Harry Kim
Mayor

Wilfred M. Okabe
Managing Director

William A. Kucharski
Director

Diane A. Noda
Deputy Director

County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
345 Kekūanāo'a Street, Suite 41 · Hilo, Hawai'i 96720
Ph: (808) 961-8083 · Fax: (808) 961-8086
Email: cohdem@hawaiicounty.gov

March 11, 2019

Dr. Alan S. Downer, SHPD Administrator
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamōkila Boulevard, Suite 555
Kapolei, Hawai'i 96707

Re: Draft Archaeological Inventory Survey for the Pāhala Wastewater Treatment Plant and Sewer System Project, Hionamoa, Pālima, and Pā'au'au 1 and 2 Ahupua'a, Ka'ū District, Hawai'i Island
TMKs: (3) 9-6-002:016 por. and 018 por., 9-6-005:036 por. and 044, and County of Hawai'i Right-of-Ways (Bautista et al. 2019)
Submitted for HRS 6E-8 Review

Dear Dr. Downer:

The County of Hawai'i Department of Environmental Management is submitting the attached Draft Archaeological Inventory Survey (AIS) for the Pāhala Wastewater Treatment Plant and Sewer System Project, Hionamoa, Pālima, and Pā'au'au 1 and 2 Ahupua'a, Ka'ū District, Hawai'i Island, TMKs: (3) 9-6-002:016 por. and 018 por., 9-6-005:036 por. and 044, and County of Hawai'i Right-of-Ways (Bautista et al. 2019) for SHPD review, along with a 6E submittal filing fee form and check. These materials are additional submittals associated with existing Log No. 2018.000722.

The County of Hawai'i contracted Brown and Caldwell and its sub-consultants, Wilson Okamoto Corporation and Cultural Surveys of Hawai'i Inc., to prepare the attached AIS and has authorized them to coordinate directly with SHPD for processing and review and to address associated SHPD comments for this submittal.

The project's point of contact at the County of Hawai'i Department of Environmental Management is:

William A. Kucharski, Director
345 Kekuanaoa Street, Suite 41
Hilo, Hawai'i 96720
Phone: (808) 961-8083
Email: william.kucharski@hawaiicounty.gov

The project's point of contact at the County of Hawai'i Department of Environmental Management's Wastewater Division is:

Dora Beck, Wastewater Division Chief
108 Railroad Avenue
Hilo, Hawai'i 96720
Phone: (808) 961-8513
Email: dora.beck@hawaiicounty.gov

If you have any questions or comments, please contact Craig Lekven with Brown and Caldwell at (808) 442-3301. You may also reach him by email at CLekven@brwncald.com.

Sincerely,

William A. Kucharski
Director

WK:mef

Encs: Submittal Form
Draft AIS
Check for Filing Fee

cc: Diane Noda, DEM Deputy Director
Dora Beck, DEM-WWD Chief
Craig Lekven, P.E., Brown and Caldwell
John Sakaguchi, Wilson Okamoto Corporation

Draft

Archaeological Inventory Survey for the Pāhala Wastewater Treatment Plant and Sewer System Project, Hionamoa, Pālima, and Pā‘au‘au 1 and 2 Ahupua‘a, Ka‘ū District, Hawai‘i Island TMKs: [3] 9-6-002:016 por. and 018 por., 9-6-005:036 por. and 044, and County of Hawai‘i Right-of-Ways

Prepared for
Wilson Okomoto Corporation
and the
County of Hawai‘i Department of Environmental Management,
Wastewater Division

Prepared by
Olivier M. Bautista, B.A.,
Sarah Wilkinson, B.A.,
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: HIONAMOA 2)

March 2019

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Hawai‘i Office
399 Hualani St. #124
Hilo, Hawai‘i 96720
Ph.: (808) 965-6478
Fax: (808) 965-6582

Management Summary

Reference	Archaeological Inventory Survey for the Pāhala Wastewater Treatment Plant and Sewer System Project, Hionamoa, Pālima, and Pā‘au‘au 1 and 2 Ahupua‘a, Ka‘ū District, Hawai‘i Island, TMKs: [3] 9-6-002:016 por. and 018 por., 9-6-005:036 por. and 044, and County of Hawai‘i Right-of-Ways (Bautista et al. 2019)
Date	March 2019
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: HIONAMOA 2
Investigation Permit Number	CSH completed the archaeological inventory survey (AIS) fieldwork under archaeological fieldwork permit numbers 18-15 and 19-07, issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-282.
Agencies	United States Environmental Protection Agency (EPA); Hawai‘i State Department of Health (DOH); SHPD; County of Hawai‘i Department of Environmental Management (DEM), Wastewater Division
Land Jurisdiction	County; private (Kamehameha Schools, Olson Trust)
Project Proponent	County of Hawai‘i DEM
Project Funding	EPA (EPA Grant XP-96942401-6); State Revolving Fund
Project Location	The project is located in the town of Pāhala, approximately 5 km (3.1 miles) back from the coast in the Ka‘ū District, Hawai‘i Island. The project area crosses portions of Hionamoa, Pālima, and Pā‘au‘au 1 and 2 Ahupua‘a. The proposed treatment plant is located adjacent to the Maile Street and Hawai‘i Belt Road (Route 11) intersection. The project and is depicted on a portion of the 1995 Pahala U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The project includes closure of two Large Capacity Cesspools (LCCs) and development of a new collection system and treatment and disposal facility to service the Pāhala community. The collection system is located on county streets. The treatment disposal facility will occupy 14.9 acres and is located on a portion a 42.5-acre property (TMK: [3] 9-6-002:018) near the southern edge of Pāhala Town presently owned by Kamehameha Schools and under lease to Royal Hawaiian Orchards. Almost the entire parcel is planted in a commercial macadamia nut orchard, with a macadamia nut processing plant parking lot in the southeastern corner outside the limits of the current project area.
Area of Potential Effect (APE) and AIS Project Area Acreage	The project APE comprises 57.7 acres (23.4 hectares) in Pāhala Town, while the AIS project area is a 29.3-acre (11.8 hectares) area within the APE. The TMK parcels listed under “Reference” above are those associated with the project area; a full list of TMK parcels for the overall APE is given in Appendix A.

	The APE includes the following: 1. The 14.9-acre wastewater treatment plant (WWTP) site, within which all project-related staging, including for the collection system and the treatment and disposal facility, will be located; 2. An approximately 1,500-foot (ft) long by 25-ft wide utility easement (about 0.94 acres) located entirely within TMK: [3] 9-6-002:018 to connect the collection system line and other utilities to the WWTP; 3. The path of the new sewer collection lines, to be located within the 22- to 24-ft wide travel surface of select county streets; 4. Sewer line easements of similar width (22-24 ft) through TMKs: [3] 9-6-005:036 and 044 connecting the collection lines to the proposed Pāhala WWTP site; 5. The existing LCC 1 and 2 locales (located in TMKs: [3] 9-6-002:016 and 9-6-016:041, respectively), and an approximately 100-m (328-ft) long by 15-m (49-ft) wide corridor along the existing sewer line easement in TMK: [3] 9-6-002:016 between Maile Street and LCC 1; and 6. Numerous single-family residential/other properties with existing sewer laterals, some of which may need to be replaced/repaired/rehabilitated by the County. The AIS project area comprises Items 1–5 within the project APE, except for the LCC 2 location behind a private residence in TMK: [3] 9-6-016:041. It also does not include the numerous private properties located along the county streets selected for new sewer collection lines (Item 6).
Historic Preservation Regulatory Context	This AIS investigation was designed to comply with both federal and Hawai‘i State environmental and historic preservation review legislation. Due to federal (EPA) funding, this project is a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). As a county project within both private and county lands, the project is also subject to Hawai‘i State environmental and historic preservation review legislation (Hawai‘i Revised Statutes [HRS] §343 and HRS §6E-8/HAR §13-275, respectively). In consultation with the SHPD, this archaeological inventory survey (AIS) investigation fulfills the requirements of HAR §13-276 and the *Secretary of the Interior's Standards for Archaeology and Historic Preservation*. It was conducted to identify, document, and make National Register of Historic Places (National Register) and Hawai‘i Register of Historic Places (Hawai‘i Register) eligibility recommendations for any historic properties. This report is also intended to support any project-related historic preservation consultation with stakeholders such as state and county agencies and

	interested Native Hawaiian Organizations (NHOs) and community groups, if applicable. Pacific Legacy in 2016 conducted an archaeological field inspection of the entire 42.5-acre TMK: [3] 9-6-002:018 (Cleghorn 2016). The 11 November 2016 letter report was addressed to Dora Beck, P.E., Wastewater Division Chief for the County DEM Wastewater Division. The report noted extensive ground disturbance throughout the parcel conducted "prior to the planting of the present macadamia nut orchard. The area at the southeastern corner of the parcel that is not planted in macadamia nut trees has also been extensively disturbed and a portion of it serves as a graveled parking lot for the adjacent macadamia nut processing plant." A sealed lava tube entrance is present in this corner of the parcel outside the current project area. No surface archaeological features were documented by Cleghorn (2016). A handful of surface artifacts, including a single discoidal hammerstone and fragmental bottle glass and ceramics, were documented within the northern portion of the parcel outside the current project area. Cleghorn (2016) recommended consultation with SHPD about project historic preservation requirements, noting that SHPD would likely require an AIS. Cleghorn (2016) also recommended limiting the project area footprint to avoid the lava tube located in the southeastern corner of TMK: [3] 9-6-002:018. On 17 October 2017 the project proponent provided a written request to the SHPD for a letter of determination in accordance with HAR §13-275-3 (Appendix B). The Cleghorn (2016) letter report was attached as supportive information. CSH on 22 February 2018 met with SHPD Archaeology Branch Chief Dr. Susan Lebo to follow up on a 17 October 2017 request for project determination. During this meeting Dr. Lebo indicated the following: • An AIS should be undertaken addressing the entire area of proposed ground disturbance, with subsurface testing; • The AIS should include a "good faith effort" to address possible lava tubes within the area of proposed ground disturbance; • Backhoe assisted excavations should be conducted within select proposed features at the plant site; • All areas of the project not included in TMK: [3] 9-6-002:018 should be addressed, in particular the lateral installations along the county roadways; these areas probably would not require subsurface testing but should be evaluated for any relation to a possible historic plantation village or historic property designation.

	The items outlined above, and a more detailed summary of the subsurface testing schema, were supplied in a 22 March 2018 county DEM letter addressed to SHPD, which requested formal written concurrence with the AIS approach; additional materials were subsequently supplied to SHPD on request (see Appendix B). SHPD replied to this letter concurring with the AIS approach in a §6E-8 and NHPA Section 106 Review letter dated 20 August 2018 (Log No.: 2018.00722; Doc. No.: 1808JA02) (Appendix C). CSH on 6 December 2018 met with Dr. Susan Lebo and Dr. Jane Allen of SHPD to discuss the project APE and documentation requirements (Appendix D).
Fieldwork Effort	CSH archaeologists Olivier Bautista, B.A., and Sarah Wilkinson, B.A., conducted fieldwork on 18 September 2018, 1–4 October 2018, and 10 January 2019 under the general supervision of Principal Investigator Hallett H. Hammatt, Ph.D. This work required approximately 8 person-days to complete.
Consultation	Consultation is being undertaken for the project to comply with Section 106 of the NHPA. Presently, Section 106 consultation with community, agency, and Native Hawaiian Organizations has been initiated and is ongoing by the project proponents. The results of the current investigation will be utilized in these ongoing efforts. To date, no historic properties have been assessed as having traditional cultural significance to an ethnic group (Criterion e) within the project area.
Historic Properties Identified	Two newly documented historic properties were identified through background research: State Inventory of Historic Places (SIHP) #s 50-10-69-31088 is the historic Wood Valley Road/Coastal Road corridor, and SIHP # 50-10-69-31089 is the historic Volcano Road corridor. They are both assessed as significant under Criterion d for yielding important information for research on former rights of way in Pahala history. Constructed elements of the portions of these road alignments within the project area have been thoroughly impacted by the development of modern roadways, becoming Maile Street and Pikake Street in Pahala town within the original corridors. Due to the impacts and changes to these roads in Pāhala over time these historic properties only maintain integrity of location of the old corridor. SIHP # s -31088 and -31089 are assessed as significant under Criterion d per HAR §13-275-6 for the information they have yielded about primary transportation routes in the Pāhala vicinity during the late nineteenth and early twentieth centuries.
Effect Recommendation	Following consultation among EPA, DOH, DEM, and SHPD regarding the project effect for the segments of the Wood Valley/Coastal Road (SIHP # 50-10-69-31088) and Volcano Road (SIHP # 50-10-69-31089)

	within the project area under HRS §6E-8, per HAR § 13-275-7(a)(1) the County of Hawai‘i DEM’s project effect determination is “no historic properties affected.” In accordance with federal regulations (36 CFR 800.5), the AIS results support a determination of “no historic properties affected.”
Mitigation Recommendations	No mitigation commitments are recommended for the portions of SIHP #s 50-10-69-31088 and -31089 within the project area. The portions of these historic properties within the project area only maintain integrity of location as all of the constructed elements of the original Wood Valley/Coastal road and Volcano road are no longer evident today. While this project will have no effect on historic properties, archaeological monitoring during construction for identification and/or cautionary measures is proposed. This is based on the location of the project being within the “Pahala Historic District” (SIHP # 50-10-69-07362), as well as the presence near the project area of three historic properties as follows: • a lava tube system (SIHP # 50-10-69-27570) with some cultural modifications beneath Pahala town; • Ka‘ū High and Pāhala Elementary School (SIHP # 50-10-69-07522), a National Register-eligible historic property; and • the Hawai‘i Belt Road, (SIHP # 50-10-47-30187), a National Register-eligible historic property south of the project area.

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Section 1 Introduction

1.1 Project Background

At the request of Wilson Okomoto Corporation and on behalf of the County of Hawai‘i Department of Environmental Management, Wastewater Division, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological inventory survey report (AISR) for the Pāhala Wastewater Treatment Plant and Sewer System project, Hionamoa, Pālima, and Pā‘au‘au 1 and 2 Ahupua‘a, Ka‘ū District, Hawai‘i Island, TMKs: [3] 9-6-002:016 por. and 018 por., 9-6-005:036 por. and 044, and County of Hawai‘i Right-of-Ways. The project area is located within a larger Area of Potential Effect (APE) in the town of Pāhala. The project area is depicted on a portion of the 1995 Pahala U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), tax map plats (Figure 2 and Figure 3), and a 2013 aerial photograph (Figure 4).

The project includes closure of two Large Capacity Cesspools (LCCs) and development of a new collection system and treatment and disposal facility to service the Pāhala community. The collection system is located on county streets. The treatment disposal facility will occupy 14.9 acres and is located on a portion a 42.5-acre property (TMK: [3] 9-6-002:018) near the southern edge of Pāhala Town adjacent to the Maile Street and Hawai‘i Belt Road (Route 11) intersection. This parcel is presently owned by Kamehameha Schools and under lease to Royal Hawaiian Orchards. Almost the entire parcel is planted in a commercial macadamia nut orchard, with a macadamia nut processing plant parking lot in the southeastern corner outside the limits of the current project APE.

The project APE comprises 57.7 acres (23.4 hectares) in Pāhala Town, while the AIS project area is a 29.3-acre (11.8 hectares) area within the APE (Figure 5). The TMK parcels listed above are those associated with the project area; a full list of TMK parcels for the overall APE is given in Appendix A. The APE includes the following:

1. The 14.9-acre wastewater treatment plant (WWTP) site, within which all project-related staging, including for the collection system and the treatment and disposal facility, will be located (Figure 6);
2. An approximately 1,500-foot (ft) long by 25-ft wide utility easement (about 0.94 acres) located entirely within TMK: [3] 9-6-002:018 to connect the collection system line and other utilities to the WWTP (see Figure 6);
3. The path of the new sewer collection lines, to be located within the 22- to 24-ft wide travel surface of select county streets;
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5. The existing LCC 1 and 2 locales (located in TMKs: [3] 9-6-002:016 and 9-6-016:041, respectively), and an approximately 100-m (328-ft) long by 15-m (49-ft) wide corridor along the existing sewer line easement in TMK: [3] 9-6-002:016 between Maile Street and LCC 1; and
6. Numerous single-family residential/other properties with existing sewer laterals, some of which may need to be replaced/repaired/rehabilitated by the County.

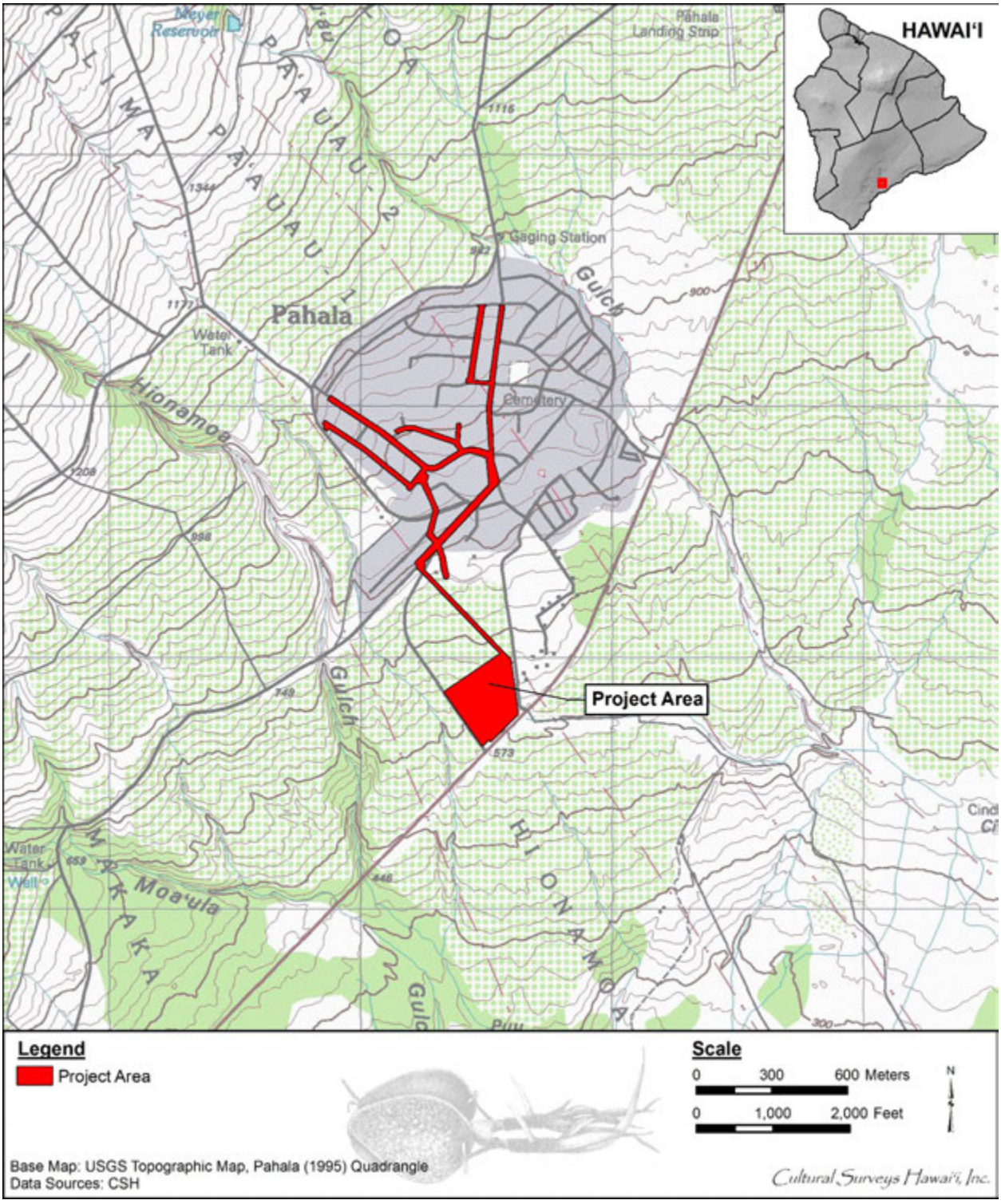

Figure 1. Portion of the 1995 Pahala USGS 7.5-minute topographic quadrangle showing the location of the project area

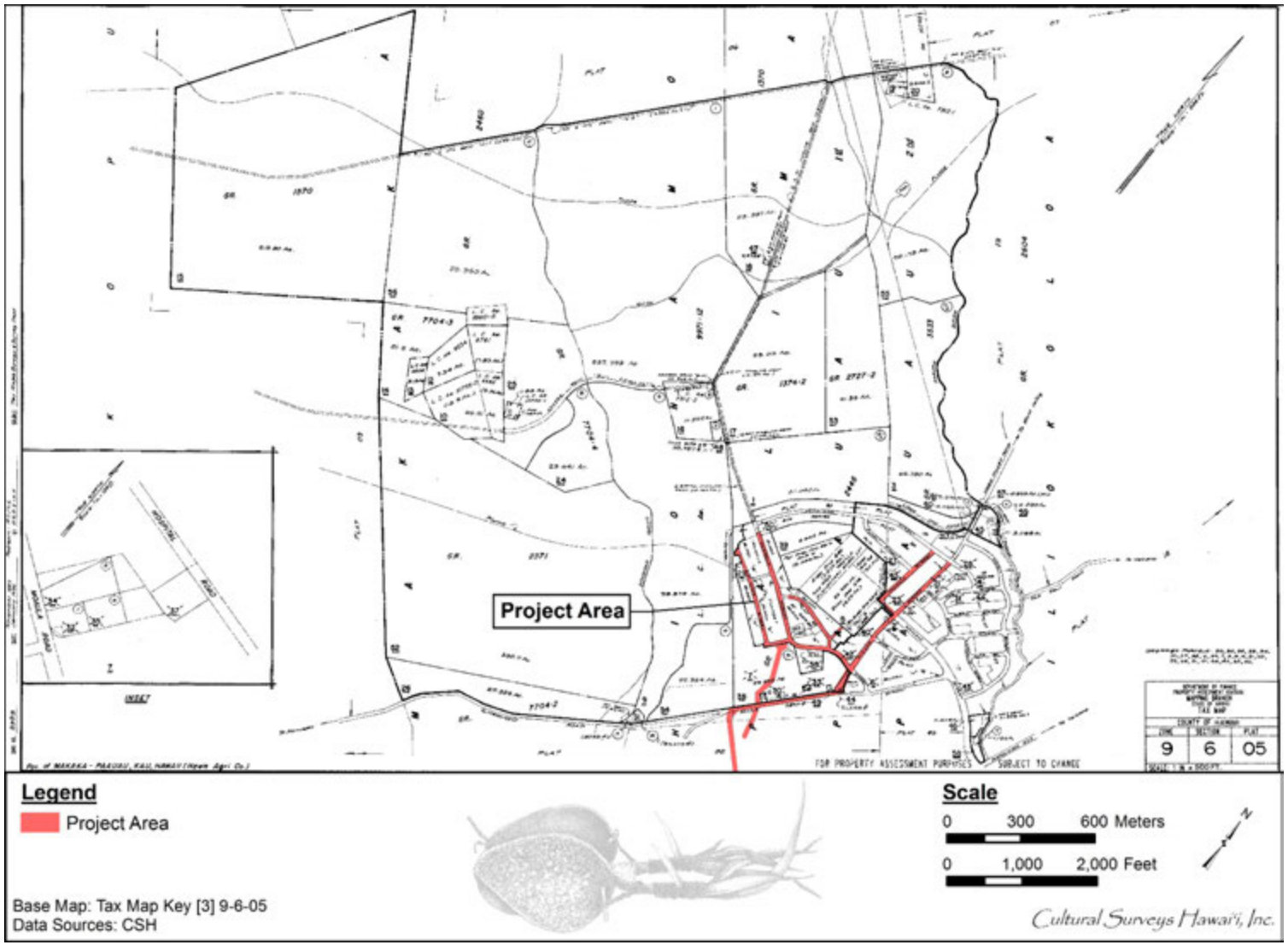

Figure 2. Tax Map Key (TMK) [3] 9-6-05 showing the northern portion of the project area (Hawai‘i TMK Service 2018)

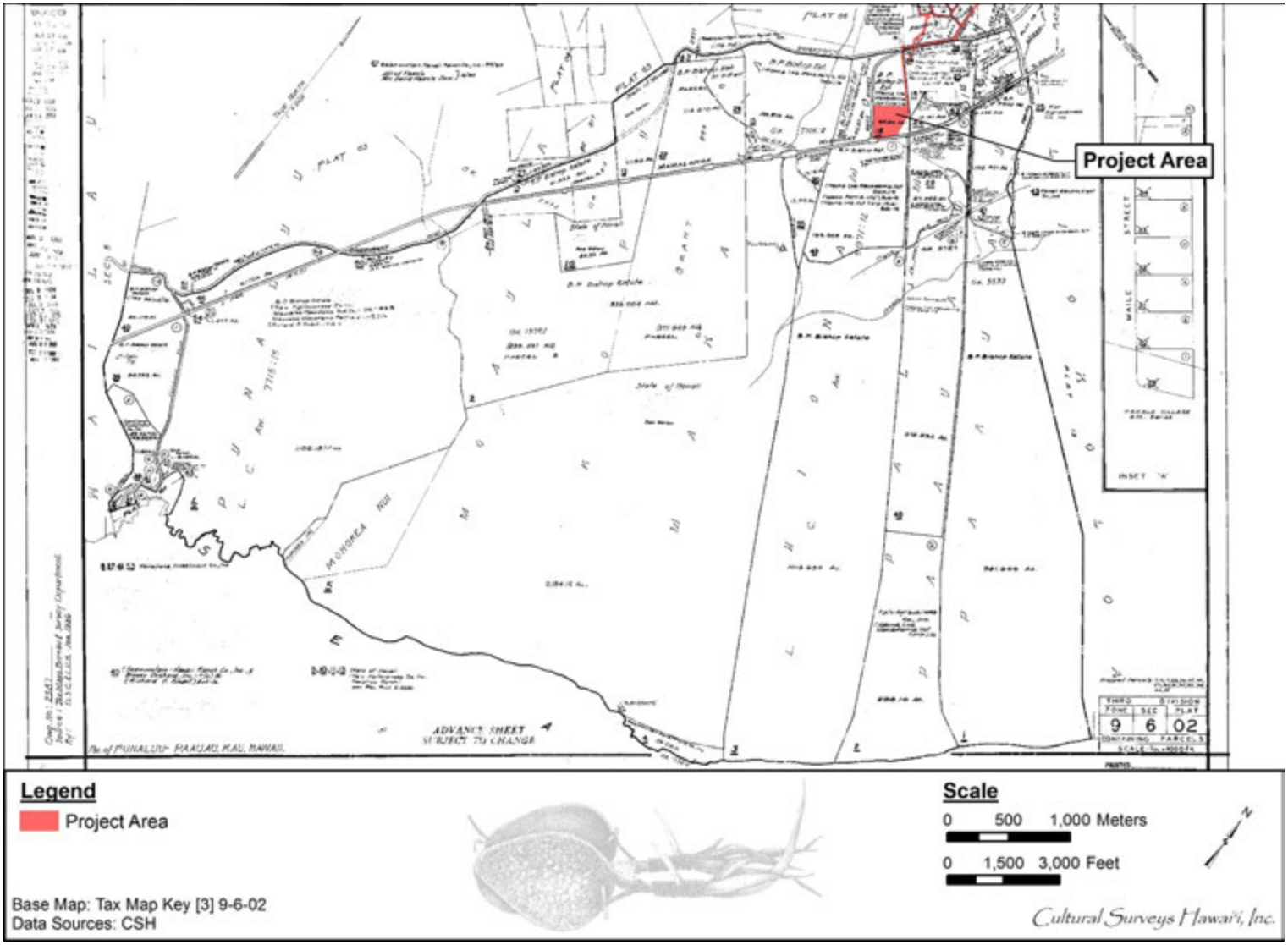

Figure 3. TMK: [3] 9-6-02 showing the southern portion of the project area (Hawai‘i TMK Service 2018)

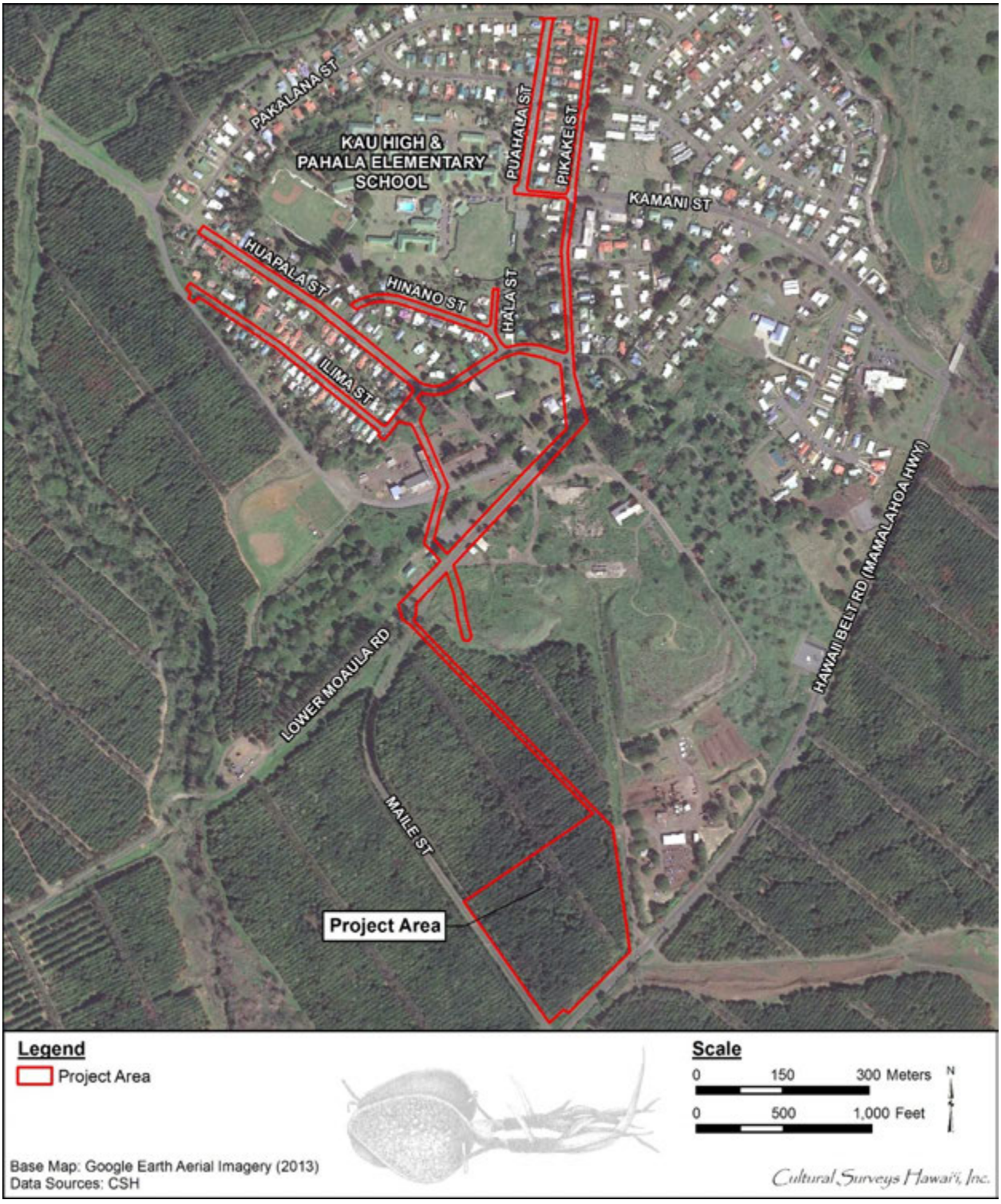

Figure 4. Aerial photograph of the project area (Google Earth 2013)

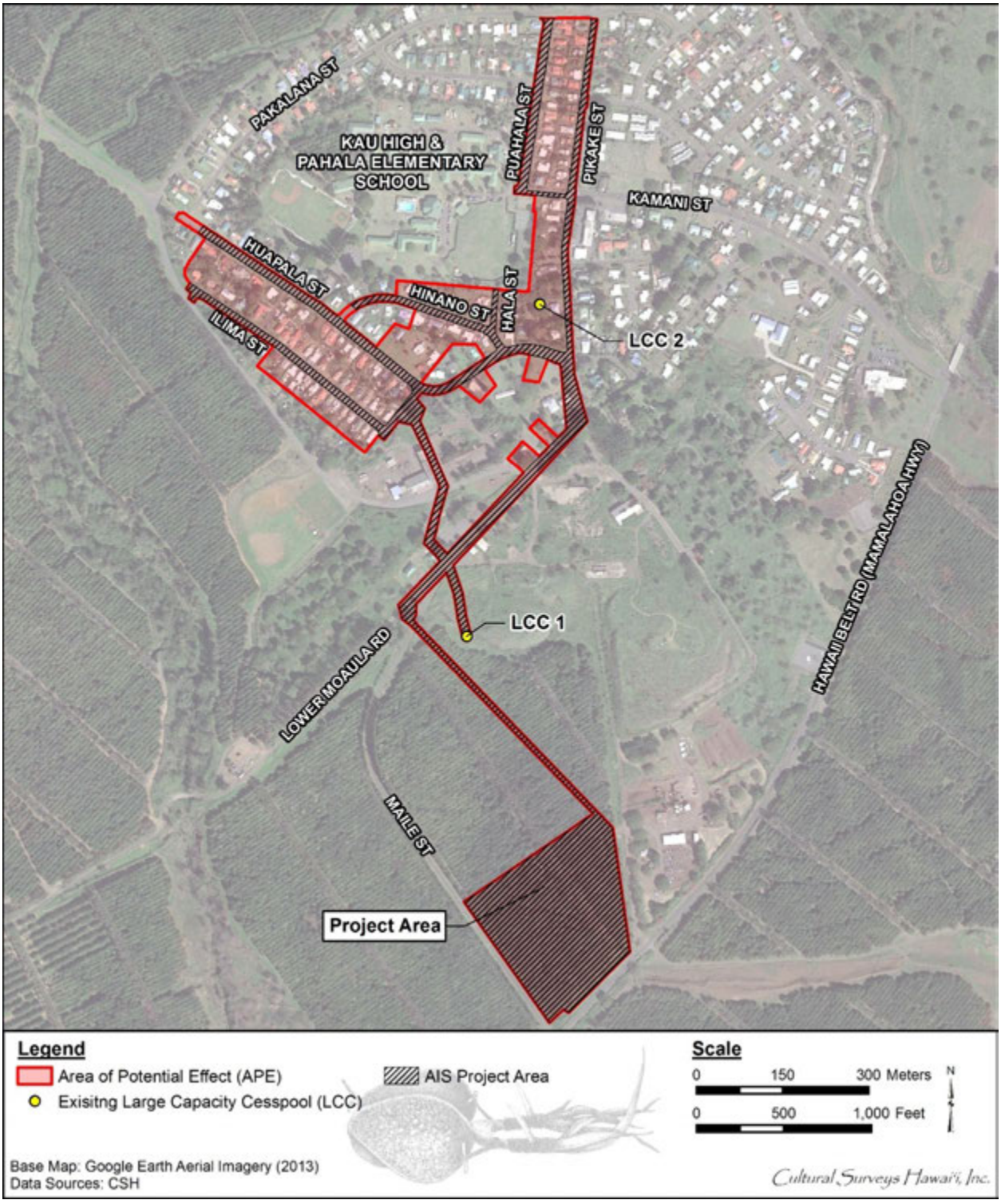

Figure 5. Aerial photograph of the project area, showing its configuration within the greater project APE and the locations of LCCs 1 and 2 (Google Earth 2013)

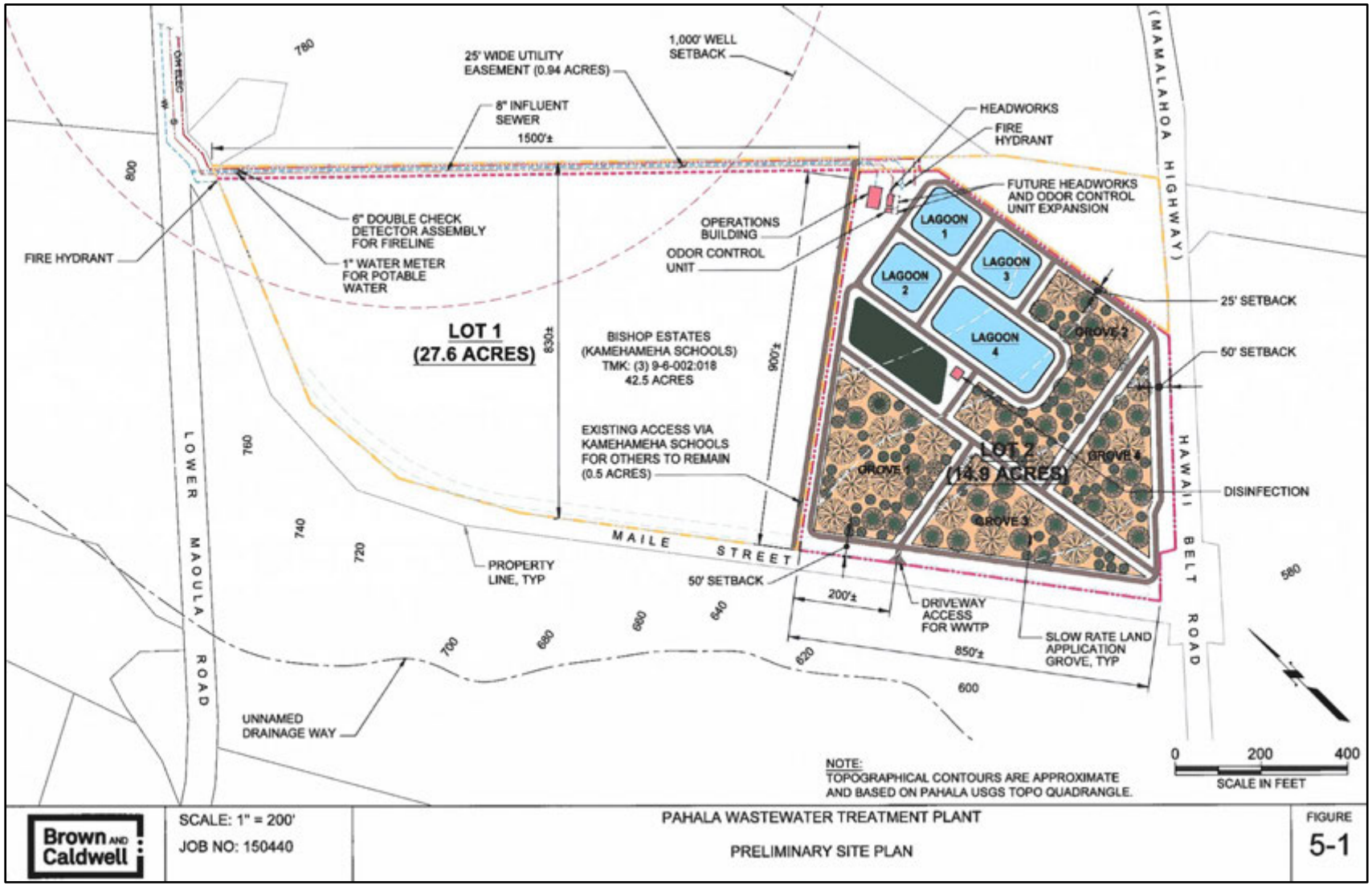

Figure 6. Preliminary site plan showing the 14.9-acre Pāhala WWTP and utility easement through TMK: [3] 9-6-002:018 (courtesy of client)

The AIS Project Area comprises Items 1–5 within the project APE, except for the LCC 2 location behind a private residence in TMK: [3] 9-6-016:041. It also does not include the numerous private properties located along the county streets selected for new sewer collection lines (Item 6).

The gravity sewer collection system lines will be mostly 8-inch diameter lines with the others from 12 to 16 inches, depending on their location, and will be placed in trenches located within the county streets. The trenches will be 3 to 4 ft wide and will be approximately 6 ft deep, or deeper depending on the location. For the former C. Brewer properties, the sewer laterals connecting the parcels to the collection system in the street have already been installed, although some of them may need to be replaced/repaired/rehabilitated by the County. For other properties that may eventually connect, the owners will be responsible for the improvements on their private property to connect to the collection system at the property line.

1.2 **Historic Preservation Regulatory Context and Document Purpose**

This AIS investigation was designed to comply with both federal and Hawai‘i State environmental and historic preservation review legislation. Due to federal (Environmental Protection Agency [EPA]) funding, this project is a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). As a county project within both private and county lands, the project is also subject to Hawai‘i State environmental and historic preservation review legislation (Hawai‘i Revised Statutes [HRS] §343 and HRS §6E-8/Hawai‘i Administrative Rules [HAR] §13-275, respectively).

In consultation with the State Historic Preservation Division (SHPD), this AIS investigation fulfills the requirements of HAR §13-276 and the *Secretary of the Interior's Standards for Archaeology and Historic Preservation*. It was conducted to identify, document, and make National Register of Historic Places (National Register) and Hawai‘i Register of Historic Places (Hawai‘i Register) eligibility recommendations for any cultural resources/historic properties. This report is also intended to support any project-related historic preservation consultation with stakeholders such as State and County agencies and interested Native Hawaiian Organizations (NHOs) and community groups, if applicable.

Pacific Legacy in 2016 conducted an archaeological field inspection of the entire 42.5-acre TMK: [3] 9-6-002:018 (Cleghorn 2016). The 11 November 2016 letter report was addressed to Dora Beck, P.E., Wastewater Division Chief for the County Department of Environmental Management (DEM) Wastewater Division. The report noted extensive ground disturbance throughout the parcel conducted "prior to the planting of the present macadamia nut orchard. The area at the southeastern corner of the parcel that is not planted in macadamia nut trees has also been extensively disturbed and a portion of it serves as a graveled parking lot for the adjacent macadamia nut processing plant." A sealed lava tube entrance is present in this corner of the parcel outside the current project area. No surface archaeological features were documented by Cleghorn (2016). A handful of surface artifacts, including a single discoidal hammerstone and fragmental bottle glass and ceramics, were documented within the northern portion of the parcel outside the current project area. Cleghorn (2016) recommended consultation with SHPD about project historic preservation requirements, noting that SHPD would likely require an AIS. Cleghorn (2016) also recommended limiting the project area footprint to avoid the lava tube located in the southeastern corner of TMK: [3] 9-6-002:018.

On 17 October 2017 the project proponent provided a written request to the SHPD for a letter of determination in accordance with HAR §13-275-3 (Appendix A). The Cleghorn (2016) letter report was attached as supportive information.

CSH on 22 February 2018 met with SHPD Archaeology Branch Chief Dr. Susan Lebo to follow up on 17 October 2017 request for project determination. During this meeting Dr. Lebo indicated the following:

- An AIS should be undertaken addressing the entire area of proposed ground disturbance, with subsurface testing;
- The AIS should include a "good faith effort" to address possible lava tubes within the area of proposed ground disturbance;
- Backhoe assisted excavations should be conducted within select proposed features at the plant site;
- All areas of the project not included in TMK: [3] 9-6-002:018 should be addressed, in particular the lateral installations along the county roadways; these areas probably would not require subsurface testing but should be evaluated for any relation to a possible historic plantation village or historic property designation.

The items outlined above, and a more detailed summary of the subsurface testing schema, were supplied in a 22 March 2018 county DEM letter addressed to SHPD, which requested formal written concurrence with the AIS approach; additional materials were subsequently supplied to SHPD on request (see Appendix A). SHPD replied to this letter concurring with the AIS approach in a §6E-8 and NHPA Section 106 Review letter dated 20 August 2018 (Log No.: 2018.00722; Doc. No.: 1808JA02) (Appendix B).

CSH on 6 December 2018 met with Dr. Susan Lebo and Dr. Jane Allen of SHPD to discuss the project APE and documentation requirements (Appendix D).

1.3 Environmental Setting

1.3.1 Natural Environment

The project area is situated approximately 5 km (3.1 miles) back from the coast on the southeastern slope of Mauna Loa volcano, at an elevation of 170–305 m (590–1,000 ft) above mean sea level (amsl). The Pāhala Town vicinity receives an annual average rainfall of 52 inches (Giambelluca et al. 2013), which today supports commercial agricultural crops like coffee and macadamia nuts and historically supported sugarcane. The Ka‘ū Forest Reserve is located approximately 2.5 miles upslope. Gulches carrying flood waters from the forest reserve *makai* (seaward; downslope) bracket the town; no natural waterways are present within the project area. Vegetation within the proposed treatment plant consists of a macadamia (*Macadamia integrifolia*) orchard with Norfolk Island pines (*Araucaria heterophylla*) used for windbreaks. The terrain in this area is gently sloped to the southwest. The sewer line easement extends through the orchard and areas of grasses and weeds. Landscaped residential yards line the sides of the County roadways in Pāhala Town. The terrain along the roadways ranges from level to sloped.

The unique geology of its upper slopes, lined with a string of large *pu‘u* (hills, cinder cones) has protected broad portions of windward Mauna Loa from relatively recent lava flows. The region is known for its arable soils formed in volcanic ash, commonly referred to as "Pāhala Ash."

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Sato et al. (1973), the project area's soils consist of soils from the Waiaha and Naalehu series (Figure 7). The northern half of the project area is Waiaha silt loam, 0 to 10% slopes (WAC), and the southeastern corner is Waiaha silt loam, 10 to 20% slopes (WKD). The remaining portions of the project area are Naalehu silty clay loam 0%-10% slopes (NaC) and Naalehu silty clay loam 10%-20% slopes (NaD) (see Figure 7).

Waiaha soils are described as

> shallow, well-drained silt loams that formed in volcanic ash. These soils are nearly level to moderately steep and most areas are extremely stony . . . The natural vegetation consists of kiawe, koa haole, natal redtop, lantana, guineagrass, and bermudagrass. . .
>
> Waiaha soils are used for pasture. [Sato et al. 1973:52]

The WAC type has a non-stony surface layer and "receives more rain during the winter than the extremely stony soil;" it is also used for orchards (Sato et al. 1973:53).

Naalehu soils are described as

> well-drained silty clay loams that formed in volcanic ash. These soils are nearly level to steep. . . The natural vegetation consists of Christmas berry, bermudagrass, guava, and kaimi cover. . . Naalehu soils are used mostly for sugarcane. Small areas are used for pasture. [Sato et al. 1973:40]

1.3.2 Built Environment

The entire project area has been altered by agricultural, commercial, and residential development. The location of the proposed treatment plant is currently an active macadamia nut orchard operated by Royal Hawaiian Orchards. This portion of the project area is on the southern outskirts of Pāhala Town, bound to the west by Maile Street, to the south by the Hawai‘i Belt Road or Māmalahoa Highway (State Inventory of Historic Places [SIHP] # 50-10-47-30187), to the north by additional macadamia orchard, and to the east by an unimproved jeep road separating the orchard from the Royal Hawaiian processing facilities. This road is bound to the east by a concrete flume extending *mauka-makai* (from mountains to sea), located outside the project area. An unnamed paved roadway forms the approximate northern boundary of the proposed plant area; this road provides access to and from the Royal Hawaiian Orchards processing facility via Maile Street. Just inside the western boundary of the parcel parallel to Maile Street is another unimproved road, used to access the orchard. An earthen ditch is situated between this road and Maile Street, designed to channel run-off downslope. The orchard itself is bisected by a large, linear dozer push pile containing a row of trees forming additional wind-breaks; unimproved access roads run along both sides of this push pile.

The proposed sewer collection line extends for the most part along existing, paved County roadways including Maile Street, Pikake Street, Ilima Street, Huapala Street, Hinano Street, Kamani Street, and Puahala Street (see Figure 4). These roadways extend through predominately residential areas of Pāhala Town. The portion of Maile Street in which the sewer line will be placed is located between the Pikake Street/Old Camp Mill Road intersection and the Lower Moa‘ula

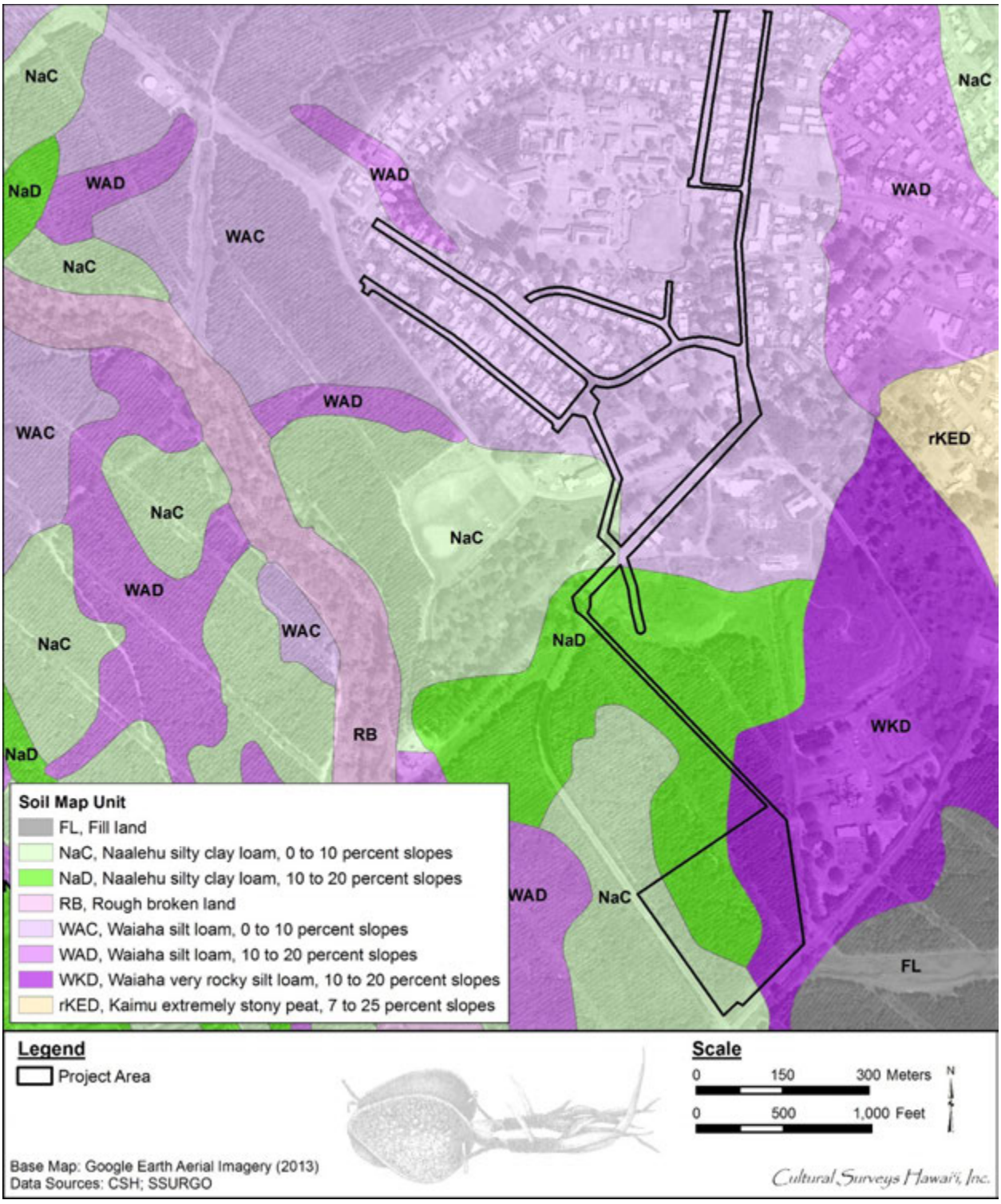

Figure 7. Overlay of *Soil Survey of the State of Hawaii* (Sato et al. 1972), indicating soil types within and surrounding the project area (USDA SSURGO 2001)

Road fork. Remnants of the sugar mill and associated plantation structures are present on either side of Maile Street outside of the project area.

Three sewer line easements are proposed for portions of the sewer line not within county roadways. One of these easements would extend along the southernmost segment of Pikake Street, which crosses privately owned TMK: [3] 9-6-005:044. This sewer line easement would also be within the existing paved roadway. Another easement extends from the eastern section of ‘Ilima Street through the old Pāhala Sugar Mill maintenance yard at TMK: [3] 9-6-005:036. The maintenance yard property has been completely altered with the development of the sugar plantation and town. The property has been graded and contains structures, driveways, parking areas, and a portion of a roadway used to access Ka‘ala‘iki Road/Pāhala Cane Haul Road. Though this overall parcel is within the project APE, no new sewer connections are proposed under the current project for any of its structures. The easement extends between and around the existing historic structures on this parcel and exits the property at Maile Street, where the line then extends southeast into TMK: [3] 9-6-002:018. The sewer line runs through the macadamia nut orchard, connecting to the northern corner of the proposed plant site.

The project involves the closure of the two existing LCCs (LCC 1 and LCC 2). LCC 1 is located in TMK [3] 9-6-002:016 south of Maile Street, at the terminus of a sewer easement maintained by the County. The portion of the parcel containing LCC 1 and its associated easement are fallow cane land. LCC 2 and its tie-ins to existing sewer lines are located behind a private residence at TMK [3] 9-6-016:041. This residential property comprises a main dwelling, outbuildings, driveway, and landscaped yard.

The sewer collection and transmission lines overlap with the known boundaries of the “Pāhala Historic District.” In the 1970s the majority of Pāhala Town was designated SIHP # 50-10-69-07362, a historic district associated with the historic sugar plantation and village. This historic property is not listed on the National Register or Hawai’i Register, and to the best of our knowledge has never been evaluated for eligibility for listing on these registers. CSH was unable to locate any records on file at the SHPD offices in Hilo or Kapolei pertaining to SIHP # -07362.

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of this archaeological inventory survey under archaeological fieldwork permit number 18-15, issued by the SHPD pursuant to HAR §13-282. Fieldwork was conducted on 18 September 2018 and 10 January 2019 by CSH Field Supervisor Olivier Bautista, B.A., and Project Director Sarah Wilkinson, B.A.; and on 1-4 October 2018 by Olivier Bautista B.A., under the general supervision of CSH Principal Investigator Hallett H. Hammatt, Ph.D. This work required approximately 8 person-days to complete. In general, fieldwork included 100% pedestrian inspection of the project area, GPS data collection, and subsurface testing.

2.1.1 Pedestrian Survey

A 100%-coverage pedestrian inspection of the project area was undertaken for the purpose of historic property identification and documentation. The pedestrian survey was accomplished through systematic sweeps spaced 2-5 m apart depending on ground visibility.

Where a new historic property was encountered, the determination of its boundary was based on factors including apparent age, architectural style, and the spatial and functional interrelationships of both natural and man-made features.

2.1.2 Subsurface Testing

A program of subsurface testing was undertaken for the AIS to assess the potential for subsurface archaeological features, including but not limited to buried cultural deposits and/or culturally modified lava tubes. The number and locations of the test excavations were chosen based on consultation with SHPD (see Appendices A and B). The subsurface testing program consisted of backhoe assisted excavation of seven trenches within the proposed plant site: one each within proposed Lagoons 1 and 4, Groves 1–4, and the Wetland area. The test excavations were placed to avoid trees, roots, and irrigation lines. In general, the seven linear trenches measured approximately 5 m (20 ft) long and 1.0 m (3.2 ft), and all trenches were excavated to bedrock.

A stratigraphic profile of each test excavation was drawn and photographed. The observed sediments were described using standard USDA soil description observations/terminology. Sediment descriptions included Munsell color; texture; consistence; structure; plasticity; cementation; origin of sediments; descriptions of any inclusions, such as cultural material and/or roots; lower boundary distinctiveness and topography; and other general observations. Were stratigraphic anomalies or potential cultural deposits exposed, these were to be carefully represented on test excavation profile maps.

2.2 Laboratory Methods

No samples or cultural materials were collected during the AIS fieldwork; therefore, laboratory studies were unnecessary.

2.3 **Research Methods**

Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai‘i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona ‘Aina database (Waihona ‘Aina 2000).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected types and locations of cultural resources in the project area.

2.4 **Consultation Methods**

Consultation is being undertaken for the project to comply with Section 106 of the National Historic Preservation Act (NHPA). Presently, Section 106 consultation with community, agency, and Native Hawaiian Organizations has been initiated and is ongoing by the project proponents. The results of the current investigation will be utilized in these ongoing efforts. No historic properties have been assessed as having traditional cultural significance to an ethnic group (Criterion e) within the project area.

Section 3 Background Research

3.1 Traditional and Historical Background

3.1.1 Traditional Accounts

The district of Ka‘ū is the southernmost and largest district of Hawai‘i Island, encompassing over 600,000 acres and nearly 30 *ahupua‘a* (land divisions usually extending from uplands to the sea). The current project area crosses the boundaries of four *ahupua‘a*, including (from west to east) Hionamoa, Pālima and Pā‘au‘au 1 and 2. According to Pukui et al. (1976:173, 177), Pā‘au‘au translates as “bath enclosure,” and Pālima literally means “five-fold.” The meaning of “Hionamoa” was not found.

Traditional accounts concerning the area known as Pāhala are limited, likely due to scarcity of pre-Contact settlement in the vicinity. Pāhala is a historic-era settlement that formed around a sugar plantation in the late 1800s; the name “Pāhala” refers to a practice in the cane fields of “cultivation by burning mulch” (Pukui et al. 1976:174) made from the *hala* tree (*Pandanus tectorius*). That sugar became one of the first industries of Ka‘ū is indicative of the suitability of this inland regions for agriculture: Handy and Handy (1972:558) note that the *kula* (plains) lands of Ka‘ū are “perhaps the finest arable country in the Hawaiian Islands.”

Given its geological and climatic complexity, it is not surprising that Ka‘ū came to be known as a land of fierce and independent people, a “fatal land to chiefs.” These characteristics are expressed in David Malo’s (1951) delineation of the responsibilities of the *ali‘i* (chiefly class), and of the treatment meted out to those *ali‘i* who abused their power:

> It was the king’s duty to seek the welfare of the common people, because they constituted the body politic. Many kings have been put to death by the people because of their oppression of the *maka‘āinana* [populace].
>
> The following kings lost their lives on account of their cruel exactions on the commoners: Koihala was put to death in Kau, for which reason the district of Kau was called The Weir (Makaha) [*Mākaha*, “fierce Ka‘ū”]. [Malo 1951:195]

Samuel Kamakau, in *Ruling Chiefs of Hawai‘i*, mentions Ka‘ū as he recounts the political unification of the island of Hawai‘i under ‘Umi-a-Līloa during the sixteenth century.

> I-mai-ka-lani was the chief of Ka-u. He was blind, but noted for his strength and skill in battle. Many chiefs who had fought against him were destroyed. . . . ‘Umi-a-Liloa feared I-mai-ka-lani. . . After I-mai-ka-lani became blind the fight between him and ‘Umi continued . . . After I-mai-ka-lani’s death Ka-u became ‘Umi-a-Liloa’s. [Kamakau 1961:18–19]

Kamakau also details the shifts of power within Ka‘ū and other districts through generations on the island of Hawai‘i. Power, apparently, did not necessarily transfer from a ruler to his descendants (Kamakau 1961:61–65).

At times, the contiguous districts Kohala, Kona, and Ka‘ū formed a triumvirate under a single ruler. However, such unions were subject to change as, according to Kamakau, in later times rule over Ka‘ū was consolidated with that of Puna:

> Ka-lani-‘opu‘u and Keoua were the hereditary heirs to the land of Hawaii, for it had belonged to their father, Ka-lani-nui-‘i-a-mamao, and [his brother] Ka-lani-ke‘e-au-moku; but Alapa‘i had seized it through force of arms and had slain the inheritors.
>
> . . . a great battle was fought [between Ka-lani-‘opu‘u and Alapa‘i] at Kualoa and Mokaulele all the way to Mahinaakaka, at which Ka-lani-‘opu‘u almost lost his life . . . Ka-lani-‘opu‘u’s men were victorious that day, and the chief realized how powerful his following was in chiefs and fighting men and how strong he himself was to break men’s bones with his hands.
>
> After this battle Mahinaakaka, Ka-lani-‘opu‘u ruled over Ka-‘u and Puna, for he was a native of Ka-‘u. There were the birth sands of his ancestors. [Kamakau 1961:76–77]

Kamakau’s account suggests the precariousness of the inter-district power combinations by the ruling *ali‘i* during traditional Hawaiian times in Ka‘ū and other districts.

The chief Ka-lani-‘opu‘u ruled Ka‘ū during the eighteenth century just before the first European visitors began to record their early impressions of the land and its people.

3.1.2 Early Historic Period

Lt. James King, sailing off the island of Hawai‘i during the 1779 voyage of Captain James Cook, described the Ka‘ū first seen by Europeans:

> The coast of Kaoo [Ka‘ū] presents a prospect of the most horrid and dreary kind: the whole country appearing to have undergone a total change from the effects of some dreadful convulsion. The ground is every where covered with cinders and intersected in many places with black streaks, which seem to mark the course of a lava that has flowed, not many ages back, from the mountain Roa [Mauna Loa] to the shore. The southern promontory looks like the mere dregs of a volcano. The projecting headland is composed of broken and craggy rocks, piled irregularly on one another, and terminating in sharp points. [King 1784:104]

The only onshore exploration at Ka‘ū involved a search for freshwater:

> When [Mr. Bligh] landed, he found no stream or spring, but only rain-water, deposited in holes upon the rocks; and even that was brackish, from the spray of the sea; and that the surface of the country was entirely composed of flags and ashes, with a few plants here and there interspersed. [King 1784:545]

Archibald Menzies, a surgeon and naturalist on the 1794 voyage of Captain George Vancouver, describing an excursion from Kona across Ka‘ū to the top of Mauna Loa, found a different scene in areas that received more rainfall. Menzies writes of

> a fine fertile valley [where he] put up for the night at a village called Kioloku, on a rich plantation belonging to Keawe-a-heulu.
>
> . . . This was by far the most populous village we had yet met with since we left Kealakekua. Towards the dusk of the evening, there fell some showers of rain which gave a gay and refreshing look to the most enchanting scenes of rural

> industry with which we were surrounded. The economy with which these people laid out and managed their ground and the neatness with which they cultivated their little fields made the whole valley appear more like a rich garden than a plantation. A stream of water which fell from the mountain through the middle of it was ingeniously branched off on each side to flood and fertilize the most distant fields at pleasure. [Menzies 1920:184–185]

This abundance was not isolated; continuing on his way east through the *ahupua‘a* of Honu‘apo (approximately 9 miles southwest of Pālima), Menzies found

> . . . the people everywhere busily employed in their little fields, many of which were here cropped with plantains and bananas that had a ragged appearance from having little or no shelter, yet they bore fruit tolerably well. [Menzies 1920:185]

In 1823, Rev. William Ellis, journeying like Menzies from Kona through Ka‘ū, recorded his impressions of the land, demonstrating like Menzies a willingnessto look and let the land speak for itself. He describes the valley of Wai‘ōhinu (located approximately 12 miles southwest of the project area) as open toward the sea, and on both sides adorned with gardens and interspersed with cottages, even to the summits of the hills.

> A fine stream of fresh water, the first we had seen on the island, ran along the centre of the valley, while several smaller ones issued from the rocks on the opposite side, and watered the plantations below.
>
> Our road, for a considerable distance, lay through the cultivated parts of this beautiful valley: the mountain taro, bordered by sugar-cane and bananas, was planted in fields six or eight acres in extent, on the sides of the hills, and seemed to thrive luxuriantly. [Ellis 1963:133–134]

Ellis’ account confirms the upland luxuriance that had made the *ahupua‘a* of Wai‘ōhinu a center for the *ali‘i* of Ka‘ū. As Ellis continued his journey he moved closer to the coast and his journal illumines areas where western eyes had previously perceived only a “prospect of the most horrid and dreary kind.” Travelling northeast toward Punalu‘u (located approximately 4.5 miles southwest of the project area), Ellis found the countryside “more thickly inhabited [as his walk continued] . . . The villages along the sea shore, were near together, and some of them extensive” (Ellis 1963:136). Ellis also notes the intervening broad stretches of rough *‘a‘ā* between the habitation areas. These flows had been made traversable by waterworn boulder paths. Ellis thus reveals the desolate coastline described 44 years earlier by James King was in fact the site of a well-populated, active culture and economy where habitation centers, though isolated, were accessible to each other and to the resources of land and sea.

William Ellis in 1823 may have been the first missionary to visit Ka‘ū. During the 1830s Protestant missionaries based in Kona and Hilo made occasional tours into Ka‘ū, but a permanent missionary presence was not installed until the early 1840s when Catholic and Protestant missions were established in the district. In 1841, a Catholic priest, Father Marechal, arrived in Ka‘ū and within a few months boasted of 900 converts. The following year, 1842, the Protestant minister John Paris reached Ka‘alu‘alu (located at Ka Lae, approximately 19 miles southwest of the project area) by schooner where he found,

> The shore was lined with hundreds of natives as our little boat neared the shore.. . . Then came greetings from the multitude, some kissing my hands and some taking hold of my feet. A joyful ‘Aloha ino!’ with a low wail, rose from the aged ones. [Paris 1926:89]

Paris’ account illustrates the abundant resources available in the district:

> . . . two strong men, tattooed from head to foot, came in bearing a huge whole hog, baked entire minus hair and entrails. These bearers were followed by others, dressed in the same style bringing calabashes of various sizes filled with fish, poi, potatoes, then came melons, bananas, and sugar cane, and little gourds filled with goat’s milk. All was spread out in royal Hawaiian style, a dozen kukuis [nuts from the Candlenut tree, *Aleutris moluccana*] burning and kahilis [feather standards] waving to and fro. [Paris 1926:90]

Paris settled in Wai‘ōhinu where he founded a church and school. Later, in 1843, a stone church was also built at Punalu‘u to the northeast. Cordy (1986:21) postulates that around this time a settlement shift was occurring from coastal to inland regions, the result of depopulation and of efforts to gain access to the government road and to populate the economic center of Wai‘ōhinu.

Mission station reports, censuses, and accounts by visitors to Ka‘ū during the mid-nineteenth century document changes to the district brought about by natural forces and the pressures of an increasing western presence. A visitor to Wai‘ōhinu and its environs in 1849 anonymously published an account describing the devastating effects of a drought and fire that had occurred three years earlier:

> [W]e noticed many a tall, stately trunk, branchless and lifeless standing monument-like, all over the country. On enquiry we ascertained that they were the remains of a noble forest, which, with the whole surrounding country, were burnt in 1846. In that year a severe drought visited the Island, the streams dried up, the grass withered, and fire swept over the whole district. [Sailor in Kelly 1980:89]

The author also describes an area above the settlement at Wai‘ōhinu that, apparently undamaged by the 1846 fire, probably represents the idyllic setting that had drawn the Ka‘ū *ali‘i* to the *ahupua‘a*:

> [W]e ascended the hills back of the mission, and when we had reached an elevation of about 5,000 feet were repaid with one of the richest scenes it was our privilege to look upon. Below us lay, fashioned by the hand of nature, within a range of ten miles, six lovely terraces, on which one thousand dwellings might be placed, each of which should have a prospect of the sea, the rocky shore, the lava and the verdant upland. . . . On this land we saw some noble upland kalo, and a number of very large banana trees. Several crystal springs take their rise on the summit, and might send, if rightly directed, a portion of their treasures through every man’s fields. Behind this noble series of hills, timber abounds. So that there is to be found every thing desirable to make a rich farming country, and in a circuit of some fifteen miles, might be abundantly grown the best products of the temperate, with the rich and varied fruits of the tropic zones. But alas the farmers are wanting, the land lies in all the wild luxuriance of nature desolate, there are no passable roads, except foot

> paths, to it, and no harbor at which vessels could lie in safety, is found within many miles. [Sailor in Kelly 1980:89]

Noticeably missing from this account is mention of any Hawaiians occupying and utilizing this verdant land "now lying utterly waste." An 1831-1832 census of Ka‘ū, the first taken within the district, records a total population of 5,800. In 1835 the total population is counted as 4,766. The first official government census, taken in 1847, records the population as having dropped to 3,010. Reverend John Paris would write in an 1848 mission station report (Paris 1848:3), "Since the year 1845 the work of depopulation of Kau has gone on with fearful rapidity." He notes, during the years 1845 and 1846 (Paris 1848:3), a "distressing famine and fire which overran the country," the same disasters the anonymous visitor of 1849 mentioned. By the time of the 1853 government census only 2,210 people are recorded in Ka‘ū.

3.1.3 The Māhele and the Kuleana Act

In the mid-nineteenth century, during the time of Kamehameha III, a series of legal and legislative changes were brought about in the name of land reform (see the works of Jon Chinen 1958, 1971 for a thorough and well-written explanation). Previous to the Māhele, all land belonged to the *akua* (gods), held in trust for them by the paramount chief, and managed by subordinate chiefs.

Following the enactment of a series of new laws from the mid-1840s to mid-1850s, Kamehameha III divided the land into four categories: Crown Lands reserved for himself and the royal house; Government Lands for the government; Konohiki Lands claimed by *ali‘i* and their *konohiki* (supervisors); and *kuleana*, small plots claimed by the *maka‘āinana* (commoners) (Chinen 1958:8–15). These claims are described in Land Commission Award (LCA) testimony from the claimant and witnesses. A Royal Patent (RP), which quit-claimed the government's interest in the land, was issued on most Land Commission Awards (LCA) (Chinen 1958:14). In some cases, more than one RP number was issued for an LCA, especially in cases where there were several widely separated *‘āpana* (lots), such as an award with agricultural land in one *ahupua‘a* and a house lot in another.

Ali‘i were required to pay a commutation fee to the government for their confirmed Konohiki Land titles; this payment could be in cash or in the return of land to the government or crown. Many *ali‘i* elected to return substantial portions of their awarded lands to avoid the one-third commutation cash fee. The Kuleana Act of 1850 allowed *maka‘āinana*, in principle, to own land parcels where they were currently and actively cultivating and/or residing. In 1851, certain Government Lands became available for purchase in lots of 1 to 50 acres in fee simple; this new category of land ownership became known as Royal Patent Grants or Land Grants. Unfortunately, Land Grant records tend to offer far less insight into specific land use than LCA records.

According to Soehren (2010), Hionamoa, Pālima, and Pā‘au‘au were not named in the Māhele Book. However, a 1914 map (Figure 8) shows 1,950 acres in Hionamoa awarded to the *ali‘i* William Pitt Leleiohoku as LCA 9971:12.

Waihona ‘Aina (2000) indicates Moses Keawe claimed five *‘apana* in the vicinity of the project area as part of LCA 7312. Two of the five lots were awarded. LCA 7312:1 comprised 1.5 acres located in Pā‘au‘au 2, approximately 750 m north of the project area along the "Kau-Volcano Road" (present Ka‘ala‘iki Road). LCA 7312:2 comprised 11.7 acres in Hionamoa, located

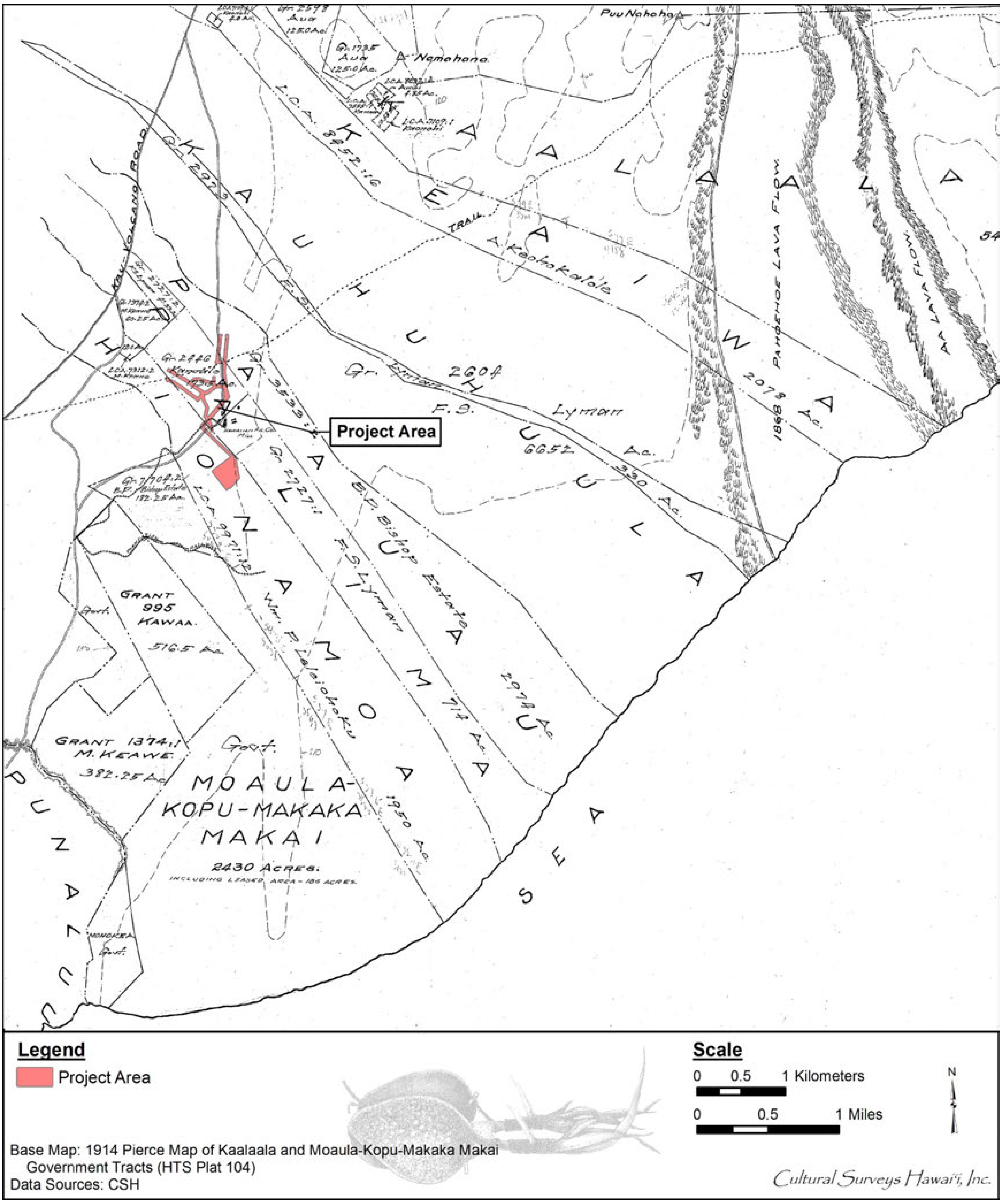

Figure 8. Portion of R.F. Pierce's 1914 map of Kalaala and Moaula-Kopu-Makaka Makai Government Tracts, showing the project area in relation to roads, trails, and the plantation railroad

approximately 350 m northwest of the project area along the “Kau-Volcano Road”/Ka‘ala‘iki Road. Both of the awarded *‘apana* were house lots. The three *‘apana* not awarded comprised taro fields.

LCA 10248 to Mahi was also awarded in Pā‘au‘au 2. This award comprised 13 acres straddling the “Kau-Volcano Road”/Ka‘ala‘iki Road adjacent to LCA 7312:1, approximately 750 m north of the project area. Unfortunately, the testimony for this award does not provide information about land use. No *kuleana* are indicated within Pā‘au‘au 1 or Pālima.

Waihona ‘Aina (2000) lists four land grants in Pālima-Pā‘au‘au: Land Grant 01370 to Nahala, 02446 to Kamalo (overlapped by the project area), 02655 to Nahala, and 02727 to F.S. Lyman. In addition to these, Pā‘au‘au also contained Land Grant 03533 made to the trustees of the Bernice Pauahi Bishop Estate; this grant is also overlapped by the project area. Soehren (2010) notes that Grant 03533, which also included lands at Kaunakakai on Moloka‘i and Honolulu and Ka‘akaukukaui on O‘ahu, was made “in exchange for quitclaim deed to certain lands in Hilo.” Grants 01370 and 02655 are located *mauka* (inland) of the “Kau-Volcano Road”/Ka‘ala‘iki Road. Grants 02446, 02727, and 03533 are depicted on the 1914 map (see Figure 8) in relation to the project area. Figure 8 also indicates a fifth grant in upland Pālima: Land Grant 01374 to Keawe. This grant, comprising two separate *‘apana*, is listed on Waihona ‘Aina (2000) as being located in Kopu-Moaula a short distance east of Pālima. Figure 8 indicates the portion of Land Grant 01374 north of the project area is ‘Apana 2. No Land Grants are indicated within Hionamoa.

3.1.4 Mid- to Late 1800s

By the middle of the nineteenth century, imported livestock roaming freely throughout pasturelands of Ka‘ū were creating new aggravations. Ka‘alu‘alu had become a focus of activity as the export of agriculture and livestock began to dominate the Ka‘ū economy; at the same time, about 1852, an improved, 7-mile-long cart road was constructed between the bay and Wai‘ōhinu. In the 1850s, Rev. Henry Kinney (cited in Kelly 1980) commented on the “hundreds of goats salted and dried” as well as “upland taro, potatoes and onions” which previously had to be hauled “on the backs of men” overland to Hilo and which could now be taken to the harbor and shipped.

Ranching activity in Ka‘ū commenced sometime after the middle of the century when Princess Ruth Ke‘elikolani started Ka‘alu‘alu Ranch with cattle brought from Waimea. Cattle continued to be shipped out of Ka‘alu‘alu at least until the 1920s. Organized cattle ranching was focused at Ka‘alu‘alu, Kahuku, and Kapāpala (located northeast of present Pāhala Town).

While cattle and other livestock were significant elements of the new western economic focus imposed upon Ka‘ū during the nineteenth century, it was agriculture that had the most extensive impact on the land and people. Among new agricultural pursuits attempted in Ka‘ū was wheat growing:

> But it proved difficult to co-ordinate the size of the wheat crop with the requirements of the flour mills; difficult also to coordinate the output of the mills with the demands of the market, domestic and foreign. The business did not become a permanent one. [Kuykendall 1966:150]

Contributing to the failure of wheat production was the harvesting of *pulu*, a soft, flossy, yellow wool on the base of tree-fern leaf stalks (*Cibotium* spp.) used for stuffing mattresses and pillows. During the 1860s *pulu* constituted the major export crop from Ka‘ū. A mission station report

written in 1860 by W.C. Shipman relates the ruinous effect upon the native population of participation in the *pulu* trade:

> The effect—on them is not good; not that the pulu is not a source from which they might secure comfort to themselves and families, but the actual result is the reverse. They are offered goods to almost any amount, to be paid for in pulu; this to a native is a strong temptation to go into debt. Consequently many of them are deeply in debt and almost all to some extent. The policy of the traders is to get them in debt and to keep them there so long as possible . . . [T]hey are almost entirely under the control of their creditors, and are compelled to live in the pulu regions, at the peril of losing their houses and lots, and whatever other property they may possess. Thus their homes are almost in reality deserted, ground uncultivated. [Shipman 1860:4]

Life in Ka‘ū during the 1860s was further disrupted and devastated by the forces of nature. A sequence of major earthquakes and eruptions of Mauna Loa beginning in March 1868 resulted in many deaths and losses of property and livestock. Then an earthquake in early April precipitated a tidal wave that destroyed coastal villages, dislodged a cliff side at Kapāpala blanketing the land below and burying a village, and opened the Great Crack at Kīlauea (located approximately 2.5 miles east of Pāhala), emptying the crater’s lava lake into Punalu‘u and Keauhou. A subsequent lava flow, this time in western Ka‘ū, buried all of Wai‘ahukini Valley west of the great *pali*.

Apparently great natural disasters could not hinder the pace of foreign business interests in Ka‘ū. In 1868, the same year as the great earthquake, Alexander Hutchinson established the Naalehu Sugar Company and built a mill at Nā‘ālehu just east of Wai‘ōhinu. More enduring commercially than either wheat or *pulu*, sugar cultivation beaome the major industry within Ka‘ū, appropriating the focus of life in the district.

During the mid-1870s Waiohinu Plantation was established by John Nott and Company. This operation was bought out in 1877 by Alexander Hutchinson who at the same time founded Hilea Plantation. By the end of the 1870s, sugar mills were operating at Nā‘ālehu, Hīlea, and Honu‘apo. Though Hutchinson died in 1879, his name survived in the Hutchinson Sugar Company which during the remainder of the nineteenth century continued to expand and consolidate existing plantation operations in Ka‘ū.

Another plantation operation, the Hawaiian Agricultural Company, was established in Pāhala in 1876 by a consortium of Honolulu businessmen. An 1877 map of the Hawaiian Agricultural Company sugarcane lands (Figure 9) shows the Pāhala Mill located just east of the project area, overlapping lands indicated as already planted in cane, as well as unplanted areas labeled as “Good, Stony land.” No roads or trails are indicated. An 1886 map (Figure 10) also depicts the location of the mill at the “Pahala Plantation,” as well as the Hutchinson Sugar Company mills at Hīlea, Honu‘apo, and Nā‘āleahu to the southwest and the associated wharves at Honu‘apo and Punalu‘u. Dorrance and Morgan (2000:110) note that Pāhala’s “steam driven mill was the most modern and largest in the islands.” Figure 10 curiously depicts the project area overlapping land divisions called “Nakumu” and “Makaka;” no information about these places names was found. Figure 10 also illustrates three travel routes extending though the Pāhala vicinity: two routes extend from Nā‘ālehu northeast, one along the coast and one *mauka*, joining and continuing northeast above Pāhala Mill. Another route is shown extending northeast from Nīnole/Punalu‘u through Pāhala, parallel and *makai* of the Nā‘ālehu route.

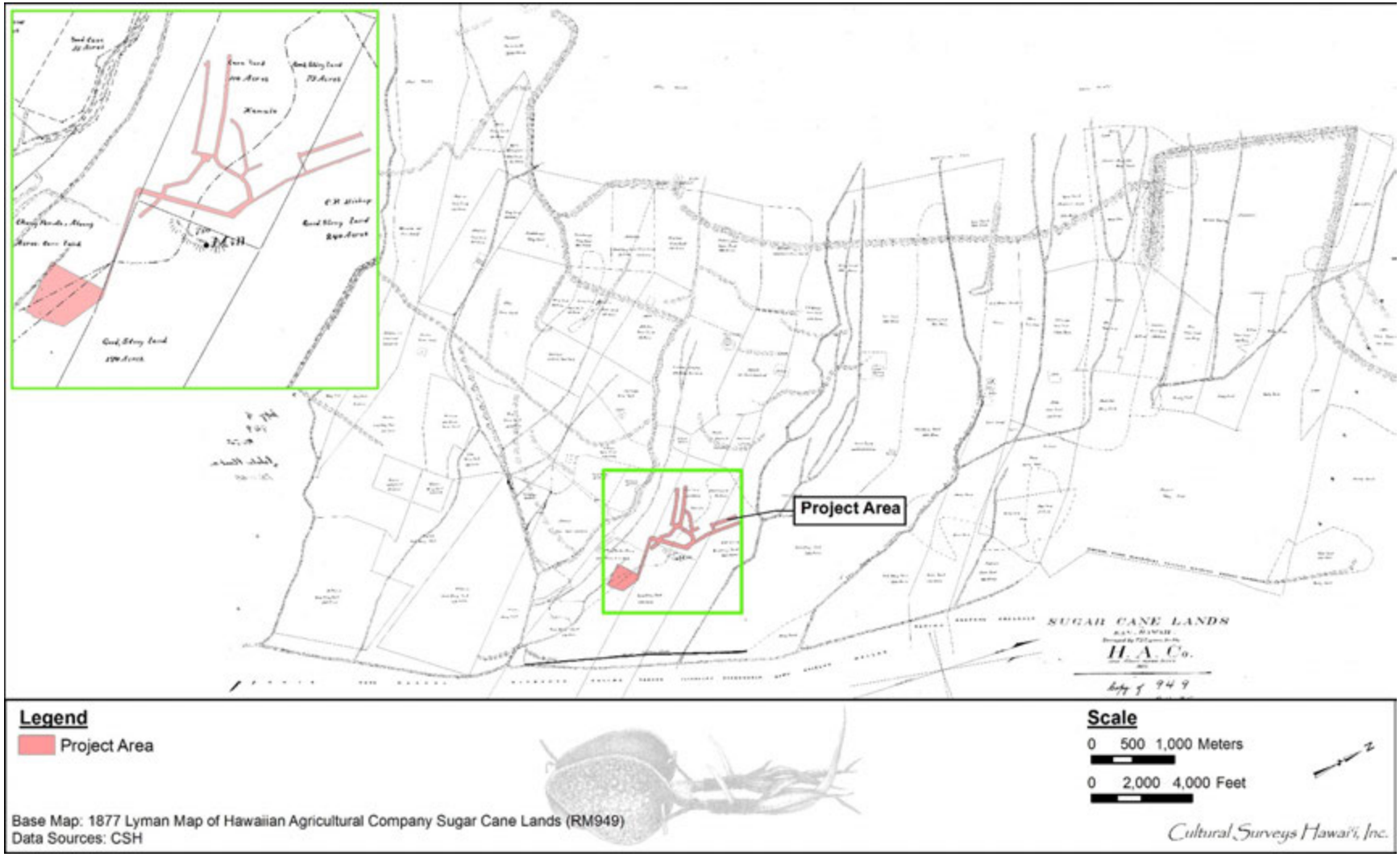

Figure 9. F.S. Lyman 1877 map of Hawaiian Agricultural Company sugarcane lands, showing the project area in relation to the Pāhala Mill and developed cane lots

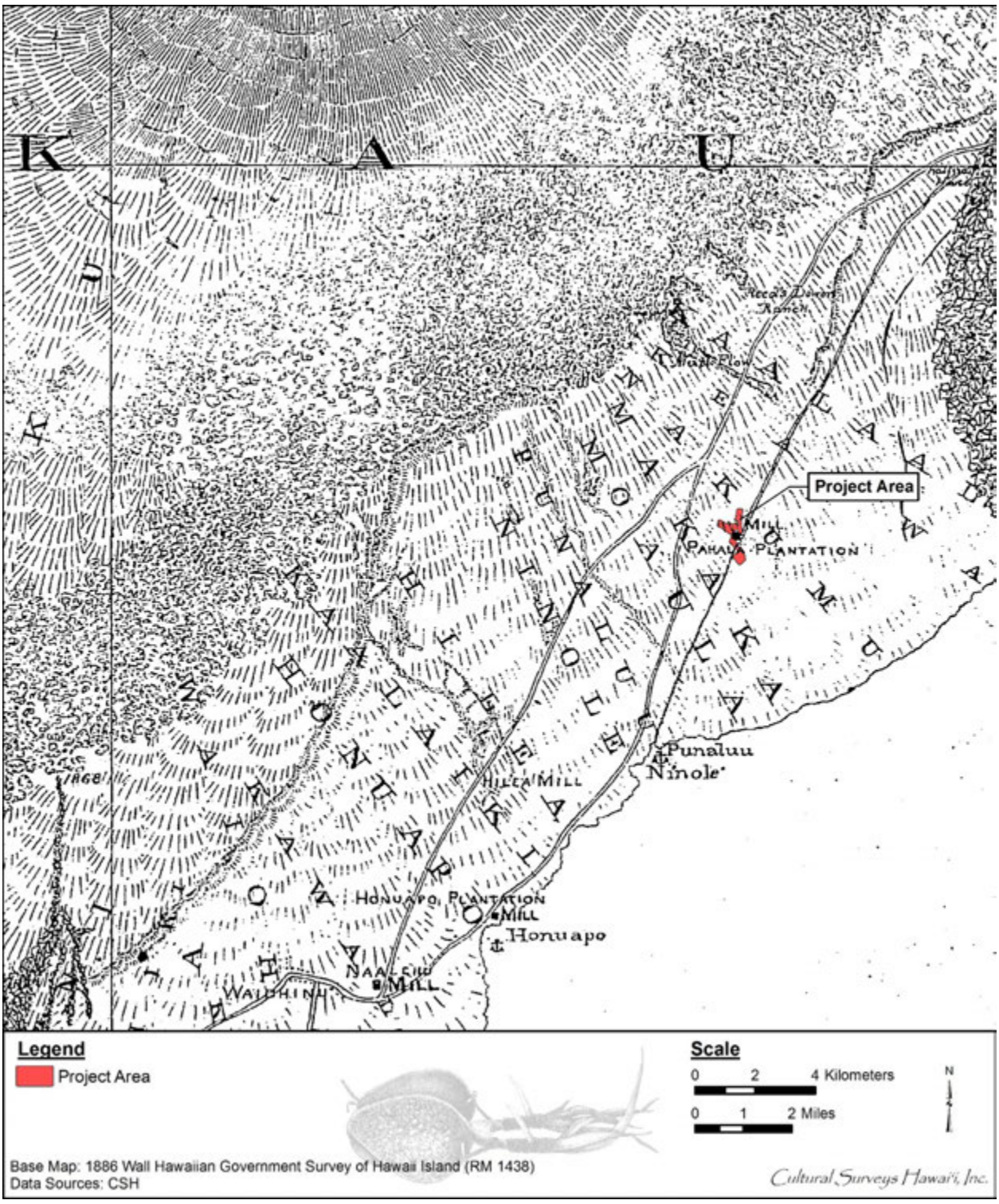

Figure 10. Portion of W.A. Wall's 1886 map of Hawai‘i Island, showing the project area in relation to sugar mills and harbors in windward Ka‘ū

By the end of the nineteenth century the Hawaiian Agricultural Company controlled almost 10,000 acres of cane land and constituted the largest plantation in the Hawaiian Islands. The extensive agricultural endeavors taking place in Ka‘ū at this time were also altering the social landscape. During the 1870s, Chinese laborers were brought in by Alexander Hutchinson. By the time of the 1884 government census there were 568 Chinese in the district. Japanese laborers were imported beginning in the latter 1880s and Filipinos began arriving during the first decade of the twentieth century. Ethnic workers' camps surrounded the mill at Pāhala. As the town around the mill developed, a school was established at Pāhala in 1881 to serve the children of the plantation workers.

3.1.5 1900s

Life in the early twentieth century continued to center around the activities of the two sugar operations, Hutchinson Sugar Plantation and the Hawaiian Agricultural Company. Pāhala continued to develop as a town. A 1906 map (Figure 11) depicts the location of a school approximately 0.5 miles north of the current Ka‘ū High and Pāhala Elementary School (KHPES) campus location, and a post office in the vicinity of the project area. Figure 11 also illustrates the approximated boundaries of sugar plantation lands (in red) in relation to the forest lands *mauka* (in blue) and grazing lands east associated with Kapapala Ranch. The continued development of roadways in the vicinity of Pāhala Town is also depicted, with the addition of *mauka-makai* andlateral routes between the mills at Honu‘apo and Pāhala (see Figure 11). The portions of these roadways in closest proximity to Pāhala are shown in more detail on the 1914 map (see Figure 8); the uppermost road shown is labeled "Kau-Volcano Road." The lower roadway extending through Pāhala plantation is not named.

The 1914 map (see Figure 8) includes some additional details about the Pāhala vicinity. A trail is depicted with a dashed line, crossing the northern portion of the current project area and continuing off the map to the east and west. It is unlikely that any portion of this trail remains within the town vicinity, which has been completely altered by agricultural and residential development. Furthermore, a meandering "Plantation Railroad" is shown, extending southwest roughly parallel to the unnamed roadway and then curving back to the east where it stops abruptly. Presumably this limited railroad was used to carry cut cane to the mill from some of the nearby fields. More remarkable upon the physical landscape at this time must have been the systems of flumes for transporting cane from fields to mills; this was the main method of transporting cane at the time.

Railway development continued, with the establishment of lines running from Nā‘ālehu and Hīlea to Honu‘apo and from Punalu‘u to Pāhala. A 1929 map of Hawaiian Agricultural Co. cane fields (Figure 12) depicts the route of the rail line extending from the mill across through the narrow central portion of the project area and to the west; also shown are the major roadways of the time merging along the present Maile Street corridor. The 1930 USGS topographic map (Figure 13) shows the Pāhala area in better detail, including the narrow-gauge rail line running to Pāhala parallel the coastal road from Punalu‘u. The expansion of the town is evident on this map, which includes additional rows of structures along roadways and around the mill, as well as the locations of the school (still north of the present campus), a church, a pipeline, and a large stone wall to the southeast of the town. The route of the major roadway crossing through Pāhala Town, labeled

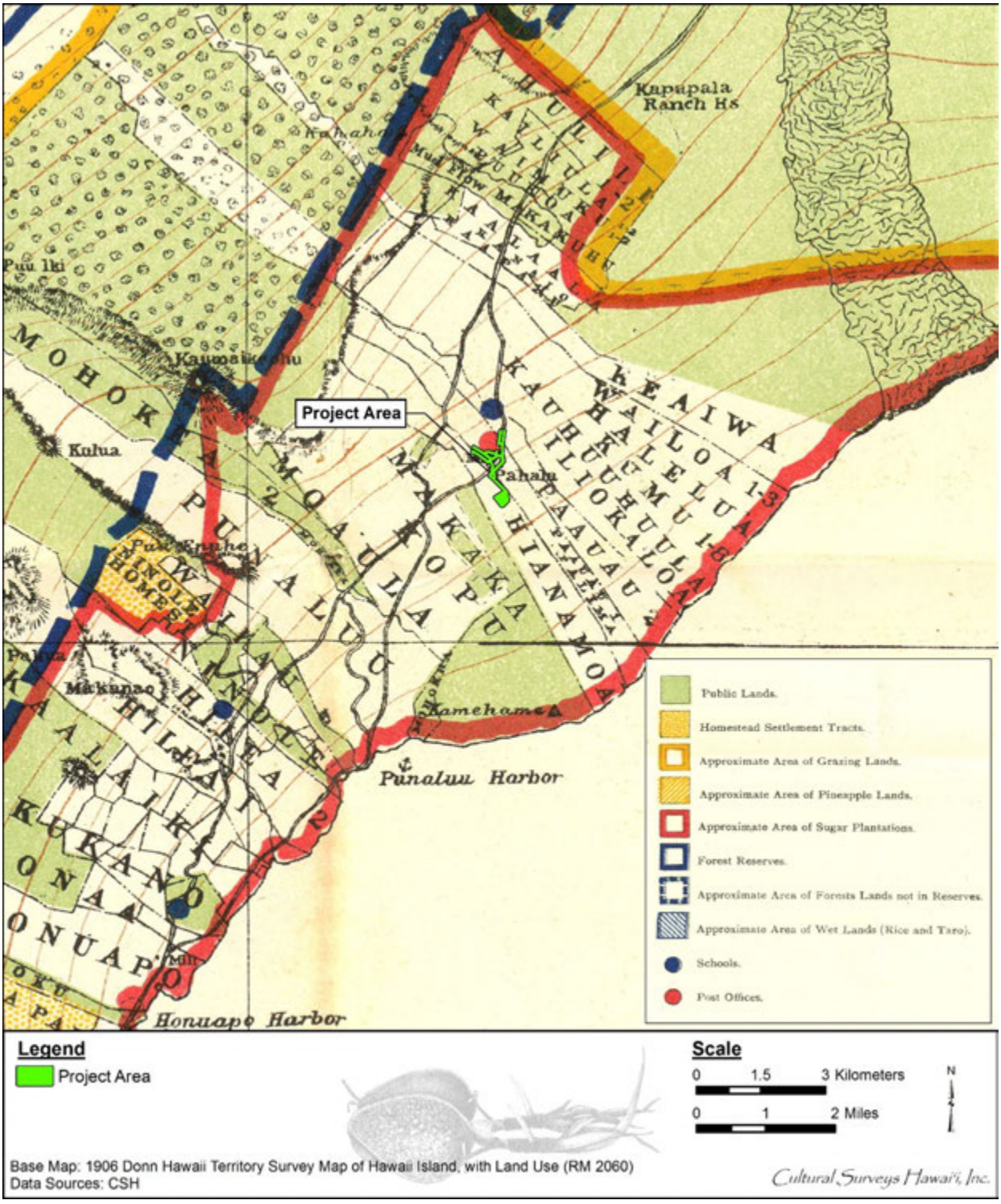

Figure 11. Portion of J.M. Donn’s 1906 map of Hawai‘i Island, showing the project area in relation to Pāhala Mill, school, post office, and areas of different land use

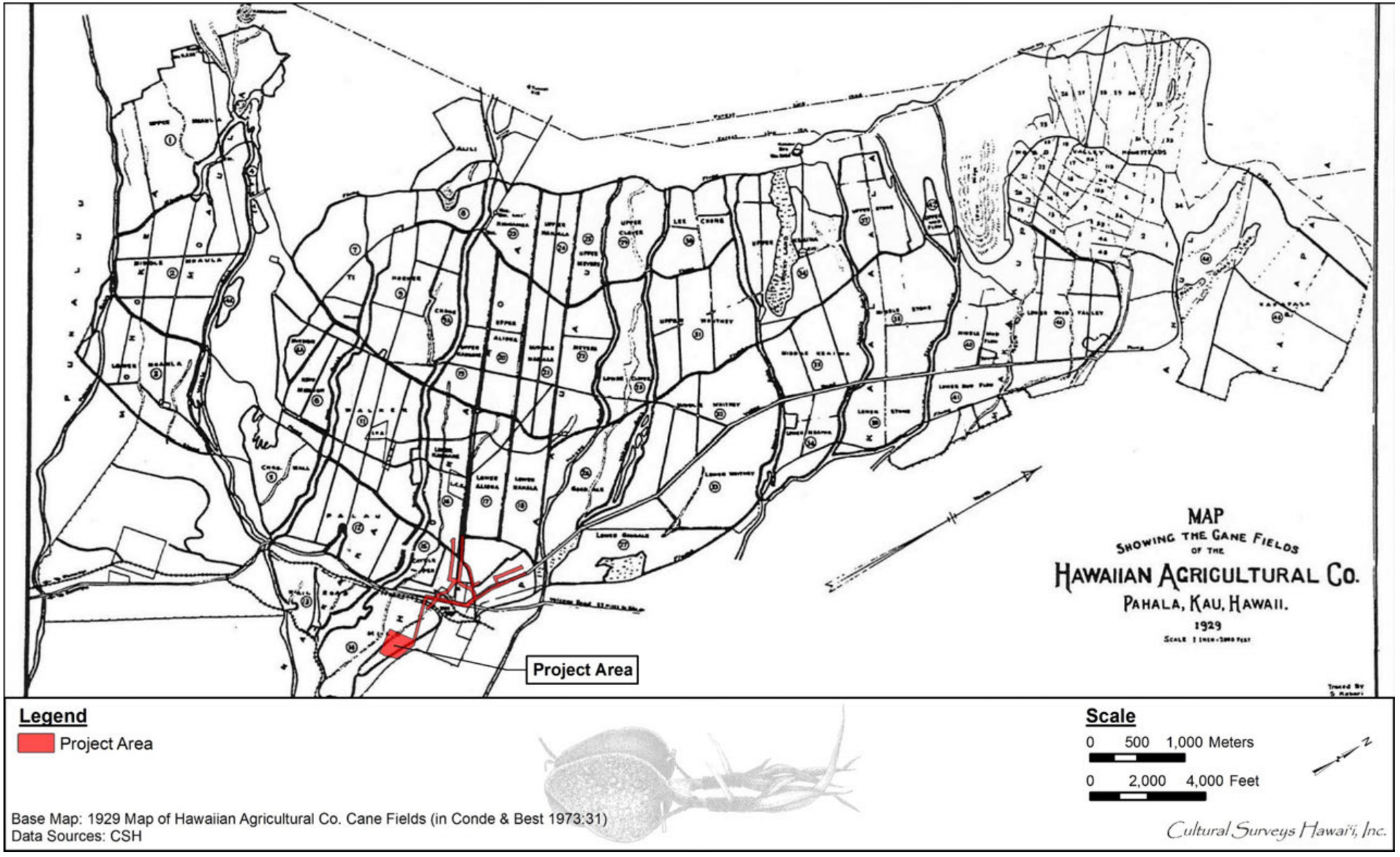

Figure 12. 1929 map of Hawaiian Agricultural Co. cane fields, showing the location of the project area

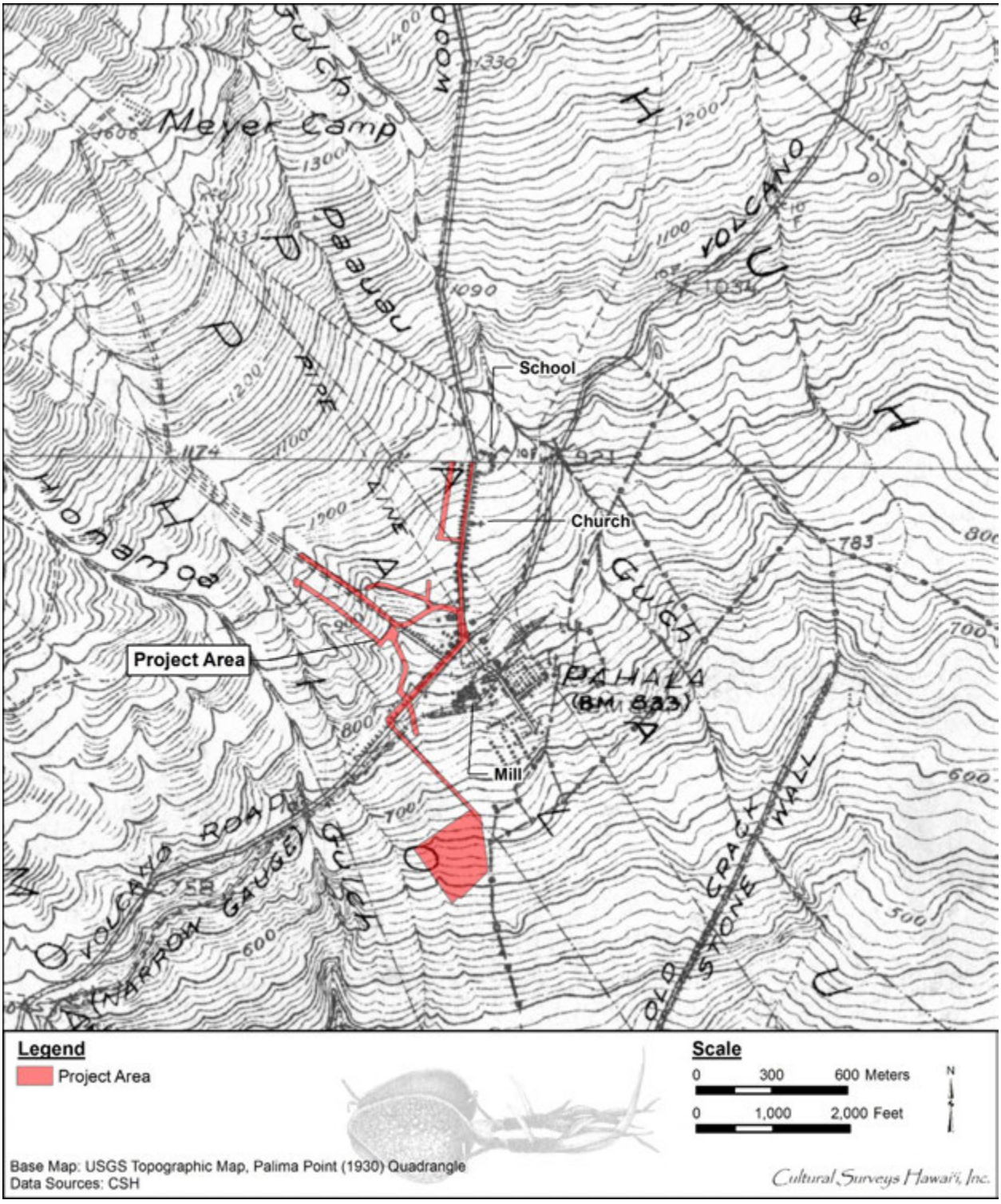

Figure 13. Portion of the 1930 Palima Point USGS 7.5-minute topographic quadrangle showing the project area in relation to the mill, school, church, roads, and railroad in the Pāhala vicinity

“Volcano Road,” utilizes a new eastward extension, with the portion of the older alignment that extended north from the town is now labeled “Wood Valley Road.”

The flumes and railroads in Ka‘ū were abandoned by the 1940s with the advent of trucking. In the 1940s the Belt Road or Māmalahoa Highway (Route 11) was constructed through Ka‘ū, running just *makai* of Pāhala Town. A 1967 USGS map (Figure 14) shows this new route and the continued development of the town. By this time the school had moved southwest into the heart of the town, and a landing strip had been constructed to the northeast. All of the older road alignments are still depicted, but not as major roadways, with the exception of a Route 15 looping off the Belt Road along present Maile Street and Kamani Street. During this latter half of the twentieth century the residential side-streets within Pāhala were also improved with paving and installation of the culvert at the Huapala and Ilima Streets intersection.

The 1940s Belt Road alignment appears on an undated Olson Trust map (Figure 15) reprinted in Cleghorn (2016:13). Hand drawn annotations indicate some land uses in the area dating to the 1960s and 1970s. This map indicates the WWTP site and adjacent areas were under pasture; the easement extending to Maile Street also crosses through a rectangular area labeled “Cane Area Planted Aug. 1966” and a fence line “Plotted Oct. 1961.” Also significant are the locations of a “Cesspool” (LCC 1), and a concrete flume and lava tube located east of the proposed WWTP site. This map appears to depict a portion of the former narrow-gauge railroad following a “1.8 %” grade west of the easement extending south from Maile Street; this illustration may indicate disturbance to or dismantling of the former railroad route by the mid-twentieth century in the area crossed by the easement. The Olson Trust drawing also depicts numerous structures along Maile Street, many of which are no longer present.

A 1977 aerial photo (Figure 16) indicates further expansion of the town to the east amidst large agricultural plots. Note that the proposed WWTP plant site portion of the project area is not cultivated in sugarcane at this time; instead, these former cane fields were being readied for planting of the macadamia orchard that is now fully matured.

The Hawaii Agricultural Company operated until 1972 when it merged with the Hutchinson Sugar Company to form the Kau Sugar Company, which was renamed as the Kau Agribusiness Company in 1986 (Dorrance and Morgan 2000:112). Following the demise of the sugar industry in other parts of the island, Kau Agribusiness Company ceased its sugar operations in 1996 (Dorrance and Morgan 2000:112).

3.1.6 Contemporary Land Use

Pāhala continues to serve a small rural population supported by predominately agricultural and livestock economies. The town is also used as a stop-over for tourists visiting Punalu‘u Beach located 5 miles southwest and/or travelling between Hilo and Kailua-Kona.

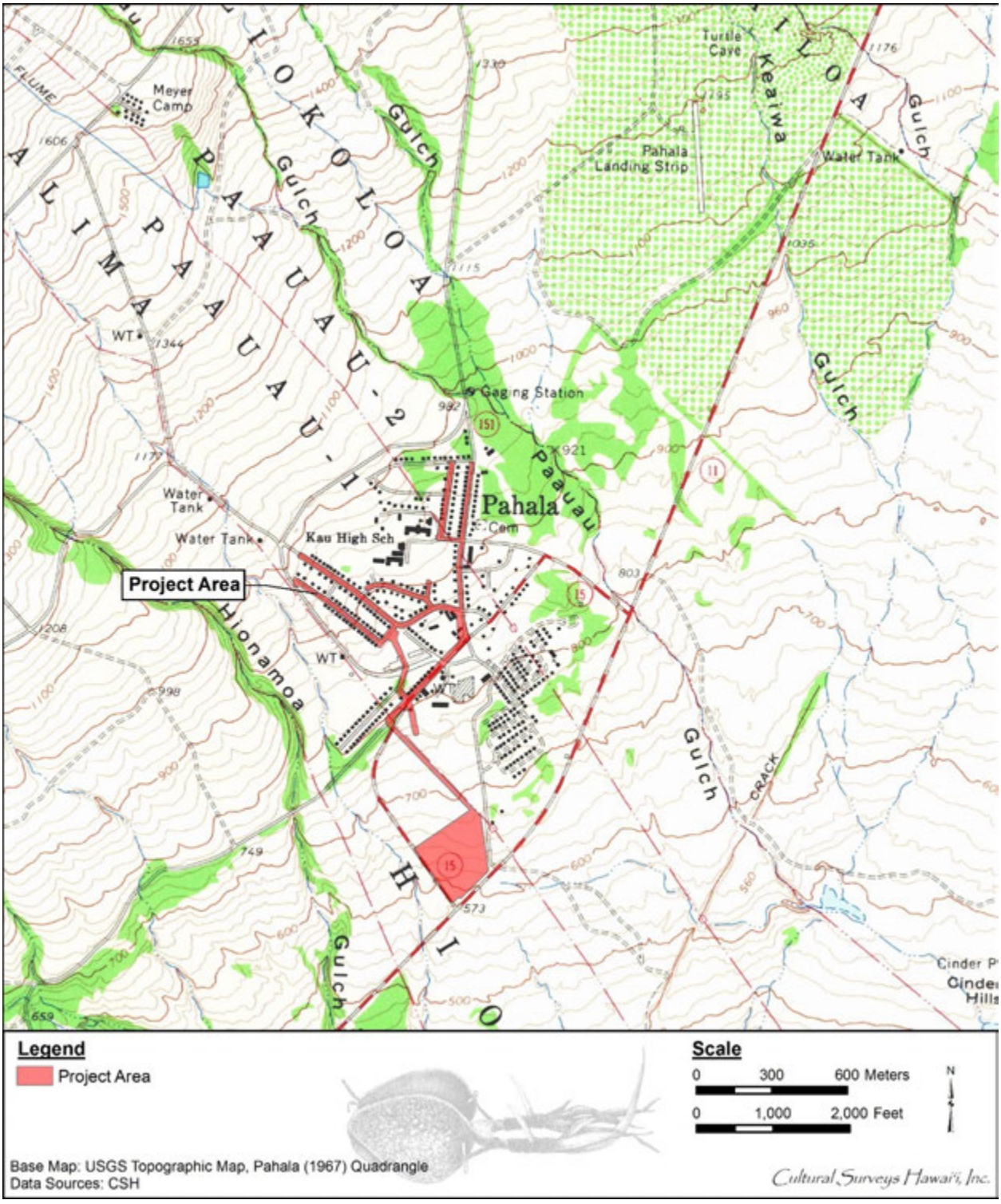

Figure 14. Portion of the 1967 Pahala USGS 7.5-minute topographic quadrangle showing the project area and development within Pāhala Town

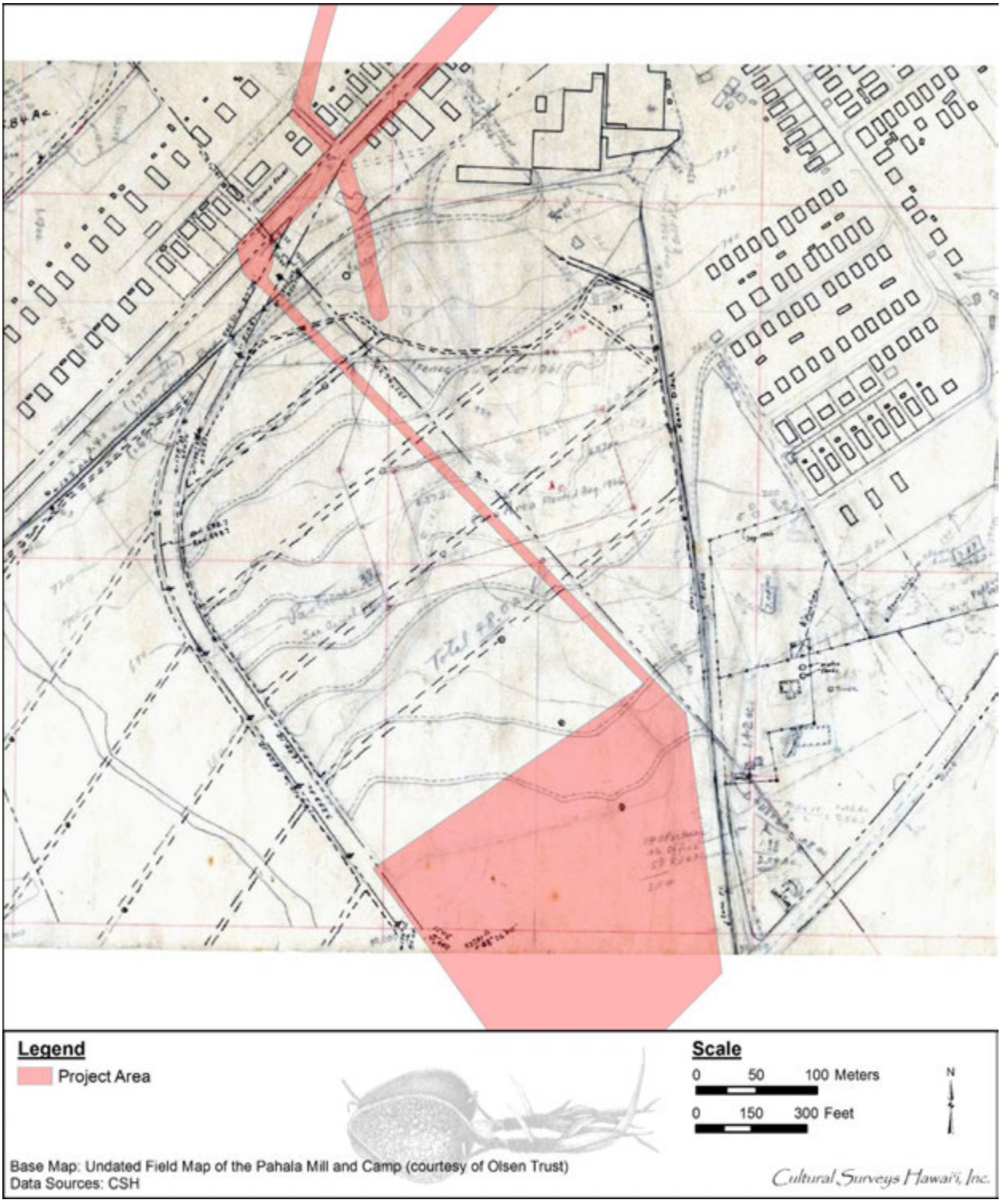

Figure 15. Portion of an undated field map of the Pahala Mill and Camp reprinted in Cleghorn (2016:13) showing the project area in relation to plantation features

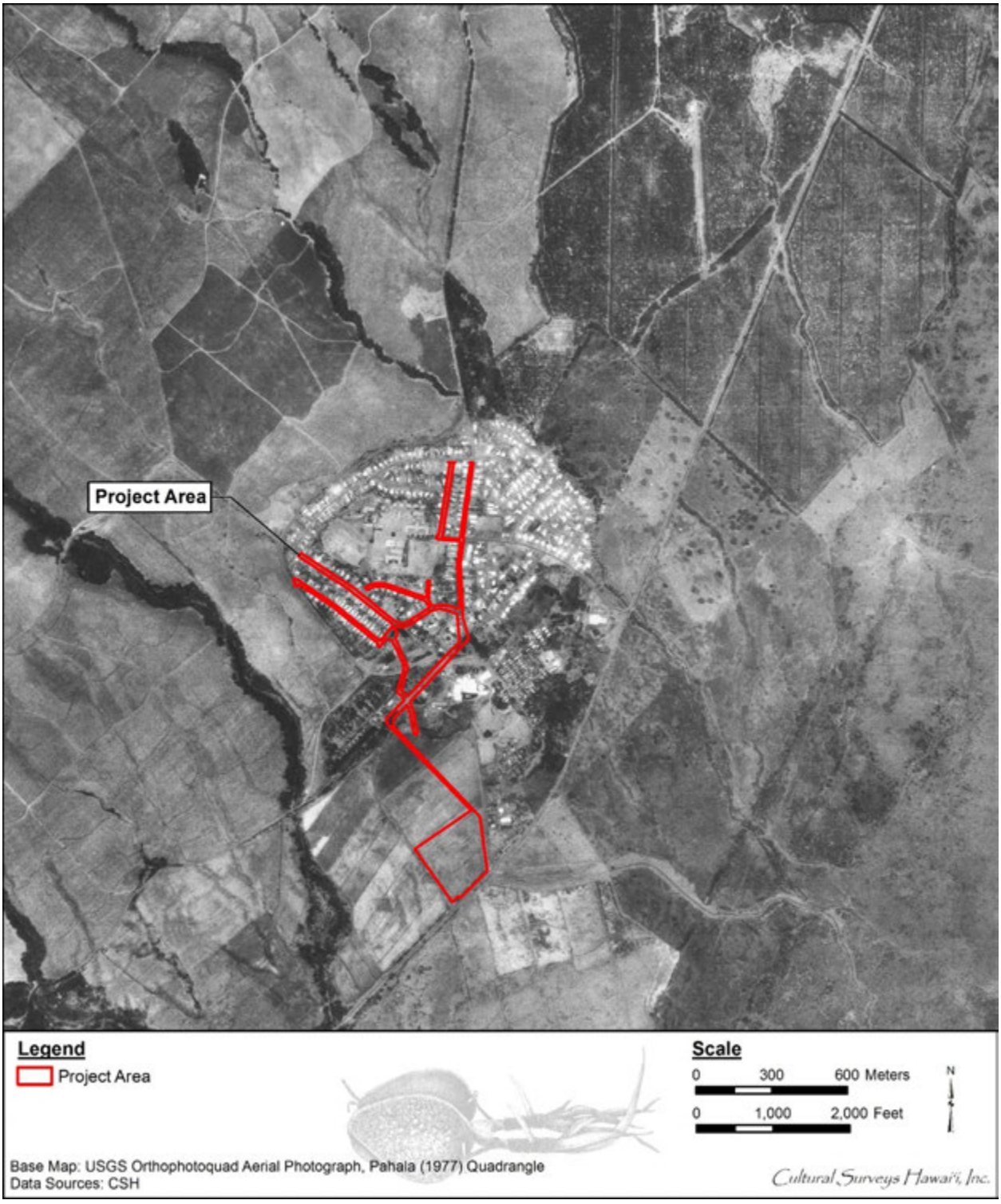

Figure 16. Portion of the 1977 USGS orthophotoquad aerial photo, Pahala Quadrangle, showing the project area and continued development of Pāhala Town

3.2 **Previous Archaeological Research**

3.2.1 Previous Archaeological Studies

Eight previous archaeological studies have been conducted in the vicinity of the current project area in Pāhala. These previous archaeological studies are presented in Table 1 and shown in Figure 17.

In 1981, Hamilton Ahlo undertook an archaeological reconnaissance for the U.S. Army Corps of Engineers Pā‘au‘au Stream Flood Control project, located east of the current project area along the Pā‘au‘au 2 and ‘Iliokoloa Ahupua‘a boundary (Ahlo 1981; see Figure 17). The study examined an approximately 4,000-ft (1.2-km) section of Pā‘au‘au Stream just *mauka* of the Hawai‘i Belt Road (Route 11) and the adjacent embankments. Extensive prior disturbance was noted along both sides of the stream; no archaeological features were documented, and no further work was recommended.

In 2001, Haun and Associates conducted an archaeological assessment (no finds AIS) for an emergency replacement of the Pā‘au‘au Bridge, situated east of the current project area along the Hawai‘i Belt Road in Pā‘au‘au 2 and ‘Iliokoloa (Haun 2001; see Figure 17). The 5.256-acre project area included the bridge over Pā‘au‘au Gulch, the approaches on either side of the bridge along the highway, and adjacent areas to the east. Significant prior disturbance from agricultural and road development and a major flooding event were noted. No archaeological features were documented, and no further work was recommended.

In 2004, Haun and Associates conducted an AIS on 255.7 acres in Palima and Pā‘au‘au Ahupua‘a, northwest of the current project area (Haun and Henry 2004; see Figure 17). The study confirmed extensive prior disturbance from modern and historic agricultural activity dating back to the latter half of the nineteenth century. One newly recorded historic property was documented: SIHP # -24119, a 105-m-long section of a historic irrigation flume associated with the former sugar plantation (Figure 18). No traditional sites were identified, and no further work was recommended.

In 2006, T. S. Dye & Colleagues, Archaeologists, Inc. conducted an archaeological assessment of a proposed cellular site within a 1,600-sq-ft portion of TMK: [3] 9-6-005:018, northwest of the current project area in Pālima and Pā‘au‘au 1 Ahupua‘a (Jourdane and Dye 2006; see Figure 17). Prior disturbance associated with commercial agriculture were noted. No archaeological features were observed.

As part of a state-wide Department of Education (DOE) wastewater systems improvement project, CSH undertook a literature review and field inspection (LRFI) for two Ka‘ū District schools, including KHPES located between the northern portions of the project area (Hammatt and Shideler 2006; see Figure 17). The LFRI included background research for the Pāhala area including LCA data and previous archaeological studies in the vicinity and noted that the school is listed on the HRHP under the thematic group “Public Schools on the Island of Hawai‘i” (SIHP # -07522; see Figure 18). Hammatt and Shideler (2006:27) recommended on-site archaeological monitoring for the project.

In 2009 CSH monitored the DOE wastewater systems improvements project at KHPES (Wilkinson et al. 2010; see Figure 17). The project involved the installation of a new leach field, eight septic tanks, and associated sewer lines. While no subsurface cultural deposits were located

Table 1. Previous archaeological studies in the vicinity of the project area

Reference	Type of Study	Location	Results (SIHP # 50-10-69****)
Ahlo 1981	Archaeological reconnaissance	Pā‘au‘au Stream between Māmalahoa Hwy (Route 11) and Wood Valley Rd, Pā‘au‘au 2 and ‘Iliokoloa Ahupua‘a; TMK not listed	No historic properties or cultural materials identified
Haun 2001	Archaeological inventory survey (recorded as an archaeological assessment)	Pā‘au‘au Bridge, Pā‘au‘au 2 and ‘Iliokoloa Ahupua‘a, portions TMKs: [3] 9-6-002:047, 9-6-012:012, 9-6-013:005, 9-6-023:043	No historic properties or cultural materials identified
Haun and Henry 2004	Archaeological inventory survey	Pālima and Pā‘au‘au 1 Ahupua‘a, TMKs: [3] 9-6-005:017, 018 and 9-6-006:004	One historic property documented: SIHP # -24119, historic irrigation flume associated with sugarcane cultivation
Dye and Jourdane 2006	Archaeological inventory survey (recorded as an archaeological assessment)	Pālima and Pā‘au‘au 1 Ahupua‘a, TMK: [3] 9–6–005:018 por.	No historic properties or cultural materials identified
Hammatt and Shideler 2006	Literature review and field inspection	Two DOE schools in Ka‘ū District, TMKs: [3] 9-6-005:008, 039; 9-5-009:006, 015	Noted listing of KHPES on the HRHP; on-site archaeological monitoring recommended
Wilkinson et al. 2010	Archaeological monitoring	Ka‘ū High and Pāhala Elementary School, Pā‘au‘au Ahupua‘a, TMKs: [3] 9-6-005:008, 039	Noted listing of KHPES on the HRHP; one other historic property documented: SIHP # -27570, lava tube
Escott 2013	Archaeological inventory survey	Ka‘ū High and Pāhala Elementary School, TMK: [3] 9-6-005:008 por.	Explored and mapped previously recorded SIHP # -27570 (lava tube system), documenting three new features; documented one new historic property, a historic-era burial (SIHP # -29501) within the SIHP # -27570 lava tube
Cleghorn 2016	Archaeological field inspection	Pa‘au‘au 1 Ahupua‘a, TMK: [3] 9-6-002:018	Documented scattered surface artifacts and a lava tube within former plantation land; AIS recommended

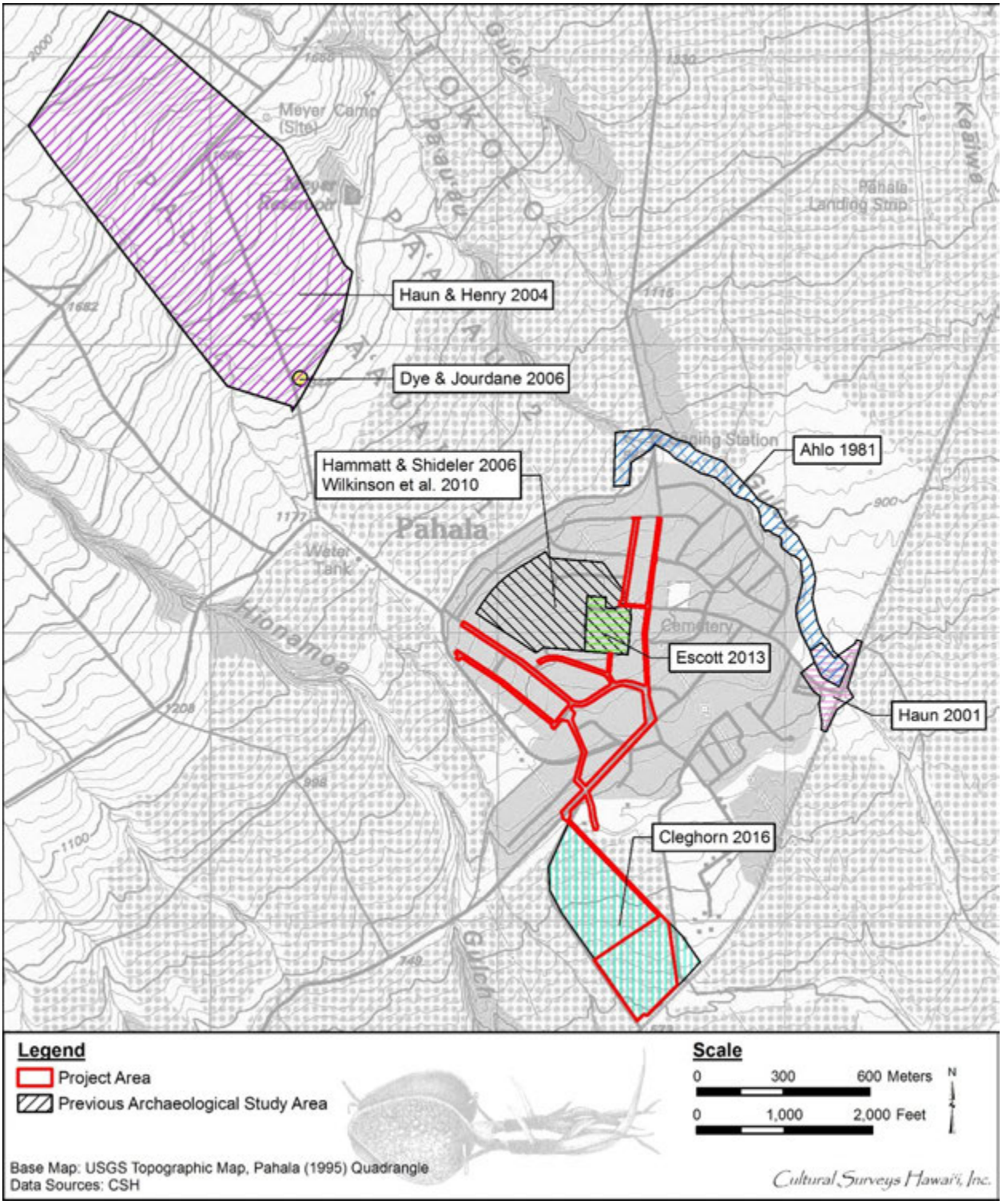

Figure 17. Portion of the 1995 Pahala USGS 7.5-minute topographic quadrangles showing previous archaeological studies in the vicinity of the project area

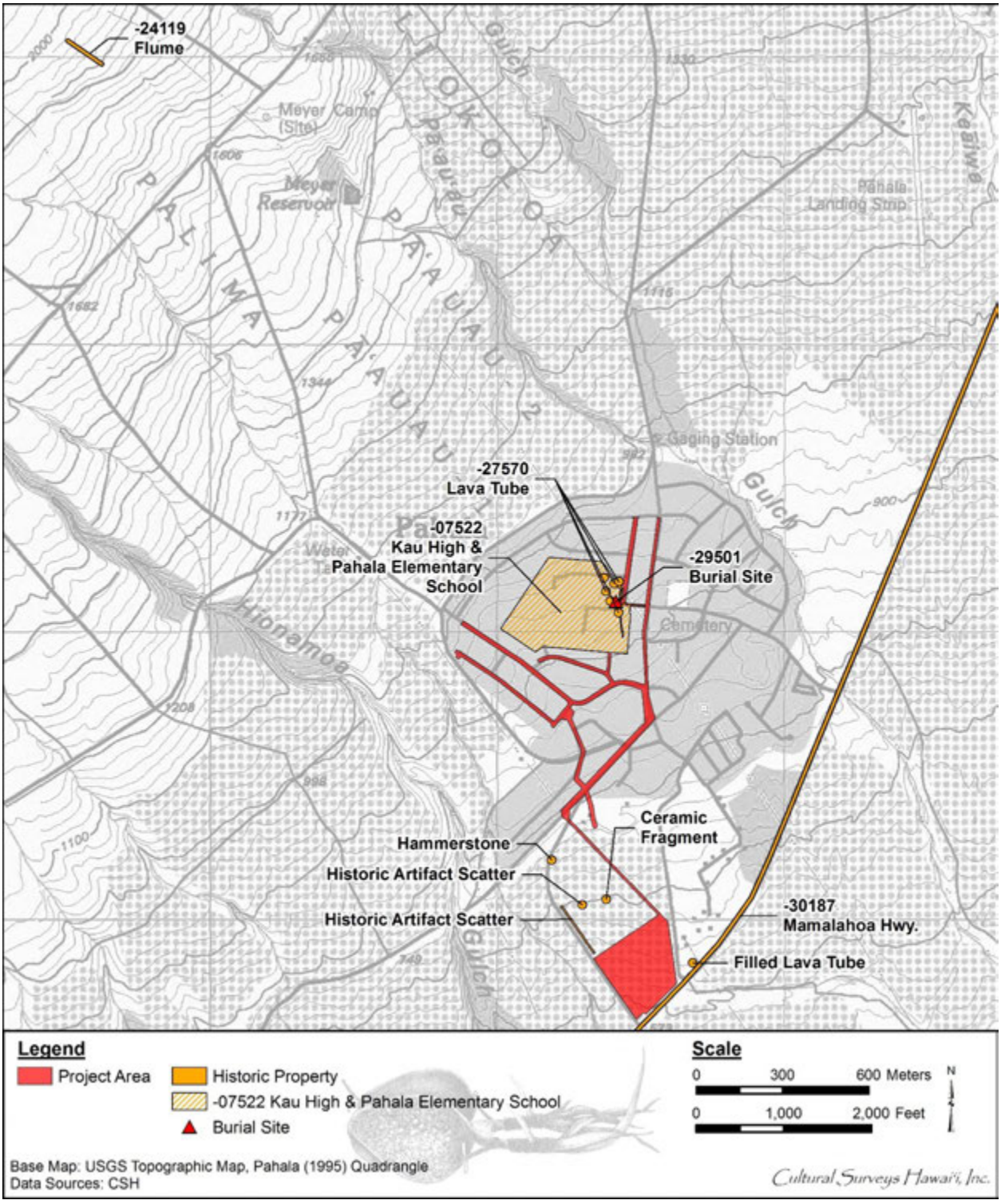

Figure 18. Portion of the 1995 Pahala USGS 7.5-minute topographic quadrangles showing locations of sites documented in previous archaeological studies in the vicinity of the project area

during excavation, a lava tube system was breached and assigned a site number (SIHP # 50-10-69-27570) despite an absence of cultural modifications to the breached portion of the tube system. The location of SIHP # -27570 is shown on Figure 18.

In 2012, Scientific Consultant Services, Inc., conducted an AIS for a proposed gymnasium and disaster relief shelter within a 4.5-acre portion of the KHPES campus, adjacent to but outside the northeastern portion of the current project area (Escott 2013; see Figure 17). The SIHP # -27570 lava tube system was also explored and mapped. A burial site was found within the tube and designated SIHP # 50-10-69-29501 (see Figure 18). This burial is located away from the limits of the current project area. Escott (2013) describes the lava tube system as follows:

> The lava tube system containing Site 27570 and Site 29501 has three main branches converging near the tube system opening under a modern storm drain grate [Figure 19]. The southern branch does not contain archaeological sites. Sites 27570 and 29501 are located in the northern and western branches of the tube system, respectively.
>
> The western branch includes two tubes that are situated parallel to each other and are connected at two points. The western branch of the tube system is closed off by collapse at its western terminus. Site 29501 is located in the northern tube of the western branch, roughly 35.0 meters in from the storm grate opening [Figure 20].
>
> The northern branch of the tube system is accessed through an opening in the floor of the western tube system. The floor of the northern branch is approximately 3.0 meters below the floor of the western branch tube . . . [Escott 2013:17]

No other archaeological features were located within the 4.5-acre project area. Escott (2013:36) noted SIHP # -29501 would “be preserved in accordance with a Hawai‘i Island Burial Council-approved Burial Treatment Plan,” and recommended archaeological monitoring of any future ground disturbing work “near the northern and western branches of the tube system.”

In 2016 Pacific Legacy, conducted archaeological field inspection of TMK: [3] 9-6-002:018, addressing an earlier and larger version of the WWTP project (Cleghorn 2016; see Figure 17). Extensive disturbance associated with development of the macadamia nut orchard was noted. Surface artifacts were encountered within a portion of the macadamia nut orchard that is no longer within the project area limits (see Figure 18). These artifacts included a single traditional hammerstone and fragmental historic glass and ceramics. The report also discussed a lava tube known to exist between the vicinity of the present Royal Hawaiian Orchards processing plant and KHPES; an opening to the tube on the processing plant property was filled in sometime in the past to prevent access. Pacific Legacy recommended discussion with SHPD regarding project historic preservation requirements, noting that an AIS would likely be required. It was also recommended that the vicinity of the lava tube entrance known to exist near the processing plant be excluded from the project area (Cleghorn 2016:7).

Figure 19. Aerial photo showing the Escott (2013) project area and site locations (Escott 2013:18)

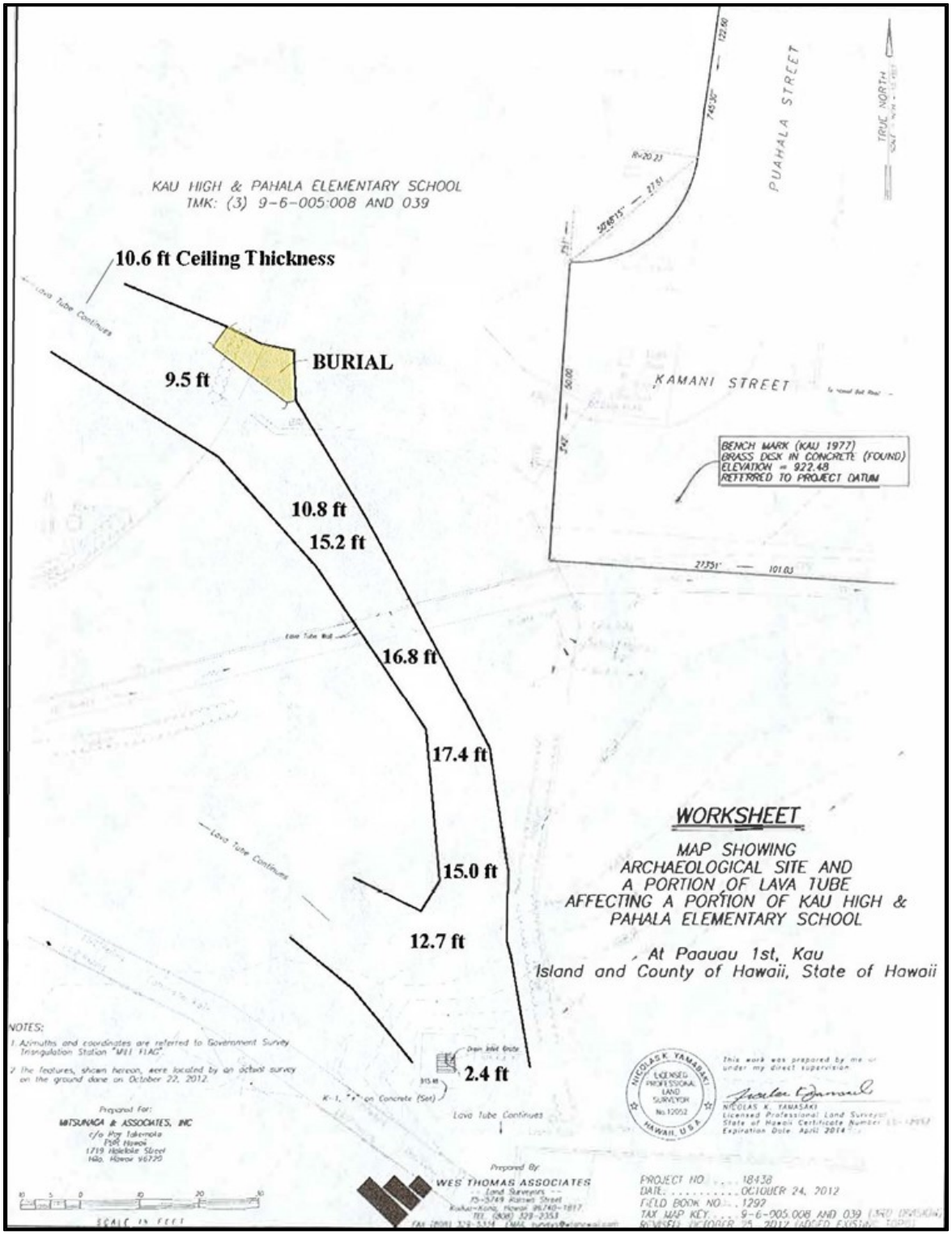

Figure 20. Survey map of SIHP # -29501 burial and SIHP # -27570 lava tube ceiling thicknesses (Escott 2013:19); note the tube is set back from Kamani Street and Puahala Street where a portion of the current project area is located

3.3 National Register-Eligible Historic Properties in the Vicinity

Two historic properties near the project APE have been evaluated as eligible for listing on the National Register: Ka‘ū High and Pāhala Elementary School and the Māmalahoa Highway. Neither of these sites are within the project APE.

3.3.1 Ka‘ū High and Pāhala Elementary School

Ka‘ū High and Pāhala Elementary School, located north of and between portions of the project APE (see Figure 18), is part of the thematic grouping “Public Schools on the Island of Hawai‘i” (SIHP # 50-10-69-07522). SIHP # -07522 is listed on the Hawai‘i Register. The school was nominated to the National Register in May 2002 under the name “Ka‘u High and Pahala Elementary School.” The nomination form lists the period of significance as 1935-1950 and areas of significance as Criteria A (education/social history value) and C (architecture value). This historic property has not been listed on the National Register.

3.3.2 Māmalahoa Highway

SIHP # 50-10-47-30187 comprises the former and present alignments of the Māmalahoa Highway (Highway 11/Hawai‘i Belt Road); an actively used and contemporary portion of this roadway is located adjacent to the southern boundary of the proposed WWTP site (see Figure 18). Under a prior study (Clark et al. 2014:81) this historic property was evaluated as eligible for inclusion on the National Register under Criteria A and D for its importance in and information about “late nineteenth and early twentieth events in establishing a regional transportation network that has its roots in antiquity.” The portion of the roadway adjacent to the project area was constructed in the 1940s. This historic property has not been nominated for listing on the Hawai‘i Register or National Register.

3.4 Background Summary and Predictive Model

Ka‘ū is a large district known for its dynamic natural environment and fierce people. Despite the impressions of early visitors that the district was a barren wasteland, its abundant and varied resources supported a substantial population. However, in pre-Contract times Pāhala was not a habitation center. Villages were located at the coast or in places like Wai‘ōhinu to the southwest where water and other resources were more abundant.

In the first 50 years after Contact, the population of Ka‘ū declined dramatically due to introduced disease, natural disasters, and outmigration to developing economic centers. Missions were established in Wai‘ōhinu and Punalu‘u. In the Māhele, a handful of *kuleana* claims in the Pāhala vicinity indicate land use associated with residence and small-scale farming. The vast majority of Hionamoa Ahupua‘a was awarded as LCA 9971:12 to the *ali‘i* William Pitt Leleiohoku; this award overlaps the proposed WWTP site. A number of Land Grants were also made in the Pāhala vicinity, including Land Grant 02446 to Kamalo overlapping the northern portion of the project area.

The historic era in Ka‘ū was dominated by the development of the livestock and commercial agriculture industries. Several large ranching outfits were established in Ka‘ū in the mid-1800s, including Kapāpala Ranch located a relatively short distance east of present Pāhala Town. However, it was sugar plantations that produced the most widespread and lasting impact on the physical and social landscape of Ka‘ū. The Hawaiian Agricultural Company was established in

the Pāhala vicinity in 1876 and quickly grew. A mill was established and the village of Pāhala began to develop with the influx of plantation workers and their families. The majority of the project area was under cane at some point in time.

Previous archaeological research in the vicinity has documented very little evidence of pre-Contact land use, partially due to widespread land alteration for the sugar plantation. Historic plantation remnants such as cane flumes have been documented in the area. Lava tubes are also known to be present in and around Pāhala. A lava tube system (SIHP # -27570) has been documented to the north and east of the project area; the lava tube contains a historic to modern refuse dump and a historic burial site (SIHP # -29501) located on the KHPES campus. The school itself is on the HRHP as part of a thematic group of historic Hawai‘i Island schools (SIHP # -07522). The Māmalahoa Highway (SIHP # 50-10-47-30187) located just south of the project area has been evaluated as eligible for inclusion on the NRHP but has not been nominated. The current project area does not encroach on any previously documented portions of the lava tube system, the school campus, or the Māmalahoa Highway.

Given the known traditional land use in this area and the impacts of continued agricultural and residential development, surface pre-Contact sites are not expected within the project area. The modern development of the macadamia nut orchard has likely also obliterated any plantation-era sites once present in that portion of the project area; surface features associated with the former plantation village and/or historic transportation routes may be present in other portions of the project area. Subsurface historic features related to sugar cultivation could be present throughout the project area. Furthermore, additional lava tubes may be present and have the potential to contain pre- and/or post-Contact archaeological features, including human burials.

Section 4 Results of Fieldwork

CSH completed the fieldwork component of this archaeological inventory survey under archaeological fieldwork permit number 17-08, issued by the SHPD pursuant to HAR §13-282. Fieldwork was conducted on 18 September 2018, 1–4 October 2018, and 10 January 2019. This work required approximately 8 person-days to complete.

The fieldwork comprised a 100% pedestrian inspection of the project area and a program of subsurface testing. The results of the pedestrian inspection are provided in Section 4.1 and the subsurface testing results are provided in Section 4.2.

Two historic properties characterized as historic-era transportation routes (SIHP #s 50-10-69-31088 and -31089) were documented within the project area (Figure 21; see Section 5 for full site descriptions). No pre-Contact features or lava tubes were encountered within the project area.

4.1 Pedestrian Inspection Results

A 100% pedestrian inspection was undertaken with the field crew spaced 3-5 m apart depending upon the density of the vegetation. Ground visibility was very good throughout most of the inspection area.

The pedestrian inspection began along the easement located within TMK: [3] 9-6-005:036. This area has been completely disturbed by prior development. From Maile Street, the easement extends northwest along an existing paved driveway to an open, asphalted area located along the southern side of the private roadway used to access Ka‘ala‘iki Road (Figure 22). This asphalt area is surrounded by previously graded land presently overgrown with California grass. The easement crosses the roadway, entering the former sugar plantation maintenance yard. The easement extends along a dirt driveway between two large, old maintenance buildings that are still in use (Figure 23). These buildings are located outside the easement and project area. North of these structures is a graded, grassy parking area; the easement crosses this parking area and through a previously disturbed, heavily vegetated area containing scrap metal and miscellaneous trash located along the *makai* side of Ilima Street (Figure 24). An earthen storm water drainage channel extends along the *makai* side of Ilima Street southwest from a culvert at Huapala Street and contains scattered modern household trash (Figure 25).

Upon exiting the proposed easement within TMK: [3] 9-6-005:036, the survey continued along various residential streets within the project area, including Pikake Street, Kamani Street, Puahala Street, Huapala Street, Hala Street, Hinano Street, and Ilima Street (Figure 26 through Figure 29). These streets consist of one-to-two-lane asphalt travel ways with no curbing or sidewalks. These streets employ variable use of standard signage and center and outer lane striping. A four-way crosswalk is located at the Pikake Street and Kamani Street intersection near the KHPES campus (Figure 30). Kamani Street dead ends at the school and the project area does not cross onto the campus. The homes lining these residential streets outside the project area are of variable age but are commonly of post-and-pier “plantation style” design with corrugated metal roofing. Slight linear depressions are typically present along one side of each street within the asphalt or grassy shoulder, providing drainage for runoff; these drainages are also outside the asphalt travel ways comprising the project area. A single culvert constructed in the 1960s was observed running under the modern Huapala Street surface adjacent to the Ilima Street intersection (Figure 31); this culvert

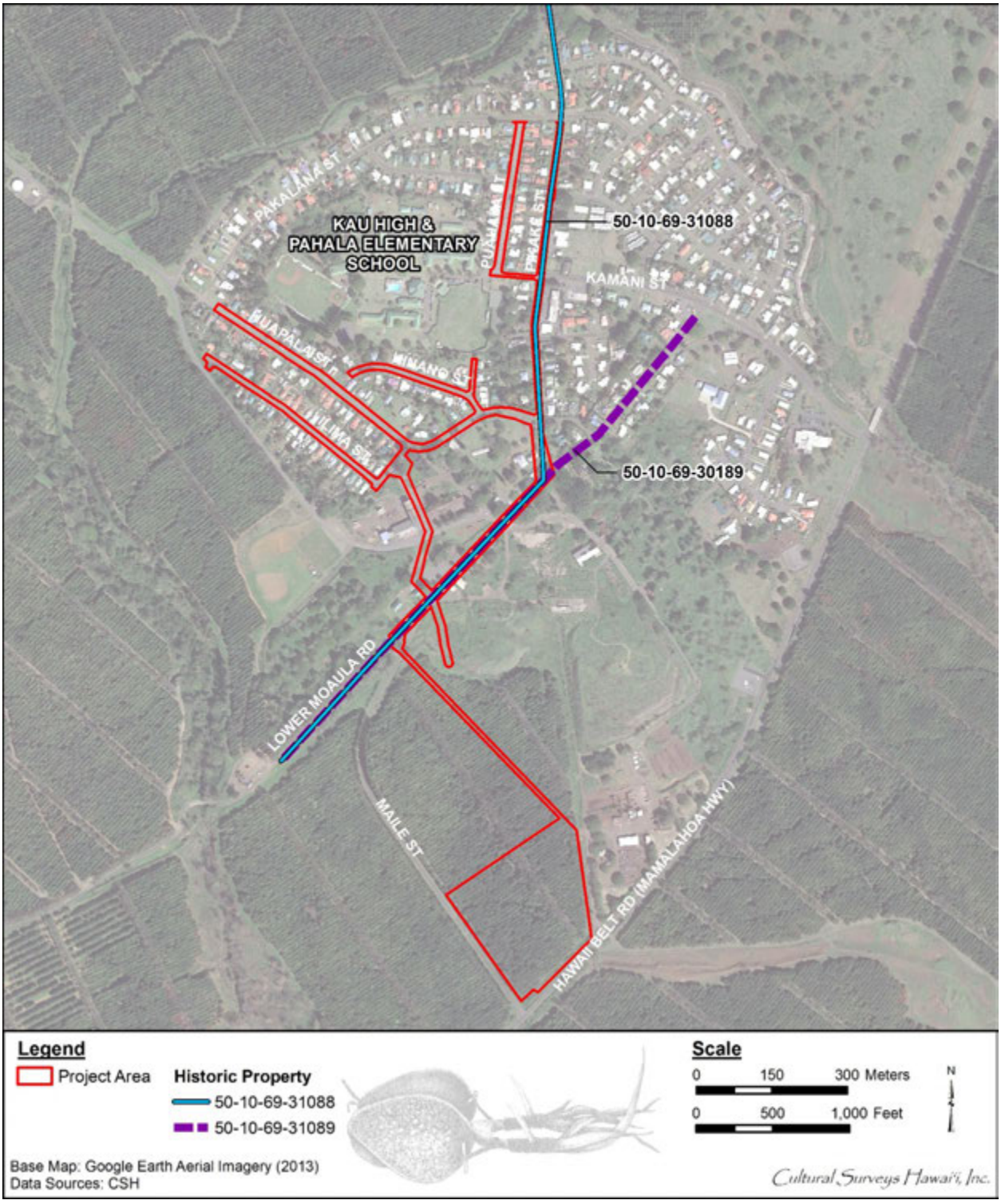

Figure 21. Aerial photo of the project area (Google Earth 2013) showing the locations of newly documented historic properties

Figure 22. Photo showing the portion of the easement in TMK: [3] 9-6-005:036 that extends from Maile Street along an existing asphalt driveway; view northwest

Figure 23. Photo showing the portion of the easement in TMK: [3] 9-6-005:036 that passes through the old plantation maintenance yard; the structures present to either side are outside the project area; view to northwest

Figure 24. Photo showing the forested area between the maintenance yard and Ilima Street at the northern end of the easement in TMK: [3] 9-6-005:036; view to northwest

Figure 25. Photo showing the location where the easement in TMK: [3] 9-6-005:036 exits at Ilima Street (frame right); the earthen drainage channel extending from the Huapala Street culvert is beneath the grass to the left of the road; view to southwest

Figure 26. Photo looking down Huapala Street; note linear drainage in grassy lawn on left side of photo; view to southeast

Figure 27. Photo looking up Ilima Street; note drainage in grassy shoulder on right side of photo; view to northwest

Figure 28. Photo looking up Hinano Street from the eastern Huapala Street intersection; view to northwest

Figure 29. Photo looking up Hala Street from the Hinano Street intersection; view to north

Figure 30. Photo of the intersection of Pikake and Puahala streets; view to northwest

Figure 31. Photo of the culvert located at the Huapala Street and Ilima Street intersection; view to northeast

diverts runoff into the channel located along the *makai* side of Ilima Street (see Figure 25).

Pikake Street is an arterial route in Pāhala lined with commercial establishments in addition to residences. Research has indicated this present roadway is a portion of a historic road alignment (SIHP # -31088, Wood Valley Road/Coastal Road; see Figure 21 and Section 5.1). A commercial center at the Pikake Street and Kamani Street intersection includes a bank, drugstore, post office, and the Mizuno Superette (Figure 32). The southern portion of Pikake Street approaching its terminus at Maile Street is technically a private roadway located within TMK: [3] 9-6-005:044. Pikake Street at the Maile Street intersection includes turn lanes (Figure 33). A broad asphalt parking area is located along the northeastern side of the intersection, fronting the offices of Olson Trust. On the western side of this intersection are the offices of Kau Agribusiness Company, comprising two plantation-era buildings (see Figure 33). Within the grassy yard fronting these buildings is an old Corliss steam engine once used by the sugar mill. These structures and the engine are located outside the project area.

The inspection proceeded southwest down Maile Street from the Pikake Street intersection. The project area includes an approximately 0.25-mile portion of Maile Street located between the old mill camp road and the Lower Moaula Road intersection (Figure 34 and Figure 35). Research has indicated this present roadway is a portion of a historic road alignment (SIHP # -31089, Volcano Road; see Figure 21 and Section 5.2). Along the *makai* side of Maile Street in this area are an old plantation house (which has been subsequently used as a store) and visible remnants of the mill and theater; all these features are located outside the project area. Along the *mauka* side of Maile Street in this area are a Hawaiian Telcom building (see Figure 34), a few old plantation homes serving as residences, and the asphalt parking area noted previously, as well as a section of concrete sidewalk. Both sides of Maile Street exhibit extensive prior disturbance. No remnants of the old plantation railroad were observed.

From the vicinity of the Maile Street/Lower Moaula Road intersection, the inspection continued southeast along the proposed utility easement within TMK: [3] 9-6-002:018. Closest to Maile Street the easement briefly crosses a previously graded area overgrown in California grass and other weeds, before entering the macadamia orchard. This easement extends through the orchard to the proposed WWTP plant site. The orchard contains linear rows of mature trees watered via surface irrigation lines (Figure 36). Fallen macadamia nuts, leaf litter, and relatively few small stones are present on the ground surface. Signs of surface water runoff were observed throughout the orchard. An asphalt road accessing the processing plant from Maile Street forms the *mauka* border of the proposed plant site (Figure 37). Bulldozer push piles were observed along the Belt Road edge and down the center of the orchard (Figure 38 and Figure 39), and bulldozer blade scars are frequently visible on small exposures of lava bedrock throughout the orchard. During the survey fieldwork CSH crew observed operation of a machine in an adjacent orchard used to harvest macadamia nuts off the ground; this machine was observed to scatter small rocks and other natural materials around.

A few scattered pieces of highly fragmental glass and ceramics were observed in the vicinity of the proposed Test Excavation (TE) 2 location in the northern-central portion of the proposed site; testing at this location did not uncover any subsurface cultural materials (see Section 4.2.2). The nature and density of the fragmental cultural materials observed on the surface within the macadamia orchard were not sufficient to comprise a significant cultural deposit. These materials

Figure 32. Photo looking up Pikake toward the Kamani Street intersection; commercial center is visible to the right; view to north

Figure 33. Photo showing the Pikake Street terminus at Maile Street; Hawaiian Telcom building is on opposite corner; view to southwest

Figure 34. Photo of a portion of Maile Street within the project area, showing the Pikake Street intersection in the background and the HELCO building (left frame); view to northeast

Figure 35. Photo of a portion of Maile Street in the project area, showing the Lower Moaula Road fork in the far background; view to southwest

Figure 36. Representative photo of the macadamia orchard; note the surface irrigation lines between the trees; view to southwest

Figure 37. Photo of the paved road that passes through the macadamia orchard between Maile Street and the macadamia nut husking plant; this road forms the *mauka* boundary of the proposed WWTP site portion of the project area; view to northeast

Figure 38. Photo showing the margin of the macadamia orchard at the southeastern corner of the proposed WWTP site portion of the project area; a dozer push pile is present beneath the grass along the left side of the photo; view to southwest

Figure 39. Photo showing a portion of the linear push pile/berm located along the wind break bisecting the macadamia orchard; view to southwest

were similar in nature to those scattered historic artifacts encountered by Cleghorn (2016) in the portion of the orchard north of the current project area. No traditional artifacts like the hammerstone recorded by Cleghorn (2016) were encountered within the current project area.

The last portion of the project area to be inspected was the location of existing LCC 1 and associated sewer easement in TMK: [3] 9-6-002:016. The sewer line easement was recently cleared from an area just below Maile Street; the areas surrounding the cleared easement are fallow with overhead California grass. Ground visibility was excellent along the maintained easement, allowing for relocation of a sewer manhole (Figure 40) and cleanout along the existing sewer line. The LCC 1 location at the *makai* end of the maintained easement is not marked on the ground surface; a low dirt mound is believed to indicate its location (Figure 41). No remnants of the old plantation railroad were observed.

4.2 **Subsurface Testing Results**

Subsurface testing was conducted within the proposed WWTP site portion of the project area, to determine the nature of the sediments and the potential for subsurface archaeological features including but not limited to buried cultural deposits and/or culturally modified lava tubes. This area is a mature macadamia nut orchard. The subsurface testing program involved mechanical excavation of seven test trenches measuring approximately 5 m (16.5 ft) long and 1 m (3.2 ft) wide, with an average depth of 1.6 m (5.2 ft). All seven test excavations terminated at bedrock. The locations of the excavation trenches are depicted on Figure 42 and Figure 43. An archaeologist was present to monitor the excavations and document the exposed stratigraphy, which was recorded upon completion of each trench. No subsurface features or deposits were exposed during excavation, which is consistent with known prior disturbance from sugarcane cultivation and the present macadamia orchard. The stratigraphic information, profile drawings, and photographs taken at each trench follow.

The subsurface testing program generally revealed two distinct natural sedimentary layers located atop decomposing bedrock: a dark, rich silty loam A horizon overlying a dusky red silty clay loam B horizon. These findings are consistent with the USGS Soil Survey (Sato et al. 1973) sediment types depicted in Figure 7 and with past and present agricultural land use. The exception was in TE 1, which contained three stratigraphic layers. Here, the two natural sediment layers are interposed by a layer of ash deposit. The ash was deposited and subsequently covered up at some point in time. Of all the test excavations, TE 1 is in closest proximity to the macadamia but processing plant (see Figure 42) and may be the result of some activity at the former plantation. No charcoal or cultural materials were present within the ash layer.

4.2.1 Test Excavation 1 (TE 1)

Test Excavation 1 (TE 1) was located in the northern corner of the proposed WWTP site portion of the project area, where a lagoon is planned for development (see Figure 42 and Figure 43). Figure 44 shows TE 1 marked out with orange flagging tape prior to excavation. TE 1 measured approximately 5 m long and 1 m wide. TE 1 was excavated to a depth of up to 230 cm below surface (cmbs) through two layers of natural Waiaha series sediment (Strata I and III) interposed by a layer of deposited ash (Stratum II), and terminated at basalt bedrock (Figure 44 through Figure 46 and Table 2). No charcoal or cultural materials were observed within TE 1.

Figure 40. Photo of the sewer manhole located along the existing, maintained sewer easement within TMK: [3] 9-6-002:016; view to southwest

Figure 41. Photo showing the LCC 1 location at the *makai* terminus of the existing, maintained sewer easement within TMK: [3] 9-6-002:016; view to south

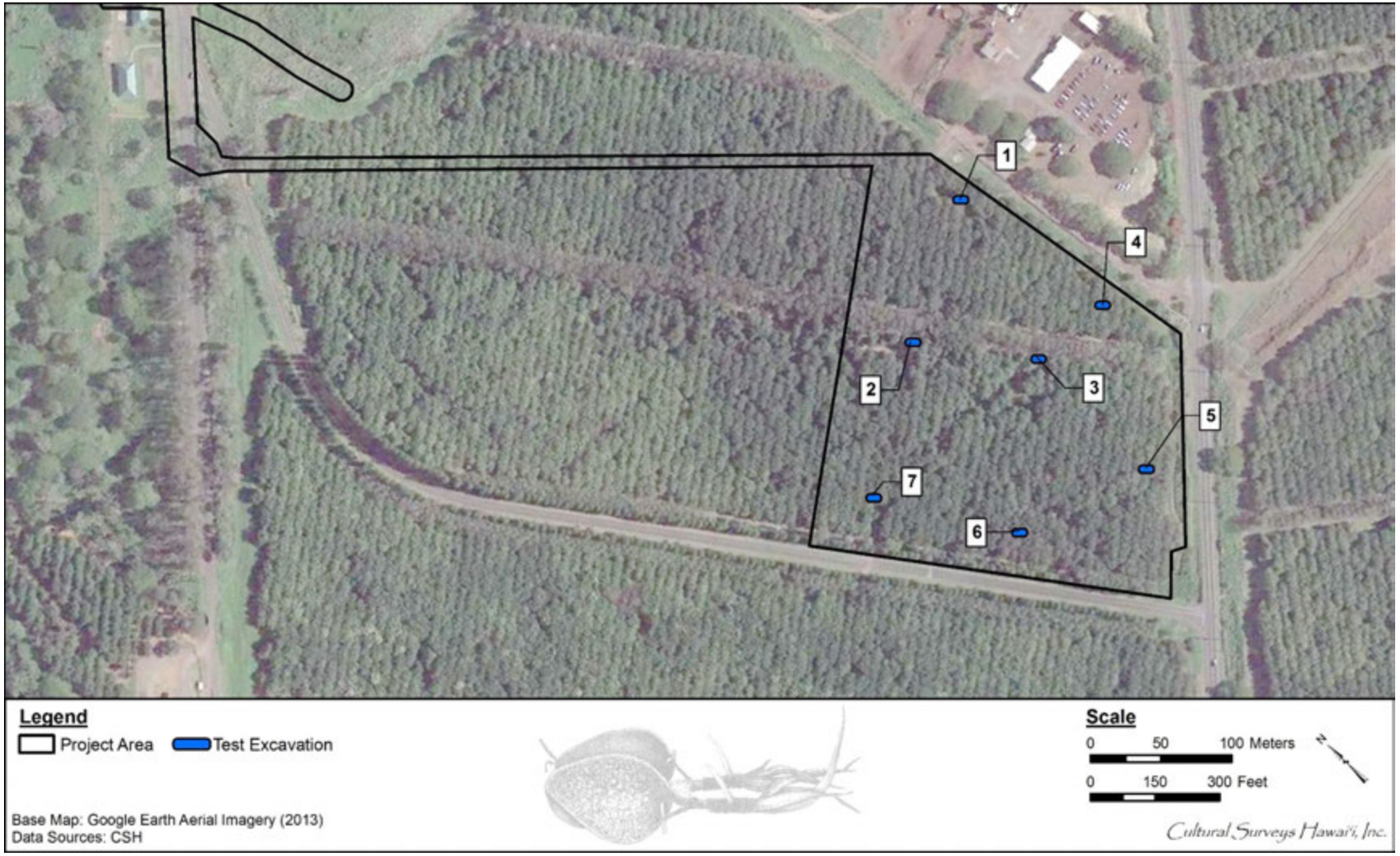

Figure 42. Aerial photograph showing the locations of the seven test excavation trenches within the proposed WWTP site portion of the project area (TE 1 through TE 7) (Google Earth 2013)

Figure 43. Preliminary WWTP site plan, overlain with locations of the seven test excavation trenches within the proposed WWTP site portion of the project area (TE 1 through TE 7) (site plan courtesy of client, with Google Earth 2013 overlay added)

Figure 44. Photo of TE 1 marked out with flagging tape prior to excavation; view to southwest

Figure 45. Photo of TE 1 northwest sidewall profile; view to northwest

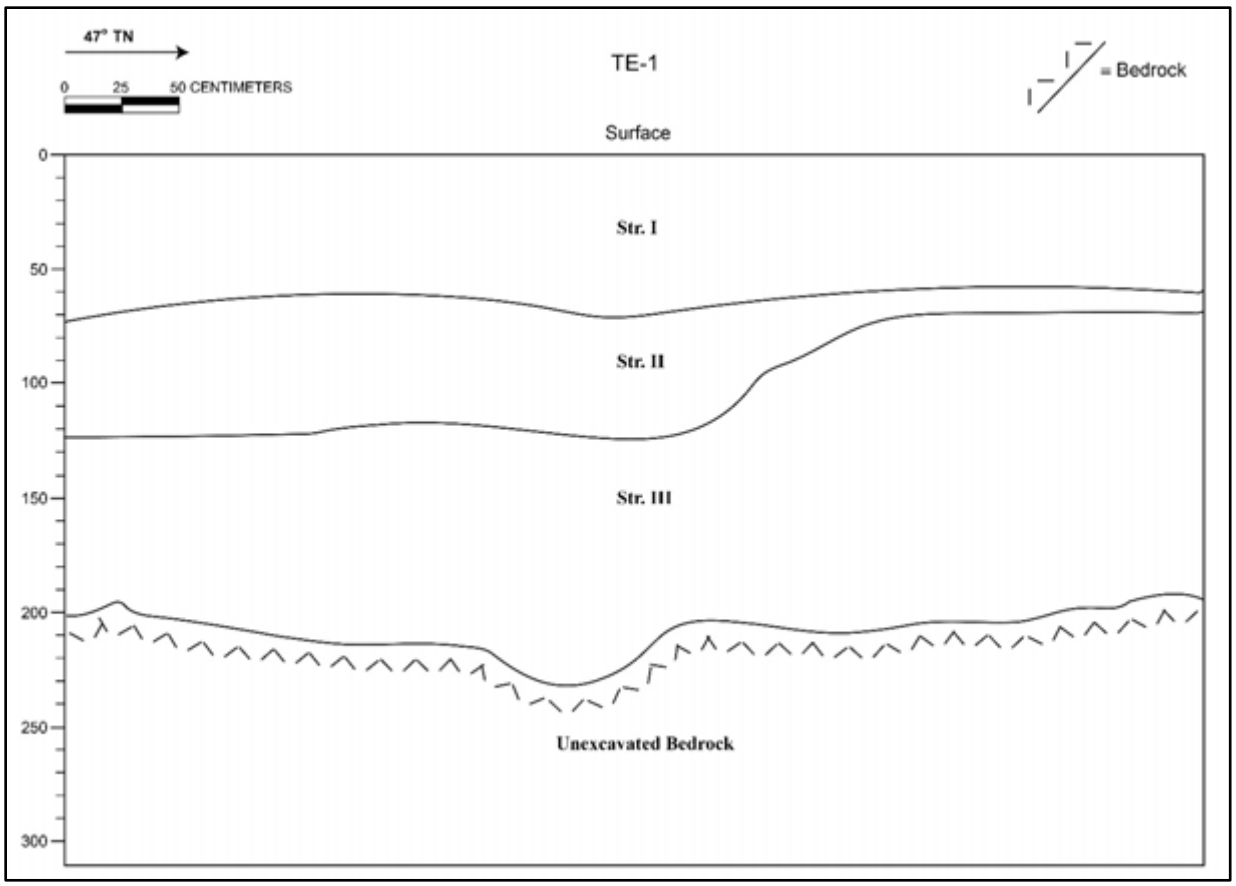

Figure 46. Profile of TE 1 northwest sidewall

Table 2. TE 1 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–72	A horizon; 7.5YR 2.5/3, very dark brown; silty loam; weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; clear, smooth lower boundary; roots common; no cultural material present; natural Waiaha series sediment
II	72–123	Ash; 5Y 7/1, light gray; ash; structureless (single-grain); dry, loose, no cementation consistence; non-plastic; unknown origin; diffuse, wavy lower boundary; few roots; no charcoal or cultural material present; ash deposit possibly associated with former plantation
III	123–230	B horizon; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, wavy lower boundary, terminated at bedrock; few roots; no cultural material present; natural Waiaha series sediment

4.2.2 Test Excavation 2 (TE 2)

Test Excavation 2 (TE 2) was located within the northern-central section of the proposed WWTP site portion of the project area, where a wetland is planned for development (see Figure 42 and Figure 43). Figure 47 shows TE 2 marked out with orange flagging tape prior to excavation. TE 2 measured approximately 5 m long and 1 m wide. TE 2 was excavated to a depth of up to 120 cmbs through two layers of natural Waiaha series sediment (Strata I and II) and terminated at basalt bedrock (Figure 48, Figure 49, and Table 3). Despite the presence of a few small pieces of highly fragmental historic materials on the ground surface in the TE 2 locale (see Section 4.1), no cultural materials were observed within TE 2.

4.2.3 Test Excavation 3 (TE 3)

Test Excavation 3 (TE 3) was located near the center of the proposed WWTP site portion of the project area, where a lagoon is planned for development (see Figure 42 and Figure 43). Figure 50 shows TE 3 marked with orange flagging tape prior to excavation. TE 3 measured approximately 5 m long and 1 m wide. TE 3 was excavated to a depth of up to 180 cmbs through two layers of natural Waiaha series sediment (Strata I and II) and terminated at basalt bedrock (Figure 51, Figure 52, and Table 4). No cultural materials were observed within TE 3.

4.2.4 Test Excavation 4 (TE 4)

Test Excavation 4 (TE 4) was located along the eastern boundary of the proposed WWTP site portion of the project area, where a grove is planned for development (see Figure 42 and Figure 43). Figure 53 shows TE 4 marked with orange flagging tape prior to excavation. TE 4 measured approximately 5 m long and 1 m wide. TE 4 was excavated to a depth of up to 155 cmbs through two layers of natural Waiaha series sediment (Strata I and II) and terminated at basalt bedrock (Figure 54, Figure 55, and Table 5). No cultural materials were observed within the TE 4.

4.2.5 Test Excavation 5 (TE 5)

Test Excavation 5 (TE 5) was located in the southeastern section of the proposed WWTP site portion of the project area, where a grove is planned for development (see Figure 42 and Figure 43). Figure 56 shows TE 5 marked with orange flagging tape prior to excavation. TE 5 measured approximately 5 m long and 1 m wide. TE 5 was excavated to a depth of up to 162 cmbs through two layers of natural Waiaha series sediment (Strata I and II) and terminated at basalt bedrock (Figure 57, Figure 58, and Table 6). No cultural materials were observed within TE 5.

4.2.6 Test Excavation 6 (TE 6)

Test Excavation 6 (TE 6) was located along the western boundary of the proposed WWTP site portion of the project area, where a grove is planned for development (see Figure 42 and Figure 43). Figure 59 shows TE 6 marked with orange flagging tape prior to excavation. TE 6 measured approximately 5 m long and 1 m wide. TE 6 was excavated to a depth of up to 160 cmbs through two layers of natural Naalehu series sediment (Strata I and II) and terminated at basalt bedrock (Figure 60, Figure 61, and Table 7). No cultural materials were observed within TE 6.

Figure 47. Photo of TE 2 marked out with flagging tape prior to excavation; view to southeast

Figure 48. Photo of TE 2 southwest sidewall; view to northeast

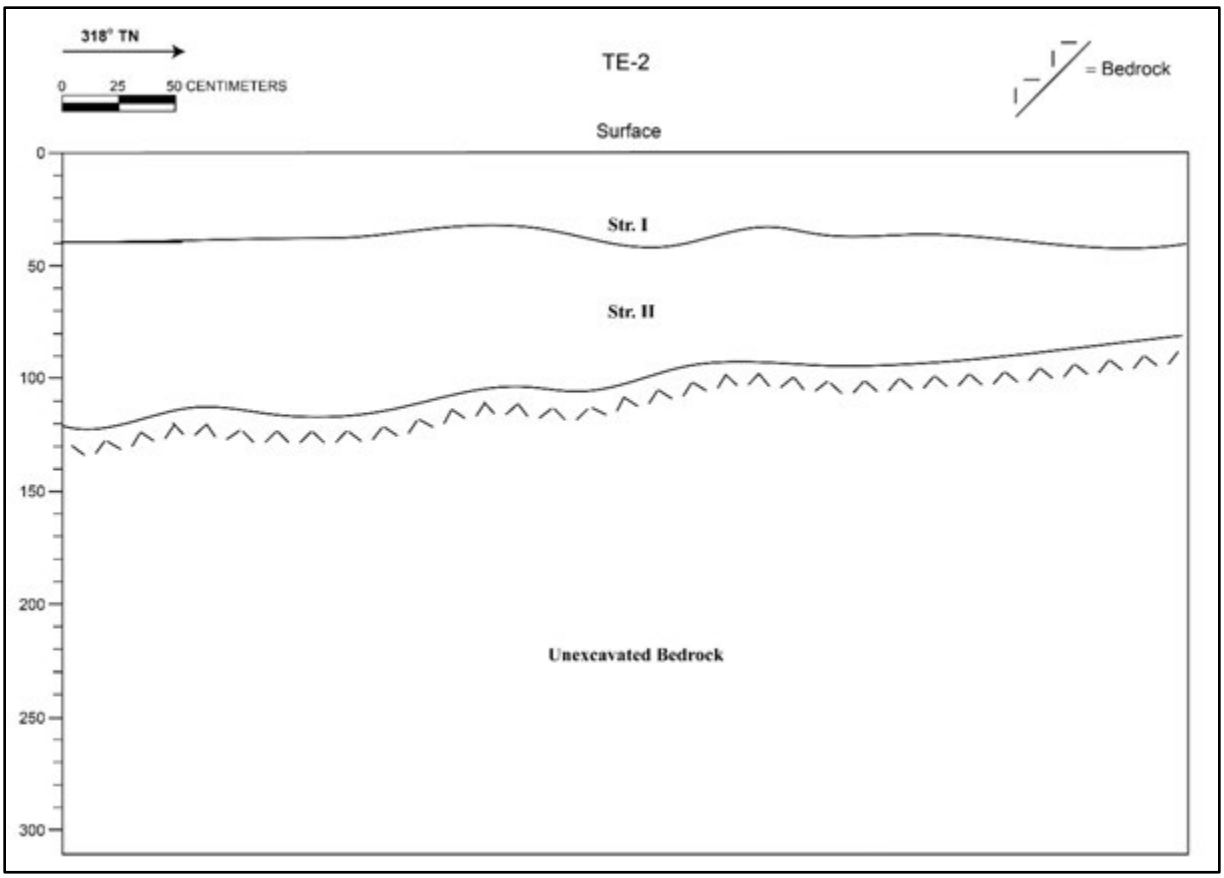

Figure 49. Stratigraphic profile of TE 2 southwest sidewall

Table 3. TE 2 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–45	A horizon; 7.5YR 2.5/3, very dark brown; silty loam, weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; diffuse, smooth lower boundary; roots common; no cultural material present; natural Waiaha series sediment
II	45–120	B horizon; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, smooth lower boundary, terminated at bedrock; few roots; no cultural material present; natural Waiaha series sediment

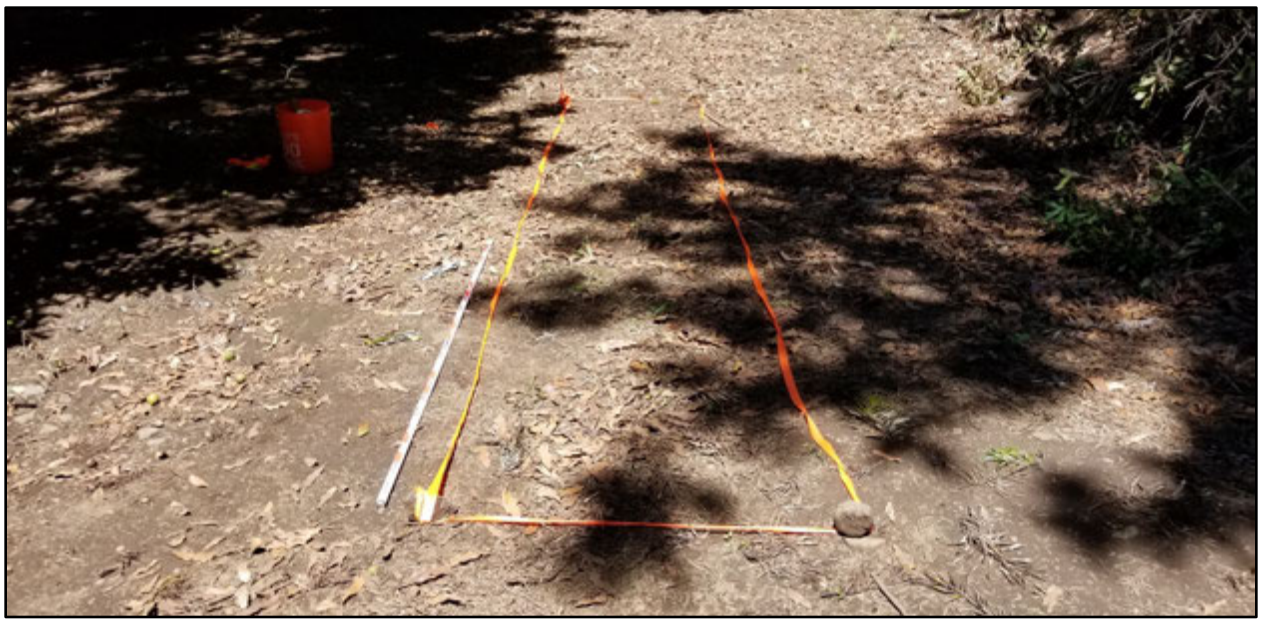

Figure 50. Photo of TE 3 marked out with flagging tape prior to excavation; view to southeast

Figure 51. Photo of TE 3 west sidewall; view to northeast

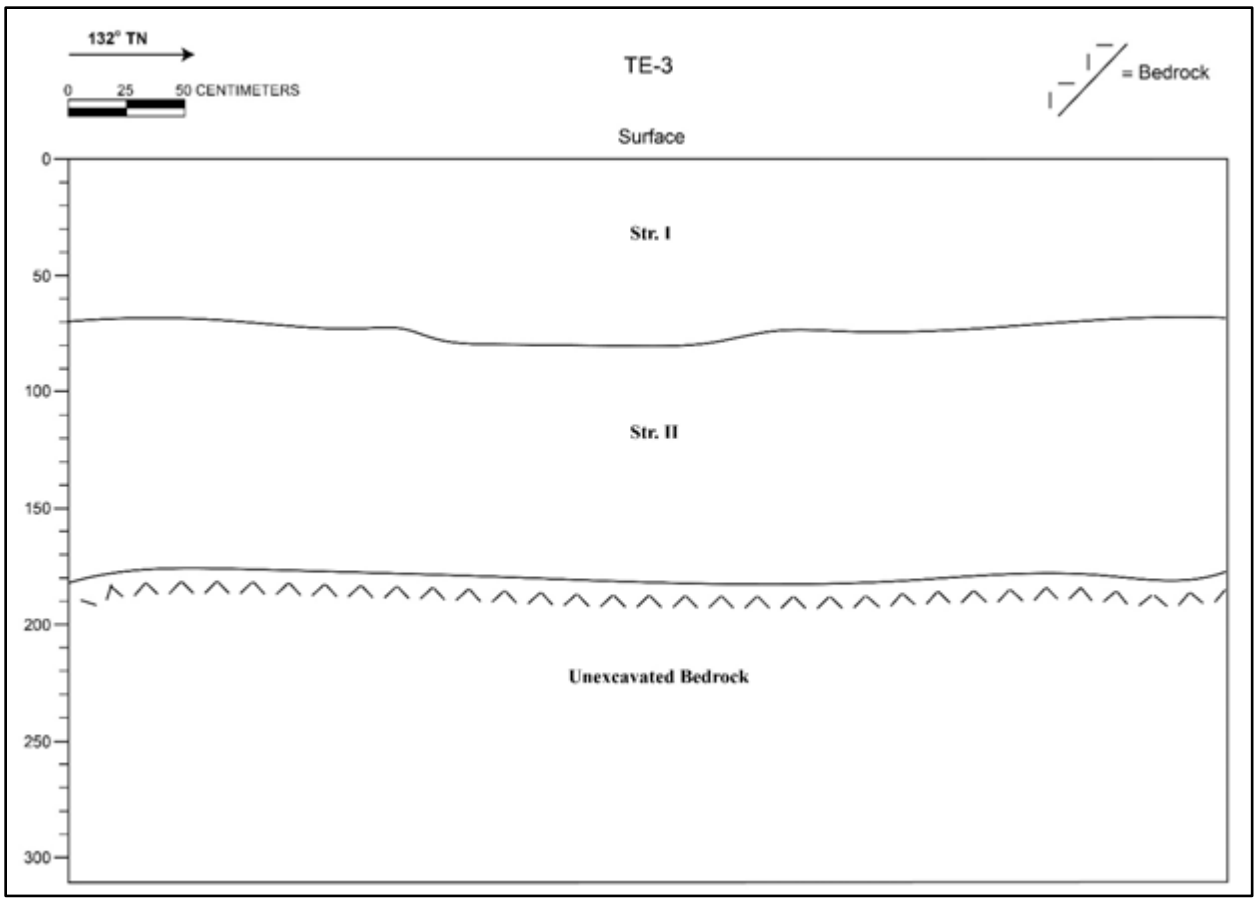

Figure 52. Stratigraphic profile of TE 3 northeast sidewall

Table 4. TE 3 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–82	A horizon; 7.5YR 2.5/3, very dark brown; silty loam; weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; diffuse, smooth lower boundary; roots common; no cultural material present; natural Waiaha series sediment
II	82–180	B horizon, Natural; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, smooth lower boundary, terminated at bedrock; few roots; no cultural material present; natural Waiaha series sediment

Figure 53. Photo of TE 4 marked out with flagging tape prior to excavation; view to south

Figure 54. Photo of TE 4 northwest sidewall; view to northwest

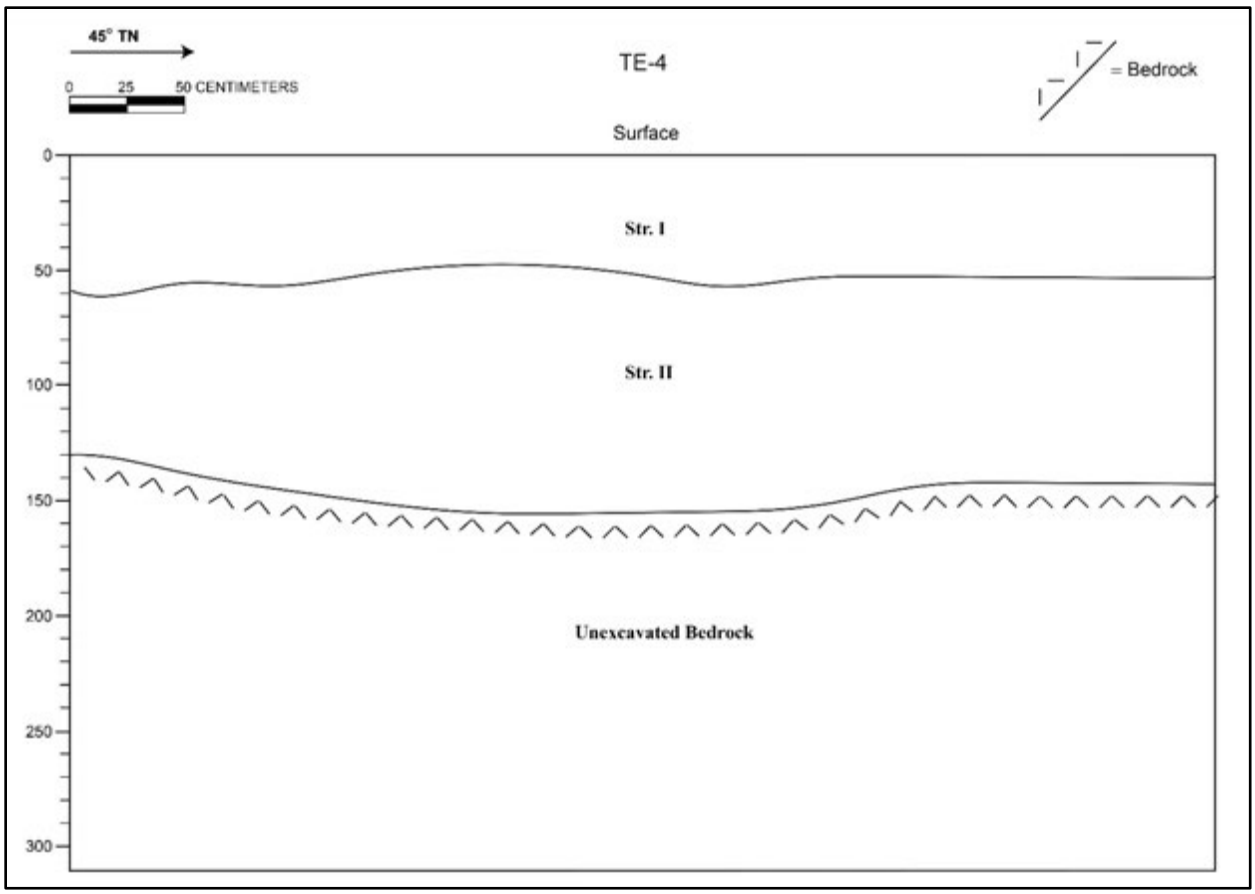

Figure 55. Stratigraphic profile of TE 4 northwest sidewall

Table 5. TE 4 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–60	A horizon; 7.5YR 2.5/3, very dark brown; weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; clear, smooth lower boundary; roots common; no cultural material present; natural Waiaha series sediment
II	60–155	B horizon; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, wavy lower boundary, terminated at bedrock; few roots; no cultural material present; natural Waiaha series sediment

Figure 56. Photo of TE 5 marked out with flagging tape prior to excavation; view to southwest

Figure 57. Photo of TE 5 southwest sidewall; view to south

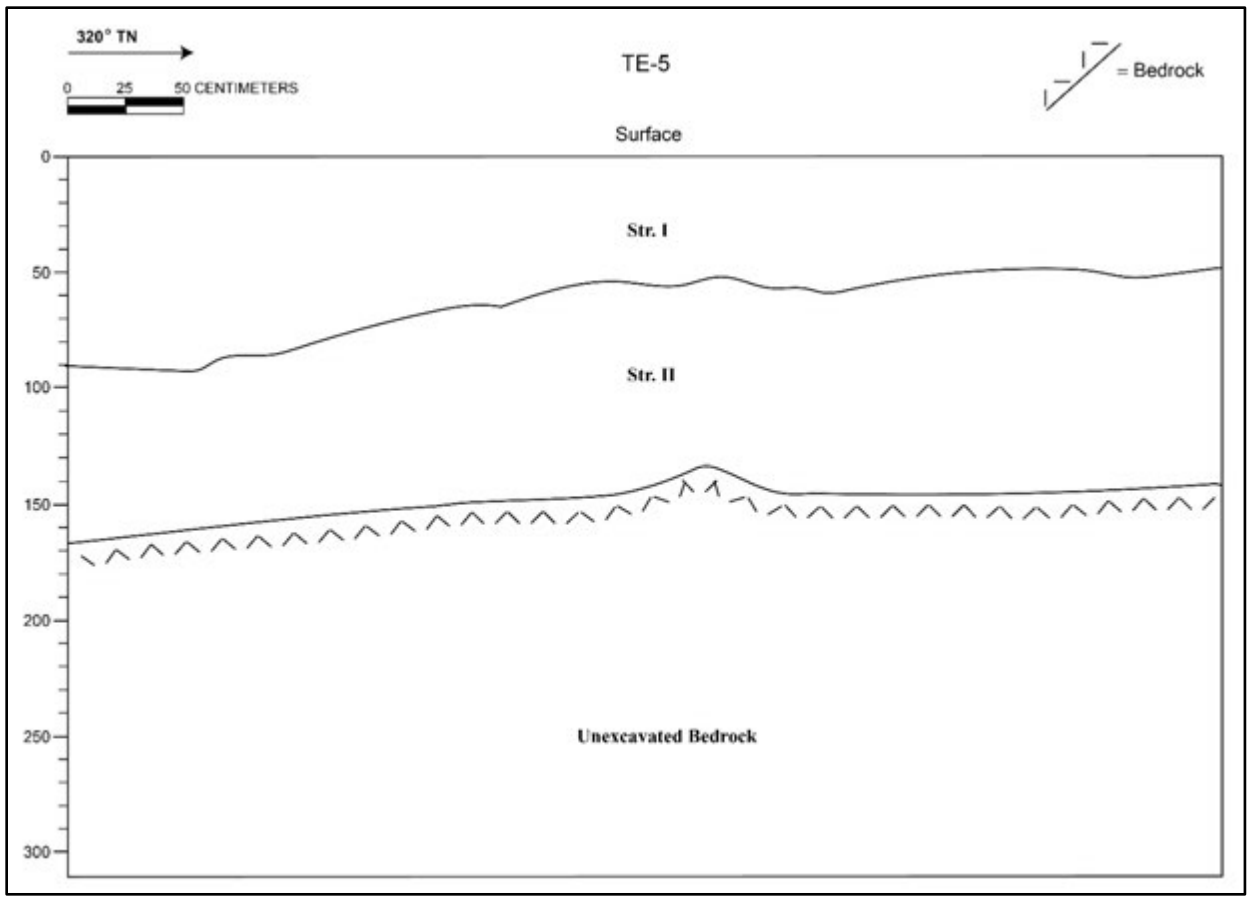

Figure 58. Stratigraphic profile of TE 5 southwest sidewall

Table 6. TE 5 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–95	A horizon; 7.5YR 2.5/3, very dark brown; silty loam, weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; clear, smooth lower boundary; roots common; no cultural material present; natural Waiaha series sediment
II	95–162	B horizon, Natural; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, smooth lower boundary, terminated at bedrock; few roots; no cultural material present; natural Waiaha series sediment

Figure 59. Photo of TE 6 marked out with flagging tape prior to excavation; view to southwest

Figure 60. Photo of TE 6 southeast sidewall; view to southeast

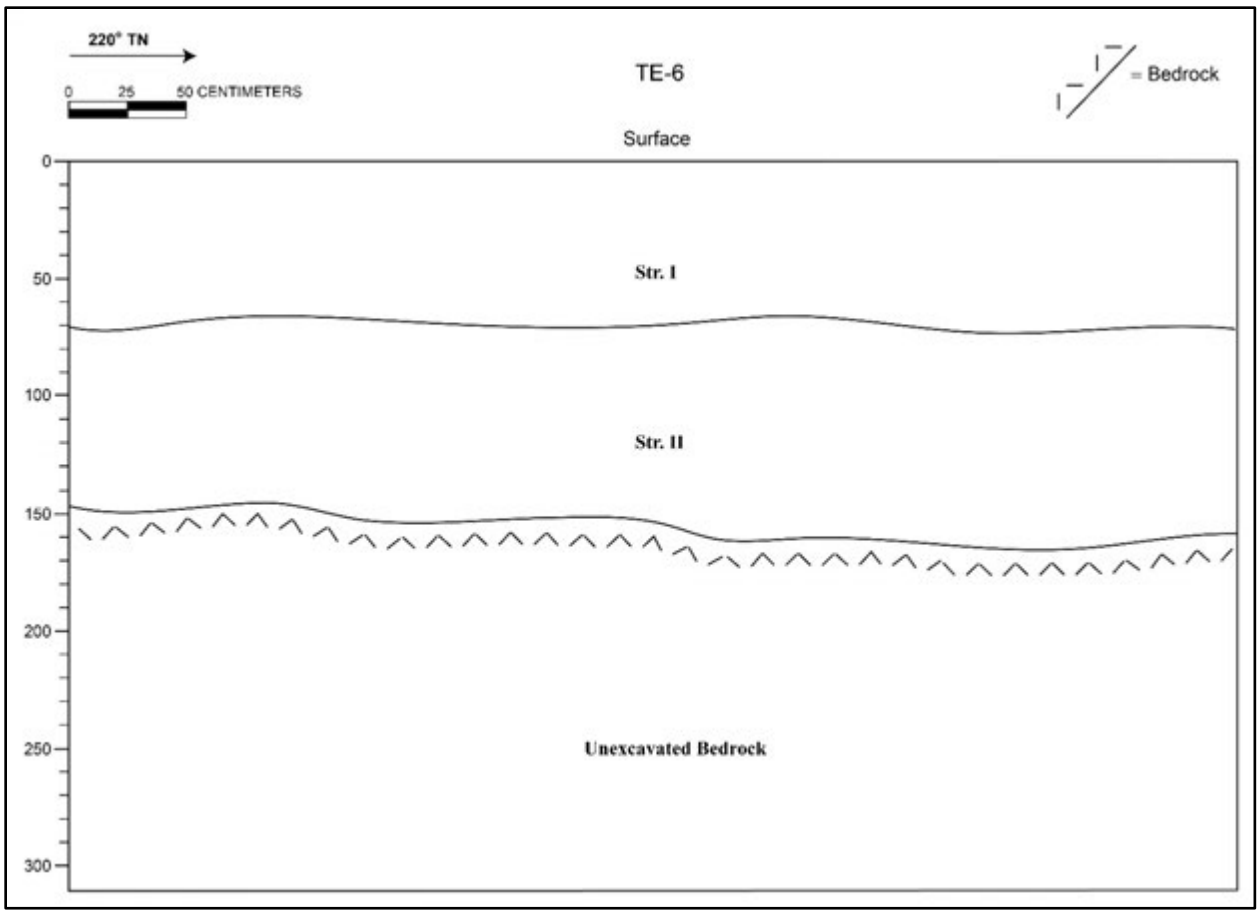

Figure 61. Stratigraphic profile of TE 6 southeast sidewall

Table 7. TE 6 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–70	A horizon; 7.5YR 2.5/3, very dark brown; weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; clear, smooth lower boundary; roots common; no cultural material present; natural Naalehu series sediment
II	70–160	B horizon, Natural; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, smooth lower boundary, terminated at bedrock; few roots; no cultural material present; natural Naalehu series sediment

4.2.7 Test Excavation 7 (TE 7)

Test Excavation 7 (TE 7) was located in the western corner of the proposed WWTP site portion of the project area, where a grove is planned for development (see Figure 42 and Figure 43). Figure 62 shows TE 7 marked with orange flagging tape prior to excavation. TE 7 measured approximately 5 m long and 1 m wide. TE 7 was excavated to a depth of up to 175 cmbs through two layers of natural Naalehu series sediment (Strata I and II) and terminated at basalt bedrock (Figure 63, Figure 64, and Table 8). No cultural materials were observed within TE 7.

Figure 62. Photo of TE 7 marked out with flagging tape prior to excavation; view to southwest

Figure 63. Photo of TE 7 south sidewall; view to southeast

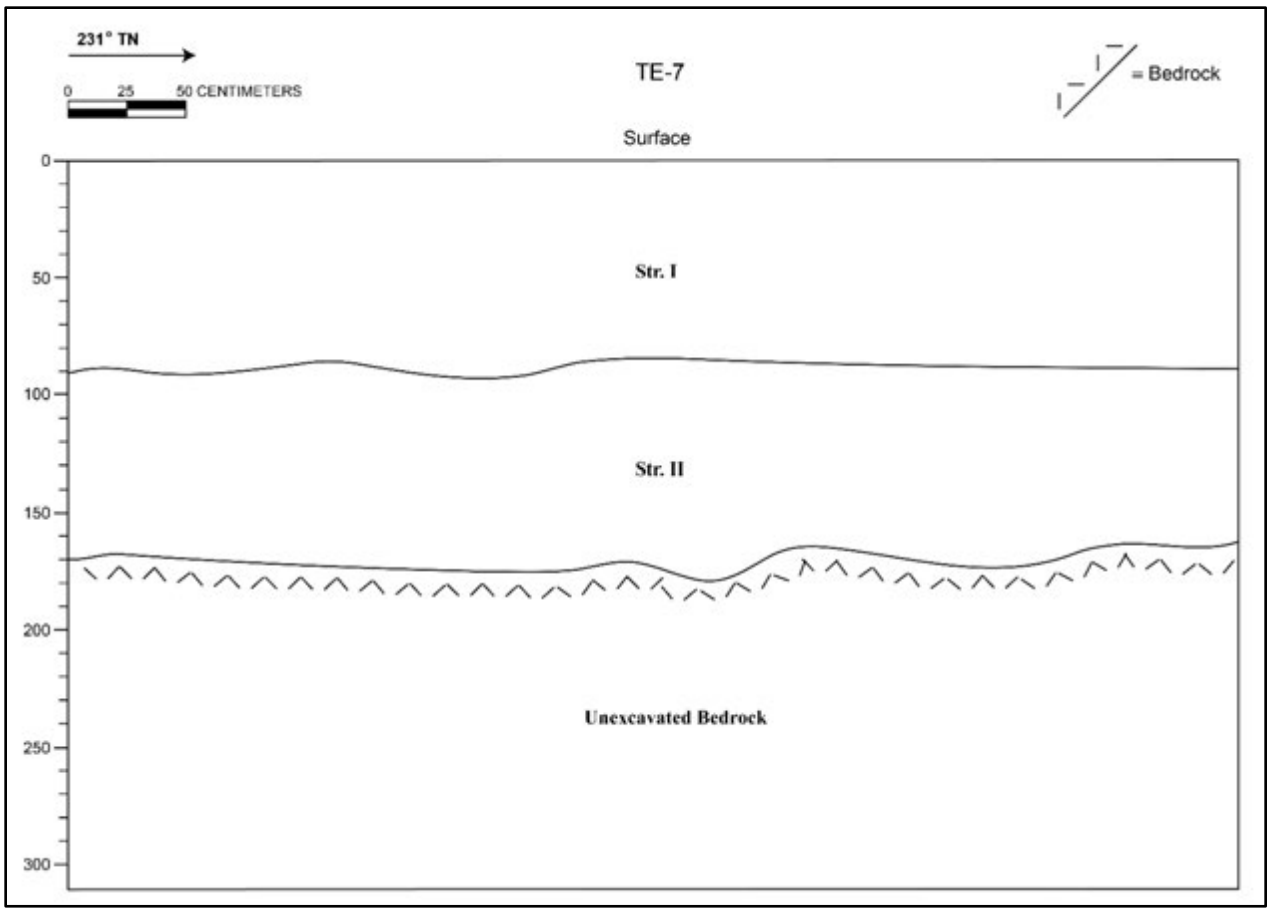

Figure 64. Stratigraphic profile of TE 7 southeast sidewall

Table 8. TE 7 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–90	A horizon; 7.5YR 2.5/3, very dark brown; weak, fine, granular structure; dry, loose, weak cementation consistence; slightly plastic; terrigenous sediment origin; clear, smooth lower boundary; roots common; no cultural material present; natural Naalehu series sediment
II	90–175	B horizon; 2.5YR 3/4, dusky red; silty clay loam; moderate, medium, subangular blocky structure; dry, weakly coherent, weak cementation consistence; slightly plastic; terrigenous sediment origin; abrupt, wavy lower boundary, terminated at bedrock; few roots; no cultural material present; natural Naalehu series sediment

Section 5 Historic Property Descriptions

Two historic properties (historic-era road alignments) were identified within the project area during this AIS. They are summarized in Table 9 and their distributions are depicted on Figure 21.

Table 9. Sites identified within the current project area

SIHP # (50-10-69)	Formal Type	Function
-31088	Road alignment (Volcano Road)	Transportation
-31089	Road alignment (Wood Valley Road/Coastal Road)	Transportation

5.1 SIHP # 50-10-69-31088

FORMAL TYPE:	Road (Wood Valley Road/Coastal Road)
FUNCTION:	Transportation
NUMBER OF FEATURES:	1
AGE:	Late 1800s-1920s
TAX MAP KEY:	[3] 9-6-005:999 (county right-of-way)
LAND JURISDICTION:	County of Hawai‘i
PREVIOUS DOCUMENTATION:	None

SIHP # 50-10-69-31088 consists of a 1.16-km (0.72-mile) section of the historic Wood Valley Road/Coastal Road alignment located within the current project area (see Figure 21). The section of this alignment within the project area follows the present Maile Street and Pikake Street alignments located between the Lower Moaula Road fork and Pakalana Street on the west and northern edges of Pāhala Town, respectively (see Figure 4). Construction of the modern Maile Street and Pikake Street roadways, which are approximately 5-10 m (16.5-33 ft) wide, has impacted all the constructed elements of the corresponding portions of the former Wood Valley Road/Coastal Road roadway (see Figure 32 through Figure 35).

Background research, particularly examination of historic maps from the Pāhala and greater Ka‘ū areas, indicate a coastal route extending from Nā‘ālehu to the Punalu‘u vicinity and then east and north through Pāhala Town, where it merged with the original (late 1800s) “Volcano Road” alignment further upslope (see Figure 8, Figure 10, Figure 11, Figure 65, and Figure 66). With the construction of the new Volcano Road (SIHP # -31089) in the 1920s the Wood Valley Road/Coastal Road alignment became obsolete as a primary route (see Section 5.2), and the central portion of the stretch between Pāhala and Nā‘ālehu was abandoned after the development of SIHP # -31089 (see Figure 65). Above Pāhala Town the route is still called Wood Valley Road, but it is used by residents of Wood Valley located approximately 5 miles to the northeast and not as a primary route to Kīlauea.

SIHP -31088 (Wood Valley Road/Coastal Road) is a primary transportation route that linked Kīlauea with Nā‘ālehu from the late 1800s–1920s. Pursuant to HAR §13-275-6, SIHP # -31088 is assessed as significant under Criterion d for the information it has yielded about primary transportation routes in the Pāhala vicinity during the late nineteenth and early twentieth centuries.

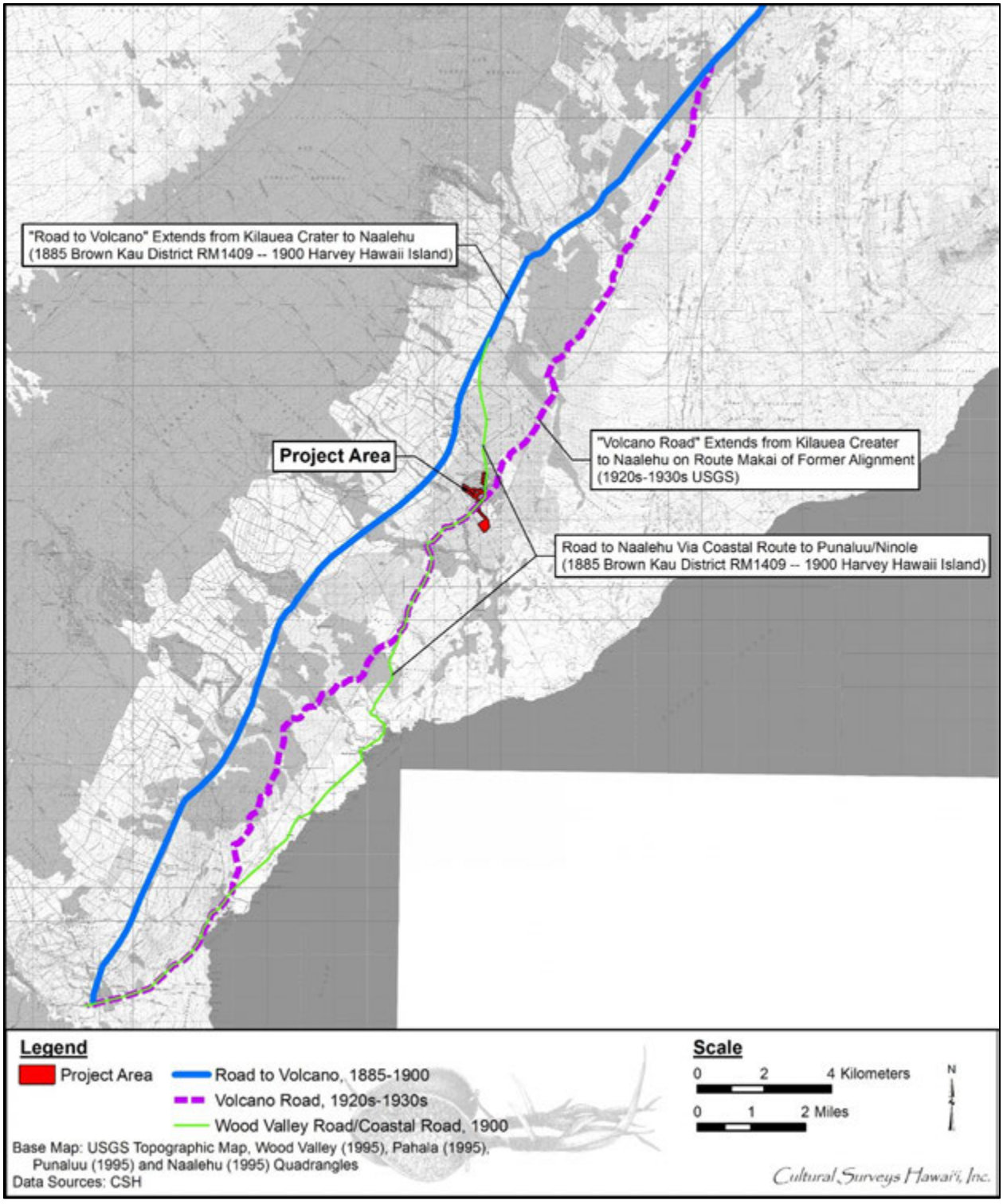

Figure 65. Portions of the 1995 Wood Valley, Pahala, Punaluu, and Naalehu USGS 7.5-minute topographic quadrangles showing the location of the project area in relation to historic roadways

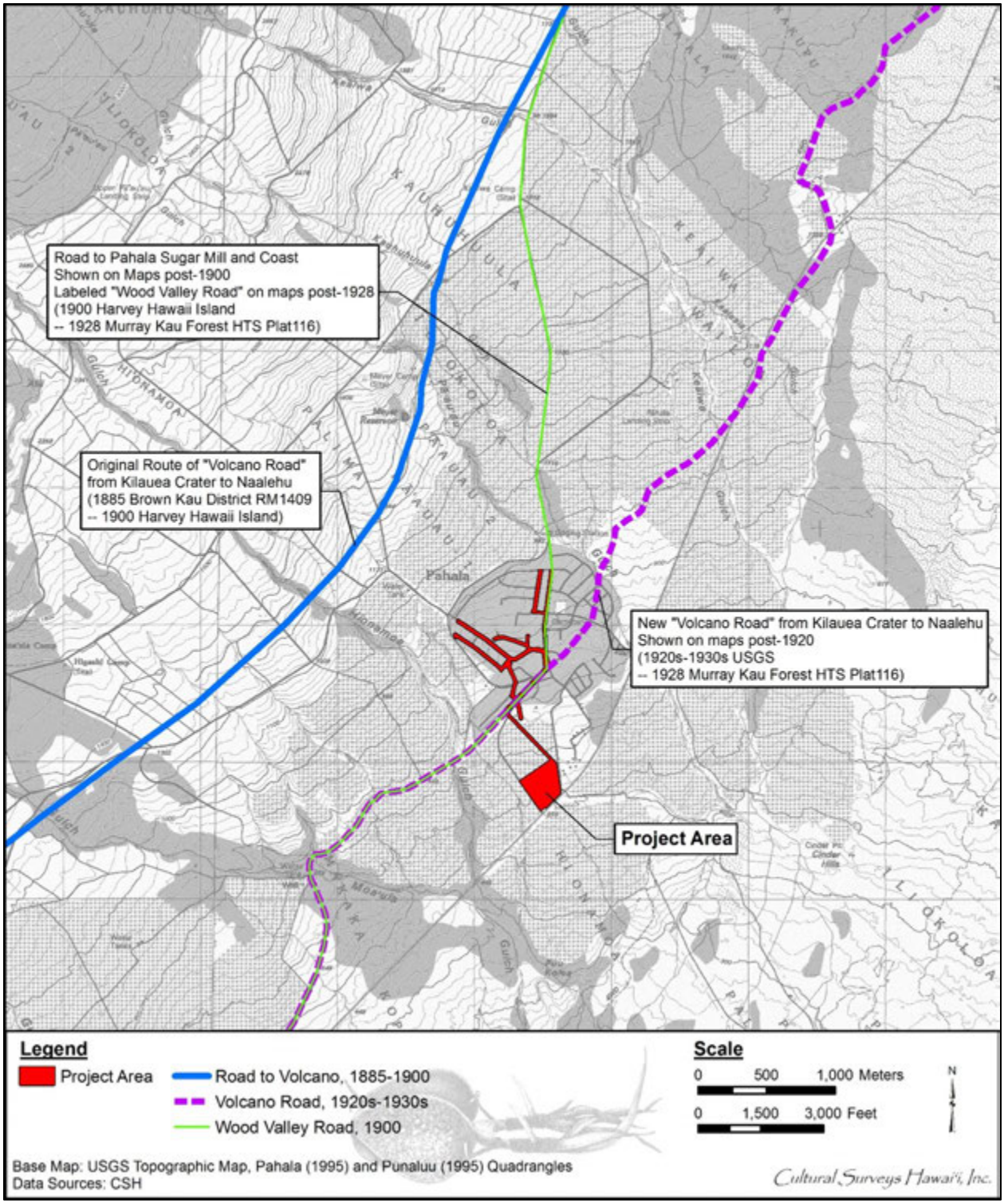

Figure 66. Portions of the 1995 Pahala and Punaluu USGS 7.5-minute topographic quadrangles showing the location of the project area in relation to historic roadways

5.2 **SIHP # 50-10-69-31089**

FORMAL TYPE:	Road alignment (Volcano Road)
FUNCTION:	Transportation
NUMBER OF FEATURES:	1
AGE:	1920s-1930s
TAX MAP KEY:	[3] 9-6-005:999 (county right-of-way)
LAND JURISDICTION:	County of Hawai‘i
PREVIOUS DOCUMENTATION:	None

SIHP # 50-10-69-31089 consists of a 0.47-km (0.29-mile) section of the historic Volcano Road alignment located with the current project area (see Figure 21). The section of this alignment within the project area follows the present Maile Street alignment located between the Lower Moaula Road fork and Pikake Street, overlapping along Maile Street with the SIHP # -31088 alignment. Additional portions of these two historic routes also overlapped further west toward Nā‘ālehu (see Figure 65). Construction of the modern Maile Street roadway, which is approximately 10 m (33 ft) wide, has impacted all the constructed elements of the corresponding portions of the former Volcano Road roadway (see Figure 33 through Figure 35).

Background research, particularly examination of historic maps from the Pāhala and greater Ka‘ū areas, indicate a route extending from Kīlauea Crater to Nā‘ālehu called “Volcano Road,” replacing the similarly named route located more *mauka* on maps from the late 1800s and early 1900s (see Figure 12, Figure 13, Figure 65, and Figure 66). With the construction of the Māmalahoa Highway (SIHP # 50-10-47-30187) in the 1940s the Volcano Road alignment became obsolete as a primary route; the 1967 USGS map (see Figure 14) shows the portion of the Volcano Road alignment along present Maile Street as part of a “Route 15” looping through Pāhala from the Belt Road, while the current USGS map (see Figure 1) does not label the route at all.

SIHP -31089 (Volcano Road) is a primary 1920s-1930s transportation route that linked Kīlauea with Nā‘ālehu.

Pursuant to HAR §13-275-6, SIHP # -31089 is assessed as significant under Criterion d for the information it has yielded about primary transportation routes in the Pāhala vicinity during the late nineteenth and early twentieth centuries.

Section 6 Significance Assessments and Register Eligibility

This AIS identified two newly documented historic properties: SIHP #s 50-10-69-31088 and -31089, overlapping historic-era roadways crossing through the project area and APE. Section 6.1 provides significance assessments for these historic properties under HRS §6E, while Section 6.2 provides National Register and Hawai‘i Register eligibility determinations.

6.1 Significance Assessments under HRS §6E

Under HRS §6E, for a historic property to be significant under HAR §13-275-6 (applicable to government projects), the historic property should possess integrity of location, design, setting, materials, workmanship, feeling, and/or association, and meet one or more of the following significance 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; or

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.

The segments of SIHP #s -31088 and -31089 within the current project area only maintain integrity of location as all the constructed elements of the original roadways are no longer present today. While the corridors remain active roadways, they no longer function as the primary routes they once were; furthermore, the plantation setting has been altered to one based more on residential and commercial use, and the route names themselves have also changed. Pursuant to HAR §13-275-6, SIHP # s -31088 and -31089 are assessed as significant under Criterion d for the information they have yielded about primary transportation routes in the Pāhala vicinity during the late nineteenth and early twentieth centuries.

6.2 National Register and Hawai‘i Register Eligibility Determination

Under Section 106, historic property significance is evaluated as eligibility for listing on the National Register pursuant to 36 CFR 60.4. An evaluation of eligibility for listing on the Hawai‘i Register pursuant to HAR §13-198-8 is also included in this section. To be considered eligible for listing on the National Register and/or Hawai‘i Register, a historic property should possess integrity as described in Section 6.1 above, and meet one or more of the following broad significance criteria:

A That are associated with events that have made a significant contribution to the broad patterns of our history;

B That are associated with the lives of persons significant in our past;

C That embody the distinctive characteristics of a type, period, or method of construction, or that represent that work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;

D That have yielded, or may be likely to yield, information important in prehistory or history.

As discussed in Section 6.1, none of the constructed elements of the subject portions of the original SIHP #s -31088 and -31089 roadways are evident today, and these portions of the historic properties lack integrity apart from their location (determined in consultation with SHPD; see Appendix D). These segments of these historic properties have limited relevance and importance in illustrating the historic context of vehicular transportation systems on Hawai‘i island. Therefore, SIHP #s -31088 and -31089 are evaluated as not eligible for inclusion on the National Register or Hawai‘i Register.

Section 7 Summary and Interpretation

The entire project area was covered in close pedestrian sweeps. Except for a couple small areas of dense vegetation, access and visibility were good during the survey. The project area has been completely altered by past agricultural and residential/town development. Historic remnants of the sugar plantation are present throughout Pāhala Town and surrounding the project area, but these remnants are all located outside the limits of the project area.

No significant artifacts or cultural deposits were observed on the ground surface within the proposed WWTP site portion of the project area; this area experiences ongoing disturbance by storm water runoff and macadamia harvesting operations. No lava tube openings were encountered within the project area.

A program of subsurface testing was conducted within the proposed WWTP site and consisted of mechanical excavation of seven test trenches. The subsurface testing generally revealed two distinct natural stratigraphic layers atop decomposing bedrock; these sediments are consistent with known sediment types in the area and with past and present agricultural land use. In one trench (TE 1) the two natural sediment layers are interposed by a layer of culturally sterile ash deposit, likely associated with activity at former sugar plantation. No cultural deposits or lava tubes were encountered during the testing.

Two historic properties were newly documented within the project area based on a review of historic maps. These include SIHP #s -31088 and -31089, overlapping historic-era road corridors which functioned as primary transportation routes throughout the greater Pāhala/eastern Ka‘ū area. None of the constructed elements of the subject portions of the original SIHP #s -31088 or -31089 roadways are evident today, and these portions of the historic properties lack integrity apart from their location. While the project would involve ground disturbance within the existing corresponding road corridors (Maile Street and Pikake Street), it would not create new impacts to the historic corridors nor change their present characteristics.

Section 8 Project Effect and Mitigation Recommendations

8.1 Project Effect

Following consultation among EPA, DOH, DEM, and SHPD regarding the project effect for the segments of the Wood Valley/Coastal Road (SIHP # 50-10-69-31088) and Volcano Road (SIHP # 50-10-69-31089) within the project area under HRS §6E-8, per HAR § 13-275-7(a)(1) the County of Hawai‘i DEM's project effect determination is "no historic properties affected." In accordance with federal regulations (36 CFR 800.5), the AIS results support a determination of "no historic properties affected."

8.2 Mitigation Recommendations

No mitigation commitments are recommended for the portions of SIHP #s 50-10-69-31088 or -31089 within the project area. The portions of these historic properties within the project area only maintain integrity of location as all the constructed elements of the original Wood Valley/Coastal road and Volcano road are no longer evident today.

While this project will have no effect on historic properties, archaeological monitoring during construction for identification and/or cautionary measures is proposed. This is based on the location of the project being within the "Pahala Historic District" (SIHP # 50-10-69-07362), as well as the presence near the project area of three historic properties as follows:

- a lava tube system (SIHP # 50-10-69-27570) with some cultural modifications beneath Pahala town;
- Ka‘ū High and Pāhala Elementary School (SIHP # 50-10-69-07522), a National Register-eligible historic property; and
- the Hawai‘i Belt Road, (SIHP # 50-10-47-30187), a National Register-eligible historic property south of the project area.

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1967 Pahala USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

1977 USGS Orthophotoquad (Aerial photograph), Pahala Quadrangle. USGS Information Services, Denver, Colorado.

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Appendix A APE Land Jurisdiction

1

TMK	Owner	TaxAcres
396002016	PMK CAPITAL PARTNERS LLC	66.719
396002018	KAMEHAMEHA SCHOOLS	42.5
396002024	COUNTY OF HAWAII	0.41
396005036	EDMUND C. OLSON #2 TRUST	25.35
396005044	EDMUND C. OLSON #2 TRUST	0.4937
396014001	MCBEATH,BARBARA ANN	0.1714
396014002	BECKER,PHILIP ALEXANDER TRST /etal	0.1731
396014003	FUKUNAGA,FAMILY TR	0.1781
396014004	POLIDO,SANDRA A	0.1798
396014005	BRANCH,YOUNG ELENA	0.1764
396014006	BRANCH,YOUNG ELENA	0.1774
396014007	PANGLAO,MALIA L /etal	0.1741
396014008	NURIAL-DACALIO,DEISHA-LYN KAWEHILANI /etal	0.1798
396014009	LEDERGERBER,ALBERT /etal	0.1791
396014010	KAILIAWA,PATRICK K-DEC'D	0.1798
396014011	ANDRADE,CLEMENT /etal	0.1791
396014012	WROBLEWSKI,STEVEN W /etal	0.1814
396014013	STONE,ELIZABETH /etal	0.2503
396014014	LORENZO,FRANK J SR /etal	0.2154
396014017	ORCINO,LILYBETH AURELIO /etal	0.3083
396014018	JARA,JUDY S /etal	0.1609
396014019	LONGAKIT,FAMILY TRST	0.1561
396014020	LORENZO,STANLEY R JR /etal	0.1591
396014021	RAPP,MARK STEVEN /etal	0.165
396014022	OLIVEIRA,LILLIAN K ESTATE /etal	0.1654
396014023	SILVA,GEORGE A JR /etal	0.1652
396014024	ASUNCION,SIXTO P /etal	0.1626
396014025	FUKUNAGA,SABURO /etal	0.1673
396014026	GALIZA,ALFRED L SR/ADELA TR	0.1646
396014027	VILLA,JERRY R /etal	0.1644
396014028	MITSUNAGA,GREG HIDEKI SEBASTIAN /etal	0.1673
396014029	ITO,NEWTON SHIGERU/CECILIA MAE TTEES	0.1684
396014030	HAUGEN,IRIS N P /etal	0.1641
396014031	OKAMURA,TOSHIO /etal	0.1626
396014032	CLH,TRST	0.1615
396014033	BECKER,PHILIP A /etal	0.1576
396014034	YOKOTA,KENNETH K /etal	0.1581
396014035	EUSTATHIADES,ZOE ALEXANDRA	0.1627
396014036	KUNIHIRO,TAKESHI /etal	0.1674
396014037	GALIMBA,KELLY KEOKI TR	0.1674
396014038	ANDRES,DENNIS M	0.1658
396014039	ASISTIN,ALFREDO /etal	0.1658
396014040	KANESHIRO,HAROLD K TR /etal	0.1666
396014041	JUDALENA,KAZUTO R	0.1681
396014042	JOHNSON,MARIA BERNARDETT FG	0.1674
396014043	PONCE,RAMONA	0.1674
396014044	GALAPIR,WESLEY	0.168
396014045	SANDERS,KANDRA	0.2479
396014046	KATCHMAR,JOHN M TR	0.2435
396014047	RAMOS,DOMINGO C JR /etal	0.293
396014048	ASUNCION,EMITERIO /etal	0.2861
396014049	TAKAKI,RODNEY H	0.3014
396014050	KEKOA,JEFFREY /etal	0.3315
396014051	KAWACHI,MICHAEL H	0.3315
396014052	SUMIDA,TSURUO TR	0.3073
396014053	MUNNERLYN,MICHAEL /etal	0.3315
396014054	NAGASAKO,LEROY KENJI /etal	0.3315
396014055	MITSUNAGA,EDWIN H /etal	0.3315
396014056	ANDRADE,FAMILY TR	0.3014
396014057	RAMOS,FERDINAND CAPIRAL /etal	0.2861
396015001	KAWAAUHAU,STEPHANIE M /etal	0.2438

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2

396015006	UEDA,HAJIME TRST /etal	0.3464
396015007	MIZUNO,STANLEY KAZUO TR	0.1662
396015008	YAMAGUCHI,SALLY C TRUST	0.5667
396015009	CAMBA,GLORIA /etal	0.6415
396015016	MANANTAN,RUBY N	0.2271
396015017	HIGASHI,CHUCK /etal	0.2939
396015018	HAWAII METHODIST UNION	0.262
396015019	DACALIO,MILTON /etal	0.2006
396015020	TAMONDONG,GARY /etal	0.3253
396015021	TAMONDONG,SHANDON L /etal	0.3544
396015022	YOSHIMURA,HISAKO I /etal	0.2879
396015023	KALEOHANO,ARTHUR H /etal	0.3247
396015024	NISHIMURA,NED NOBUO/GAIL TOYOKO TTEES	0.2443
396015025	GALIMBA,KELLY KEOKI /etal	0.3829
396015026	YOKOMIZO,FAMILY TRST /etal	0.3485
396015027	DACALIO,MORGAN	0.2939
396015028	NABOA,ROY/LUCINDA R TR	0.282
396015033	HAWAII METHODIST UNION	1.332
396016036	OLDMEN,MICHAEL J /etal	0.4
396016039	BARAN,EVELYN BARBARA	0.3017
396016040	NEAL,JULIA A /etal	0.6606
396016041	DAVIS-NATIVIDAD,BRYAN RUDY /etal	0.6259
396016042	PROVOST,AKIKO	0.6402
396016043	DACALIO,DON FRANCISCO /etal	0.4293
396016044	AH SAN,JOHN L	0.4253
396016045	NEAL,JULIA A /etal	0.3598
396016046	CAMBA,GLORIA	0.2523
396020001	OLSON,EDMUND C TRUST NO 2	0.1907
396020002	ORTEGA,MICHELLE M	0.184
396020003	RYDER,FRANK III /etal	0.1856
396020004	GANDALIRA,PEDRO /etal	0.1801
396020005	ROSALES,DAWN L C /etal	0.1787
396020006	EVANGELISTA,RODRIGO R /etal	0.1789
396020007	SOUZA,DAVID JR TR /etal	0.1768
396020008	CABATINGAN,ABDON /etal	0.1719
396020009	FUERTE,FLORENDO /etal	0.1733
396020010	REQUELMAN,EDWARD/C TR	0.1699
396020011	ADERINTO,FELIPE C /etal	0.1661
396020012	PORTILLO,WIDO CHALITO MARTINEZ	0.1677
396020013	IVERSON,LESTER MATT	0.1633
396020014	GABINI,SONNY A /etal	0.203
396020015	LEE,BARBARA A	0.2236
396020016	AGLIA,JOSEPH P /etal	0.2478
396020017	NAVARRO-VIERRA,CRISTEN DOLLY	0.2208
396020018	BECKER,PHILIP A /etal	0.2215
396020019	KAMAKURA,CLARITA /etal	0.1549
396020020	VILLA,TEOFILO	0.1495
396020021	LORENZO-OLEYTE,LENORA M /etal	0.1609
396020022	SANTIAGO,DENNIS E	0.1499
396020023	CABUDOL,APOLINARIO /etal	0.166
396020024	ANDRADE,EDWARD /etal	0.1563
396020025	DELOS SANTOS,MARIANO V /etal	0.1592
396020026	PENERA,FREDDIE L /etal	0.2018
396020027	LOUIS,ALBERT G /etal	0.2044
396020028	YAMAKI,JAMES M	0.2079

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Appendix B County of Hawai‘i Correspondence to SHPD

WASTEWATER DIVISION
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
108 RAILROAD AVENUE - HILO, HAWAII 96720
(808) 961-8338 - FAX (808) 961-8644

October 17, 2017

Susan Lebo, Ph.D.
DLNR—State Historic Preservation Division
Kākuhihewa Bldg., Suite 555
601 Kamōkila Boulevard
Kapolei, Hawai'i 96707
Phone: (808) 692-8019
Fax: (808) 692-8020

Subject: Request for a State Historic Preservation Division determination letter (as per HAR §13-275-3) for a Wastewater Treatment and Disposal System Project in Pāhala, Pā'au'au 1, Ka'ū District, Hawaii Island (TMK: (3) 9-6-002:018)

Dear Dr. Lebo:

The County of Hawaii Wastewater Division is requesting a State Historic Preservation Division (SHPD) determination letter (as per HAR §13-275-3) for a Wastewater Treatment and Disposal System Project in Pāhala, Pā'au'au 1, Ka'ū District, Hawaii Island (TMK: (3) 9-6-002:018).

The project is to service the Pāhala community and is located on a 42.5 acre property near the southern edge of Pāhala Town presently owned by Kamehameha Schools and under lease to Royal Hawaiian Orchards. Almost the entire parcel is planted in a commercial macadamia nut orchard with a macadamia nut processing plant parking lot in the southeastern corner.

The project will include a Wastewater Treatment Plant (WWTP) on the 42.5 acre property that will connect to a line currently discharging wastewater into two (2) Large Capacity Cesspools (LCC's) which are lava tubes. The project may also include a network of sewerline improvements in Pāhala Town on the southwest and southeast sides of Ka'ū High & Pāhala Elementary School. This project will use the State Revolving Funds in addition to an EPA Grant (EPA Grant XP-96942401-6) which includes federal and state monies, so Section 106 consultation will also be required.

To supply background information to facilitate SHPD project review, we are providing an *Archaeological Field Inspection of a 42.5 Acre Property in the Ahupua'a of Pa'au'au 1, Ka'ū District, Hawai'i Island [TMK: (3) 9-6-002:018]* (Cleghorn 2016).

The project's point of contact at County of Hawaii Wastewater Division is:

Ms. Dora Beck, P.E.
Wastewater Division Chief
County of Hawaii Wastewater Division
108 Railroad Avenue
Hilo, Hawaii 96720

Hawaii County is an Equal Opportunity Provider and Employer

Request for a State Historic Preservation Division determination letter Wastewater Treatment and Disposal System Project in Pāhala, Pā'au'au 1, Ka'ū District, Hawaii Island (TMK: (3) 9-6-002:018)

Should you have any questions or comments about this project, please feel free to call me at (808) 961-8513 (dora.beck@hawaiicounty.gov) or you may also contact Lyle Hirota, Wastewater Deputy Division Chief at 808-961-8333 (lyle.hirota@hawaiicounty.gov).

We look forward to an SHPD determination letter (as per HAR §13-275-3) to guide this project moving forward.

Sincerely,

Dora Beck

Dora Beck, P.E.
Wastewater Division Chief

ATTACHMENT

Cc: William A. Kucharski, DEM Director
Diane Noda, DEM Deputy Director
Craig Lekven, P.E., Brown and Caldwell
Earl Matsukawa, Wilson Okamoto Associates

2

Harry Kim
Mayor

Wilfred M. Okabe
Managing Director

William A. Kucharski
Director

Diane A. Noda
Deputy Director

County of Hawai‘i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
345 Kekūanāo‘a Street, Suite 41 · Hilo, Hawai‘i 96720
Ph: (808) 961-8083 · Fax: (808) 961-8086
cohdem@co.hawaii.hi.us
http://www.hawaiicounty.gov/environmental-management/

March 22, 2018

Via email: alan.s.downer@hawaii.gov and U.S. Mail

Alan S. Downer, Ph.D., Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Boulevard, Room 555
Kapolei, Hawai‘i 96707

Subject: Request for Concurrence of Proposed Pāhala Wastewater Treatment Plant and Sewer System Project and the Archaeological Inventory Survey Approach for the Project Hionamoa Ahupua‘a, Ka‘ū District, Hawai‘i Island Tax Map Key: Multiple

Dear Dr. Downer:

On October 17, 2017, the County of Hawai‘i Department of Environmental Management, Wastewater Division, the project proponent, provided a written request to the State Historic Preservation Division (SHPD) for a letter of determination in accordance with Hawai‘i Administrative Rules (HAR) 13-275-3 for a proposed Pāhala Wastewater Treatment Plant (WWTP) and Sewer System Project.

Attached with the determination request to SHPD, the County supplied a November 11, 2016, letter report from Pacific Legacy, an archaeological firm, addressed to Dora Beck, P.E., Wastewater Division Chief for the Department of Environmental Management's Wastewater Division, the subject of which is an *Archaeological Field Inspection of a 42.5 Acre Property in the Ahupua‘a of Pa‘au‘au 1, Ka‘ū District, Hawai‘i Island [TMK: (3) 9-6-002:018]*. The letter reports on the finds of an archaeological field inspection conducted by Pacific Legacy of the proposed Pāhala WWTP and Sewer System Project area.

Alan S. Downer, Ph.D., Administrator
State Historic Preservation Division
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Page 2

On February 22, 2018, David Shideler of Cultural Surveys Hawai‘i, Inc. (CSH) met with SHPD Archaeology Branch Chief Dr. Susan Lebo to follow up on the County of Hawai‘i’s determination request. They discussed the proposed Pāhala Wastewater Treatment Plant and Sewer System Project in the Hionamoa Ahupua‘a, Ka‘ū District, Hawai‘i Island, which has multiple tax map keys. Attached is the original correspondence from CSH, the contents of which are also described below. The site map showing the proposed layout and location of the proposed test excavation areas is attached to CSH’s correspondence.

The reported outcome of the February 22, 2018, discussion between CSH and Dr. Lebo is summarized as follows:

1. Dr. Lebo indicated a desire for an archaeological inventory survey addressing the entire area of proposed ground disturbance, with subsurface testing.

2. Dr. Lebo indicated particular concern for a good faith effort to address possible lava tubes within the area of proposed ground disturbance. Related investigations would include an effort to develop available information on the location of any such lava tubes, further pedestrian work, and subsurface testing.

3. Dr. Lebo indicated a schema of a total of six backhoe assisted excavations (one in Lagoon 1, one in Lagoon 4, and one in each of Basins 1, 2, 3, and 4) which would only need to go as deep as the proposed maximum excavation for the lagoons/ basins. This would probably be all of the indicated subsurface testing required.

4. Dr. Lebo indicated a desire that all areas of project-related ground disturbance that were not addressed in the Pacific Legacy 2016 report be addressed in the AIS. In particular, this would include consideration of the lateral installation areas, predominately located along existing residential subdivision roadways. AIS efforts in these later installation areas probably would not require subsurface testing, but would include documentation and an evaluation of how these streets might relate to a possible historic plantation village or historic property designation.

Backhoe excavations would likely measure 20’ long by 2’ wide. The depth of excavation at each trench would be determined by whichever of the following is reached first: bedrock; maximum depth of project-related ground disturbance indicated for that location; or a depth of 6 feet, which is the approximate maximum depth of the naturally occurring sediments throughout the project area. Typically, this subsurface testing schema would be:

- Refined in the course of consultation with the SHPD as applicable during the surface survey work;

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- Refined to address new locations encountered in the surface survey that indicate a probability of subsurface cultural deposits; and
- Refined to avoid trees, tree roots, and other conflicting constraints.

We kindly request concurrence of this AIS strategy. Please feel free to contact me with any questions or concerns.

Sincerely,

William A. Kucharski
Director

WK:mef

Attachment: CSH 3/15/18 letter

cc: Dr. Susan Lebo, SHPD (with attachment)
Sean Naleimaile, SHPD (with attachment)
Dora Beck, P.E., Wastewater Division (with attachment)
Craig Lekven, Brown and Caldwell (w/o attachment)

State Historic Preservation Division
HRS 6E Submittal Form

Per §6E, Hawai'i Revised Statutes, if the Project requires review by the State Historic Preservation Division (SHPD), please review and fill out this form and submit all requested information to SHPD. Please submit this form and project documentation **electronically** to:

dlnr.intake.shpd@hawaii.gov

If you are unable to submit electronically, please contact SHPD at (808) 692-8015. Mahalo.

The submission date of this form is: April 25, 2018

1. APPLICANT (select one)

☐ Property Owner ☑ Government Agency

2. AGENCY (select one)

☐ Planning Department ☐ Department of Public Works ☑ Other (specify): County of Hawai'i,

Type of Permit Applied For: Concurrence with AIS approach

3. APPLICANT CONTACT

3.1) Name: William A. Kucharski 3.2) Title: Director

3.3) Street Address: 345 Kekuanao'a Street, Suite 41

3.4) County: Hawai'i 3.5) State: HI 3.6) Zip Code: 96720

3.7) Phone: (808) 961-8083 3.8) Email: cohdem@co.hawaii.hi.us

4. PROJECT DATA

4.1) Permit Number (if applicable): Not applicable

4.2) TMK [e.g. (3) 1-2-003:004]: (3) 9-6-002:018

4.3) Street Address: Adjacent to Maile Street, Pahala

4.4) County: Hawai'i 4.5) State: HI 4.6) Zip Code: 96777

4.7) Total Property Acreage: 42.5 acres

4.8) Project Area (acreage, square feet): 14 acres

4.9) List any previous SHPD correspondence (LOG Number & DOC Number, if applicable):

LOG NO. 2018.00722 DOC NO.

5. PROJECT INFORMATION

5.1) Does the Project involve a Historic Property? A Historic Property is any building, structure, object,

district, area, or site, including heiau and underwater site, **which is over 50 years old** (*HRS §6E-2*).

☐ Yes ☑ No

5.2) The date(s) of construction for the historic property (building, structure, object, district, area, or site, including heiau and underwater site) is not applicable

5.3) Is the Property listed on the Hawai‘i and or National Register of Historic Places? To check: http://dlnr.hawaii.gov/shpd/

☐ Yes ☑ No

5.4) Detailed Project Description and Scope of Work:

Wastewater Treatment and Disposal System Project in Pahala, Pa'au'au 1, Ka'u District, Hawaii Island (TMK: (3) 9-6-002:018). The project is to service the Pahala community and is located on a 42.5 acre property near the southern edge of Pahala Town presently owned by Kamehameha Schools and under

5.5) Description of **previous** ground disturbance (e.g. previous grading and grubbing):

Majority of project area is presently macadamia nut orchard and residential neighborhood

5.6) Description of **proposed** ground disturbance (e.g. # of trenches, Length x Width x Depth):

Project will involve construction/installation of wastewater treatment lagoons, land application tree groves, a polishing constructed wetland, and associated pipelines and structures.

5.7) The Agency shall ensure whether historic properties are present in the project area, and, if so, it shall ensure that these properties are properly identified and inventoried. Identify all known historic properties:

No archaeological inventory survey has been completed for the updated Pahala WWTP project

5.8) Once a historic property is identified, then an assessment of significance shall occur.

Integrity (check all that apply):

☐ Location ☐ Design ☐ Setting ☐ Materials ☐ Workmanship ☐ Feeling ☐ Association

Criteria (check all that apply):

☐ a – associated with events that have made an important contribution to the broad patterns of our history
☐ b – 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

5.9) The effects or impacts of a project on significant historic properties shall be determined by the agency.

Effect Determination (select one):

☐ No Historic Properties Affected
☐ Effect, with Agreed Upon Mitigation Commitments (§6E-42, HRS)
☐ Effect, with Proposed Mitigation Commitments (§6E-8, HRS)

5.10) This project is (check all that apply, if applicable):

☑ an activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency;

☑ carried out with Federal financial assistance; and or

☑ requiring a Federal permit, license or approval.

If any of these boxes are checked, then the Project may also be subject to compliance with Section 106 of the National Historic Preservation Act (NHPA).

6. PROJECT SUBMITTALS

6.1) Please submit a copy of the Tax Map Key (TMK) map

6.2) Please submit a copy of the property map showing the project area and indicate if the project area is smaller than the property area.

6.3) Please submit a permit set of drawings. A permit set is a set of drawings prepared and signed by a licensed architect or engineer and is at least 65% complete.

6.4) Are you submitting a survey?

☐ Yes ☑ No

Specify Survey:

6.5) Did SHPD request the survey?

☐ Yes ☐ No

If 'Yes', then please provide the date, SHPD LOG NO, and DOC NO:

Date: LOG NO. DOC NO.

6.6) **SURVEY REVIEW FEES**. Fee for Review of Reports and Plans (§§13-275-4 and 284-4). A filing fee will be charged for all reports and plans submitted to our office for review. Please go to:

http://dlnr.hawaii.gov/shpd/about/branches/archaeology/filing-fee-schedule/

A check payable to the Hawaii Historic Preservation Special Fund should accompany all reports or plans submitted.

6.7) Please submit color photos/images of the Historic Property (any building, structure, object, district, area, or site, including heiau and underwater site) that will be affected by the Project.

The following are the minimum number and type of color photographs required:

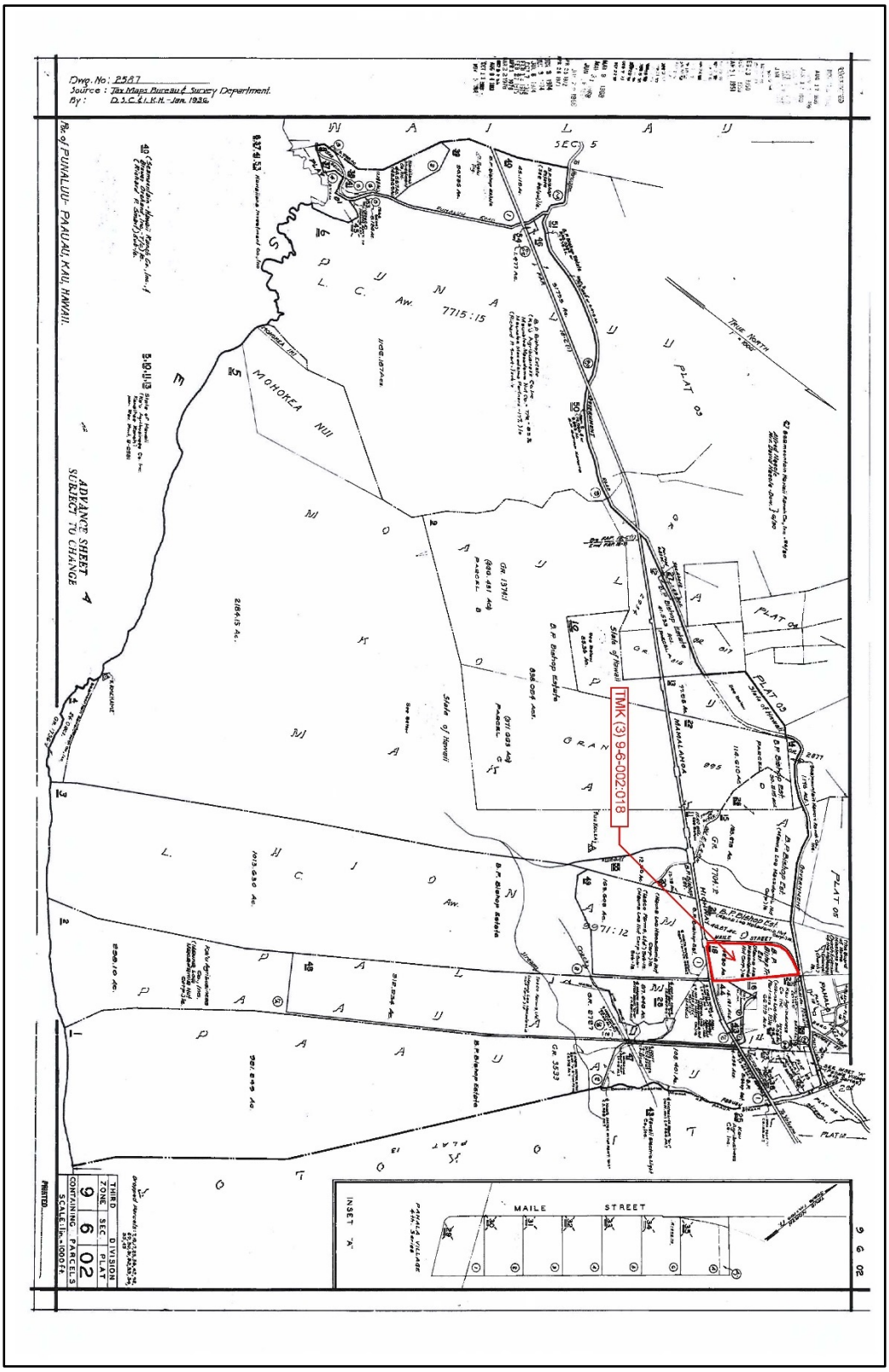
Quantity	Description
1-2	Street view(s) of the resource and surrounding area
1-2	Over view of exterior work area
1	exterior photo of the North elevation (if applicable)
1	exterior photo of the South elevation (if applicable)
1	exterior photo of the East elevation (if applicable)
1	exterior photo of the West elevation (if applicable)
1-2	interior photos(s) of areas affected (if applicable)

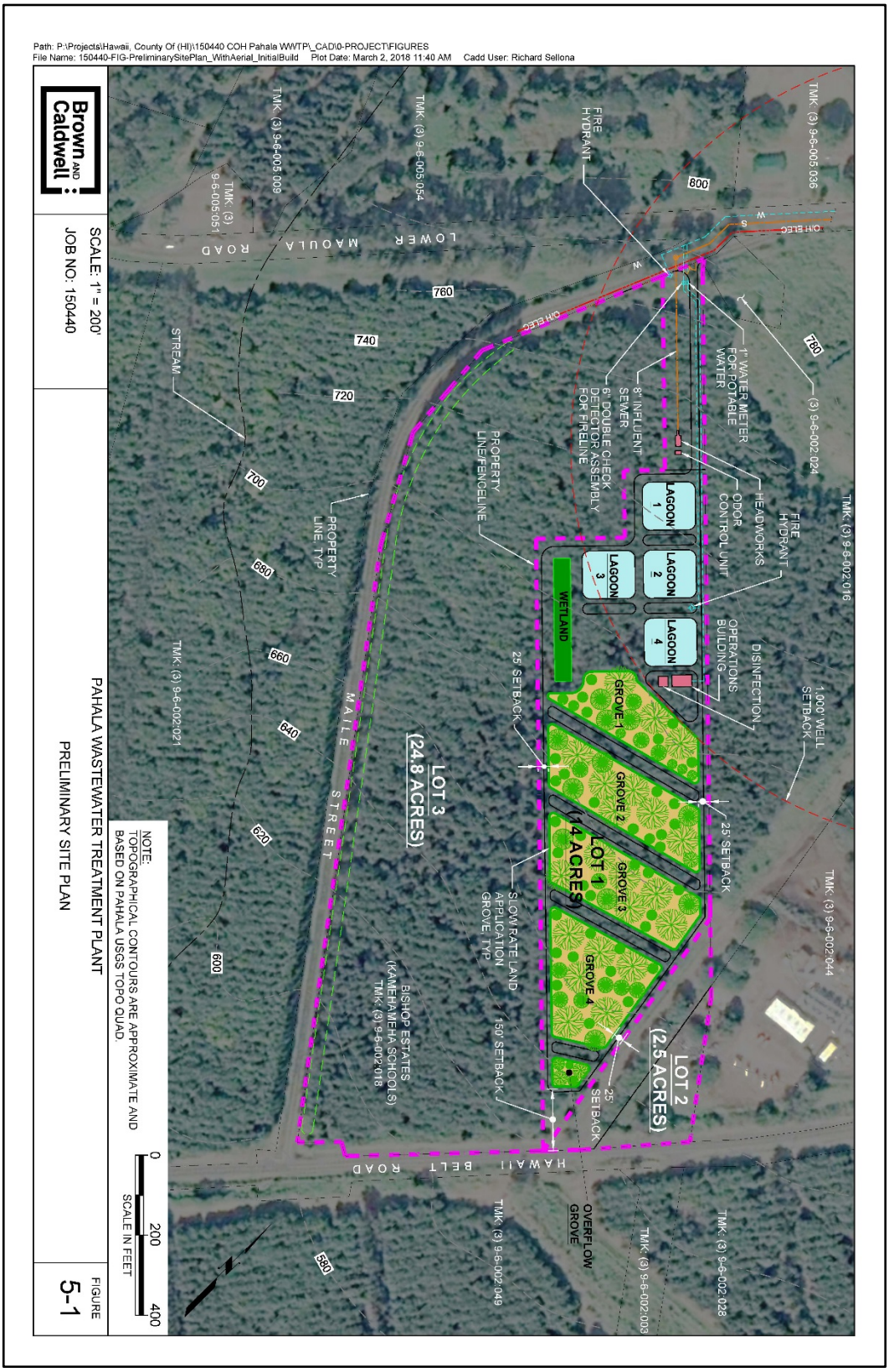
CHECKLIST

☑ **SHPD FORM 6E** (this form)

☑ **PROJECT SUBMITTALS** (any requested documentation for items 6.1 - 6.7 of this form)

☑ **FILING FEE FORM** (if applicable)


TMK (3) 9-6-002:018
MAILE STREET
INSET "A"
THIRD ZONE 9 SEC 6 DIVISION PLAT 02
ADVANCE SHEET SUBJECT TO CHANGE
MOHOKEA NUI
PUNALUU-PAAUAU, KAU, HAWAII


Path: P:\Projects\Hawaii, County Of (HI)\150440 COH Pahala WWTP_CAD\0-PROJECT\FIGURES
File Name: 150440-FIG-PreliminarySitePlan_WithAerial_InitialBuild Plot Date: March 2, 2018 11:40 AM Cadd User: Richard Sellona
Brown AND Caldwell
SCALE: 1" = 200'
JOB NO: 150440
PAHALA WASTEWATER TREATMENT PLANT
PRELIMINARY SITE PLAN
FIGURE 5-1
NOTE: TOPOGRAPHICAL CONTOURS ARE APPROXIMATE AND BASED ON PAHALA USGS TOPO QUAD.
SCALE IN FEET 0 200 400
LOT 3 (24.8 ACRES)
LOT 1 (14 ACRES)
LOT 2 (2.5 ACRES)
LAGOON 1
LAGOON 2
LAGOON 3
LAGOON 4
WETLAND
GROVE 1
GROVE 2
GROVE 3
GROVE 4
OVERFLOW GROVE
HEADWORKS
ODOR CONTROL UNIT
OPERATIONS BUILDING
DISINFECTION
FIRE HYDRANT
1" WATER METER FOR POTABLE WATER
8" INFLUENT SEWER
6" DOUBLE CHECK DETECTOR ASSEMBLY FOR FIRELINE
PROPERTY LINE/FINGBLINE
PROPERTY LINE, TYP
25' SETBACK
1,000' WELL SETBACK
150' SETBACK
SLOW RATE LAND APPLICATION GROVE, TYP
STREAM
OH ELEC
MALE STREET
LOWER MAOULA ROAD
HAWAII BELT ROAD
BISHOP ESTATES (KAMEHAMEHA SCHOOLS) TMK: (3) 9-6-002:018
TMK: (3) 9-6-005:036
TMK: (3) 9-6-005:054
TMK: (3) 9-6-005:009
TMK: (3) 9-6-005:051
TMK: (3) 9-6-002:024
TMK: (3) 9-6-002:016
TMK: (3) 9-6-002:044
TMK: (3) 9-6-002:028
TMK: (3) 9-6-002:003
TMK: (3) 9-6-002:049
TMK: (3) 9-6-002:021
800
780
760
740
720
700
680
660
640
620
600
580

SHPD 6E Form; Item 5.4) Detailed Project description and Scope of Work

Background

The Pāhala Large Capacity Cesspool Closure is in Pahala, Pa'au'au 1, Ka'u District, Hawaii Island. The project includes a new collection system and treatment and disposal facility to service the Pahala community. The collection system is located on County streets. The treatment disposal facility will occupy 14.9 acres and is located on a portion a 42.5 acre property near the southern edge of Pahala Town presently owned by Kamehameha Schools and under lease to Royal Hawaiian Orchards. Almost the entire parcel is planted in a commercial macadamia nut orchard with a macadamia nut processing plant parking lot in the southeastern corner.

The project will also close two (2) Large Capacity Cesspools (LCC's).

This project will use the State Revolving Funds in addition to an EPA Grant (EPA Grant XP-96942401-6) which includes federal and state monies, so Section 106 consultation will also be required.

There are 2 areas of disturbance related to the project :

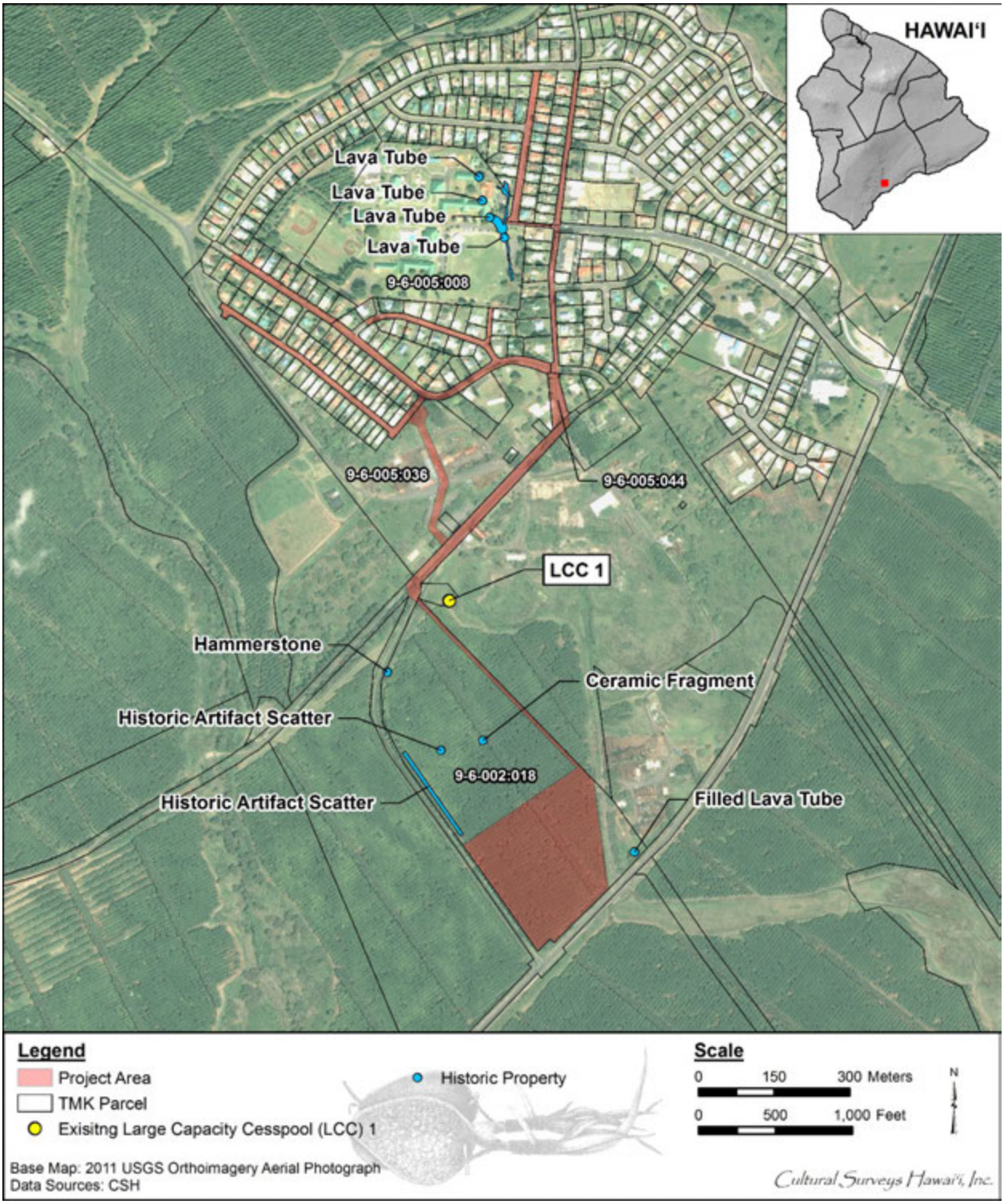
1) The new wastewater collection system will be located within public right-of-way (ROWs) in the Pāhala community. The streets within the community have been improved with asphaltic concrete (AC) surfaces with shoulders consisting improved or grass swales. Most of the streets do not have curbs or gutters. The streets have two travel lanes, one lane in each direction, although not all the streets have been stripped. The travel surface appears to be about 22 to 24 feet wide. The streets are under the jurisdiction the County and do not have TMKs. See Figure ----

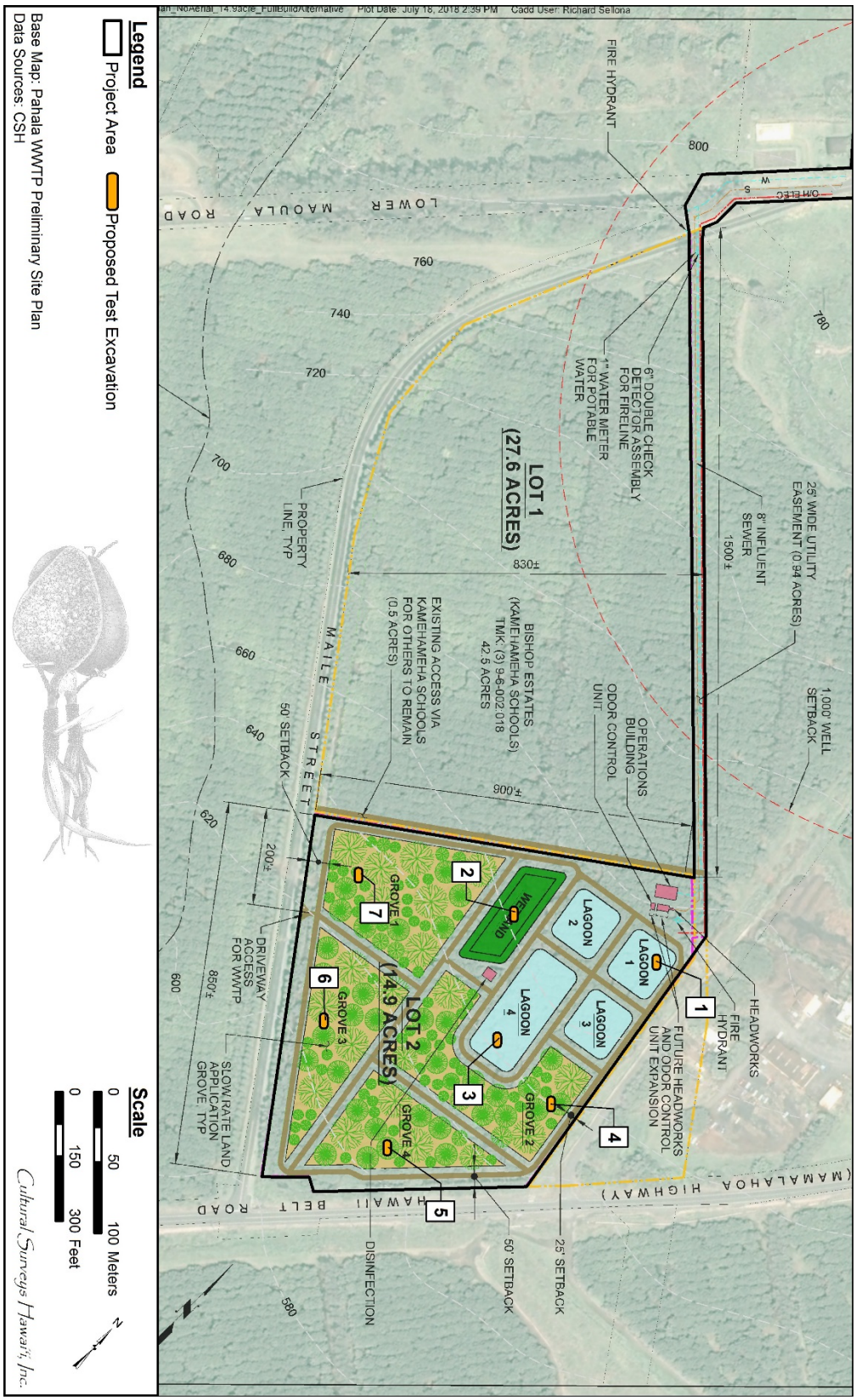
   The collection system line will use polyvinyl chloride (PVC) pipe which is corrosion resistant. The County's sewer standards show the trenches for sewer lines would require at least 4 feet of cover from the top of the pipe to grade and 12 inches of cushion material on both sides of the line and 6 inches below the line. This means the typical sewer trenches will be about 3 feet wide and at least 6 feet deep.

2) The treatment and disposal facility project site will occupy approximately 14.9 acres east (makai) of an existing access road to the adjacent parcel in the northwest corner of the Maile Street and Mamalahoa Highway intersection outside of the State of Hawai'i Department of Transportation right-of-way . The project site will occupy a portion within TMK: 9-6-002:018. An approximately 25-foot by 1,500-foot utility easement will be disturbed to construct a trench according to County standards for the influent line to the 14.9-acre site which will also be disturbed to construct treatment and disposal facility.

   The 14.9-acre treatment and disposal facility will consist of: an area for headworks and operations building: 4 lagoons to treat the effluent; a wetland area for further treatment and disinfection; 4 planted groves for disposal of the treated effluent. Each of the lagoons will require excavation about 10 feet; the planted groves about 6 feet and the wetland about 4 feet. See Figure ------

   The collection system and the treatment and disposal facility will be owned and operated by the County Department of Environmental Management and as such will be a public facility.


HAWAI'I
Lava Tube
Lava Tube
Lava Tube
Lava Tube
9-6-005:008
9-6-005:036
9-6-005:044
LCC 1
Hammerstone
Ceramic Fragment
Historic Artifact Scatter
9-6-002:018
Historic Artifact Scatter
Filled Lava Tube
Legend
Project Area
TMK Parcel
Exisitng Large Capacity Cesspool (LCC) 1
Historic Property
Scale
0 150 300 Meters
0 500 1,000 Feet
N
Base Map: 2011 USGS Orthoimagery Aerial Photograph
Data Sources: CSH
Cultural Surveys Hawai'i, Inc.


Legend
Project Area
Proposed Test Excavation
Base Map: Pahala WWTP Preliminary Site Plan
Data Sources: CSH
Scale
0 50 100 Meters
0 150 300 Feet
N
Cultural Surveys Hawai'i, Inc.
LOT 1 (27.6 ACRES)
LOT 2 (14.9 ACRES)
MAOULA ROAD
LOWER
MAILE STREET
HAWAII BELT ROAD
(MAMALAHOA HIGHWAY)
FIRE HYDRANT
6" DOUBLE CHECK DETECTOR ASSEMBLY FOR FIRELINE
1" WATER METER FOR POTABLE WATER
PROPERTY LINE TYP
25' WIDE UTILITY EASEMENT (0.94 ACRES)
8" INFLUENT SEWER
1,500 ±
1,000' WELL SETBACK
OPERATIONS BUILDING
ODOR CONTROL UNIT
BISHOP ESTATES (KAMEHAMEHA SCHOOLS) TMK: (3) 9-6-002:018 42.5 ACRES
EXISTING ACCESS VIA KAMEHAMEHA SCHOOLS FOR OTHERS TO REMAIN (0.5 ACRES)
50' SETBACK
±1,005
830±
200±
850±
DRIVEWAY ACCESS FOR WWTP
SLOW RATE LAND APPLICATION GROVE TYP
GROVE 1
GROVE 2
GROVE 3
GROVE 4
LAGOON 1
LAGOON 2
LAGOON 3
LAGOON 4
WETLAND
HEADWORKS
FUTURE HEADWORKS AND ODOR CONTROL UNIT EXPANSION
DISINFECTION
25' SETBACK
50' SETBACK
1
2
3
4
5
6
7

Appendix C SHPD Correspondence

DAVID Y. IGE
GOVERNOR OF
HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

August 20, 2018

William A. Kucharski, Director
County of Hawai‘i Department of Environmental Management
345 Kekūanāo‘a Street Suite 41
Hilo Hawai‘i 96720
William.Kucharski@hawaiicounty.gov

IN REPLY REFER TO:
Log No. 2018.00722
Doc. No. 1808JA02
Archaeology

Dear Mr. Kucharski:

SUBJECT: **Chapter 6E-8 and National Historic Preservation Act (NHPA) Section 106 Review – Request for Acceptance of the Archaeological Inventory Survey Approach for Proposed Pāhala Wastewater Treatment Plant and Sewer System Project Hionamoa Ahupua‘a, Ka‘ū District, Hawai‘i Island TMK: (3) 9-6-002:018**

This letter provides the State Historic Preservation Division's (SHPD's) response to the County of Hawai‘i Department of Environmental Management (DEM) office's March 22, 2018, letter concerning the subject titled *Request for Concurrence of Proposed Pāhala Wastewater Treatment Plant and Sewer System Project and the Archaeological Inventory Survey Approach for the Project Hionamoa Ahupua‘a, Ka‘ū District, Hawai‘i Island Tax Map Key: (3) 9-6-002:018* (William A. Kucharski, March 2018). The SHPD received this request on March 23, 2018 (Log No. 2018.00722) and a follow up letter on April 27, 2018 (Log No. 2018.01021).

This letter also reviews three additional documents, received electronically by SHPD on August 2, 2018. These documents, which include two aerial photomaps and a text summary, finalize the boundaries for the proposed Pāhala Wastewater Treatment Plant and Sewer System project area, and the locations and plans for seven test trenches to be excavated during the project archaeological inventory survey (AIS). The AIS will be conducted by Cultural Surveys Hawai‘i, Inc., (CSH), at the request of the County of Hawai‘i.

The submittal reviewed here follows a February 22, 2018, meeting between David Shideler of CSH and Dr. Susan A. Lebo of SHPD; the meeting was held to define an acceptable strategy for the project AIS and to obtain SHPS's concurrence with the plan. Additional correspondence in SHPD's files includes CSH's March 15, 2018, letter to Brown and Caldwell, with a copy to SHPD, also following up the February 22, 2018, SHPD-CSH consultation regarding the testing approach.

The proposed project will replace the current Pāhala Large Capacity Cesspool, in a portion of Pāhala in Pa‘au‘au 1 Ahupua‘a. This cesspool is one of two large-capacity cesspools that will close when the proposed project is completed.

The project will create a new collection system, and a treatment and disposal facility, both designed to serve the Pāhala community. The proposed collection portion of the project area will be located on County roads and streets, where trenches up to 6 feet deep will be excavated to accommodate the sewer system. The total area to be included in the collection system project area needs to be clarified. The County roads and streets, which cross through the central and southwest portions of Pāhala town, do not have TMK parcel numbers. Two wider roads assigned to TMK: (3) 9-6-005 Parcels 044 and 036 on the TMK photomap, connect the town road network with the treatment- and disposal-facility project area, farther south.

The treatment and disposal facility will occupy 14.9 acres in a portion of a 42.5-acre property south of Pāhala town that is currently owned by Kamehameha Schools and leased to Royal Hawaiian Orchards. Most of the parcel is located in a commercial macadamia nut orchard; a macadamia nut processing plant parking lot occupies the southeast corner. The 14-9-acre project area is bounded on the southeast by Hawai‘i Belt Road (Māmalahoa Highway), on the southwest by Maile Street, on the northwest side by orchard, and on the northeast side by a road that is not labeled in the available maps.

SHPD accepts the AIS approach. The seven units will include one in Lagoon 1, one in Lagoon 4, and one each in Basins 1, 2, 3, 4, and 5.

Please send two hard copies clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the Kapolei SHPD office, attention SHPD Library.

Please contact Dr. Jane Allen at (808) 692-8027 or by email at Jane.Allen@hawaii.gov if you have any questions, or if we can be of assistance.

Aloha,
Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Dora Beck, Dora.Beck@hawaiicounty.gov
Craig Lekven, CLekven@BrwnCald.com
William Folk, WFolk@culturalsurveys.com

Appendix D SHPD Meeting Notes

SHPD Meeting (Dec 6, 2018) Agenda Matters to Discuss with SHPD

Location: Kapolei

Time: Noon

Attendees: SHPD – Susan Lebo (SL) and Jane Allen (JA)

CSH – DS (12pm), WF (1pm)

- **HIONAMOA 2 Determining new/larger APE for Pahala Wastewater Project**
  SL: every lot will need to be part of the APE do not concern yourself with each lot.

  WF: anything with a lateral or to receive a lateral will be in the APE?

  SL/JA. LCC will be included in the APE,

  WF: The easement for a section of the new sewer line, and buildings related to the old mill operations that are to receive new laterals are all within one large parcel. Will we need to include the entire parcel in the APE?

  SL/JA: you will have a portion of the TMK parcel in the APE that includes the buildings; the building in your APE will be historic building. Those buildings will need to be reviewed by Architecture branch which may ask for an LRS for them, but the underground installation of WW line will not affect the building, you will still end up with no adverse effect/no historic properties effect – contact architecture they may request a "mini" LRS, We need to search to determine if the plantation may have a SHIP #.

  WF: The Pahala historic district map showing the SHIP # 7362 (Pahala Historic District) for the 1970's state wide inventory the SHPD/State Parks did in the 70's.

  SL: there is a SHIP # 7362. Did you contact Sean? Or here? in the district it depends if the archaeology is a component of the district. Email SW and Sean an email about historic district of Pahala. Statewide inventory of historical districts.

  WF: Yes. We will check again with Sean and email Dr. Lebo

  WF: So building would be contributing elements of a new SHIP or the 1970's historic district number if someone wished to nominate these for the registers.

  SL: 2-3 building associated with plantation; are they significant or on the State or Historic register? This should be addressed to architecture branch.

  WF: do we need to address the four roads since they are documented on historic maps.

  SL: You would indicate that there are historic roads, which are not in your project, and indicate which are within/through your APE. Obtain SIHP numbers for the roads. Will you

do anything to impact the roads? SHIP # integrity for the roads are only the location or the corridor. No change to the alignment; no impact.

Your project effect would be no effect for determination. With respect to that you are not creating any new impact and not changing characteristics.

Monitoring could be recommended for identification/cautionary measures not for Data Recovery.

Under 106 do you have any historical properties, single house lots not eligible for an historic property.

Notifications of homeowners that their house is within the APE will need to be done via public meetings and consultation letters

.

DS: passive consultation with homeowners?
WF: there will be public meetings,

SL: Give the home owners the project description at the public meeting. Who is the lead agency?

WF: EPA

SL: they will get input from you on APE. They need to do consultation/identification process to start the 60 days.

Identify historic properties within the APE.

Testing is not needed for the entire APE.

Staging areas need to be added within the APE. APE in letter and AIS need to be include text stating "staging areas will be within the existing road, the PA and APE" or something similar;

Funding of EPA and subject to 6E and 106. Ask for SHPD concurrence on APE. When you complete the 6E document (AIS), support county as no historic properties affected. Precautionary monitoring, to extensive excavation.

Under HRS 6E review – "No historic properties affected"; means the project will have no effect on significant historic properties. The CoH makes this determination and asks for SHPD concurrence. Supporting documents for this determination should be sent to SHPD Archaeology Branch and Architecture Branch.

For Federal projects (under Section 106) – "No adverse effect" means historic properties are present but there is no adverse impact to the properties. The EPA makes this determination and asks for SHPD concurrence.

EPA – 106 determination of "no historic properties affected".

LRS – identification purpose, no impact, no historic properties affected.

End time: 2:18