultation with a certified arborist.

Should you have any questions, please contact Heather McMillen at 587-0054 or email at heather.l.mcmillen@hawaii.gov.
February 11, 2019

Mr. Ron Terry
Principal
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

Subject: Request for Comments
Early Consultation for Draft Environmental Assessment
Kolekole Gulch Park Improvements
TMK No: (3) 2-8-015: 015 – Hilo, Hawaii

Thank you for the opportunity to review the subject project as an early consultation on the preparation of a Draft Environmental Assessment (DEA) required by Chapter 343, Hawaii Revised Statutes for the use of State and County lands and funds. The project proposed by the Hawaii County Department of Parks and Recreation consists of soil remediation, renovation of restrooms, and various drainage and utility improvements within the park to ensure public safety. The principle access for the park appears to be off State Mamalahoa Highway (Route 19).

Based on the information provided, after completion the proposed project does not appear to significantly impact the State Highway System. However, during construction, the transportation impacts the State Highway System should be evaluated and mitigation provided, if necessary.

If you have any questions, please contact Ken Tatsuguchi, Engineering Program Manager, Highways Division, Planning Branch at (808) 587-1830. Please reference file review number PS 2018-137.

Sincerely,

JADE T. BUTAY
Director of Transportation
[This page intentionally left blank]
Kolekole Gulch Park Accessibility Improvements

Environmental Assessment

APPENDIX 1b
Comments to Draft EA and Responses
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Aloha Mr. Sakai,

I have read the Draft Environmental Assessment (EA) and Anticipated Finding of No Significant Impact (DEA-AFNSI) for the Kolekole Gulch Park Accessibility Improvements published in the February 23, 2020 edition of The Environmental Notice. It appears that the proposed improvements will be constructed immediately adjacent to the lower reaches of Kolekole Stream, yet the Draft EA has no discussion of the stream environment or the significance of the Kolekole Stream to native stream biota.

Kolekole was identified as a high quality stream ecosystem in the Hawaii Stream Assessment, and has been the focus of many research studies by university, state, and federal agency scientists over the past 40 years. The EA contains testimony of area residents who cited use of the stream for recreational and subsistence fishing for native stream life. The Cultural Resource Study echos this testimony and provides a historical perspective.

I would therefore recommend that Section 3.1 of the final EA include a description of the resident aquatic species within Kolekole Stream (with an emphasis on native amphidromous species and aquatic insects), a discussion of potential impacts of proposed drainage improvements upon the stream ecosystem and populations of native species and fishery resources, and best management practices specifically designed to prevent erosion and contaminated storm water from the construction site and new parking areas into the stream.

Thanks for your consideration.

Best regards,
John Ford

John Ford
808-382-7705
April 8, 2020

John Ford
jfordhawaii@gmail.com

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Mr. Ford:

Thank you for your comment email dated February 24, 2020, on the Draft EA requesting more information on the aquatic biota of Kolekole to be included in the Final EA. We have added a section discussing the aquatic fauna and potential impacts. Our department shares your concern, and has designed the project to improve upon existing conditions rather than simply mitigate for additional impacts to water quality.

For background, the park has existed for almost a hundred years, for most of that time surrounded on the tablelands above by sugar cane fields and bordered by a bridge that shed lead paint during maintenance. While this environment produced pollution that was likely detrimental to stream and marine life to some degree, the aquatic life in Kolekole Stream fortunately continued to thrive. The improvements at the park are being conducted in such a manner that will further protect water quality through the strict construction BMPs listed in the Draft EA to prevent runoff or pollution into the stream or ocean. Operationally, conducting drainage in shallow drywells, with direct piping from buildings and the shower, will greatly improve upon the historic situation, where drainage has gone directly to the stream. An individual wastewater system will be installed to better treat wastewater. Separately, lead-tainted soil is planned for removal and if necessary, coverage by DOT. With completion of these projects, water quality and fish habitat will both be enhanced. The passage of time has led to the disappearance of sugar cane and reversion of much of the watershed to vegetation less affected by chemical agriculture, along with lead cleanup and the standard use of BMPs in construction. Fish habitat is thus much better protected nowadays, and this project will further enhance this protection.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project Manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

[Signature]
Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associate

County of Hawai‘i is an Equal Opportunity Provider and Employer.
March 4, 2020

Mr. Kevin H. Sakai  
Park Project Manager  
County of Hawaii  
Department of Parks and Recreation  
101 Pauahi Street, Suite 6  
Hilo, HI 96720

Dear Mr. Sakai:

SUBJECT: KOLEKOLE GULCH PARK ACCESSIBILITY IMPROVEMENTS  
ISLAND: HAWAII; DISTRICT OF SOUTH HILO  
TMK: (3) 2-8-015:015

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

Thank you for allowing us the opportunity to comment.

If you need any additional assistance, please contact Captain Kenneth Quiocho at (808)961-2214 or via e-mail at kenneth.quiocho@hawaiicounty.gov.

Sincerely,

JAMES B. O’CONNOR  
ASSISTANT POLICE CHIEF  
AREA I OPERATIONS

c: Ron Terry, Geometrician Associates
April 8, 2020

James B. O’Connor
Assistant Police Chief
AREA I OPERATIONS
Hawaii County Police Department
349 Kapiolani Street
Hilo HI 96720-3398
Via email only: Kenneth.quiocho@hawaiicounty.gov

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Assistant Chief O’Connor:

Thank you for your comment letter dated March 4, 2020, on the Draft EA, stating that you did not anticipate any significant impact to traffic and/or other public safety concerns.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates
March 6, 2020

Kevin H. Sakai, Parks Project Manager
County of Hawaii
Department of Parks and Recreation
(via. email: kevin.sakai@hawaiicounty.gov)

SUBJECT: EARLY CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT FOR KOLEKOLE GULCH PARK ACCESSIBILITY IMPROVEMENTS
SOUTH HILO, ISLAND OF HAWAII, HAWAII
TMK: (3) 2-8-015:015

We have reviewed the request for early consultation for a draft Environmental Assessment dated February 23, 2020, and have the following comments:

1. All development generated runoff shall be disposed of on-site and shall not be directed toward adjacent properties. A drainage study shall be prepared by a licensed civil engineer and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works.

2. All earthwork activity, including grading, grubbing and stockpiling, shall conform to Chapter 10, Erosion and Sedimentary Control, of the Hawaii County Code.

3. All driveway connections and construction within the Old Mamalahoa Highway Right-of-Way shall conform to Chapter 22, County Streets, of the Hawaii County Code. Access to Old Mamalahoa Highway, including the provision of adequate sight distances, shall meet with the approval of the Department of Public Works, Engineering Division.

4. The subject parcel is in an area designated as Zone X on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Zone X is an area determined to be outside the 500-year floodplain.

Should there be any questions concerning this matter, please contact Bryce Harada of our Engineering Division at (808) 961-8042.

For BEN ISHII, Division Chief
Engineering Division

BH

cc: Ron Terry, Geometrician Associates (via. email: rterry@hawaii.rr.com)

County of Hawaii is an Equal Opportunity Provider and Employer.
April 8, 2020

Ben E. Ishii, Division Chief
Engineering Division
Hawai‘i County Department of Public Works
101 Pauahi Street, Suite 7
Hilo HI 96720-4224

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Mr. Ishii:

Thank you for your comment email dated February 24, 2020, on the Draft EA

1. Development-generated runoff to be disposed of onsite and not be directed toward adjacent properties, and drainage study shall be prepared by a licensed civil engineer and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works.

Project design and construction will ensure adherence to his requirement of Chapter 27.

2. Earthwork and grading shall conform with Chapter 10 of the Hawaii County Code

Conformance with Chapter 10 is understood to be required, and the contractor will apply for a grading permit at the appropriate time.

3. All driveway connections and construction within the Old Mamalahoa Highway Right-of-Way shall conform to Chapter 22, County Streets, of the Hawaii County Code. Access to Old Mamalahoa Highway, including the provision of adequate sight distances, shall meet with the approval of the Department of Public Works, Engineering Division.

No new driveway construction is anticipated, although repaving will occur. In any event, our department will ensure that the project conforms with Chapter 22 and will coordinate with DPW as appropriate.

County of Hawai‘i is an Equal Opportunity Provider and Employer.
4. The subject parcel is in an area designated as Zone X on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA).

Thank you for the information concerning the flood zone information for the parcel and project area.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project Manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

[Signature]

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates
March 9, 2020

Kevin H. Sakai
County of Hawai‘i
Dept. of Parks and Recreation
101 Pauahi St., Ste. 6
Hilo, HI 96720

Dear Mr. Sakai,

Subject: Draft Environmental Assessment (DEA) and Anticipated Finding of No Significant Impact (AFONSI) for the Kolekole Gulch Park Accessibility Improvements and Soil Remediation Project

Location: South Hilo District, Island of Hawai‘i

Tax Map Key: (3) 2-8-015:015

The County of Hawai‘i Planning Department has reviewed the subject Draft Environmental Assessment (DEA) for the proposed Kolekole Gulch Park Improvement Project. According to our information the entire parcel is located within the State Land Use (SLU) Conservation District and is therefore under the regulatory authority of the DLNR Office of Conservation and Coastal Lands. However, a portion of the project parcel and proposed activities are located within the County of Hawai‘i Special Management Area (SMA) and therefore will require the applicant to submit to the Planning Department a SMA Use Permit Assessment Application (SAA) for review and processing prior to development.

The Planning Department requests that the applicant demarcate the approximate location of the SMA boundary on the project parcel on future project plans to ensure SMA compliance and a thorough review of the projects impact on coastal resources. If you have any questions, please contact Alex J. Roy of our Planning staff at 808-961-8140 or via email at alex.roy@hawaiicounty.gov

Sincerely,

MICHAEL YEE
Planning Director
April 8, 2020

Michael Yee, Director
Hawaii County Planning Department
101 Pauahi Street, Suite 3
Hilo HI 96720

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Mr. Yee:

Thank you for the comment letter dated March 9, 2020, in which you provided the land use designation information for the property. P&R understands the need to demarcate the approximate location of the SMA boundary on future project plans and to provide an SMA Use Permit Assessment Application for the activity, which we will be applying for at the conclusion of the EA process.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project Manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates
Via U.S. mail and email:

Department of Parks and Recreation, County of Hawai‘i
101 Pauahi Street, Suite 6
Hilo, HI 96720

Attention: Mr. Kevin Sakai

Re: Draft Environmental Assessment (AFNSI)
Kolekole Gulch Park Accessibility Improvements
TMK: (3) 2-8-015:015 and Old Mamaloha Highway R-O-W

Dear Mr. Sakai:

Thank you for the opportunity to comment on the Draft Environmental Assessment for the proposed Kolekole Gulch Park Accessibility Improvements referenced above (published February 23, 2020), specifically with respect to issues and concerns regarding light pollution.

The University of Hawai‘i Institute for Astronomy (IfA) conducts research in astronomy using telescopes located on Haleakalā and Maunakea and operated by IfA and our partner institutions. Both Haleakalā and Maunakea are among the best sites in the world for astronomical facilities because of their elevation, clear skies, favorable atmospheric conditions, and low levels of light pollution. Hawai‘i-based observatories have played major roles in the advancement of astronomy and astrophysics for over 50 years and are well positioned to remain at the forefront of astronomical research for decades to come.

Because of the outstanding quality and productivity of these facilities, IfA is acutely concerned about negative impacts on astronomy from increased light pollution. Our work to combat light pollution has also brought us into contact with others concerned about light pollution for other reasons, including impacts on wildlife (particularly seabirds) and on human health.

With that background, we offer the following comments:

Any new or additional artificial light at night has an adverse effect on astronomical observations by increasing the night sky brightness. Nearly all observations performed by the telescopes on Maunakea are sky-background limited. This means that there is a natural sky brightness coming from airflow and zodiacal light. Artificial light increases the sky brightness, thereby decreasing the sensitivity of the telescopes.

Lights can have an adverse effect on astronomical observations by incrementally increasing the night sky brightness, effectively making the telescope smaller and less sensitive.

Appropriate steps to reduce the impact on the observatories would include:
1. Use NO light at night. This is the preferred approach. If no light is used, then there would be no impact on the observatories.

2. Using lights that are activated by motion sensors, in a manner such that no light is emitted when no one is present. We also believe that this strategy may improve security compared to static lighting because presence of a light will indicate presence of a person who should not be there.

3. Any lighting at the facility must follow the Hawai‘i County lighting ordinance. Note that revisions to the county lighting ordinance are presently being discussed, and may occur in the next few months. All lighting must be fully shielded. This means that all lighting fixtures must emit zero light above the horizontal plane.

4. The minimum possible amount of outdoor lighting should be used. Blue light is most harmful to the observatories, so blue-deficient lighting should be exclusively selected. The best choices are filtered LED lights, or amber LED lights. Under no circumstances should high-intensity discharge lamps such as metal halide be used; fluorescent lights also must be avoided. Both of these types of lamps use mercury and emit light at wavelengths that is very damaging to astronomy.

5. White light should be avoided because the blue component of white light is very damaging to astronomy. White light should only be used for tasks that require full color rendition, and is not appropriate for parking lots or security lighting. White light should always have a Correlated Color Temperature of 2700 K or below.

The draft EA states that “only minor exterior lighting is planned, and it will be shielded to protect dark skies and transitory seabirds.” These safeguards are appropriate, and we hope that the comments above are helpful in further refining lighting plans.

Thank you for your consideration of these comments and attention to IfA’s concerns. If you have questions or need further detail regarding these comments, please do not hesitate to contact the undersigned or Richard Wainscoat (rjw@hawaii.edu).

Very truly yours,

Robert McLaren
Interim Director

cc: Mr. Ron Terry, Geometrician Associates
April 8, 2020

Dr. Robert McLaren, Interim Director
University of Hawai‘i Institute for Astronomy
2680 Woodlawn Drive
Honolulu HI 96822

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Dr. McLaren:

Thank you for your comment letter dated March 23, 2020, in which you state that IfA is acutely concerned about negative impacts on astronomy from increased light pollution. To summarize your recommendations concerning lighting:

1. Use NO light at night. This is the preferred approach.
2. Use lights that are activated by motion sensors.
3. Ensure at least that any lighting at the facility follows the Hawai‘i County lighting ordinance that requires full shielding. Be sure to keep up with current ordinances, which may be revised soon.
4. Use the minimum possible amount of outdoor lighting, using blue-deficient lighting such as filtered or amber LED lights, or amber LED lights. Do not use fluorescent lights or high-intensity discharge lamps such as metal halide.
5. Avoid white light, especially for parking lots or security lighting, and make sure that if white light is needed for full color rendition, the lighting has a Correlated Color Temperature of 2700 K or below.

As stated in the EA, all lighting will be required to be shielded in conformance with the Hawai‘i County Outdoor Lighting Ordinance, Chapter 14 – General Welfare, Article 9 “Outdoor Lighting”. In cases where fixtures located outside the building are fully shielded by the building itself and are thus not required to comply with this section, fixtures which are not fully shielded by the building are specified as LED with less than 2% blue light content as defined by the Code. Such lights include outdoor pole mounted fixtures and wall mounted fixtures. Both products specified are full cutoff in accordance with Table 14-A of the Code. All exterior lights are controlled via photocell and time clock with user adjustable time parameters. We appreciate the County of Hawai‘i is an Equal Opportunity Provider and Employer.
IfA’s goals of reducing light pollution and are striving to accommodate them as much as possible consistent with keeping our facilities safe and secure.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project Manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

[Signature]

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates

County of Hawai‘i is an Equal Opportunity Provider and Employer.
Aloha

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


Please let me know if you have any questions.

Barry Ching
Clean Air Branch
Hawaii Department of Health
(808) 586-4200
April 8, 2020

Barry Ching
Cab.General@doh.hawaii.gov

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Mr. Ching:

Thank you for your comment email dated March 23, 2020, on the Draft EA. In answer to your specific comments:


We reviewed the standard comments as part of EA preparation. The grading notes on the construction plans direct the contractor to keep the area free of dust nuisances and to conduct all work in conformance with Department of Health Rules at HAR 11-60.1, Fugitive Dust. Extensive dust control measures will be implemented during the project in consultation with the DOH-HEER office.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project Manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates

County of Hawai’i is an Equal Opportunity Provider and Employer.
Feb. 26, 2020

County of Hawaii
DEPARTMENT OF PARKS AND RECREATION
IOI Pauahi Street, Suite 6 • Hilo, Hawai‘i 96720

Attn: Roxcie Waltjen, Director, Department Of Parks and Recreation & Kevin Sakai, (contact person D.O.P.&R), Ron Terry, Geometric Consultant, c.c. Sam Lemmo, OCCL., Suzanne Case DLNR, Scott Glenn, OEQC,

Subject: DEA - AFONSI Kolekole Park refurbishment (the "Project")

Dear the noted mail list above,

I am a resident in the area and I have a residence a few hundred feet from the north side of Kolekole Park. While this letter may seem otherwise I support that the project proceed and I anxiously await its re-opening.

The DLNR suffers public criticism from all sides (both for and against planned projects) regarding allowing/permitting Conservation Districted lands uses. I particularly can think of the highly publicized telescope permit that the DLNR issued several years ago. There has to be a better way to simplify and streamline uses of Conservation Districted lands, EA's, EIS's and the like particularly as it affects small property owners simply desiring to use their privately owned land vs. big projects of considerable public interest. In the present system all projects are treated the same which places an unreasonable burden on private land owners desiring to develop their land.

In the case of the Project it seems to me that the accepting agency for the draft EA ought to be the DLNR and not the County as the property is zoned in the State's Conservation District. All uses of Conservation Districted land is governed by the DLNR through HAR 13-5 first (the "Rules") before the County can weigh in with its permitting process. I believe that it is for the DLNR to "Determine" that an anticipated FONSI may result and not the County for the Kolekole park Project. Anyway unless the DLNR approves/issues a permit for the Project whatever the County would like to do is of no matter.

Also rather than an EA an EIS will likely be required. An EIS requires that the Project meet a much higher standard than an EA, particularly public hearings are required for an EIS. While all of this seems excessive to me there exists Rules for using Conservation Districted lands. If the public, like me, is required to navigate through the very burdensome approval processes so ought the State and the County as they are largely responsible for the Rules being put in place and can effect their likely amendment.
The project will likely require that the DLNR issue numerous "Determinations" (ref., HAR 13-5-30) and a rather large CDUP from the DLNR as the County's plan for the project has many elements that require a permit from the DLNR. The Draft EA or Draft EIS should describe the anticipated Determinations, CDUPermits and SPAapproval(s) that will likely be required. Of considerable relevance to the Project, the park and its existing structures, facilities and uses existed before the Conservation District was overlaid on it.

HAR 13-5-7's Nonconforming Use Rule ought to apply that the existing park etc. is an "Allowed use" which requires no permit from the DLNR which is different than an "Allowable use" which requires permits etc. Unfortunately it has been my experience that the DLNR discourages such uses as "Allowed". I am aware that the OCCL has taken the recent positions, in the case of at least 3 land owners, that only uses that continued uninterrupted qualified to be resumed as "Allowed" (specifically in these cases the OCCL has advised that HAR 13-5 requires that if the use is interrupted for a period greater than one year it may not be resumed without a formal use permit from the DLNR). I believe that the DLNR is generally improperly applying its Rules by resisting land owners resuming Allowed Nonconforming land uses and structures.

It is a legal fact that the DLNR's Board ("BLNR") is not bound by precedence but rather guided by its Rules and policies that are consistently and evenly applied no matter what the project or the applicant! This is described in a report by the State's Auditor General, Report No. 91-1, January 1991, to the Governor and the Legislature of the State of Hawaii, wherein the auditor identified on the report's page 22 that the BLNR.............

'is not bound by precedent and is obligated by its own policy to examine applications on a case-by-case basis.

Particularly relevant to the Project the Auditor's report went on to describe....

"When the law was enacted in 1957, the Legislature apparently intended to exempt nonconforming uses from all regulations adopted by DLNR. The provision in the rules appeared some years later, in 1978. By including nonconforming use within the scope of regulation, the department may have intended to limit the intrusion of residences into sensitive areas. In spite of good intentions, however, the rule did exceed the scope of the statute."

(while the report was a study relating to residences it equally applies to all land uses in the Conservation District).

and beginning on the reports page 10....................

Grandfather: clauses in the forest and water reserve zones law allow two kinds of nonconforming use within the conservation district. These clauses cover
activities that were (1) already being conducted or (2) intended to be conducted, on or before the dates stated in the statutes.

The first clause covers a range of activities circumscribed by previous use of the land. It allows continued use of “any building, premises or land for any trade, industrial, residential, or other purpose for which the building premises or land is used on July 1, 1957, or at the time any regulation adopted under authority of this part takes effect.”

and on page 15 of the Auditor’s report...

“Citizens concerned with preserving the natural wonders of the state have turned to the land use law (Chapter 205, Hawaii Revised Statutes) and the forest and water reserve zones law (Section 183-41, HRS) for help in protecting the conservation district. It is in these laws that scenic and natural values find their expression. But the laws, and the rules adopted under them, are bound to disappoint many. They do not have, as some might wish, an orientation that is purely preservationist. Instead, the laws contain the dual public purposes of preservation and conservation. Preservation seeks to protect land areas from any kind of development, while conservation seeks to manage natural resources and fully use them.

and on page 17 ........

“The forest and water reserve zones law requires DLNR both to “maintain, improve, protect, limit the future use of, or otherwise conserve open spaces” and to “allow and encourage the highest economic use” consistent with maintaining pure water supplies.”

Clearly Kolekole park serves the public's interest. I believe that its resumed use as a park ought not to be burdened so heavily by the Conservation District Rules but the Rules are the Rules and if applied so vigorously against private owners of land the same burden of application/permitting ought to be applied consistently and evenly to all applicants including the County.

Resulting from the Auditor's Report dated in the early 1990's the State changed to Rules governing the Conservation District from HAR 13-2 (the former Rules) to HAR 13-5 (the current Rules). Particularly any previous use of land that predated the Conservation District overlay is an "Allowed" use of land. Frankly the State needs to have a hard look again at the Rules and simplify them for the benefit of all! The existing Rules do not allow a lot of the proposed park use to be resumed as Nonconforming however. Particularly total replacement of structures requires that new studies be carried out, an EIS, and formal permits be applied for, considered by the BLNR and, if approved, be issued.
This is a significant issue in the case of both Kolekole gulch park and Hakalau as both parks have been closed for a period greater than one year. Their re-opening for the benefit of the public ought not to be burdened unnecessarily with regulatory process as may happen or the general public will suffer a further prolonged period of park closure.

It has been my experience that the DLNR's OCCL position has been that if an Allowed nonconforming use is discontinued for a period greater than one year it may not be resumed. This is not supported by HAR 13-5 but, by administrative conduct, the DLNR's OCCL seemingly believes it has a substantial "Discretionary" power in this regard and often has resisted formally allowing historical preexisting uses of properties to be resumed without formally being first suffer through the DLNR's formal permitting processes.

None-the-less I believe that the above comments and quotes are directly relevant to the Project. I believe that the DLNR ought to more generously allow "Allowed" (ref., HAR 13-5-7) Nonconforming land uses as requiring formal permitting for such to be unwarranted, however again if a private land owner is forced to do these sorts of things then why should the County and State not also have to conform to their own Rules similarly?

I am very disappointed with portions of the DraftEA - Anticipated FONSI. I expected to open the electronic DEA file and enjoy reading it and the history of the area. I expected it to be a well researched document. Something that I would have expected that I could have described as a "historical library edition/analysis". Instead it is factually incomplete, insufficiently researched (in a big way) and is often documented poorly. Particularly the professional studies, that are part of the DEA, have incorrect content and are grossly incomplete.

Without a lot of research I have identified, what I believe to be, many, many deficiencies in the DEA. While it is an enormous document it has the appearance to me to be a submission lacking a lot of original research but rather seemingly has a lot of 'cut and paste' repeating text seen in other EA(s). This gives a burdensome volume to the studies but not the sort of historical research that I expected. The County, Kolekole Park, local residents and the public deserve AND have probably paid for a lot more!

Here are some of my comments. I have not put them in any particular prioritized order.

1. At the time recently before the park was closed I witnessed, on several occasions, that homeless people had taken up residence in the park structures. One day I observed that a female park resident was showering naked under the provided wash station in the park. I also was intimidated away from an area near a picnic table which picnic table had been taken over
by a park resident and some sort of apparent shrine had been configured on it which I observed remained there repeatedly for a considerable period of weeks.

Is there a plan to allow the resumption of overnight camping in the park? The DEA does describe that the park allowed intermittent camping continuously over the years. If not what enforcement of closing the park at night is planned?

2. If a gate at the park entrance is intended will it be CDUPermitted and will it be locked at night? Perhaps the gate qualifies to not require permitting consideration, i.e., Allowed Nonconforming, as it seems to have existed historically?

3. What signage is planned for the park? Approval/formal permitting of signage is normally required by the Rules.

   Again I believe that the DLNR ought not to require such as it seems to be excessive and unwarranted, however again if a private land owner is forced to do these sorts of things then why should the County and State not also have to conform to their own Rules similarly?

4. Regarding Lepto Sporosis pathogens in Kolekole stream. Will swimming continue to be allowed? Will there be signage warning swimmers?

5. Will a life ring be provided for swimmers? This would seem to be very subject to theft and vandalism.

Later herein I describe two very interesting historic features on the north pali by the bridge supports wherein Ka'ahakini stream empties into Kolekoli stream. They do not appear to have been documented for SHPD consideration. I think it would be good to have signage describing these two features, particularly the cave like feature be clarified to not be a lava tube but rather a former man made tunnel if that is found to be true? A discussion of these features is found later in this letter.

6. Regarding the driveway and parking area described in the DEA. In the case of a planned residence on Oahu wherein the owner was negotiating with the OCCL during a *discretionary consultation phase* before the OCCL would agree to accept the CDUA as a complete application for processing the land owner was asked what design features the applicant intended to incorporate in their *grass-crete* driveway in order to insure that the potential for contaminating oil drips and the like would be limited. The driveway and parking area of the Project obviously would be more highly used and thus similarly susceptible, but with a much higher potential, than was the case on
Oahu. While it seems to me that, in this described way, the OCCL was unnecessarily resisting/delaying that CDUA's acceptance for processing, consideration of this in this DEA may be advisable??

Again I believe that the OCCL ought not to require such as it seems to be excessive and unwarranted, however again if a private land owner is forced to do these sorts of things then why should the County and State not also have to conform to their own Rules similarly?

7. I believe that serious consideration ought to be given to hook up to the County water supply rather than putting in a tank for 'potable water' that will also be a continuing liability and costly to manage.

8. The existing structures in the park are historic by definition. Will SHPD have to determine if they may be removed/replaced as is proposed??

9. Will a SMA permit be required for the Project?

10. Projects like this that are funded with public money notoriously fall horribly behind their original anticipated project time-line. This can lead to studies such as the DEA's 'Botanical Study' to become out of date. By example when I submitted a Draft EA and CDUA to the DLNR's OCCL for my property I was required, by the OCCL, to update a reasonably current professional Botanical Study for my property. The OCCL representative stated to me that 'a bird(s) may have dropped seeds of endangered plants that had since began growing on the property that may now need protection'.

I argued that my Applied for Project, which was to combine and resubdivide my 6 legal lots of record into 3, would not result in any disturbance of such plants, if they even existed (ref TMK lots., 29003: 060, 029, 013). In fact I stated that my property was a former sugar cane field and since that ceased it was regularly mowed grasses anyway so no such plants, if they started to grow, would exist. None-the-less I was required to conduct/commission an expensive new Botanical study before my CDUA was "accepted for processing" by the DLNR's OCCL.

It seems to me that a bar graph of anticipated time line for various aspects of the Project intended to be measured against the time line of the Project and a statement by the applicant that if the Project falls behind that schedule any time sensitive professional studies may be reviewed and re-submitted for approval appropriately as was the case for my CDUA.

Also in the case of that CDUA I was required to also apply for, as part of my project, a description of intended signage (no trespassing etc.), their
placement, sign size etc. This is likely applicable to the Kolekole Project signage also.

Again I believe that the DLNR ought not to require such as it seems to be excessive and unwarranted, however again if a private land owner is forced to do these sorts of things then why should the County and State not also have to conform to their own Rules similarly?

11. During LUC hearings in 2005, for a petition by the McCully(s), a representative of the Sierra Club protested against that Petition, describing that a rare fish migrated up the Kolekole stream and then climbed Akaka falls rock wall using a suction cup like mouth in order to lay its eggs upstream above the falls. The McCully property was a 1/4 mile away from the park and was not directly adjacent to Kolekole gulch. The proposed Kolekole Project lies directly adjacent to the stream. Has the Project's effect on what was described as this 'rare' fish's migration been considered?

12. Regarding the removal of lead contaminated soil: it seems to me that the County's scarce financial resources would be better spent covering contaminated soils with a reasonably thick cap of soils instead of digging out contaminated soils, sealing such appropriately for transport and long term disposal, and then hauling in new top soil. Frankly we are talking about a lot of soil that unnecessarily adds considerably to the cost of the Project. Simply adding a cap layer of new soil would be an environmentally beneficial effect of the Project. Has this option been considered? Where would contaminated soil be landfilled? Hauling it to the west side of the island to a landfill would add a lot of cost to the project.

The Project then would also have the beneficial effect of raising the park area which would reduce the effect of minor flooding. Perhaps the more highly contaminated areas of the site could be first made level, an overlay of landscape fabric put down and then 6" or so of top soil applied. The landscape fabric would allow long term monitoring of erosion of capping soil and block the possible exposure of contaminated soils below? Was this considered?

13. Without a doubt the overhead painted steel trestle will be taken apart and replaced by a new bridge at some point in the future after the park and its soils have already been refurbished as is proposed in the DEA. It is unfortunate to do remedial work of soils on the area below the trestle today to only have to suffer the potential of having to do it again in the future when new lead based paint, resulting from the structures demolition, again contaminates the site. There is no way that ALL of the lead paint was removed during cleaning of the steel in the past!
14. I don't recall seeing in the DEA studies a description of the overhead power lines that exist.

15. I did not see a description of the County's record in the DEA regrading the incidence of landslides on to/blocking the roads in to and out of the park on the south and north pali sides including the roadway along the adjacent Ka'ahakini stream/gulch immediately to the north of Kolekole gulch. This has resulted in very frequent and very long periods of road/park closures in the past. What actions are intended to be taken to fix this problem so that the use of public park will not be so regularly interrupted?

16. Albezia trees on both pali(s) falling on to the road etc. are one of the major causes of road closure. This has been a repeating problem where trees fell on to the road from privately owned lot 29003058 leading along the upper areas of the north pali of the Project area. Is there a plan to remove such trees as part of the existing plan? Is there an ongoing plan for maintaining such slopes as part of the long term maintenance of the Park in order to prevent such in the future which will undoubtedly result in repeated park closures? Surely existing County records will show the incidence and severity of this. and, if not already part of the Project, ought to be addressed in the Project.

When I requested a Determination by the OCCL regarding my planned removal of 5 or 6 Albezia trees on my property I was advised that I would need a full blown CDUA with supporting studies, costs and delays and the like. Again the discretionary authority of the DLNR can reasonably simplify this requirement not just for the Project but for everyone. The discretionary administration of existing Rules by the DLNR's OCCL needs an examination and, if warranted, a correction.

Again I believe that the DLNR ought not to require such as it seems to be excessive and unwarranted, however again if a private land owner is forced to do these sorts of things then why should the County and State not also have to conform to their own Rules similarly?

17. As I stated earlier I found the professional archaeological and historical study in the DEA a big disappointment! I expected a "historical library edition/analysis" document. The report lacked such quality.

(please note, page numbers described herein refer to the order that they appear in the pdf text copy, the studies in the DEA carry their own page numbers which have not been referenced by me as the pdf page count was a more efficient way for me to use)
confusingly the picture, figure 29, on page 161 seems to describe that it shows Kolekole Bridge. The picture, in fact, is of Hakalau Bridge.

on page 133, figure 9 is a picture of Ka'ahakini Stream where it enters into Kolekole gulch through a man made cut through the north gulch pali. This picture is looking north. The stream appears to be on the government owned north highway bridge abutment lot.

This picture shows the Ka'ahakini stream cascading down the guch rock face through a man made channel from Ka'ahkini gulch. The waterfall is a beautiful and outstanding feature of the park and is frequently photographed by visitors. Ka'ahakini stream and gulch lie a few hundred feet directly after Kolekole gulch to its north. It is both visually interesting and a major feature of the park.

The Ka'ahakini stream used to empty directly into the ocean crossing the railway bridge abutment lot 329003044. It was diverted, first through a historic "tunnel", ref., figure 20 (which shows an area described as "tunnel"). It appears to me that the tunnel can be seen as a curious looking cave in the figure 9 picture and ought to have its history explained on park signage otherwise people may misunderstand it to be a lava tube. While technically it is outside the park lot it is a historic structure and its history ought to have been researched and be part of the report with a SHPD sign off and again I believe that it warrants explanatory park signage.

Usually the 'middle of the stream' is a boundary line for properties like these. In the case of the park it would appear that the stream is entirely on the privately owned lot 329003044 and the highway bridge lot. Is this correct? If the stream is on privately owned land (either partially or wholly) there probably is a liability issue that should be considered if the County effectively has encouraged swimming in the stream??

Just above this picture's r.h.side and to the r.h.s. of the existing highway bridge threshold the Ka'ahakini gulch was filled in over a large area likely in order to facilitate the r.r. passage leading away from the threshold landing of the r.r. trestle. A long, tall rock wall exists on the eastern side of the described filled area of Ka'ahkini gulch, facing the ocean, seemingly constructed for the high filled embankment retention. Perhaps the filled area was extended westward when the highway bridge was put in as it was unlikely to have been necessary for the much narrower r.r. crossing. Anyway all of these features ought to have been investigated and described in the report and documented for SHPD consideration.

It is important to describe that the highway bridge is not in the same location as the former r.r. bridge but rather to the west. The r.r. veered off to the east
after crossing Kolekole gulch leading north and entered into the gulch
through a deep cut in the south pali. Conversely the highway did not follow
that same route. Instead it was cut deeply into the walls of the pali(s) on both
south and north sides leading in to the bridge. Therefore the old r.r.
abutments are man made and ought to be documented for SHPD
consideration. Has consideration for pictoral, descriptive signage, of trains
crossing the Kolekole gulch, the raising of the steel structure trestle, such as
historical ones, shown in the DEA been considered as part of the tourist
element of the Project.

Also there exists a large paved area east of the highway on the north side of
the bridge. Currently the State stores soil and landslide material there. Has
consideration been given to dedicating this area to visitor parking, historical,
pictoral signage and the like. Often visitors can be seen along the bridge
walkway photographing the park from above. Hawai'i has a lot of potential
points of interest along the Hamakua coast. In order that the tourist potential
of the island be developed more completely opportunities such as fully
developing the resources of Kolekole need to be considered??

As can be seen in fig. 20 on page 160 of the DEA a historic railroad
"depot" hut existed at the north threshold of the Kolekole r.r. bridge with a
road leading westward down across and above the earlier described historic
"tunnel" shown in this figure 20 and connected with the old highway which
wound up and out of Kolekole gulch's norther side before it likely connected
with Homestead Estates road which then crossed Ka'ahakini stream leading
into Wailea. It would appear that the location of the former "depot" lays
directly under the present highway.

I have often looked at the "tunnel" from the park believing it to be a lava tube.
Apparently it likely is not. Rather it may be a "historic" structure that is not
identified and documented for SHPD consideration as such as was also the
re-routing of Ka'ahakini stream through the man made cut through the north
wall of Kolekole pali which occurred in a later period! If found to be true
there ought to be signage in the park describing same and the DEA ought to
research and document whether a mill (ref., 2004 Reitchman study) and
depot and roadway (ref., referred fig. 20 in the DEA) ever existed
immediately adjacent to the railroad at this location. What named mill
existed??

It is likely that the channel was created when the highway and its bridge was
created crossing Kolekole as tunnels like the described one typically suffered
from blockage of floatsome and boulders washing downstream during heavy
rainfall events. If such happened after transportation needs filled in
Ka'ahakini's streams downstream exit (which obviously did occur) directly to
the ocean it may have washed out the r.r. and/or the highway had the
channel not been created. It is obvious that Ka'ahakini stream was first diverted through a "tunnel" and into Kolekole gulch entering first through a tunnel (ref., figure 9, page 133).

As earlier described there apparently also existed a mill directly at this location above the tunnel also and immediately on the west side of the r.r. bridge. It is shown on a plantation map in a study described in "Table 2", on this study's page 176, by "Desilets" (Reitchman) but not in the DEA for the Kolekole park project!

That study showed various plantation housing camps in the area immediately to the north of Kokekole gulch. That map may be useful signage utilized in conjunction with the park as it gives an excellent historical presentation of the area. That same study described interviews with Kiyoshi Kubo and Masaichi Chinen who described that there existed "a pig farm used by camp residents" and a trail in that gulch leading down to the ocean where 'good fishing formerly existed.' The trail was described in that study in what I would describe as an undefined gulch which would have likely been Ka'ahakini gulch.

While the DEA shows a number of cemetery(s) in the area it has missed the very closest one on Lot 29003051. The County's TMK maps shows a local 'cemetary' a few hundred feet north of the northern edge of Kolekole gulch pali on Lot 29003051 and a 'spring fed pipe' leading across the present highway and former r.r. and on to that property also. I have seen the cemetery and it even has at least one head stone. Maps in the Reichtman study also show both features. What the pipe was all about is a mystery and deserves an explanation in the DEA?

- As described the same Reichtman report shows the various sugar cane labor camps in the area. The map provided there would also add value to this report.

- The old highway leading out of Kolekole gulch did not take the current route up the north pali wall. The "historic" road grade rather rose steeply up to the headlands above and between Kolekoli and Ka'ahakini gulches and then dropped down into Ka'ahakini stream gulch and crossed the stream at the present bridge location where Homestead Road also crosses today (I do not believe that Homestead Road always crossed at this location according to some of the maps that I have seen). I know the road existed because I walked on several intermittent sections of perfectly existing road grade which exist in the woody over-growth on the pali wall above the current road located on privately owned lot 29003058.
• Both the former and present old roads and both of the old concrete bridges on the old roads crossing Kolekole stream and Ka'ahakini stream ought to be identified as "historic" structures, identified and recorded with SHPD if they are not already?

• There also exists man made threshold embankments on either side of Kolekoli gulch that facilitated the railway trestle beginning and end points. These lie adjacent to the existing highway bridge on its east side and are clearly man made "historic" structures. The south threshold leads back into a substantial cut through the pali wall and on to a property which is a different route than the present highway route. Similarly the r.r. exited north on to its own threshold which is quite large and flat (man-made) and accommodated at least two large railroad related structures (including a residence) which can be seen in the picture on page 159. The residence was occupied by a person who managed a switch that branched the r.r. into at least two r.r. lines. Presumably one went to the sugar warehouse in Hakalau and the other led to and across Hakalau gulch further to the west of the sugar warehouse. These thresholds ought also be identified and recorded appropriately. The north r.r. threshold abutment has a very high, long, man made, stone wall along its eastern side which was presumably in order to stop erosion of the gulch filled embankment. One switch used to exist on lot 32003043 just below the current residence on lot 32003051. The cast iron post and sign with a hand operated handle still existed in 2014 but does not appear to exist today.

• the leg of the r.r. track leading from the 'switch' northward to the sugar warehouse in Hakalau was constructed beginning around 1917. This is evidenced by a date mark on a headstone on a mortar and rock tunnel that exists on my property where that same leg or the r.r. track crossed. This tunnel was described in the 2005 Reichtman study and was recorded with SHPD. While the track was likely laid in 1919 the infrastructure like the tunnel that I describe likely coincided with preparatory work for the leg of r.r. track.

• As I have described earlier here exists insufficient discussion in the DEA regarding the relocation of and raising of a bridge section relocated from Hilo to form the new highway bridge, ref., page 165, figure 27. The bridge section shown being raised into place was a former "drive through" railroad bridge (meaning the tracks and train went through the steel structure and not over it at its former Hilo location). In its new Kolekole configuration the roadway was built on top of the former "drive through" structure. It is obvious to be such in the picture. I believe that I read about this in the Reichtman report or I saw info regarding same at the Tsunami museum in Hilo.
• Interviews for the DEA ought to have included John Cross. He managed sugar cane fields in the area all around Kolekole gulch in the period for a considerable time before and at the time of the cessation of sugar cane production. He was the former manager of the Sugar Cane Museum referenced in the report. Both he and the sugar cane museum have a wealth of information which may be worth documenting for a more complete historical perspective in the DEA. Again there exist many opportunities to draw tourists to visit the east side of the island. Highway signage for the museum would help to add to the touristic value of the drive through the Hamakua district.

• There exist several historical maps and photographs of the area showing cane fields and the like, including the present day area of Kolekoli park at the Sugar Cane Museum. These ought to be shown and referenced in the DEA.

18. Any CDUA for the refurbishment/repair of Kolekole park ought to reflect that the existing park use is already an "Allowed" land use according to HAR 13-5-7’s Nonconforming Use Rule. Allowed uses are different than Allowable uses that require BLNR CDUPermits and the like. The park and its structures clearly existed before the State overlaid the Conservation District on it. Clearly certain aspects of the project fall into areas that require a CDUP but some are simply repairs to existing land uses and structures which do not need a full BLNR approval.

The County ought to request a Determination from the DLNR according to HAR 13-5-30 what aspects of the project are existing Allowed uses and which would be new uses requiring a permit. I am aware that the County’s Planning Department presently has in its employ Alex Roy who was a former DLNR planner that analyzed CDUA(s) until he re-employed with the County. He would probably be a good resource person for the submission of any application to the DLNR for the Kolekole park project.

19. There exists a residence under construction at the west end of the park on lot 329003003. There ought to be a more thorough notation and description of it in the DEA.

Finally I want to close by saying, contrary to what some may believe, people actually read these DEA(s) and the like and there will likely be many references to this in the future in other documents. The Kolekole park Project, in particular, ought to be a more complete "historic" document of library quality. Insuring its completeness and accuracy ought to be a priority. Comments from the public at the back of a resulting FONSI and the applicant’s responses in the same area at the end of the report do not do justice to the document nor serve its intent. I believe that my comments to the DEA ought to be studied and, if found correct, the DEA ought to be re-written so its content is more complete and accurate.
Sincerely,
Ken Church
P.O. Box 100014
Hakalau, Hi. 96710
April 8, 2020

Ken Church
Dockline3@yahoo.ca

Subject: Comment to Draft Environmental Assessment on Kolekole Gulch Park Accessibility Improvements, TMK (3) 2-8-015:015

Dear Mr. Church:

Thank you for your comment email dated February 26, 2020, on the Draft EA. In answer to your specific comments:

INTRODUCTORY COMMENTS.

a. DLNR should be the approving agency.

The County of Hawai‘i, Department of Parks and Recreation is the correct approving agency. The park is on County lands. Title 11-200.1, the administrative rules that govern the EIS process in Hawaii, state that the County government is the approving agency for projects that involve the use of county lands or county funds.

b. The project merits an EIS, not an EA.

Title 11-200.1-13(b)(1)-(13) provides significance criteria. Only when it is determined that an action may have a significant effect on the environment per these criteria is an EIS required. As stated in Part 5 of the Draft EA, no aspect of the project causes significant impacts, individually or cumulatively.

c. EA should describe the determinations, CDU Permits and SP Approval(s) that the project will require.

Section 3.6.6 outlines the process by which the project will be considered for permitting by the DLNR, and potential identified uses. It is not up the County to prescribe exactly what the permitting process is – i.e., Site Plan Approval versus Department Permit versus Board Permit; that is DLNR’s role. The EA provides part of the information DLNR requires in order to
d. Park is a non-conforming use and it ought not be burdened by additional permit requirements.

The County agrees that the park existed before the Conservation District was established, but what that means in terms of park improvements and permitting will be established through DLNR review and subsequent discussions among the parties.

e. Document is inadequate, with too much cut and paste, poorly documented, insufficiently researched, and not much good as a historical library edition/analysis. It needs to be rewritten.

The County believes the EA was more than adequate to document the existing resources, determine impacts and make a decision regarding the need or lack thereof for an EIS, which is the role of an EA. The EA was never intended to be a treatise on the history or natural resources of Kolekole Park. It is focused on identifying impacts from the proposed project and mitigation measures. EAs by their nature should not be exhaustive, encyclopedic, or overly long. If relevant information is similar to that found in other documents, it is appropriate to “cut and paste” it, rather than re-research and write it. We do not concur with your conclusion that the Draft EA needs to be rewritten and resubmitted.

NUMBERED COMMENTS

1. Is there a plan to resume overnight camping. If not, what enforcement will there be?

The Department may or may not resume camping at a future date; this EA does not concern that. Camping is already permitted in the park as long as Department permits it. Enforcement of laws, as always, rests with the Police Department. If incidents occur in a park, we are/is concerned, and if the incident appears to be criminal, it should be reported to the Police immediately, and to our Department.

2. Is a CDUP needed for a gate, if it is allowed non-conforming?

There are no plans to upgrade or move the gate.

3. What signage is planned?

Some minor new signage may be installed, a function that is allowed within a County park.

4. Will swimming continue to be allowed? What about leptospirosis? Will there be signage warning swimmers?

No additional signage concerning swimming or health risks in planned, but P&R will be monitoring the situation. Any health risk signage would be the responsibility of DOH, with whom P&R would cooperate.
5. **Will County install a life ring? Structures on bridge supports on north end not documented in historical study; signage for feature is needed.**

Life rings, similar to those put up by several non-profits around the County, would be welcome, and P&R is actively seeking cooperation from the Rotary Club and the Sayres Foundation. The structures you reference are not in the park and not part of the project area.

6. **Why should the County not have to describe the design features of the driveway that would avoid water pollution?**

The driveway already exists and will be repaved. Grasscrete would be prohibitively expensive for such a length and such volumes of use. No appreciable pollution would occur.

7. **Consider hooking up to county water supply, because a potable water tank is a liability and costly to maintain.**

This was considered as part of project design and it was determined that the nearest connection was in Wailea, which was distant and required a circuitous route using a 12-inch waterline to get to the park. At this time, it would not be cost effective or prudent to hook up to DWS water.

8. **The existing park structures are historic and SHPD may not allow them to be demolished.**

As stated in the Draft EA on Page 58, SHPD has already approved the archaeological survey and its conclusions that the pavilions are not significant historic properties that require preservation. (letter dated December 27, 2019; Log No. 2019.01792, Doc No. 1912SN10).

9. **Will an SMA permit be required?**

The SMA requirements are discussed in Section 3.6.5. In its comment letter on the Draft EA, the Planning Department requested preparation of a SMA Use Permit Assessment Application, as stated in the Final EA.

10. **A bar-graph of expected schedule should be provided. If too much time elapses, new studies should be done.**

We do not concur that a bar-graph schedule is needed; the schedule information in the EA is sufficient. Furthermore, falling behind schedule is not an environmental impact. Note that some CDUPs and SMA Permits have time performance conditions, which the County intends to meet, applying for extensions if necessary. If before the project is implemented there are changes in the scope or scale of the project, or if the project or the environment changes in some way that would appear to have the potential for new or more severe impacts, new studies, and perhaps even a new EA, would be done.

11. **Is there an effect of the project on rare fish?**

A discussion of the aquatic life in Kolekole Stream has been added to the Final EA in Section 3.1.4, including discussion of the o’opu (gobies) and invertebrates in the stream. It is important to note that the park has existed for almost a hundred years, for most of that time surrounded by
sugar cane and bordered by a bridge that shed lead paint during periodic maintenance. While this environment produced pollution that was likely detrimental to stream and marine life to some degree, the aquatic life in Kolekole Stream has continued to thrive. The park itself has had almost no environmental impact. The improvements at the park are being conducted in such a manner that will further protect water quality through the strict construction BMPs listed in the Draft EA to prevent runoff or pollution into the stream or ocean. Operationally, conducting drainage in shallow drywells, with direct piping from buildings and the shower, will improve upon the current situation, where drainage goes directly to the stream. An individual wastewater system will be installed to better treat wastewater. Separately, lead-tainted soil is planned for removal by DOT, and if necessary, coverage. The passage of time has led to the disappearance of sugar cane and reversion of much of the watershed to vegetation less affected by chemical agriculture, along with lead cleanup and the standard use of BMPs in construction. Fish habitat is thus much better protected nowadays, and this project will further enhance this protection. No rare fish will be adversely affected.

12. **Lead contaminated soil removal.**

The project to remediate the lead-contaminated soil is a separate effort being led by the Department of Transportation (DOT), and it is not the County’s project, although the County is being consulted. It is discussed in the EA for context. Your ideas have been provided to DOT. Experts from DOT and the Department of Health are handling it minimize cost, effort, and future risk. It is environmentally preferable to remove the soil, because it gets rid of a potential future liability. HDOT is handling that. Please note that it is problematic to raise land within a floodplain.

13. **Future lead paint removal**

DOT is aware that future efforts to remove lead paint must be properly diligent and be undertaken with additional monitoring. It is likely that most of the current lead paint residue resulted from efforts long before lead paint precautions and monitoring were required.

14. **Overhead power lines.**

The electric service is mentioned in Section 3.3.1. There are no impacts of replacing the service to hook up to the pavilion.

15. **No discussion of DPW work on the landslides on Old Mamalahoa Highway.**

Although work by DPW is not directly related to the proposed project, it is briefly discussed in Section 3.3.2, which notes: “The Department of Public Works is currently working on obtaining funding and permits to repair Kolekole Stream Bridge and to address the landslide problems on Old Mamalahoa Highway. When this section of the road is reopened, Kolekole Gulch Park will once again have an alternate access.”
16. Falling albizia trees.

As discussed in various sections of the EA, among them, Section 3.1.4, the Proposed Action includes removal of nuisance non-native trees and vegetation that pose a hazard to park users, facilities or operations, or neighboring properties. This removal will be determined with the assistance of an ISA-certified arborist and will specifically target albizia, gunpowder and African tulip trees.

Trees that are far from the project site on Mamalahoa Highway or other areas are not being addressed, as they do not affect the park. Other agencies, including DPW, DOT, BIISC and HELCO, are also addressing albizia trees in the area. Any trees that have the potential to affect the park will be dealt with directly, if it is within P&R’s power to remove or trim them, or indirectly, if other landowners must be involved.

17. Disappointment with archeological study.

First, the archaeological study was complete and accurate, even if it contained certain trivial errors. Most importantly, it correctly assessed historic properties in the area of effect. As stated previously, your expectations of a “historical/library edition/analysis” are not in line with requirements or best practices for archaeological assessments and cultural impact assessments. The cultural and archaeological studies included in the DEA focused specifically on the cultural history of the park parcel itself, which is the area of effect, and while there are many other interesting facts concerning the region, they are beyond the scope of work that guided the production of the compliance documents. The archaeological assessment prepared for the Kolekole Gulch Park project meets the requirements of HAR §13-275 and 276, and was accepted by the State Historic Preservation Division by letter dated December 27, 2019 (Log No. 2019.01792, Doc No. 1912SN10). The cultural impact assessment (CIA), to which your specific comments pertain, was produced following the Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts. CIAs are intended to identify and address effects on Hawaii’s culture, and traditional and customary rights, in order to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups, and a good faith effort was made to do so for the Kolekole Gulch Park project. The preparers of these documents reviewed all of your comments and specific information and determined that with only one exception, discussed below, the resources are outside of the area of effect are do not pertain to the central questions that are the purpose for these documents. That said, the archaeologists appreciated learning the information you shared concerning the plantation and railroad history in the vicinity of the Kolekole Gulch Park. In response to questions of yours that concerned research methods or resources that were within the area of effect and are thus relevant:

- The archaeologists concur with your statement that Figure 29 on page 161 of the CIA is not Kolekole. Upon closer examination, this photograph does appear to show Hakalau Bridge rather than Kolekole Bridge (as was captioned in the cited website that it was sourced from). This photograph has been removed from the CIA report included in the FEA.
- The boundary of the park parcel is the middle of the stream.
- Please note also that the Olson Plantation Archives were consulted as part of the research.
- Figures showing some former cane lands were included in the reports.
18. Consultation with DLNR on allowed nonconforming use.

DLNR-OCCL was provided a copy of the EA in order to assist in starting the permitting determination process, including the potential for non-conforming use.


The commenter provides no reason for discussing the residence. Providing upgraded and accessible facilities does not affect this residence, and the residence does not affect the park.

We very much appreciate your review of the document. If you have any questions, please contact Kevin Sakai, Parks Project Manager at (808) 961-8939, or Ron Terry, the preparer of the EA, at (808) 969-7090.

Sincerely,

Roxcie L. Waltjen
Director

Cc: Ron Terry, Geometrician Associates
Kolekole Gulch Park Accessibility Improvements

Environmental Assessment

APPENDIX 2
Cultural Impact Assessment
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A Cultural Impact Assessment for the County of Hawaiʻi's Kolekole Gulch Park Accessibility Improvements Project

TMK: (3) 2-8-015:015

Kuhua Ahupuaʻa
South Hilo District
Island of Hawaiʻi

Prepared By:
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May 2019
A Cultural Impact Assessment for the County of Hawaiʻi's Kolekole Gulch Park Accessibility Improvements Project

TMK: (3) 2-8-015:015

Kuhua Ahupuaʻa
South Hilo District
Island of Hawaiʻi
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1. INTRODUCTION

At the request of Ron Terry of Geometrician Associates, LLC on behalf of the County of Hawai‘i (landowner), Department of Parks and Recreation, ASM Affiliates has prepared this Cultural Impact Assessment (CIA) in support of the proposed improvements to the County of Hawai‘i’s Kolekole Gulch Park, located in Kuhua Ahupua’a, South Hilo District, Island of Hawai‘i on TMK: (3) 2-8-015:015 (Figures 1 and 2). This park is situated within the coastal portion of Kolekole Gulch along the southern embankment of Kolekole Stream (Figure 3). Kolekole Gulch Park has been closed to the public since June of 2017, when testing conducted by the State of Hawai‘i Department of Transportation (HDOT) determined that lead is present in various locations within the park at levels greater than the Hawai‘i State Department of Health’s (DOH) Environmental Action Level, indicating a potential risk to public health. In late August of 2018, Kolekole Gulch Park also suffered extensive flood damage during Tropical Storm Lane. Sediments, consisting of eroded soil, rock rubble, and debris, have covered the majority of the parking lot and damaged the recreation facilities, and the picnic area has been partially washed out as a result of the flooding. In an effort to reopen and improve the park, the County of Hawai‘i intends to convert the existing men’s and women’s restrooms into single-occupant accessible restrooms; providing a new accessible comfort station; repairing and making general safety improvements to existing pavilions; providing a single new pavilion; providing drainage sump improvements for existing shower area to prevent runoff from eroding the riverbank and entering the river or shoreline area; replacing the existing shower with an accessible unit; addressing drainage problems near pavilions; removing nuisance non-native trees that may pose a risk to park facilities or users; repaving the existing parking lot; and improving the stability and integrity of the driveway (Appendix A).

Plans by HDOT, independent of the County of Hawaiʻi’s proposed park improvements, are currently underway to remediate and/or encapsulate the contaminated soil to allow for safe public use of the park so that it can be reopened. No historic properties were identified within the park boundaries as a result of an intensive archaeological survey conducted in December of 2018 (Glennon et al. 2019, in prep.).

The current study was prepared in support of an Environmental Assessment conducted in compliance with HRS Chapter 343; pursuant to Act 50; and in accordance with the Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impact, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997. As stated in Act 50, which was proposed and passed as Hawai‘i State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, “environmental assessments . . . should identify and address effects on Hawaii’s culture, and traditional and customary rights . . . native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ‘aloha spirit’ in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.”

This report is divided into four main sections, beginning with an introduction and a general description of the study area, followed by a detailed culture-historical background and a presentation of prior studies; all of which combine to provide a physical and cultural context for the current project area. The results of the consultation process are then presented, along with a discussion of potential cultural impacts, as well as appropriate actions and strategies to mitigate any such impacts.
1. Introduction

Figure 1. Study area location.
Figure 2. Tax Map Key (3) 2-8-015 showing the current study parcel (015).
STUDY AREA DESCRIPTION

The current study area consists of the existing County of Hawai‘i Kolekole Gulch Park, a 5.497-acre parcel located along the eastern portion of the Kolekole Stream located in Kuhua Ahupua’a, South Hilo District, Island of Hawai‘i (see Figure 3). Access into the park is along the Old Māmalahoa Highway from Hawai‘i Belt Road (Route 19). This County park is set within Kolekole Gulch, which is one of many large, steep-sided gulches found along the Hilo and Hāmakua coast. The Kolekole Stream flows through the gulch and forms the park’s western boundary. Kolekole Gulch Park is just above sea level and extends roughly 396 meters (1,299.21 feet) mauka from the Kolekole Stream Bridge. The park consists of an asphalt paved parking lot, five covered pavilions with barbeque areas, a few picnic benches, and restrooms. It is bounded on the west by Kolekole Stream, to the east and south by the Old Mamālahoa Highway, and to the north by the Hawai‘i Belt Road right of way and the Kolekole Stream Bridge.

Soils within the study area (Figure 4) are classified as belonging to the Hilo-Rock outcrop complex on 35 to 100 percent slopes (Soil Survey Staff 2017). These soils are gently to steep sloping and are found within steep sided gulches at elevations ranging from sea level to 800 feet. They consist of well drained, silty clay loams formed in a series of volcanic ash layers overlying basalt that originated from Mauna Kea Volcano 64,000 to 300,000 years ago (Figure 5) (Sherrod et al. 2007). The study area receives a mean annual rainfall of approximately 3,500 millimeters, with the majority of the rain occurring during the spring months, with the most typically occurring in March, and the least occurring in June (Giambelluca et al. 2013). The climate is generally cool, with a mean annual temperature ranging from 72 to 77 degrees Fahrenheit throughout the year.

Kolekole Gulch Park is accessed by the Old Māmalahoa Highway, which extends southwest from Highway 19 (Hawai‘i Belt Road) to a gated, single-lane paved driveway (located to the east of Kolekole Stream) that accesses the paved parking lot for the park (Figures 6 and 7). A now overgrown picnic area consisting of a large, grass lawn comprises the northeastern portion of Kolekole Gulch Park (Figure 8). The lawn extends beneath the Kolekole Stream Bridge (on to the adjacent road parcel) nearly to the rocky coastline, but the park parcel does not include the bridge, the road parcel it is situated within, or the coastal area seaward of it; and there are no physical barriers to restrict the movement of park visitors from accessing the shoreline.
1. Introduction

Figure 4. Map showing soil deposits within the current study area (outlined red).

Figure 5. Map showing geological deposits within the current study area.
1. Introduction

The majority of the park consists of an open, grassy field maintained by the County of Hawai‘i, Department of Parks and Recreation, with a relatively large, asphalt parking area to accommodate park users (see Figures 6 and 7). The park’s entrance is secured by a County gate, which is accessed from the Old Māmalāhoa Highway. A single-lane, paved driveway leads from the gate into the large parking area (see Figure 6). The eastern boundary of the park is comprised of the heavily vegetated slope of Kolekole Gulch, that ascends steeply up to the Old Māmalāhoa Highway. The perennial Kolekole Stream (see Figures 6 and 7), defines the western boundary of the park and empties into the Pacific Ocean. During inclement weather, Kolekole Stream is prone to flooding. Ka‘ahakini Stream drops directly from a small cliff on the western slope of the gulch, into Kolekole Stream forming a small estuary at the river mouth (Figure 9).

Since April of 2017 public access to the park has been restricted and the park has since suffered extensive flood damage. Sediment has covered portions of the parking area and the Epy Yadao pavilion (see Figure 8). The remaining pavilions are overgrown with vegetation, and the grassy field was only recently mowed as of the date of the current survey. Large trees lie uprooted along the stream’s edge (Figure 10), and, as a result of recent landslides, soil and rock rubble has damaged portions of the Old Māmalāhoa Highway that leads to the park’s entrance.

The vegetation regime found within the park consists primarily of mowed grass, as well as albizia (Falcatoria moluccana) trees, banana (Musa sp.), hau (Hibiscus tiliaceus), bing-a-bing (Macaranga mapa), gunpowder tree (Trema orientalis), African tulip (Spathodea campanulata), ironwood (Casuarina sp.), Alexander palm (Archontophoenix alexandrae) and various ferns, vines, ginger and ornamental species that are growing along the slope’s edge. It is of note that although the park is bounded to the north by the Hawai‘i Belt Road right of way and the Kolekole Stream Bridge, the park’s grassy field extends below the bridge to the rocky coastline. There are no physical barriers to restrict the movement of park visitors from accessing the coastline and ocean entrance.

Figure 6. Aerial showing parking lot, pavilions, and access road situated to the east of Kolekole Stream, view to the southwest.
1. Introduction

Figure 7. Aerial showing Kolekole Stream emptying into the Pacific Ocean, view to the northeast.

Figure 8. Picnic area and the Epy Yadao pavilion area now overgrown with vegetation, view to the southwest.
1. Introduction

Figure 9. Ka'ahakini Stream emptying into Kolekole Stream along its west bank, view to the northwest.

Figure 10. Accumulated debris located along eastern mouth of Kolekole Stream, view to the north.
2. **BACKGROUND**

The chronological summary presented below begins with the peopling of the Hawaiian Islands and a generalized model of Hawaiian Prehistory followed by a summary of Historic events in the Hawaiian Islands after the arrival of foreigners. The discussion continues with a presentation of legendary and historical references to places within and near to Kuhua Ahupua’a and at times that portion of the South Hilo District known in legendary accounts as Hilo Palikū—a section of the Hilo District characterized by its upright cliffs. This summary includes oral traditions and first-hand Historic accounts recorded by visitors and missionaries. Land use practices in the study area vicinity are also presented, including commercial sugar cultivation and the formalization of Kolekole Gulch Park. The discussion concludes with a review of the findings from prior archaeological and cultural studies conducted in the subject area vicinity.

**GENERAL CULTURE-HISTORICAL CONTEXT**

**Early Hawaiian Settlement**

While the question of the timing of the first settlement of Hawai‘i by Polynesians remains unanswered, several theories have been offered that derive from various sources of information (i.e., genealogical, oral-historical, mythological, radiometric). However, none of these theories is today universally accepted (Kirch 2011). What is more widely accepted is the answer to the question of where Hawaiian populations came from and the transformations they went through on their way to establishing a uniquely Hawaiian culture. The initial settlement in Hawai‘i is believed to have originated from the southern Marquesas Islands (Emory in Tatar 1982). During these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy and Handy 1991). This was a period of great exploitation and environmental modification when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order; which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1880), the Hawaiians brought from their homeland certain universal Polynesian customs and belief: the major gods Kāne, Kū, and Lono; the kapu system of law and order; cities of refuge; the ‘aumakua concept; and the concept of mana. The initial permanent settlements were established at sheltered bays with access to freshwater and marine resources. These communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Over a period of a few centuries, the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. As populations increased so did societal conflict, which resulted in hostility and war between neighboring groups (Kirch 1985). Soon, large areas of Hawai‘i were controlled by a few powerful chiefs.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites of this next period reflect an evolution of the traditional tools and distinctly Hawaiian inventions. The adze (ko‘i) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are ‘ulu maika stones and lei niho palaoa. The latter was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985). As the population continued to expand so did social stratification, which was accompanied by major socioeconomic changes and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. During this expansion period, additional migrations to Hawai‘i occurred from Tahiti in the Society Islands. Rosendahl (1972) has proposed that settlement at this time was related to the seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites were occupied during the winter months, with a focus on agriculture. An increasing reliance on agricultural products may have caused a shift in social networks as well; as Hommon (1976) argues, kinship links between coastal settlements disintegrated as those links within the mauka-makai settlements expanded to accommodate the exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the ahupua’a system sometime during the A.D. 1400s (Kirch 1985), which added another component to an already well-stratified society. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to the permanent dispersed occupation of both coastal and upland areas.

The ahupua’a became the equivalent of a local community, with its own social, economic, and political significance, which added another component to a then well-stratified society. Ahupua’a were ruled by ali‘i ‘ai ahupua’a or chiefs who controlled the ahupua’a resources; who, for the most part, had complete autonomy over this...
generally economically self-supporting piece of land. Ahupua’a lands were in turn, managed by an appointed konohiki or lesser chief-landlord. The ali‘i-ai-ahupua’a, in turn, answered to an ali‘i ‘ai moku (chief who claimed the abundance of the entire district). Thus, ahupua’a resources supported not only the maka’āinana (commoners) and ‘ohana (families) who lived on the land but also contributed to the support of the royal community of regional and/or island kingdoms. Ahupua’a are land divisions that typically incorporated all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). Although the ahupua’a land division typically incorporated all of the eco-zones, their size and shape varied greatly. This form of district subdividing was integral to Hawaiian life and was the product of resource management planning that was strictly adhered to. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). In communities with long-term royal residents, divisions of labor (with specialists in various occupations on land and in the procurement of marine resources) were also strictly enforced.

By the 17th century, large areas of Hawai‘i Island were controlled by a few powerful ali‘i ‘ai moku. There is island-wide evidence to suggest that growing conflicts between independent chiefdoms were resolved through warfare, culminating in a unified political structure at the district level. It has been suggested that the unification of the island resulted in a partial abandonment of portions of leeward Hawai‘i, with people moving to more favorable agricultural areas (Barrera 1971; Schilt and Sinoto 1980). ‘Umi a Līloa, a renowned ali‘i of the Pi‘i line, is often credited with uniting the Island of Hawai‘i under one rule during the Precontact Period (Cordy 1994). ‘Umi-a-Līloa is also credited with formalizing the land division system on Hawai‘i Island and separating the various classes of chiefs, priests, and laborers (Beamer 2014; Cordy 2000; Kamakau 1992). Upon the death of ‘Umi-a-Līloa, Hawai‘i Island came under the control of his eldest son Keli‘iokāloa-A-‘Umi (Cordy 2000), whose reign is marked by his mistreatment of the lesser chiefs and commoners. His reign was short-lived and by the early eighteenth century, Hawai‘i Island fell under the control of Alapa‘inui, who assembled a robust army and assigned his closest potential usurpers (his nephews Keawemauhili, Kalani‘ōpu‘u, and Keōua) as generals in his militia. The prodigious ‘Ī clan, which spread across the districts of Ka‘ū, Puna, Hilo, and portion of Hāmākua was also a powerful force and threat to Alapa‘i’s campaign (Cordy 2000). As Alapa‘i gathered his forces to go to war with Kekaulike, the ali‘i nui of Maui, the high ranking ali‘i wahine (chiefess) Keku‘iapoiwa made her way to Kokoiki, Kohala to give birth to Pai‘ea, the birth name of Kamehameha (ibid.).

Upon Alapa‘i’s death, his eldest son Keawe‘ōpala was named heir to the kingdom. By the mid-18th century, the young and determined Kamehameha directed his efforts toward consolidating Hawai‘i Island under his rule. To accomplish this monumental task, Kamehameha continued his training under his more experienced kin namely Kalani‘ōpu‘u, who was the ali‘i nui of Hawaii‘i Island (Tī 1959). During Kalani‘ōpu‘u’s reign, the first foreign vessels arrived in Hawaiian waters captained by the British explorer, James Cook. Cook first landed at Waimea, Kaua‘i in 1778 and in 1779, he anchored just off the shores of Kealakekua Bay, Kona. Aboard these ships were innovative technologies and diseases unknown to the inhabitants of these islands. Items such as metal, nails, guns, canons, and the large foreign vessels themselves stirred the interest of the ali‘i and maka’āinana alike. The acquisition of these technological advancements came through barter. This resulted in the ali‘i gaining possession of such items that ultimately set traditional Hawaiian warfare in a new trajectory; one that would be forged by none other than Kamehameha. During this period, wars occurred regularly between intra-island and inter-island polities.

**A Brief History of Hawai‘i After Western Contact**

The arrival of Western explorers in Hawai‘i signified the end of the Precontact Period and the beginning of the Historic Period. With the influx of foreigners, Hawai‘i’s culture and economy underwent drastic changes. Demographic trends during the early Historic Period indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first, there was a continued trend toward craft and status specialization, intensification of agriculture, ali‘i controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history. The Kū cult, luakini heiau, and the kapu system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kent 1983; Kirch 1985). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha had conquered O‘ahu, Maui, and Moloka‘i, in 1795, Hawai‘i saw the beginnings of a market system economy (Kent 1983). Some of the work of the maka’āinana shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845). In 1819, Kamehameha died and the kapu system that governed all aspects of traditional Hawaiian society was symbolically abolished when Liholiho (son of Kamehameha) ate in the presence of his mothers, Keōpūolani and Ka‘ahumanu. Shortly after 1820, Christianity
established a firm foothold in the islands, and introduced diseases and global economic forces began to have a devastating impact on traditional life-ways.

The Arrival of Captain James Cook and the End of Kalaniʻōpuʻu’s Reign (1778-1782)

British explorer Captain James Cook, in command of the ships H.M.S. Resolution and H.M.S. Discovery, landed in the Hawaiian Islands on January 18, 1778. The following January 17th [1779], on a return trip to Hawaiian waters, Cook anchored near Kaʻawaloa along the north shore of Kealakekua Bay in the South Kona District to resupply his ships. This return trip occurred at the time of the annual Makahiki festival, and many of the chiefs and commoners were gathered around the bay celebrating. It has been suggested that Captain Cook was understood to be the god Lono himself returned, as men would not normally be allowed to paddle out during the Makahiki without breaking the kapu and forfeiting all of their possessions (Kamakau 1992). Kalaniʻōpuʻu, the reigning chief of Hawaiʻi Island, left a battle with Kahekili on Maui, and after arriving at Kealakekua Bay, visited Cook on board the H.M.S. Resolution, where they exchanged gifts. Kamehameha, the future ruler of all of Hawaiʻi, was present at this meeting (Jarves 1847). On February 4th, Cook set sail, but a storm off the Kohala coast damaged the mast of the H.M.S. Resolution, and both ships were forced to return to Kealakekua Bay to make repairs. With Cook’s return, many of the inhabitants of Kealakekua began to doubt that he was the physical manifestation of Lono (Kamakau 1992). Ten days later, a dispute over stolen nails escalated and after one of Cook’s boats was stolen, the captain set ashore at Kaʻawaloa with six marines to ask Kalaniʻōpuʻu for its return. When Kalaniʻōpuʻu denied any knowledge of the theft, Cook tried to take him captive (Kamakau 1992). A fight ensued, and Cook was killed along with four of his men and several natives. Kalaniʻōpuʻu and his retinue retreated inland. After offering the body of Cook as a sacrifice to the akua, some of his bones were returned to the British aboard Resolution (Kamakau 1992), who shortly thereafter returned to sea.

After the death of Captain Cook and the departure of H.M.S. Resolution and Discovery, Kalaniʻōpuʻu moved to Kona, where he amused himself with the pleasures of hula (dance) and surfing (Kamakau 1992). While he was living in Kona, famine struck the district and Kalaniʻōpuʻu ordered that all the cultivated products of that district be seized. He then set out on a circuit of the island and while in Kohala, Kalaniʻōpuʻu proclaimed that his son Kiwalaʻō would be his successor and gave the guardianship of the war god Kūkāʻiliʻimoku to his nephew, Kamehameha. As custom dictated, it was the duty of the newly appointed chief to execute a land division process known as a kālaiʻāina (lit. to carve the land), thereby diving up and redistributing the lands of his kingdom to his closest chiefs, priest, and supporters. However, Kamehameha and a few other chiefs were concerned about their land claims, which Kiwalaʻō did not seem to honor (Fornander 1996; Kamakau 1992). The heiau of Moaʻula was erected in Waipiʻo at this time (ca. A.D. 1781), and after its dedication, Kalaniʻōpuʻu set out for Hilo to quell a rebellion by a Puna chief named ʻImakakōloa.

Imakakoloʻa was defeated in Puna by Kalaniʻōpuʻu’s superior forces, but he managed to avoid capture and hid from detection for the better part of a year. While the rebel chief was sought, Kalaniʻōpuʻu went to Kaʻu and erected a heiau called Pākini (Kamakau 1992). Imakakoloʻa was eventually captured and brought to the heiau, where Kiwalaʻō was to sacrifice him. In describing the nature of this sacrifice, Fornander (1996:202), writes, “The routine of the sacrifice required that the presiding chief should first offer up the pigs prepared for the occasion, then bananas, fruit, and lastly the captive chief.” However, before Kiwalaʻō could finish the first offerings, Kamehameha, “grasped the body of Imakakoloʻa and offered it up to the god, and the freeing of the tabu for the heiau was completed” (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawaiʻi. After usurping Kiwalaʻō’s authority with a sacrificial ritual in Kaʻu, Kamehameha retreated to his home district of Kohala. While in Kohala, Kamehameha farmed the land, growing taro and sweet potatoes (Handy and Handy 1972). Kalaniʻōpuʻu died in April of 1782 and was succeeded by his son Kiwalaʻō.

The Rule of Kamehameha I (1782-1819)

After Kalaniʻōpuʻu died, several chiefs were unhappy with Kiwalaʻō’s division of the island’s lands, and civil war broke out. Kiwalaʻō was killed at the battle of Mokuʻōhai, South Kona in July of 1782 by Kamehameha’s forces. Kamehameha ordered that the body of Kiwalaʻō be taken immediately to Nāpoʻopoʻo where it could be tended with reverence until the proper burial rituals could be completed (Desha 2000). Supporters of Kiwalaʻō, including his half-brother Keōuaʻahuʻula (Keōua) and his uncle Keawemauhili (the son of Keawe, the great chief of Hawaiʻi Island), escaped and laid claim to the Kaʻu, Puna, Hilo, and a portion of the Hāmākua Districts. After the battle, Kamehameha assembled his council of chiefs (ʻahaʻula) at Hikiau Heiau in Kealakekua to offer up the body of Kiwalaʻō to the war god Kūkāʻiliʻimoku and to determine the fate of Keawemauhili. Because of Kamehameha’s close relationship with Keawemauhili, he and some of his closest chiefs opted to let Keawemauhili live. However, Keʻeaumoku, a close
advisor to Kamehameha, and other chiefs, vehemently insisted that the reluctant Kamehameha wage war on Keawemauhili. In describing the reason for Kamehameha going to war with Keawemauhili, Desha writes:

Because of these demands of the chiefs, Kamehameha realized that perhaps if he did not consent to the demands of these war-loving chiefs, it would cause dissatisfaction amongst these chiefs who had numerous people, and they might attempt to assassinate him. The chiefs whom these ali‘i of Kamehameha’s court wanted to make war on were Keōuaʻāhuʻula [of Kaʻū] and Keawemauhili, the high chief of the Hilo and Puna Districts. (2000:165)

The forces of Kamehameha and Keawemauhili eventually met in Hilo, where warriors numbering in the tens of thousands, engaged in nearly three days of combat. Keawemauhili with the backing of some of Kahekili’s (ali‘i of Maui) warriors routed Kamehameha’s forces (ibid.). After this initial battle, historical accounts suggest that Keawemauhili joined forces with Kamehameha in an attempt to defeat Keōua. Keawemauhili was, however, killed in a battle at Alae in Hilo between Kamehameha and Keōua, thereby giving Kamehameha control over Hilo (Thrum 1925).

According to ‘Ītī (1963), nearly ten years of almost continuous warfare followed, as Kamehameha endeavored to unite the island of Hawai‘i under his rule and conquered the islands of Maui and O‘ahu. Keōua became Kamehameha’s main rival on the island of Hawai‘i, and he proved difficult to defeat (Kamakau 1992). Around 1790, in an effort to secure his rule, Kamehameha began building the heiau of Pu‘ukoholā at Kawainae, which was to be dedicated to the war god Kūkā‘iliimoku (Fornander 1996). When Pu‘ukoholā Heiau was completed in the summer of 1791, Kamehameha sent his two counselors, Keaweaheulu and Kamanawa, to Keōua to offer peace. Keōua was enticed to the dedication of the Pu‘ukoholā Heiau by this ruse and when he arrived at Kawainae he and his party were sacrificed to complete the dedication (Kamakau 1992). The assassination of Keōua gave Kamehameha undisputed control of Hawai‘i Island (Greene 1993). Between 1792 and 1796, after the dedication of Pu‘ukoholā, Kamehameha mostly resided at Kawainae and worked the lands of the Waikoloa-Waimea region (Maly and Maly 2002). By 1796, Kamehameha had conquered all the island kingdoms except for Kaua‘i. It was not until 1810, when Kaumuali‘i of Kaua‘i gave his allegiance to Kamehameha, that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976). Kamehameha would go on to rule the islands for another nine years and he and his high chiefs participated in foreign trade but continued to enforce the rigid kapu system.

In the twelve years following the death of Captain Cook, sixteen foreign ships (all British and American) called in Hawaiian waters (Restarick 1928). In 1790, two sister ships, the Eleanor and the Fair American were trading in Hawaiian waters when a skiff was stolen from the Eleanor and one of its sailors was murdered. The crew of the Eleanor proceeded to slaughter more than 100 natives at Olowalu [Maui]. After leaving Maui, the Eleanor sailed to Hawai‘i Island, where one of its crew, John Young, went ashore and was detained by Kamehameha’s men. The other vessel, the Fair American, was captured by the forces of Kamehameha off the coast of North Kona, and in an act of retribution for the Olowalu massacre, they slaughtered all but one crew member, Isaac Davis. Guns and a cannon (later named “Lopaka”) were recovered from the Fair American and were kept by Kamehameha as part of his fleet (Kamakau 1992). Kamehameha made John Young and Isaac Davis his advisors.

During the first part of the nineteenth century, Hawai‘i’s culture and economy continued to change drastically as capitalism and industry established a firm foothold in the islands. The sandalwood (Santalum ellipticum) trade, established by Euro-Americans in 1790 and turned into a viable commercial enterprise by 1805 (Oliver 1961), was flourishing by 1810. This added to the breakdown of the traditional subsistence system, as farmers and fishermen were ordered to spend most of their time logging, resulting in food shortages and famine that led to a population decline. Kamehameha, who resided on the Island of O‘ahu at this time, did manage to maintain some control over the trade on Hawai‘i Island (Kent 1983; Kuykendall and Day 1976).

Upon returning to Kailua in 1812, Kamehameha resided at Kamakahou, from whence he continued to rule the islands for another nine years. While in Kailua, Kamehameha and his high chiefs participated in foreign trade but also continued to enforce the rigid kapu system. He ordered men into the mountains of Kona to cut sandalwood and carry it to the coast, paying them in cloth, kapu material, food and fish (Kamakau 1992). This new burden added to the breakdown of the traditional subsistence system. Farmers and fishermen were ordered to spend most of their time logging, resulting in food shortages and famine that led to a population decline. Kamakau indicates that “this rush of labor to the mountains brought about a scarcity of cultivated food . . . The people were forced to eat herbs and tree ferns, thus the famine [was] called Hi-laulele, Haha-pilau, Laulele, Pualele, ‘Ama’u, or Hapu’u, from the wild plants resorted to” (ibid.: 1992:204). Once Kamehameha realized that his people were suffering, he “declared all the sandalwood the property of the government and ordered the people to devote only part of their time to its cutting and return to the cultivation of the land” (ibid.: 1992:204).
The Death of Kamehameha I and the Abolition of the Kapu System (1819-1820)

Kamehameha I died on May 8, 1819, at Kamakahonu, and the changes that had been affecting the Hawaiian culture since the arrival of Captain Cook in the Islands began to accelerate. Following the death of a prominent chief, it was customary to eliminate all of the regular kapu that maintained social order and the separation of men and women, elite and commoner. Thus, following Kamehameha’s death, a period of 'ai noa (free eating) was observed along with the relaxation of other traditional kapu. It was the responsibility of the new ruler and kahuna to re-establish kapu and restore social order, but at this point in history, traditional customs were altered (Kamakau 1992).

The death of Kamehameha was the first step in the ending of the tabus; the second was the modifying of the mourning ceremonies; the third, the ending of the tabu of the chief; the fourth, the ending of carrying the tabu chiefs in the arms and feeding them; the fifth, the ruling chief’s decision to introduce free eating (‘ainoa) after the death of Kamehameha; the sixth, the cooperation of his aunts, Ka-ahu-manu and Ka-heihei-malie; the seventh, the joint action of the chiefs in eating together at the suggestion of the ruling chief, so that free eating became an established fact and the credit of establishing the custom went to the ruling chief. This custom was not so much of an innovation as might be supposed. In old days the period of mourning at the death of a ruling chief who had been greatly beloved was a time of license. The women were allowed to enter the heiau, to eat bananas, coconuts, and pork, and to climb over the sacred places. You will find record of this in the history of Ka-ula-hea-nui-o-ka-moku, in that of Ku-ali‘i, and in most of the histories of ancient rulers. Free eating followed the death of the ruling chief; after the period of mourning was over the new ruler placed the land under a new tabu following old lines. (Kamakau 1992:222)

Immediately upon the death of Kamehameha I, Liholiho (his son and to be successor) was sent away to Kawaihao to keep him safe from the impurities of Kamakahonu brought about from the death of Kamehameha. After purification ceremonies, Liholiho returned to Kamakahou. Instead of reinstating the traditional kapu, Liholiho ate the dog meat kapu to the women ali‘i, entered the women’s lauhala house, and did whatever he desired. While he may have done so during a time when he had not yet reinstituted the eating kapu, other chiefs present appear to have thought otherwise, and word spread that the kapu had been abandoned. Kekuaokalani, caretaker of the war god Kīkā'ilimoku, was dismayed by his cousin’s (Liholiho) actions and revolted against him, but was defeated.

With an indefinite period of free-eating and the lack of the reinstatement of other kapu extending from Hawai‘i to Kaua‘i, and the arrival of the Christian missionaries shortly thereafter, the traditional religion had been officially replaced by Christianity within a year following the death of Kamehameha I. By December of 1819, Kamehameha II had sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the heiau images, and ordering that the heiau structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the ‘aumakua worship, to continue (Kamakau 1992; Oliver 1961). With the end of the kapu system, changes in the social and economic patterns began to affect the lives of the common people. Liholiho moved his court to O‘ahu, lessening the burden of resource procurement for the chiefly class on the residents of Hawai‘i Island. Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that could trade with early Western visitors. Introduced foods often grown for trade included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845).

KUHUA AHUPUA‘A AND THE GREATER SOUTH HILO DISTRICT

The current study area is within Kolekole Gulch in the ahupua‘a of Kuhua. The term kuhua has been translated by Pukui and Elbert (Pukui and Elbert 1986:174) as “to thicken,” or “to become pasty; to gel.” Kuhua is located in the traditional moku (district) of Hilo (Figure 11), which is one of six moku on Hawai‘i Island. The Hawaiian proverb, “Hilo, mai Mawae a ka pali o Maulua” (Pukui 1983:108) details the extent of the district spanning from Mawae, a fissure separating Hilo from Puna and Maulua, separating Hilo from Hāmākua. Handy and Handy provides a general description of the district:

Hilo as a major division of Hawai‘i included the southeastern part of the windward coast most of which was in Hamakua, to the north of Hilo Bay. This, the northern portion, had many scattered settlements above streams running between high, forested kula lands, now planted with sugar cane. From Hilo Bay southeastward to Puna the shore and inland are rather barren and there were few settlements. The population of Hilo was anciently as now concentrated mostly around and out from Hilo Bay, which is still the island’s principal port. The Hilo Bay region is one of lush tropical verdure and beauty, owing to the prevalence of nightly showers and moist warmth which prevail under the northeasterly trade winds into which it faces. Owing to the latter it is also subject to violent oceanic
2. Background

storms and has many times in its history suffered semidevastation from tidal waves unleashed by
earthquake action in the Aleutian area of the Pacific. (Handy and Handy 1991:538)

The low-lying coastal areas of South Hilo thrived with traditional Hawaiian habitation and cultivation. Within the
larger gulches and kula (broad plateaus) regions, were lush, fertile lands well suited for agriculture. The staple
traditional crop, kalo (taro), was cultivated in irrigated terraces along the stream edges while ‘uala (sweet potato),
mai’a (banana) and kō (sugarcane) were grown in the wet kula lands of the lower forest zone (Handy and Handy
1991). The region had an abundance of kukui (candlenut), ‘ulu (breadfruit), and niu (coconut) groves and was also
rich in marine resources, easily accessible from the sheltered bays. Although settlements were prominent in these areas
with the increase of population and agricultural production settlements spread into the upland kula regions. Handy
and Handy (1972), provide yet another description of the fertile landscapes of South Hilo:

The light and fertile soil is formed by decomposing lava, with a considerable portion of vegetable
mould. The whole is covered with luxuriant vegetation, and the greater part of it formed into
plantations, where plantains, bananas, sugar-cane, taro, potatoes and melons, come to the greatest
perfection. Groves of cocoa-nut and bread-fruit trees are seen in every direction, loaded with fruit,
or clothed with luxuriant foliage. (Ellis in Handy and Handy 1972:539)

Traditionally, the moku of Hilo was divided into three ‘okana (sub-districts) with place names that have their
origins in legendary times. The three ‘okana are (from north to south): Hilo Palikū—characterized by its upright cliffs,
this area of Hilo extends north of the Wailuku River to Ka‘ula Gulch. The Hawaiian proverb, Hilo iki, pali ‘ele’ele
(little Hilo of the dark cliffs) describes this sub-district noted for its greeneroy, rain, and mists (Pukui 1983:107). The
second sub-district is Hilo One—or sandy Hilo, which extends along the shoreline of Hilo Bay between the Wailoa
and Wailuku Rivers; and finally, Hilo Hanakahi—the land region extending south of Wailoa River to include
Keaukaha (Edith Kanakaʻole Foundation 2012). The current study area is within the traditional ‘okana of Hilo Palikū.
The source of these ‘okana is found in the legendary account titled “Ka‘ao Ho‘oniua Pu‘uwai no Ka-Miki” (“The
Heart Stirring Story of Ka-Miki”) written by John Wise and J.W.H.I. Kihe and published in Hilo’s Hawaiian language
newspaper Ka Hōkū O Hawai‘i between January 8, 1914, through December 6, 1917 (Wise and Kihe 1914–1917).

The study area is located on what is traditionally known as Hilo Palikū. The name is apt for the magnificent
display of precipitous bluffs carved by a plethora of stream-cut gulches filled by abundant rainfall. The sheer
precipices span along the northeastern coastline of Hawai‘i Island running north from the mouth of the Wailuku River,
broken only by a string of relatively narrow gulches extending down from the slopes of Mauna Kea. The broad
plateaus, referred to as kula lands, between the gulches are fertile and lush and served as an ideal environment for
thriving populations prior to Western contact. Additionally, in the book, The Legends and Myths of Hawaii, Kalākaua
(1972) described these lush landscapes and the extensive cultivation within these areas.

The northeastern coast of the island of Hawaii presents an almost continuous succession of valleys,
with intervening uplands rising gently for a few miles, and then more abruptly toward the snows of
Mauna Kea and the clouds. The rains are abundant on that side of the island, and the fertile plateau,
boldly fronting the sea with a line of cliffs from fifty to a hundred feet in height, is scored at intervals
of one or two miles with deep almost impassable gulches, whose waters reach the ocean either
through rocky channels worn to the level of the waves, or in cascades leaping from the cliffs and
streaking the coast from Hilo to Waipio with lines that seem to be molten silver from the great
crucible of Kilauea.

In the time of Liloa, and later, this plateau was thickly populated, and requiring no irrigation, was
cultivated from the sea upward to the line of frost. A few kalo patches are still seen, and bananas
grow, as of old, in secluded spots and along the banks of the ravines; but the broad acres are green
with cane, and the whistle of the sugar-mill is heard above the roar of the surf that beats against the
rock-bound front of Hamakua (Kalākaua 1972:284)

The abundance of streams, valleys, and gulches in this region made for a difficult and treacherous pass. A
legendary account, published in the Hawaiian language newspaper Ka Hōkū O Hawai‘i on March 30, 1916, poetically
describes the difficulties faced by early travelers. Kepā Maly, a Hawaiian historian translated the account as such:

Of Hilo Palikū it is said—One becomes short of breath traveling through Hilo, for there are many
(400) hills, many (4,000) areas to descend, and many (40,000) streams to cross; indeed, while
swimming through the waters of Hilo one becomes out of breath, but one is never out of water at
Hilo. [The saying was reportedly also used to describe and warn travelers about the many ‘olohe
(skilled fighters and thieves) who lived along the trails of this region at one time] (Wise and Kihe in Maly 1994:1)
2. Background

Rains, Rivers, and Waterways in Kuhua Ahupua’a and Hilo Palikū

The moku of Hilo is renowned for its abundance of rain and fresh water, which has been recorded in countless oral traditions including mele (songs), oli (chants), and ‘ōlelo no’eau (proverbs and poetical expressions). In their most recent publication Hānau Ka Ua, Collette Akana and Kiele Gonzalez (2015) describe the Hawaiian cultural significance of rain:

"Our kūpuna [ancestors] 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)
2. Background

In a traditional mele titled “Ka Ua A’o Hilo” (The Rain of Hilo), the composer’s clever use of an ‘ōlelo noʻeau, “Hana mao ‘ole ka ua o Hilo” (Endlessly pours the rain of Hilo) (Pukui 1983:56), implied an endless love that outlasted the infamous Hilo rain (de Silva 1997:11–12). First performed by Kawai Cockett on his album “Beautiful Kaua’i,” Cockett attributed John Kameaaloha Almeida for composing this piece which speaks of a young O’ahu man that longed for his Hilo sweetheart and the rare and precious moments they shared together.

Ka ua a‘o Hilo a‘e mao ana la
Ke aloha o ka ipo mea pau ‘ole
He aniani ku kou aloha na΄u
He hoa kuka po me ke ao
Ua ao ka ua e ku΄u aloha
Ke noe mai nei ka liko lehua
He lehua mua ‘oe na΄u i lei
Ka helena o ka ‘āina malihini
Ha΄ina ‘ia mai ana ka puana la
Ke aloha o ka ipo mea pauʻole

The rain of Hilo will clear up
Love of the sweetheart, an endless thing
A standing mirror is your love for me
A companion to talk with all night and day
The rain grows light, my love
It mists the lehua bud
You are the first lehua for me to wear as a lei
Traveling the land for the first time
The story is told
Love of my sweetheart is an endless thing

The rains of Hilo Palikū are also mentioned in mele written for Queen Emma. A portion of a mele kūʻauhau, or genealogical chant, titled “No ke lii wahine” is taken from the publishing, He Lei no ‘Emalani: Chants for Queen Emma Kaleleono‘ālani, which describes the Nāulu rain for that region.

Hāne’e mai Liloa me he Uluaunui lā
Me he kuʻuua Nāulu nui i pano Hilo
Pali Kū

Liloa sags like an Uluaunui lā
Like a heavy Nāulu shower that obscures Hilo
Pali Kū.

(Nogelmeier in Akana and Gonzalez 2015:187)

A mele kālaiʻāina, or political chant, titled “He kuleana ko ka ua Kanilehua,” was also written for Queen Emma by O. Lumacheihei. This mele speaks of the Kanilehua rain which is occasionally associated with the Moani breeze.

He maʻu makamaka ia na ka Moani
He pohu lā ia na ka Pu΄ulema
Ua honi ke kini o ka Hilo Pali Kū.

The Kanilehua rain has a prerogative
It is a wetness that accompanies the Moani breeze
Carrying fragrance over the sea of Hanakahi
The multitudes of Hilo Pali Kū have smelled it.

(Akana and Gonzalez 2015:51)

Additionally, the nuanced understanding of the various rains of Hilo has been captured in the following ‘ōlelo noʻeau published by Pukui. These ‘ōlelo noʻeau offer a more detailed understanding of the characteristics of the many rains of Hilo:

‘Eleʻele Hilo, panopano i ka ua.
Dark is Hilo, clouded with the rain (Pukui 1983:40)

Halulu me he kapuaʻi kanaka la ka ua o Hilo.
The rain of Hilo makes a rumbling sound like the treading of feet. (ibid.:53)

Hana Hilo i ka poʻi a ka ua.
Hilo works on the lid of the rain.
Refers to the constant showers typical of Hilo district on Hawaiʻi. (ibid.:54)

Hilo ʻāina ua lokuloku.
Hilo of the pouring rain. (ibid.:107)
Hilo i ka ua kinakinaia, ka ua mao ʻole.
Hilo of the constant rain, where it never clears up. (ibid.)

ʻAu umauma o Hilo i ka wai.
Hilo has breasted the water.
To weather the storm. The district of Hilo had many gulches and streams and was difficult to cross.

“Māmā Hilo?” “ʻAe, māmā Hilo i ka wai ʻole.”
“Is Hilo light?” “Yes, Hilo is light for lack of water.”
A question asked of a runner, and his reply. It means that the way is clear, with no robbers or unpleasant experiences, and no rains to swell the streams and make traveling difficult. (ibid.:232)

Pau ke aho i ke kahawai lau o Hilo.
One’s strength is exhausted in crossing the many streams of Hilo.
Said of or by one who is weary with effort. First uttered by Hi‘iaka in a chant when she found herself weary after a battle with the lizard god Pana‘ewa. (ibid.:287)

Hilo Palikū, renowned in traditional lore for its steep cliffs, lush valleys, and streams, includes the lands of Kuhua Ahupua‘a which contains the waters of Kolekole—a perennial stream connected to the popular and scenic ‘Akaka Falls, situated within the adjacent ahupua‘a of Kaiwiki-nui. As duly noted, Kolekole defined as “raw, scarred” (Pukui et al. 1974), is a stream gulch that begins at the cusp of Makahanaloa and Hakalau Ahupua‘a. This kahawai, or stream, is the main source for ‘Akaka Falls. In the August 14, 1869 publication of Ka Nūpepa Kū‘oko‘a (1869), ‘Akaka Falls is recognized as the tallest waterfall in Hawaii standing at 560 feet. ‘Akaka meaning “a rent, split, chink, separation; to crack, split, scale” (Pukui and Elbert 1986), references the deep gorge therein where the waterfall lies. This famous cascade of water is also described in a composition written and arranged by Helen Parker, titled Wailele ‘O ‘Akaka (‘Akaka Falls).

As a stranger, I saw
The waterfall of ʻAkaka
From high above
The water flows gently down the cliff
One great thought arises
Of being overcome by the beauty
Of the sweet-smelling uplands
Fragrant and lovely
Continually one with the misty rain
Whose overwhelming scent
Is welcomed into my heart
Is welcomed into my heart
It is for the Almighty
To guide and protect
The precious people
Of my beloved land
There it is a rarity
Mine to be smelled and kissed
Mine to be smelled and kissed
Tell the refrain
The waterfall of ʻAkaka
From high above
The water flows gently down the cliff
The water flows gently down the cliff.
(Parker 1934)

Traditional moʻolelo (stories, tales, and myths) associated with ‘Akaka Falls reference large pōhaku, or stones, which are prominent features of the waterfall. According to the following version of the legend published in Place Names of Hawai‘i by Pukui et al. (1974:8), when a stone called Pōhaku-a-Pele (stone of Pele) is struck by a lehua-ʻapane (a red blossom from the ‘ōhi‘a tree) branch, the sky darkens and rain falls. Additionally, a large stone located 70 feet upstream from the crest of the waterfall is named Pōhaku-o-Kāloa (ibid). Perhaps, one of the most famed moʻolelo associated with this falls concerned a young man from Honomū Ahupua‘a named ‘Akaka. The common
2. Background

version of this story is often portrayed as a love story that tells of a young man and his two lovers, Lehua and Maile. It is said that after ‘Akaka fell to his death over the falls the two women wept, heartbroken over the loss of their lover. Their tears are said to be seen in a ravine close by until this day, disguised as two smaller waterfalls. However, a review of Hawaiian accounts describes ‘Akaka as the victim of mistreatment by his two lovers.

In an excerpt taken from the book, *Ka Lei Ha‘aheo: Beginning Hawaiian* (Hopkins 1992), Edith Kanaka’ole, a Hawaiian cultural practitioner born in Honomū, near ‘Akaka Falls, tells one version of the story titled “No Ka Wailele ‘o Akaka” (Concerning ‘Akaka Falls). Kanaka’ole’s story tells of the young man who lived with his grandmother in Honomū. One evening Akaka’s grandmother washed his *malo* into a rock at the crest of the waterfall (ibid.) discovering her grandson and his dog at the bottom of the waterfall, ‘Akaka’s grandmother wept until she too turned his dog and followed the trail up to the waterfall. Standing at the edge of the cascade both ‘Akaka and his dog jumped off the waterfall, plunging to their death below and numinously transformed into pōhaku (stones). Brokenhearted upon discovering her grandson and his dog at the bottom of the waterfall, ‘Akaka’s grandmother wept until she too turned into a rock at the crest of the waterfall (ibid.)

Another version published in the September 1st (1916a), and the September 8th (1916b), edition of the Hawaiian language newspaper *Ka Pu‘uholua* further describes the story of ‘Akaka. In the article titled *Ka Huaka‘i no Hilo Hanakahī* (The Expedition of Hilo Hanakahī), ‘Akaka is said to have lived in isolation with his grandmother and was an avid bird catcher. He was also given the responsibility to stoke the fire, which was used by his grandmother for her tobacco. ‘Akaka did not know of anyone else except for his grandmother, but one day as he approached their home, he heard laughter coming from within the home. He asked his grandmother if there was someone else in the house to which she replied, “No!” Sometime later, ‘Akaka again heard laughter and he once again asked his grandmother of the source of this chatter. She again, denied that there was anyone else in the home. The chatter was, however, coming from ‘Akaka’s father, who was a chief that enjoyed surfing and the game of kilu.

One day, without informing his grandmother, ‘Akaka set out in search of the source of this clamor. He packed his belongings and made his way through the undergrowth and descended to the beach at Honomū, a place where the chiefs would bathe. When he arrived at the top of the cliff, he looked down and his surprise, saw a crowd of people, some gayly engaged in surfing, while others played kilu. ‘Akaka had discovered the source of chatter that he had been hearing. While looking over the crowd from the cliff, ‘Akaka saw a man of great stature with imposing beauty, gracefully surfing the waves. His attention was also caught by saw several strikingly beautiful women. Hours had passed, and it was nearing sunset, so ‘Akaka hastily grabbed his belongings and rushed home where he was met by his grandmother who was puzzled over her grandson’s absence. The grandmother scolded ‘Akaka for his disappearance and inquired his whereabouts, to which he replied:

“Aole o‘u pilikia, aka, ua hele aku nei au e hookolo i kela mau leo hauwawa, a ua ike aku nei au, he anaina kanaka nui kela a‘u i ike aku nei, o ka lakou hana, e heenalu ana, a e lealea ana no hoi, ua ike aku nei no hoi au i kekahi kanaka kilakila kona kulauna a me he aliʻi ala oia no kela poe.”

“I was not troubled; however, I went to track those voices, and what I discovered was a great crowd of people, surfing and having a good time, and I saw a man of great stature who appeared to be a chief of those people”

When the grandmother heard the words of her grandson, she wept and told him that that great man was none other than ‘Akaka’s father. He then replied, when tomorrow comes, I will descend to the coast to see that man, for he is my father. ‘Akaka’s grandmother pleaded with him, begging that he not go back to the coast because his father was kapu (sacred) and if he is not approached carefully, trouble would befall the boy. The insistent ‘Akaka refused his grandmother’s request, so she instead gave him specific instructions on how to approach the kapu chief. (*Ka Pu‘uholua*, September 8, 1916)

The following day, with the instructions of his grandmother, ‘Akaka went down to the coast and watched his father surf the waves of Honomū. As described by his grandmother, the chief caught his final wave and landed on the beach and then went to the spring to bathe. After washing himself, the chief made his way towards to house to girdle his *malo* (loincloth), at which time, ‘Akaka quietly made his way towards the house and as his father sat down, ‘Akaka leaped onto the chief’s lap. The chief then inquired “nawai ka pua o oe?”, whose child are you? To which ‘Akaka replied, yours, and handed the chief his scented consecrated *malo*. Upon receiving the *malo*, the chief recognized the young boy as his own. His father then betrothed ‘Akaka to two beautiful women. The women were entranced by ‘Akaka’s beauty.
Additionally, the wind has played an essential role in shaping these landscapes and were well documented in historical literature and compositions. The Uluau is the power of the winds. While Paka'a was serving under Keawenuia'umi, two men Ho'okeleihilo and Ho'okeleipuna were a respected servant of Keawenuia'umi, a chief of Hawai'i Island. As a valued advisor to the king, he had the duty of caring for the king’s personal possessions and his double-hulled canoe, and whatever Paka’a advised, the king obeyed. Paka’a’s brother, Lapakahoe also served as an advisor in the chief’s royal court. Paka’a kept a special gourd calabash called La’amaomao, which he named after his mother, who during her lifetime had developed a special relationship with the winds. Within this special container were her bones and Paka’a would call upon her to summon the power of the winds. While Paka’a was serving under Keawenuia’umi, two men Ho’okeleihilo and Ho’okeleipuna joined the court and Paka’a soon found himself being mistreated by the king. His responsibilities except for caring for the king’s personal items were stripped from him and given to the two men. After some time, Paka’a left Keawenuia’umi’s court and took some of the king’s possessions including his kapa (bark cloth), malo (loincloth) and placed them in his sacred calabash.

Paka’a settled on the leeward side of Moloka’i and took up a wife, who was a chiefess. She later gave birth to their son, who they named Kuapaka’a. Paka’a taught his son all the chants and everything he knew about Keawenuia’umi for he wanted to be prepared should the king desire to have him back in his court. His son had mastered all that he had taught him. Paka’a’s prediction had come true and one day a canoe arrived from Hilo carrying the message that Keawenuia’umi was looking for his long lost servant. Paka’a, however, did not tell the messengers that he was indeed Paka’a. In a dream, Paka’a and Keawenuia’umi came to each other and Paka’a told the chief of his whereabouts. Without hesitation, Keawenuia’umi summoned his six district chiefs to seek out Paka’a.

Paka’a and his son set out in their canoe pretending to be fishing for ‘ahu (parrotfish), a fishing style that required one to continuously gaze down at the ocean to avoid being seen by Keawenuia’umi’s chiefs. The canoes of the district chiefs led the way with Keawenuia’umi’s canoe following behind. As each of the canoe’s belonging to the district chiefs passed, Kuapaka’a at the advice of his father chanted insoltingly out to each of the district chiefs, pointing out discrepancies in their lineage and the shortcomings of the lands they ruled. This greatly angered the district chiefs causing them to sail past the father and son duo.

The king’s double-hulled canoe finally made its way toward the small fishing canoe and onboard was Lapakahoe, brother of Paka’a. Lapakahoe inquired with the young boy about his knowledge of these chiefs, pointing out that such knowledge was only held by a few people, one of which was Paka’a and asked if he knew where the chief’s former servant was. The boy, however, continued with his taunts, this time calling forth all the winds of the various lands, including those of Hilo Palikū. The line describing the winds of Hilo-pali-kū reads, “He uluau ko Hilo paliku,” which translates as the Ulua is [the wind] of Hilo Palikū (Fornander 1918–1919:95).

After calling forth all the winds of the islands, Kuapaka’a proceeded to call forth all the men aboard the king’s canoe by name. Angered by the boy’s remarks, the chief’s canoe drew away until nothing, but a mere speck of the canoe was in sight. At which time, at the orders of his father, Kuapaka’a uncovered the sacred wind gourd La’amaomao, sending a fury of wind over the ocean causing it to churn where it overwhelmed the chief’s canoe. After
watching the chief’s canoe nearly swamped with water, the boy placed the cover back on the sacred gourd, thereby bringing calmness over the ocean. Although loss of all their possessions, the chief and his men made their way back to Moloka‘i where they landed their canoe.

Although Paka‘a remained out of sight of the chief, he gave specific orders to his son on how to best care for the chief, for he knew of all the chief’s favorite things. He gave his son the chief’s malo and told the son to offer it to Keawenuia‘umi. Paka‘a then gave his son the chief’s kapa which was scented with fragrant plants of La‘a (‘Ōla’a), Punu. As Kuapaapa‘a handed the kapa to the chief, he recognized the scent. Paka‘a intended to grow the chief’s desires by giving him all of his favorite things that reminded him of how he once cared for the chief. This went on for some time as Kuapaapa‘a again uncovered La‘amaomao causing a storm that kept the chief on the island which lasted for four months. After closing the gourd, the weather had calmed and Keawenuia‘umi strongly desired to have the young Kuapaapa‘a join his court. After negotiating with the king, the boy consented. The chief’s canoe was made ready and they set sail for Ka‘u‘i, where they encountered a storm incited by the wind gourd La‘amaomao. Nonetheless, Kuapaapa‘a had come prepared with food and other necessities. The young boy offered protection and food to everyone on the canoe except for the sailing masters, Ho‘okeleihilo and Ho‘okeleiipuna, the very men that had replaced his father. Weak and battered from the storm, the two men eventually fell overboard at which time Kuapaapa‘a covered the gourd sending calmness over the waters. Kuapaapa‘a ordered the canoe back to Hawai‘i Island and after several more cunning acts, Kuapaapa‘a revealed his true identity to Keawenuia‘umi who ordered the boy to bring his father Paka‘a to him. Paka‘a refused the king’s orders until full restoration was made to which the king agreed and upon Paka‘a’s return to Hawai‘i, the whole of Hawai‘i was given to him.

“Ke Ka‘ao Ho‘oniua Pu‘uawai no Ka-miki” - The Heart Stirring Story of Ka-Miki

Specific legendary and historical references to Kuhua Ahupua‘a are limited and appear mainly as passing remarks, or are lumped together with references to the neighboring ahupua‘a. Additionally, the literature referring to Kuhua does not distinguish whether the ahupua‘a being referred to is Kuhua or Homomū. One such account making explicit reference to Kuhua Ahupua‘a has been identified and that story concerns an ʻōlohe (skilled fighter/competitor) named Kuhua-i-Hālala, which appears in “Ke Ka‘ao Ho‘oniua Pu‘uawai no Ka-miki” (The Heart Stirring Story of Ka-Miki). According to Maly (1997), the land of Kuhua was named in honor of an ʻōlohe chiefess, Kuhua-i-Hālala, daughter of Homomū and sister of ʻOpe‘a-i-Honohina. From this account, we also learn that the place Kolekole was named after the chief Kolekole and that this area was a famed contest grounds. A summary of this story is presented below. The moʻolelo titled, “Ka‘ao Ho‘oniua Pu‘uawai no Ka-Miki”, originally appeared in the Hawaiian language newspaper Ka Hōkū o Hawai‘i between 1914 and 1917. This moʻolelo was likely authored during the late 1800s through the early 1900s by noted Hawaiian scholars John Wise and J.W.H.I. Kihe. Maly, who translated this story noted that although this moʻolelo,

. . . is not an ancient account, the authors used a mixture of local legends, tales, and family traditions in association with place names to tie together fragments of site specific stories that had been handed down over the generations. Thus, while in many cases, the personification of individuals and their associated place names may not be “ancient,” the site documentation within the “story of Ka-miki” is of both cultural and historical value. (Maly 1997:5)

The story tells of two supernatural brothers, Ka-Miki and Maka-ʻiole, who were skilled ʻōlohe, and their travels around Hawai‘i Island by way of the ancient trails and paths (ala loa and ala hele), seeking competition with other ʻōlohe. The two brothers were born to Pōhaku-o-Kāne (male) and Kapa‘ihilani (female), who were the ali‘i of the lands of Kohana-iki and Kaloko, North Kona. Upon the mysterious and premature birth of Ka-miki, he was placed in the cave of Pōnahanaha and given up for dead. He was eventually saved and raised by his ancestor, Ka-uluhu-nui-hihī-kolo-i-uka, a manifestation of the goddess Haumea, at Kalama‘ula, an area located on Hualalai. Ka-miki was later joined by his elder brother Maka‘iole where their ancestress Ka-uluhu-nui trained her grandsons into ʻōlohe, or experts skilled in fighting, wrestling, debating,iddle solving, and running, and how to use their supernatural power.

That portion of the legend set in the Kuhua-Kolekole area was published in Ka Hōkū o Hawai‘i between May 24, 1916, to July 27, 1916. The moʻolelo begins along the ala loa in the kula regions, overlooking the infamous cliffs, of Hilo Paliikē. The supernatural brothers Ka-Miki and Maka-ʻiole, along with the chiefs of Hilo Hanakahi and Keahialaka were attacked by Kapāhe‘ehe‘e and a chief, named Homomū. Victorious in warding off their attackers, Ka-Miki and his fellow companions restrained Kapāhe‘ehe‘e and Homomū and left them stranded on the trailside. A short distance away they met Kuhua-i-Hālala, guardian of Kapāhe‘ehe‘e and daughter of Homomū.

Kuhua-i-Hālala was an ʻōlohe skilled in the art of haʻihaʻi (bone-breaking) and lua (hand-to-hand combat) and like her father, Homomū and his adopted son, Kapāhe‘ehe‘e, would often challenge travelers who traversed the ala loa near their residence. If the travelers were successful in protecting themselves and could not be killed in combat, she
Kūlanikapele sent the misfortune Miki and the unusual occurrences he had witnessed. Kūlanikapele then sent a messenger, ʻŌhiʻaokalani, to confirm his admiration for the carvings, Ka-Miki complimented his ancestors, and from the mountains, a mysterious voice replied to him. Upon hearing this, Hālala questioned their visit to their village. Kuhua-i-Hālala was then entrapped by their mischievous doings, Kuhua-i-Hālala strangled her victims to death using her ʻaha puluniu (sennit crab snare). However, her encounter with Ka-Miki fared much differently from her previous conquests and thus began with a riddle: “Can one move swiftly through Hilo?” asked Kuhua-i-Hālala. To which Ka-Miki replied, “Yes indeed one may travel swiftly through Hilo, for there is no water in the streams!” implying that there were no ʻōlohe on the trail that could stop them from continuing on their journey (Maly 1994:6). Kuhua-i-Hālala having been intrigued by their response, replied thusly:

How is it that Hilo is without water (ʻōlohe)? There are many (400) hills, many (4,000) descents, and many (40,000) rivers in Hilo, one becomes breathless (is overcome) swimming in the waters of Hilo, but one is never out of water in Hilo…Hilo is the land of rain, rain that goes on and on, rain that darkens the sun. Indeed the sun is darkened by the rains, and it is the Māluakī‘i wai that pushed down the river debris (travelers) from the uplands. So is the stormy nature of Hilo known, and blocked are the trails that one would travel. (Maly 1994:6)

To which Ka-Miki replied in a poetic-riddle form:

Hilo has no water. The water has returned and sits in the springs, along the dripping cliff faces, to the quiet pools. The rivers have receded, the rain trough of Hilo is placed in the heavens…we have come to see Hilo bound in the meshes of heavenly rains, Hilo in the long twined lines of the Mālualuua, which fetches the multitudinous waters (ʻōlohe), those of skill, [wind] upon the mountain tops [adorned] with budding ʻōhiʻa, and the māmāne that droops in the cold, on the mountains that move overhead like birds soaring in the heights of the heavens. Hilo is consumed by the great wind of the gourd; now it is like a small gourd to be set aside, the children call out; for it is ended, Hilo is [no longer] black, darkened by the rains, [emptied] are the rain troughs in the heavens… (Maly 1994:7)

Here Ka-Miki cleverly referenced the many waters, streams, rains, and storms of Hilo that described the ʻōlohe who tormented the people within the region. The winds Ka-Miki spoke of, referred to him and his men clearing the heavens thereby giving way for the people of Hilo to celebrate and feel safe in their homeland once again. Ka-Miki with an ingenious retort tells Kuhua-i-Hālala:

It is I, the descendent of Ka-uluhe-nui-hihi-kolo-i-uka, who have cleansed and dried the rivers. Hereafter the debris (ʻōlohe) that has blocked the pathways will never again rise. Nana-i-ke-kīhi-o-Kamalama, the descendent of Lani-nui-ku‘i-a-mamao-loa has ended the practices of Upeloa, Kaʻumana, Kalanakama‘a-o-uli, Pūkihæ, Mokuhonua, Waiaea, Kaiwiku, Honoli‘i, Kiko‘okapuna, Pau and Keka‘a [Pauka‘a], Pueopākū, Pāpa‘i-nui-a-kou [Pāpa‘ikou], Waiahōle Kaie‘ie-lulu-ka-i‘a [Ka‘ie‘ie], Kalaoa, Hanawī, Kula‘imanono, Kukuiluaunia, Kapāhe‘ehe‘e, and Honomū—for all have been bound by Ka-Miki. Thus Ka-Miki has waded through half of the streams of Hilo, and here is Ka-Miki seeking out and judging the skilled ʻōlohe who remain, seeking the koa trees that darken [i.e. disreputable warriors] all the forests. (Seeking) the great koa and little koa, those who are called the Koapaʻele o Hilo—Koa trees that darkens Hilo [high canopy trees that shade all that is below; descriptive of powerful warriors]. (Maly 1994:7)

After a series of taunts, Kuhua-i-Hālala realized that Ka-Miki and his group deliberately sought after her. Incensed by their mischievous doings, Kuhua-i-Hālala lunged forward and attacked them. Kuhua-i-Hālala was then ensnared in the net of Lani-nui-ku‘i-a-mamao-loa to which she then surrendered and agreed to no longer ambush any more travelers. Upon her release, she then took them to meet Hū‘ia, a master carver, and skilled orator, from Kolekole who questioned their visit to their village. Kuhua-i-Hālala told Hū‘ia and the people of Kolekole about Ka-Miki and his victory over them and that no one was capable of beating him, not even Hakalau-nui, a priest of the area.

Ka-Miki quickly took notice of the village of Kolekole and observed many magnificent carved images. In his admiration for the carvings, Ka-Miki complimented Hū‘ia for his work to which Ka-Miki was met with much arrogance. Hū‘ia challenged Ka-Miki by stating that Kūlanikapele and Kolekole’s finest champions could defeat him. Ka-Miki quickly learned that Kolekole was the grounds where many contests were held and therefore, requested to meet with the area champions on the contest field. In preparation for the contest, Ka-Miki uttered a chant to call upon his ancestors, and from the mountains, a mysterious voice replied to him. Upon hearing this, Hū‘ia became terrified and hurried to the home of Kūlanikapele, who was a chief, ʻōlohe, and advisor to chief Kolekole, to tell him of Ka-Miki and the unusual occurrences he had witnessed. Kūlanikapele then sent a messenger, ʻŌhi‘aokalani, to confirm the misfortune of Honomū, Kuhua-i-Hālala, and Kapāhe‘ehe‘e which to his dismay was confirmed to be true. Kūlanikapele sent his messenger again but this time to retrieve his grandson, Akaka, who was also a skilled competitor.
2. Background

In the contest games. However, after much discussion, both Kulanikapele and Akaka agreed that they were outmatched by Ka-Miki and instead arranged for him a feast and 'awa ceremony. Meanwhile, at the kahua (contest field) in Kolekole, the people of the area gathered and Akaka escorted Ka-Miki to the field to spectate and observe the contest.

Kuhua-i-Hālala was the first contestant arranged to compete against Waile‘ale‘a, a famous ‘ōlohe from Maui, but since Kuhua-i-Hālala had surrendered to Ka-Miki, she claimed that he must fight him instead. Ka-Miki, never one to back down from a challenge, met Waile‘ale‘a on the kahua and with great skill and speed, flung Waile‘ale‘a off the platform. Following his victory, Ka-Miki called out for his next opponent but to his surprise, Waile‘ale‘a requested a rematch. Ka-Miki responded by teasing Waile‘ale‘a of his prior defeat and the great humiliation he would be subjected to if he challenged him a second time. This enraged Waile‘ale‘a and without hesitation, he stomped onto the kahua to try his hand again at defeating Ka-Miki. To his displeasure, he was thrown from the kahua in the same manner as before to which he accepted his defeat and realized he was no match for Ka-Miki.

Following his victory over Waile‘ale‘a, another contender, named Hakalau-nui, entered the kahua to compete against Ka-Miki. They exchanged banter, boasting of their abilities and skills to each other, and when the contest began, Hakalau-nui attempted to seize Ka-Miki but instead found himself trapped by Ka-Miki’s malo. Unable to free himself, Hakalau-nui was slain by Ka-Miki who then called for his next opponent, to which Kamaʻēʻē-a-kau answered and stepped on to the kahua ready to challenge him. Kamaʻēʻē-a-kau would not be victorious in his attempts to defeat Ka-Miki either and was killed. In an attempt to avenge the deaths of the slain, eleven ‘ōlohe broke the rules of the kahua and rallied together to kill Ka-Miki. However, they were unsuccessful and were left bounded by Ka-Miki until the next day. Hiʻia, humbled by the outcome, asked for forgiveness from Ka-Miki and was then made the konohiki for Kolekole of which he cared for the lo‘i (taro) terraces, ‘uala (sweet potato) gardens and sugar cane, banana and ‘awa plantings that grew along the cliffs of ‘Akaka.

Kolekole, having been impressed by Ka-Miki and defeating all the ‘ōlohe of Hilo Palikū, prepared a grand feast and ‘awa ceremony for Ka-Miki and his friends. Following the ceremony, they continued their journey to meet with Maulua-a-piʻo, a friend of Hilo Hanakahi who shared with Maulua-a-piʻo all the feats that Ka-Miki had accomplished and asked for his friend to not challenge Ka-Miki (Maly 1994).

Historical Accounts of Hilo Palikū (1825-1847)

In the early 19th century, the increase of foreign visitors and explorers began to influence Hawai‘i’s economic, social, and religious systems. The district of Hilo became one of the main ports for commerce such as sandalwood, whaling and eventually the notorious sugar industry. Some of the earliest written descriptions of Hilo come from the accounts of the first Protestant missionaries to visit the island. Early Historic era visitors to Hilo often wrote about the beauty, fertility, and ruggedness of the region. In 1823, the Reverend William Ellis one of the first Christian missionaries to arrive in Hawai‘i passed along the South Hilo coast during his tour of the island. Having been warned against walking due to the ruggedness of the terrain, he sailed from Hilo to Laupāhoehoe in a canoe. Ellis described the South Hilo coastline as follows:

The face of the country by which we sailed, was fertile and beautiful, and the population throughout considerable. The numerous plantations on the tops or sides of the deep ravines, or valleys, by which they were frequently interspersed, with the meandering streams running down them into the sea, presented altogether a most agreeable prospect. (Ellis 1825:191)

Overland travel across the central and northern Hilo District remained difficult throughout the first part of the nineteenth century due to its rugged coastline and many deep gulches. Transportation difficulties may have even temporarily delayed large-scale commercial exploitation of the kula lands in the vicinity of the study area (Desilets and Rechtman 2004). Initial commercial exploitation of these lands was limited to small scale agriculture in areas with coastal access for shipping and receiving goods. The Reverend Titus Coan, who settled at the Hilo Mission Station in 1835, wrote that:

For many years after our arrival there were no roads, no bridges, and no horses in Hilo, and all my tours were made on foot. . . The path was a simple trail, winding in a serpentine line, going down and up precipices, some of which could only be descended by grasping the shrubs and grasses, and with no little weariness and difficulty and some danger. (Coan 1882:31–32).

By the mid-1800s the first roads had been established along the coast of South Hilo perhaps following the route of the older path described by Coan (PHRI 1991). These first roads, designed for travel on horses and in carts, were likely developed by landholders, primarily sugar growers, looking to connect their plantation lands. Chester S. Lyman, traveling from Kawaihao to Hilo with the Reverend Titus Coan on June 19th, 1846, recorded their visit to the area, which began with a visit to ‘Akaka Falls in which Lyman described thusly:
The gulf into which the water falls, is of a circular, or rather semicircular form with perpendicular walls of nearly naked lava rock some 400 or 500 feet high. Except on the face of this horse shoe precipice the two steep sides of the ravine are clothed with a dense mass of wanton vegetation. The stream falls in an unbroken mass of white foam down the face of this precipice into a basin below. Smaller rills were falling from the sides of chasm & such was the force of the wind circulating here that the whole gulf below the falls was filled with spray & mist, so that one approaching near the bottom of the cascade was soon wet to the skin. The Basin into which the water falls is several rods in diameter & the perpendicular height of the falls as measured with a line by Mr Coan is 426 ft. We threw down several stones and found them to occupy from 4¾ to 5¼ seconds in falling, which w[e] give a depth corresponding with Mr Coan’s measurement. (Lyman 1925:81)

In his journal, he also described their travels along a cart road and discussed the holdings of Mr. Castle the progenitor of the first sugar plantation in the area. Mr. Lyman writes:

After resting we started on at 41/2 & soon arrived at Mr Castle’s, 3/4 of a mile beyond. When half way there we fell in with two carts each drawn by 4 yokes of oxen, one set of them just broken in; the two teams were connected by a long rope & went on by fits & starts, now stopping & now going on the run. The carts were large & heavy with thick solid wheels made of planks pinned together. They were well filled with a crowd of noisy girls & boys & by invitation of the Driver, an American, I took a ride in one of these Hawaiian Coaches as far as Mr Castle’s house, glad thus to relieve a little my feet which were becoming sore from walking in water and climbing precipices.

Stopped a few minutes at Mr C[astle]’s; were entertained with a refreshing bowl of milk, & then going on a mile & a half or 2 miles put up for the night at a native house, near by. The place is called Puu mo. Mr. Castle is an American, has been in the country many yrs, has an extensive plantation & a native wife & family. Near his house we passed large fields of sugar cane on his lands, but cultivated by Chinamen who have pretty much monopolized the sugar business in this region. Mr C[astle] has also considerable herds of cattle. (Lyman 1925:81).

In 1872, nearly a half a century after Reverend William Ellis passed through the South Hilo coast, an English explorer and writer, named Isabella Bird, visited the Hawaiian Islands and recorded her travels of Hawaiʻi Island. While aboard a ship, steaming towards Hilo town, she poetically noted the inhabited gulches along the northeastern coastline and highlighted the picturesque landscape of the region:

There was a magnificent coast-line of grey cliffs many hundred feet in height, usually draped with green, but often black, caverned, and fantastic at their bases. Into cracks and caverns the heavy waves surged with a sound like artillery, sending their broad white sheets of foam high up among the ferns and trailers, and drowning for a time the endless baritone of the surf, which is never silent through the summer years. Cascades in numbers took one impulsive leap from the cliffs into the sea, or came thundering down clefts or “gulches,” which, widening at their extremities, opened on smooth green lawns, each one of which had its grass house or houses, kalo patch, bananas, and coco palms, so close to the broad Pacific that its spray often flittered itself away over their fan-like leaves. Above the cliffs there were grassy uplands with park-like clumps of the screw pine, and candle nut, and glades and dells of dazzling green, bright with cataracts, which opened up among the dark dense forests which for some thousands of feet girdle Mauna Kea and Mauna Loa, two vast volcanic mountains, whose snow-capped summits gleamed here and there above the clouds, at an altitude of nearly 14,000 feet. Creation surely cannot exhibit a more brilliant green than that which clothes windward Hawaii with perpetual spring. I have never seen such verdure. In the final twenty-nine miles there are more than sixty gulches, from 100 to 700 feet in depth, each with its cataracts, and wild vagaries of tropical luxuriance. Native churches, frame-built and painted white, are almost like mile-stones along the coast, far too large and too many for the notoriously dwindling population. Ten miles from Hilo we came in sight of the first sugar plantation, with its patches of yet brighter green, its white boiling houses and tall chimney stack; then more churches, more plantations, more gulches, more houses, and before ten we steamed into Byron’s Bay, or as it is now called Hilo Bay. (Bird 1882:35–36)

During her stay in Hilo, Bird made a tour on horseback from Onomea to Waipiʻo Valley where she described her encounters with her hosts, foods, and the difficulty of navigating the steep terrain. Bird’s descriptions of the domiciles and native inhabitants reveal a changing traditional life. Although no specific mention of Kuhua or Kolekole appears in her writings, she did, however, describe the nearby area of Hakalau, commenting:
2. Background

All the gulches for the first twenty-four miles contain water. The great Hakalau gulch we crossed early yesterday, has a river with a smooth bed as wide as the Thames at Eton. Some have only quiet streams, which pass gently through ferry grottoes. Others have fierce strong torrents dashing between abrupt walls of rock, among immense boulders into deep abysses, and cast themselves over precipice after precipice into the ocean. Probably, many of these are the courses of fire torrents, whose jagged masses of a-a have since been worn smooth, and channeled into holes by the action of water. A few are crossed on narrow bridges, but the majority are forded, if that quiet that quiet conventual term can be applied to the violent flounderings by which the horses bring one through. (Bird 1875:138)

Bird’s account of the journey also mentions the presence of houses within the gulches, specifically grass-houses and a schoolhouse within Kawainui Gulch (south of the study area). With respect to Laupāhoehoe Gulch (north of the study area) she stated, “a number of disastrous-looking native house are clustered under some very tall palms in the open part of the gulch (Bird 1875:139). Her detailed and colorful accounts provide a glimpse into the early nineteenth century environs and native lifeways of the steep terrain section of the South Hilo District.

The Māhele ‘Āina of 1848

By the mid-nineteenth century, the ever-growing population of Westerners in the Hawaiian Islands forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. By 1840 the first Hawaiian constitution had been drafted and the Hawaiian Kingdom shifted from an absolute monarchy into a constitutional government. Convinced that the feudal system of land tenure previously practiced was not compatible with a constitutional government, the Mōʻī Kauikeaouli and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King n.d.). The change in land tenure was further endorsed by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be revoked from them at any time. After much consideration, it was decided that three classes of people each had one-third vested rights to the lands of Hawai‘i: the Mōʻī (monarch), the aliʻi (chiefs) and konohiki (land agents), and the makaʻāinana (common people or native tenants).

In 1845 the legislature created the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission), first to adopt guiding principles and procedures for dividing the lands and granting land titles, and then to act as a court of record to investigate and ultimately award or reject all claims brought before them. All land claims, whether by chiefs for entire ahupua’a or by tenants for their house lots and gardens, had to be filed with the Land Commission within two years of the effective date of the Act (February 14, 1848) to be considered. This deadline was extended several times for the aliʻi and konohiki, but not for commoners (Alexander 1920; Soehren 2004).

The Mōʻī and some 245 aliʻi (Kuykendall 1938) spent nearly two years trying unsuccessfully to divide all the lands of Hawai‘i amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King n.d.). Once the Mōʻī and his aliʻi accepted the principles of the Privy Council, the Māhele ‘Āina (Land Division) was completed in just forty days (on March 7, 1848), and the names of all of the ahupua’a and ‘ili kūpono (nearly independent ‘ili land division within an ahupua’a) of the Hawaiian Islands and the chiefs who claimed them, were recorded in the Buke Mahele (1848) (also known as the Māhele Book) (Soehren 2004). As this process unfolded the Mōʻī, who received roughly one-third of the lands of Hawai‘i, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased by his subjects to live on. Accordingly, the day after the division when the last chief was recorded in the Buke Mahele, the Mōʻī commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike the Mōʻī, the aliʻi and konohiki were required to present their claims to the Land Commission to receive their Land Commission Award (LCAw.). The chiefs who participated in the Māhele were also required to provide commutations of a portion of their lands to the government to receive a Royal Patent that gave them title to their remaining lands. The lands surrendered to the government by the Mōʻī and aliʻi became known as “Government Land,” while the lands that were personally retained by the Mōʻī became known as “Crown Land,” and the lands received by the aliʻi became known as “Konohiki Land” (Chinen 1958:vii, 1961:13). Most importantly, all lands (Crown, Government, and Konohiki lands) identified and claimed during the Māhele were “subject to the rights of the native tenants” therein (Garavoy 2005:524). Finally, all lands awarded during the Māhele were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be formally surveyed. This process expedited the work of the Land Commission.

During the Māhele, native tenants of the lands that were divided up among the Crown, Konohiki, and Government could claim, and acquire title to, kuleana parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered the kuleana as Land Commission Awards (LCAw.). Claims for kuleana had to be submitted during a two-year period that expired on February 14, 1848, to be considered. All of the land claimants
were required to provide proof of land use and occupation, which took the form of volumes of native registry and testimony. The claims and awards were numbered, and the LCAw. numbers, in conjunction with the volumes of documentation, remain in use today to identify the original owners and their use of the kuleana lands. The work of hearing, adjudicating, and surveying the claims required more than the two-year term, and the deadline was extended several times for the Land Commission to finish its work (Maly 2002). In the meantime, as the new owners of the lands on which the kuleana were located began selling parcels to foreigners, questions arose concerning the rights of the native tenants and their ability to access and collect the resources necessary for sustaining life. The “Enabling” or “Kuleana Act,” passed by the King and Privy Council on December 21, 1849, clarified the native tenants’ rights to the land and resources, and the process by which they could apply for fee-simple interest in their kuleana. The work of the Land Commission was completed on March 31, 1855. A total of 13,514 kuleana were claimed by native tenants throughout the islands, of which 9,337 were awarded (Maly 2002). As a result of the Māhele, Kuhua Ahupua’a was returned as commutation by Mataio Kekuanāo’a on behalf of his daughter, Victoria Kamāmalu and retained as Government Land (Buke Mahele 1848). No claims were made for kuleana lands within the ahupua’a.

**Land Grants Purchased within the Study Area (1852-1863)**

In conjunction with the Māhele, the King also authorized the issuance of Royal Patent Grants to applicants for tracts of land, larger than those generally available through the Land Commission. The process for applications was clarified by the “Enabling Act,” which was ratified on August 6, 1850. The Act resolved that portions of the Government Lands established during the Māhele of 1848 should be set aside and sold as grants ranging in size from one to fifty acres at a cost of fifty cents per acre. The stated goal of this program was to enable native tenants, many of whom were not awarded kuleana parcels during the Māhele, to purchase lands of their own. Despite the stated goal of the land grant program, this provided the mechanism that allowed many foreigners to acquire large tracts of the Government Lands. Unlike in the kuleana claims, where claimants stated their use of the land, the grant records are silent regarding the grantees’ intended use. The Royal Patent deeds and survey notes do contain some limited information about geographical features of the grant lands, and describe boundary markers, such as rock piles and vegetation, but they generally do not say anything about improvements to the land or land use.

The study area comprises portions of two Land Grant parcels (616:1 and 2, and 2933) purchased by Kaawa (Table 1). Grant 616:1 and 616:2 comprise 50 acres of land purchased on the 14th of May, 1851, and Land Grant 2933, totaling 7 acres, was purchased on the 27th of August, 1863. Hawai’i Registered Map No. 342, prepared in 1879, depicts the location of Kaawa’s grant (labeled “Grant 616B Kaawa”), as well as the route of the Old Māmalahoa Highway (Figure 12). Also portrayed on this map is the potential location of the Kaawa house (located on the tablelands to the southeast of the study area), as well as a ford crossing, indicating a shallow place within Kolekole Stream where one could walk or ride across (see Figure 12). An undated Hawaiian Government Road Survey Map (Figure 13) also depicts the location of Kaawa’s house. While an 1884 Hawaiian Government Survey Map (Figure 14) depicts the locations of notable landmarks and geography in the vicinity of the study area, it suffers from significant inaccuracies, and therefore cannot be used to determine the precise locations of the Land Grants directly associated with the current study area themselves, particularly in the case of Land Grant 2933 to Kaawa which is mislabeled as “Grant 623” to “Kakaio.” However erroneous, this map is useful for its depiction of the conglomeration of grants present in the immediate vicinity of the study area within Kuhua and the neighboring ahupua’ a of Wailea and Honomū.

<table>
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<tr>
<th>Grant No.</th>
<th>Number of parcels</th>
<th>Name of Grantee</th>
<th>Acres</th>
<th>Year Purchased</th>
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<td>2</td>
<td>Kaawa</td>
<td>Portion of 50 acres</td>
<td>1852</td>
</tr>
<tr>
<td>2933</td>
<td>1</td>
<td>Kaawa</td>
<td>7</td>
<td>1863</td>
</tr>
</tbody>
</table>

Table 1. Land Grants within the study area (1852-1863)
2. Background

Figure 12. Undated Territory of Hawai‘i Registered Map No. 342 showing the location of the Kaawa household, the Old Government Road, and a ford crossing in relation to study area (outlined in red).
Figure 13. 1884 Register Map 0519 showing the location of Grant 616 awarded to Kaawa. The approximate location of the study area is outlined in red.
2. Background

Figure 14. Register Map 519 Road Survey by Cabot, L (N.D), depicting the location of a structure that likely represents the Kaawa household (labeled Kaawa). The approximate location of the study area is outlined in red.
The Late Nineteenth and Early Twentieth Century in Kuhua and South Hilo

Following the Māhele and the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawai'i which guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, commercial sugarcane cultivation and sugar production became the central economic focus for the Hilo area, as in other harbor towns throughout the islands. By 1874, Hilo already ranked as the second-largest population center in the islands and within a few years the fertile uplands, plentiful water supply, and port combined to make Hilo a major center for sugarcane production and export. According to Best (1978:123), the new plantations commonly extended some two to three miles inland from the coast. Elevations typically ranged from 250 feet above sea level along the shoreline bluffs to 2,000 feet above sea level at their western (mauka) limits. Ocean frontage could range from two to six miles. Railroads operating on steam and animal power were built on some plantations by 1887, however, some plantations utilized flumes or cable railways to transport cane from the fields to the coastal mills.

With the annexation of Hawai'i to the United States in 1898 and the granting of Territory status in 1900, Hilo was designated the center of county government in 1905 and remained the second most populated city in the newly formed Territory of Hawai'i. Sugar cultivation continued to be the island’s most lucrative industry and brought dramatic changes to the Hilo area until the 1970s. Some of the large fishponds (Hanalei, Kalepolepo, Mohouli, Waiākea, and Hoakumau) located in Waiākea Ahupua‘a, were filled and thus destroyed; and many old residences, burial sites, trails, heiau, and more were destroyed by the development of sugar plantation fields.

In prospecting Hilo for land suitable for development, a report was made by the Royal Commissioners on Development of Resources. Formed by King David Kalākaua in 1877, commissioners conducted examinations of lands along the Hāmākua/Hilo coastline and consulted with residents in an effort to learn about needs and natural resources. In 1877, Honomū was investigated for its potential as a landing and sugar mill location:

At Honomu, in ordinary weather, a good landing can be made in a surf boat, and would only need a buoy; parties are projecting a small plantation on this land with a mill in the gulch. There are some 1500 acres of Government land in the vicinity, and 1250 sold to private parties, some of which is cane land. The establishment of a good mill at Honomu would greatly add to the value of these lands. (Maly and Maly 2006:48)

Three years later in 1880, M. Kirchoff & Company, along with C. Brewer & Company, Ltd. as an agent, established Honomū Sugar Company on 2,400 acres of land within the South Hilo District, including the current study area (Dorrance and Morgan 2000). The Honomū Sugar Company mill was located on the coast, and the upper region of Honomū was interspersed with small-farm homesteaders (Figure 15). By 1890 the plantation was producing 2,000 tons of sugar yearly. Initially, no Hilo coast plantations had a railroad, so fluming was extensively utilized by the Honomū Sugar Company who shipped its product from Honomū Landing to Honolulu via inter-island vessels that anchored offshore.

Figure 15. 1929 aerial photograph of Honomū Sugar Company Mill and Camp.
2. Background

By 1919, the Honomū Sugar Company encompassed roughly 2,300 acres of land; 1,271 of which were owned outright by the company, and 1,000 of which were leasehold. The company’s cultivated sugarcane lands extended from 50 to 1,500 feet above sea level and was situated between the neighboring mills of Pepe‘ekeo and Hakalau, including the majority of the current study area, with the more seaward portion of the parcel being unplanted (Figures 16 and 17). Water was diverted from several perennial streams including Pāheʻeheʻe, Honomū, and Kolekole through a 9-mile long network of flumes to the fields which grew several varieties of cane including “. . . Yellow Caledonia with a little Rose Bamboo and a small amount of different varieties sent from the Planters’ Experiment Station” and crop yields were further supplemented by nearby homestead growers who dedicated approximately 400 additional acres of land to cane cultivation for the company (Evening Bulletin Industrial Edition 1909).

Figure 16. 1916 photograph of the makai portion of the current study area with railroad bridge in the background (The Honolulu Advertiser 1916).
That same year, a small, independently owned and operated plantation, the Wailea Milling Company, was formed by Tatsuji Kawachi on the northern edge of Kolekole Gulch, directly north of the current study area. Unlike Honomū Sugar Plantation and most of the commercial sugar plantations in Hawai‘i, the Wailea Milling Company was the smallest sugar mill in Hawai‘i and was independently owned and operated by a cooperative of Wailea homesteaders who held over 3,000 acres of land for cultivation including lands formerly held by the Hakalau Plantation Company (Lydgate 1919). Despite being an autonomous enterprise, the company sustained a cordial relationship with the Hakalau Plantation, who acquired it in 1943 (Dorrance and Morgan 2000).

By 1941, Honomū Sugar Company held 3,027 acres of cane land, and production had reached 10,407 tons (Hitch 1992), but years following World War II left an indelible mark on the company as it fell under duress due to wage increases and labor scarcity. A pattern of cane field acquisition emerged in the following years in an effort to boost cultivatable acreage and thereby ensure sustainable profitability for the big players in the industry, and in 1946, C. Brewer & Co. acquired an interest in Honomū Sugar Company and merged it into the Pepe‘ekeo Sugar Company (Dorrance and Morgan 2000). Nearly two decades later in 1962, Pepe‘ekeo Sugar Company fused with Hakalau Plantation, and in 1973 Hakalau consolidated into Mauna Kea Sugar Company, a non-profit corporation that now held Hakalau in addition to the Honomū, Pepe‘ekeo, Onomea, and Hilo Sugar companies (ibid.). Mauna Kea Sugar Company, which eventually became Mauna Kea Agribusiness, became the third largest in acreage (13,000 acres) on Hawai‘i Island. It continued to operate until 1994 when it phased out sugar production and closed its doors forever, marking the end of commercial sugarcane production in the Hilo area (ibid.). The rise and fall of the sugar industry were closely intertwined with the development of rail transportation in the district.

Railroad construction was one of the most important elements of governmental and private sector planning following the Treaty of Reciprocity, as crops and products were still being transported by animal and cart (Dorrance and Morgan 2000). On the Island of Hawai‘i, the first major line to be constructed was in the North Kohala District, which operated as the Hawaiian Railroad Company. The North Kohala line, however, was envisioned as only the first step toward a much larger system connecting the cane fields of Kohala, Hāmākua, and Hilo with Hilo Harbor, the only protected deep-water port on the island. Beginning in 1899, railroad lines began transporting sugar to the harbor for marine transport, thus Hilo became an important shipping and railroad hub.

Lorrin A. Thurston, who according to Thrum had “been connected with the enterprise from its initiation” (Thurston 1913:142), wrote an article upon the completion of the railroad from Hilo to Pa‘auilo, Hāmākua in May of 1913 entitled “Railroading in Hilo” which was published in Thrum’s Hawaiian Annual and Almanac for 1914. Thurston reported that the Hilo Railroad Company (HRC) initiated the railroad endeavor in 1899 from Waiakea south
2. Background

The commercial sugar industry provided most of the cargo transported by HRC, but suffered a sharp decline between the years of 1904-1907, which halted development in Hilo (Thurston 1913). In response, HRC worked with ‘Ōla’a Sugar Company to send a representative to Washington D.C. in 1907 to secure funding for the construction of a breakwater that would allow Hilo Bay to accommodate larger ocean-going vessels. Construction on the breakwater began in 1908 and was still ongoing at the time of Thurston’s writing (ca. 1914); the breakwater was finally completed in 1929. In exchange for the construction of a breakwater in Hilo Bay, the Hilo Railroad was required to build a new wharf, a one-mile rail extension from Waiākea, and a 50-mile rail extension north to Honoka’a Mill (the Hāmākua Division). The funding of the breakwater by HRC resulted in the extension of the railroad through the populated section north of Hilo all the way to Hakalau and Hāmākua (Figure 18):

When the breakwater project was pending before Congress, opposition was made to the appropriation on account of the limited commerce then being transacted through Hilo harbor.

Assurances were thereupon made by the Hilo Railroad Company, that if the breakwater were constructed, a railroad would be built into the country north of Hilo and suitable wharf facilities provided under the lee of the breakwater. Such assurances had a material effect in securing the appropriation. (ibid.:145)

The extension to Honoka’a would finally connect the sugar mills of South Hilo, North Hilo, and Hāmākua with Hilo’s protected harbor. Between June 1909 and December 24, 1911, HRC built 12.7 miles of rail extending from Hilo to Hakalau Mill, crossing many deep gulches and valleys along its route. This was followed by the construction of an additional 21 miles of rail that connected Hakalau with Pa‘auilo to the north, which covered a total distance from Hilo of roughly 34 miles and was known as the “Hamakua Division” (ibid.:146). Thurston defined the objective of the Hāmākua Division thusly:

The principal object of the extension is to give adequate transportation facilities between Hilo and the fertile and well-settled territory extending for 50 miles north of the town of Hilo, and averaging...
three to four miles in width. This district produces nearly one-fourth of the entire output of sugar of
the Territory and is, including the town, the home of over 30,000 people. The only means of access
to this section has heretofore been by wagon road, almost impassable in rainy weather, and by
derrick and cable landings over bluffs rising from 50 to 300 feet sheer from blue ocean. There are
no harbors. (ibid.:147)

Thurston described the scenery afforded to passengers who traveled on the Hāmākua Division as follows:

Incidentally, the road has opened up one of the most remarkable, unique and spectacular scenic
routes to be found in any part of the world. It may appear impossible for a railroad to run through a
thickly-settled, highly-cultivated country and yet be noted for spectacular scenery. The paradox is
explained by the fact that the district lies along the base and on the steep slope of Mauna Kea, the
highest mountain in the Pacific.

The combination of steep grade and heavy rainfall has resulted in excessive erosion, the mountain
side being seamed at frequent intervals with deep gulches, in which the streams form innumerable
rapids and waterfalls.

Some conception of the rugged character of the country can be gained from the fact that in less than
34 miles, there are 211 water openings under the railroad track, ranging from a concrete culvert to
steel bridges up to 1006 feet in length and 230 feet high. (ibid.147-149)

The section of railroad spanning Kolekole Bridge (Figures 19) was described by John W. Bains in an article
titled “Around About Hilo” that was published in a January 1913 edition of the Mid-Pacific Magazine:

After leaving Onomea more broad gorges spanned by steel viaducts are crossed, each unveiling a
picture more beautiful than the last, until Kolekole Bridge is reached. Kolekole is not the largest nor
the highest of the steel structures, but it spans an estuary of the sea and affords the visitor a long
view of headlands to the south, which stamps it as one of the most attractive of all the bridges. It is
just 100 feet in height and from the train the tourist can gaze down on the tops of the cocoa-nut
palms reaching up from the valley below. The green combers thunder on the pebble-strewn beach
and in the distance dash on the precipitous cliffs, ever changing and ever adding life and variety to
the view.

Mile upon mile of sugarcane fields stretch away on both sides of the line, insistent evidence of the
magnitude of Hawaii’s most valued product. The quaint and unique method of conveying the cane
from the uttermost borders of the fields to the very jaws of the mill rollers by the means of water
flumes is to be seen at various points along the line. (Bains 1913:356–357)

Ultimately, the cost of the Hāmākua Division ruined HRC and as a result, they were forced to sell out and
reorganize under the name Hawaii Consolidated Railway (HCR) in 1916. A 1919 Copy of Survey Furnished (C.S.F.)
map (Figure 20) depicts the HCR bridge crossing over Kolekole Stream and the study area, and shows the two-
hundred-foot wide right of way extending along the northern flank of Kolekole Gulch to the north of the study parcel.
A depot, railroad house lot, and the Old Māmalahoa Highway (labeled “Gov’t Main Road) which leads to the park’s
entrance are also illustrated on this map. In 1920, HCR attempted to capture a larger piece of the growing tourist
business with its adventurous scenic route tour dubbed the “Scenic Express.” HCR had long offered service to
Glenwood for tourists visiting Kilauea, but motorbuses now dominated this route. The Hāmākua Coast, by contrast,
was not easily accessible by automobile. HCR was, therefore, able to run passenger coaches profitably along the
Hāmākua Division with stops at select scenic points. Passenger business declined precipitously in the early decades
of the twentieth century, and the rise of the automobile was a harbinger for the railroad. In 1920, 607,220 passengers
were carried. In 1930, the number dropped to just 77,894 and continued to decline as the years progressed, with
passenger counts dropping as low as 16,681 in 1936 (Best 1978:145–146). As a result, the remaining passenger cars
were converted for other uses, and the little passenger traffic which persisted was hauled on custom-built railbuses.

The picturesque purlieus of the study area described by Bains (1913) persisted at least until 1938; and although
the study area remained cane lands until April of that year, the growing popularity of Kolekole Stream as “perhaps
the finest swimming place of the entire island” prompted county officials to initiate improvements to the area
associated with development of the “...road and parking for the swimming facilities [Kolekole Stream] and picnic
grounds” (The Honolulu Advertiser 1937, 1938). Later that year, a survey was conducted by the Territory of Hawai‘i
in anticipation of the acquisition of 2.932 acres of land from Honomū Sugar Company for the official creation of
Kolekole Gulch Park. The survey was completed later that year and the park was officially created via executive order
(Executive Order No. 938) on May 2, 1941. A 1938 Territory of Hawai‘i Survey Map for the initial acquisition of
lands for the park shows the proposed transfer of 1.81 acres of cultivated cane land from the Honomū Sugar Company

CIA for the County of Hawai‘i’s Kolekole Gulch Park Accessibility Improvements Project, Kuhua, South Hilo, Hawai‘i
2. Background

to the Territory of Hawai‘i (Figure 21). As illustrated in Figure 21 this section of Kolekole Gulch possessed arable land for the planting of cane and clearly shows that cultivated cane land dominated the majority of the proposed park’s footprint, extending along the flat of the gulch floor and along the eastern edge of Kolekole Stream. The map also depicts a road (labeled “Present Road”, likely a cane haul road, extending *makai* from the existing gate along the eastern edge of Kolekole Stream, as well as portions of Land Grants 616:1 and 2933 to Kaawa.

Figure 19. Undated photograph of passenger car traveling across Kolekole Bridge (https://www.hakalauhome.com/the-railroad.html).
Figure 20. 1919 C.S.F No.3274 showing study area location (outlined in red) in relation to the Hawai’i Consolidated Railway Kolekole Stream Bridge.
2. Background

Figure 21. 1938 Territory of Hawai‘i survey map for the proposed Kolekole Park and Roadway.

CIA for the County of Hawai‘i’s Kolekole Gulch Park Accessibility Improvements Project, Kuhua, South Hilo, Hawai‘i
In the years following the acquisition of the first phase of parklands, railway passenger-ship progressively dropped, but with the onset of World War II, usage spiked significantly due to war-time gas rationing and the dramatic influx of servicemen. By 1943 passenger totals had rebounded profoundly to 103,635 but inevitably, the popularity of automobiles began to take a toll on the railroad’s industrial customers. As roadways were improved and gasoline prices dropped, simple economics favored trucking over trains. Ironically, just as rail transportation was in the throes of decline, HCR was by 1945 almost out of debt for the first time since its inception. The great tsunami of 1946, however, would soon seal its fate.

The Tsunami of April 1, 1946

On April 1, 1946, a tsunami triggered by an earthquake in the Aleutian Islands slammed into Hawai‘i’s north shore, which dealt a fatal blow to the already struggling HCR. Tracks around the waterfront were entirely washed out and the Hilo Station was wrecked. An entire span of the Wailuku Bridge was torn out and washed out the river and “twelve miles north of Hilo, the railroad bridge at the mouth of the Kolekole Stream lost its center span” (Figure 22, 23 and 24) from a massive inundation of water that reached heights of 37 feet in Kolekole and neighboring Hakalau Gulch (Klein et al. 1985; MKE Associates LLC and Fung Associates, Inc. 2013:E8). The effects of tsunami run-up and inundation on the current study area are evident in Figure 24, which shows the leveled, washed-out makai portion of the study area devoid of infrastructure and most vegetation except for two surviving coconut trees. An article in the Honolulu Star-Bulletin from April 5, 1946 (Honolulu Star-Bulletin 1946) relates the destruction of a rest house and ball field within Kolekole Gulch Park (Figure 25), and the park, apparently a favorite recreation spot for the employees of Hakalau Sugar Company, suffered such extreme damage that it did not officially reopen until over two years later (Honolulu Star-Bulletin 1948). Improvements for the park were tentatively proposed during December of that year and included the anticipated “construction of men’s and women’s bathhouses and toilets, water mains and sewerage, also grading of grounds and access roads” (The Honolulu Advertiser 1946).

The destruction from the tsunami was so severe that the Hawaii Railroad Company filed for abandonment soon thereafter, receiving permission to do so in December of 1946. Despite its destruction, the bridge-laden Hāmākua Division was later appropriated by the Territorial Government, who utilized the abandoned railroad alignment to construct the Hawai‘i Belt Road in the 1950s:

. . . the railroad asked shippers to determine whether they would use the line if it were rebuilt or were intending to ship their raw sugar by truck. Only Theo H. Davies Ltd. voted to retain the railroad; the rest voted to use the existing highways, despite their poor condition. Hawai‘i Consolidated Railroad then offered its entire right-of-way, including all bridges and tunnels, to the Territorial Highway Department and to the Hawai‘i County supervisors. Both agencies declined the railroad’s offer.

The entire railroad was sold as scrap to Gilmore Steel & Company of San Francisco for $81,000. About the time the scrappers had finished pulling up the rails and begun dismantling the steel bridges, the Territorial Highway Department changed its mind. They decided to improve the Hawai‘i Belt Road, along the Hāmākua Coast by relocating it to the railroad right-of-way and to utilize the railroad trestles as highway bridge supports. They bought the bridges still in place, as well as the parts of bridges already trucked to Hilo, for $303,723.53 – nearly four times the amount Gilmore Steel & Supply Company had paid to Hawai‘i Consolidated for the entire railroad. These railroad bridge elements were used for the Hawaii Belt Road. . . (MKE Associates LLC and Fung Associates, Inc. 2013:E8)

Kolekole Stream Bridge was reconstructed from older railroad trestles and girder spans as well as salvaged materials from the Wailuku River Bridge and Maulua Gulch Bridges (Figures 26 and 27), and it was one of 40 bridges built during the construction of the new highway (Figure 28). It was completed and dedicated in 1950 and remains in its original location. The bridge carries the Hawai‘i Belt Road, the primary transportation artery for Hilo that extends along the Hāmākua coast, and thus over the study area. Pepe‘ekeo Sugar Company continued its operations, however, following the 1946 tsunami and the subsequent loss of the railroad, cane was instead hauled from Honomū by truck to the Hilo port.
2. Background

Figure 22. View of Kolekole Bridge after the 1946 tsunami, center support washed out (Pacific Tsunami Museum Archives-Henrietta Carvalho Collection).

Figure 23. Damaged HCR Bridge crossing Kolekole Gulch the day of the 1946 tsunami (http://www.hakalauhome.com/the-rainroad.html).
2. Background

Figure 24. *Makai* portion of study area and damaged HCR Bridge following the 1946 tsunami (https://www.hakalauhome.com/the-railroad.html).

Figure 25. Newspaper article from April 5, 1946 edition of the Honolulu Star-Bulletin.
2. Background

Figure 26. Kolekole Bridge under reconstruction, ca. 1950 (https://www.hakalauhome.com/new-bridges-hakalau-html).

Figure 27. Staged construction materials in study area during the reconstruction of Kolekole Stream Bridge ca. 1950 (https://www.hakalauhome.com/new-bridges-hakalau-html).
The Development of Kolekole Gulch Park During the Second Half of the Twentieth Century

In the years following 1938 and the official transition of the study area into a County park, Kolekole Gulch Park remained a popular recreation spot and was utilized by “the people of Honomu, Wailea and Hakalau for its unique swimming pool – ocean water where the tide was at the lower end, and fresh water in the upper half” (Honolulu Star-Bulletin 1941). The destruction of the rest house and ball field that occurred in the park as a result of the 1946 tsunami did not deter the Territory of Hawai’i from investing in the park and initiating further improvements.

Following the reopening of Kolekole Gulch Park in October 1948 in the wake of the tsunami, the Senate and House of Representatives authorized the construction of a pavilion within the park the following year (The Honolulu Advertiser 1949). Territory of Hawai’i tax records (County of Hawaii 1944–1986) indicate that the development of park facilities was undertaken in four separate building episodes between 1949 and 1966, with the first park facility (shower and lavatory structure being constructed in 1949 (Figures 29 and 30). However, the records do not substantiate the construction of a pavilion on park grounds.

Five years later in 1954, a 14 by 38-foot toilet building and a 24 by 30-foot pavilion were erected. A violent storm ravaged Hilo later that year, and although “heavy seas covered most of the park area with big boulders” the pavilion structure remained undamaged (The Honolulu Advertiser 1954). In 1956, the Territory of Hawai’i conducted an additional survey for Kolekole Gulch Park and acquired an additional 2.565 acres of land immediately adjacent to the east and south boundaries of the original park footprint (Figure 31). Upon completion of the survey, the deed was formally transferred on February 14th, 1958 from Pepe’eko Sugar Company to the Territory of Hawai’i, and as a result, the acreage of the park increased to 5.497 acres and included a portion of Land Grant 616:2 awarded to Kaawa.

In late December 1959, a tree planting ceremony and concert was held by the Hawai’i County Band in honor of two new pavilions that had been constructed at Kolekole Gulch Park (Honolulu Star-Bulletin 1959), however, county tax records do not reflect the development of any new structures in the park during that year. An article published in the May 15th, 1960 edition of the Honolulu Star-Bulletin (Engledow 1960) indicates that at that time three pavilions were present within the park, two of which were constructed in the previous year (Figure 32). The third pavilion mentioned in the article is presumably the pavilion constructed in 1954, however, no mention is made of the original shower/lavatory structure previously erected in 1949.

Less than two weeks later on May 23rd, 1960, a devastating tsunami swept Hawai’i Island. The most severe impacts were experienced at the Waiakea peninsula and in the general vicinity of Hilo Bay, with wave heights between Honomū and Hakalau spanning between 5 and 9 feet high (Kline 2016). The late Evelyn Lyn Kagawa of Hilo recalled the destruction left by the 1960 tsunami on the store (S. Hata Shoten, Ltd.) she and her husband managed on Kamehameha Avenue in downtown Hilo. An excerpt from an oral history interview conducted by the University of Mānoa’s Center for Oral History in 2000 is presented below, where Kagawa describes how they had taken rolls of fabric to Kolekole Gulch to clean it and dry it on the grassy lawn in the makai portion of the current study area:

We did find some material underneath all that mud and debris. The Y. Hata trucks came over and they put them on the back of the trucks, took ‘em out to Kolekole—I don’t know how we got there or why someone decided we should go there—and threw the material in at the top of the river and let it run down and let the water clean it. And then we laid it on the grass, the lawn over there, stretched out and dried it. And people came in to buy ten cents a yard, twenty-five cents a yard. And they bought it too. (Center for Oral History, University of Hawai’i 2000:213)

In the years following the 1960 tsunami, Kolekole Gulch Park remained a popular recreation spot for picnickers, campers, ball-players, swimmers, and fishermen (Figure 33). Although it is unclear from tax records and historical documentation what specific physical effects this tsunami had on Kolekole Gulch Park, the County of Hawai’i continued to revamp existing and develop new recreation facilities. Six months after the tsunami, a new 25 foot by 2 foot long concrete walkway was installed in the park by the Hilo Crescent City Lions Club as a public service, who also refurbished eight existing trash cans by painting and stenciling them (The Honolulu Advertiser 1960). A plan view prepared by the County in 1961 illustrates the layout of five pavilions and a toilet building (presumably the shower/lavatory structure built in 1949; Figure 34), and County tax records from 1962 confirm the construction of a new “pavilion”, which may actually be representative of some or all of the pavilions depicted on the plan view (see Figure 34). In 1966, the County of Hawai’i completed its final phase of development of park facilities with the addition of a restroom. At the recommendation of the Hakalau Volunteer Firefighters, in 1972, the County Council approved a resolution to dedicate the largest pavilion at the park in honor of Elias “Epy” Yadao, a former County Supervisor who obtained funding for the pavilion’s construction (Clark 1985). A newspaper article (Figure 35) published in Hilo’s Hawaii Tribune-Herald on June 9, 1972, highlighted the occasion and contained a brief biography of Yadao’s accomplishments as a civil service worker.
The red-roofed pavilion pictured on the grassy lawn area in Figures 29 and 30 is likely the original shower and lavatory building constructed in 1949. It is no longer present and was likely demolished sometime between 2009 and 2011 based on a review of historical Google Earth™ satellite imagery. The five extant pavilions in Kolekole Gulch Park were most likely constructed in 1962, and it is probable that the ancillary recreation features present within the park (e.g. mortared stone barbeque pits, outdoor shower and associated mortared stone wall segment, concrete stairway, and poured concrete slabs, and retaining wall) were added to the grassy lawn portion of the park between 1962 and the present day. A photograph taken sometime between 2000-2016 (Figure 36) shows four mortared stone barbeque pits, all of which are already filled in with concrete and rendered non-functional with the exception of the most southwestern pit which remained operational until at least 2016 (Figure 37). At the time of the current study, only two of the barbeque pits (see Figure 36) were identified with the others having been previously demolished.
2. Background

Figure 29. 2006 photo of original pavilion constructed in 1949 (with red roof), Epy Yadao pavilion in foreground (with green roof) (http://commons.wikimedia.org/wiki/File:Hawaii_Belt_Road_over_kolek.jpg).

Figure 30. 2009 photo of original red roofed pavilion (http://lovingthebigisland.wordpress.com/tag /leptospirosis).
Figure 31. 1956 Territory of Hawai‘i map showing addition to Kolekole Gulch Park.
2. Background

Figure 32. Newspaper article about Kolekole Gulch Park from May 15, 1960 edition of the Honolulu Star-Bulletin.

CIA for the County of Hawai’i's Kolekole Gulch Park Accessibility Improvements Project, Kuhua, South Hilo, Hawai’i
Figure 33. 1962 photograph of man fishing in Kolekole Stream (The Honolulu Advertiser 1962)

One of the many attractions offered by the Big Island’s scenic Kolekole Park is fishing, as this photograph by The Advertiser’s Y. Ishii shows. The little seaside park is perfect also for picnicking or just to enjoy a leisurely stroll enjoying the sights.
2. Background

Figure 34. Territory of Hawai‘i Department of Taxation map showing location of pavilions and toilet building ca. 1961.
Figure 35. June 9, 1972, Hawaii Tribune Herald newspaper article commemorating the naming of the Epy Yadao pavilion (Hawaii Tribune-Herald 1972:11).
2. Background

Figure 36. Undated photograph of Kolekole Gulch Park showing the location of four barbeque pits and picnic tables on concrete slabs (http://onlyinhawaii.org/kolekole-beach-park-big-island-hawaii/).

Figure 37. A 2016 photograph of Kolekole Gulch Park showing barbeque pit prior to being filled in (http://www.trailblazerhawaii.com/2016_12_22_archive.html).
Previous Studies

A search of archaeological reports filed with the DLNR-SHPD revealed that there have been no previous archaeological studies conducted specifically within Kolekole Gulch Park. However, several previous studies have been conducted in the vicinity of the study area in the neighboring ahupua’ a of Hakalau Nui, Hakalau Iki, Wailea, and Kaiwiki 3. The most relevant of these studies are discussed below and presented in Table 2 and the location of these studies is depicted in Figure 38.

Table 2: Previous studies conducted in the vicinity of the current study area.

<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Type of Study</th>
<th>Ahupua’a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994a</td>
<td>Walker and Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>1994b</td>
<td>Walker and Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>1994</td>
<td>Maly</td>
<td>Historical Documentary Research</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>1998</td>
<td>Hammatt and Colin</td>
<td>Archaeological Assessment</td>
<td>Wailea</td>
</tr>
<tr>
<td>2001</td>
<td>Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>2004</td>
<td>Desilets et. al.</td>
<td>Archaeological Inventory Survey</td>
<td>Wailea</td>
</tr>
<tr>
<td>2009</td>
<td>Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>2011</td>
<td>Escott</td>
<td>Archaeological Assessment</td>
<td>Kaiwiki 3</td>
</tr>
<tr>
<td>2014</td>
<td>ASM Affiliates</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Iki</td>
</tr>
<tr>
<td>2018</td>
<td>Haun and Henry</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>2019</td>
<td>Glennn et al.</td>
<td>Archaeological Inventory Survey</td>
<td>Kuhua</td>
</tr>
</tbody>
</table>

Among the earliest archaeological work to be done in East Hawai’i was that of the early twentieth century heiau researchers Thrum and Stokes (Stokes and Dye 1991; Thrum 1908). No heiau were identified in the current study area or within the larger region spanning between Honomū and Hakalau. During the early 1930s, A.E. Hudson (Hudson 1932), working under the aegis of the Bernice Pauahi Bishop Museum, also conducted archaeological investigations in East Hawai’i. He found little in the region surrounding the current area of study, although he did note the presence of a roughly .25-mile square area of kalo terraces north of the study area in the upper part of Hakalau Gulch (Hudson in Maly 1994).

Walker and Rosendahl (Walker and Rosendahl 1994a, 1994b) conducted an AIS of approximately 595 acres of land within TMKs: (3) 2-9-002 and 004 located north of the current study area within Hakalau Nui Ahupua’a (see Figure 38). The study area was situated between the Hawai’i Belt Road and the 1,500 foot elevation mark on the northern side of Hakalau Gulch. An initial, low-level aerial (helicopter) survey was conducted over some of the uncultivated portions of the study area. Other uncultivated areas were investigated using “variable-coverage (partial to 100%) variable-intensity ground survey” (Walker and Rosendahl 1994b:2). As a result of the survey, it was evident that the study area had been extensively modified during Historic times for commercial sugar cultivation. As a result of this, no archaeological sites were identified.

In 2001, Paul H. Rosendahl, Inc. (PHRI) (Rosendahl 2001) conducted a study of two former Historic cemeteries located within TMKs: (3) 2-9-002:001 (por.) and :083 (por.) (identified as Lots 5 and 10 of the Hakalau Estates Subdivision, respectively), both of which are located to the northwest of the current study area along the coastal bluffs (see Figure 38). With respect to Lot 5, Rosendahl (2001) sought to determine the status of the cemetery and identify potential impacts that would be caused by the sale of the property. As a result of the study, the cemetery was identified as an informal, plantation-era cemetery associated with the Hakalau Jodo Mission (locally referred to as the “Japanese Cemetery”). The cemetery was primarily utilized during the first third of the twentieth century and may have held approximately 200 individuals. All of the graves were disinterred with a backhoe in the early 1970s by Homelani Memorial Park staff and were reinterred in that cemetery. Most of the individual interments consisted of deteriorated wooden coffins and skeletal remains. The grave monuments were generally reburied in the excavated pits after the remains were removed.

The study for Lot 10 was conducted in two stages; preliminary research and subsequent field inspection. The purpose of the study conducted by Rosendahl (2001) was to confirm the boundaries of what is referred to as the “Catholic Cemetery.” The initial research conducted for the study included oral history consultation with local informants familiar with the area. As a result of the study, Rosendahl (2001) concluded that the cemetery was an informal plantation-era cemetery with an overall total area estimated between 1 to 2 acres and held possibly 200 to as much as 250 interments of individuals of several ethnicities (Filipino, Portuguese, Puerto Rican), all of whom were likely mainly plantation employees and/or family members of the Catholic faith. They found that the cemetery was
2. Background

primarily utilized during the first half of the twentieth century, and, while a few of the graves were disinterred in the late 1970s by individual families; most of the graves remain in their original place. Some of the graves within the cemetery probably date to the end of the nineteenth century or early twentieth century.

Rechtman Consulting, LLC (Desilets et al. 2004) conducted an AIS and limited cultural assessment of three land parcels comprising 4.5 acres (TMK: (3) 2-9-003, 013, 029, and 060) to the north of the current study area in Wailea Ahupua‘a (see Figure 38). A systematic survey of the study area (TMKs: (3) 2-9-003:013, 029, 060) produced no evidence of traditional Hawaiian remains or evidence that the area was currently being accessed for the exercise of traditional and/or customary practices. A single Historic era site (Site 24212) with two associated features (Features 1 and 2) were recorded as a result of the study. This site consisted of two features situated in the northwestern portion of the study area that were interpreted as being associated with the Hāmākua Division of Hilo Railroad-Hawaii Consolidated Railway. Feature 1 consisted of a possible 10-15 meter long and 4 meter wide section of the former Hawaii Consolidated Railway railroad grade section of railroad grade. Feature 2 consisted of a railroad trestle abutment that formerly crossed Ka‘ahakini Gulch. Site 24212 was actively utilized by the railroad between 1911 to 1946, and primarily served to facilitate the transport of raw sugar from the many mills along the Hilo and Hāmākua Coasts to the harbor at Hilo Bay. In later years, they also served the secondary function of facilitating tourism.

While no archaeological studies have been undertaken explicitly for Kolekole Gulch Park, an archaeological survey was undertaken in support of an Environmental Assessment (EA) for the seismic retrofitting of Kolekole Bridge by Cultural Surveys Hawai‘i, Inc. (Hammatt and Colin 1998) in 1998 (see Figure 38). The survey area included “the slopes of Kolekole Gulch under and surrounding the Kolekole Bridge and approximately 100.0 feet of the slopes mauka and makai of the bridge” as well as “any access route to the gulch or other areas which would be used during construction of the bridge improvements” (Hammatt and Colin 1998:i and 1). Based upon the area of study encompassed by the scope of work, the investigated area presumably included portions of the current study area, however the park and its facilities were not acknowledged in the study. As a result of the study, square footings from the pre-1946 Kolekole Bridge were noted outside the current study area and a cylindrical cement footing was observed in the middle of Kolekole Stream. No other cultural remains were observed.

In 2009, The Kolekole Stream Bridge (Site 50-10-26-09090), which was originally constructed as part of the Hawaii Consolidated Railway in 1911 and later reconstructed in 1950-1953 as part of the “Seismic Wave Damage Rehabilitation Project”, was nominated and later listed on the State Register of Historic Places (SIHP) as significant under Criteria a, b, and c (Leineweber 2009). The bridge’s nomination form states that the bridge is significant under Criteria a for its association with the Hilo Railroad Company; Criterion b for its association with three founders of the Hilo Railroad Company; and Criterion c is applicable since the bridge is a representative example of early twentieth-century technology. The nomination form goes on to state that some of the bridge parts and materials were salvaged from the Wailuku River Bridge and the Maulua Gulch Bridge, and that its unusual construction type contributes to the historic character and feeling of the bridge. Kolekole Stream Bridge now carries the Hawai‘i Belt Road across Kolekole Gulch, and the bridge’s right-of-way along the gulch floor is adjacent to the northeastern boundary of the current study area.

PHRI (Rosendahl 2009) conducted an AIS and Cultural Impact Assessment (CIA) for an 8.7-acre property in Hakalau (TMKs: (3) 2-9-002:079 and 081) situated along the coastal bluffs to the north of the current study area (see Figure 38). The purpose of the study was to determine the general nature, extent, and potential significance of any archaeological-historical remains present, the historic preservation implications of any such remains for the feasibility of proposed residential development, and the general scope of work and level of effort for any subsequent archaeological-historic preservation work that might be needed. As a result of the fieldwork, two archaeological sites were identified: Site 26591, which consists of two warehouses (Features A and B) and associated foundation remnants (Features C thru I); and Site 26592, the site of the former Japanese/Korean cemetery (previously documented by PHRI (2001) but never assigned an SIHP number). Site 26591 was assessed as significant under Criteria a, c, and d, and Site 26592 was assessed for significance under Criteria d and e. With respect to Site 26591 Features A and B, Rosendahl (2009) recommended preservation with interpretive development and suggested renovation, and data recovery was the recommended treatment for Site 26592.

In 2011, Scientific Consultant Services, Inc. (Escott 2011) conducted an archaeological assessment of a 3.5-acre parcel in the adjacent ahupua‘a of Kaiwiki 3, directly north of the current study area along the northern bank of Kolekole Stream (see Figure 38). No archaeological resources were identified as a result of the study.

In 2014, ASM Affiliates (in prep) conducted an AIS of 31.02 acres of land (TMK: (3) 2-9-002:001) within Hakalau Iki Ahupua‘a, to the northwest of the study area for the proposed development of a single-family dwelling (see Figure 38). As a result of the study, three newly identified archaeological sites were recorded within the study area and assigned temporary site numbers (T-1 through T-3). These sites consisted of a stone and mortar Historic CIA for the County of Hawai‘i's Kolekole Gulch Park Accessibility Improvements Project, Kuhua, South Hilo, Hawai‘i.
2. Background

foundation structure (T-1), the ruins of a Historic wooden structure (T-2), and a project area-wide complex of features pertaining to commercial sugarcane cultivation (T-3). Additionally, an 800-meter long section of the Hawai’i Consolidated Railway Hāmākua Division rail bed (Site 24212) previously identified by Rechtman Consulting, LLC (Desilets et al. 2004) was recorded, along with its associated Historic structural elements including an earthen berm, possible flume remnants, roads, and ditches. A tunnel and culvert for storm water run-off associated with Site 24212 was also recorded. All of the recorded sites were assessed as significant under Criterion d, with Site T-3 being assessed as significant under Criteria a and d. No further work was the recommended treatment for all of the sites. Although fieldwork was completed, a report has not yet been finalized or submitted to DLNR-SHPD as of the current date.

Haun and Henry (2014) conducted an AIS of a 2.332-acre parcel (TMK: (3) 2-9-002:083) within the neighboring ahupua’a of Hakalau Nui situated to the northwest of the current study area (see Figure 38). A portion of this parcel was also investigated by Rosendahl (2001). As a result of the study, Haun and Henry (2014) identified the remnants of a plantation hospital (Site 30085), a concrete culvert that extended over a ditch (Site 30086) and the former location of the Japanese cemetery (Site 30087) previously documented during the Rosendahl (2001) study that existed within their project area prior to reinternment. Preservation was the recommended treatment for the cemetery location (Site 30087) and no further work was recommended for Sites 30085 and 30086.

In December of 2018, ASM Affiliates (in prep.), conducted an archaeological inventory survey for the current study area parcel (TMK: (3) 2-8-015:015) (see Figure 38) in anticipation of the proposed improvements and soil remediation for the removal of lead deposits at Kolekole Gulch Park. Although no archaeological resources were discovered during the course of the survey, five architectural structures and most of the ancillary structures that are determined to be slightly older than 50 years were noted. As a result, an archaeological assessment report (Glennon et al. 2019) was prepared, and no further work was the recommended treatment.

Previous Cultural Impact Assessment Studies

A Historical Documentary Research study was completed by Kepa Maly (1994) as part of an Archeological Inventory Survey of Chin Chuck Road conducted by Walker and Rosendahl (1994b) (see Figure 38). The scope of the study extended beyond the project area and encompassed Hakalau Nui Ahupua’a and the greater Hilo Palikū region. A thorough review of cultural and historical documents provided an extensive summary of legendary accounts within the study area and also included a summary of land use, previous archaeological studies and the results of the consultation efforts. During a field inspection of the study area, consultation was conducted with a former resident of the Hakalau Plantation camp. Several cemeteries associated with the camp communities were identified by the informant who indicated that “most of the burials, particularly the Japanese burials, had been disinterred and relocated by family members” (Maly 1994:18). However, he also stated that there were possible unmarked burials at some of the other nearby camps that were not disinterred and remained in those areas. As a result of the consultation, Maly concluded that “additional documentation will need to be gathered from local informants, and that during ground disturbing activities around the camps, archaeological monitoring should be considered” (Maly 1994:18).

In 2018, the Department of Hawaiian Home Lands requested an Environmental Assessment (EA) for the Honomū Subsistence Agricultural Homestead Community. As part of the preparation of the EA, Cultural Surveys Hawai’i (Bautista et al. 2018) completed a Cultural Impact Assessment study (see Figure 38). The study area is located in the ahupua’a of Honomū and Kuhua. The report included a brief review of cultural and historical accounts, land tenure, previous studies, which was supplemented with three oral history interviews. Their findings were summarized and Bautista et al. concluded “that the Project area is located in an area previously developed for agriculture, therefore, many pre-existing archaeological sites might have been destroyed from sugarcane cultivation and cattle ranching” (Bautista et al. 2018:8). Additionally, the consultation efforts exhibited that subsistence practices within the nearby streams and the disturbance of historical features associated with the sugarcane era would be impacted as a result of the project. As a precautionary measure, Bautista et al. (2018:8) noted that appropriate actions should be “faithfully” considered and implemented to address concerns surrounding burials, cultural and historic preservation, traditional customs and practices, land use and community engagement associated with that study area.
2. Background

Figure 38. Previous archaeological studies conducted in the vicinity of the current study area.
3. Consultation

Gathering input from community members with genealogical ties and long-standing residency or relationships to the study area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs. It is precisely these individuals that ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area. It is the present authors’ further contention that the oral interviews should also be used to augment the process of assessing the significance of any identified traditional cultural properties. Thus, it is the researcher’s responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary.

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current subject property, a public notice was submitted to the Office of Hawaiian Affairs (OHA) for publication in their newspaper, *Ka Wai Ola*. The notice was submitted via email on February 5, 2019, and published on February 27, 2019, in the March 2019 issue (Appendix B). As of the date of the current report, no responses have been received from this public notice.

Although no responses were received as a result of the *Ka Wai Ola* public notice, a concerted effort was made to contact and consult with community members of Kuhua and Honomū, and any individuals who might have knowledge of, or concerns about traditional cultural practices associated with the project area. This effort was made through email, phone, and mailed letters. In all the initial correspondences to the potential interviewees, ASM staff described the nature of the proposed project, its location, and the nature of the study. ASM staff, then followed up with each of the interviewees and conducted an informal interview. The location and the preferred method of communication (in-person or phone) was determined by the interviewee. As part of the interview process and only with the consent of the interviewees, the in-person interviews were audio recorded for note-taking purposes only (audio files are not available). Upon completion of the interview, an interview summary was prepared by ASM staff and emailed to the interviewees for review. All request for edits were completed and approved by the interviewees and the finalized version of the summaries are presented below.

ASM staff received two referrals identified as individuals possessing knowledge related to either the study area vicinity or areas within close proximity. The two individuals were, Kehaulani Lum and Larry Kimura, both of which were contacted via email on January 7th, 2019. To date no response has been received from Kehaulani Lum, however, on January 15th, 2019, Larry Kimura responded by email that he had no knowledge of the area. An additional referral was provided for a Honomū resident, Yoriko Ishii, who was contacted by phone on January 16th, 2018 but responded that she had no knowledge of the area other than her late husband frequented the area for recreational fishing. On January 17th, 2018, ASM staff contacted the Hawaii Plantation Museum in Pāpa‘ikou via phone in which a gentleman by the name of Karl Eschbach, a Honomū resident and volunteer of the museum, spoke with us and expressed interest in participating. ASM completed an interview with Mr. Eschbach and the findings from which has been summarized below. Mr. Eschbach referred ASM staff to Springer Kaye, also a resident of Honomū and manager of the Big Island Invasive Species Committee (BIISC). An initial contact email was sent to Mrs. Kaye on January 17th, 2019. However, to date, no response has been received. On February 7th, 2019, Derek Kurisu, a former resident of Wailea Ahupua’a, was contacted via phone and expressed interest in participating. ASM staff interviewed Mr. Kurisu on February 8th, 2019, and the findings from this interview is summarized below. Rodney Cambra, originally from Pepe‘ekeo and the current Recreation Director for the Honomū gym, spoke with ASM staff on February 13th, 2019. The findings from this interview is included below. On February 13th, 2019, ASM staff contacted Albert Nakaji via letter, however, Mr. Nakaji declined the invitation to participate in the current study. On September 20th, 2019, ASM staff contact Mr. Emil John Yadao via phone and left a message. To date, no response has been received by Mr. Yadao. Additionally, a summary of findings from a previous Cultural Impact Assessment for the lands of Kuhua and Honomū, completed by Cultural Surveys Hawai‘i between June 2017 and June 2018 are also included below.

**KARL ESCHBACH**

On January 17th, 2019 a phone interview was conducted by Aoloa Santos with Karl Eschbach, a Honomū resident and volunteer at the Hawai‘i Plantation Museum. Mr. Eschbach recently moved to Honomū to help care for his mother who was a Honomū resident for 40 years. Prior to moving to Hawai‘i, he received degrees in sociology and demography and was a professor at the University of Texas. His academic background along with a specific interest in understanding ethnic disparities in health while focusing on migration patterns helped spark his interest in the
demography and census of the Honomū area. Through his research, Mr. Eschbach shared that between 1900 and 1940
the departure of many Hawaiian families may have resulted from the introduction of the sugar plantations, which
drastically effected the Hawaiian population within this region. Mr. Eschbach was unaware of any traditional cultural
practices associated with the Kolekole Gulch Park area.

DEREK KURISU

Mr. Derek Kurisu, was born in 1951 and raised in the plantation town of Wailea. When asked about Kolekole Gulch
Park, Mr. Kurisu referred to Kolekole as “our stomping grounds” and “second home,” and recalling having gone there
on weekends and after school with his friends and family. Mr. Kurisu attended Hakalau Elementary School, then
Kalanianaʻole Elementary and Intermediate School, and later graduated from Hilo High School. While attending Hilo
High School, he found work as a bag boy at the renowned Hawaiʻi Island establishment, KTA (shortened for K.
Taniguchi). Mr. Kurisu shared that, growing up in a sugar plantation community helped influence his decision to
pursue a degree in Agriculture after high school. While attending the University of Hawaiʻi at Hilo, Mr. Kurisu
continued to work at KTA until he transferred to the University of Hawaii at Mānoa (UH Mānoa). There he worked
at Times Supermarket for two years and graduated with a degree in agriculture from UH Mānoa’s College of Tropical
Agriculture and Human Resources. Upon receiving his degree, Mr. Kurisu moved back to Hilo and returned to KTA,
where he has since been employed for over 40 years and now serves as the Executive Vice President of KTA Super
Stores. On February 8, 2019, Lokelani Brandt and Aoloa Santos interviewed Mr. Kurisu at the KTA establishment
located in Puʻainakō.

When asked about his time spent at Kolekole Gulch Park, Mr. Kurisu shared sentiments of how the area “brings
back so many good childhood memories.” With respect to Kolekole stream, he recalled, playing in the stream with
his friends and where they often went to gather their favorite ‘o‘opu, the Hawaiian freshwater goby. Mr. Kurisu also
recalled catching other species of fish and shrimp including, shrimp, river wī (river snail), moi (threadfish), āholehole
(Hawaiian flagtail) and mullet, which he remembered seeing further upstream where they gathered to spawn. He also
described Kolekole stream as a popular swimming area and noted that the stream was a place where children were
taught to swim. He specified that the areas near the stream bank were used by small children and beginner swimmers
and as one’s skills improved, they would swim in the middle of the river where the current was stronger and to “Aikini”
(Kaʻahakini) falls, a favorite leaping spot. With respect to Kaʻahakini falls, Mr. Kurisu remembered diving under the
water at the base of the falls where he used to gather a red clay, which he and the other children would playfully rub
all over their bodies. In describing his time leaping from the falls, Mr. Kurisu playfully spoke about gathering guava
leaves, which they placed in their mouths before diving into the water. He explained that when they jumped into the
water, the guava leaf flipped up and covered their nose, thus preventing water from rushing up their nostrils. Mr.
Kurisu spoke about his time surfing at Kolekole and explained that the mouth of the river where the surf pounds
against the coast was only for advanced swimmers and surfers. He commented that progressing to the various parts of
the river symbolically marked one’s strength, skill, and maturation. Referred to as their “form of entertainment,”
Kolekole stream had so many areas for Mr. Kurisu and his friends to explore. He remembered hiking to an area at the
top of Kolekole stream, called “Seven Falls,” and noted that this was an expedition he experienced only twice in his
lifetime.

Mr. Kurisu’s memories of Kolekole was strongly connected to the people from the plantation camps who greatly
influenced his childhood and life. The plantation lifestyle and his time at Kolekole taught him the importance of
community and family. He referred to the plantation community as a “family of families,” and that Kolekole was “the
gathering place for community.” Kolekole park was a popular recreation area frequently visited by his family, friends
as well as the extended families from the nearby plantation camps. He remembered attending many family and
community functions at Kolekole. He recalled playing baseball on the field, which he identified as the open area near
the red-roofed pavilion (Figure 39). Camping at Kolekole was also a favorite pastime, which he often did with his
family and friends. He also remembered camping there with the Boy Scouts, as he considered the landscape there a
perfect place where the scouts could complete certain tasks to earn their badges. He recollected that Kolekole also
taught him about respect for others in the community and for the place. Growing up in an area filled with gulches and
streams, he was taught the importance of being aware of his surroundings and environment, sharing that if the
mountains were dark, they would not go near the streams or visit the park.

In describing some of the cultural activities that took place at the park, Mr. Kurisu pointed out the location of a
“kalua pit” (imu), a traditional Hawaiian underground oven. Although Mr. Kurisu could not recall when and who
constructed the imu, he did explain that it was a communal imu used to prepare food (see Figure 39). He explained
that the dense, round river stones found at Kolekole are the preferred type of stones used to make a traditional imu.
He recalled people from the community gathering stones from the river for imu. Additionally, Mr. Kurisu described a
When asked what kind of vegetation he remembers of the Kolekole area, Mr. Kurisu reminisces, picking ginger leaves to make whistles, picking guavas for snacks, and using the guava leaves to cover their noses when leaping from “Aikini” falls. Additionally, he recollected picking “watagi,” or *hau*, to make canoes and belly boards to swim with and little floaters for fishing. Lightheartedly, he recalled how, he and his friends, picked the “flat round nut that you rub to make hot,” which he referred to as “hot nut,” (*Dioclea reflexa*) and how they playfully tried to burn each other with it.

When asked if he remembered how he accessed Kolekole, he described the old Māmalahoa road being the main access route, but as children, they often used previously cut trails. He remembered two main trails. The first trail he described extended from the old Māmalahoa road down along the southeast slope of the gulch and led directly into the park (see Figure 39). The other trail extended from the main highway down along the northeast side of the gulch slope towards the river (see Figure 39). Mr. Kurisu referred to these quick access trails to the park as “cut shorts” as it allowed them to avoid hiking on the long winding Māmalahoa road that leads from the highway to the park.

When asked if he remembered any of the old park structures, Mr. Kurisu recalled that not much had changed and noted seeing the existing park structures and facilities when he was a child. When asked if any of the structures were important to him, he explained that Kolekole Gulch Park is special not because of the structures, rather its uniqueness comes from the land, the river, and the environment in which it is situated.

Mr. Kurisu spoke about the changing communities of the region, after the closing of the plantation, which he described as changing the feeling of the park. As a child, he remembered always feeling safe at Kolekole, never being harmed or bothered by other park users. Mr. Kurisu has not visited the area recently since the park’s closing but shared that the last time he visited the area with his children, the feeling he had as a kid while growing up there, “is different.” When asked if he had any additional thoughts on the proposed project, he was happy to see the County making efforts to gather community input and hopes the County will reopen the park so that the families from the area can continue to enjoy Kolekole.

![Figure 39. Sites and vegetation remembered by Derek Kurisu.](image-url)

**RODNEY CAMBRA**

Born in Hilo and raised in the community of Pepe’ekeo, Mr. Cambra currently works for the County of Hawai‘i, Department of Parks and Recreation as the Recreation Director for the Honomū Gym located in the old plantation town of Honomū. During the interview conducted by Lokelani Brandt on February 13, 2019, Mr. Cambra spoke candidly about his experiences at Kolekole and his frustration following the park’s abrupt closure. In reflecting on his
time there, Mr. Cambra stated that he “grew up there” and described many childhood experiences at Kolekole. He noted that Kolekole stream was where he and his brother were taught to swim by their father, where they fished. He also described playing under the Kolekole bridge. Mr. Cambra also spoke of his adventures into the interior parts of the valley, leaping stone-to-stone up the river where they gathered wild guava. He also recalled observing many other folks fishing, picnicking, and swimming at Kolekole.

Growing up during the plantation era, Mr. Cambra explained that Kolekole was an integral part of the plantation community and was used extensively for various community gatherings and parties. He described the annual kumiai picnics, where hundreds of people from the nearby plantation communities would gather to socialize, eat, and play. He also described softball games taking place at the park during this annual event. He commented that the park’s unexpected closure has created discontent amongst members of the community, which has been further compounded by the closure of the park at Hakalau. He described that the closure of these two parks has adversely impacted the people of this community as there no place for the community to gather. Mr. Cambra was aware of the lead contamination at Kolekole but opined that many people who grew up during the plantation era, do not share the same sentiment or fear about lead contamination. Mr. Cambra hopes that the park can be reopened so that the communities from this area can continue to enjoy Kolekole Gulch Park.

SUMMARY OF PRIOR RELEVANT INTERVIEWS

In September 2018, at the request of Department of Hawaiian Home Lands, Cultural Surveys Hawai‘i (CSH) completed a Cultural Impact Assessment, as parts of the preparation of the EA for the Honomū Subsistence Agricultural Homestead Community (Bautista et al. 2018). Between June 2017 to June 2018, CSH staff met with four individuals who participated in a talk-story interview. Unfortunately, one informant had passed during the process and that interview was not included in the assessment. As a result of these consultations, specific cultural practices associated with the subsistence collection of freshwater species from the area’s rives were noted. Such species included the gathering of ōpae (shrimp), hīhīwai (an endemic freshwater snail), and ‘o‘o‘opu (general name for fishes of the families, Eleotridae, Gobiidae, and Blennidae). However, it was noted that traditional subsistence gathering practices have been severely impacted since the sugar plantation era, which limited access to the streams and with the introduction of invasive species, has affected the native fauna populations.

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are natural features of the landscape and historic sites, including traditional cultural properties. In the Hawai‘i Revised Statutes–Chapter 6E a definition of traditional cultural property is provided.

“Traditional cultural property” means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community’s history and contribute to maintaining the ethnic community’s cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. “Traditional” as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. “Cultural” refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term “Property” defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of “Property” wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first
place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties. As the OEQC guidelines do not contain criteria for assessing the significance for traditional cultural properties, this study will adopt the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a. Be associated with events that have made an important contribution to the broad patterns of our history;

b. Be associated with the lives of persons important in our past;

c. Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d. Have yielded, or is likely to yield, information important for research on prehistory or history;

e. Have an important value to the native Hawaiian people or to another ethnic group of the 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.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa’akai O Ka ‘Āina vs Land Use Commission* court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

### SUMMARY OF CULTURE-HISTORICAL BACKGROUND FOR KUHUA

A review of the culture-historical background material reveals, at a minimum, the history of Kuhua Ahupua‘a with its association with the greater *Hilo Palikū* region, is commemorated in several traditional *mo‘olelo* and historical accounts. The illustrious landscapes of this region, characterized by its upright cliffs and *kula* regions served as an ideal landscape for habitation and cultivation, which has been historically documented. Many of these historical accounts described the intimidating rugged coastline and deep gulches but noted that these lands were heavily inhabited. It was also considered an idyllic environment to cultivate traditional crops such as *kalo* (taro), *‘uala* (sweet potato), *ma‘i* (banana) and *kō* (sugarcane) coupled with an abundance of marine and freshwater resources that were easily accessible from the sheltered bays and streams. Additionally, a trademark of the region was the abundance of water resources from the rain to its infamous streams and waterfalls, which includes Kolekole stream and ‘Akaka falls. So much, that these waterways have been honored and described in many *mo‘olelo, mele, oli* and *‘ōlelo no‘eau.*

Following the *Māhele ‘Āina* of 1848, the *ahupua‘a* of Kuhua was relinquished by Victoria Kamāmalu to the Hawaiian Kingdom Government where it was retained as Government land. The privatization of land and the subsequent the Treaty of Reciprocity passed in 1875, were two significant events that were necessary for businessmen to stake their claim on a rapidly growing sugar industry. Development of the lands in and around the study area began in 1880 and was rapidly accelerated during the Historic Period for agricultural and transportation purposes as the commercial sugar industry infiltrated the district. As a result, the region underwent a series of unprecedented changes such as land clearing, the establishment of roadways and railroads to transport cane from the fields to coastal mills, and the construction of flumes to transport water to irrigate the cane fields. Honomū Sugar Company, established in 1880, relied heavily on the railroad to transport their sugar cane and with the expansion of the trunk line from Kohala to Hilo, the railroad extension included the construction of the Kolekole Stream Bridge. Although the decline of the sugar plantations in the area began during World War II, the plantation experienced a significant setback on April 1, 1946 when a massive tsunami hit Hawai‘i Island resulting in the destruction of the Kolekole Bridge. The bridge was eventually reconstructed as part of the rerouting of the Hawaii Belt Road project in the 1950s. A land survey conducted within the current study area was completed in 1938 by the Territory of Hawai‘i to acquire land from Honomū Sugar

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CIA for the County of Hawai‘i's Kolekole Gulch Park Accessibility Improvements Project, Kuhua, South Hilo, Hawai‘i
4. Identification and Mitigation of Potential Cultural Impacts

Company in order to establish the Kolekole Gulch Park. The deed was transferred via Executive Order (No. 938) signed in 1941 and in 1948 the County of Hawai‘i constructed the first park facilities.

Only one archaeological study was conducted within the current study area parcel, in which no archaeological resources were identified (Glennon et al. 2019). An archeological survey conducted by Hammatt and Colin (1998) as part of an environmental assessment for seismic retrofitting of Kolekole Bridge, identified cement footings within the stream but no other cultural remains were observed. However, several studies were completed for lands in the vicinity near the project area, which includes the ʻahupuaʻa of Hakalau and Wailea. The Kolekole Stream Bridge SIHP Site 50-10-26-09090, located outside of the current study area parcel was nominated for inclusion on the State Register of Historic Places under Criterion a, b, and c.

IDENTIFIED CULTURAL IMPACTS AND PROPOSED MITIGATIVE MEASURES

From the information presented in this study it is evident that Kolekole Gulch Park has its roots in Hawai‘i’s sugar plantation history. From the knowledge collected through the consultation efforts, it is evident that this park was one of very few places found along this section of South Hilo where individuals, families, and groups came to practice subsistence fishing, to camp, to conduct religious ceremonies, to celebrate important life events, and to simply recreate. Kolekole Gulch Park is a treasured resource for the South Hilo communities, as it provided a safe space where they could reconnect to the area’s unique geographical landscape and engage in long-standing cultural traditions. Recreating, and engaging in such practices and traditions aid in nurturing healthy individuals and fortifies familial and communal bonds. The lasting-impacts of the identified cultural traditions and practices remain vibrant in the minds and spirits of the interviewees. It is the author’s contention that the closure of Kolekole Gulch Park to the public, has effectively eliminated the space in which such activities and traditions have been practice, thereby, resulting in an adverse impact to the identified cultural traditions and practices. Making the appropriate repairs and improvements (as described in the scope of the proposed project) that will facilitate reopening public access to Kolekole Gulch Park, is the first step towards mitigating future impacts of the identified practices and traditions.

More recently, efforts to preserve this region’s Precontact and Historic era histories through education has led to the creation of local museums and grassroots organizations that are working to educate locals and visitors alike on the history in South Hilo. To keep in alignment with these efforts, we recommend the County develop interpretative signage within the park, which could include, but not be limited to: narratives featuring traditional moʻolelo and traditional place names associated with Kolekole; descriptions of some of the identified cultural practices including the subsistence collection of freshwater species from the stream; a description of the sugar plantation era use of the park; an overview on the history of Kolekole stream bridge; and Kolekole stream’s association to ‘Akaka Falls. It is our recommendation that the County of Hawai‘i utilize this opportunity to recognize Kolekole Gulch Park’s role in Hawai‘i Island’s Precontact and Historic era history through the creation of interpretive signage.

In further review of the assessment and consultation process, we conclude that the proposed improvements to the County of Hawai‘i’s Kolekole Gulch Park on TMK (3) 2-8-015:015 will not result in any direct adverse impacts to any traditionally valued cultural or historical resources nor will it impact any traditional cultural practices or beliefs. In contrary, if the proposed improvements do incorporate the above described recommendations, these considerations may help to initiate a process that will have positive, long-term impacts that will allow for the restoration of the identified traditional cultural practices and traditions, in addition to raising awareness about the area’s Precontact and Historic era history.
REFERENCES CITED

Akana, C. L., and K. Gonzalez

Alexander, A. C.

Bains, J.
1913 *Around About Hilo.* The Mid-Pacific Magazine.

Barrera, W., Jr

Bautista, O., M. Wildey, S. Wilkinson, and H. Hammatt

Beamer, K.

Best, G.

Bird, I.


Buke Mahele
1848 *Buke Kakau Paa no ka mahele aina i Hooholoia iwaena o Kamehameha III a me Na Lii a me Na Konohiki ana.* Hale Alii Honolulu.

Center for Oral History, University of Hawai‘i
2000 Tsunamis Remembered: Oral Histories of Survivors and Observers in Hawai‘i Volume I.

Chinen, J. J.

1961 *Original Land Titles in Hawaii.* Privately published.

Clark, J. R. K.
1985 *Beaches of the Big Island.* University of Hawaii Press, Honolulu.
References Cited

Coan, T.  
1882  

Cordy, R.  
1994  
*A Regional Synthesis of Hamakua District, Hawai‘i Island.* Historic Preservation Division, DLNR, State of Hawai‘i, Honolulu.

2000  
*Exalted Sits the Chief, The Ancient History of Hawai‘i Island.* Mutual Publishing, Honolulu, Hawai‘i.

County of Hawaii  
1944–1986  

Desha, S.  
2000  

Desilets, M., A. Kasberg, and R. Rechtman  
2004  

Desilets, M., and R. B. Rechtman  
2004  

Dorrance, W., and F. Morgan  
2000  
*Sugar Islands: The 165-Year Story of Sugar in Hawaii.* Mutual Publishing, Honolulu, Hawai‘i.

Edith Kanaka‘ole Foundation  
2012  

Ellis, W.  
1825  
*Journal of William Ellis, Narrative of a Tour of Hawaii, or Owhyee; with remarks on the History, Traditions, Manners, Customs and Language of the Inhabitants of the Sandwich Islands.* Cocker and Brewster, Boston.

Engledow, E.  
1960  

Escott, G.  
2011  
An Archaeological Assessment of 3.5 Acres Along the Kolekole Stream in Kaiwiki 3 Ahupua‘a, South Hilo District, Hawai‘i [TMK: (3) 2-9-03:003]. Scientific Consultant Services INC, Prepared for Douglas B. Goehring & Dawn Goehring.

Evening Bulletin Industrial Edition  
1909  

Fornander, A.  
1880  
<table>
<thead>
<tr>
<th>Year</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>Garavoy, J.</td>
</tr>
<tr>
<td>2019</td>
<td>Glennon, G., L. M. U. K. Tam Sing, and M. R. Clark</td>
</tr>
<tr>
<td></td>
<td>An Archaeological Assessment of the County of Hawai‘i’s Kolekole Beach Park. ASM Affiliates Report 31480. Prepared for Ron Terry, Geometrician Associates, LLC, Hilo, HI.</td>
</tr>
<tr>
<td>1993</td>
<td>Greene, L.</td>
</tr>
<tr>
<td></td>
<td>A Cultural History of Three Traditional Hawaiian Sites on the West Coast of Hawai‘i Island. United States Department of the Interior, National Park Service, Denver Service Center.</td>
</tr>
<tr>
<td>1998</td>
<td>Hammatt, H., and B. Colin</td>
</tr>
<tr>
<td></td>
<td>Archaeological Assessment for Seismic Retrofitting for the Kolekole Stream Bridge Wailea, South Hilo District, Hawaii Island. Cultural Surveys Hawaii Prepared For Engineering Concepts, INC.</td>
</tr>
<tr>
<td>1972</td>
<td>Handy, E. S. C., and E. G. Handy</td>
</tr>
<tr>
<td>2014</td>
<td>Haun, A., and D. Henry</td>
</tr>
<tr>
<td></td>
<td>Archaeological Inventory Survey TMK: (3) 2-9-02:083 Hakalau Nui Ahupuaa, South Hilo District, Island of Hawaii. Haun &amp; Associates Report 1035-041514. Prepared for Chad and Jennifer Walker, Pearl City, HI.</td>
</tr>
<tr>
<td>1972</td>
<td>Hawaii Tribune-Herald</td>
</tr>
<tr>
<td>1992</td>
<td>Hitch, T.</td>
</tr>
<tr>
<td>1976</td>
<td>Hommon, R.</td>
</tr>
<tr>
<td></td>
<td>The Formation of Primitive States in Pre-Contact Hawaii. Ph.D. Dissertation, Department of Anthropology, University of Arizona, Tucson.</td>
</tr>
<tr>
<td>1941</td>
<td>Honolulu Star-Bulletin</td>
</tr>
<tr>
<td>Year</td>
<td>Reference</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>1847</td>
<td>Jarves, J. <em>History of the Hawaiian Islands: embracing their antiquities, mythology, legends, discovery by Europeans in the sixteenth century, re-discovery by Cook, with their civil, religious and political history, from the earliest traditionary period to the present time</em>. C. E. Hitchcock, Honolulu.</td>
</tr>
<tr>
<td>2016</td>
<td>Kline, M. Modeling Potential Impacts of Tsunamis on Hilo, Hawaii Comparison of the Joint Research Centre’s Schema and FEMA’s Hazus Inundation Scenarios. University of Southern California.</td>
</tr>
</tbody>
</table>
References Cited

Kuykendall, R., and A. G. Day

Leineweber, S.
2009  National Register of Historic Placed Registration Form Kolekole Stream Bridge. Heritage Center, University of Hawai‘i at Manoa, Honolulu.

Lydgate, J. M.
1919  Notes From Hawaii. The Garden Island, August 12, p. 3.

Lyman, C.
1925  Around the Horn to the Sandwich Islands and California, 1845-1850. Yale University Press, New Haven.

Maly, K.

Maly, K.

Maly, K.
2002  The Māhele ‘Āina (The Land Division) an Overview of Documentation Found in the Claims and Awards of the Māhele. Kumu Pono Associates, LLC.

Maly, K., and O. Maly
2002  He Wahi Mo’olelo No Ka ‘Āina A Me Nā ‘Ohana O Waikī’i Ma Waikōloa (Kalana O Waimea, Kohala), A Me Ka ‘Āina Mauna: A Collection of Traditions and Historical Accounts of the Lands and Families of Waikī’i at Waikōloa (Waimea Region, South Kohala), and the Mountain Lands, Island of Hawai‘i (TMK Overview Sheet 6-7-01). Kumu Pono Associates Report HiWaikii61-111202. Prepared for Waiki‘i Ranch Homeowner’s Association, Kamuela, Hawai‘i.


MKE Associates LLC, and Fung Associates, Inc.
2013  Hawaii State Historic Bridge Inventory And Evaluation. Prepared for State of Hawai‘i, Department of Transportation, Highway Division, Honolulu.

Oliver, D.

Parker, H.
<table>
<thead>
<tr>
<th>Year</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>Aboriginal Agriculture and Domestic Residence Patterns in Upland Lapakahi, Island of Hawaii. Ph.D. Dissertation, Department of Anthropology, University of Hawaii at Manoa, Honolulu.</td>
</tr>
</tbody>
</table>
Soil Survey Staff

Stokes, J., and T. Dye

Tatar, E.

The Honolulu Advertiser
1916 The Honolulu Advertiser, August 26, p. 6.
1937 Kolekole Stream To Be Improved. The Honolulu Advertiser, April 29, p. 11.
1938 Parks Win Grants. The Honolulu Advertiser, January 1, p. 5.
1946 $128,750 Set For Repairing Wave Damages. The Honolulu Advertiser, December 14, p. 2.
1949 Senate Calendar. The Honolulu Advertiser, April 17, p. 2.
1954 Storm Rips Gap in Breakwater at Hilo. The Honolulu Advertiser, March 9, p. 3.
1960 Lions Install Park Walkway. The Honolulu Advertiser, November 1, p. 8.
1962 The Honolulu Advertiser, April 15, p. 9.

Thrum, T.

Thrum, Thos. G.
1925 The Hawaiian Annual for 1926. Thos. G. Thrum, Honolulu.

Thurston, L.

Walker, A., and P. H. Rosendahl

Wilkes, C.

Wise, J., and J. W. H. I. Kihe
<table>
<thead>
<tr>
<th>Year</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>1916b</td>
<td>Ka Huakai No Hilo Hanakahi. <em>Ka Puuhonua</em> (Honolulu), September 8, vol. VIII, no. 34, p. 6.</td>
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APPENDIX A.

PROPOSED SITE PLAN FOR KOLEKOLE GULCH PARK
APPENDIX B.

KA WAI OLA, PUBLIC NOTICE
PUBLIC NOTICE

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) in advance of the Proposed Kolekole Gulch Park Lead-Impacted Soil Response Action, State of Hawai‘i Department of Health, Island of Hawai‘i. The current Kolekole Gulch Park is located on TMK (2) 2-8-015-015 in Honomū, Kūhualahaina, Island of Hawai‘i.

We are seeking consultation with any community members that might have knowledge of traditional cultural uses of the proposed project area; or who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject properties, which may be impacted by the proposed project. If you have and can share any such information please contact Bob Rechtman brechtman@asmaffiliates.com, or Aoloa Santos asantos@asmaffiliates.com, phone (808) 969-6066, mailing address ASM Affiliates 507A E. Lanikaula Street, Hilo, HI 96720.

Ka Wai Ola, Malaki (March) 2019, Vol. 36, No. 3.
Kolekole Gulch Park Accessibility Improvements

Environmental Assessment

APPENDIX 3
Archaeological Report
An Archaeological Assessment for the County of Hawai‘i's Kolekole Gulch Park Accessibility Improvements Project

TMK: (3) 2-8-015:015

Kuhua Ahupua‘a
South Hilo District
Island of Hawai‘i

Prepared By:
Genevieve Glennon, B.A.,
Lauren M. U. Kepa’a,
and
Matthew R. Clark, M.A.

Prepared For:
Ron Terry
Geometrician Associates, LLC
P.O Box 369
Hilo HI 96721

August 2019
(Revised January 2020)
An Archaeological Assessment of the County of Hawaiʻi's Kolekole Gulch Park

TMK: (3) 2-8-015:015

Kuhua Ahupuaʻa
South Hilo District
Island of Hawaiʻi
EXECUTIVE SUMMARY

At the request of Ron Terry of Geometrician Associates, LLC, on behalf of the County of Hawai‘i, ASM Affiliates completed an archaeological assessment of a 5.497-acre parcel (TMK: (3) 2-8-015:015) in anticipation of proposed improvements to the County of Hawai‘i’s Kolekole Gulch Park in Kuhua Ahupua‘a, South Hilo District, Island of Hawai‘i. The County of Hawai‘i intends to improve the existing park facilities by converting the existing men’s and women’s restrooms into single-occupant accessible restrooms; providing a new accessible comfort station; repairing and making general safety improvements to existing pavilions; providing a single new pavilion; providing drainage sump improvements for existing shower area to prevent runoff from eroding the riverbank and entering the river or shoreline area; replacing the existing shower with an accessible unit; addressing drainage problems near pavilions; removing nuisance non-native trees that may pose a risk to park facilities or users throughout the park site; repaving the existing parking lot; and improving the stability and integrity of the driveway. No previous archaeological surveys of Kolekole Gulch Park are known to have been conducted. The current study was undertaken in accordance with Hawai‘i Administrative Rules 13§13–275 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in Hawai‘i Administrative Rules 13§13–276.

The archaeological survey of the park was conducted on December 4, 2018, by Matthew Clark, M.A., Genevieve Glennon, B.A., Joshua Gastilo, M.A., and Lauren M. U. Kepa‘a, but no archaeological sites were identified. According to 13§13-275-5(b)(5)(A), when no archaeological resources are discovered during an Archaeological Inventory Survey the production of an Archaeological Assessment report is appropriate. With respect to the historic preservation review process of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawai‘i Planning Department, it is our conclusion that the proposed improvements to the County of Hawai‘i’s Kolekole Gulch Park will not affect any historic properties, therefore the effect determination for this project is “no historic properties affected,” and no further work needs to be conducted prior to, or during, project implementation. In the unlikely event that unanticipated archaeological resources are discovered during the proposed development activities, work should cease in the area of the discovery and DLNR-SHPD should be contacted, pursuant to HAR 13§13-280.
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1. INTRODUCTION

At the request of Ron Terry of Geometrician Associates, LLC, on behalf of the County of Hawai‘i, ASM Affiliates conducted an Archaeological Inventory Survey of a 5.497-acre parcel (Tax Map Key [TMK]: (3) 2-8-015:015) in anticipation of proposed improvements to the County of Hawai‘i’s Kolekole Gulch Park in Kuhua Ahupua‘a, South Hilo District, Island of Hawai‘i (Figures 1, 2, and 3). The County of Hawai‘i intends to improve the existing park facilities by converting the existing men’s and women’s restrooms into single-occupant accessible restrooms; providing a new accessible comfort station; repairing and making general safety improvements to existing pavilions; providing a single new pavilion; providing drainage sump improvements for existing shower area to prevent runoff from eroding the riverbank and entering the river or shoreline area; replacing the existing shower with an accessible unit; addressing drainage problems near pavilions; removing nuisance non-native trees that may pose a risk to park facilities or users throughout the park site; repaving the existing parking lot; and improving the stability and integrity of the driveway (Figures 4 and 5). Kolekole Gulch Park suffered extensive flood damage in late August of 2018 as a result of Tropical Storm Lane, when storm sediments filled the largest pavilion and covered a portion of the parking lot. The proposed County of Hawai‘i improvements to the park facilities will address the existing damage and help prevent future flood damage. Kolekole Park has been closed to the public since June of 2017, when testing conducted by the State of Hawai‘i Department of Transportation (HDOT) determined that lead is present in various locations within the park at levels greater than the Hawai‘i State Department of Health’s (DOH) Environmental Action Level, indicating a potential risk to public health. Plans by HDOT, independent of the County of Hawai‘i’s proposed park improvements, are currently underway to remediate and/or encapsulate the contaminated soil to allow for safe public use of the park so that it can be reopened.

The current study was undertaken in accordance with Hawai‘i Administrative Rules 13§13–275 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in Hawai‘i Administrative Rules 13§13–276. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawai‘i Planning Department. According to 13§13-275-5(b)(5)(A), when no archaeological resources are discovered during an Archaeological Inventory Survey the production of an Archaeological Assessment report is appropriate. This report contains background information outlining the project area’s physical and cultural contexts, a presentation of previous archaeological work in the vicinity of the project area, and current survey expectations based on that previous work. Also presented are an explanation of the project’s methods and a description of the findings.
1. Introduction

Figure 1. Study area location.

An archeological assessment of the County of Hawai‘i’s Kolekole Gulch Park, Kuhua, South Hilo, Hawai‘i
1. Introduction

An archeological assessment of the County of Hawai‘i’s Kolekole Gulch Park, Kuhua, South Hilo, Hawaiʻi

Figure 2. Tax Map Key (3) 2-8-015 showing location of study area.
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Figure 4. Proposed site plan for Kolekole Park (makai portion).

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Figure 5. Proposed site plan for Kolekole Park (mauka portion).
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STUDY AREA DESCRIPTION

The current study area consists of the existing County of Hawai‘i Kolekole Gulch Park facility situated at elevations ranging from 3 to 66 feet (roughly 1 to 20 meters) above sea level within Kuhua Ahupua‘a, South Hilo District, Island of Hawai‘i (see Figure 1). The study area comprises the makai bottomlands of Kolekole Gulch, which is one of several large, steep-sided gulches that outlet along the South Hilo coastline. Kolekole Stream flows through the gulch and empties into the Pacific Ocean, and Ka‘ahakini Stream ascends directly into Kolekole Stream from a small cliff on the western slope of the gulch, forming a small estuary at the mouth of the stream. Kolekole Gulch Park is bounded to the west by Kolekole Stream, to the east and south by the Old Māmalahoa Highway, and to the north by the Hawai‘i Belt Road Right-of-Way (ROW) and Kolekole Stream Bridge (see Figure 3).

Soils within the study area (Figure 6) are classified as belonging to the Hilo-Rock outcrop complex on 35 to 100 percent slopes (Soil Survey Staff 2017). These soils are gently to steep sloping and are found within steep sided gulches at elevations ranging from sea level to 800 feet. They consist of well drained, silty clay loams formed in a series of volcanic ash layers overlying basalt that originated from Mauna Kea Volcano 64,000 to 300,000 years ago (Figure 7) (Sherrod et al. 2007). The study area receives a mean annual rainfall of approximately 3,500 millimeters, with the majority of the rain occurring during the spring months, with the most typically occurring in March, and the least occurring in June (Giambelluca et al. 2013). The climate is generally cool, with a mean annual temperature ranging from 72 to 77 degrees Fahrenheit throughout the year.

Kolekole Gulch Park is accessed by the Old Māmalahoa Highway, which extends southwest from Highway 19 (Hawai‘i Belt Road) to a gated, single-lane paved driveway (located to the east of Kolekole Stream) that accesses the paved parking lot for the park (Figures 8 and 9). A picnic area consisting of a large, grass lawn comprises the northeastern portion of Kolekole Gulch Park (Figure 10). The lawn extends beneath the Kolekole Stream Bridge (on to the adjacent road parcel) nearly to the rocky coastline, but the park parcel does not include the bridge, the road parcel it is situated within, or the coastal area seaward of it; and there are no physical barriers to restrict the movement of park visitors from accessing the shoreline. At the time of the current fieldwork, the parking lot was still covered with flood sediments left by Tropical Storm Lane; the lawn area had been recently mowed for the first time since the tropical storm, but the damage from the flooding is still evident.

The built environment of the study area consists of recreation facilities and associated infrastructure including five covered pavilions, all of which were constructed after 1962, that abut the eastern slope of Kolekole Gulch (below the Old Māmalahoa Highway) and face the large grassy lawn area (Figure 11). The largest pavilion is named after Elias “Epy” Yadao, a former County supervisor who obtained funding for the pavilion’s construction (Figure 12), and was named in his honor in 1972 (Clark 1985). Four wooden picnic tables are situated within the interior of the pavilion, the floor of which has been almost entirely covered in sediment due to recent flooding, and a currently inoperable gender-segregated restroom is present at the southeastern end of the building. The remaining, smaller pavilions (Pavilion Numbers 2, 3, 6, and 7) each contain a single picnic bench within their interiors, are overgrown by vegetation, and are in a similar state of disrepair and disuse (Figures 13, 14, 15, and 16). The County intends to remove any lead paint from the existing pavilions, repaint them, and refurbish them as necessary to reopen the park.

The other constructed features present within the study area are situated in the park’s picnic area (Figure 18). These include two former stone and concrete barbeque pits along the southern edge of Kolekole Stream that are no longer operable (Figure 18), an outdoor shower and short stone wall adjacent to the stream’s edge (Figure 19), four poured concrete slabs within the lawn area, three of which currently have wooden picnic benches on them (Figures 20 and 21), and a retaining wall that extends along the southern bank of Kolekole Stream for 52 meters, protecting the lawn area from erosion (Figure 22). Near the southern end of the retaining wall, a three-step concrete stairway provides access from the shower area to the stream bank (Figure 23).

Vegetation within the park’s picnic area consists primarily of mowed grass. However, the thickly vegetated eastern slope of Kolekole Gulch (which forms the park’s eastern boundary) contains several invasive species including but not limited to, albizia (Falcataaria moluccana) trees, banana (Musa sp.), bingabing (Macaranga mapa) gunpowder tree (Trema orientalis), African tulip (Spathodea campanulata), ironwood (Casuarina sp.), Alexander palm (Archontophoenix alexandrae) and various ferns, vines, ginger, and ornamental species that are growing along the slope edge (Figure 24). A few native species such as hau (Hibiscus tiliaceus), and hapu‘u (Cibotium glaucum) fern were also observed.
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Figure 6. Soils in the current study area.

Figure 7. Portion of a geologic map of Hawai‘i Island showing the current study area.
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Figure 8. Entrance to Kolekole Gulch Park from the Old Māmalahoa Highway, view to the northeast.

Figure 9. Paved single-lane driveway leading to parking area and pavilions, view to the northeast.
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Figure 10. Grassy lawn area and parking lot, view to the northeast.

Figure 11. Existing park pavilions, view to the southeast.
1. Introduction

Figure 12. The Epy Yadao Pavilion, view to the south.

Figure 13. Pavilion Number 2, view to the southeast.
1. Introduction

Figure 14. Pavilion Number 3, view to the southeast.

Figure 15. Pavilion Number 6, view to the southeast.
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Figure 16. Pavilion Number 7, view to the southeast.

Figure 17. Barbeque pits, concrete slabs with picnic tables, and retaining wall along Kolekole Stream, view to the southeast.
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Figure 18. Former barbeque pits along southern edge of Kolekole Stream, view to the northwest.

Figure 19. Park shower with adjacent wall segment, view to the west.
1. Introduction

Figure 20. Example of poured concrete slab, view to the northeast.

Figure 21. Concrete slab with picnic bench, view to the west.
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Figure 22. Concrete and cobble retaining wall along the edge of Kolekole Stream, view to the southwest.

Figure 23. Concrete steps leading from shower area to Kolekole Stream (partially obscured by fallen tree), view to the northeast.
2. Background

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Figure 24. Typical vegetation along eastern slope of study area, view to the southeast.

2. BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered within the study area, and to establish an environment within which to assess the significance of any such resources, a general culture-historical background for the region is presented, and the results of previous archaeological studies conducted in the vicinity of the study area are summarized.

CULTURE-HISTORICAL CONTEXT

The study area is situated in Kuhua Ahupua‘a on the windward coast of Hawai‘i Island, within the present-day district of South Hilo, and the traditional moku (district) of Hilo, one of six moku of Hawai‘i Island (Figure 25). The chronological summary presented below begins with the peopling of the Hawaiian Islands and includes the presentation of a generalized model of Hawaiian Prehistory and a discussion of the general settlement patterns for South Hilo. The discussion of Prehistory is followed by a summary of Historical events in the district that begins with the arrival of foreigners in the islands and then continues with the history of land use in South Hilo after contact. The summary includes a discussion of the changing lifeways and population decline of the early Historic Period, a review of land tenure in the study ahupua‘a during the Māhele ʻĀina of 1848, and documentation of the transition to the commercial sugar industry from the last quarter of the nineteenth century into the twentieth century. A synthesis of the Precontact settlement patterns and the Historically documented land use, combined with a review of the findings of previously conducted archeological studies, provides a means for predicting the types of archaeological features that may be encountered within the study area, and forms a basis for assessing the function, age, and significance of any encountered archaeological sites.

A Generalized Model of Hawaiian Prehistory

This generalized cultural sequence is based on Kirch’s (1985) model and is amended to include recent revisions offered by Kirch (2011) and Athens et al. (2014). The conventional wisdom has been that first inhabitants of Hawai‘i Island probably arrived by at least A.D. 300, and focused habitation and subsistence activity on the windward side of the island (Burtchard 1995; Hommon 1986; Kirch 1985). Recent re-evaluation and syntheses of genealogical, oral historical, mythological, and radiometric data by Kirch (2011) and others (Athens et al. 2014; Duarte 2012; Wilmshurst et al. 2011) have convincingly argued that Polynesians may not have arrived in the Hawaiian Islands until at least A.D. 1000, but expanded rapidly thereafter. The implications of this on the currently accepted chronology would alter the timing of the Settlement, Developmental, and Expansion Periods, possibly shifting the Settlement
Period to A.D. 1000 to 1100, the Developmental Period to A.D. 1100 to 1350, the Expansion Period to A.D. 1350 to 1650, and the Proto-Historic Period to A.D. 1650-1795. It has been generally reported that the sources of the early Hawaiian population—the Hawaiian Kahiki—were the Marquesas and Society Islands (Emory in Tatar 1982:16–18).

The Settlement Period was a time of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order. Order was further assured by the conical clan principle of genealogical seniority (Kirch 1984, 2010). According to Formander (1969), Hawaiians brought from their homeland certain universal Polynesian customs: the major gods Kāne, Kū, Kanaloa, and Lono; the kapu system of law and order; cities of refuge; the 'aumakua concept; various epiphenomenal beliefs; and the concept of mana. Conventional wisdom suggests that the first inhabitants of Hawai'i Island focused habitation and subsistence activity on the windward side of the island (Burchard 1995; Hommon 1986; Kirch 1985). Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and marine resources. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources.

As time passed a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites of the Development Period of the Hawaiian prehistory reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (koʻi) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are ʻulu maika stones and lei niho palaoa. The later were status items worn by individuals of high rank, which indicates recognition of status differentiation (Kirch 1985). As population expanded in the Hawaiian Islands so did social stratification, which was accompanied by major socioeconomic changes and intensive land modification. Once most of the ecologically favorable zones of the windward and coastal regions of the major islands were settled, the more marginal leeward areas were developed. Migrations to Hawai‘i from the Marquesas and Society Islands may have continued throughout the early Settlement and Development Periods (Kirch 1985, 2012).

The lowland portion of South Hilo was region thriving with traditional Hawaiian habitation and cultivation. The bottom-lands of the larger gulches, and the broad plateaus (kula) between them are lush, fertile lands well-suited to agriculture. Kalo (taro) could be grown either in watered terraces along the stream edges, such as the current study area, or in the wet kula lands of the lower forest zone where ʻuala (sweet potatoes), maiʻa (bananas), and kō (sugarcane) were also grown (Handy and Handy 1991). Groves of kukui (candlenut), ʻulu (breadfruit), and niu (coconuts) thrived in this region, and rich marine resources were readily accessible in the sheltered bays. Initially settlements were established along the shores of these bays, but eventually as population and agricultural production increased, settlements spread into the upland kula areas. The current study area is nestled within the level floor of Kolekole Gulch, where Kolekole Stream empties into the sea. The study areas location along the edge of Kolekole Stream and its relatively level terrain would have made this area well suited for the farming of kalo. Although Kolekole Gulch is not an entirely sheltered bay, it affords relatively easy access to marine resources and the sea, as the surrounding lands consist of rugged, high cliff faces. Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of Hawai‘i were controlled by a few powerful chiefs.

The Expansion Period is characterized by the greatest social stratification, major socioeconomic changes, and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. Subsistence patterns intensified as crop farming evolved into large irrigated field systems and expanded into the marginal dry land areas. The greatest population growth occurred during the Expansion Period, and it was during this time that a second major migration settled in Hawai‘i, this time from Tahiti in the Society Islands. According to Kamakau (1976), the kahuna Pāʻao settled in the islands during the 13th century. Pāʻao was the keeper of the god Kūkāʻilimoku, who had fought bitterly with his older brother, the high priest Lonopele. After much tragedy on both sides, Pāʻao was expelled from his homeland in Tahiti by Lonopele. He prepared for a long voyage and set out across the ocean in search of a new land. On board Pāʻao’s canoes were thirty-eight men (kānaka), two stewards (kānaka ʻi ʻupu ʻu), the chief Pilikaʻiaien (Pili) and his wife Hina ʻaukekele, Nāmaʻu o Malaia, the sister of Pāʻao, and the prophet Makuakaʻūmana. Kamakau (1991:100–102) told the following story of their arrival in Hawai‘i:
Puna on Hawai‘i Island was the first land reached by Pā‘ao, and here in Puna he built his first heiau for his god Aha‘ula and named it Aha‘ula [Waha‘ula]. It was a luakini. From Puna, Pā‘ao went on to land in Kohala, at Pu‘upea. He built a heiau there called Mo‘okini, a luakini.

It is thought that Pā‘ao came to Hawai‘i in the time of the ali‘i La‘au because Pili ruled as mo‘i after La‘au. You will see Pili there in the line of succession, the mo‘o kū‘auhau, of Hanala‘anui. It was said that Hawai‘i Island was without a chief, and so a chief was brought from Kahiki; this is according to chiefly genealogies. Hawai‘i Island had been without a chief for a long time, and the chiefs of Hawai‘i were ali‘i maka‘āinana or just commoners, maka‘āinana, during this time.

…There were seventeen generations during which Hawai‘i Island was without chiefs—some eight hundred years…The lack of a high chief was the reason for seeking a chief in Kahiki, and that is perhaps how Pili became the chief of Hawai‘i. He was a chief from Kahiki and became the ancestor of chiefs and people of Hawai‘i Island.

The Pili line’s initial ruling center was likely in Kohala, but Cartwright (1933) suggests that Pili resided in and ruled from Waipi‘o Valley in the Hāmākua District. Ethnohistorical traditions (Fornander 1880) indicate that valley was associated with at least nine successive Pili line rulers of Hawai‘i Island, from Kaha‘imoole‘a to Umi (from roughly A.D. 1460 to 1620). Prior to the establishment of these Pili rulers, Waipi‘o was the residential base for powerful local rulers dating back to at least the A.D. 1200s (Cartwright 1933).

Heiau construction flourished during the Expansion Period as religion became more complex and embedded in a sociopolitical climate of territorial competition. Monumental architecture, such as heiau, “played a key role as visual markers of chiefly dominance” (Kirch 1990:206). This pattern continued to intensify from A.D. 1500 to Contact (A.D. 1778), and evidence suggests that substantial changes were made to the political system as well. Within Kohala, for example, the Great Wall complex at Koai‘e is organized with certain platforms in the complex physically separated from contemporaneous features. Griffin et al. (1971) interpret these separate spaces as symbolizing class stratification.

The period from A.D. 1300–1500 was characterized by population growth as well as expanded efforts to intensify upland agriculture. (Rosendahl 1972) has proposed that settlement in leeward Kohala at this time was related to seasonal, recurrent occupation, and that coastal sites were occupied in the summer to exploit marine resources, while upland sites were being occupied during the winter months with a primary focus on agriculture. An increasing reliance on agricultural products may have caused a shift in social networks as well, according to Hommon (1976). Hommon argues that kinship links between coastal settlements disintegrated as those links within the mauka-makai settlements expanded to accommodate exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the ahupua‘a system. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas.

According to Kirch’s (1985) model, the concept of the ahupua‘a was established sometime during the A.D. 1400s, adding another component to an already well-stratified society. This land unit became the equivalent of a local community, with its own social, economic, and political significance. Ahupua‘a were ruled by ali‘i or lesser chiefs; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a konohiki. Ahupua‘a generally speaking, are wedge-shaped subdivisions of land that radiate out from the center of the island, typically extending from the mountain into the sea. Their boundaries are often defined by the topography of the land and its geological features. In these land units the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and kapu (restrictions) were observed, the common people (maka‘āinana), who lived in a given ahupua‘a had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the ali‘i (see Kamakau 1992; Malo 1951).

Entire ahupua‘a, or smaller portions of the land called ‘ili were generally under the jurisdiction of appointed konohiki or lesser chief-landlords, who answered to an ali‘i-‘ai-ahupua‘a (chief who controlled the ahupua‘a resources). The ali‘i-‘ai-ahupua‘a in turn answered to an ali‘i at moku (chief who claimed the abundance of the entire district). Thus, ahupua‘a resources supported not only the maka‘āinana and ‘ohana who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resource management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). The ahupua‘a were further divided into smaller sections such as the ‘ili ‘āina, mo‘o ‘āina, paukū ‘āina, kāhāpai, kō‘ele, hakūone, and kua‘aua (Hommon 1986; Pogue 1978). The chiefs of these land units gave their allegiance to a territorial chief or mō‘ī (king).
By the seventeenth century, large areas of Hawai‘i Island (moku āina – districts) were controlled by a few powerful ali‘i ‘ai moku. There is island-wide evidence to suggest that growing conflicts between independent chieftdoms were resolved through warfare, culminating in a unified political structure at the district level. It has been suggested that the unification of the island resulted in a partial abandonment of portions of leeward Hawai‘i, with people moving to more favorable agricultural areas (Barrera 1971; Schilt and Sinoto 1980). ‘Umi a Līloa, a renowned ali‘i of the Pili line who ruled from Waipi‘o Valley, is often credited with uniting the island of Hawai‘i under one rule (Cordy 1994). According to Kamakau (1992) ‘Umi was a skilled fisherman, and fishing for aku, his favorite fish, often brought him to the beaches of South Kohala from Kalalau‘upa’a to Makaula, where he also fished for ‘ahi and kala with many other famed fishermen and all the chiefs of the kingdom. ‘Umi’s reign lasted until around a.d. 1620, and was followed by the rule of his son, Keawenui a ‘Umi, and then his grandson, Lonoikamakahiki (Cordy 1994).

Kirch (1985) places the beginning of the Proto-Historic Period during the rule of Lonoikamakahiki. This was a time marked by both political intensification and stress and continual conquest by the reigning ali‘i. Wars occurred regularly between intra-island and inter-island polities during this period. By the 1700s, rule of Hawai‘i Island was divided among the chiefs of Kona and Hilo (Kamakau 1992). Keawe, a Pili line ruler and the son of Kanaloakapulehu, was the chief of Kohala, Kona, and Ka‘ū. When Keawe died, he split the rule of his lands between two of his sons, further dividing the island’s chieftdoms; Kalaninui‘iamamao became the ruling chief of Ka‘ū, and Ke‘eauumoku became the ruling chief of Kona and Kohala (Kamakau 1992). Wars between the ali‘i continued unabated through this transition. Alapa‘inui, the son of former Kona war chief Kauauanui a Mahi, desired to take control of Hawai‘i Island (Kamakau 1992), and successfully waged war against the chiefs of Kona and Kohala, and eventually took control of Ka‘ū and Hilo as well. Alapa‘inui ruled for many years, and appointed his son Keawe‘ōpala ruler of the island upon his death in 1754 (ibid.: 1992). It was during this time of warfare that Kamehameha was born in the North Kohala District in the ahupua‘a of Kokoiki, near the heiau of Mo‘okini (ibid.: 1992). There is some controversy about the year of his birth, but Kamakau (1992:66–68) places the birth event sometime between A.D. 1736 and 1758, most likely nearer to the later date. This period was one of continual conquest by the reigning ali‘i. In A.D. 1775 Kalani‘ōpu‘u and his forces, who had already conquered Hāna in eastern Maui, raided and destroyed the neighboring Kaupō District, then launched several more raids on Moloka‘i, Lāna‘i, Kaho‘olawe, and parts of West Maui. It was at the battle of Kalaeoka‘ilio that Kamehameha, a favorite of Kalani‘ōpu‘u, was first recognized as a great warrior and given the name of Pai‘ea (hard-shelled crab) by the Maui chiefs and warriors (Kamakau 1992). During the battles between Kalani‘ōpu‘u and Kahekili (1777–1779), Ka‘ahumanu and her parents left Maui to live on the island of Hawai‘i (ibid.: 1992). Kalani‘ōpu‘u was fighting on Maui when the British explorer Captain James Cook first arrived in the islands.

**History After Contact**

The arrival of foreigners in Hawai‘i marks the beginning of the Historic Period. Demographic trends during the latter Proto-Historic Period indicate population reduction in some areas, due to war and disease, yet increases in others, with relatively little change in material culture. There was a continued trend toward craft and status specialization, intensification of agriculture, ali‘i controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history. The Kū cult, luakini heiau, and the kapu system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kent 1983; Kirch 1985). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered O‘ahu, Maui and Moloka‘i, in 1795, Hawai‘i saw the beginnings of a market system economy (Kent 1983). This marked the end of the Proto-Historic Period and the end of an era of uniquely Hawaiian culture.

*The Arrival of Captain James Cook and the End of Kalani‘ōpu‘u’s Reign (1778-1782)*

British explorer Captain James Cook, in command of the ships H.M.S. Resolution and H.M.S. Discovery, landed in the Hawaiian Islands on January 18, 1778. The following January 17th [1779], on a return trip to Hawaiian waters, Cook anchored near Ka‘awaloa along the north shore of Kealakekua Bay in the South Kona District to resupply his ships. This return trip occurred at the time of the annual Makahiki festival, and many of chiefs and commoners were gathered around the bay celebrating. It has been suggested that Captain Cook was understood to be the god Lono himself returned, as men would not normally be allowed to paddle out during the Makahiki without breaking the kapu and forfeiting all of their possessions (Kamakau 1992). Kalani‘ōpu‘u, the reigning chief of Hawai‘i Island, left a battle with Kahekili on Maui, and after arriving at Kealakekua Bay, visited Cook on board the H.M.S. Resolution, where they exchanged gifts. Kamehameha, the future ruler of all of Hawai‘i, was present at this meeting (Jarves 1847). On February 4th Cook set sail, but a storm off the Kohala coast damaged the mast of the H.M.S. Resolution, and both ships were forced to return to Kealakekua Bay to make repairs. With Cook’s return many of the inhabitants of Kealakekua began to doubt that he actually was the physical manifestation of Lono (Kamakau 1992). Ten days later, a dispute...
over stolen nails escalated and after one of Cook’s boats was stolen, the captain set ashore at Ka‘awaloa with six marines to ask Kalani‘ōpu‘u for its return. When Kalani‘ōpu‘u denied any knowledge of the theft, Cook tried to take him captive (Kamakau 1992). A fight ensued, and Cook was killed along with four of his men and several natives. Kalani‘ōpu‘u and his retinue retreated inland. After offering the body of Cook as a sacrifice to the ahu, some of his bones were returned to the British aboard Resolution (Kamakau 1992), who shortly thereafter returned to sea.

After the death of Captain Cook and the departure of H.M.S. Resolution and Discovery, Kalani‘ōpu‘u moved to Kona, where he surfed and amused himself with the pleasures of dance (Kamakau 1992). While he was living in Kona, famine struck the district. Kalani‘ōpu‘u ordered that all the cultivated products of that district be seized, and then he set out on a circuit of the island. While in Kohala, Kalani‘ōpu‘u proclaimed that his son Kiwala‘ō would be his successor, and he gave the guardianship of the war god Kūka‘ilimoku to Kamehameha. However, Kamehameha and a few other chiefs were concerned about their land claims, which Kiwala‘ō did not seem to honor (Fornander 1996; Kamakau 1992). The heiau of Moa‘ula was erected in Waipio at this time (ca. A.D. 1781), and after its dedication Kalani‘ōpu‘u set out for Hilo to quell a rebellion by a Puna chief named Imakakolo‘a.

Imakakolo‘a was defeated in Puna by Kalani‘ōpu‘u’s superior forces, but he managed to avoid capture and hide from detection for the better part of a year. While the rebel chief was sought, Kalani‘ōpu‘u went to Ka‘ū and erected a heiau called Pākini (Kamakau 1992). Imakakolo‘a was eventually captured and brought to the heiau, where Kiwala‘ō was to sacrifice him. “The routine of the sacrifice required that the presiding chief should first offer up the pigs prepared for the occasion, then bananas, fruit, and lastly the captive chief” (Fornander 1996:202). However, before Kiwala‘ō could finish the first offerings, Kamehameha, “grasped the body of Imakakolo‘a and offered it up to the god, and the freeing of the tabu for the heiau was completed” (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawai‘i. After usurping Kiwalao’s authority with a sacrificial ritual in Ka‘ū, Kamehameha retreated to his home district of Kohala. While in Kohala, Kamehameha farmed the land, growing taro and sweet potatoes (Handy and Handy 1972). Kalani‘ōpu‘u died in April of 1782 and was succeeded by his son Kiwala‘ō.

The Rule of Kamehameha I (1782-1819)

After Kalani‘ōpu‘u died, several chiefs were unhappy with Kiwala‘ō’s division of the island’s lands, and civil war broke out. Kiwala‘ō, Kalani‘ōpu‘u’s son and appointed heir, was killed at the battle of Moku‘ohai, South Kona in July of 1782. Supporters of Kiwala‘ō, including his half-brother Keōua and his uncle Keawemauhili, escaped the and laid claim to the Hilo, Punu, and Ka‘ū Districts. According to ‘Ī‘ī (1963), nearly ten years of almost continuous war followed, as Kamehameha endeavored to unite the island of Hawai‘i under his rule and conquer the islands of Maui and O‘ahu. Keōua became Kamehameha’s main rival on the island of Hawai‘i, and he proved difficult to defeat (Kamakau 1992). Around 1790, in an effort to secure his rule, Kamehameha began building the heiau of Pu‘ukoholā at Kawaihāe, which was to be dedicated to the war god Kūka‘ilimoku (Fornander 1996). When Pu‘ukoholā Heiau was completed in the summer of 1791, Kamehameha sent his two counselors, Keawaheulu and Kamanawa, to Keōua to offer peace. Keōua was enticed to the dedication of the Pu‘ukoholā Heiau by this ruse and when he arrived at Kawaihāe he and his party were sacrificed to complete the dedication (Kamakau 1992). The assassination of Keōua gave Kamehameha undisputed control of Hawai‘i Island (Greene 1993). Between 1792 and 1796, after the dedication of Pu‘ukoholā, Kamehameha mostly resided at Kawaihāe and worked the lands of the Waikīloa-Waimea region (Maly and Maly 2002). By 1796, Kamehameha had conquered all the island kingdoms except for Kaua‘i. It wasn’t until 1810, when Kaumuali‘i of Kaua‘i gave his allegiance to Kamehameha, that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976). Kamehameha would go on to rule the islands for another nine years. He and his high chiefs participated in foreign trade, but continued to enforce the rigid kapu system.

In the twelve years following the death of Captain Cook, sixteen foreign ships (all British and American) called in Hawaiian waters (Restarick 1928). In 1790, two sister ships, the Eleanora and the Fair American, were trading in Hawaiian waters when a skiff was stolen from the Eleanora and one of its sailors was murdered. The crew of the Eleanora proceeded to slaughter more than 100 natives at Olowalu [Mau]. After leaving Maui, the Eleanora sailed to Hawai‘i Island, where one of its crew, John Young, went ashore and was detained by Kamehameha’s men. The other vessel, the Fair American, was captured by the forces of Kamehameha off the coast of North Kona, and in an act of retribution for the Olowalu massacre, they slaughtered all but one crew member, Isaac Davis. Guns and a cannon (later named “Lopaka”) were recovered from the Fair American and were kept by Kamehameha as part of his fleet (Kamakau 1992). Kamehameha made John Young and Isaac Davis his advisors.

During the first part of the nineteenth century, Hawai‘i’s culture and economy continued to change drastically as capitalism and industry established a firm foothold in the islands. The sandalwood (Santalum ellipticum) trade, established by Euro-Americans in 1790 and turned into a viable commercial enterprise by 1805 (Oliver 1961), was...
2. Background

flourishing by 1810. This added to the breakdown of the traditional subsistence system, as farmers and fishermen were ordered to spend most of their time logging, resulting in food shortages and famine that led to a population decline. Kamehameha, who resided on the Island of O’ahu at this time, did manage to maintain some control over the trade on Hawai‘i Island (Kent 1983; Kuykendall and Day 1976).

Upon returning to Kailua in 1812, Kamehameha resided at Kamakahonu, from whence he continued to rule the islands for another nine years. While in Kailua, He and his high chiefs participated in foreign trade, but also continued to enforce the rigid kapu system. He ordered men into the mountains of Kona to cut sandalwood and carry it to the coast, paying them in cloth, kapa material, food and fish (Kamakau 1992). This new burden added to the breakdown of the traditional subsistence system. Farmers and fishermen were ordered to spend most of their time logging, resulting in food shortages and famine that led to a population decline. Kamakau indicates that, “this rush of labor to the mountains brought about a scarcity of cultivated food . . . The people were forced to eat herbs and tree ferns, thus the famine [was] called Hi-laulele, Haha-pilau, Laulele, Pualele, ‘Ama‘u, or Hapu‘u, from the wild plants resorted to” (ibid.: 1992:204). Once Kamehameha realized that his people were suffering, he “declared all the sandalwood the property of the government and ordered the people to devote only part of their time to its cutting and return to the cultivation of the land” (ibid.: 1992:204).

The Death of Kamehameha I and the Abolition of the Kapu System (1819-1820)

Kamehameha I died on May 8, 1819 at Kamakahonu, and the changes that had been affecting the Hawaiian culture since the arrival of Captain Cook in the Islands began to accelerate. Following the death of a prominent chief, it was customary to eliminate all of the regular kapu that maintained social order and the separation of men and women, elite and commoner. Thus, following Kamehameha’s death, a period of ‘ai noa (free eating) was observed along with the relaxation of other traditional kapu. It was the responsibility of the new ruler and kahuna to re-establish kapu and restore social order, but at this point in history traditional customs were altered (Kamakau 1992).

The death of Kamehameha was the first step in the ending of the tabus; the second was the modifying of the mourning ceremonies; the third, the ending of the tabu of the chief; the fourth, the ending of carrying the tabu chiefs in the arms and feeding them; the fifth, the ruling chief’s decision to introduce free eating (‘ai noa) after the death of Kamehameha; the sixth, the cooperation of his aunts, Ka-ahu-manu and Ka-heihei-malie; the seventh, the joint action of the chiefs in eating together at the suggestion of the ruling chief, so that free eating became an established fact and the credit of establishing the custom went to the ruling chief. This custom was not so much of an innovation as might be supposed. In old days the period of mourning at the death of a ruling chief who had been greatly beloved was a time of license. The women were allowed to enter the heiau, to eat bananas, coconuts, and pork, and to climb over the sacred places. You will find record of this in the history of Ka-ula-hea-nui-o-ka-moku, in that of Ku-ali‘i, and in most of the histories of ancient rulers. Free eating followed the death of the ruling chief; after the period of mourning was over the new ruler placed the land under a new tabu following old lines. (Kamakau 1992:222)

Immediately upon the death of Kamehameha I, Liholiho (his son and to be successor) was sent away to Kawaihæ to keep him safe from the impurities of Kamakahonu brought about from the death of Kamehameha. After purification ceremonies Liholiho returned to Kamakahonu. Instead of re-instating the traditional kapu, Liholiho ate the dog meat kapu to the women ali‘i, entered the women’s lauhala house, and did whatever he desired. While he may have done so during a time when he had not yet re-instituted the eating kapu, other chiefs present appear to have thought otherwise, and word spread that the kapu had been abandoned. Kekuaokalani, caretaker of the war god Kūka‘ilimoku, was dismayed by his cousin’s (Liholiho) actions and revolted against him, but was defeated.

With an indefinite period of free-eating and the lack of the reinstatement of other kapu extending from Hawai‘i to Kaua‘i, and the arrival of the Christian missionaries shortly thereafter, the traditional religion had been officially replaced by Christianity within a year following the death of Kamehameha I. By December of 1819, Kamehameha II had sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the heiau images, and ordering that the heiau structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the ‘aumakua worship, to continue (Kamakau 1992; Oliver 1961).

With the end of the kapu system, changes in the social and economic patterns began to affect the lives of the common people. Liholiho moved his court to O‘ahu, lessening the burden of resource procurement for the chiefly class on the residents of Hawai‘i Island. Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early Western visitors. Introduced foods often grown for trade included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845).
Figure 25. A 1901 Hawaii Territory Survey map showing the location of the study area within Kuhua Ahupua’a and South Hilo District.
Hilo 1820-1848: A Land in Transition

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawai’i. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the ali‘i, who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopted their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government. During this period, the sandalwood trade wrought havoc on the lives of the commoners, as they weakened from the heavy production, exposure, and famine just to fill the coffers of the ali‘i, who were no longer under any traditional constraints (Kuykendall and Day 1976; Oliver 1961). The lack of control of the sandalwood trade was to soon lead to the first Hawaiian national debt as promissory notes and levies were initiated by American traders and enforced by American warships (Oliver 1961). The Hawaiian culture was well on its way towards Western assimilation as industry in Hawai‘i went from the sandalwood trade, to a short-lived whaling industry, to the more lucrative, but environmentally destructive sugar industry.

Some of the earliest written descriptions of Hilo come from the accounts of the first Protestant Missionaries to visit the island. Early Historic visitors to Hilo noted the beauty, fertility, and ruggedness of this part of the island. In 1823, the Reverend William Ellis one of the first Christian missionaries to arrive in Hawai‘i, passed along the South Hilo coast during his tour of Hawai‘i Island. Having been warned against walking due to the ruggedness of the terrain, he sailed from Hilo to Laupāhoehoe in a canoe. Ellis (2004:344) described the South Hilo coastline as follows:

The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, by streams meandering through them into the sea, presented altogether a most agreeable prospect.

Overland travel across the central and northern Hilo District remained difficult throughout the first part of the nineteenth century due to its rugged coastline and many deep gulches. Transportation difficulties may have even temporarily delayed large-scale commercial exploitation of the kula lands in the vicinity of the study area (Desilets and Rechtman 2004). Initial commercial exploitation of these lands was limited to small scale agriculture in areas with coastal access for shipping and receiving goods. The Reverend Titus Coan (Coan 1882:31–32), who settled at the Hilo Mission Station in 1835, wrote that:

For many years after our arrival there were no roads, no bridges, and no horses in Hilo, and all my tours were made on foot... The path was a simple trail, winding in a serpentine line, going down and up precipices, some of which could only be descended by grasping the shrubs and grasses, and with no little weariness and difficulty and some danger.

By the mid-1800s, the first roads had been established along the coast of South Hilo, perhaps following the route of the older path described by Coan (PHRI 1991). These first roads, designed for travel on horses and in carts, were likely developed by land holders, primarily sugar growers, looking to connect their plantation lands. Chester S. Lyman, travelling from Kawaihae to Hilo with the Reverend Titus Coan on June 19th, 1846, stayed in the vicinity one of the early sugar plantations located to the south of the study area. In his journal he described travel along a cart road and discussed the holdings of Mr. Castle, the progenitor of the first sugar plantation in the area. Lyman (1925:81) writes:

After resting we started on at 4 1/2 & soon arrived at Mr Castle’s, 3/4 of a mile beyond. When half way there we fell in with two carts each drawn by 4 yokes of oxen, one set of them just broken in; the two teams were connected by a long rope & went on by fits & starts, now stopping & now going on the run. The carts were large & heavy with thick solid wheels made of planks pinned together. They were well filled with a crowd of noisy girls & boys & by invitation of the Driver, an American, I took a ride in one of these Hawaiian Coaches as far as Mr Castle’s house, glad thus to relieve a little my feet which were becoming sore from walking in water and climbing precipices.

Stopped a few minutes at Mr Castle’s; were entertained with a refreshing bowl of milk, & then going on a mile & a half or 2 miles put up for the night at a native house, nearby. The place is called Puumoi. Mr. Castle is an American, has been in the country many yrs, has an extensive plantation & a native wife & family. Near his house we passed large fields of sugar cane on his lands, but cultivated by Chinamen who have pretty much monopolized the sugar business in this region. Mr Castle has also considerable herds of cattle.

In 1872, Isabella Bird traveled by horseback along the Hāmākua Coast from Onomea to Waipiʻo Valley and described the general terrain and the difficult passage through the various gulches she crossed. Although Kolekole is
not specifically mentioned in her account, she would have inevitably crossed this gulch on her journey towards Waipiʻo. Of the region she writes:

All the gulches for the first twenty-four miles contain water. The great Hakalau gulch we crossed early yesterday, has a river with a smooth bed as wide as the Thames at Eton. Some have only quiet streams, which pass gently through ferny grottoes. Others have fierce strong torrents dashing between abrupt walls of rock, among immense boulders into deep abysses, and cast themselves over precipice into the ocean. Probably, many of these are the courses of fire torrents, whose jagged masses of a-a have since been worn smooth, and channeled into holes by the action of water. A few are crossed on narrow bridges, but the majority are forded, if that quiet conventional term can be applied to the violent flounderings by which the horses bring one through. (Bird 1974:88).

Bird’s account of the journey also mentions the presence of houses within the gulches, specifically grass-houses and a schoolhouse within Kawainui Gulch (south of the study area). With respect to Laupōhoehoe Gulch (north of the study area) she stated, “a number of disastrous-looking native house are clustered under some very tall palms in the open part of the gulch” (Bird 1974:91). Her detailed and colorful accounts provide a vivid glimpse into the early nineteenth century environs and native lifeways of the South Hilo District.

The Legacy of the Māhele ‘Āina of 1848

By the mid-nineteenth century, the ever-growing population of Westerners in the Hawaiian Islands forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. By 1840 the first Hawaiian constitution had been drafted and the Hawaiian Kingdom shifted from an absolute monarchy into a constitutional government. Convinced that the feudal system of land tenure previously practiced was not compatible with a constitutional government, the King (Kamehameha III) and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King). This change was further promoted by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be taken from them at any time. After much consideration, it was decided that three classes of people each had one-third vested rights to the lands of Hawai‘i: the King, the chiefs and konohiki, and their tenants (the makaʻāinana or common people). In 1845 the legislature created the “Board of Commissioners to Quiet Land Titles” (more commonly known as the Land Commission. All land claims, whether by chiefs for entire ahupua’a or by tenants for their house lots and gardens, had to be filed with the Land Commission within two years of the February 14, 1846, but the deadline was extended several times for chiefs and konohiki (Soehren 2005).

The King and some 245 chiefs (Kuykendall 1938) spent nearly two years trying unsuccessfully to divide all the lands of Hawai‘i amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King). Once the King and his chiefs accepted the principles of the Privy Council, the Māhele ‘Āina (Land Division) was completed in just forty days (on March 7, 1848), and the names of all of the ahupua’a and ‘ili kūpono (nearly independent ‘ili land division within an ahupua’a, that paid tribute to the ruling chief and not to the chief of the ahupua’a) of the Hawaiian Islands and the chiefs who claimed them, were recorded in the Māhele Book (Soehren 2005). As this process unfolded King Kamehameha III, who received roughly one-third of the lands of Hawai‘i, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased by his subjects to live on. Accordingly, the day after the division with the last chief was recorded in the Buke Māhele (Māhele Book), King Kamehameha III commuted about two-thirds of the lands awarded to him to the government (King). Unlike the King, the chiefs and konohiki were required to present their claims to the Land Commission to receive their awards (LCAw.). The chiefs who participated in the Māhele were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as “Government Land,” while the lands retained by Kamehameha III became known as “Crown Land,” and the lands received by the chiefs became known as “Konohiki Land” (Chinen 1958:vii, 1961:13). All lands awarded during the Māhele were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission.

During the Māhele, native tenants of the lands that were divided up among the Crown, Konohiki, and Government could claim, and acquire title to, kuleana parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered the kuleana as Land Commission Awards (LCAw.). Claims for kuleana had to be submitted during a two-year period that expired on February 14, 1848 to be considered. All of the land claimants were required to provide proof of land use and occupation, which took the form of volumes of native registry and testimony. The claims and awards were numbered, and the LCAw. numbers, in conjunction with the volumes of documentation, remain in use today to identify the original owners and their use of the kuleana lands. The work of
2. Background

hearing, adjudicating, and surveying the claims required more than the two-year term, and the deadline was extended several times for the Land Commission to finish its work (Maly 2002). In the meantime, as the new owners of the lands on which the kuleana were located began selling parcels to foreigners, questions arose concerning the rights of the native tenants and their ability to access and collect the resources necessary for sustaining life. The “Enabling” or “Kuleana Act,” passed by the King and Privy Council on December 21, 1849, clarified the native tenants’ rights to the land and resources, and the process by which they could apply for fee-simple interest in their kuleana. The work of the Land Commission was completed on March 31, 1855. A total of 13,514 kuleana were claimed by native tenants throughout the islands, of which 9,337 were awarded (Maly 2002). As a result of the Māhele, Kuhua Ahupua’a was retained as Government Land. No claims were made for kuleana lands within the ahupua’a.

Land Grants, Land Use, and Changes in Tenure in the Vicinity of the Study Area (1850-1863)

In conjunction with the Māhele, the King also authorized the issuance of Royal Patent Grants to applicants for tracts of land, larger than those generally available through the Land Commission. The process for applications was clarified by the “Enabling Act,” which was ratified on August 6, 1850. The Act resolved that portions of the Government Lands established during the Māhele of 1848 should be set aside and sold as grants ranging in size from one to fifty acres at a cost of fifty cents per acre. The stated goal of this program was to enable native tenants, many of whom were not awarded kuleana parcels during the Māhele, to purchase lands of their own. Despite the stated goal of the land grant program, this provided the mechanism that allowed many foreigners to acquire large tracts of the Government Lands. Unlike in the kuleana claims, where claimants stated their use of the land, the grant records are silent regarding the grantees’ intended use. The Royal Patent deeds and survey notes do contain some limited information about geographical features of the grant lands, and describe boundary markers, such as rock piles and vegetation, but they generally do not say anything about improvements to the land or land use.

The study area comprises portions of two Land Grant parcels (616:1 and 2, and 2933) purchased by Kaawa. Grant 616:1 and 616:2 comprise 50 acres of land purchased on the 14th of May, 1851, and Land Grant 2933, totaling 7 acres, was purchased on the 27th of August, 1863. Hawai‘i Registered Map No. 342, prepared in 1879, depicts the location of Kaawa’s grant (labeled “Grant 616B Kaawa”), as well as the route of the Old Māmalahoa Highway (Figure 26). Also portrayed on this map is the potential location of the Kaawa house (located on the tablelands to the southeast of the study area), as well as a ford crossing, indicating a shallow place within Kolekole Stream where one could walk or ride across (see Figure 26). An undated Hawaiian Government Road Survey Map (Figure 27) also depicts the location of Kaawa’s house. While an 1884 Hawaiian Government Survey Map (Figure 28) depicts the locations of notable landmarks and geography in the vicinity of the study area, it suffers from significant inaccuracies, and therefore cannot be used to determine the precise locations of the Land Grants directly associated with the current study area themselves, particularly in the case of Land Grant 2933 to Kaawa which is mislabeled as “Grant 623” to “Kakaito.” However erroneous, this map is useful for its depiction of the conglomeration of grants present in the immediate vicinity of the study area within Kuhua and the neighboring ahupua‘a of Wailea and Homomū.

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<tr>
<th>Table 1. Land Grants purchased within the study area (1852-1863).</th>
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<td><strong>Grant No.</strong></td>
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Honomū Sugar Company/Wailea Milling Company and Railroad Development (ca. 1880-1946)

Following the Māhele and the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawai‘i which guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, commercial sugarcane cultivation and sugar production became the central economic focus for the Hilo area. By 1874, Hilo already ranked as the second largest population center in the islands and within a few years the fertile uplands, plentiful water supply, and port combined to make Hilo a major center for sugarcane production and export. The plantation lands commonly extended some two to three miles inland from the coast (Best 1978:123). Elevations typically ranged from 250 feet above sea level along the shoreline bluffs to 2,000 feet above sea level at their western (mauka) limits. Ocean frontage could range from two to six miles. Railroads operating on steam and animal power were built on some plantations by 1887, however some plantations utilized flumes or cable railways to transport cane from the fields to the coastal mills.
2. Background

An archeological assessment of the County of Hawai‘i’s Kolekole Gulch Park, Kuhua, South Hilo, Hawai‘i

Figure 26. Undated Territory of Hawai‘i Registered Map No. 342 showing the location of the Kaawa household, the Old Government Road, and a ford crossing in relation to study area (outlined in red).
Figure 27. Portion of undated Hawai‘i Registered Map No.519 showing study area location (outlined in red) in relation to a structure (labeled Kaawa) that likely represents the Kaawa household.
2. Background

Figure 28. Portion of 1884 Hawai‘i Registered Map No. 1092 showing the location of Land Grants awarded in vicinity of the current study area (outlined in red).
With the annexation of Hawai‘i to the United States in 1898 and the granting of Territory status in 1900, Hilo was designated the center of county government in 1905 and remained the second most populated city in the newly formed Territory of Hawai‘i. Sugar cultivation continued to be the island’s most lucrative industry until the ca. 1970s. The sugar industry brought widespread changes to the Hilo area and the drastically altered the traditional landscape of the district. As part of the late nineteenth century development of the sugar plantations and related infrastructure, some of Hilo’s largest fishponds (Hanalei, Kalepolepo, Mohouli, Waiāhole, and Hoakumau) were filled in, and many old residences, burial sites, trails, heiau, formerly located in the cane fields were destroyed as a result.

In prospecting Hilo for land suitable for development, a report was made by the Royal Commissioners on Development of Resources. Formed by King David Kalākaua in 1877, commissioners conducted examinations of lands along the Hāmākua/Hilo coastline and consulted with residents in an effort to learn about needs and natural resources. In 1877, Honomū was investigated for its potential as a landing and sugar mill location:

At Honomu, in ordinary weather, a good landing can be made in a surf boat, and would only need a buoy; parties are projecting a small plantation on this land with a mill in the gulch. There are some 1500 acres of Government land in the vicinity, and 1250 sold to private parties, some of which is cane land. The establishment of a good mill at Honomu would greatly add to the value of these lands. (Maly and Maly 2006:48)

Three years later in 1880, M. Kirchoff & Company, along with C. Brewer & Company, Ltd. as agent, established Honomū Sugar Company on 2,400 acres of land within the South Hilo District, including the current study area (Dorrance and Morgan 2000). The Honomū Sugar Company mill itself was located on the coast, and the upper region of Honomū was interspersed with small-farm homesteaders (Figure 29). By 1890 the plantation was producing 2,000 tons of sugar yearly. Initially, no Hilo coast plantation had a railroad, so fluming was extensively utilized by the Honomū Sugar Company who shipped its product from Honomū Landing to Honolulu via inter-island vessels that anchored offshore.

![Figure 29. 1929 aerial photograph of Honomū Sugar Company Mill and Camp.](image)

By 1919, the Honomū Sugar Company encompassed roughly 2,300 acres of land: 1,271 of which were owned outright by the company, and 1,000 of which were leasehold. The company’s cultivated sugarcane lands extended from 50 to 1,500 feet above sea level and were situated between the neighboring mills of Pepe’ekoe and Hakalau, including the majority of the current study area, with the more seaward portion of the parcel being unplanted (Figures 30 and 31). Water was diverted from several perennial streams including Pahaehae, Honomū, and Kolekole through a 9-mile long network of flumes to the fields which grew several varieties of cane including “... Yellow Caledonia with a little Rose Bamboo and a small amount of different varieties sent from the Planters’ Experiment Station” and crop yields were further supplemented by nearby homestead growers who dedicated approximately 400 additional acres of land to cane cultivation for the company (Evening Bulletin Industrial Edition 1909).
2. Background

That same year a small, independently owned and operated plantation, the Wailea Milling Company, was formed by Tatsuji Kawachi on the northern edge of Kolekole Gulch, directly north of the current study area. Unlike Honomū Sugar Plantation, and most of the commercial sugar plantations in Hawai‘i, the Wailea Milling Company was the smallest sugar mill in Hawai‘i and was independently owned and operated by a cooperative of Wailea homesteaders who held in excess of 3,000 acres of land for cultivation including lands formerly held by the Hakalau Plantation Company (Lydgate 1919). Despite being an autonomous enterprise, the company sustained a cordial relationship with the Hakalau Plantation, who acquired it in 1943 (Dorrance and Morgan 2000).

By 1941, Honomū Sugar Company held 3,027 acres of cane land, and production had reached 10,407 tons (Hitch 1992), but in years following World War II left an indelible mark on the company as it fell under duress due to wage increases and labor scarcity. A pattern of cane field acquisition emerged in the following years in an effort to boost cultivatable acreage and thereby ensure sustainable profitability for the big players in the industry, and in 1946, C. Brewer & Co. acquired controlling interest in Honomū Sugar Company and merged it into the Pepe‘ekeo Sugar Company (Dorrance and Morgan 2000). Nearly two decades later in 1962, Pepe‘ekeo Sugar Company fused with Hakalau Plantation, and in 1973 Hakalau consolidated into Mauna Kea Sugar Company, a non-profit corporation that now held Hakalau in addition to the Honomū, Pepe‘ekeo, Onomea, and Hilo Sugar companies (ibid.). Mauna Kea Sugar Company, which eventually became Mauna Kea Agribusiness, became the third largest in acreage (13,000 acres) on Hawai‘i Island. It continued to operate until 1994 when it phased out sugar production and closed its doors forever, marking the end of commercial sugarcane production in the Hilo area (ibid.). The rise and fall of the sugar industry were closely intertwined with the development of rail transportation in the district.

Figure 30. 1916 photograph of the makai portion of the current study area with railroad bridge in background (The Honolulu Advertiser 1916).
2. Background

Railroad construction was one of the most important elements of governmental and private sector planning following the Treaty of Reciprocity, as crops and product were still being transported by beast and cart (Dorrance and Morgan 2000). On the Island of Hawai‘i, the first major line to be constructed was in North Kohala District, which operated as the Hawaiian Railroad Company. The North Kohala line, however, was envisioned as only the first step toward a much larger system connecting the cane fields of Kohala, Hāmākua, and Hilo with Hilo Harbor, the only protected deep-water port on the island. Beginning in 1899, railroad lines began transporting sugar to the harbor for marine transport, thus Hilo became an important shipping and railroad hub.

Lorrin A. Thurston, who according to Thrum had “been connected with the enterprise from its initiation” (Thurston 1913:142), wrote an article upon the completion of the railroad from Hilo to Pa‘auilo, Hāmākua in May of 1913 entitled “Railroading in Hilo” which was published in *Thrum’s Hawaiian Annual and Almanac for 1914*. Thurston reported that the Hilo Railroad Company (HRC) initiated the railroad endeavor in 1899 from Waiakea south to ‘Ōla‘a and onwards to Kapoho. The initial distance of twenty-five miles of track was completed by April 1901. Later that same year, the track was extended along the waterfront of Hilo to the Wailuku River, at the foot of Waianuenue Street” (ibid.:143). In 1903, HRC constructed a wharf at Waiakea and completed a branch line connecting it to the waterfront line.

The commercial sugar industry provided most of the cargo transported by HRC, but suffered a sharp decline between the years of 1904-1907, which caused a halt of development in Hilo (Thurston 1913). In response, HRC worked with ‘Ōla‘a Sugar Company to send a representative to Washington D.C. in 1907 to secure funding for the construction of a breakwater that would allow Hilo Bay to accommodate larger ocean-going vessels. Construction on the breakwater began in 1908 and was still ongoing at the time of Thurston’s writing (ca. 1914); the breakwater was finally completed in 1929. In exchange for construction of a breakwater in Hilo Bay, the Hilo Railroad was required to build a new wharf, a one-mile rail extension from Waiakea, and a 50-mile rail extension north to Honoka‘a Mill (the Hāmākua Division). The funding of the breakwater by HRC resulted in the extension of the railroad through the populated section north of Hilo all the way to Hakalau and Hāmākua (Figure 32):

When the breakwater project was pending before Congress, opposition was made to the appropriation on account of the limited commerce then being transacted through Hilo harbor. Assurances were thereupon made by the Hilo Railroad Company, that if the breakwater were constructed, a railroad would be built into the country north of Hilo and suitable wharf facilities provided under the lee of the breakwater. Such assurances had a material effect in securing the appropriation. (ibid.:145)
2. Background

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The extension to Honokaa would finally connect the sugar mills of South Hilo, North Hilo, and Hāmākua with Hilo’s protected harbor. Between June 1909 and December 24, 1911, HRC built 12.7 miles of rail extending from Hilo to Hakalau Mill, crossing many deep gulches and valleys along its route. This was followed by the construction of an additional 21 miles of rail that connected Hakalau with Pa‘auilo to the north, which covered a total distance from Hilo of roughly 34 miles and was known as the “Hamakua Division” (ibid.:146). Thurston defined the objective of the Hamakua Division thusly:

The principal object of the extension is to give adequate transportation facilities between Hilo and the fertile and well-settled territory extending for 50 miles north of the town of Hilo, and averaging three to four miles in width. This district produces nearly one-fourth of the entire output of sugar of the Territory and is, including the town, the home of over 30,000 people. The only means of access to this section has heretofore been by wagon road, almost impassable in rainy weather, and by derrick and cable landings over bluffs rising from 50 to 300 feet sheer from blue ocean. There are no harbors. (ibid.:147)

Thurston described the scenery afforded to passengers who traveled on the Hamakua Division as follows:

Incidentally, the road has opened up one of the most remarkable, unique and spectacular scenic routes to be found in any part of the world. It may appear impossible for a railroad to run through a thickly-settled, highly-cultivated country and yet be noted for spectacular scenery. The paradox is explained by the fact that the district lies along the base and on the steep slope of Mauna Kea, the highest mountain in the Pacific. . .

The combination of steep grade and heavy rainfall has resulted in excessive erosion, the mountain side being seamed at frequent intervals with deep gulches, in which the streams form innumerable cataracts and waterfalls. . .

Some conception of the rugged character of the country can be gained from the fact that in less than 34 miles, there are 211 water openings under the railroad track, ranging from a concrete culvert to steel bridges up to 1006 feet in length and 230 feet high. . . (ibid.147-149)
2. Background

The section of railroad spanning Kolekole Bridge (Figure 33; see Figure 31) and the environs of the current study area were described by John W. Bains in an article entitled “Around About Hilo” that was published in a January 1913 edition of the Mid-Pacific Magazine:

After leaving Onomea more broad gorges spanned by steel viaducts are crossed, each unveiling a picture more beautiful than the last, until Kolekole Bridge is reached. Kolekole is not the largest nor the highest of the steel structures, but it spans an estuary of the sea and affords the visitor a long vista of headlands to the south, which stamps it as one of the most attractive of all the bridges. It is just 100 feet in height and from the train the tourist can gaze down on the tops of the cocoa-nut palms reaching up from the valley below. The green combers thunder on the pebble-strewn beach and in the distance dash on the precipitous cliffs, ever changing and ever adding life and variety to the view.

Mile upon mile of sugarcane fields stretch away on both sides of the line, consistent evidence of the magnitude of Hawaii’s most valued product. The quaint and unique method of conveying the cane from the uttermost borders of the fields to the very jaws of the mill rollers by the means of water flumes is to be seen at various points along the line. (Bains 1913:356–357)

Ultimately, the cost of the Hāmākua Division ruined HRC and as a result, they were forced to sell out and reorganize under the name Hawaii Consolidated Railway (HCR) in 1916. A 1919 Copy of Survey Furnished (C.S.F.) map (Figure 34) depicts the HCR bridge crossing over Kolekole Stream and the study area, and also shows the twenty-foot ROW extending along the northern flank of Kolekole Gulch to the north of the study parcel. A train depot, railroad, and house lot are illustrated on this map north of the study area in Wailea, as is the Old Māmalahoa Highway (labeled “Gov’t Main Road) leading to the entrance of Kolekole Gulch Park. In 1920, HCR attempted to capture a larger piece of the growing tourist business with its adventurous scenic route tour dubbed the “Scenic Express.” HCR had long offered service to Glenwood for tourists visiting Kīlauea, but motorbuses now dominated this route. The Hāmākua Coast, by contrast, was not easily accessible by automobile. HCR was therefore able to run passenger coaches profitably along the Hāmākua Division with stops at scenic points. Passenger business declined precipitously in the early decades of the twentieth century, and the rise of the automobile was a harbinger for the railroad. In 1920, 607,220 passengers were carried. In 1930, the number dropped to just 77,894 and continued as the years progressed, with passenger counts dropping as low as 16,681 in 1936 (Best 1978:145–146). As a result, the remaining passenger cars were converted for other uses, and the little passenger traffic which persisted was hauled on custom-built railbuses.

The picturesque purlieus of the study area described by Bains (1913) persisted at least until 1938; and although the study area remained cane lands until April of that year, the growing popularity of Kolekole Stream as “perhaps the finest swimming place of the entire island” prompted county officials to initiate improvements to the area associated with development of the “... road and parking for the swimming facilities [Kolekole Stream] and picnic grounds” (The Honolulu Advertiser 1937, 1938). Later that year, a survey was conducted by the Territory of Hawai‘i in anticipation of the acquisition of 2.932 acres of land from Honomū Sugar Company for the official creation of Kolekole Gulch Park. The survey was completed later that year and the deed was officially transferred via executive order (Executive Order No. 938) on May 2, 1941. A 1938 Territory of Hawai‘i Survey Map for the initial acquisition of lands for the park shows the proposed transfer of 1.81 acres of cultivated cane land from the Honomū Sugar Company to the Territory of Hawai‘i. As illustrated in Figure 35, this section of Kolekole Gulch possessed arable land for the planting of cane and clearly shows that cultivated cane land dominated the majority of the proposed park’s footprint, extending along the flat of the gulch floor and along the eastern edge of Kolekole Stream. The map also depicts a road (labeled “Present Road”, likely a cane haul road, extending makai from the existing gate along the eastern edge of Kolekole Stream, as well as portions of Land Grants 616:1 and 2933 to Kaaawa.

In the years following the acquisition of the first phase of park lands, railway passenger-ship progressively dropped, but with the onset of World War II usage spiked significantly due to war-time gas rationing and the dramatic influx of servicemen. By 1943 passenger totals had rebounded profoundly to 103,635 but inevitably, the popularity of automobiles began to take a toll on the railroad’s industrial customers. As roadways were improved and gasoline prices dropped, simple economics favored trucking over trains. Ironically, just as rail transportation was in the throes of decline, HCR was by 1945 almost out of debt for the first time since its inception. The great tsunami of 1946, however, would soon seal its fate.
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Figure 33. Undated photograph of passenger car traveling across Kolekole Gulch from Wailea (https://www.hakalauhome.com/the-railroad.html).
Figure 34. 1919 C.S.F No.3274 showing study area location (outlined in red) in relation to the Hawai‘i Consolidated Railway Kolekole Stream Bridge.
Figure 35. 1938 Territory of Hawai‘i survey map for the proposed Kolekole Park and Roadway.
2. Background

The Tsunami of April 1, 1946

On April 1, 1946, a tsunami triggered by an earthquake in the Aleutian Islands slammed into the north facing shores of Hawai‘i Island, dealing a fatal blow to the already struggling HCR. Tracks around the waterfront were entirely washed out and the Hilo Station was wrecked. An entire span of the Wailuku Bridge was torn out and washed out river and “twelve miles north of Hilo, the railroad bridge at the mouth of the Kolekole Stream lost its center span” (Figures 36, 37, and 38) from a massive inundation of water that reached heights of 37 feet in Kolekole and neighboring Hakalau Gulch (Klein et al. 1985; MKE Associates LLC and Fung Associates, Inc. 2013:E8). The effects of tsunami run-up and inundation on the current study area is evident in Figure 36, which shows the leveled, washed-out makai portion of the study area devoid of infrastructure and most vegetation except for two surviving coconut trees. An article in the Honolulu Star Bulletin from April 5, 1946 (Honolulu Star-Bulletin 1946) relates the destruction of a rest house and ball field within Kolekole Gulch Park (Figure 39), and the park, apparently a favorite recreation spot for the employees of Hakalau Sugar Company, suffered such extreme damage that it did not officially reopen until over two years later (Honolulu Star-Bulletin 1948). Improvements for the park were tentatively proposed during December of that year and included the anticipated “construction of men’s and women’s bathhouses and toilets, water mains and sewerage, also grading of grounds and access roads” (The Honolulu Advertiser 1946).

The destruction from the tsunami was so severe that the Hawaii Railroad Company filed for abandonment soon thereafter, receiving permission to do so in December of 1946. Despite its destruction, the bridge-laden Hāmākua Division was later appropriated by the Territorial Government, who utilized the abandoned railroad alignment to construct the Hawai‘i Belt Road in the 1950s:

. . . the railroad asked shippers to determine whether they would use the line if it were rebuilt or were intending to ship their raw sugar by truck. Only Theo H. Davies Ltd. voted to retain the railroad; the rest voted to use the existing highways, despite their poor condition. Hawai‘i Consolidated Railroad then offered its entire right-of-way, including all bridges and tunnels, to the Territorial Highway Department and to the Hawai‘i County supervisors. Both agencies declined the railroad’s offer.

The entire railroad was sold as scrap to Gilmore Steel & Company of San Francisco for $81,000. About the time the scrappers had finished pulling up the rails and begun dismantling the steel bridges, the Territorial Highway Department changed its mind. They decided to improve the Hawai‘i Belt Road, along the Hāmākua Coast by relocating it to the railroad right-of-way and to utilize the railroad trestles as highway bridge supports. They bought the bridges still in place, as well as the parts of bridges already trucked to Hilo, for $303,723.53 – nearly four times the amount Gilmore Steel & Supply Company had paid to Hawai‘i Consolidated for the entire railroad. These railroad bridge elements were used for the Hawaii Belt Road. . . (MKE Associates LLC and Fung Associates, Inc. 2013:E8)
Kolekole Stream Bridge was reconstructed from older railroad trestles and girder spans as well as salvaged materials from the Wailuku River Bridge and Maulua Gulch Bridges (Figures 40 and 41), and it was one of 40 bridges built during the construction of the new highway (Figure 42). It was completed and dedicated in 1950 (Figure 43) and remains in its original location. The bridge carries the Hawai‘i Belt Road, the primary transportation artery for Hilo that extends along the Hāmākua coast, and thus over the study area. Pepe‘ekeo Sugar Company continued its operations, however following the 1946 *tsunami* and the subsequent loss of the railroad, cane was instead hauled from Honomū by truck to the Hilo port.

![Figure 37. Damaged Hawai‘i Consolidated Railroad Bridge crossing Kolekole Gulch on the day of the 1946 tsunami with the makai portion of study area visible below (https://www.hakalauhome.com/the-railroad.html).](https://www.hakalauhome.com/the-railroad.html)
2. Background

Figure 38. *Makai* portion of study area and damaged Hawai‘i Consolidated Railroad Bridge following the 1946 *tsunami* (https://www.hakalauhome.com/the-railroad.html).

Figure 39. Newspaper article from April 5, 1946 edition of the Honolulu Star-Bulletin (Honolulu Star-Bulletin 1946).
2. Background

Figure 40. Kolekole Stream Bridge under (re)construction, ca. 1950 (https://www.hakalauhome.com/new-highway-bridges-hakalau.html).

Figure 41. Staged construction materials in study area during reconstruction of Kolekole Stream Bridge ca. 1950 (https://www.hakalauhome.com/new-highway-bridges-hakalau.html).
2. Background

Figure 42. Newspaper clipping from a December 11, 1950 edition of the Honolulu Advertiser (https://www.hakalauhome.com/new-highwayd-bridges-hakalau.html).
2. Background

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Figure 43. Dedication of Kolekole Stream Bridge ca. 1950 (https://www.hakalauhome.com/new-highway-bridges-hakalau.html).

An archeological assessment of the County of Hawai’i’s Kolekole Gulch Park, Kuhua, South Hilo, Hawai’i
2. Background

The Development of Kolekole Gulch Park During the Second Half of the Twentieth Century

In the years following 1938 and the official transition of the study area into a county park, Kolekole Gulch Park remained a popular recreation spot, and was utilized by “the people of Honomu, Wailea and Hakalau for its unique swimming pool – ocean water where the tide was in at the lower end, and fresh water in the upper half” (Honolulu Star-Bulletin 1941). The destruction of the rest house and ball field that occurred in the park as a result of the 1946 tsunami did not deter the Territory of Hawaiʻi from investing in the park and initiating further improvements. Following the reopening of Kolekole Gulch Park in October 1948, in the wake of the tsunami, the Senate and House of Representatives authorized the construction of a pavilion within the park the following year (The Honolulu Advertiser 1949). Territory of Hawaii tax records (County of Hawaii 1944–1986) indicate that development of this phase of park facilities was undertaken in four separate building episodes between 1949 and 1966, with the first park facility (a 14 by 38-foot shower and lavatory structure; Figures 44 and 45) being constructed in 1949. However, the records do not substantiate the construction of a pavilion on park grounds.

Five years later in 1954, a 24 by 30-foot pavilion was erected. A violent storm ravaged Hilo later that year, and although “heavy seas covered most of the park area with big boulders” the pavilion structure remained undamaged (The Honolulu Advertiser 1954). In 1956, the Territory of Hawaiʻi conducted another survey for Kolekole Gulch Park and acquired an additional 2.565 acres of land immediately adjacent to the east and south boundaries of the original park footprint (Figure 46). Upon completion of the survey, the deed was formally transferred on February 14th, 1958 from Pepe’ekeo Sugar Company to the Territory of Hawaiʻi, and as a result the acreage of the park increased to 5.497 acres and now included a portion of Land Grant 616:2 to Kaawa.

In late December 1959, a tree planting ceremony and concert was held by the Hawaiʻi County Band in honor of two new pavilions that were recently constructed at Kolekole Gulch Park (Honolulu Star-Bulletin 1959), however, county tax records do not reflect the development of any new structures in the park during that year. An article published in the May 15, 1960 edition of the Honolulu Star Bulletin (Engledow 1960) indicates that at that time three pavilions were present within the park, two of which were constructed in the previous year (Figure 47). The third pavilion mentioned in the article is presumably the pavilion constructed in 1954, however no mention is made of the original shower/lavatory structure previously erected in 1949.

Less than two weeks later, on May 23, 1960, a devastating tsunami swept Hawaiʻi Island. The most severe impacts were experienced at the Waikākea Peninsula and in the general vicinity of Hilo Bay, with wave heights between Honomū and Hakalau spanning between 5 and 9 feet high (Kline 2016:15). The late Evelyn Lyn Kagawa of Hilo recalled the destruction left by the 1960 tsunami on the store (S. Hata Shoten, Ltd.) she and her husband managed on Kamehameha Avenue in downtown Hilo. An excerpt from an oral history interview conducted by the University of Mānoa’s Center for Oral History in 2000 is presented below, where Kagawa describes how they had taken rolls of fabric to Kolekole Gulch to clean it and dry it on the grassy lawn in the makai portion of the current study area:

We did find some material underneath all that mud and debris. The Y. Hata trucks came over and they put them on the back of the trucks, took ‘em out to Kolekole—I don’t know how we got there or why someone decided we should go there—and threw the material in at the top of the river and let it run down and let the water clean it. And then we laid it on the grass, the lawn over there, stretched out and dried it. And people came in to buy ten cents a yard, twenty-five cents a yard. And they bought it too. (Center for Oral History, University of Hawaiʻi 2000:213)

In the years following the 1960 tsunami, Kolekole Gulch Park remained a popular recreation spot for picnickers, campers, ball-players, swimmers, and fishermen (Figure 48). Although it is unclear from tax records and historical documentation what specific physical effects this tsunami had on Kolekole Gulch Park, the County of Hawaiʻi continued to revamp existing and develop new recreation facilities. Six months after the tsunami, a new 25 foot by 2 foot long concrete walkway was installed in the park by the Hilo Crescent City Lions Club as a public service, who also refurbished eight existing trash cans by painting and stenciling them (The Honolulu Advertiser 1960). A plan view prepared by the county in 1961 illustrates the layout of five pavilions and a toilet building (presumably the shower/lavatory structure built in 1949; Figure 49), and county tax records from 1962 confirm the construction of a new “pavilion”, which may actually be representative of some or all of the pavilions depicted on the plan view (see Figure 49). In 1966, the County of Hawaiʻi completed its final phase of development of park facilities with the addition of a restroom.

The red-roofed pavilion pictured on the grassy lawn area in Figures 44 and 45 is likely the original shower and lavatory building constructed in 1949. It is no longer present and was likely demolished sometime between 2009 and 2011 based on a review of historical Google Earth™ satellite imagery. The five extant pavilions in Kolekole Gulch Park were most likely constructed in 1962, and it is probable that the ancillary recreation features present within the

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park (e.g. mortared stone barbeque pits, outdoor shower and associated mortared stone wall segment, concrete stairway, and poured concrete slabs, and retaining wall) were added to the grassy lawn portion of the park between 1962 and the present day. A photograph taken sometime between 2000-2016 (Figure 50) shows four mortared stone barbeque pits, all of which are already filled in with concrete and rendered non-functional with the exception of the most southwestern pit which remained operational until at least 2016 (Figure 51). At the time of the current study, only two of the barbeque pits (see Figure 50) were identified, the others being previously demolished.

Figure 44. 2006 photo of original pavilion constructed in 1949 (with red roof), Epy Yadao pavilion in foreground (https://commons.wikimedia.org/wiki/File:Hawaii_Belt_Road_over_kolek.jpg).

Figure 45. 2009 photo of original pavilion (https://lovingthebigisland.wordpress.com/tag/leptospirosis/).
Figure 46. 1956 Territory of Hawai‘i map showing addition to Kolekole Gulch Park.
2. Background

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Figure 47. Newspaper article about Kolekole Gulch Park from the May 15, 1960 edition of the Honolulu Star-Bulletin (Engledow 1960).
2. Background

Figure 48. 1962 photograph of man fishing in Kolekole Stream (The Honolulu Advertiser 1962).
2. Background

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2. Background

Figure 50. Undated photograph of Kolekole Gulch Park showing the location of four barbeque pits and picnic tables on concrete slabs (http://onlyinhawaii.org/kolekole-beach-park-big-island-hawaii/).

Figure 51. A 2016 photograph of Kolekole Gulch Park showing barbeque pit prior to being filled in (http://www.trailblazerhawaii.com/2016_12_22_archive.html).

Barbeque pits identified during the current study
PREVIOUS ARCHAEOLOGICAL STUDIES

A search of archaeological reports filed with the DLNR-SHPD revealed that there have been no previous archaeological studies conducted specifically within Kolekole Gulch Park. However, several previous studies have been conducted in the vicinity of the study area in the neighboring ahupua’a of Hakalau Nui, Hakalau Iki, Wailea, and Kaiwiki 3. The most relevant of these studies are discussed below and presented in Table 2 and Figure 52.

Table 2. Previous archaeological studies conducted in the vicinity of the current study area.

<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Type of Study</th>
<th>Ahupua’a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994a</td>
<td>Walker and Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>1994b</td>
<td>Walker and Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>1998</td>
<td>Hammatt and Colin</td>
<td>Archaeological Assessment</td>
<td>Wailea</td>
</tr>
<tr>
<td>2001</td>
<td>Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>2004</td>
<td>Desilets et. al</td>
<td>Archaeological Inventory Survey</td>
<td>Wailea</td>
</tr>
<tr>
<td>2009</td>
<td>Rosendahl</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
<tr>
<td>2011</td>
<td>Escott</td>
<td>Archaeological Assessment</td>
<td>Kaiwiki 3</td>
</tr>
<tr>
<td>2014</td>
<td>ASM Affiliates</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Iki</td>
</tr>
<tr>
<td>2014</td>
<td>Haun and Henry</td>
<td>Archaeological Inventory Survey</td>
<td>Hakalau Nui</td>
</tr>
</tbody>
</table>

Figure 52. Previous archaeological studies conducted within the vicinity of the study area.
Among the earliest archaeological work to be done in East Hawai‘i was that of the early twentieth century heiau researchers Thur and Stokes (Stokes and Dye 1991; Thur 1908). No heiau were identified in the current study area or within the larger region spanning between Honomū and Hakalau. During the early 1930s, A.E. Hudson (Hudson 1932), working under the aegis of the Bernice Pauahi Bishop Museum, also conducted archaeological investigations in East Hawai‘i. He found little in the region surrounding the current area of study, although he did note the presence of a roughly .25-mile square area of kalo terraces north of the study area in the upper part of Hakalau Gulch (Hudson in Maly 1994).

Walker and Rosendahl (Walker and Rosendahl 1994a, 1994b) conducted an AIS of approximately 595 acres of land within TMKs: (3) 2-9-002 and 004 located north of the current study area within Hakalau Nui Ahupua‘a (see Figure 52). The study area was situated between the Hawai‘i Belt Road and the 1,500-foot elevation mark on the northern side of Hakalau Gulch. An initial, low-level aerial (helicopter) survey was conducted over some of the uncultivated portions of the study area. Other uncultivated areas were investigated using “variable-coverage (partial to 100%) variable-intensity ground survey” (Walker and Rosendahl 1994b:2). As a result of the survey, it was evident that the study area had been extensively modified during Historic times for commercial sugar cultivation. As a result of this, no archaeological sites were identified.

In 2001, Paul H. Rosendahl, Inc. (PHRI) (Rosendahl 2001) conducted a study of two former Historic cemeteries located within TMKs: (3) 2-9-002:001 (por.) and :083 (por.) (identified as Lots 5 and 10 of the Hakalau Estates Subdivision, respectively), both of which are located to the northwest of the current study area along the coastal bluffs (see Figure 52). With respect to Lot 5, Rosendahl (2001) sought to determine the status of the cemetery and identify potential impacts that would be caused by the sale of the property. As a result of the study, the cemetery was identified as an informal, plantation-era cemetery associated with the Hakalau Jodo Mission (locally referred to as the “Japanese Cemetery”). The cemetery was primarily utilized during the first third of the twentieth century and may held approximately 200 individuals. All of the graves were disinterred with a backhoe in the early 1970s by Homelani Memorial Park staff and were reinterred in that cemetery. Most of the individual internments consisted of deteriorated wooden coffins and skeletal remains. The grave monuments were generally reburied in the excavated pits after the remains were removed.

The study for Lot 10 was conducted in two stages; preliminary research and subsequent field inspection. The purpose of the study conducted by Rosendahl (2001) was to confirm the boundaries of what is referred to as the “Catholic Cemetery.” The initial research conducted for the study included oral history consultation with local informants familiar with the area. As a result of the study, Rosendahl (2001) concluded that the cemetery was an informal plantation-era cemetery with an overall total area estimated between 1 to 2 acres and held possibly 200 to as much as 250 internments of individuals of several ethnicities (Filipino, Portuguese, Puerto Rican), all of whom were likely mainly plantation employees and/or family members of the Catholic faith. They found that the cemetery was primarily utilized during the first half of the twentieth century, and, while a few of the graves were disinterred in the late 1970s by individual families; most of the graves remain in their original place. Some of the graves within the cemetery probably date to the end of the nineteenth century or early twentieth century.

Rechtman Consulting, LLC (Desilets et al. 2004) conducted an AIS and limited cultural assessment of three land parcels comprising 4.5 acres (TMK: (3) 2-9-003, 013, 029, and 060) to the north of the current study area in Wailea Ahupua‘a (see Figure 52). A systematic survey of the study area (TMKs: (3) 2-9-003:013, 029, 060) produced no evidence of traditional Hawaiian remains or evidence that the area was currently being accessed for the exercise of traditional and/or customary practices. A single Historic era site (Site 24212) with two associated features (Features 1 and 2) were recorded as a result of the study. This site consisted of two features situated in the northwestern portion of the study area that were interpreted as being associated with the Hämākua Division of Hilo Railroad-Hawai‘i Consolidated Railway. Feature 1 consisted of a possible 10to 15-meter long and 4-meter wide section of the former Hawai‘i Consolidated Railway railroad grade section of railroad grade. Feature 2 consisted of a railroad trestle abutment that formerly crossed Kaahakini Gulch. Site 24212 was actively utilized by the railroad between 1911 to 1946, and primarily served to facilitate the transport of raw sugar from the many mills along the Hilo and Hāmākua Coasts to the harbor at Hilo Bay. In later years, they also served the secondary function of facilitating tourism.

While no archaeological studies have been undertaken explicitly for Kolekole Gulch Park, an archaeological survey was undertaken in support of an Environmental Assessment (EA) for the seismic retrofitting of Kolekole Bridge by Cultural Surveys Hawai‘i, Inc. (Hammatt and Colin 1998) in 1998 (see Figure 52). The survey area included of “the slopes of Kolekole Gulch under and surrounding the Kolekole Bridge and approximately 100.0 feet of the slopes mauka and makai of the bridge” as well as “any access route to the gulch or other areas which would be used during construction of the bridge improvements” (Hammatt and Colin 1998:i and 1). Based upon the area of study encompassed by the scope of work, the investigated area presumably included portions of the current study area.
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however the park and its facilities were not acknowledged in the study. As a result of the study, square footings from the pre-1946 Kolekole Bridge were noted outside the study area and a cylindrical cement footing was observed in the middle of Kolekole Stream. No other cultural remains were observed.

In 2009, the Kolekole Stream Bridge (Site 50-10-26-09090), which was originally constructed as part of the Hawai‘i Consolidated Railway in 1911 and later reconstructed in 1950-1953 as part of the “Seismic Wave Damage Rehabilitation Project”, was nominated for the State Register of Historic Places (SIHP) under Criteria a, b, and c. The Bridge’s nomination form states that the bridge is applicable for Criterion a for its association with the Hilo Railroad Company, Criterion b for its association with three founders of the Hilo Railroad Company, and Criterion c is applicable since the bridge is a representative example of early twentieth-century technology.

The nomination form goes on to state that the bridge was assembled from parts of a number of railroad bridges, and that its unusual construction type contributes to the historic character and feeling for the bridge. Kolekole Stream Bridge now carries the Hawai‘i Belt Road across Kolekole Gulch, and the bridges’ right-of-way along the gulch floor is adjacent to the northeastern boundary of the current study area.

PHRI (Rosendahl 2009) conducted an AIS and Cultural Impact Assessment (CIA) for an 8.7-acre property in Hakalau (TMKs: (3) 2-9-002:079 and 081) situated along the coastal bluffs to the north of the current study area (see Figure 52). The purpose of the study was to determine the general nature, extent, and potential significance of any archaeological-historical remains present, the historic preservation implications of any such remains for the feasibility of proposed residential development, and the general scope of work and level of effort for any subsequent archaeological-historic preservation work that might be needed. As a result of the fieldwork, two archaeological sites were identified: Site 26591, which consists of two warehouses (Features A and B) and associated foundation remnants (Features C thru I); and Site 26592, the site of the former Japanese/Korean cemetery (previously documented by PHRI (2001) but never assigned an SIHP number). Site 26591 was assessed as significant under Criteria a, c, and d, and Site 26592 was assessed for significance under Criteria d and e. With respect to Site 26591 Features A and B, Rosendahl (2009) recommended preservation with interpretive development and suggested renovation, and data recovery was the recommended treatment for Site 26592.

In 2011, Scientific Consultant Services, Inc. (Escott 2011) conducted an archaeological assessment of a 3.5-acre parcel in the adjacent ahupua‘a of Kaiwiki 3, directly north of the current study area along the northern bank of Kolekole Stream (see Figure 52). No archaeological resources were identified as a result of the study.

In 2014, ASM Affiliates (in prep) conducted an AIS of 31.02 acres of land (TMK: (3) 2-9-002:001) within Hakalau Iki Ahupua‘a, to the northwest of the study area for the proposed development of a single-family dwelling (see Figure 52). As a result of the study, three newly identified archaeological sites were recorded within the study area and assigned temporary site numbers (T-1 through T-3). These sites consisted of a stone and mortar Historic foundation structure (T-1), the ruins of a Historic wooden structure (T-2), and a project area-wide complex of features pertaining to commercial sugarcane cultivation (T-3). Additionally, an 800-meter long section of the Hawai‘i Consolidated Railway Hāmakua Division rail bed (Site 24212) previously identified by Rechtman Consulting, LLC (Desilets et al. 2004) was recorded, along with its associated Historic structural elements including an earthen berm, possible flume remnants, roads, and ditches. A tunnel and culvert for storm water run-off associated with Site 24212 was also recorded. Although fieldwork was completed, the proposed project is indefinitely on hold, and a report has not yet been finalized or submitted to DLNR-SHPD for review.

Haun and Henry (2014) conducted an AIS of a 2.332-acre parcel (TMK: (3) 2-9-002:083) within the neighboring ahupua‘a of Hakalau Nui to the northwest of the current study area (see Figure 52). A portion of this parcel was also investigated by Rosendahl (2001). As a result of the study, Haun and Henry (2014) identified the remnants of a plantation hospital (Site 30085), a concrete culvert that extended over a ditch (Site 30086) and the former location of the Japanese cemetery (Site 30087) previously documented during the Rosendahl (2001) study that existed within the project area prior to reinternment. Preservation was the recommended treatment for the cemetery location (Site 30087) and no further work was recommended for Sites 30085 and 30086.
3. STUDY AREA EXPECTATIONS

The culture-historical context presented above for Kolekole Gulch Park, the ahupua’a of Kuhua, and the South Hilo District, combined with the summary of previous archaeological research conducted in the vicinity of the study area, provides a basis for predicting the type and location of archaeological resources that may be present within the current study area. During the Precontact Period, the lowland portion of South Hilo was region thriving with traditional Hawaiian habitation and cultivation. The bottom-lands of the larger gulches, such as Kolekole Gulch, where fresh water was easily obtained, were well-suited to both traditional habitation and agriculture. Although Kolekole Gulch is not an entirely sheltered bay, it afforded relatively easy access to marine resources and the sea, and may have been a preferred location for early habitation. Houses of Hawaiian families would have been clustered inland of the rocky beach, and the staple crop kalo (taro) was once likely grown in watered terraces (lo‘i) adjacent the stream’s edge, along with ‘uala (sweet potatoes), mai’a (bananas), and kō (sugarcane), kukui (candlenut), ‘ulu (breadfruit), and niu (coconuts). The traditional coastal foot trail through the South Hilo District (the alalaoa) would have wound through Kolekole Gulch in the vicinity of the study area, providing access to the adjacent tablelands, and points further east and west.

While traditional residency and cultivation may have continued within the study area during the early Historic Period, following the Māhele ʻĀina of 1848, Kuhua Ahupua’a became Government Land, and the makai portions of the ahupua’a (including the current study area) were subsequently divided up (as land grants) and sold to private land owners. Kolekole Park includes portions of two former grant parcels (Grant Nos. 616 and 2933) purchased by Kaawa in 1851 and 1863, respectively. While the specific use of these grant parcels is not known, Historic maps indicate that Kaawa’s house was located on the tablelands to the southeast of the study area, and not within the gulch lands. By the mid- to late 1800s the Government Road, or Alamu‘i Aupuni (approximating the current route of the Old Mamālahoa Highway along the eastern and southern boundaries of the study area), had replaced the alalaoa as the primary transportation route through the district.

By the late nineteenth century, the lands encompassed by the current study area, like much of the arable land in the South Hilo District had been planted in sugarcane by commercial sugar growers. Modern/Historic development of the lands in and around the study area began during the 1880s, but rapidly accelerated during the middle Historic Period as the commercial sugar industry expanded, and associated railroad infrastructure was developed to spur that economic growth. By the early twentieth century, a railroad had been built from Hilo to Hakalau that included a bridge crossing Kolekole Gulch, fronting the current study area at the ocean. Photographs of this bridge show the flat lands adjacent to the stream (within the current study area) planted in sugarcane (see Figures 30 and 31). While the railroad was abandoned following the April 1, 1946 tsunami, the sugar industry persisted in the South Hilo District until 1994. The railroad bridge across Kolekole Gulch was destroyed by the 1946 tsunami, but the Kolekole Stream Bridge was rebuilt and reopened for vehicular travel along the Hawai‘i Belt Road in 1950, which replaced the old Mamālahoa Highway, and remains in use to this day. As can be seen in Figures 40 and 41, the staging area for the reconstruction of the bridge was situated within the current study area.

In separate purchases in 1938 and 1956, the Territory of Hawai‘i acquired the lands that now make up Kolekole Gulch Park from the Honomū (and later Pepe’ekeo) Sugar Company. Since 1938 the park has been a favored destination for recreation along the South Hilo coast. Early park facilities, built prior to 1946, and in ca. 1949 to 1959, were mostly destroyed by the 1946 and 1960 tsunamis (one bathroom built in 1949 seems to have survived until ca. 2016, when it was demolished and removed). The existing structures and facilities within the park were built following the 1960 tsunami, and have been continually maintained by the County of Hawai‘i up to the point when the park closed to the public in June of 2017 (due to lead contamination in the soil).

Given the history of tsunami and periodic flooding within Kolekole Gulch, the former commercial cultivation of sugarcane adjacent to the stream, construction activities associated with Kolekole Stream Bridge, and prior park development, the likelihood of encountering Precontact or early Historic Period sites within the study area (surface or subsurface) is extremely remote. Prior archaeological studies conducted in the vicinity of the study area indicate a general lack of Precontact Period features, but have documented numerous features related to Historic Period sugarcane cultivation and railroad transportation. It is possible that Historic infrastructure related to the former use of Kolekole Park for sugarcane cultivation, or the adjacent bridge for railroad transportation, may be present within the study area, but again this is unlikely given the reasons listed above, particularly the history of park development. In regards to the park, some of the existing facilities (pavilions) may be more than fifty years old, and if so, will need to be assessed for their potential to be considered significant historic properties under the Hawaii Register of Historic Places (HRHP) significance criteria.
4. FIELDWORK

Fieldwork was conducted on December 4, 2018 by Matthew Clark, M.A., Genevieve Glennon B.A., Joshua Gastilo M.A., and Lauren M. U. Kepa’a. Fieldwork consisted of pedestrian survey with 100% coverage of the study area. The survey crew walked systematic transects across the survey area between Kolekole Stream and the Old Māmālahoa Highway with spacing between crew members of no more than 15 meters. Visibility of the ground surface was excellent within the lawn area adjacent to the stream, and adequate for identifying any historic properties that may have been present beneath the more densely vegetated area along the steep, eastern slope of Kolekole Gulch. The study area and the existing park facilities were photographed using a Canon EOS Rebel T6 camera and a Phantom 4 Pro Unmanned Aerial Vehicle (UAV) operated by a licensed pilot.

FINDINGS

No archaeological resources were identified within Kolekole Park as a result of the current study, and field observations of past ground disturbance, combined with the results of prior studies conducted in the area, indicate that subsurface archaeological resources are unlikely to be encountered in the areas proposed for park rehabilitation.

The background research presented above indicates that the five existing park pavilions, and some of the associated ancillary structures within the park, were built shortly after the 1960 tsunami and may be slightly more than 50 years old. These structures, consisting of the cinder block Epy Yadao Pavilion and four pole structure pavilions (see Figures 11 to 16), which will be repaired as part of the planned improvements to Kolekole Park, are not considered significant historic properties, however. Although the pavilions and associated park structures post-date the 1960 tsunami, their presence or creation is in no way directly associated with that event. Furthermore, they are not directly associated with important persons of Hawai’i’s past. Architecturally, all of these structures are nondescript and fail to embody distinctive characteristics that would make them significant. Moreover, the information gleaned from the current study with respect to these potential resources and ancillary features cannot be said to play a significant role in Hawai’i’s prehistory or history. As a public County of Hawai’i park facility, Kolekole Gulch Park has been important to locals and tourists alike since its establishment in 1938, however, the existing structures bear no known direct association to ongoing cultural practices, traditional beliefs, events, or oral history of native Hawaiians or other ethnic groups. As such, the existing pavilions are not considered significant under any of the Hawai’i Register of Historic Places (HRHP) significance criteria, and therefore no SIHP Site numbers were assigned to them. They are not discussed further in this report.

CONCLUSION AND RECOMMENDATIONS

The proposed infrastructure rehabilitation, and addition of a comfort station and septic system, will restore Kolekole Gulch Park to its former capacity as a gathering place for community and ‘ohana (family), and will help ensure the safety of all visitors. Kolekole Gulch Park, since its inception in 1938, has historically been acknowledged as the heart of recreation for this portion of the South Hilo coastline. Its revitalization is crucial to bridging and maintaining the bond between Kolekole’s past and present, and ensuring that the generations to come will be able to partake in its splendor. Thus, given the negative findings of the current study with respect to archaeological sites, the determination of effect for the County of Hawai’i’s Kolekole Gulch Park project is “no historic properties affected.” No further historic preservation work is recommended for the current park project. In the unlikely event that any unanticipated archaeological resources are unearthed during development activities, work in the immediate vicinity of the finds will be halted and DLNR-SHPD contacted in compliance with HAR 13§13-280.
REFERENCES CITED


Center for Oral History, University of Hawai‘i 2000 Tsunamis Remembered: Oral Histories of Survivors and Observers in Hawai‘i Volume I.


1961 *Original Land Titles in Hawai‘i*. Privately published.


Desilets, M., A. Kasberg, and R. Rechtman

Desilets, M., and R. B. Rechtman

Dorrance, W., and F. Morgan

Duarte, T.

Ellis, W.

Engledow, E.

Escott, G.

Evening Bulletin Industrial Edition

Fornander, A.


Greene, L.

Griffin, P. B., P. H. Rosendahl, and H. D. Tuggle
<table>
<thead>
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<th>References Cited</th>
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<tr>
<td>Hammatt, H., and B. Colin</td>
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<tr>
<td>Handy, E. S. C., and E. G. Handy</td>
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<tr>
<td>Haun, A., and D. Henry</td>
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<td>Hitch, T.</td>
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<tr>
<td>Hommon, R.</td>
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<tr>
<td>Honolulu Star-Bulletin</td>
</tr>
<tr>
<td>Hudson, A.</td>
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<tr>
<td>I‘i, J. P.</td>
</tr>
<tr>
<td>Jarves, J.</td>
</tr>
<tr>
<td>1847 <em>History of the Hawaiian Islands: embracing their antiquities, mythology, legends, discovery by Europeans in the sixteenth century, re-discovery by Cook, with their civil, religious and political history, from the earliest traditionary period to the present time</em>. C. E. Hitchcock, Honolulu.</td>
</tr>
<tr>
<td>Kamakau, S.</td>
</tr>
<tr>
<td>1991 <em>Tales and Traditions of the People of Old, Nā Mo‘olelo a ka Po‘e Kahiko</em>. Bishop Museum Press, Honolulu, Hawai‘i.</td>
</tr>
</tbody>
</table>

King, R.  

Kirch, P.  

Klein, G., M. Koob, and D. Lee  

Kline, M.  
2016 Modeling Potential Impacts of Tsunamis on Hilo, Hawaii Comparison of the Joint Research Centre’s Schema and FEMA’s Hazus Inundation Scenarios. University of Southern California.

Kuykendall, R.  

Kuykendall, R., and A. G. Day  

Lydgate, J. M.  
1919 Notes From Hawaii. *The Garden Island,* August 12, 1919, p. 3.

Lyman, C.  
1925 *Around the Horn to the Sandwich Islands and California, 1845-1850.* Yale University Press, New Haven.

Malo, D.  
References Cited

Maly, K.

2002 The Māhele ‘Āina (The Land Division) an Overview of Documentation Found in the Claims and Awards of the Māhele. Kumu Pono Associates, LLC.

Maly, K., and O. Maly
2002 He Wahi Mo’olelo No Ka ‘Āina A Me Nā ‘Ohana O Waiki’i Ma Waikōloa (Kalana O Waimea, Kohala), A Me Ka ‘Āina Mauna: A Collection of Traditions and Historical Accounts of the Lands and Families of Waiki’i at Waikōloa (Waimea Region, South Kohala), and the Mountain Lands, Island of Hawai‘i (TMK Overview Sheet 6-7-01). Kumu Pono Associates Report HiWaikii61-111202. Prepared for Waiki‘i Ranch Homeowner’s Association, Kamuela, Hawai‘i.


MKE Associates LLC, and Fung Associates, Inc.
2013 Hawaii State Historic Bridge Inventory And Evaluation. Prepared for State of Hawai‘i, Department of Transportation, Highway Division, Honolulu.

Oliver, D.

PHRI

Pogue, J. F.

Rechtman, R. B., and K. Maly

Restarick, H.

Rosendahl, P.


60 An archeological assessment of the County of Hawai‘i’s Kolekole Gulch Park, Kuhua, South Hilo, Hawai‘i
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<thead>
<tr>
<th>Year</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1916</td>
<td>. The Honolulu Advertiser, August 26, 1916, p. 6. Thrum, T.</td>
</tr>
<tr>
<td>1937</td>
<td>Kolekole Stream To Be Improved. The Honolulu Advertiser, April 29, 1937, p. 11. Thurston, L.</td>
</tr>
</tbody>
</table>
Walker, A., and P. H. Rosendahl


Wilkes, C.

Wilmshurst, J., T. Hunt, C. Lipo, and A. Anderson
December 27, 2019

Mr. Kevin Sakai, Parks Project Manager
County of Hawaii
Department of Parks and Recreation
101 Pauahi Street, Suite 6
Hilo, Hawai‘i 96720
kevin.sakai@hawaiicounty.gov

Dear Mr. Sakai:

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Request for Concurrence with “No Historic Properties Affected”
Archaeological Assessment for the Kolekole Gulch Park Improvements
Kuhua Ahupua‘a, South Hilo District, Island of Hawai‘i
TMK: (3) 2-8-015:015

This letter provides the State Historic Preservation Division’s (SHPD’s) review of the County of Hawai‘i Department of Parks and Recreation’s (County of Hawai‘i DPR) project and request for SHPD’s concurrence with an HRS 6E project effect determination of “no historic properties affected” and the draft archaeological report titled, An Archaeological Assessment for the County of Hawai‘i’s Kolekole Gulch Park Accessibility Improvements Project, Kuhua Ahupua‘a, South Hilo District, Island of Hawai‘i, Hawai‘i (TMK (3)2-8-015:015 (Glennon et al., August 2019). On August 7, 2019, SHPD received a letter dated August 7, 2019 from County P&R, along with an HRS 6E Submittal Form, and the draft archaeological assessment (AA) report (Log No. 2019.01792). SHPD previously received a copy of the draft AA report from ASM Affiliates on August 5, 2019 (Log No. 2019.01740). The proposed project is subject to compliance with historic preservation review under Hawaii Revised Statutes (HRS) §6E-8. The project area is the entire 5.497-acre parcel.

ASM Affiliates conducted the archaeological inventory survey (AIS) at the request of Ron Terry of Geometrician Associates, LLC, on behalf of County of Hawai‘i DPR, in support of the proposed improvements to existing park facilities that include the following:

- converting the existing men’s and women's restrooms into single-occupant accessible restrooms;
- providing a new accessible comfort station; repairing and making general safety improvements to existing pavilions;
- providing a single new pavilion;
- providing drainage improvements for existing shower area to prevent runoff from eroding the riverbank and entering the river or shoreline area;
- replacing the existing shower with an accessible unit;
- addressing drainage problems near pavilions;
- removing nuisance non-native trees that may pose a risk to park facilities or users throughout the park site;
- repaving the existing parking lot; and
- improving the stability and integrity of the driveway. The project will also repave the existing paved parking lot and access road.
Mr. Sakai  
December 27, 2019  
Page 2

The AIS included a pedestrian survey of the entire project area; no subsurface testing was conducted. No previous archaeological inventory surveys were conducted for the project area. Several existing park pavilions and ancillary structures within the park were built shortly after the 1960 tsunami but have been determined to not be significant under any of the Hawai‘i Register of Historic Places (HRHP) significance criteria. Due to the negative AIS results, the report is presented as an archaeological assessment report (AA) per HAR §13-275-5(b)(5)(A). SHPD concurs with the report recommendation of no further historic preservation work for the current project.

The report meets the minimum requirements of HAR §13-276-5. It is accepted. Please send two hard copies of the document, clearly marked FINAL, along a copy of this acceptance letter and a text-searchable PDF of the report to the Kapolei SHPD office, attention SHPD Library.

Based on the AA report results, SHPD concurs with the County of Hawai‘i DPR’s project effect determination of “no historic properties affected.” As stipulated in HAR §13-275-7(e), when the SHPD agrees that the action will not affect any significant historic properties, this is the SHPD’s written concurrence and the historic preservation review ends. The historic preservation review process is ended.

Please contact Sean Nāleimaile at (808) 933-7653 or at Sean.P.Naleimaile@hawaii.gov for questions regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD  
Administrator, State Historic Preservation Division  
Deputy State Historic Preservation Officer

cc. Matt Clark, mclark@asmaffilistes.com  
Mark Grant, mark.grant@epinc.pro  
Ron Terry, rterry@hawaii.rr.com
Kolekole Gulch Park Accessibility Improvements

Environmental Assessment

APPENDIX 4
Hazardous Materials Reports and Fact Sheet
Introduction

This fact sheet provides information on the State of Hawai‘i Department of Transportation (HDOT) Lead-Impacted Soil Response Action for Kolekole Gulch Park. Under the oversight of the Hawaiʻi Department of Health (HDOH) Hazard Evaluation and Emergency Response Office (HEER Office), a response action has begun for assessment of lead-impacted soil found around Kolekole Stream Bridge and within Kolekole Gulch Park. Park users and especially young children are advised to avoid bare soil exposures and maintain good hygiene, including washing hands before eating, and cleaning soil from shoes and personal items prior to leaving the park.

Site Description and Previous Uses

The Project site is located beneath Kolekole Stream Bridge. Kolekole Stream runs northwest and adjacent to the Project site. Access to the Project site is via Old Mamalahoa Highway. Kolekole Gulch Park is located southwest and adjacent to Kolekole Stream Bridge.

Kolekole Stream Bridge was originally part of a railroad that was rebuilt in 1950 to be used by cars. Lead paint removal from the bridge was completed in 2001.

Characterization of Contamination

Soil sampling and analysis results show that lead-impacted soils are present in the park area under and Mauka of Kolekole Stream Bridge. Lead was found in soils at concentrations exceeding action levels established by HDOH for public parks. The presence of lead in soil above the HDOH action level does not necessarily indicate a risk to users of the park. It does, however, indicate that precautions are necessary to minimize exposure as cumulative lead exposure has shown to adversely impact human health. Lead is especially harmful to children who accidentally eat small amounts of lead-impacted soil or lead containing paint on a regular basis. Lead is more harmful to children than adults because it can accumulate and persist in their bodies, and young children are more sensitive to its potentially harmful effects.

The full extent of lead-impacted soil has not been delineated. The grass cover in the park helps to minimize exposure, but mud that may come up through the grass on wet days would increase potential for exposure. If soil or mud exposure should occur, hands should be washed off, and shoes should be washed off before leaving the park to prevent spreading potentially lead-impacted soil. Additional delineation assessment is planned. A map showing the areas that have been found to be impacted by lead (i.e. lead in soils below grass or gravel at surface) during initial testing is provided on the next page.

The reported concentrations of lead in the soil are similar to what is typically found along a busy roadside. In this case the lead in soil might also be related to historic, lead-based paint used on Kolekole Stream Bridge (during 1950 -2000). Lead-based paints were commonly used in the past and may have been released to soil as it aged and became weathered or through past maintenance activities. Accidentally swallowing lead-impacted soil or very small lead containing paint chips, would be the major route of potential exposure at the site. Harmful health effects from swallowing the lead impacted soil and lead containing paint chips will depend upon the levels of lead in the soil and paint, the quantity of soil and paint that were ingested, and the frequency for which the soil and paint were ingested. The soil and sediment inside the stream and along the stream bank have not yet been tested for lead; however, elevated lead concentrations are not expected in the stream or adjacent rocky banks where periodic flash flooding over the years would remove fine soils or very small paint chips. Additional assessment of soil along the stream banks is planned.

Response Actions

Through HDOT coordination with the HDOH HEER Office, various response actions for the impacted soil were identified.

As a temporary measure to minimize exposure of the public to the impacted soils, bare soil in areas where elevated concentrations of lead were found will be covered using material such as gravel or sod. In addition, caution signs will be posted in these areas, and an assessment of hazards for the general public is underway. Once lead impacts are fully delineated at the site, long-term options will be evaluated (to include public input) and an action plan selected and approved by the HDOH HEER Office will be implemented.
Additional sampling and analysis of soils at the Project site should be completed in summer 2017, and this Fact Sheet will be updated to reflect the new findings.

The public is encouraged to comment on or ask questions regarding the site response actions. Written comments can be directed to John Peard (HDOH HEER Office) by email at randall.peard@doh.hawaii.gov or by mail at 1582 Kamehameha Avenue, Hilo, Hawai`i 96720, or by phone at 808-933-9921 or Tim Sakahara (HDOT) by email at Timothy.J.Sakahara@hawaii.gov.

Map of Lead-impacted soil from Kolekole Gulch Park Environmental Assessment
SUPPLEMENTAL HAZARDOUS MATERIALS SURVEY AND SOIL SCREEN REPORT

KOLEKOLE GULCH PARK ACCESSIBILITY IMPROVEMENTS PROJECT
28-1908 MAMALAOA HIGHWAY
HONOMU, HAWAII 96728

Prepared for:
ENGINEERING PARTNERS, INC.
P.O. Box 4159
Hilo, Hawaii 96720

Prepared by:
LEHUA ENVIRONMENTAL INC.
P.O. Box 1018
Kamuela, Hawaii 96743

July 15, 2019
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Kolekole Gulch Park Accessibility Improvements Project

July 15, 2019
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</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
</tbody>
</table>
1.0 CERTIFICATIONS AND LIMITATIONS

Lehua Environmental Inc. (LEI) has completed this supplemental hazardous materials survey and soil screen for the Kolekole Gulch Park Accessibility Improvements Project located at the Kolekole Gulch Park located at 28-1908 Mamalahoa Highway in Honomu, Hawaii. This supplemental hazardous materials survey and soil screen report is a supplement to the December 24, 2009, Hazardous Material Survey Report completed by MNA & Associates. LEI’s findings and recommendations contained herein are based on research, site observations, government regulations and laboratory data, which were gathered at the time and location of the study. Opinions stated in this report do not apply to changes that may have occurred after the services were performed.

LEI has performed specified services for this project with the degree of care, skill and diligence ordinarily exercised by professional consultants performing the same or similar services. No other warranty, guarantee, or representation, expressed or implied, is included or intended; unless otherwise specifically agreed to in writing by both LEI and LEI’s Client.

This report is intended for the sole use of Engineering Partners, Inc., exclusively for the Subject Site. Engineering Partners, Inc. may use and release this report, including making and retaining copies, provided such use is limited to the particular site and project for which this report is provided. However, the services performed may not be appropriate for satisfying the needs of other users. Release of this report to third-parties will be at the sole risk of LEI’s Client and/or said user, and LEI shall not be liable for any claims or damages resulting from or connected with such release or any third party’s use or reuse of this report.

Prepared By:

Kamalana Kobayashi
State of Hawaii Certified Asbestos Inspector
Certification #: HIASB-0613, Expires: 6/18/19
State of Hawaii Certified Lead Risk Assessor
Certification #: PB-0132, Expires: 5/16/21

Date: July 15, 2019
2.0 EXECUTIVE SUMMARY

This report describes the results of LEI’s supplemental hazardous materials survey and soil screen (Survey) for the Kolekole Gulch Park Accessibility Improvements Project located at the Kolekole Gulch Park located at 28-1908 Mamalahoa Highway in Honomu, Hawaii (Subject Site). This supplemental hazardous materials survey and soil screen report is a supplement to the December 24, 2009, Hazardous Material Survey Report completed by MNA & Associates (Previous Report). The Survey and review of the Previous Report for the Subject Site was conducted in support of a planned ADA renovation project. All site work for this Survey was completed from November 6-23, 2018 at the Subject Site.

Project Scope and Objectives
The objective of the Survey was to identify the existence (if any), extent, and condition of any asbestos-containing material (ACM), lead painted surfaces including lead-containing paint (LCP) and lead-based paint (LBP), arsenic-containing building materials (ArCBM), mercury-containing lamps and polychlorinated biphenyl (PCB) containing light ballasts and the presence of arsenic-, lead- and organochlorinated pesticide-contaminated soil around the structures, walkways and parking area at the Subject Site not included in the Previous Report, so that the information can be incorporated in the design.

Summary of Supplemental Hazardous Materials Survey
During LEI’s supplemental hazardous materials survey, ACM, LCP and LBP were identified at the Subject Site. The following summarizes these hazardous materials identified during LEI’s survey:

Summary of ACM Survey
The following table lists the ACM determined to have regulated asbestos content greater than 1% at the Subject Site. Figure 2 located in Appendix II identifies the location of the identified ACM at the Subject Site. Photograph Logs 1 in Appendix III identifies the observed ACM. The laboratory results are included in IV.

<p>| Identified Asbestos-Containing Material (ACM) |
| Kolekole Gulch Park Accessibility Improvements Project |</p>
<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Room/Area</th>
<th>Homogeneous Areas</th>
<th>Material</th>
<th>Color/Description</th>
<th>Friable</th>
<th>Type</th>
<th>Cond.</th>
<th>Est. Amt. of Material (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 4</td>
<td>Roof</td>
<td>Bathroom exhaust pipe seal</td>
<td>Mastic</td>
<td>Black</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>2</td>
</tr>
</tbody>
</table>
Summary of Lead Paint Survey
Paint chip laboratory results indicated that fifty-four (54) sampled painted building components contained detectable concentrations of lead at levels less than 5,000 mg/kg or were identified to have an elevated laboratory detection limit and are considered and/or assumed to be Lead-Containing Paint (LCP). Four (4) of the sampled painted building components contained lead in excess of the EPA/HUD guideline of 5,000 mg/kg and are considered to be Lead-Based Paint (LBP). Figure 1 located in Appendix II identifies the building descriptions listed in the table below. Photograph Log 2 in Appendix III identifies the LCP and LBP at the Subject Site. The following table lists the identified and assumed LCP and LBP building components at the Subject Site.

### Identified Lead-Containing Paint Building Components
Kolekole Gulch Park Accessibility Improvements Project

<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Description</th>
<th>Color</th>
<th>Substrate</th>
<th>Cond.</th>
<th>LCP or LBP?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 3</td>
<td>Ceiling beam</td>
<td>Red</td>
<td>Wood</td>
<td>Poor</td>
<td>LBP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Ceiling beam and rafter</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Bench</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>BBQ pit</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Ceiling</td>
<td>Brown</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Conduit</td>
<td>Red</td>
<td>Plastic</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>Brown</td>
<td>CMU</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>White</td>
<td>CMU</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom exterior)</td>
<td>White</td>
<td>CMU</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom interior)</td>
<td>Yellow</td>
<td>Wood</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Door Jamb</td>
<td>Yellow</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom exterior)</td>
<td>White</td>
<td>Wood</td>
<td>Poor</td>
<td>LBP</td>
</tr>
<tr>
<td>Bldg.</td>
<td>Description</td>
<td>Color</td>
<td>Substrate</td>
<td>Cond.</td>
<td>LCP or LBP?</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------</td>
<td>-------</td>
<td>-----------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Conduit</td>
<td>White</td>
<td>Plastic</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Stall Door (Women’s Bathroom)</td>
<td>Yellow</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling (Pavilion)</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Support posts</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling</td>
<td>Brown</td>
<td>Metal</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling beams and rafters</td>
<td>Brown</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>6” Support pipe</td>
<td>White</td>
<td>Metal</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling beam and rafters</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling (Women’s bathroom)</td>
<td>White</td>
<td>Wood</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Sign</td>
<td>Brown</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Sign</td>
<td>Yellow</td>
<td>Wood</td>
<td>Fair</td>
<td>LBP</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Pipe</td>
<td>Red</td>
<td>Metal</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Ceiling beams and rafters</td>
<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Conduit</td>
<td>Red</td>
<td>Plastic</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Side Bench</td>
<td>Green</td>
<td>Wood</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Pipe</td>
<td>Red</td>
<td>Metal</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Conduit</td>
<td>Red</td>
<td>Plastic</td>
<td>Fair</td>
<td>LCP</td>
</tr>
</tbody>
</table>
### Continued - Identified Lead-Containing Paint Building Components
**Kolekole Gulch Park Accessibility Improvements Project**

<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Description</th>
<th>Color</th>
<th>Substrate</th>
<th>Cond.</th>
<th>LCP or LBP?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 6</td>
<td>Ceiling beams and rafters</td>
<td>Tan</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>BBQ pit</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Railing</td>
<td>Yellow</td>
<td>Metal</td>
<td>Poor</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Ceiling beams and rafters</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Ceiling beams and rafters</td>
<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Conduit</td>
<td>White</td>
<td>Plastic</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>Roof supports</td>
<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>LCP</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>Attic/Crawl space</td>
<td>Blue</td>
<td>Wood</td>
<td>Poor</td>
<td>LBP</td>
</tr>
</tbody>
</table>

**Summary of Arsenic-Containing Building Materials (ArCBM) Survey**

During this survey, LEI inspected the Subject Site for previously unidentified ArCBM. None were observed; therefore, no samples were collected.

**Summary of Mercury-Containing Lamps/switches and PCB-Containing Light Ballasts Survey**

During this survey, LEI inspected the Subject Site for previously unidentified mercury-containing lamps/switches and PCB-containing light ballasts. None were observed at the Subject Site during this Survey.
Summary of Multi-Increment Sampling Soil Screen Survey

The purpose of the soil screen survey was to evaluate the presence (if any) and concentrations of arsenic, lead and organochlorinated pesticide-contaminated soil around the structures, walkways and parking area at the Subject Site, so that the information can be incorporated in the design. The results of the soil screen survey were used to determine if these soils may pose a potential health risk to construction workers and the general public during the renovation work at the Subject Site and to determine appropriate soil management and disposal practices.

The multi-increment sampling (MIS) soil screen at the Subject Site was conducted on October 5, 2018 and included a surface (0”-6” bgs) and subsurface (6”-12” bgs) soils screen for the contaminants of potential concern (COPC) at the Subject Site with established Department of Health (DOH) Environmental Action Levels (EALs) to be disturbed during this project. Laboratory analytical results of the soil samples were used to determine if the surface and/or subsurface soils contain COPC that exceed applicable DOH Environmental Action Levels (EALs) for residential (unrestricted) and commercial/industrial (restricted) land use.

The Decision Units (DUs) at the Site were based on the planned soil disturbance activities at the Subject Site and included the following locations:

- DU-1: Perimeter of Pavilion 4, 0”-6” bgs
- DU-2: Perimeter of Pavilion 4, 6”-12” bgs
- DU-3: Perimeters of Pavilion 2, Pavilion 6 and Pavilion 7, 0”-6” bgs
- DU-4: Perimeters of Pavilion 2, Pavilion 6 and Pavilion 7, 6”-12” bgs
- DU-5: Perimeter of Pavilion 3, 0”-6” bgs
- DU-6: Perimeter of Pavilion 3, 6”-12” bgs
- DU-7: Planned Soil Disturbance Area “A” (East Field), 0”-6” bgs
- DU-8: Planned Soil Disturbance Area “A” (East Field), 6”-12” bgs
- DU-9: Planned Soil Disturbance Area “B” (West Field), 0”-6” bgs
- DU-10: Planned Soil Disturbance Area “B” (West Field), 6”-12” bgs

**TOTAL AND BIOACCESSIBLE ARSENIC**

Total arsenic was detected in the surface and subsurface soil samples of DU-1, DU-2, DU-3, DU-4 and DU-6 at concentrations that exceed the arsenic DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. However, bioaccessible arsenic concentrations in DU-1, DU-2, DU-3, DU-4 and DU-6 did not exceed the arsenic DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. Table 3 located in Appendix I summarizes the results for the soil screen at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

**LEAD**

Lead was detected in the subsurface soil samples of DU-4 at concentrations that exceed the lead DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. Table 3 located in Appendix I
summarizes the results for the soil screen at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

ORGANOCHLORINE PESTICIDES
Organochlorine pesticides were not detected in the sampled surface and subsurface soils of the Subject Site at concentrations that exceed the organochlorine pesticide DOH EALs for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. Table 3 located in Appendix I summarizes the results for the soil screen at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.
**Recommendations**

In summary, ACM, LCP, LBP, and lead-contaminated soils were observed at the Subject Site. Based on LEI’s visual survey of the site, inventory of identified potentially hazardous materials, and laboratory data, LEI recommends the following:

- Manage and/or remove and dispose of hazardous and regulated materials in accordance with applicable local, state, and federal regulations, prior to renovation and/or demolition activities that may disturb these materials.

- There is a potential environmental hazard with respect to direct exposure levels of lead in the soils of the Site. Additionally, land use restrictions of soils at the Site may apply.

- Remove and dispose of all loose and flaking (poor condition) lead-containing paint and lead-based paint that may be disturbed during renovation and/or demolition activities in accordance with applicable local, state, and federal regulations.

- Spot remove and dispose of lead-containing paint and lead-based paint in areas that have the potential to become airborne or otherwise create dust (i.e. from sanding, drilling, friction, etc.) during renovation and/or demolition activities.

- Any non-friable ACM, which could be crumbled and pulverized during renovation and/or demolition activities must be removed and disposed of by a qualified asbestos abatement contractor. In addition, the services of a qualified consultant should be obtained to monitor and inspect the removal activities to ensure compliance with applicable Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and Hawaii Occupational Safety and Health (HIOSH) regulations pertaining to the handling of asbestos-containing material.

- Any abatement, renovation and demolition contractor(s) must take appropriate measures to comply with applicable EPA, OSHA and HIOSH regulations pertaining to the handling of asbestos-containing materials, lead paint and lead contaminated soils/dusts and worker protection. Note that OSHA and HIOSH regulate activities that disturb paint which contain any detectable concentration of lead. Note that detectable levels of lead in the paint were found throughout the Subject Site.

- Have air monitoring conducted for airborne lead, asbestos and arsenic dusts by qualified personnel during any lead and asbestos abatement, lead-contaminated soil disturbance and general renovation/demolition activities of areas that were determined to contain these contaminants.

- The following recommendations should be followed in areas with soils identified to exceed the Hawaii DOH EAL for unrestricted land use for lead in soil. 1) contaminated soil removed from the Subject Site should be considered for onsite reuse or must be disposed of in accordance with Federal and State rules and regulations, 2) dust control practices should include both wetting during soil disturbance activities and monitoring by a designated competent person, in addition to containing temporary soil stockpiles, 3) use of good general hygiene practices for public, employees and workers to avoid contaminated soil exposure, 4) long-term controls should be implemented on the site to minimize the potential for exposure to lead-contaminated soil by the public, employees and workers, 5) possible need to cover any bare soil, if subject to wind or water transport off-site.
3.0 INTRODUCTION/PURPOSE

The objective of the Survey was to identify within the structures, walkways and parking areas of the Subject Site the existence (if any), extent, and condition of any ACM, LCP, LBP, ArCBM, mercury-containing lamps and PCB-containing light ballasts and the presence of arsenic-, lead- and organochlorinated pesticide-contaminated soil around the buildings and walkways of the Subject Site not included in the Previous Report, so that the information can be incorporated in the design. Specifically, LEI completed the following tasks:

- Performed site reconnaissance at the Subject Site;
- Reviewed the December 24, 2009, Hazardous Material Survey Report completed by MNA & Associates to identify previously untested hazardous materials and soils at the Subject Site;
- Collected twenty-four (24) samples of suspect asbestos-containing material (ACM) throughout the Subject Site;
- Submitted the twenty-four (24) samples of suspected ACM to Hawaii Analytical Laboratories, LLC for analysis of asbestos via Polarized Light Microscopy (PLM) in accordance with the AHERA protocol and NIOSH Method 600/R-93/116;
- Collected sixty-five (65) paint chip samples from the interior and exterior surfaces of the Subject Site;
- Submitted the sixty-five (65) paint chip samples to Hawaii Analytical Laboratories, LLC for analysis via EPA Method 7420 for total lead content;
- Inspected the Subject Site for suspect arsenic-containing building materials;
- Inspected the Subject Site for suspect mercury-containing light bulbs and PCB-containing light ballasts;
- Identified a total of ten (10) decision units within the Subject Site;
- Collected a total of twelve (12) multi-increment samples (MIS) from the 10 decision units of the Subject Site. Each MIS included 50 sub-samples collected utilizing DOH recommended hand tools and equipment;
- Submitted the twelve (12) MIS soil samples to Hawaii Analytical Laboratories, LLC in Honolulu, Hawaii for the following analysis:
  - MIS laboratory preparation
  - Total Arsenic and Lead by Environmental Protection Agency (EPA) Method 6010B and 7471A
  - Organochlorine Pesticides by EPA Method 8141A/B
- Prepared this report documenting the field activities and the results of the investigation including analytical results, photographs and recommendations.
4.0 METHODOLOGY

4.1 Asbestos
LEI personnel collected a total of twenty-four (24) samples of suspect building materials for asbestos analysis. All of the suspect ACM samples were collected from the Subject Site in general accordance with EPA guidelines and recommendations.

The suspect ACM were wetted with amended water before sample collection. A small piece was then carefully cut out and placed into a labeled re-sealable plastic bag. The sampling equipment was cleaned between each sample collection to avoid cross-contamination between samples. The approximate quantity of each suspect ACM was noted. Sample locations were randomly selected in accordance with EPA protocols and recommendations.

All samples were properly logged and recorded following strict chain of custody procedure and submitted to Hawaii Analytical Laboratories, LLC in Honolulu, Hawaii for analysis by polarized light microscopy in accordance with EPA Method 600/R-93/116. Hawaii Analytical Laboratories, LLC is accredited for bulk asbestos analysis through successful participation in the National Voluntary Lab Accreditation Program (NVLAP).

4.2 Lead Paint
LEI personnel collected and analyzed sixty-five (65) paint chip samples from the Subject Site in accordance with the EPA guidelines and recommendations.

The suspect lead-containing paints were wetted with amended water before sample collection. Paint was carefully scraped and placed into a labeled re-sealable plastic bag. The sampling equipment was cleaned between each sample collection to avoid cross-contamination between samples. All samples were properly logged and recorded following strict chain of custody procedure and submitted to Hawaii Analytical Laboratories, LLC for analysis in accordance with EPA method 7420.

4.3 Arsenic-Containing Building Materials (ArCBM)
LEI inspected the Subject Site for suspect ArCBM. LEI personnel did not identify suspect ArCBM at the Subject Site.

4.4 Mercury-Containing Lamps/switches and PCB-Containing Light Ballasts
LEI inspected the Subject Site for previously unidentified mercury-containing lamps/switches and PCB-containing light ballasts. LEI personnel did not identify any previously unidentified mercury-containing lamps/switches and PCB-containing light ballasts at the Subject Site.
4.5 Soil Screen

The multi-increment sampling (MIS) soil screen at the Subject Site was conducted on October 5, 2018 and included a surface (0”-6” bgs) and subsurface (6”-12” bgs) soils screen for the contaminants of potential concern (COPC) at the Subject Site with established Department of Health (DOH) Environmental Action Levels (EALs) to be disturbed during this project. Laboratory analytical results of the soil samples were used to determine if the surface and/or subsurface soils contain COPC that exceed applicable DOH Environmental Action Levels (EALs) for residential (unrestricted) and commercial/industrial (restricted) land use.

The COPC were identified based on past land use of the Site. COPC for the Site includes arsenic, lead and organochlorine pesticides. Field activities involved the sampling and/or documentation of suspect hazardous materials and multi-incremental sampling (MIS) of surface and subsurface soils.

The Decision Units (DUs) at the Site were based on the planned soil disturbance activities at the Subject Site and included the following locations:

- DU-1: Perimeter of Pavilion 4, 0”-6” bgs
- DU-2: Perimeter of Pavilion 4, 6”-12” bgs
- DU-3: Perimeters of Pavilion 2 and Pavilion 6, 0”-6” bgs
- DU-4: Perimeters of Pavilion 2 and Pavilion 6, 6”-12” bgs
- DU-5: Perimeter of Pavilion 3, 0”-6” bgs
- DU-6: Perimeter of Pavilion 3, 6”-12” bgs
- DU-7: Planned Soil Disturbance Area “A” (East Field), 0”-6” bgs
- DU-8: Planned Soil Disturbance Area “A” (East Field), 6”-12” bgs
- DU-9: Planned Soil Disturbance Area “B” (West Field), 0”-6” bgs
- DU-10: Planned Soil Disturbance Area “B” (West Field), 6”-12” bgs

MIS soil sampling was chosen for the Subject Site so that reproducible data, representative of average background concentrations, can be obtained for use as reference control data. A total of ten (10) DUs were identified at the Subject Site. DU boundaries were based on the location of the proposed site work and site characteristics (Figure 5, Appendix II). Each MIS soil sample consisted of 50 increments. Based on sampling theory (Pitard, 1993), a minimum of 30 increments per sample is generally recommended in order to obtain a reliable estimate of the mean concentration. The DOH typically specifies the use of 30 to 100 increments per sample in their Technical Guidance Manual (DOH, 2009b). Each increment was taken from 0-6 inches below ground surface for surface soils and from 6-12 inches below ground surface for subsurface soils. Samples were screened for lead, arsenic and organochlorine pesticides.

The location of each increment was based on a systematic random grid that was developed during the site visit. The grid was drawn with a random starting point for even distribution across the sampling area. The systematic random sampling design provided coverage of the DU along a horizontal plane, without the gaps associated with purely random designs.
Each increment was taken and then placed into a double-bagged Ziploc® bag. This process was repeated until 50 increments were collected. MIS soil samples were then placed into a cooler with ice packs for delivery to the laboratory for analysis.

**Equipment Decontamination**

All sampling equipment used to collect MIS samples were decontaminated prior to use between DUs. The decontamination procedure for sampling equipment is as follows:

1. Clean with distilled water and brush if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with tap water.
3. Rinse thoroughly with Liquinox™.
4. Rinse with distilled water.

**Soil Sample Analysis**

The twelve (12) MIS soil samples were submitted to Hawaii Analytical Laboratories, LLC for multi-increment preparation and analysis via EPA Method 6010B arsenic and lead and EPA Method 8141A/B for organochlorine pesticides.
5.0 RESULTS

5.1 Asbestos Survey
LEI’s State of Hawaii certified asbestos inspector, Mr. Kamalana Kobayashi identified eight (8) suspect materials for sample collection. The black vent mastic located on the roof of Pavilion 4 was identified to be ACM by laboratory analysis. Table 1 found in Appendix I lists the results of all samples collected during LEI’s survey. Samples which contain levels of asbestos above the regulatory limit of 1% are listed in bold text in Table 1. Figure 2 found in Appendix II identifies the approximate location of the identified ACM. Finally, Photograph Log 1 found in Appendix III contains a photograph of the identified asbestos-containing material at the Subject Site. Laboratory results are included in Appendix IV.

In accordance with federal and state regulations and industry standard practice LEI determined homogenous areas of each suspect material and collected three (3) representative samples of the material from each homogenous area. Typically, all three (3) samples will have similar laboratory results. When the results differ, a single result above the regulatory limit is sufficient to determine that the material within the homogenous area is ACM and the entirety of the homogenous area should be treated as ACM. Thus, LEI requests that the laboratory stops analyzing when the first or second sample in the set is determined to have an asbestos content greater than 1%.

5.2 Lead Paint Survey
LEI’s State of Hawaii certified lead paint risk assessor collected sixty-five (65) paint samples from various surfaces throughout the Subject Site. Paint chip laboratory results indicated that fifty-four (54) sampled painted building components contained detectable concentrations of lead at levels less than 5,000 mg/kg or were identified to have an elevated laboratory detection limit and are considered and/or assumed to be Lead-Containing Paint (LCP). Four (4) of the sampled painted building components contained lead in excess of the EPA/HUD guideline of 5,000 mg/kg and are considered to be Lead-Based Paint (LBP).

Table 2 located in Appendix I summarizes all the lead paint samples collected at the Subject Site. Figure 1 located in Appendix II identifies the building descriptions listed in Table 2. Photograph Log 2 in Appendix III identifies the LCP and LBP at the Subject Site.

5.3 Arsenic-Containing Building Materials (ArCBM) Survey
During this survey, LEI inspected the Subject Site for previously unidentified ArCBM. None were observed; therefore, no samples were collected.

5.4 Mercury-Containing Lamps/Switches and PCB-Containing Light Ballasts Survey
During this survey, LEI inspected the Subject Site for previously unidentified mercury-containing lamps/switches and PCB-containing light ballasts. None were observed at the Subject Site during this Survey.
5.5 Multi-Increment Sampling Soil Screen for COPC Survey

The purpose of the soil screen survey was to evaluate the presence (if any) and concentrations of arsenic, lead and organochlorinated pesticide-contaminated soil around the structures, walkways and parking area at the Subject Site, so that the information can be incorporated in the design. The results of the soil screen survey were used to determine if these soils may pose a potential health risk to construction workers and the general public during the renovation work at the Subject Site and to determine appropriate soil management and disposal practices.

The multi-increment sampling (MIS) soil screen at the Subject Site was conducted on October 5, 2018 and included a surface (0”-6” bgs) and subsurface (6”-12” bgs) soils screen for the contaminants of potential concern (COPC) at the Subject Site with established Department of Health (DOH) Environmental Action Levels (EALs) to be disturbed during this project. Laboratory analytical results of the soil samples were used to determine if the surface and/or subsurface soils contain COPC that exceed applicable DOH Environmental Action Levels (EALs) for residential (unrestricted) and commercial/industrial (restricted) land use.

The Decision Units (DUs) at the Site were based on the planned soil disturbance activities at the Subject Site and included the following locations:

- DU-1: Perimeter of Pavilion 4, 0”-6” bgs
- DU-2: Perimeter of Pavilion 4, 6”-12” bgs
- DU-3: Perimeters of Pavilion 2, Pavilion 6 and Pavilion 7, 0”-6” bgs
- DU-4: Perimeters of Pavilion 2, Pavilion 6 and Pavilion 7, 6”-12” bgs
- DU-5: Perimeter of Pavilion 3, 0”-6” bgs
- DU-6: Perimeter of Pavilion 3, 6”-12” bgs
- DU-7: Planned Soil Disturbance Area “A” (East Field), 0”-6” bgs
- DU-8: Planned Soil Disturbance Area “A” (East Field), 6”-12” bgs
- DU-9: Planned Soil Disturbance Area “B” (West Field), 0”-6” bgs
- DU-10: Planned Soil Disturbance Area “B” (West Field), 6”-12” bgs

**Total and Bioaccessible Arsenic**

Total arsenic was detected in the surface and subsurface soil samples of DU-1, DU-2, DU-3, DU-4 and DU-6 at concentrations that exceed the arsenic DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. However, bioaccessible arsenic concentrations in DU-1, DU-2, DU-3, DU-4 and DU-6 did not exceed the arsenic DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. Table 3 located in Appendix I summarizes the results for the soil screen at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

**Lead**

Lead was detected in the subsurface soil samples of DU-4 at concentrations that exceed the lead DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. Table 3 located in Appendix I
summarizes the results for the soil screen at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

**ORGANOCHLORINE PESTICIDES**
Organochlorine pesticides were not detected in the sampled surface and subsurface soils of the Subject Site at concentrations that exceed the organochlorine pesticide DOH EALs for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is < 150 meters. Table 3 located in Appendix I summarizes the results for the soil screen at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.
6.0 RECOMMENDATIONS

In summary, ACM, LCP, LBP and lead-contaminated soils were observed at the Subject Site. Based on LEI’s visual survey of the site, inventory of identified potentially hazardous materials, and laboratory data, LEI recommends the following:

- Manage and/or remove and dispose of hazardous and regulated materials in accordance with applicable local, state, and federal regulations, prior to renovation and/or demolition activities that may disturb these materials.
- There is a potential environmental hazard with respect to direct exposure levels of lead in the soils of the Site. Additionally, land use restrictions of soils at the Site may apply.
- Remove and dispose of all loose and flaking (poor condition) lead-containing paint and lead-based paint that may be disturbed during renovation and/or demolition activities in accordance with applicable local, state, and federal regulations.
- Spot remove and dispose of lead-containing paint and lead-based paint in areas that have the potential to become airborne or otherwise create dust (i.e. from sanding, drilling, friction, etc.) during renovation and/or demolition activities.
- Any non-friable ACM, which could be crumbled and pulverized during renovation and/or demolition activities must be removed and disposed of by a qualified asbestos abatement contractor. In addition, the services of a qualified consultant should be obtained to monitor and inspect the removal activities to ensure compliance with applicable Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and Hawaii Occupational Safety and Health (HIOSH) regulations pertaining to the handling of asbestos-containing material.
- Any abatement, renovation and demolition contractor(s) must take appropriate measures to comply with applicable EPA, OSHA and HIOSH regulations pertaining to the handling of asbestos-containing materials, lead paint and lead contaminated soils/dusts and worker protection. Note that OSHA and HIOSH regulate activities that disturb paint which contain any detectable concentration of lead. Note that detectable levels of lead in the paint were found throughout the Subject Site.
- Have air monitoring conducted for airborne lead, asbestos and arsenic dusts by qualified personnel during any lead and asbestos abatement, lead-contaminated soil disturbance and general renovation/demolition activities of areas that were determined to contain these contaminants.
- The following recommendations should be followed in areas with soils identified to exceed the Hawaii DOH EAL for unrestricted land use for lead in soil. 1) contaminated soil removed from the Subject Site should be considered for onsite reuse or must be disposed of in accordance with Federal and State rules and regulations, 2) dust control practices should include both wetting during soil disturbance activities and monitoring by a designated competent person, in addition to containing temporary soil stockpiles, 3) use of good general hygiene practices for public, employees and workers to avoid contaminated soil exposure, 4) long-term controls should be implemented on the site to minimize the potential for exposure to lead-contaminated
soil by the public, employees and workers, 5) possible need to cover any bare soil, if subject to wind or water transport off-site.
7.0 REFERENCES

- State of Hawaii, Department of Health. Update to Soil Action Levels for Inorganic Arsenic and Recommended Soil Management Practices (updates default, background arsenic soil action level presented in 2010 guidance to 24 mg/kg; arsenic exposure units in Section 3.0 table corrected to µg/day September 2012), November 2011 (updated September 2012).
Appendix I

Tables of Results
Table 1. Asbestos Inspection Results
Supplemental Hazardous Materials Survey and Soil Screen Report
Kolekole Gulch Park Accessibility Improvement Project

<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Room/Area</th>
<th>Homogeneous Areas</th>
<th>Material</th>
<th>Color/Description</th>
<th>Friable</th>
<th>Type</th>
<th>Cond.</th>
<th>Ext. Amt. of Material (ft²)</th>
<th>Asbestos Content</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 3</td>
<td>Throughout</td>
<td>BBQ</td>
<td>CMU and grout</td>
<td>Red</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>24</td>
<td>None Detected</td>
<td>A-1</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Throughout</td>
<td>Door Frame</td>
<td>Caulking</td>
<td>White</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>30 linear ft.</td>
<td>None Detected</td>
<td>A-3</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Throughout</td>
<td>CMU Walls</td>
<td>Skim coat and grout</td>
<td>Brown</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>260</td>
<td>None Detected</td>
<td>A-6</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Throughout</td>
<td>BBQ</td>
<td>CMU and grout</td>
<td>Red</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>24</td>
<td>None Detected</td>
<td>A-9</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Throughout</td>
<td>BBQ</td>
<td>CMU and grout</td>
<td>Red</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>24</td>
<td>None Detected</td>
<td>A-12</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>Throughout</td>
<td>BBQ</td>
<td>CMU and grout</td>
<td>Red</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>24</td>
<td>None Detected</td>
<td>A-13</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Throughout</td>
<td>Floors and walkways</td>
<td>Concrete</td>
<td>Gray</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>3,000</td>
<td>None Detected</td>
<td>A-17</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Roof</td>
<td>Bathroom exhaust pipe seal</td>
<td>Mastic</td>
<td>Black</td>
<td>No</td>
<td>Misc.</td>
<td>Fair</td>
<td>2</td>
<td>8% Chrysotile</td>
<td>A-22</td>
</tr>
</tbody>
</table>

Bold text indicates identified ACM.

Lehua Environmental Inc.  Asbestos Inspection Results  Page 1 of 1
<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Description</th>
<th>Color</th>
<th>Substrate</th>
<th>Cond.</th>
<th>Lead Conc. (mg/kg)</th>
<th>LCP or LBP?</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 3</td>
<td>Pole</td>
<td>Red</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-1</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Ceiling beam and rafters</td>
<td>Red</td>
<td>Wood</td>
<td>Poor</td>
<td>9,800</td>
<td>LBP</td>
<td>L-2</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Ceiling beam and rafters</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>2,400</td>
<td>LCP</td>
<td>L-3</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>56</td>
<td>LCP</td>
<td>L-4</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Bench</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;54(^2)</td>
<td>LCP</td>
<td>L-5</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>BBQ pit</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;180(^2)</td>
<td>LCP</td>
<td>L-6</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Ceiling</td>
<td>Brown</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;200(^2)</td>
<td>LCP</td>
<td>L-7</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Conduit</td>
<td>Red</td>
<td>Plastic</td>
<td>Fair</td>
<td>&lt;73(^2)</td>
<td>LCP</td>
<td>L-8</td>
</tr>
<tr>
<td>Pavilion 3</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;54(^2)</td>
<td>LCP</td>
<td>L-9</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>Light brown</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-10</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>Brown</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;53(^2)</td>
<td>LCP</td>
<td>L-11</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>White</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;44(^2)</td>
<td>LCP</td>
<td>L-12</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;54(^2)</td>
<td>LCP</td>
<td>L-13</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom exterior)</td>
<td>White</td>
<td>CMU</td>
<td>Fair</td>
<td>330</td>
<td>LCP</td>
<td>L-14</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom interior)</td>
<td>Yellow</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-15</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom interior)</td>
<td>Yellow</td>
<td>Wood</td>
<td>Poor</td>
<td>&lt;51(^2)</td>
<td>LCP</td>
<td>L-16</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Door Jamb</td>
<td>Yellow</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;49(^2)</td>
<td>LCP</td>
<td>L-17</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Wall (Bathroom exterior)</td>
<td>White</td>
<td>Wood</td>
<td>Poor</td>
<td>11,000</td>
<td>LBP</td>
<td>L-18</td>
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<tr>
<td>Pavilion 4</td>
<td>Conduit</td>
<td>White</td>
<td>Plastic</td>
<td>Fair</td>
<td>140</td>
<td>LCP</td>
<td>L-19</td>
</tr>
</tbody>
</table>

Bold text indicated identified and assumed LCP and LBP.

\(^1\) Below the laboratory detection limit. May be considered non-lead containing paint.

\(^2\) Elevated laboratory detection limit. LEI recommends assuming this paint as LCP.
Table 2. Lead Paint Inspection Results  
Supplemental Hazardous Materials Survey and Soil Screen Report  
Kolekole Gulch Park Accessibility Improvements Project

<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Description</th>
<th>Color</th>
<th>Substrate</th>
<th>Cond.</th>
<th>Lead Conc. (mg/kg)</th>
<th>LCP or LBP?</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 4</td>
<td>Stall Door (Womens Bathroom)</td>
<td>Yellow</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;53(^2)</td>
<td>LCP</td>
<td>L-20</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling (Pavilion)</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;85(^2)</td>
<td>LCP</td>
<td>L-21</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Support posts</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;44(^2)</td>
<td>LCP</td>
<td>L-22</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling</td>
<td>Brown</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;56(^2)</td>
<td>LCP</td>
<td>L-23</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Ceiling beam and rafters</td>
<td>Brown</td>
<td>Wood</td>
<td>Fair</td>
<td>680</td>
<td>LCP</td>
<td>L-24</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Support pipe</td>
<td>White</td>
<td>Metal</td>
<td>Poor</td>
<td>660</td>
<td>LCP</td>
<td>L-25</td>
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<tr>
<td>Pavilion 4</td>
<td>Storage box</td>
<td>Yellow</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-26</td>
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<tr>
<td>Pavilion 4</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;95(^2)</td>
<td>LCP</td>
<td>L-27</td>
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<tr>
<td>Pavilion 4</td>
<td>Ceiling beam and rafters</td>
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<td>Wood</td>
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<td>300</td>
<td>LCP</td>
<td>L-28</td>
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<tr>
<td>Pavilion 4</td>
<td>Ceiling (Womens bathroom)</td>
<td>White</td>
<td>Wood</td>
<td>Poor</td>
<td>820</td>
<td>LCP</td>
<td>L-29</td>
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<tr>
<td>Pavilion 4</td>
<td>Sign</td>
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<td>Wood</td>
<td>Fair</td>
<td>&lt;47(^2)</td>
<td>LCP</td>
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<tr>
<td>Pavilion 4</td>
<td>Sign</td>
<td>Yellow</td>
<td>Wood</td>
<td>Fair</td>
<td>11,000</td>
<td>LBP</td>
<td>L-31</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Pipe</td>
<td>Red</td>
<td>Metal</td>
<td>Poor</td>
<td>170</td>
<td>LCP</td>
<td>L-32</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Ceiling beam and rafters</td>
<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>1,900</td>
<td>LCP</td>
<td>L-33</td>
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<tr>
<td>Pavilion 2</td>
<td>Conduit</td>
<td>Red</td>
<td>Plastic</td>
<td>Fair</td>
<td>&lt;88(^2)</td>
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<td>L-34</td>
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<td>Pavilion 2</td>
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<td>CMU</td>
<td>Fair</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-35</td>
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<tr>
<td>Pavilion 2</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;160(^2)</td>
<td>LCP</td>
<td>L-36</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;130(^2)</td>
<td>LCP</td>
<td>L-37</td>
</tr>
</tbody>
</table>

Bold text indicates identified and assumed LCP and LBP.

\(^1\) Below the laboratory detection limit. May be considered non-lead containing paint.

\(^2\) Elevated laboratory detection limit. LEI recommends assuming this paint as LCP.
# Table 2. Lead Paint Inspection Results
Supplemental Hazardous Materials Survey and Soil Screen Report
Kolekole Gulch Park Accessibility Improvements Project

<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Description</th>
<th>Color</th>
<th>Substrate</th>
<th>Cond.</th>
<th>Lead Conc. (mg/kg)</th>
<th>LCP or LBP?</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 2</td>
<td>Bench</td>
<td>Green</td>
<td>Wood</td>
<td>Poor</td>
<td>&lt;56(^1)</td>
<td>LCP</td>
<td>L-38</td>
</tr>
<tr>
<td>Pavilion 2</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Poor</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-39</td>
</tr>
<tr>
<td>Pavilion 4</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;55(^2)</td>
<td>LCP</td>
<td>L-40</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Pipe</td>
<td>Red</td>
<td>Metal</td>
<td>Poor</td>
<td>430</td>
<td>LCP</td>
<td>L-41</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Conduit</td>
<td>Red</td>
<td>Plastic</td>
<td>Fair</td>
<td>&lt;110(^3)</td>
<td>LCP</td>
<td>L-42</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Ceiling beam and rafters</td>
<td>Tan</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;57(^2)</td>
<td>LCP</td>
<td>L-43</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Ceiling beam and rafters</td>
<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;39(^1)</td>
<td>None</td>
<td>L-44</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;230(^2)</td>
<td>LCP</td>
<td>L-45</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;170(^2)</td>
<td>LCP</td>
<td>L-46</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>BBQ pit</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;110(^3)</td>
<td>LCP</td>
<td>L-47</td>
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<tr>
<td>Pavilion 6</td>
<td>Bench</td>
<td>Green</td>
<td>Wood</td>
<td>Poor</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-48</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Poor</td>
<td>&lt;40(^1)</td>
<td>None</td>
<td>L-49</td>
</tr>
<tr>
<td>Pavilion 6</td>
<td>Floor/Walkway</td>
<td>Yellow</td>
<td>Concrete</td>
<td>Poor</td>
<td>&lt;39(^1)</td>
<td>None</td>
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</tr>
<tr>
<td>Pavilion 7</td>
<td>Railing</td>
<td>Yellow</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;43(^2)</td>
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<td>L-51</td>
</tr>
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<td>Pavilion 7</td>
<td>Pole</td>
<td>White</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;39(^1)</td>
<td>None</td>
<td>L-52</td>
</tr>
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<td>Pavilion 7</td>
<td>Ceiling beam and rafters</td>
<td>White</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;65(^2)</td>
<td>LCP</td>
<td>L-53</td>
</tr>
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<td>Pavilion 7</td>
<td>Ceiling beam and rafters</td>
<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;46(^2)</td>
<td>LCP</td>
<td>L-54</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;400(^2)</td>
<td>LCP</td>
<td>L-55</td>
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<tr>
<td>Pavilion 7</td>
<td>Conduit</td>
<td>White</td>
<td>Plastic</td>
<td>Fair</td>
<td>&lt;120(^2)</td>
<td>LCP</td>
<td>L-56</td>
</tr>
</tbody>
</table>

*Bold text indicates identified and assumed LCP and LBP.*

1. Below the laboratory detection limit. May be considered non-lead containing paint.
2. Elevated laboratory detection limit. LEI recommends assuming this paint as LCP.
<table>
<thead>
<tr>
<th>Bldg.</th>
<th>Description</th>
<th>Color</th>
<th>Substrate</th>
<th>Cond.</th>
<th>Lead Conc. (mg/kg)</th>
<th>LCP or LBP?</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavilion 7</td>
<td>Bench</td>
<td>Green</td>
<td>Wood</td>
<td>Poor</td>
<td>&lt;40&lt;sup&gt;1&lt;/sup&gt;</td>
<td>None</td>
<td>L-57</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Picnic table</td>
<td>Green</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;74&lt;sup&gt;2&lt;/sup&gt;</td>
<td>LCP</td>
<td>L-58</td>
</tr>
<tr>
<td>Pavilion 7</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;41&lt;sup&gt;2&lt;/sup&gt;</td>
<td>LCP</td>
<td>L-59</td>
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<tr>
<td>BBQ Shelter</td>
<td>Pole</td>
<td>Red</td>
<td>Metal</td>
<td>Poor</td>
<td>&lt;39&lt;sup&gt;1&lt;/sup&gt;</td>
<td>None</td>
<td>L-60</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>Ceiling</td>
<td>White</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;42&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>L-61</td>
</tr>
<tr>
<td>BBQ Shelter</td>
<td>BBQ pit</td>
<td>Red</td>
<td>CMU</td>
<td>Fair</td>
<td>&lt;40&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>L-62</td>
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<td>BBQ Shelter</td>
<td>Roof</td>
<td>Green</td>
<td>Metal</td>
<td>Fair</td>
<td>&lt;460&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>L-63</td>
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<td>BBQ Shelter</td>
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<td>Red</td>
<td>Wood</td>
<td>Fair</td>
<td>&lt;50&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>Wood</td>
<td>Poor</td>
<td>34,000</td>
<td>LBP</td>
<td>L-65</td>
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</table>

Bold text indicated identified and assumed LCP and LBP.

<sup>1</sup> Below the laboratory detection limit. May be considered non-lead containing paint.

<sup>2</sup> Elevated laboratory detection limit. LEI recommends assuming this paint as LCP.
## Table 3: Summary of Soil Sampling Results

Kolekole Gulch Park Accessibility Improvements
Honolulu, Hawaii

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Laboratory Analytical Method</th>
<th>Sample Location Descriptive Sample ID</th>
<th>Unrestricted Land Use (mg/kg)</th>
<th>Commercial/Industrial Land Use (mg/kg)</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail Result</th>
<th>Reporting Limit (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arsenic (Total)</strong></td>
<td>Laboratory Specified</td>
<td>24</td>
<td>95</td>
<td>32</td>
<td>1 Fail</td>
<td>43</td>
<td>1 Fail</td>
<td>41</td>
<td>1 Fail</td>
<td>41</td>
</tr>
<tr>
<td><strong>Arsenic (Bioaccessible)</strong></td>
<td>Laboratory Specified</td>
<td>24</td>
<td>95</td>
<td>ND</td>
<td>0.10 Pass</td>
<td>ND</td>
<td>0.10 Pass</td>
<td>ND</td>
<td>0.10 Pass</td>
<td>0.10 Pass</td>
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<tr>
<td><strong>Lead (Pb)</strong></td>
<td>EPA 3051m/7061Am</td>
<td>200</td>
<td>800</td>
<td>84</td>
<td>1 Pass</td>
<td>96</td>
<td>1 Pass</td>
<td>97</td>
<td>1 Pass</td>
<td>97</td>
</tr>
<tr>
<td><strong>Organochlorine Pesticides</strong></td>
<td></td>
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<td></td>
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<tr>
<td>a-BHC</td>
<td>EPA 8081A</td>
<td>0.11</td>
<td>0.38</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>0.001 Pass</td>
</tr>
<tr>
<td>Delta-BHC</td>
<td>EPA 8081A</td>
<td>0.9</td>
<td>8.4</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>0.001 Pass</td>
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<tr>
<td>Heptachlor</td>
<td>EPA 8081A</td>
<td>0.053</td>
<td>0.19</td>
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<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>0.001 Pass</td>
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<tr>
<td>Lindane</td>
<td>EPA 8081A</td>
<td>18</td>
<td>18</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>0.005 Pass</td>
</tr>
<tr>
<td>Aldrin</td>
<td>EPA 8081A</td>
<td>1.5</td>
<td>11</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>0.001 Pass</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>EPA 8081A</td>
<td>1.7</td>
<td>30</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>ND</td>
<td>0.001 Pass</td>
<td>0.001 Pass</td>
</tr>
<tr>
<td>Endrin</td>
<td>EPA 8081A</td>
<td>2</td>
<td>7.2</td>
<td>ND</td>
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<td>ND</td>
<td>0.002 Pass</td>
<td>ND</td>
<td>0.002 Pass</td>
<td>0.002 Pass</td>
</tr>
<tr>
<td>Endosulfan I</td>
<td>EPA 8081A</td>
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<td>18</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>0.005 Pass</td>
</tr>
<tr>
<td>Endosulfan II</td>
<td>EPA 8081A</td>
<td>1.7</td>
<td>5.6</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>0.005 Pass</td>
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<tr>
<td>Endrin Aldkydie</td>
<td>EPA 8081A</td>
<td>16</td>
<td>16</td>
<td>ND</td>
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<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>0.005 Pass</td>
</tr>
<tr>
<td>Methoxychlor</td>
<td>EPA 8081A</td>
<td>16</td>
<td>16</td>
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<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>0.005 Pass</td>
</tr>
<tr>
<td>Endrin ketone</td>
<td>EPA 8081A</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>ND</td>
<td>0.005 Pass</td>
<td>0.005 Pass</td>
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<tr>
<td>Endosulfan sulfate</td>
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<td>13</td>
<td>ND</td>
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<td>ND</td>
<td>0.010 Pass</td>
<td>ND</td>
<td>0.010 Pass</td>
<td>0.010 Pass</td>
</tr>
<tr>
<td>Chlordecone (Technical)</td>
<td>EPA 8081A</td>
<td>17</td>
<td>23</td>
<td>ND</td>
<td>0.100 Pass</td>
<td>ND</td>
<td>0.100 Pass</td>
<td>ND</td>
<td>0.100 Pass</td>
<td>0.100 Pass</td>
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<tr>
<td>Dioxinphene</td>
<td>EPA 8081A</td>
<td>0.49</td>
<td>2.1</td>
<td>ND</td>
<td>0.500 Pass</td>
<td>ND</td>
<td>0.500 Pass</td>
<td>ND</td>
<td>0.500 Pass</td>
<td>0.500 Pass</td>
</tr>
</tbody>
</table>

Notes:
- DU = Decision Unit
- DOH = State of Hawaii Department of Health
- EPA = Environmental Protection Agency
- ND = Not detected above the laboratory detection limit
- EAL = Environmental Action Level
- mg/kg = Milligrams per kilogram
- bgs = Below ground surface

Page 1 of 4
Lehua Environmental Inc.
# Table 3: Summary of Soil Sampling Results

<table>
<thead>
<tr>
<th>Kolekole Gulch Park Accessibility Improvements Honomu, Hawaii</th>
</tr>
</thead>
</table>

## Analyte Laboratory Analytical Method

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Laboratory Analytical Method</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic (Total)</td>
<td>Laboratory Specified</td>
<td>36</td>
<td>1</td>
<td>Fail</td>
<td>30</td>
<td>1</td>
<td>Fail</td>
<td>82</td>
<td>1</td>
<td>Fail</td>
<td>9.9</td>
<td>1</td>
<td>Pass</td>
</tr>
<tr>
<td>Arsenic (Bioaccessible)</td>
<td>Laboratory Specified</td>
<td>ND</td>
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<td>Pass</td>
<td>ND</td>
<td>0.10</td>
<td>Pass</td>
<td>ND</td>
<td>0.10</td>
<td>Pass</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>EPA 8051Am/7061Am</td>
<td>87</td>
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<td>Pass</td>
<td>230</td>
<td>1</td>
<td>Fail</td>
<td>10</td>
<td>1</td>
<td>Pass</td>
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</tbody>
</table>

### Organochlorine Pesticides

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Laboratory Analytical Method</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
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<td>EPA 8081A</td>
<td>ND</td>
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<td>Pass</td>
<td>ND</td>
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<td>Pass</td>
<td>ND</td>
<td>0.001</td>
<td>Pass</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>EPA 8081A</td>
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<td>Pass</td>
<td>ND</td>
<td>0.001</td>
<td>Pass</td>
<td>ND</td>
<td>0.001</td>
<td>Pass</td>
</tr>
<tr>
<td>Endrin</td>
<td>EPA 8081A</td>
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<td>0.001</td>
<td>Pass</td>
<td>ND</td>
<td>0.001</td>
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<td>ND</td>
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<tr>
<td>4,4-DDD</td>
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<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
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<tr>
<td>Endosulfan I</td>
<td>EPA 8081A</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
</tr>
<tr>
<td>2,4-DDD</td>
<td>EPA 8081A</td>
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<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
</tr>
<tr>
<td>Endosulfan II</td>
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<td>ND</td>
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<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
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<tr>
<td>2,4-DDT</td>
<td>EPA 8081A</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
<td>ND</td>
<td>0.005</td>
<td>Pass</td>
</tr>
<tr>
<td>Chlordane (Technical)</td>
<td>EPA 8081A</td>
<td>ND</td>
<td>0.100</td>
<td>Pass</td>
<td>ND</td>
<td>0.100</td>
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<td>ND</td>
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- DU = Decision Unit
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- EPA = Environmental Protection Agency
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- EAL = Environmental Action Level
- mg/kg = Milligrams per kilogram
- bgs = Below ground surface
### Table 3: Summary of Soil Sampling Results

**Kolekole Gulch Park Accessibility Improvements**

**Hononu, Hawaii**

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Laboratory Analytical Method</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
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**Locations:**
- Pavilion 3 (6"-12" bgs)
- East Field/Proposed Walkway (0"-6" bgs)
- East Field/Proposed Walkway (6"-12" bgs)
- West Field (0"-6" bgs)
Table 3: Summary of Soil Sampling Results
Kolekole Gulch Park Accessibility Improvements
Honoulu, Hawaii

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Laboratory Analytical Method</th>
<th>Result (mg/kg)</th>
<th>Laboratory Reporting Limit (mg/kg)</th>
<th>Pass/Fail</th>
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</table>

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West Field (6”-12” bgs)

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Page 4 of 4
Lehua Environmental Inc.
Figure 1: Site Layout and DU Boundaries
Figure 2: Identified ACM Map
Appendix III

PHOTOGRAPH LOG 1: ASBESTOS PHOTOGRAPH LOG
PHOTOGRAPH LOG 2: LEAD PAINT PHOTOGRAPH LOG
Photograph Log 1. Asbestos Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

A-1: None Detected
A-2: None Detected
A-3: None Detected

Red CMU and grout located at Pavilion 3.

A-4: None Detected
A-5: None Detected
A-6: None Detected

White door caulk on doors located at Pavilion 4.

A-7: None Detected
A-8: None Detected
A-9: None Detected

CMU and grout walls located at Pavilion 4.
Photograph Log 1. Asbestos Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

A-10: None Detected
A-11: None Detected
A-12: None Detected

Red CMU and grout located at Pavilion 2.

A-13: None Detected
A-14: None Detected
A-15: None Detected

Red CMU and grout located at Pavilion 6.

A-16: None Detected
A-17: None Detected
A-18: None Detected

Red CMU and grout located at the BBQ Shelter.
Photograph Log 1. Asbestos Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

A-19: None Detected
A-20: None Detected
A-21: None Detected

Gray concrete floors and walkways throughout the site.

A-22: 8% Chrysotile
A-23: Not Analyzed
A-24: Not Analyzed

Black bathroom exhaust vent mastic located on the roof of Pavilion 4.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-1: Non-LCP (< 40 mg/kg)

Red metal poles located at Pavilion 3.

L-2: LBP (9,800 mg/kg)

Red wood ceiling beams located at Pavilion 3.

L-3: LCP (2,400 mg/kg)

White wood ceiling beams and rafters located at Pavilion 3.
L-4: LCP (56 mg/kg)

Green wood picnic table located at Pavilion 3.

L-5: Assumed LCP (< 54 mg/kg)

Green wood bench located at Pavilion 3.

L-6: Assumed LCP (< 180 mg/kg)

Red CMU barbeque pit located at Pavilion 3.
Photograph Log 2. Lead Paint Photograph Log
Kokekole Gulch Park Accessibility Improvements Project

L-7: Assumed LCP (< 200 mg/kg)
Brown metal ceiling located at Pavilion 3.

L-8: Assumed LCP (< 73 mg/kg)
Red plastic electrical conduit located at Pavilion 3.

L-9: Assumed LCP (< 690 mg/kg)
Green metal rooftop located at Pavilion 3.
L-10: Non-LCP (< 40 mg/kg)
Light brown CMU walls located at Pavilion 4.

L-11: Assumed LCP (< 53 mg/kg)
Brown CMU walls located at Pavilion 4.

L-12: Assumed LCP (< 44 mg/kg)
White CMU walls located at Pavilion 4.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-13: Assumed LCP (< 53 mg/kg)
Red CMU walls located at Pavilion 4.

L-14: LCP (330 mg/kg)
White CMU walls located near bathrooms at Pavilion 4.

L-15: Non-LCP (< 40 mg/kg)
Yellow CMU wall inside men’s restroom located at Pavilion 4.
L-16: Assumed LCP (< 51 mg/kg)

Yellow wood walls inside men’s restroom located at Pavilion 4.

L-17: Assumed LCP (< 49 mg/kg)

Yellow wood door jamb inside men’s restroom located at Pavilion 4.

L-18: LBP (11,000 mg/kg)

White wood door to men’s restroom located at Pavilion 4.
Photograph Log 2. Lead Paint Photograph Log  
Kolekole Gulch Park Accessibility Improvements Project

L-19: LCP (140 mg/kg)
White plastic electrical conduit located at Pavilion 4.

L-20: Assumed LCP (< 53 mg/kg)
Yellow wood bathroom doors inside women’s restroom at Pavilion 4.

L-21: Assumed LCP (< 85 mg/kg)
White wood ceiling located above the picnic area at Pavilion 4.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-22: Assumed LCP (< 44 mg/kg)
White wood support posts located at Pavilion 4.

L-23: Assumed LCP (< 56 mg/kg)
Brown metal roof overhand located at Pavilion 4.

L-24: LCP (680 mg/kg)
Brown wood ceiling rafters and beams located at Pavilion 4.
L-25: LCP (660 mg/kg)
White metal 6” pipe located behind bathrooms at Pavilion 4.

L-26: Non-LCP (< 40 mg/kg)
Yellow metal box outside men’s bathroom located at Pavilion 4.

L-27: Assumed LCP (< 95 mg/kg)
Green metal rooftop located at Pavilion 4.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-28: LCP (300 mg/kg)
White wood ceiling beams and rafters located at Pavilion 4.

L-29: LCP (820 mg/kg)
White wood ceiling inside women’s restroom located at Pavilion 4.

L-30: Assumed LCP (< 47 mg/kg)
Brown wood sign located at Pavilion 4.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-31: LBP (11,000 mg/kg)
Yellow letters on wood sign located at Pavilion 4.

L-32: LCP (170 mg/kg)
Red metal support pipes located at Pavilion 2.

L-33: LCP (1,900 mg/kg)
Red wood ceiling beams and rafters located at Pavilion 2.
L-34: Assumed LCP (< 88 mg/kg)
Red plastic electrical conduit located at Pavilion 2.

L-35: Non-LCP (< 40 mg/kg)
Red CMU barbeque pit located at Pavilion 2.

L-36: Assumed LCP (< 160 mg/kg)
White metal ceiling located at Pavilion 2.
L-37: Assumed LCP (< 130 mg/kg)

Green metal rooftop located at Pavilion 2.

L-38: Assumed LCP (< 56 mg/kg)

Green wood bench located at Pavilion 2.

L-39: Non-LCP (< 40 mg/kg)

Green wood picnic table located at Pavilion 2.
L-40: Assumed LCP (< 55 mg/kg)

Green wood picnic tables located at Pavilion 4.

L-41: LCP (430 mg/kg)

Red metal support pipes located at Pavilion 6.

L-42: Assumed LCP (< 110 mg/kg)

Red plastic electrical conduit located at Pavilion 6.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-43: Assumed LCP (< 57 mg/kg)
Tan wood ceiling beams and rafters located at Pavilion 6.

L-44: Non-LCP (< 39 mg/kg)
Red wood ceiling beam located at Pavilion 6.

L-45: Assumed LCP (< 230 mg/kg)
White metal ceiling located at Pavilion 6.
L-46: Assumed LCP (< 170 mg/kg)

Green metal rooftop located at Pavilion 6.

L-47: Assumed LCP (< 110 mg/kg)

Red CMU BBQ pit located at Pavilion 6.

L-48: Non-LCP (<40 mg/kg)

Green wood bench located at Pavilion 6.
L-49: Non-LCP (< 40 mg/kg)
Green wood picnic table located at Pavilion 6.

L-50: Non-LCP (< 39 mg/kg)
Yellow paint on cement slab located at Pavilion 6.

L-51: Assumed LCP (< 43 mg/kg)
Yellow metal railing located at Pavilion 7.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-52: Non-LCP (< 39 mg/kg)
White metal support pole located at Pavilion 7.

L-53: Assumed LCP (< 65 mg/kg)
White wood ceiling beams located at Pavilion 7.

L-54: Assumed LCP (< 46 mg/kg)
Red wood ceiling beams located at Pavilion 7.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-55: Assumed LCP (< 400 mg/kg)
Gray metal ceiling located at Pavilion 7.

L-56: Assumed LCP (< 120 mg/kg)
White plastic conduit located at Pavilion 7.

L-57: Non-LCP (< 40 mg/kg)
Green wood bench located at Pavilion 7.
L-58: Assumed LCP (< 74 mg/kg)
Green wood picnic table located at Pavilion 7.

L-59: Assumed LCP (< 41 mg/kg)
Green metal rooftop located at Pavilion 7.

L-60: Non-LCP (< 39 mg/kg)
Red metal support poles located at the BBQ Shelter.
Photograph Log 2. Lead Paint Photograph Log
Kolekole Gulch Park Accessibility Improvements Project

L-61: Assumed LCP (< 42 mg/kg)
White metal ceiling located at the BBQ Shelter.

L-62: Non-LCP (< 40 mg/kg)
Red CMU barbecue pit located at Building E.

L-63: Assumed LCP (< 460 mg/kg)
Green metal rooftop located at the BBQ Shelter.
L-64: Assumed LCP (< 50 mg/kg)

Red wood roof supports located at Building E.

L-65: LBP (34,000 mg/kg)

Blue wood wall in crawl space of Pavilion 4.
Appendix IV

Asbestos Laboratory Analytical Results and Chain-of-Custody Forms
Lead Laboratory Analytical Results and Chain-of-Custody Forms
Soil Laboratory Analytical Results and Chain-of-Custody Forms
### Bulk Asbestos Determination

<table>
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<th>Sample No.</th>
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<th>Asbestos Present?</th>
<th>Type</th>
<th>%v/v</th>
<th>Other Fibrous</th>
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3615 Harding Avenue, Ste. 308, Honolulu, HI 96816 - Telephone: (808) 735-0422 - Fax: (808) 735-0047
Lab Job No: 201809531  
Date Submitted: 11/7/2018  
Your Project: Kolekole Beach Park, 11/6/18

## Bulk Asbestos Determination

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<tr>
<th>Sample No.</th>
<th>Your Sample Description</th>
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<th>Other Fibrous</th>
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Lehua Environmental Inc.
P.O. Box 1018
Kamuela HI 96743

Mr. Kama Kobayashi
Phone Number: (808) 494-0365
Facsimile: lehuaenvironmental@gmail.com

Lab Job No: 201809531
Date Submitted: 11/7/2018
Your Project: Kolekole Beach Park, 11/6/18

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### Bulk Asbestos Determination

<table>
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<th>Sample No.</th>
<th>Your Sample Description</th>
<th>Asbestos Present?</th>
<th>Type</th>
<th>%/v</th>
<th>Other Fibrous</th>
<th>%/v</th>
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**General Comments**

The bulk sample(s) analysis subject of this analytical report were conducted in general accordance with the procedures outlined in the United States Environmental Protection Agency’s “Interim Method for the Determination of Asbestos in Bulk Insulation Samples” (EPA-600/M4-82-020, Dec. 1982) and / or “Method for Determination of Asbestos in bulk Building Materials” (EPA-600/R-93-116, July 1993). The analysis of each bulk sample relates only to the material examined, and may or may not represent the overall composition of its original source. Floor tile and other resinously bound materials, when analyzed by the EPA methods referenced above may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. Alternative methods of identification, including Transmission Electron Microscopy (TEM) may or may not be applicable. We utilize calibrated visual area estimation on a routine basis and do not conduct point counting unless specifically requested to do so. Estimated error for the visual determinations presented are 50% relative (1 to 5%); 25% relative (6 to 25%) and 20% (>26% v/v). We will not separate layers which in our opinion are not readily discernable. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government. Unless otherwise indicated, the sample condition at the time of receipt was acceptable.

**Results and Symbols Definitions**

- > This testing result is greater than the numerical value listed.
- < This testing result is less than the numerical value listed.
- None Detected = asbestos was not observed in the sample. If trace amount of asbestos was detected below our quantifiable limits of 1.0%, <1% (trace) would be indicated and the asbestos type listed. Point counting, where applicable, are recommended to improve accuracy.

---

Jennifer Hsu Liao  
Laboratory Manager
**Lead and arsenic results can be reported in mg/kg (not in %) - per Kama - AA 11/9/18**

### Sample Identification / Description*

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*Comments / Special Instructions:* *verbal results needed?*  

**Site/Project Name:** Kolekole Beach Park

**Sampled By:** Jason Kline

**Client Project No.:**

**PLM POSITIVE STOP Instructions:**

- Positive stop per SAMPLE
- Positive stop per LAYER

**LAB USE ONLY**

201809531

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**New Client?**
- Report To: Kama Kobayashi
- Company: Lehua Environmental Inc.
- Address: PO BOX 1018
- Kamuela, Hawaii 96743
- Phone / Cell No.: 808-494-0365
- Report results to: K. Kobayashi
- via email or fax: jkline.geohawaii@gmail.com

**Need Results By**
- 5 Working Days (WD)
- 4 WD
- 3 WD
- 2 WD
- 24 hours
- 6 hours or less
- 4 hours or less
- 1-2 hours

**Site/Project Name:** Kolekole Beach Park
**Client Project No.:**

**Comments / Special Instructions:**
- verbal results needed?

**PLM POSITIVE STOP Instructions:**
- Positive stop per SAMPLE
- Positive stop per LAYER

**LAB USE ONLY**

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**Relinquished By (Print and Sign):**
- Jason Kline
- Date/Time: 11/6/2018 2:00

**Received By (Print and Sign):**
- Stephanie
- Date/Time: 11/6/2018 4:40

*Sample description can be paint chips, concrete, specific sample collection location, etc.*

If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.

All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.

*Required fields, failure to complete these fields may result in a delay in your samples being processed.

Hawaii Analytical Laboratory Chain of custody - Rev 20150224

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11-07-18P12:31 RCVD
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Relinquished By (Print and Sign): Jason Kline  
Date/Time: 11/6/2018 2:00

*Sample description can be paint chips, concrete, specific sample collection location, etc...
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.

*Required fields, failure to complete these fields may result in a delay in your samples being processed.

Hawaii Analytical Laboratory Chain of custody - Rev. 20150224
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Facsimile:  
Email: lehuaenvironmental@gmail.com  

Lab Job No: 201809531  
Date Submitted: 11/7/2018  
Your Project: Kolekole Beach Park, 11/6/18  

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Lab Job No: 201809531  
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NIOSH Method: 7082m LEAD by FAAS

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Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743  

Phone Number: (808) 494-0365  
Facsimile:  
Email: lehuaenvironmental@gmail.com  

Lab Job No: 201809531  
Date Submitted: 11/7/2018  
Your Project: Kolekole Beach Park, 11/6/18

---

**Lead, total (paint chips)**  
NIOSH Method: 7082m LEAD by FAAS

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Comments

All Quality Control data are acceptable unless otherwise noted.
MRL for lead air is 5ug.
MRL for lead wipe is 10ug.
MRL for lead paint or soil is 40 mg/kg for a 0.25g sample.

General Comments
The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the “analytical method” referenced above. Modifications to this methodology may have been made based upon the analyst’s professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document proficiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions
> This testing result is greater than the numerical value listed.
< This testing result is less than the numerical value listed.
# = Analytical methods marked with an “#” are not within our AIHA LAP, LLC Scope of Accreditation.
MRL = Method Reporting Limit.

---

Jennifer Hsu Liao  
Laboratory Manager

---

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on www.aihaaccreditedlabs.org, in accordance with the recognized ISO/ IEC 17025:2005.

Controlled doc.: Lead Report, rev. 3 - 20161017

3615 Harding Avenue, Ste. 308, Honolulu, HI 96816 - Telephone: (808) 735-0422 - Fax: (808) 735-0047
**Lead and arsenic results can be reported in mg/kg (not in %) - per Kama - AA 11/9/18**

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Hawaii Analytical Laboratory Chain of custody - Rev. 20150224

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Sample Identification / Description: (Maximum of 30 Characters)

PLM POSITIVE STOP Instructions:
- Positive stop per SAMPLE
- Positive stop per LAYER

LAB USE ONLY

201809531

Kolekole Beach Park
**Site/Project Name:** Kolekole Beach Park  

**Sample Identification / Description**  

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**Relinquished By (Print and Sign):** Jason Kline  
**Date/Time:** 11/6/2018 2:00

*Sample description can be paint chips, concrete, specific sample collection location, etc.*

If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.

All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.

*Required fields, failure to complete these fields may result in a delay in your samples being processed.*

Hawaii Analytical Laboratory Chain of custody - Rev. 20150224
### Kokekole Beach Park

**Site/Project Name:** Kokekole Beach Park  
**Client Project No.:**  
**Sampled By:** Jason Kline

#### Sample Identification / Description*  
(Maximum of 30 Characters)

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**New Client?**

- **Report To:** Kama Kobayashi
- **Company:** Lehua Environmental Inc.
- **Address:** PO BOX 1018
  Kamuela, Hawaii 96743
- **Phone / Cell No.:** 808-494-0365
- **Report results to:** K. Kobayashi

**Need Results By:**
- 5 Working Days (WD)
- 4 WD
- 3 WD
- 2 WD
- 24 hours
- 6 hours or less
- 4 hours or less
- 1-2 hours

**Site/Project Name:** Kolekole Beach Park

**Comments / Special Instructions:**
- [ ] verbal results needed?
- PLM POSITIVE STOP
  - Positive stop per SAMPLE
  - Positive stop per LAYER

**Sample Identification / Description**

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**Invoice To:** Kamalana Kobayashi

- **Company:** Lehua Environmental Inc.
- **Address:** PO BOX 1018
  Kamuela, Hawaii 96743
- **Phone / Cell No.:**
- **Purchase Order No.:**
- **Email Invoice To:** lehuaenvironmental@gmail.com
### Hawaii Analytical Laboratory Chain of custody - Rev. 20150224

**Report To:** Kama Kobayashi  
**Company:** Lehua Environmental Inc.  
**Address:** PO BOX 1018  
Kamuela, Hawaii 96743  
**Phone / Cell No.:** 808-494-0365  
**Report results to:** K. Kobayashi  
via email or fax: jkline.geo@gmail.com, lehuaenvironmental@gmail.com  
**Invoice To:** Kamalana Kobayashi  
**Company:** Lehua Environmental Inc.  
**Address:** PO BOX 1018  
Kamuela, Hawaii 96743  
**Phone / Cell No.:**  
**Purchase Order No.:**  
**Email Invoice To:** lehuaenvironmental@gmail.com

**Site/Project Name:** Kolekole Beach Park  
**Comments / Special Instructions:** verbal results needed?  
**Sample Identification / Description* (Maximum of 30 Characters)**  
**Date Sampled* (mm/dd/yyyy)**  
**Collection Medium**  
**Sample Area / Air Volume**  
**Analysis Requested***  
**Method Reference**  
**Lab ID**

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**Relinquished By (Print and Sign):** Jason Kline  
**Date/Time:** 11/6/2018 2:00

---

*Sample description can be paint chips, concrete, specific sample collection location, etc...  
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.  
All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.  
*Required fields, failure to complete these fields may result in a delay in your samples being processed.
## Analytical Report

**Client**
Advanced Analytical Laboratory

**Acculab WO#**
18-AL1012-1

**Project Manager**
Uwe Baumgartner/ Elisa Young

**Project Name**
Kole Kole Beach Park

**Date Sampled**
10/5/2018

**Date Received**
10/12/2018

**Date Reported**
10/17/2018

## Organochlorine Pesticides in Soil by EPA 8081B/EPA3550C

**Accu Lab Analytical Batch#**
AL101218-3

### Client sample ID

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### Surrogate Recoveries

| Decachlorobiphenyl | 93% | 85% | 91% | 87% | 87% | 91% |
| Tetrachloro-m-xylene | 89% | 89% | 96% | 91% | 86% | 99% |

**Acceptable Recovery Limits:**

| Surrogates | 50-150% |
| LCS/MS/MSD | 50-150% |

**Acceptable RPD limit:**

30%
**Analytical Report**

**Client**
Advanced Analytical Laboratory

**Acculab WO#** 18-AL1012-1

**Project Manager**
Uwe Baumgartner/ Elisa Young

**Project Name**
Kole Kole Beach Park

**Client Project#**
T660

---

**Organochlorine Pesticides in Soil by EPA 8081B/EPA3550C**

Accu Lab Analytical Batch# AL101218-3

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**Organochlorine Pesticides in Soil by EPA 8081B/EPA3550C**

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<th>γ-BHC (Lindane)</th>
<th>β-BHC</th>
<th>Heptachlor</th>
<th>δ-BHC</th>
<th>Aldrin</th>
<th>Heptachlor Epoxide</th>
<th>Endosulfan I</th>
<th>4,4'-DDE</th>
<th>Dieldrin</th>
<th>Endrin</th>
<th>4,4'-DDD</th>
<th>Endosulfan II</th>
<th>4,4'-DDT</th>
<th>Endrin Aldehyde</th>
<th>Methoxychlor</th>
<th>Endrin Ketone</th>
<th>Endosulfan Sulfate</th>
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**Surrogate Recoveries**

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<th>Surrogate</th>
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<th>83%</th>
<th>86%</th>
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<td>Tetrachloro-m-xylene</td>
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**Acceptable Recovery Limits:**
- Surrogates: 50-150%
- LCS/MS/MSD: 50-150%

**Acceptable RPD limit:** 30%

---

*This report is issued solely for the use of the person or company to whom it is addressed. Any use, copying or disclosure other than by the intended recipient is unauthorized.*
## Analytical Report

**Client**
Advanced Analytical Laboratory
544 Ohohia Street #10
Honolulu, HI, 96819

**Project Manager**
Uwe Baumgartner/ Elisa Young

**Project Name**
Kole Kole Beach Park

**Client Project#**

**Project#**
T660

---

### Organochlorine Pesticides in Soil by EPA 8081B/EPA3550C

**Accu Lab Analytical Batch#**
AL101218-3

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<td>nd</td>
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<tr>
<td>β-BHC</td>
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<tr>
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<td>95%</td>
<td>2%</td>
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<td>95%</td>
<td>2%</td>
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<td>nd</td>
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<td>95%</td>
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<td>Dieldrin</td>
<td>1.0</td>
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<td>nd</td>
<td>nd</td>
<td>96%</td>
<td>95%</td>
<td>2%</td>
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<tr>
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<td>nd</td>
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<td>95%</td>
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<td>nd</td>
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<td>nd</td>
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<td>95%</td>
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<td>4,4’-DDT</td>
<td>5.0</td>
<td>ug/Kg</td>
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<td>nd</td>
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<tr>
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<td>ug/Kg</td>
<td>nd</td>
<td>nd</td>
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<td>95%</td>
<td>2%</td>
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<tr>
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<td>nd</td>
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<td>Technical Chlordane</td>
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<tr>
<td>Toxaphene</td>
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<td>nd</td>
<td>96%</td>
<td>95%</td>
<td>2%</td>
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### Surrogate Recoveries

- Decachlorobiphenyl: 87% 87% 88% 84%
- Tetrachloro-m-xylene: 131% 82% 83% 87%

---

Acceptable Recovery Limits:
- Surrogates: 50-150%
- LCS/MS/MSD: 50-150%
- Acceptable RPD limit: 30%

---

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## Metals in Soil by EPA 6020B/EPA3050B

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<thead>
<tr>
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<th>Lab ID</th>
<th>Matrix</th>
<th>Unit</th>
<th>MTH BLK</th>
<th>LCS</th>
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<th>100518-DU-2</th>
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<td>Soil</td>
<td>MTH BLK</td>
<td>LCS</td>
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<td>18-AL1012-1-2</td>
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<td>10/15/2018</td>
<td>10/15/2018</td>
<td>10/15/2018</td>
</tr>
</tbody>
</table>

| Arsenic (As)     | 1.0 mg/Kg | nd | 91% | 32 | 43 | 41 | 36 |
| Lead (Pb)        | 1.0 mg/Kg | nd | 94% | 84 | 96 | 97 | 87 |

**Acceptable Recovery Limits:**
- LCS 80-120%
- MS/MSD 75-125%

**Acceptable RPD limit:** 20%
## Analytical Report

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<td>Uwe Baumgartner/ Elisa Young</td>
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<td>Project Name</td>
<td>Kole Kole Beach Park</td>
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### Metals in Soil by EPA 6020B/EPA3050B

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<tr>
<td>Arsenic (As)</td>
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<td>mg/Kg</td>
<td>30</td>
<td>82</td>
<td>9.9</td>
<td>26</td>
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<td>Lead (Pb)</td>
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<td>mg/Kg</td>
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Acceptable Recovery Limits:
- LCS: 80-120%
- MS/MSD: 75-125%

Acceptable RPD limit: 20%
## Metals in Soil by EPA 6020B/EPA3050B

### Client Project Information
- **Client**: Advanced Analytical Laboratory
- **Project Manager**: Uwe Baumgartner/ Elisa Young
- **Project Name**: Kole Kole Beach Park
- **Project #:** T660

### Analytical Report

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**Acceptable Recovery Limits:**
- **LCS**: 80-120%
- **MS/MSD**: 75-125%

**Acceptable RPD limit**: 20%
## Analytical Report

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<td>Date Sampled</td>
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<tr>
<td>Project Name</td>
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<td>Date Received</td>
<td>10/12/2018</td>
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<td>Client Project#</td>
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<td>Date Reported</td>
<td>10/17/2018</td>
</tr>
<tr>
<td>Project#</td>
<td>T660</td>
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### Data Qualifiers and Comments:

**Results reported on dry-weight basis for soil samples.**

- **MRL-** Method Reporting Limit
- **nd-** Indicates the analyte is not detected at the listing reporting limit.
- **C-** Coelution with other compounds.
- **M-** % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
- **B-** Indicates the analyte is detected in the method blank associated with the sample.
- **J-** The analyte is detected at below the reporting limit.
- **E-** The result reported exceeds the calibration range, and is an estimate.
- **D-** Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
- **H-** Sample was received or analyzed past holding time
- **Q-** Sample was received with head space, improper preserved or above recommended temperature.
- **I-** Due to insufficient sample, LCS/LCS DUP were analyzed in place of MS/MSD.
- **R-** The recovery of this analyte in QC sample failed high, but the analyte was not detected in all related samples. No action was taken.
- **R-1-** The RPD value for the MS/MSD was outside of QC acceptance limits however both recoveries were acceptable. All related samples were "nd". No action was taken.
- **R-2-** The recovery of the surrogate in sample failed high, but all related analytes were not detected in the sample. No action was taken.
### Advanced Analytical Laboratory-Chain of Custody Record

**Turnaround Time:** 3 day

**Client:** Lehua Environmental

**Address:** P.O. Box 1014

**Phone:** (405) 494-0365

**Date of Collection:** 10-5-14

**Project Name:** Pole Pole Beach Park

**Collector:** Josee Lin

**Project Manager:**

| Sample Number | Time | Sample Type | Container Type | Multi-Essential Volatile | Multi-Essential Non-Volatile | BTEX | TPH-Diesel | TPH-Gasoline | BTEX | 9031/9041-II | 9031/9041-I | 9031/9041-IV | 9031/9041-III | 9031/9041-V | Total Lead | Total Copper | Total Iron | Trace Elements | PAHs | Field Notes |
|---------------|------|-------------|----------------|-------------------------|----------------------------|------|------------|-------------|------|--------------|-------------|-------------|--------------|------------|-------------|------------|------------|-----------|-------------|
| 100-514-DU-1  | 1:50 | 0.75        | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-2  | 4:30 |             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-3  | 1:00 |             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-4  | 5:00 |             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-5  | 12:00|             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-6  | 17:50|             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-7  | 11:00|             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-8  | 15:00|             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-9  | 7:00 |             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |
| 100-514-DU-10 | 2:00 |             | ZB-10k          | X                       | X                          | X    | X          | X           | X    | X            | X           | X           | X            |            |             |            |            | X         |            |

**Laboratory Notes:**
- Total Number of Containers: 12
- Chain of Custody Seals Intact: NA
- Received in Good Condition: Yes
- Temperature: 19.6°C

**Received By (Signature):**

**Date/Time:** 10-5-14 3:00

**Relinquished By (Signature):**

**Date/Time:** 10-9-14 9:00

**Laboratory Receipt:**

**Date/Time:** 10-9-14 1:35 PM

**Page of:** 1
### Analytical Report

**Client**
Advanced Analytical Laboratory  
544 Ohohia Street #10  
Honolulu, HI, 96819

**Accu Lab WO#**
19-AL0705-6

**Project Manager**
Uwe Baumgartner/ Elisa Young

**Project Name**
Kolekole Gulch Park Accessibility Improvements Projects

**Client Project#**
201905266

**Project#**
U487

---

### Bioaccessible Arsenic in Soil (<0.25mm Fraction)

<table>
<thead>
<tr>
<th>Client sample ID</th>
<th>Lab ID</th>
<th>MRL</th>
<th>Unit</th>
<th>MTH BLK</th>
<th>LCS</th>
<th>DU-1 201931910</th>
<th>DU-2 201931911</th>
<th>DU-3 201931912</th>
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### Bioaccessible Arsenic (As)

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**Acceptable Recovery Limits:**

- **LCS**: 85-115%
- **MS/MSD**: 75-125%

**Acceptable RPD limit**: 20%

---

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#### Bioaccessible Arsenic in Soil (<0.25mm Fraction)

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<th>Client sample ID</th>
<th>Lab ID</th>
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<td>0.10 mg/Kg</td>
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Acceptable RPD limit: 20%
**Client** | Advanced Analytical Laboratory | **Acculab WO#** | 19-AL0705-6
---|---|---|---
**Project Manager** | Uwe Baumgartner/ Elisa Young | **Date Sampled** | 6/27/2019
**Project Name** | Kolekole Gulch Park Accessibility Improvements Projects | **Date Received** | 7/5/2019
**Project#** | 201905266 | **Date Reported** | 7/10/2019
**Project#** | U487

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### Arsenic Bioaccessibility in Soil (<0.25mm Fraction)

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**Arsenic (As)**

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**Acceptable Recovery Limits:**

- **LCS** 85-115%
- **MS/MSD** 75-125%

**Acceptable RPD limit:** 20%

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<td>Project#</td>
<td>U487</td>
</tr>
<tr>
<td>Acculab WO#</td>
<td>19-AL0705-6</td>
</tr>
<tr>
<td>Date Sampled</td>
<td>6/27/2019</td>
</tr>
<tr>
<td>Date Received</td>
<td>7/5/2019</td>
</tr>
<tr>
<td>Date Reported</td>
<td>7/10/2019</td>
</tr>
</tbody>
</table>

### Data Qualifiers and Comments:

*Results reported on dry-weight basis for soil samples.*

- **MRL-** Method Reporting Limit
- **nd-** Indicates the analyte is not detected at the listing reporting limit.
- **C-** Coelution with other compounds.
- **M-** % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
- **B-** Indicates the analyte is detected in the method blank associated with the sample.
- **J-** The analyte is detected at below the reporting limit.
- **E-** The result reported exceeds the calibration range, and is an estimate.
- **D-** Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
- **H-** Sample was received or analyzed past holding time
- **Q-** Sample was received with head space, improper preserved or above recommended temperature.
- **I-** Due to insufficient sample, LCS/LCS DUP were analyzed in place of MS/MSD.
- **R-** The recovery of this analyte in QC sample failed high, but the analyte was not detected in all related samples. No action was taken.
- **R-1-** The RPD value for the MS/MSD was outside of QC acceptance limits however both recoveries were acceptable. All related samples were "nd". No action was taken.
- **R-2-** The recovery of the surrogate in sample failed high, but all related analytes were not detected in the sample. No action was taken.
<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Sample Type</th>
<th>Container Type</th>
<th>BioAccessible As</th>
<th>Field Notes</th>
<th>Number of containers</th>
<th>Number containers received</th>
</tr>
</thead>
<tbody>
<tr>
<td>DU-1 (201931910)</td>
<td>Soil</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DU-2 (201931911)</td>
<td>Soil</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>DU-3 (201931912)</td>
<td>Soil</td>
<td></td>
<td>X</td>
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</tr>
<tr>
<td>DU-4 (201931913)</td>
<td>Soil</td>
<td></td>
<td>X</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>DU-6 (201931914)</td>
<td>Soil</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RELINQUISHED BY (Signature): Anne Antin  
DATE/TIME: 7/3/2019  
RECEIVED BY (Signature):  
DATE/TIME:  

SAMPLE RECEIPT
TOTAL NUMBER OF CONTAINERS
CHAIN OF CUSTODY SEALS INTACT
RECEIVED IN GOOD CONDITION
TEMPERATURE

LABORATORY NOTES:
Sample has been sieved to 0.212um.  
BioAccessible As requested
<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Description*</th>
<th>Date Sampled* (mm/dd/yy)</th>
<th>Collection Medium</th>
<th>Sample Area / Air Volume</th>
<th>Analysis Requested*</th>
<th>Method Reference</th>
<th>Lab Report No.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DU-1</td>
<td>Multi-Incremental Soil Sample From DU-1</td>
<td>6/27/2019</td>
<td>Soil</td>
<td>*TOTAL</td>
<td>Bioaccessible Arsenic</td>
<td></td>
<td>201931910</td>
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<td>DU-2</td>
<td>Multi-Incremental Soil Sample From DU-2</td>
<td>6/27/2019</td>
<td>Soil</td>
<td></td>
<td>Bioaccessible Arsenic</td>
<td></td>
<td>201931911</td>
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<tr>
<td>DU-3</td>
<td>Multi-Incremental Soil Sample From DU-3</td>
<td>6/27/2019</td>
<td>Soil</td>
<td></td>
<td>Bioaccessible Arsenic</td>
<td></td>
<td>201931912</td>
</tr>
<tr>
<td>DU-4</td>
<td>Multi-Incremental Soil Sample From DU-4</td>
<td>6/27/2019</td>
<td>Soil</td>
<td></td>
<td>Bioaccessible Arsenic</td>
<td></td>
<td>201931913</td>
</tr>
<tr>
<td>DU-6</td>
<td>Multi-Incremental Soil Sample From DU-6</td>
<td>6/27/2019</td>
<td>Soil</td>
<td></td>
<td>Bioaccessible Arsenic</td>
<td></td>
<td>201931914</td>
</tr>
</tbody>
</table>

**Site/Project Name:**
Kolekole Gulch Park Accessibly Improvements Project

**Analysis Requested:**
- Bioaccessible Arsenic
- *TOTAL

**Special Instructions:**
Client was informed of the need to perform PLM positive stop. Lab sample(s) No.:
- 201931910
- 201931911
- 201931912
- 201931913
- 201931914

**Relinquished By (Print and Sign):**
Kama Kobayashi
6/27/2019

**Date/Time:**
07-01-19 11:46 RCVD

*Sample description can be paint chips, concrete, specific sample collection location, etc.*

If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section. All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.

*Required fields, failure to complete these fields may result in a delay in your samples being processed.

*Client requested to send tot. As and bioaccessible As. on separate report - AA 7.1.19.*
Hawaii Analytical Laboratory
3615 Harding Avenue, Suite 308, Honolulu, Hawaii, 96816
WWW.analyzehawaii.com - info@analyzehawaii.com

RECEIPT & ACKNOWLEDGEMENT FORM

Our Receiving Records show the following information about your sample(s).

Basic project information can be found on the COC for job number: 20480

(Due date, TAT, Client, Received by, Project name...)

<table>
<thead>
<tr>
<th>Applies only to valid conditions</th>
<th>Answer: Yes - No - NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooler Temp. °C</td>
<td>29.1°C</td>
</tr>
<tr>
<td>Containers Intact</td>
<td>Y</td>
</tr>
<tr>
<td>Preservation Confirmed</td>
<td>Y</td>
</tr>
<tr>
<td>COC / Labels Agree</td>
<td>Y</td>
</tr>
<tr>
<td>Received On Ice</td>
<td>N</td>
</tr>
<tr>
<td>COC Signed when receipt recvd.</td>
<td>Y</td>
</tr>
<tr>
<td>Samples intact / proper cont.</td>
<td>Y</td>
</tr>
</tbody>
</table>

1. Samples were received via? USPS FedEx UPS DHL Other
   - Other

2. Samples were received in? (circle)
   - Cooler

3. Packing material used: Bubble Wrap Gel Packs Box Envelope Paper Other
   - HOT ~30°C

4. Were custody papers properly filled out, (ink, signed, etc.)?
   - Y

5. Did samples / bottles arrive in good condition (unbroken)?
   - Y

6. Were all sample labels complete?
   - Y

7. Did all sample labels and tags agree with custody papers?
   - Y

8. Were appropriate bottles / containers and volumes received for the tests indicated?
   - Y

9. Were the pH-preserved bottles received at the appropriate pH?
   - Y

10. Were VOA vials received without headspace?
    - Y

Note, Discrepancies, and Resolutions:

Sample need Ti, S + tot. As. + Bi0 Acc. As

Form Completed By: [Signature]

Controlled Document ID: M-3400 Receipt and Acknowledgement Form. Rev 20180807
Page 1 of 1
DRAFT SUPPLEMENTAL LEAD-IMPACTED SOIL RESPONSE ASSESSMENT REPORT

AT

KOLEKOLE GULCH PARK, HONOMU, HAWAII

Prepared For:
Hawaii State Department of Transportation

Prepared By:
EnviroQuest
98-029 Hekaha Street, #21
Aiea, HI, 96701
&
Kealamahi Pacific Consultants, LCC

July 2019
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ATTACHMENTS
Attachment A: Laboratory Analytical Reports

List of Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>bgs</td>
<td>below ground surface</td>
</tr>
<tr>
<td>COPC</td>
<td>contaminants of potential concern</td>
</tr>
<tr>
<td>DU</td>
<td>decision unit</td>
</tr>
<tr>
<td>EAL</td>
<td>Environmental Action Level</td>
</tr>
<tr>
<td>EPA</td>
<td>United States, Environmental Protection Agency</td>
</tr>
<tr>
<td>HDOH</td>
<td>State of Hawaii Department of Health</td>
</tr>
<tr>
<td>HEER</td>
<td>Hazardous Evaluation and Emergency Response</td>
</tr>
<tr>
<td>LBP</td>
<td>lead-based paint</td>
</tr>
<tr>
<td>mg/kg</td>
<td>milligram per kilogram</td>
</tr>
<tr>
<td>QA</td>
<td>quality assurance</td>
</tr>
<tr>
<td>TCLP</td>
<td>toxicity characteristic leaching procedure</td>
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</table>
1 Introduction

This document presents the details of the lead assessment which was conducted in May 2019 at Kolekole Gulch Park (the “site”) in Honomu, Hawaii Island. The site is accessible from Old Mamalahoa Highway, approximately 12 miles north of Hilo. The Tax Map Key (TMK) is (3) 2-8-015: parcel 015 (Figure 1). The County of Hawaii owns the site, and the County of Hawaii Department of Parks and Recreation manages the site.

1.1 Purpose

The purpose of this lead assessment was to identify and delineate the extent of lead impacted soil within the previously identified Decision Units (DUs) at Kolekole Gulch Park.

The results of the previous 2016/2017 investigation were used to identify areas of concern for future sampling. The assessment evaluated existing data and associated human health and/or environmental hazards and provides a framework for managing soil at the site.

1.2 Site Description and History

The site is located at Kolekole Gulch Park, in Honomu, HI. The site is an open, level grassy site bordered by Kolekole Stream to the north and the Pacific Ocean to the east. The site is within the steep-sided Kolekole Gulch. The site is a public park for used for camping, general recreation, and fishing (Figure 1).

The site is located below the Kolekole Stream Bridge which is the suspected source of lead. Lead-based paints were applied to the bridge structure, and the paint subsequently flaked off to the park below resulting in lead-impacted soil. Lead paint was removed from the Bridge in 2001, eliminating future sources of lead-paint flakes.

1.3 Site History

In November 2016, the HDOH HEER Office performed a site investigation of surface soil at Kolekole Gulch Park to evaluate whether historical use of lead-based paints on Kolekole Bridge may have impacted the park. HDOH used an X-ray Fluorescence [XRF] analyzer to screen for lead, arsenic, and mercury in one composite soil sample. This single exposure decision unit (DU) was located directly below Kolekole Bridge and represented the most probable location of the lead-impacted soil.

Sixteen XRF measurements were taken from the combined incremental soil samples and averaged. The average lead concentration was 196 milligrams per kilogram [mg/kg] and the average arsenic concentration was less than 8.7 mg/kg. Mercury was not detected in any of the XRF measurements (HDOH, 2016).

Following this initial screening of soil using an XRF, two additional soil assessments were conducted at the site in 2016 and 2017 respectively. These assessments submitted incremental soil samples to the laboratory for analysis for lead. The subsequent assessments also increased the number of DUs to evaluate potential areas of elevated lead exposure to human receptors based on different park use activities (e.g., maintenance, stream bank, fire pit area, etc.). Results
were compared to the HDOH Tier 1 EALs for unrestricted land use (200 mg/kg for lead) (HDOH Fall 2011 revised Fall 2017).

Initially, multi-increment soil samples were collected from four DUs at a depth of 0 to 3 inches bgs in November 2016. All DU sample results exceeded 200 mg/kg for lead, and varied from 236 mg/kg to 664 mg/kg. The average lead result for the park was 465 mg/kg, exceeding both the HDOH Tier 1 EALs (200mg/kg) and the United States Environmental Protections Agency (EPA) preliminary remediation goals screening level of 400 mg/kg for residential levels (HDOH 2017).

Subsequently, a follow-up investigation was conducted in May 2017 at eleven DUs Sample results varied from 3.5 mg/kg to 530 mg/kg for lead (ESI 2017). Results of the combined sampling are presented in Figure 2.

The assessment consisted of collecting surface soil samples (0 to 3 inches below ground surface [bgs]) from 21 decision units [DUs] at the site and analyzing the samples for lead. Lead was detected at concentrations ranging from 3.5 to 664 mg/kg. Lead was detected in the surface soils (0 to 3 inches bgs) at concentrations above the HDOH HEER Office EALs for unrestricted land use (200 mg/kg) in seven DUs (DUs 1, 2, 3, 4, 10 Fire Pit, and Swale) (ESI, 2017a, 2017c, 2017d).

The highest lead concentration identified during the investigation was identified in DU 2 (664 mg/kg maximum result). To evaluate potential disposal options for this soil (i.e., whether lead at concentrations were high enough for the soil to exhibit hazardous waste characteristics) the soil samples found to contain the highest concentrations of lead were also analyzed in accordance with the Resource Conservation and Recovery Act (RCRA) toxicity characteristic leaching procedure (TCLP). TCLP lead concentrations ranged from 0.10 to 0.36 milligrams per liter, which is well below the EPA RCRA listed hazardous waste characteristic criterion of 5 mg/L.
2 Site Location

Figure 1: Site Location
This page intentionally left blank.
Figure 2: Previously Sampled Decision Units
Figure 3: April 2019 Soil Sample Results

<table>
<thead>
<tr>
<th>Depth Inches</th>
<th>DU3 Results mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>NA</td>
</tr>
<tr>
<td>3-6</td>
<td>230</td>
</tr>
<tr>
<td>6-9</td>
<td>360</td>
</tr>
<tr>
<td>9-18</td>
<td>140</td>
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</tbody>
</table>

<table>
<thead>
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<th>Depth Inches</th>
<th>DU2 Results mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>690, 450</td>
</tr>
<tr>
<td>3-6</td>
<td>790</td>
</tr>
<tr>
<td>6-9</td>
<td>510</td>
</tr>
<tr>
<td>9-18</td>
<td>97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<td>NA</td>
</tr>
<tr>
<td>3-6</td>
<td>960</td>
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<td>6-9</td>
<td>440</td>
</tr>
<tr>
<td>9-18</td>
<td>77</td>
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<table>
<thead>
<tr>
<th>Depth Inches</th>
<th>DU10 Results mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>NA, NA</td>
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<tr>
<td>3-6</td>
<td>130, 130</td>
</tr>
<tr>
<td>6-9</td>
<td>340, 220, 110</td>
</tr>
<tr>
<td>9-18</td>
<td>2400, NA, NA</td>
</tr>
</tbody>
</table>

Notes: mg/kg = milligrams per kilogram
NA = not sampled

Below HDOH Tier 1 EALs for unrestricted land use (200 mg/kg)
Above HDOH Tier 1 EALs for unrestricted land use but below construction/trench worker direct exposure scenario (800 mg/kg)
Above HDOH Tier 1 EALs for construction/trench worker direct exposure scenario but below gross contamination (1000 mg/kg)
Above HDOH Tier 1 EALs for gross contamination.
3 Soil Sampling and Analysis

Lead contaminated surface soil in formerly identified DUs 1, 2, 3, 4, 10, Fire Pit and Swale was identified as a potential direct exposure hazard in the Kolekole Preliminary Hazard Assessment (EQI, 2017d). Since Fire Pit and Swale were locations that occurred within a larger DU (DU 1 DU 2, respectively) and were locations that were only identified as decision units based on concerns related to the very upper surface soil conditions, they were not elected as DUs to be sampled during this follow-up site investigation.

Multi-increment surface soil sampling was conducted on April 22-24, 2019 to conduct the follow-up site investigation. Sample collection followed the HDOH Technical Guidance Manual for multi-increment soil sampling.

Soil borings were installed using direct-push technology by advancing 2-inch diameter hollow samplers lined with dedicated acetate sleeves. Within each of the five DUs (DUs 1, 2, 3, 4, and 10) fifty (50) soil borings were conducted. A gasoline powered post driver was used to advance the sampler from the surface to 18-inches below ground surface. During each boring, soil samples were collected continuously during drilling in the acetate sleeve which was removed from the hollow sampler and split open to all the collection of soil from each target soil layer elevation (3-6 inches bgs, 6-9 inches bgs, and 9-18 inches bgs). From each of the 50 sampling locations in each DU, the respective target soil sample increments were placed into a plastic bag (i.e., all 3-6 inch sample in one bag, all 6-9 inch sample in its own bag, and all 9-16 inch samples into its own bag.

At DU1, because refusal was encountered 6 inches bgs only soil from the 3-6 inch soil layer was collected at this DU. The underlying substrate below the 6 inch soil layer were basalt pebbles and rock that were likely rounded in the stream and wave activity in the former stream channel or mouth of Kolekole Stream.

At DU2, additional multi-incremental soil sample was collected from the surface soil layer in this DU (0-3 inches) since it was previously demonstrated to have the highest lead concentration and our investigation wanted to evaluate the potential leaching that could be occurring from the soil. This sample was analyzed for total lead and lead using the synthetic precipitation leaching procedure (SPLP) which is based on Environmental Protection Agency (EPA) Method SW846/1312 and those requirements set forth in the latest version of the National Environmental Laboratory Accreditation Committee (NELAC) Quality Systems protocols. The SPLP is designed to determine the mobility of both organic and inorganic analytes present in liquids, solids, and wastes. The intent SPLP test is to simulate the conditions of an acidic precipitation similar to rain water which may pass through the media of interest and travel into the groundwater carrying the soluble materials with it. SPLP simulates the natural leaching process that occurs to contaminants of potential concern on, or in the ground as a result of precipitation and is used to determine the potential a material left on the ground has to impact groundwater (or surface water). Essentially, the results of the SPLP test provide an estimate of how mobile the contaminants of concern are and whether they post.

Disposable sampling equipment was used in order to avoid the risk of cross-contamination. The samplers replaced their nitrile gloves prior to the collection of each environmental sample.
Replicate samples were collected at DU15 in order to measure variability in the sampling procedure as part of the quality assurance procedure described in the project work plan (EQI, 2019). A total of three sets of 50 incremental samples from each soil layer in DU15 were performed. Refusal was also encountered during the primary sample at DU15 in approximately 40 out of 50 of the sampling increments during the 9-18 inch sampling layer. Similar frequency of refusal and recovery were encountered during the duplicate and triplicate sampling efforts. The recovered soil from this unit was mostly hard saprolite (weathered basalt) or fragments of basalt pebbles that were collected in the shoe of the sampler (between approximately 9 to 11 inches bgs). Because of poor sample recovery, the sample submitted from the 9-18 soil layer for analysis was a combination of the primary and replicate samples collected from DU15.

The samples were placed directly into a Ziploc® bag, labeled with unique sample identification information, placed into a second sealable plastic bag, and placed into a cooler chilled with ice for preservation. The samples were chilled and maintained at a temperature of four degrees Celsius (ºC) ± 2ºC and managed under chain-of-custody protocol and documentation until shipment to the analytical lab, ESN Pacific. Lab results and COCs are found in Attachment A.

As described above, samples were collected at a series of depths.

- One sample and a duplicate, was collected at DU 2 at a depth of 0 to 3 inches
- Samples were collected at a depth of 3 to 6 inches at all five decision units. A duplicate and triplicate was collected at this depth at DU10.
- Samples were collected at a depth of 3 to 6 inches at four decision units. A duplicate and triplicate was collected at this depth at DU10.
- Samples were collected at a depth of 6 to 9 inches at four decision units.

The samples were analyzed by ESN Pacific for total lead. The complete analytical laboratory reports are available in Attachment A.

4 Quality Assurance and Quality Control

Standard operating procedures were followed for soil sampling, sample custody, and laboratory analysis. Quality Assurance and Quality Control [QA/QC] procedures include the verification of chain of custody information, proper documentation within the field logbook and laboratory forms, verification of laboratory sample and QC data and collection of replicate samples. Soil samples were properly preserved (chilled to ≤ 4 degrees Celsius), and extracted within the required hold time (i.e., 6 months).

4.1 Analytical Laboratory QA/QC

Laboratory QC parameters were assessed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity parameters and analytical method requirements.
Table 1: Kolekole Gulch Park Soil Surface Sample Results 0 to 9 inches bgs

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Detection Limit (mg/kg)</th>
<th>HDOH Tier 1 EALs Unrestricted Land Use (residential) (mg/kg)</th>
<th>HDOH Commercial/Industrial Land Use and Construction/Trench Workers Exposure Scenario (mg/kg)</th>
<th>DU1_3_6_042319</th>
<th>DU2_0_3_042219</th>
<th>DU2_3_6_042419</th>
<th>DU2_6_9_042419</th>
<th>DU3_3_6_042419</th>
<th>DU3_6_9_042419</th>
<th>DU4_3_6_042319</th>
<th>DU4_6_9_042319</th>
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<td></td>
<td>HDOH Tier 1 EAL Gross Contamination (mg/kg)</td>
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<td></td>
<td></td>
<td></td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
<td>mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-6 in. bgs</td>
<td>0-3 in. bgs</td>
<td>3-6 in. bgs</td>
<td>6-9 in. bgs</td>
<td>3-6 in. bgs</td>
<td>6-9 in. bgs</td>
<td>3-6 in. bgs</td>
<td>6-9 in. bgs</td>
<td>6-9 in. bgs</td>
</tr>
<tr>
<td>Total Lead</td>
<td>5</td>
<td>200</td>
<td>800</td>
<td>1000</td>
<td>110</td>
<td>690,450</td>
<td>790</td>
<td>510</td>
<td>230</td>
<td>360</td>
<td>960</td>
</tr>
</tbody>
</table>

Total Lead  | 5                     | 200                                                        | 800                                                                              | 1000           | 160            | 340            | 130            | 220            | 220            | 110            |
Table 2: Kolekole Gulch Park Subsurface Soil (9 to 18 inches bgs) Sample Results

<table>
<thead>
<tr>
<th>Analyte</th>
<th>HDOH Tier 1 EALs Unrestricted Land Use (residential) (mg/kg)</th>
<th>HDOH Commercial/Industrial Land Use and Construction/Trench Workers Exposure Scenario (mg/kg)</th>
<th>DU2_9-18_042419</th>
<th>DU3_9-18_042419</th>
<th>DU4_9-18_042419</th>
<th>DU10_9-18_042419</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Soil</td>
<td>Soil</td>
<td>Soil</td>
<td>Soil</td>
<td>Soil</td>
<td>Soil</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>800</td>
<td>1000</td>
<td>97</td>
<td>140</td>
<td>77</td>
</tr>
</tbody>
</table>

Bgs = below ground surface  
In = inches  
nd = quantities did not exceed the method detection limit  
mg/kg = milligrams per kilogram  
na = not applicable

BOLD: Exceeds Hawaii State Department of Health (HDOH) Residential/Tier I Environmental Action Levels (EALs).  
BOLD: Exceeds HDOH Construction/Industrial land use EALs and Construction/Trench Worker Exposure Scenario and gross exposure
### Table 3: TCLP Lead Results Decision Unit 10

<table>
<thead>
<tr>
<th>Analyte</th>
<th>DU10_9-18_042419 Soil 24-April-19 9 to 18 inches bgs Mg/L</th>
<th>EPA Regulatory Limit mg/L</th>
<th>Method Reporting Limit mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLP LEAD</td>
<td>1.7</td>
<td>5</td>
<td>0.05</td>
</tr>
</tbody>
</table>

mg/L = milligrams per liter  
TCLP: toxicity characteristic leaching procedure

### Table 4: SPLP Lead Results Decision Unit 2

<table>
<thead>
<tr>
<th>Analyte</th>
<th>DU2_0-3_042219 Soil 24-April-19 9 to 18 inches bgs mg/L</th>
<th>EPA Regulatory Limit mg/L</th>
<th>Method Reporting Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPLP LEAD</td>
<td>nd</td>
<td>0.015</td>
<td>0.05</td>
</tr>
</tbody>
</table>

mg/L = milligrams per liter  
SPLP: synthetic precipitation leaching procedure  
nd = quantities did not exceed the method detection limit
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5 Comparison of Site Data to Action Levels

The surface soil sample results were compared to the HDOH Tier 1 EALs for where groundwater is a current or potential source of drinking water, and the site is less than 150 meters to a surface water body (HDOH Fall 2011 revised Fall 2017).

- Surface soil samples (0 to 3 inches bgs) were collected at DU2. These exceeded the HDOH Tier 1 EAL for lead (200 mg/kg) for unrestricted land use, but were below the Construction/Trench Worker Exposure Direct Scenario of 800 mg/kg.
- Seven samples were collected at a depth of 3 to 6 inches bgs. Three of these samples were below the Tier 1 EAL for unrestricted land use, three were above the Tier I EAL for unrestricted land use, but below the Construction/Trench Worker Direct Exposure Scenario of 800 mg/kg, and one exceeded the Construction/Trench Worker Direct Exposure Scenario (DU4).
- Six samples were collected at a depth of 6 to 9 inches bgs. One sample was below the Tier 1 EAL for unrestricted land use, and five were above Tier I EAL for unrestricted land use, but below the Construction/Trench Worker Direct Exposure Scenario.
- Four subsurface samples were collected at a depth of 9 to 18 inches bgs. Samples from DU2, DU3, and DU4 were all below 200 mg/kg for lead, and are acceptable for unrestricted land use. However, DU10 sample results were 2,400 mg/kg, more than twice the HDOH Tier 1 EAL for Gross Contamination for total lead.

The table below provides a summary of the April 2019 sample results to the 2016/2017 sample results.

**Table 5: Kolekole Gulch Park Soil Sample Comparison Table**

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>DU1</th>
<th>DU2</th>
<th>DU3</th>
<th>DU4</th>
<th>DU10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2016/2017 Sample Results</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-3 bgs</td>
<td>Worker</td>
<td>Worker</td>
<td>Worker</td>
<td>Worker</td>
<td>Worker</td>
</tr>
<tr>
<td><strong>April 2019 Soil Sample Results</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-3 bgs</td>
<td>NA</td>
<td>Worker</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>3-6 bgs</td>
<td>Unrestricted</td>
<td>Worker</td>
<td>Worker</td>
<td>Exceeds</td>
<td>Worker</td>
</tr>
<tr>
<td>6-9 bgs</td>
<td>NA</td>
<td>Worker</td>
<td>Worker</td>
<td>Worker</td>
<td></td>
</tr>
<tr>
<td>9-18 bgs</td>
<td>NA</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
<td>Gross contamination</td>
</tr>
</tbody>
</table>

*DU10 consists of a sample, duplicate and triplicate. For the purposes of this table, the highest total lead sample result is identified.*

<table>
<thead>
<tr>
<th>Unrestricted</th>
<th>Below HDOH Tier 1 EALs for unrestricted land use (200 mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worker</td>
<td>Above HDOH Tier 1 EALs for unrestricted land use, below HDOH EALs for construction/trench worker direct exposure (800 mg/kg)</td>
</tr>
<tr>
<td>Exceeds</td>
<td>Above HDOH Tier 1 EALs for construction/trench worker direct exposure (800 mg/kg)</td>
</tr>
<tr>
<td>Gross contamination</td>
<td>Exceeds HDOH EALs for Gross contamination (1000 mg/kg)</td>
</tr>
<tr>
<td>NA</td>
<td>Not sampled</td>
</tr>
</tbody>
</table>
During the November 2016 and May 2017 analysis, the highest sample results were found at DU2 (664 mg/kg). Sample results at DU1, DU2, DU3, DU4, DU5, DU6, DU10, DU19, DU20, and subsamples within DU1 and DU2 all exceeded the HDOH Tier 1 EAL for lead for unrestricted land use but were below the HDOH EALs for construction/trench worker direct exposure (800 mg/kg). Sample results were analyzed for toxicity characteristic leaching procedure (TCLP) to guide disposal. TCLP lead was not detected at concentrations above the Resource Conservation and Recovery Act [RCRA] criterion for listed hazardous waste (5 mg/L) (ESI 2017).

The results of the SPLP analysis performed on the surface soil sample collected from DU2, which had demonstrated the highest total lead concentration identified during the previous sampling events, were below method reporting limit of 0.05 mg/L. This result demonstrates that the lead present in the soil is strongly bound to the volcanic sediment that comprises the soil at Kolekole Gulch Park. This finding indicates that there is low likelihood that the lead concentrations in the soil at the park pose a risk to ecological receptors (e.g., aquatic organisms) as a result of lead leaching from the soil into rainwater and impacting the groundwater as it flows toward the stream and ocean that form the northern and eastern perimeter of the park.

Samples from DU10 (9-18 inches), which had a total lead result of 2400 mg/kg, were submitted to the lab for TCLP analysis to determine if the material would be classified as hazardous waste under RCRA, 40 CFR 26. Sample results for DU10 were 1.7 mg/L, below the TCLP regulatory level of 5 mg/L. Soils from this location are not classified as hazardous waste based on these results.
6 Summary

HDOH Soil Classification levels for lead are as follows:

- **Category A:** Background: Soils with lead results below 73 mg/kg (the natural background level for Hawaii).
- **Category B:** Meets Tier 1 EALS: Soils with lead above the background level of 73 mg/kg but below the action level of 200 mg/kg for residences and young children.
- **Category C:** Exceeds Tier 1 EALs, below Construction/Trench Worker Exposure Scenario Action Levels: soils with lead above the 200 mg/kg action level but below the 800 mg/kg soil action level for and contractors (HDOH 2016, Table I-2).
- **Category D:** Exceeds Construction/Trench Worker Exposure Scenarios: Category D soils are greater than the 800 mg/kg action level and pose a potential risk to contractors, even in low activity areas where work may potentially occur.
- **Exceeds Gross contamination.**

6.1.1 Lead Exposure Pathways

Human receptors are exposed to lead mainly through:

- **Gross contamination** (≥1,000 mg/kg): potentially mobile dusts/residues and general resource degradation. The primary concern is for potential impacts to ecological receptors on the site. The site does not have critical habitat. Ecological receptors (gross contamination) will not be discussed further in this EHMP.

- **Construction/Trench Worker** (800 mg/kg): The HDOH construction/trench worker exposure scenarios are set equal to assumptions used in the USEPA RSLs (USEPA 2016) for consistency with screening levels for occupational exposure assumptions. The exposure rate reflects projects that may require the same workers returning frequently to the same site (construction workers in utility trenches). The HDOH TGM uses a total exposure duration of seven years for both carcinogens and noncarcinogens. An exposure frequency of 20 days (4 weeks) per year for 7 years yields a total of 140 days total exposure. Construction workers may receive 140 days (roughly 6 months) of exposure in a single year and never visit the site again. The EPA evaluates lead exposure by using blood-lead modeling, such as the Integrated Exposure-Uptake Biokinetic Model which recommends that soil lead levels less than 400 mg/kg are generally safe for residential use (HDOH 2017).

- **Direct exposure** (≥200 mg/kg): exposure to contaminants via incidental ingestion, dermal absorption, and inhalation of vapors or dust in outdoor air, include the following pathways:

  - **Dermal absorption** - It is not likely to encounter lead that readily enters the human body through dermal exposure since leaded gasoline additives are no longer used.

  - **Incidental ingestion** - From 20% to 70% of ingested lead is absorbed. The primary concern is that on a regular basis some people may unintentionally swallow very small amounts of contaminated soil and/or contaminated groundwater, especially young children who are unaware of the hazards and may be exposed to contaminated soil through normal play activities. As lead paint deteriorates, peels, chips, or is removed (e.g., by renovation, etc.), or pulverizes due to friction, surrounding soil may become contaminated. Lead then enters the body through normal hand-to-mouth activity. Also, residual dirt on produce
grown in lead-contaminated soil and on hands after gardening or outside work may also contribute to lead exposure through accidental ingestion of soil particles.

- **Inhalation**—Inhalation of lead dust is another route of exposure, and almost all inhaled lead is absorbed into the body, whereas from 20% to 70% of ingested lead is absorbed (ATSDR 2005).

Once absorbed into the body, lead may be stored for long periods in mineralizing tissue (e.g., teeth, bones, etc.). The stored lead may be released again into the bloodstream, especially in times of calcium stress (e.g., pregnancy, lactation, osteoporosis, etc.), or calcium deficiency.

Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproduction and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood.

The lead effects most commonly encountered in current populations are neurological effects in children and cardiovascular effects (e.g., high blood pressure, heart disease, etc.) in adults. Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ.

### 6.1.2 Lead Environmental Concerns

Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, direct discharge of waste streams to water bodies, mining, erosion, and through deterioration and deposition of lead-based paint (LBP). Ecosystems near point sources of lead demonstrate a wide range of adverse effect including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrate
6.2 Volume of Impacted Soil at Kolekole Gulch Park

For purposes of planning, should excavation for removal impacted soil be required, the following table identifies the estimated cubic yards of each decision unit profile. As a disclaimer, not all locations at the site have been sampled. It should be noted that removal of soil from the park would likely require state federal permits to complete this type of project.

<table>
<thead>
<tr>
<th>Sq. Feet (Estimated)</th>
<th>DU1</th>
<th>DU2</th>
<th>DU3</th>
<th>DU4</th>
<th>DU10</th>
</tr>
</thead>
<tbody>
<tr>
<td>8320</td>
<td>11,274</td>
<td>18,000</td>
<td>3,934</td>
<td>2,775</td>
<td></td>
</tr>
</tbody>
</table>

Depth Profile

<table>
<thead>
<tr>
<th>0-3 bgs</th>
<th>77 CY*</th>
<th>104 CY</th>
<th>167 CY*</th>
<th>36 CY*</th>
<th>26 CY*</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6 bgs</td>
<td>77 CY</td>
<td>104 CY</td>
<td>167 CY</td>
<td>36 CY</td>
<td>26 CY</td>
</tr>
<tr>
<td>6-9 bgs</td>
<td>NA</td>
<td>104 CY</td>
<td>167 CY</td>
<td>36 CY</td>
<td>26 CY</td>
</tr>
<tr>
<td>9-18 bgs</td>
<td>NA</td>
<td>313 CY</td>
<td>500 CY</td>
<td>109 CY</td>
<td>77 CY</td>
</tr>
</tbody>
</table>

*Data from 2019/2017 Sample Results

Legend

| Below HDOH Tier 1 EALs for unrestricted land use (200 mg/kg) | Above HDOH Tier 1 EALs for unrestricted land use, below HDOH EALs for construction/trench worker direct exposure (800 mg/kg) | Above HDOH Tier 1 EALs for construction/trench worker direct exposure (800 mg/kg) | Gross contamination Exceeds HDOH EALs for Gross contamination (1000 mg/kg) | NA Not sampled |

6.3 Volume of Soil Necessary for Soil Cap

Soils at Kolekole Gulch Park have been found to exceed HDOH Tier I EALs for unrestricted land use at several decision units. HDOH and EPA acceptable mitigation measures include soil removal (Section 6.2) or soil encapsulation. During soil encapsulation, decision units which exceed HDOH unrestricted land use EALs are first covered with orange mirafi (geotextile) or black geotextile with caution tape laid at intervals to produce a visible barrier between the clean and impacted soils. Clean fill is then brought in and overlaid across the impacted site at a depth between 12 inches and 24 inches, and grass is maintained to prevent potential exposure. This method has been approved for use in open spaces by the Hawaii Department of Education and HDOH at 18 schools in East Hawaii.
Table 7: Estimated Cubic Yards of Soil Cap Per DU Profile

<table>
<thead>
<tr>
<th></th>
<th>DU1</th>
<th>DU2</th>
<th>DU3</th>
<th>DU4</th>
<th>DU10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sq. Feet (Estimated)</td>
<td>8320</td>
<td>11,274</td>
<td>18,000</td>
<td>3,934</td>
<td>2,775</td>
</tr>
<tr>
<td>12 inch soil cap</td>
<td>308 CY</td>
<td>417 CY</td>
<td>666 CY</td>
<td>146 CY</td>
<td>103 CY</td>
</tr>
<tr>
<td>18 inch soil cap</td>
<td>462 CY</td>
<td>626 CY</td>
<td>999 CY</td>
<td>219 CY</td>
<td>156 CY</td>
</tr>
<tr>
<td>24 inch soil cap</td>
<td>616 CY</td>
<td>835 CY</td>
<td>1333 CY</td>
<td>291 CY</td>
<td>206 CY</td>
</tr>
</tbody>
</table>

If impacted soil is left in place, the site will require an Environmental Hazard Management Plan (EHMP) which will provide guidance for future site workers and managers who may work, remove or plan future uses at the site.
7 References


ESI, 2017a, Environmental Assessment, Kolekole Beach Park, Mamalahoa Highway (Route 19), Honomu, Hawaii, ESI Project No. 116046, March 16, 2017.

ESI, 2017b, Addendum to Work Plan and Sampling and Analysis Plan for Additional Assessment at Kolekole Beach Park, Mamalahoa Highway (Route 19), Honomu, Hawaii, ESI Project No. 116046, March 30, 2017.

ESI, 2017c, Preliminary Environmental Hazard Evaluation, Kolekole Beach Park, Mamalahoa Highway (Route 19), Honomu, Hawaii, ESI Project No. 116046, August 30, 2017.

ESI, 2017d, Addendum 2 - Work Plan and Sampling and Analysis Plan for Additional Assessment at Kolekole Beach Park, Mamalahoa Highway (Route 19), Honomu, Hawaii, ESI Project No. 116046, October 10, 2017.


———, 2003. *Guidance for Obtaining Representative Laboratory Analytical Subsamples from Particulate Laboratory Samples*. October 27.
APPENDIX A:
LABORATORY ANALYTICAL REPORTS