

**APPENDIX A: BACKGROUND SECTIONS FOR AREAS 2 AND 3 FROM VERNON AND
COLLINS (2020)**

This Page Left Blank Intentionally

AREA 2: H-2–WAIAWA INTERCHANGE TO WAIPIO

Area 2 totals 113.09 ac (45.77 ha) and includes the Waiawa IC and the H-2 Freeway to Waipi'o Gentry. Figure 17 shows the location of Area 2 on the 2017 USGS Waipahu Quadrangle Map. Figure 18 presents an aerial image of Area 2. Proposed work, listed in Table 5, includes trenching 2.0 to 3.0 ft (0.6 to 0.91 m) wide and 4.0 to 8.0 ft (1.21 to 2.44 m) deep for conduits and splice cabinets, and excavations 4.0 ft (1.21 m) wide and 15.0 to 25.0 ft (4.57 to 7.62 m) deep for installation of three (3) traffic camera poles. Specifically, two new CCTV are proposed on the H-2 between Waipio Gentry and Waiawa IC, a single new CCTV camera is proposed near H-1/Kamehameha Highway overpass in the Waiawa IC, and various conduit routing is proposed in the Waiawa IC.

Table 5. List of Proposed Project Activities in Area 2.

PROPOSED ACTIVITY	ANTICIPATED DEPTH OF GROUND DISTURBANCE
Conduit trenching	4.0 to 8.0 ft (1.21 to 2.44 m)
Splice cabinet installation	4.0 to 8.0 ft (1.21 to 2.44 m)
Installation of three traffic camera poles and CCTV	15 to 25 ft (4.57 to 7.62 m)

ENVIRONMENTAL SETTING

Waipi'o and Waiawa Ahupua'a are situated on the leeward side of O'ahu and extend from the Ko'olau mountain range through the coastal plain to the shoreline at Pearl Harbor. Area 2 is situated on the border of the two *ahupua'a* and extends north along the H-2, immediately east of the Waipi'o neighborhood. The southern reach of Area 2 is 500 meters north of Middle Loch at Pearl Harbor.

Annual rainfall in this part of leeward O'ahu averages about 63.5–78.5 mm (25.0–30.90 in) per year, with most rain falling in the winter months between November and March (Giambelluca et al. 2013). Area 2 is situated on a moderately sloping to level area approximately 28.0 to 115.0 m amsl.

Various soil types are found throughout Area 2, which are summarized in Table 6 and displayed in Figures 19 and 20. The modern built-environment includes the H-1 Freeway bordered by commercial and residential developments.

HISTORICAL BACKGROUND

This section presents the ethno-historical and archaeological background information of Area 2. Data from the background research were compiled to create an overview of traditional Hawaiian and historic-era land use and subsistence practices. Previous archaeological research is reviewed and anticipated archaeological findings are discussed

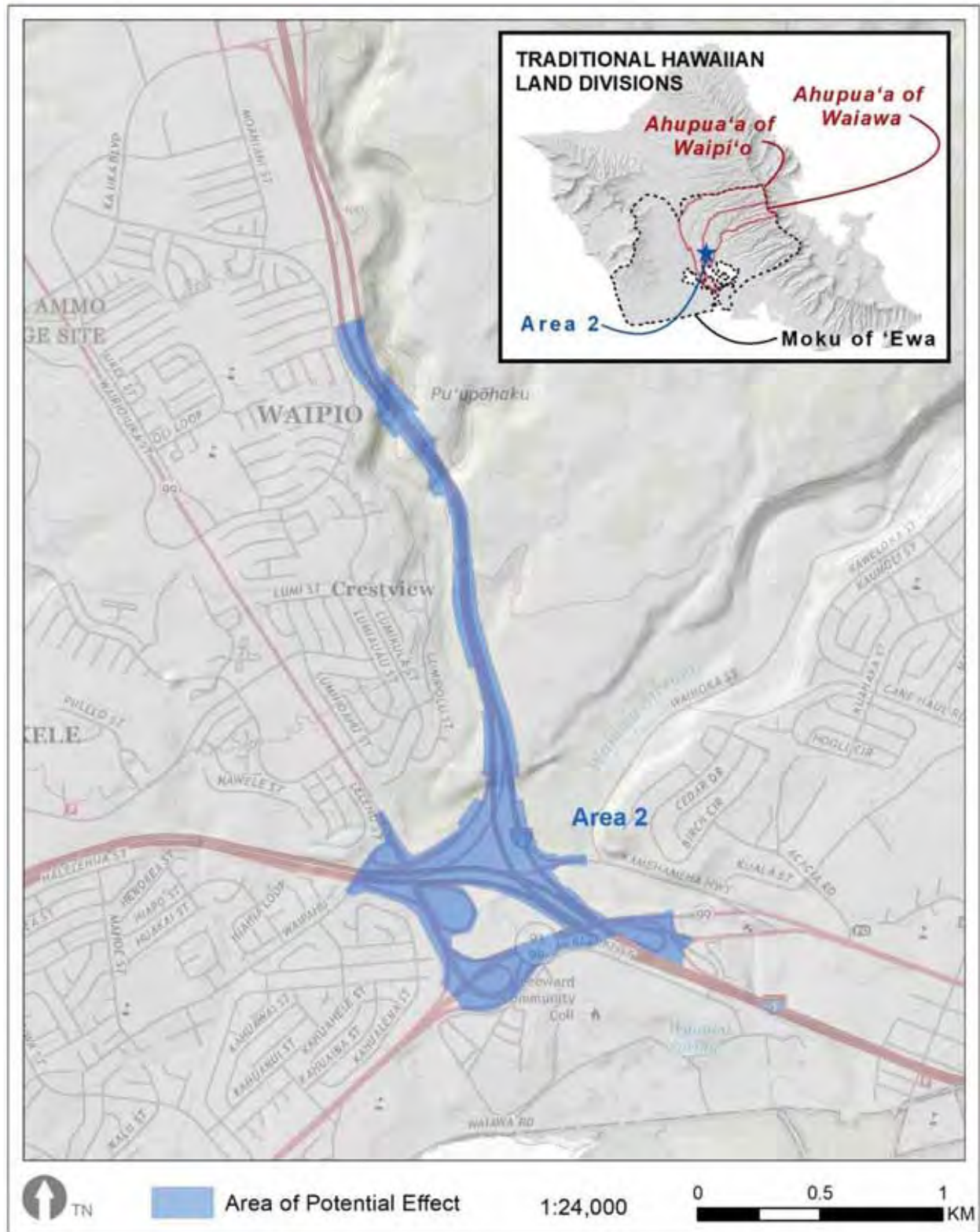


Figure 17. Location of the Area 2 APE on a 7.5-Minute Series USGS Waipahu Topographical Quadrangle (USGS 2017b), FMS Phase 3, Unit 1, H-2 Freeway from the Waiawa Interchange to Waipi'o Gentry.



Figure 18. Location of the Area 2 APE on an Aerial Image (Esri et al. 2019), FMS Phase 3, Unit 1, H-2 Freeway from the Waiawa Interchange to Waipi'o Gentry.

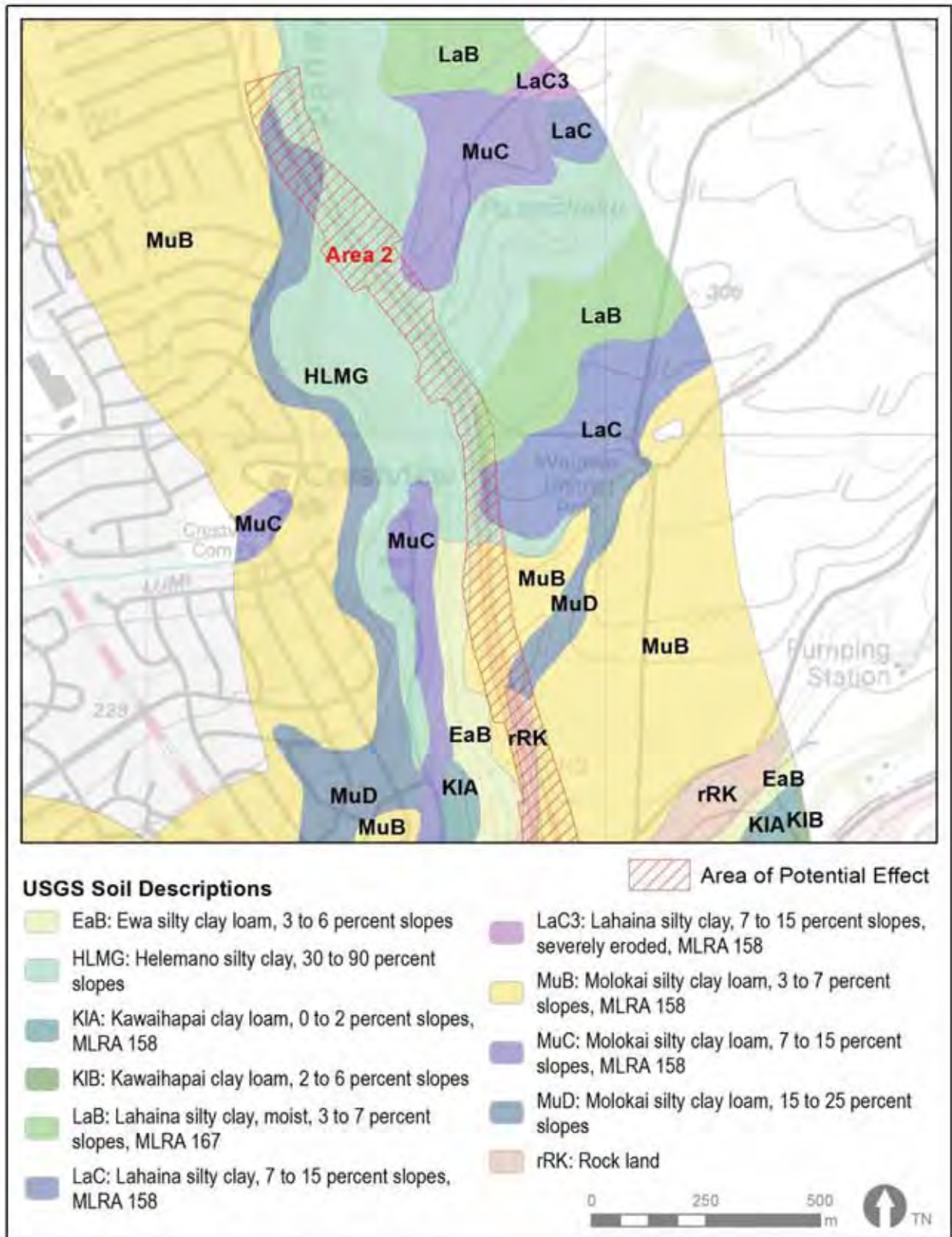


Figure 19. Soil Units within the Northern Portion of the Area 2 APE (Soil Survey Staff 2019; USGS 2017b).

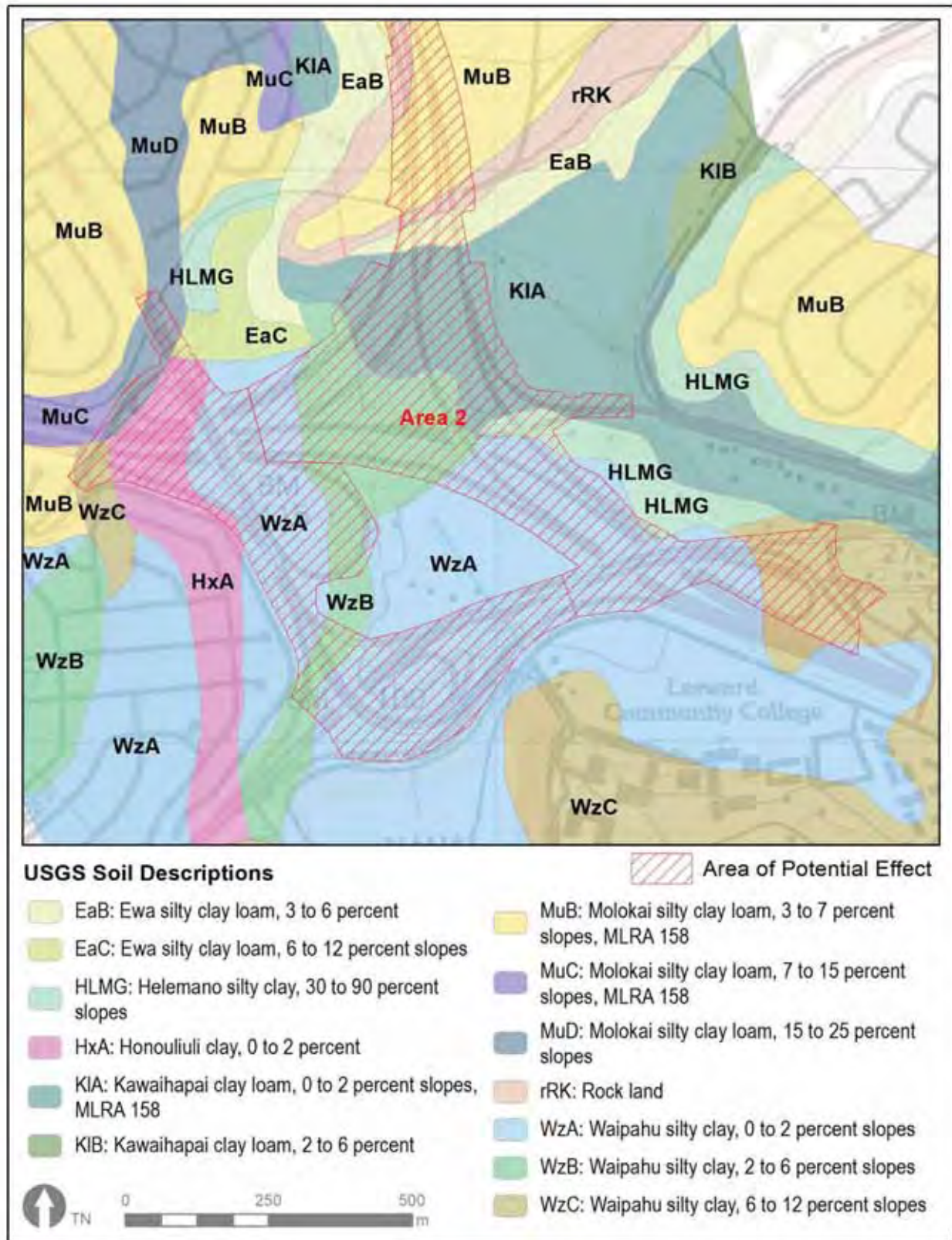


Figure 20. Soil Units within and near the Southern Portion of the Area 2 APE (Soil Survey Staff 2019; USGS 2017b).

Table 6. Summary of Soil Units in the Area 2 APE (Foote et al. 1972; Soil Survey Staff 2019).

Series	Map Unit Symbol	Soil Unit	Percent slope	Properties
Ewa: well-drained soils in basins and on alluvial fans; developed in alluvium derived from basic igneous rock	EaB	Ewa silty clay loam	3 to 6	Moderate permeability; slow runoff; slight erosion hazard
	EaC	Ewa silty clay loam	6 to 12	Slow to medium runoff; slight to moderate erosion hazard
Helemano: well-drained soils on alluvial fans and colluvial slopes on the sides of gulches; developed in alluvium and colluvium derived from basic igneous rock	HLMG	Helemano silty clay	30 to 90	Moderately rapid permeability; medium to very rapid runoff; severe to very severe erosion hazard
Honouliuli: well-drained soils on coastal plains; developed in alluvium derived from basic igneous material.	HxA	Honouliuli clay	0 to 2	Moderately slow permeability; slow runoff; no more than slight erosion hazard is.
Kawaihapai: well-drained soils in drainageways and on alluvial fans and the coastal plains; formed in alluvium derived from basic igneous rock in humid uplands	KIA	Kawaihapai clay loam, MLRA 158	0 to 2	Moderate permeability; slow runoff; no more than slight erosion hazard
Lahaina: well-drained soils on uplands; developed in material weathered from basic igneous rock	LaB	Lahaina silty clay, moist, MLRA 167	3 to 7	Moderate permeability; slow runoff; slight erosion hazard
	LaC	Lahaina silty clay, MLRA 158	7 to 15	Medium runoff; moderate erosion hazard
Molokai: well-drained soils on uplands; formed in material weathered from basic igneous rock	MuB	Molokai silty clay loam, MLRA 158	3 to 7	Slow to medium runoff; slight to moderate erosion hazard
	MuC	Molokai silty clay loam, MLRA 158	7 to 15	Medium runoff; moderate erosion hazard
	MuD	Molokai silty clay loam	15 to 25	Medium runoff; severe erosion hazard

Table 6. Summary of Soil Units in the Area 2 APE (Foote et al. 1972; Soil Survey Staff 2019).

Series	Map Unit Symbol	Soil Unit	Percent slope	Properties
Waipahu: well-drained soils on marine terraces; developed in old alluvium derived from basic igneous rock	WzA	Waipahu silty clay	0 to 2	Moderately slow permeability; slow or very slow runoff; none to slight erosion hazard
	WzB	Waipahu silty clay	2 to 6	Slow runoff; slight erosion hazard
	WzC	Waipahu silty clay	6 to 12	Medium runoff; moderate erosion hazard
-	rRK	Rock land	Nearly level to steep	Exposed rock covers 25 to 90 percent of the surface; contains rock outcrops (mainly basalt and andesite) and very shallow soils

Traditional History

In Waiawa there were two *kūlu maika* playing fields called Puehulunui and Haupū'u, which were both in the vicinity of the southern portion of Area 2. 'Ī'i wrote of a trail in 'Ewa that crossed the upper boundary of the *lo'i* that were once present nearby and mentions the playing fields. Traveling from Honolulu:

The trail went down to the stream and up again, then went above the taro patches of Waiau, up to a *maika* field, to Waimano, to Manana, and to Waiawa; then to the stream of Kukehi and up to two other *maika* fields, Pueohulunui and Haupuu. At Pueohulunui was the place where a trail branched off to go to Waialua and down to Honouliuli and on to Waianae [Ī'i 1959:97].

The trails near Area 2 that are mentioned by 'Ī'i are shown on a map from 1851 in Figure 21. Stone markers along this trail, called Nāpōhaku-luahine, are said to be old women transformed into stones:

When you leave the bridge of Waiawa, for Honolulu, go up and then down an incline. The hill standing on the seaward side is Nuku-o-ka-manu. The next incline is Waiawa. Go up the ascent till you reach the top and above that, about two chains from the road you will find the stones. The names of these royal stones were Kahoaiai (also the name of an 'ili in Waiawa), Waiawakalea, Piliaumoa, Kahe'ekuluaikamoku, all chiefesses. Their four servants were Nohoana, Kikaeleke, Piliamo'o, Nohoanakai. These were the guardians of the trail [Ka Loea Kalaiaina 1899 in Sterling and Summers 1978:6].

Several *wahi pana* in the area are associated with Ka'ahupahau, the shark goddess of Pearl Harbor. Kuhialoko (SIHP Site 50-80-09-00119) is named after Kuhia, "one of the butlers or purveyors to Kaahupahau the shark queen of Ewa" (Saturday Press 1884 in Sterling and Summers 1978:17). Kahi'ukā, Ka'ahupahau's brother, had a cave in Waiawa, which is said to have been located below the home of Reverend Bishop of the 'Ewa Church (Ke Au Hou 1910 in Sterling and Summers 1978:18).

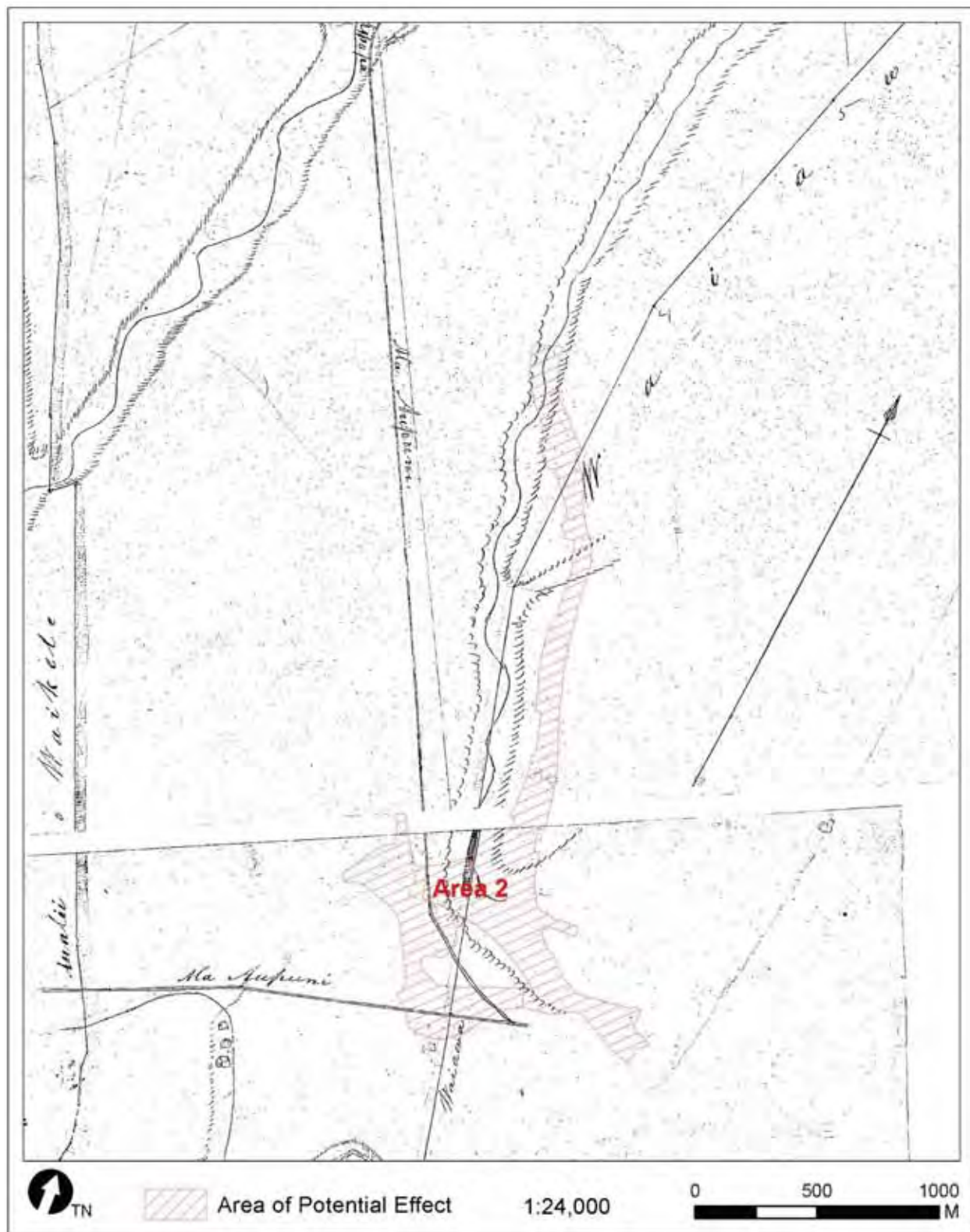


Figure 21. Portion of 1851 Map Showing Trails Crossing the Area 2 APE (Bishop 1851).

The name Waipi'o can be translated as "curved waters" (Pukui et al. 1974:227). 'Ai'ai (son of the fishing god) is said to have established a *pōhaku i'a* (fish stone) at Hanapouli and a *ku'ula*, "stone god used to attract fish" (Pukui and Elbert 1986:187), named Ahu'ena in Waipi'o. Ahu'ena Heiau, was once located between Farrington Highway and the coast. When documented by Thrum (1906:46) only the foundations remained. 'Ī'i was once the custodian of the idols at this *heiau*. Along the coast of the *ahupua'a* there were formerly several fishponds, which included Loko 'Eo and Loko Hanaloa (Hammatt 2010:46).

A chant for the chief Kūali'i, an ancient chief of O'ahu, mentions all twelve *ahupua'a* of 'Ewa Moku (Fornander 1917:400–401). Each line of the chant is a play on words and not associated with the actual place name meaning (Hammatt and Shideler 2012:16).

Uliuli ka poi e piha nei—o Honouliuli;	Blue is the poi [pounded taro] which appeases [the hunger] of Honouliuli;
Aeae ka paakai a Kahuaiki—Hoeaeoe,	Fine the salt of Kahuaiki—Hoeaeoe;
Pikele ka ia e Waikele-- o Waikele;	Slippery the fish of Waikele—Waikele;
Ka hale pio i Kauamoa—o Waipio;	The arched house at Kauamoa—Waipio;
E kuu kaua i ka loko awa—o Waiawa;	Let us cast the net in the awa-pond—of Waiawa;
Mai hoomanana ia oe—o Manana.	Do not stretch yourself at—Manana.
He kini kahawai,	Many are the ravines,
He lau kamano—o Waimano;	Numerous the sharks, at Waimano;
Ko ia kaua e ke au o Waiau;	We are drawn by the current of Waiau;
Kukui malumalu kaua—Waimalu;	In the kukui grove we are sheltered—in Waimalu;
E ala kaua ua ao-e—o Kalauao;	Let us arise, it is daylight at Kalauao;
E kipi kaua e ai-o Aiea;	Let us enter and dine-at Aiea;
Mai hoochalawa ia oe—o Halawa.	Do not pass by —Halawa.
	[Fornander 1917:400–401]

In the story of the dividing of 'Ewa by the gods Kane and Kanaloa, Waiawa is mentioned as a place where *kāwa* (*Piper methysticum*) is grown, which is not to be confused with *awa*, or milkfish (*Chanos chanos*), which was mentioned in the above chant. "Maihea, a man, resided at Waimalu at a place called Punanalo. He cultivated sweet potatoes, taros and planted 'awa. The place where he planted the *kāwa* was on a hill in the upland of Waiawa. This is what he did up to the time when the gods came to earth" (Ka Loea Kalaiaina 1899 in Sterling and Summers 1978:6). As the story goes on, Maihea prays for knowledge and *mana* (power) for his family and a whale is sent by the gods. Maihea's son is taken by the whale to Kahiki to study the priesthood. The two gods then visit Maihea and reveal that they are Kane and Kanaloa. The gods travel around the land and 'Ewa is divided.

On their return after dividing the land, they came to the top of Haupuu (that is the present site of the Kahikuonalani Church at Waiawa), they turned to look at Ewa and when they saw the fish ponds at Waiawa, they said, "May the fish ponds down at Waiawa be as the stars in the sky above. May there be mullets at Kuhia-loko, fine sea weeds at Kuhia-waho, salt at Ninauele, the single fruited coconut at Hapenui, the taro greens at Mokaalika and the water of Kaaimalu, to remove the bitterness of the awa of Kalahikuola. " This was the last thing that they did before returning to Maihea's house. They drank awa again that afternoon. They spent the remainder of the day going to Puuloa. The result of this was that Maihea obtained the knowledge of the priesthood, oratory and so on. This was the first time that these arts were practiced here in Hawaii [Ka Loea Kalaiaina 1899 in Sterling and Summers 1978:6].

Traditional Land Use

Based on *mo'Uelo* and early historical accounts, 'Ewa was a densely populated area that would have offered abundant resources. McAllister (1933) also wrote of Waipi'o as a location favored by the *ali'i* (chiefly class). "The populous dwelling place of the *ali'i* was formerly located on an east point of Waipi'o Peninsula known as Lēpau" (McAllister 1933:106). Several pre-Contact sites have been interpreted as permanent habitations and fishing shrines. Marine and estuarine resources existed along the coast, while around today's Pearl Harbor *loko i'a* were present. The irrigated lowlands would have supported *lo'i*, while the lower forest area of the mountain slopes offered other subsistence resources during famine or low rainfall (Handy 1940:211; Handy and Handy 1972:469–470). Additionally, the upper valley slopes may have been used for quarrying of basalt to manufacture stone tools (O'Hare et al. 2011:12).

In a study of resources and population of the *ahupua'a* of 'Ewa, archaeologist Ross Cordy (1996:12) posited a correlation between floodplain size, fishery size, and population size. Specific to the current study area, Waipi'o had a large floodplain, irrigated fields along Kīpapa Stream, and a large fishery, covering a majority of Pearl Harbor's Middle Loch and portions of West Loch along the Waipi'o Peninsula. Waiawa possessed smaller, but similar resources. Following this correlation, Waipi'o had a large population and Waiawa had a medium-sized population relative to the other *ahupua'a* in 'Ewa.

Historical Land Use

Beginning in 1811, Kamehameha I commenced intensive sandalwood logging on O'ahu. The trade was strictly under the control of the *ali'i* and harvesting was conducted by the *maka'āinana* (commoners). After a famine in 1821 due partially to the intensive logging, Kamehameha reversed the order to log so that the *maka'āinana* were not overworked to the extent that farming was neglected (Cottrell 2002:10–11). He also instituted conservation measures that spared young trees. Upon Kamehameha's death in 1819, Liholiho (Kamehameha II) opened the sandalwood trade to his *ali'i*, which caused the island to revert to intensive harvesting.

The sandalwood harvesting had negative ecological consequences for the land, which were exacerbated by domesticated animals introduced to the islands. Reverend Serano Bishop spent time as a child in 'Ewa when his family moved from Kailua in 1836. His father, Artemas Bishop, was stationed at 'Ewa Church in Waiawa. He wrote, "My father's cows were the first cattle that had ever run on the Ewa uplands. Waiawa Valley above us lay knee deep with the richest of grass, where our cows rioted" (Bishop 1921:156). A map from 1877, shown in Figure 22, shows the 'Ewa Church, land owned by Bishop, and a grassy plain to the north. He recalled the dramatic changes that occurred in the first half of the nineteenth century:

Our family made repeated trips to the home of Rev. John S. Emerson at Waialua during those years. There was then no road save a foot path across the generally smooth upland. We forded the streams. Beyond Kipapa gulch the upland was dotted with occasional groves of Koa trees. On the high plains the ti plant abounded, often so high as to intercept the view. No cattle then existed to destroy its succulent foliage. According to the statements of the natives, a forest formerly covered the whole of the then nearly naked plains. It was burned off by the natives in search of sandalwood, which they detected by its odor burning [Bishop 1921:158].

Ūi was born in Waipi'o Ahupua'a at the beginning of the nineteenth century. When he was ten years old he was placed in the household of Liholiho (Kamehameha II) and became Liholiho's personal attendant.

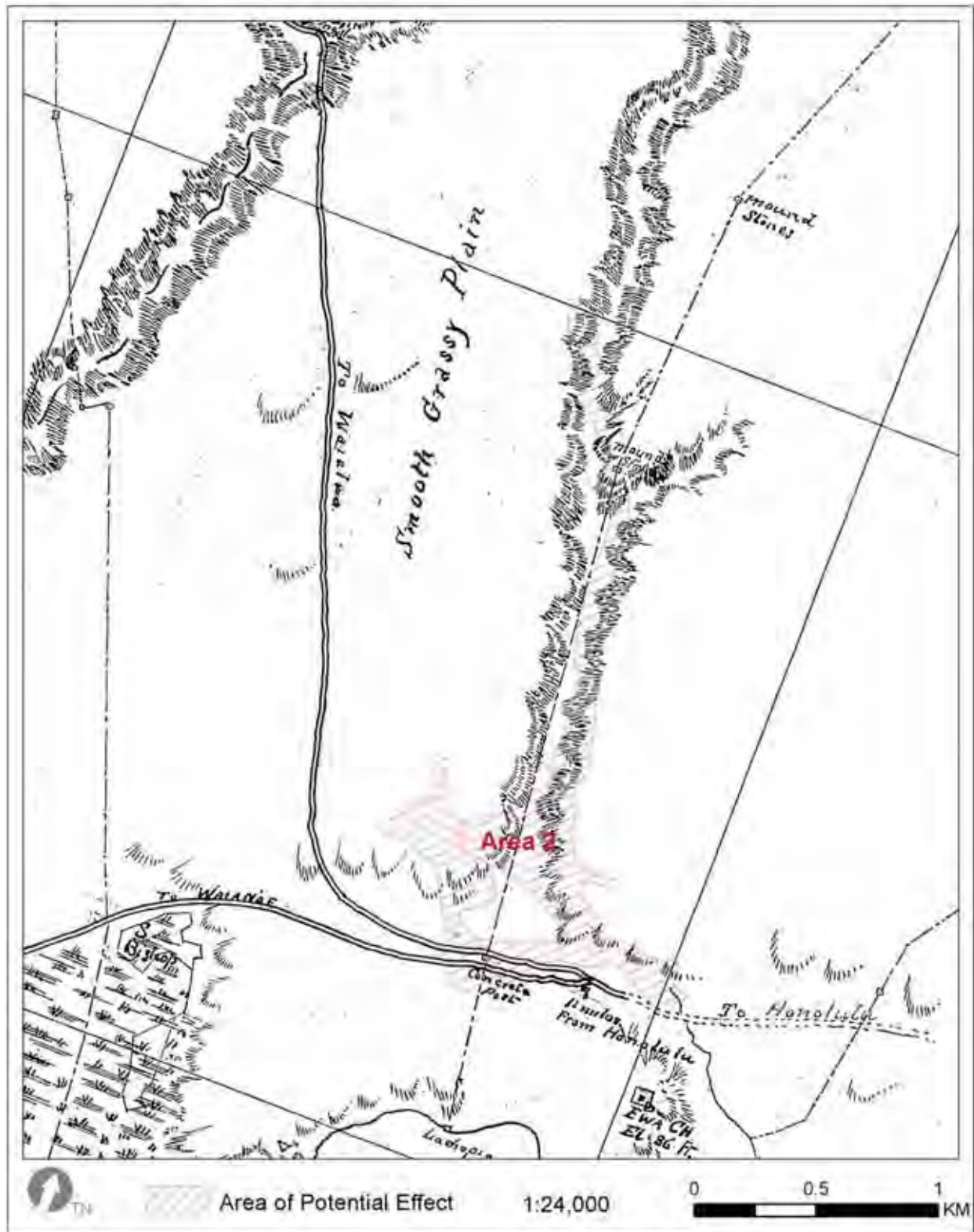


Figure 22. Portion of 1877 Map of Waipi'o Showing the Area 2 APE (Brown 1877).

John Papa Ii was born in Kumelewai, Waipio, in Ewa, Oahu, on the third day of August (Hilinehu in the Hawaiian calendar) in 1800, on the land of Papa Ii, whose namesake he was. Papa was the owner of the pond of Hanaloa and two other pieces of property, all of which he had received from Kamehameha, as did others who lived on that ahupua'a, or land division, after the battle of Nuuanu. He gave the property to his kaikuahine, or cousin, who was the mother of the aforementioned boy. Her names were Wanaoa, Pahulemu, and Kalaikane [ĪĪ 1959:20].

In the nineteenth century, disease and famine impacted the population of the 'Ewa district. The population was recorded at 4,015 people in the 1831–1832 census; four years later the population dropped to 3,423 (Schmitt 1973:9, 36). Regarding a famine that affected Waipi'o Ahupua'a, ĪĪ wrote:

Here is a wonderful thing about the land of Waipio. After a famine had raged in that land, the removal of new crops from the taro patches and gardens was prohibited until all of the people had gathered and the farmers had joined in thanks to the gods. This prohibition was called kapu 'ohi'a because, while the famine was upon the land, the people had lived on mountain apples ['ohi'a 'ai], ti, yams, and other upland foods. On the morning of Kane an offering of taro greens and other things was made to remove the 'ohi'a prohibition, after which each farmer took of his own crops for the needs of his family [ĪĪ 1959:77].

Reverend Lowell Smith, who was stationed at 'Ewa Church and preceded Reverend Artemas Bishop, wrote of the devastation caused by disease:

The people of Ewa are a dying people. I have not been able to obtain an exact count of all the deaths & births since the last general meeting. But my impression is that there have been as many as 8 or 10 deaths to one birth. I have heard of but 4 births on Waiawa during the year, & all of these children are dead. I have attended about 20 funerals on that one land, & 16 of these were adults. [Ewa Station Report 1836 in Hammatt 2010:83]

There were no *kuleana* awards granted in Area 2. In Waiawa, there were seven *kuleana* awards along Waiawa Stream immediately north of Area 2 near the H-1 Freeway and one award to the south. These parcels can be seen on Figure 23. The awards included *pahale* (house lot), *lo'i* and *kula* (dry agricultural) land, as described in Table 7.

Table 7. Land Commission Awards (LCAs) Near Area 2.

LCA No.	KLI	AWARDEE	AWARD
4213:1, 2	Holoipiapia	Kauhi	3 <i>lo'i</i> , <i>pahale</i>
5591, 9357	Kahoaiai	Kekua	3 <i>lo'i</i> called Kaihumenenui and 1 <i>kula</i>
10942:1, 2 3, 4	Kahoaiai	William Wallace	House lot, <i>mo'o kaina</i> called Kalualii and Mooiki, 2 <i>lo'i</i> in the <i>mok kaina</i> Oopa, four <i>loi</i> and <i>kula</i> in <i>mok kaina</i> Oopa
904:1	Kahoaiai	Naheana	<i>Pahale</i>
9294	Piliaumoa	Kekeni	<i>Pahale</i>
904:3	Kahoaiai	Naheana	<i>Lo'i</i>

Figure 23. Portion of 1887 Map Showing Land Commission Awards near the Area 2 APE along Waiawa Stream (Bishop 1887).

The entire *ahupuaʻa* of Waiawa, less the *kuleana* land parcels, was Crown Land awarded as LCA 7713, Apana 46 to Victoria Kamāmalu, sister to King Kamehameha IV and V. After her death, the land was passed on to her father, followed by her sister; then Lot Kapuāiwa (Kamehameha V) followed by his half-sister, Ruta Keʻelikōlani; then finally Bernice Pauahi Bishop in 1883. The Bernice Pauahi Bishop Estate was left to Kamehameha Schools, who currently owns a large portion of the *ahupuaʻa* (Hammatt 2010:97).

LCA 8241 to John Papa ʻĪʻĪ, which totaled 20,540, was within the portion of Area 2 situated in Waipiʻo Ahupuaʻa. At his death in 1870, his daughter Irene Brown inherited his estate. Not long after, small parcels of the *ahupuaʻa* were sold off (Hammatt 2010:97).

At the end of the nineteenth century, the *loʻi* in the *makai* portions of Waiawa and Waipiʻo were converted to rice fields, while *mauka* lands were under cultivation for pineapple and sugar (Tulchin et al. 2009:17; Conde and Best 1973:313–317). A map from 1902, shown in Figure 24, indicates taro or rice was being cultivated (shown in blue on Figure 24) along Waiawa Stream, which likely corresponds to the LCA shown in Figure 23. This land is also demarcated as grazing land (outlined in orange on Figure 24).

Figure 25 shows that Area 2 was within the Oahu Sugar Company's land. The sugar industry had vastly expanded throughout the Hawaiian Kingdom and the need for field laborers led to contract labor laws. In 1852, Chinese workers began arriving in the islands on five-year contracts that paid \$3 a month plus room and board (Coman 1903:495; MacLennan 1997). Many of these laborers remained in the islands as merchants or rice farmers after their contracts expired (Coman 1903:35; Tulchin et al. 2009:43).

Following the change in agriculture, numerous irrigation ditches were constructed in the vicinity of Area 2. These features can be seen on a 1954 topographical map shown in Figure 26. The Oahu Sugar Company operated until the 1990s, though fields were gradually encroached on by residential developments. A photomap from 1978, presented in Figure 27, shows sugarcane fields, residential developments, and the newly constructed H-2 Freeway in the vicinity of Area 2.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Several archaeological investigations have been conducted in the immediate vicinity of Area 2. Previous work has included archaeological reconnaissance survey, archaeological and cultural assessment, and historical literature review. Two instances of the inadvertent discovery human remains have also occurred. These projects are summarized in Table 8. The following section focuses on projects conducted within approximately 500 meters of Area 2 in order to compare previous findings of land use. Figure 28 presents the locations of previous archaeological studies and Figure 29 locates historic properties in the vicinity. All site numbers follow SIHP Site 50-80-09-.

In 1985, William Barrera Jr. carried out an archaeological reconnaissance survey in Waikele (Barrera 1985). The survey covered approximately 237 ha northeast of the Waiawa IC. Findings indicated that sugarcane agriculture had removed all evidence of past land use.

Reconnaissance survey was conducted for a 37-acre wetland parcel south of Leeward Community College (Hammatt and Borthwick 1985). The parcel formerly contained the fishpond named Loko Moʻo. A portion of the parcel was planted in watercress and the remainder had been filled. No historic properties were encountered during the survey.

In 1988, human skeletal remains were encountered during demolition of a wooden shack east of Leeward Community College (Bath 1988). This secondary burial site was designated

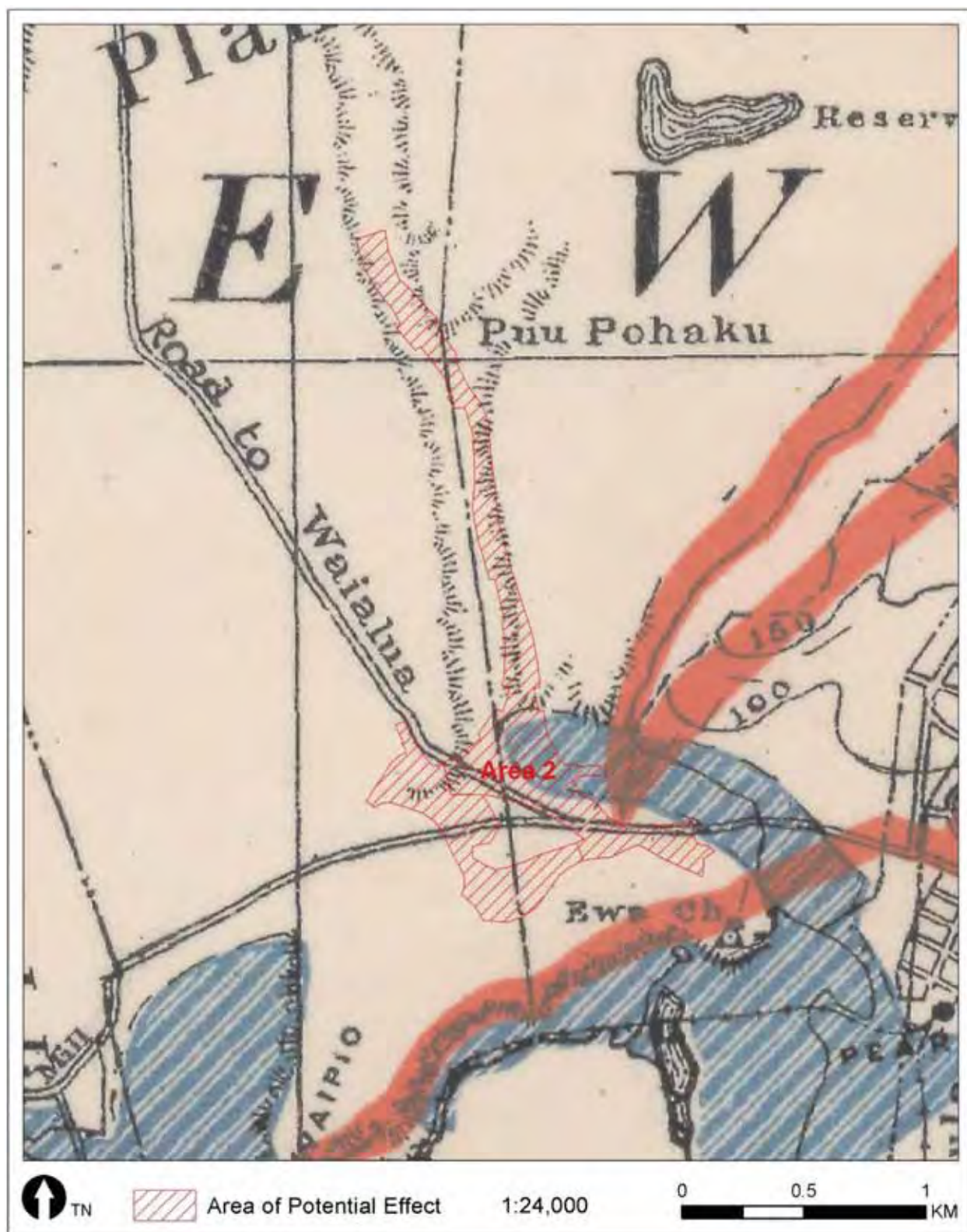


Figure 24. Portion of 1902 Map Showing the Area 2 APE within Grazing Land and in or near Rice or Taro *Lo'i* (Donn 1902).

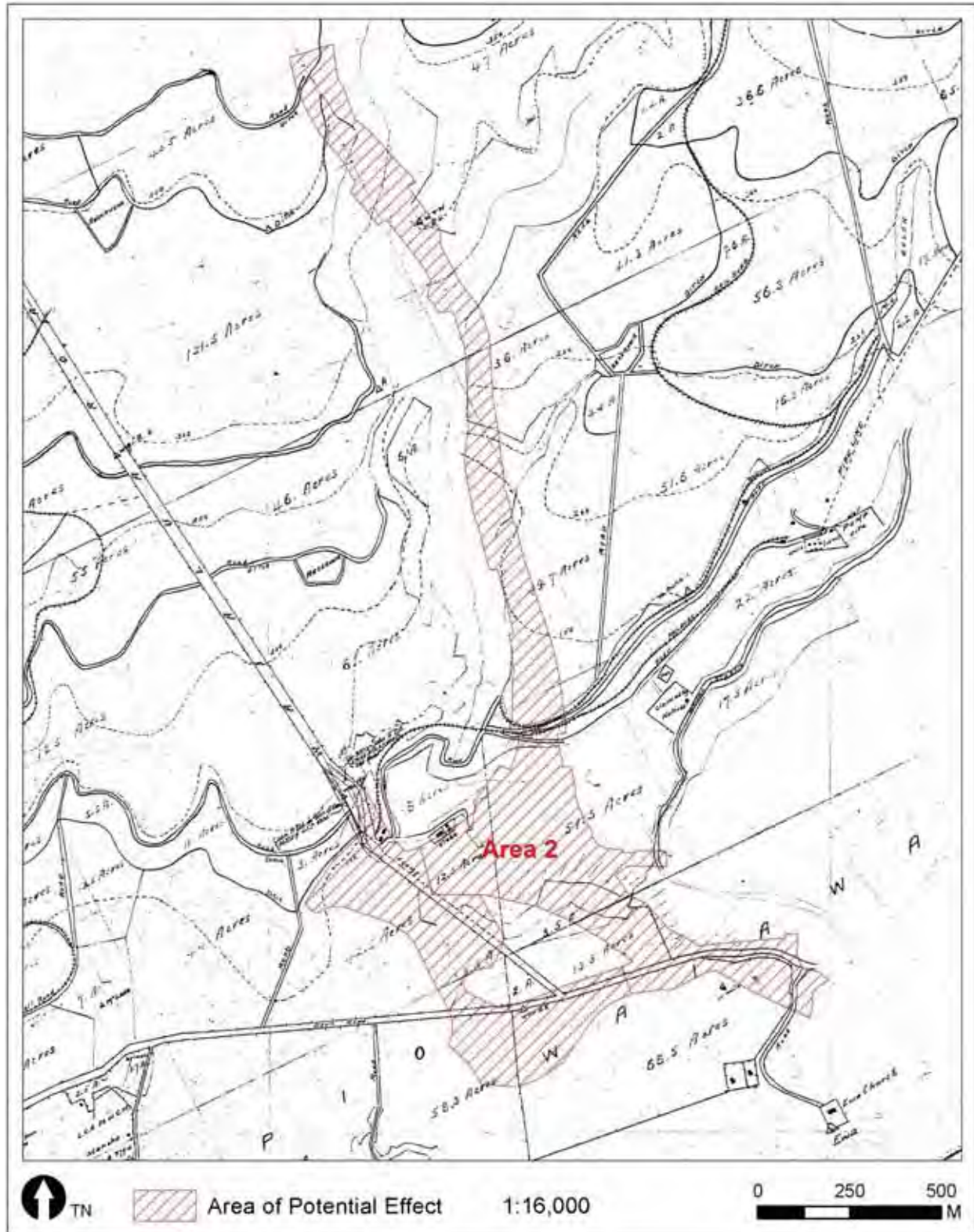


Figure 25. Portion of ca 1920 Map Showing the Area 2 APE within Oahu Sugar Company Fields (Monsarrat ca 1920).

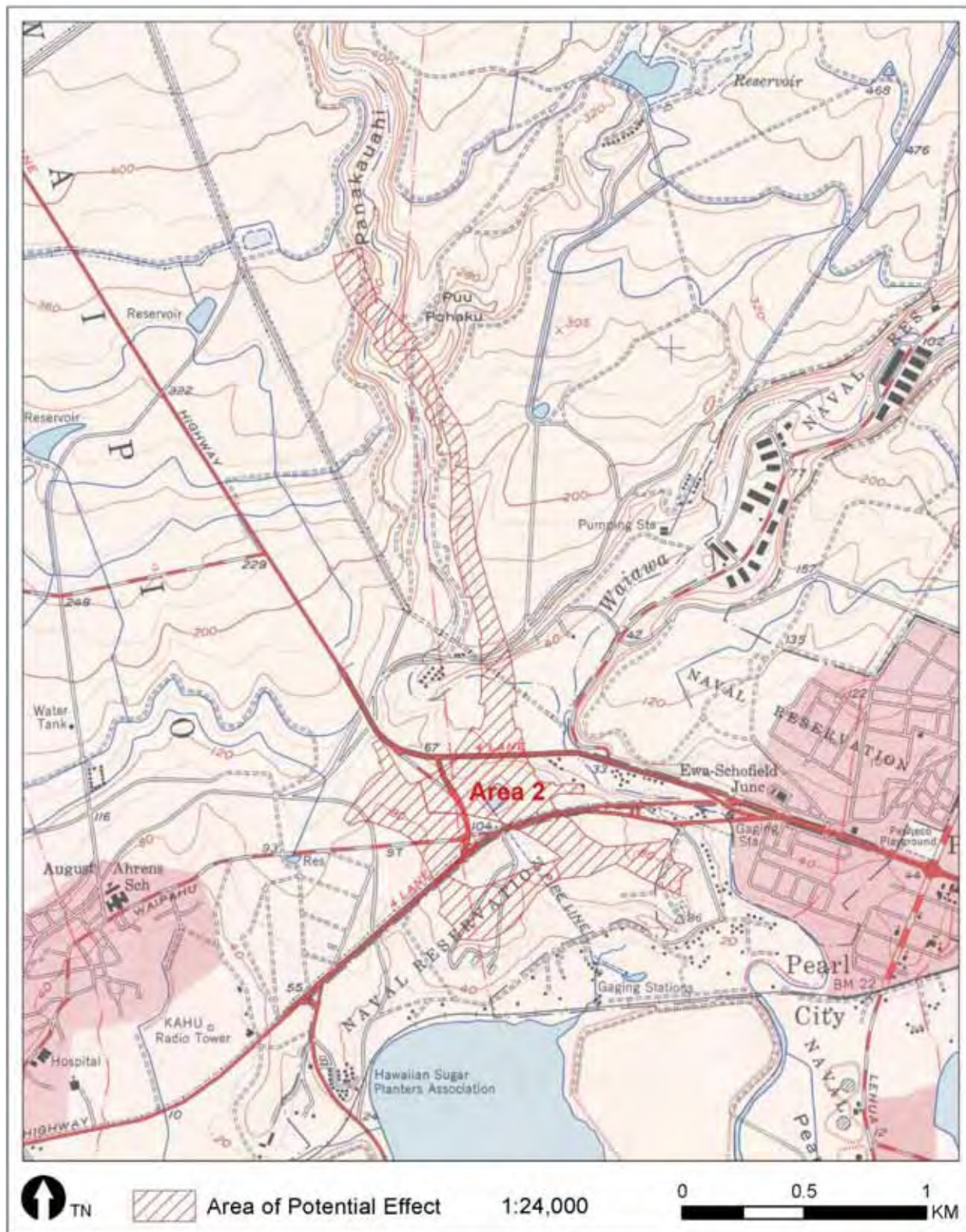


Figure 26. Portion of Topographic Map Dated 1954 Showing Irrigation Features on the Landscape (USGS 1954).



Figure 27. Portion of Aerial Photograph Dated 1978 Showing Sugarcane Fields and Residential Developments near the Area 2 APE (USGS 1978).

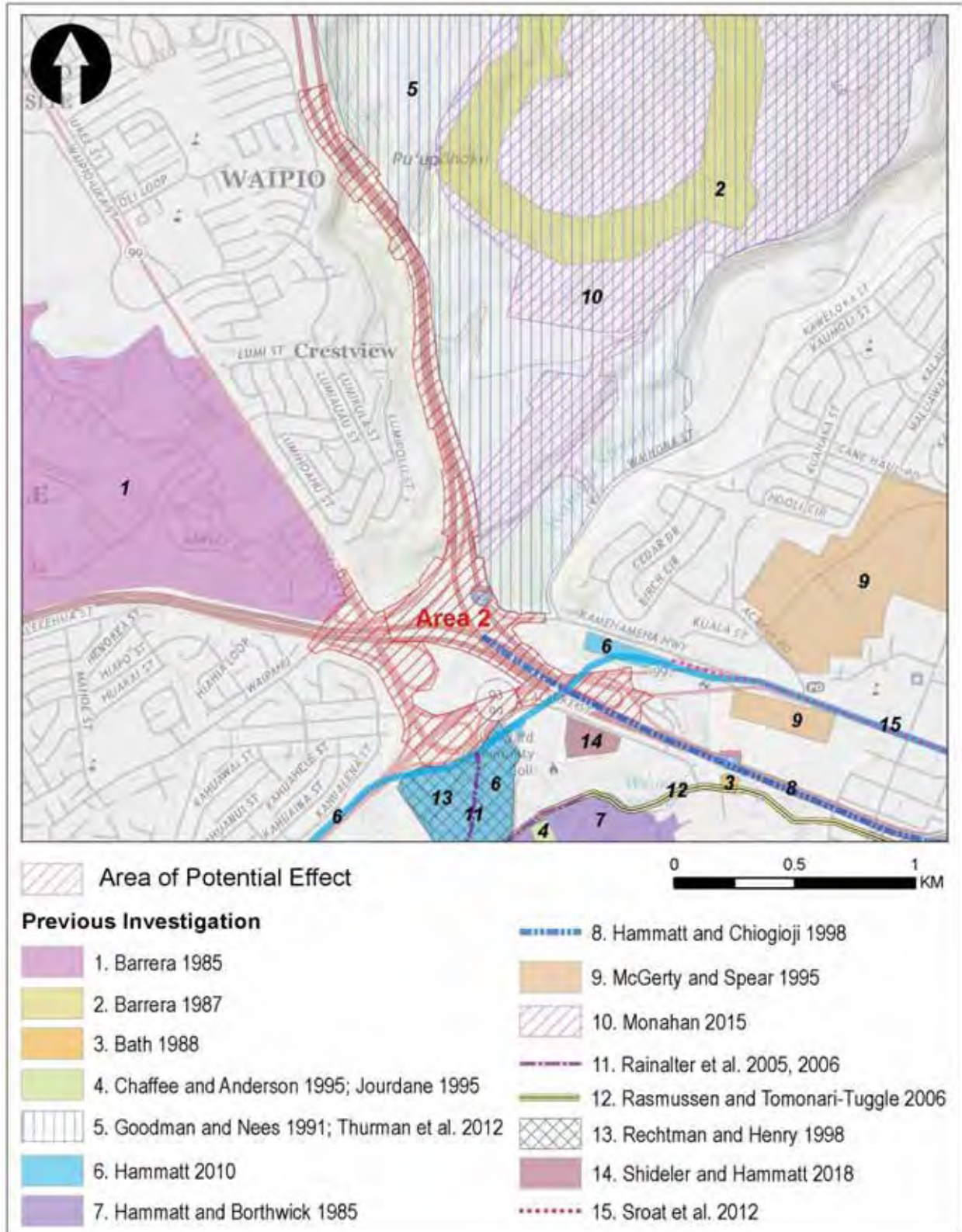


Figure 28. Previous Archaeological Investigations near and within the Area 2 APE (USGS 2017b).

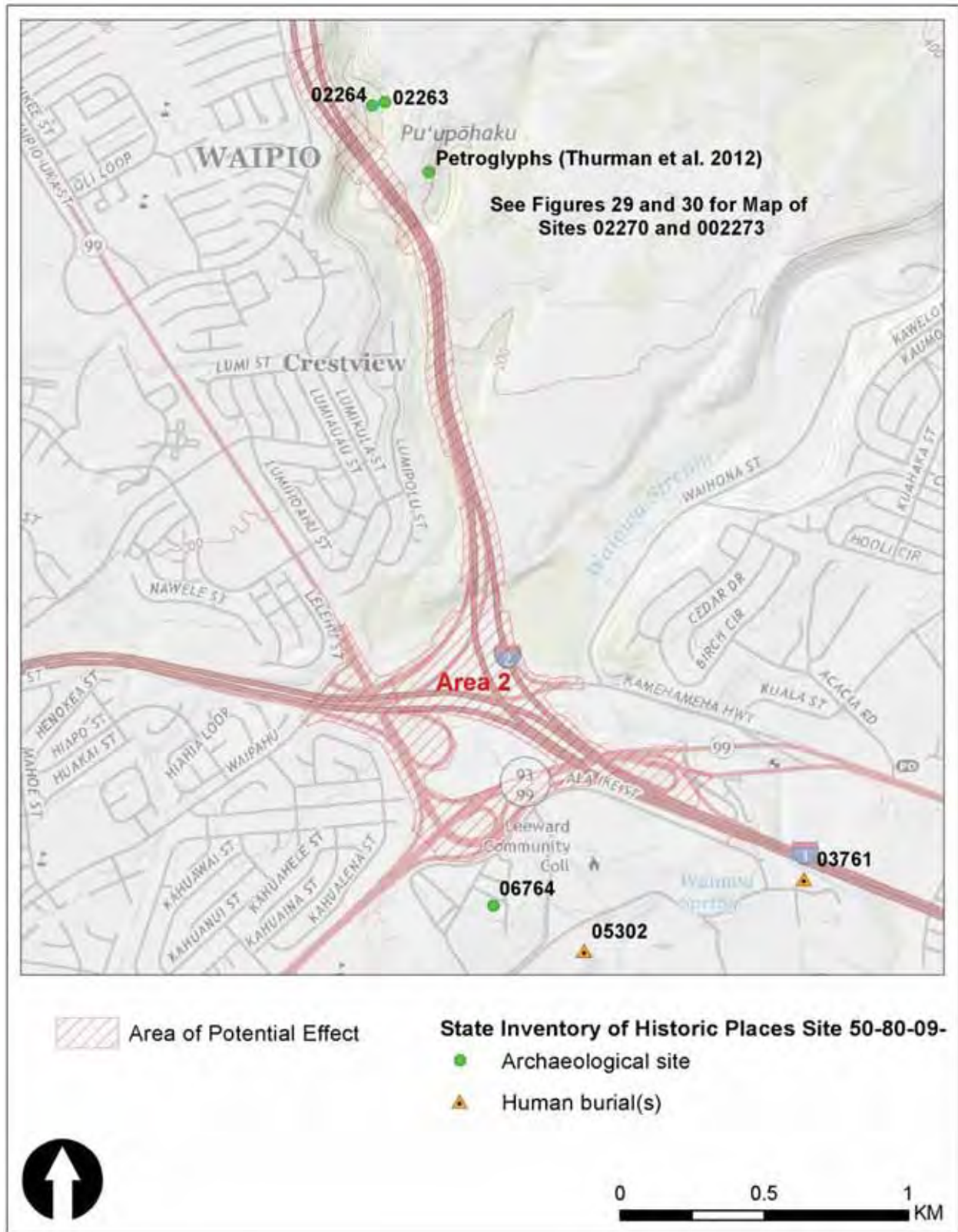


Figure 29. Archaeological Sites and Human Burial Finds near the Area 2 APE (USGS 2017b).

Table 8. List of Previous Archaeological Studies and Burial Finds Near Area 2.

Author & Year	TMK (1)	Nature of Study	SIHP* No. 50-80-09-	Site Description
Barrera 1985	9-4-007 and 9-4-014/ Waikele north of H-1 Fwy	Archaeological Reconnaissance Survey	-	No significant finds
Hammatt and Borthwick 1985	9-6-003:025–028/ South of Leeward Community College	Archaeological Reconnaissance Survey	-	No significant finds
Barrera 1987	9-6-004/ Waiawa Ridge	Archaeological Reconnaissance Survey	-	No sites near Area 2
Bath 1988	9-6-002:033 and 034/ Waiawa Rd	Inadvertent Burial Discovery	03761	Secondary Burial
Pietrusewsky and Mahoney 1988	9-6-002:033 and 034/ Waiawa Rd	Osteological Analysis	03761	Secondary Burial
Goodman and Nees 1991	9-4-006:011, 026; 9-6-004:001, 004, 016; 9-6-005:001–009, 013, 014/ 3,600 Acres east of H-2 Fwy	Archaeological Reconnaissance and Inventory Survey	02263	Rock-shelter complex
			02264	Traditional Hawaiian trail
			02270	Road/Railway system
			02273	Irrigation complex
Chaffee and Anderson 1995	9-6-003:005/ 96-035 Waiawa Road	Archaeological Excavations of Inadvertent Burial Discovery	05302	Coffin burial and tumble pit burial
Jourdane 1995	9-6-003:005/ 96-035 Waiawa Road	Inadvertent Burial Discovery	05302	Coffin burial and tumble pit burial
McGerty and Spear 1995	9-7-023-001 and 9-7-024:006/ 138.5 acres in Pearl City	Archaeological Assessment	-	No historic properties identified.

Hammatt and Chiogioji 1998	9-8-026: var. parcels, 9-8:027:002, 9-8-060:015/ H-1 Hwy from Halawa to the Waiawa IC	Archaeological Assessment	-	No significant finds
Rechtman and Henry 1998	9-4-008:010/ 'Ewa Junction Drum Filling and Fuel Storage Area	Archaeological Reconnaissance Survey	-	No significant finds
Rainalter and Tomonari-Tuggle 2006	9-4-008:010, 023, 025, 9-6-003/ Leeward Community College access road	Archaeological Field Inspection and Literature Search	05302 06764	Coffin and pit burials 'Ewa Junction Drum Filling and Fuel Storage Area
Rasmussen and Tomonari-Tuggle 2006	9-4/ Waiau Fuel Pipeline corridor	Archaeological Monitoring	03761 05302	Secondary Burial Coffin and pit burials
Hammatt 2010	9-1, 9-4, 9-6, 9-7/ Honolulu High-Capacity Transit Corridor	Archaeological Inventory Survey	-	No sites near Area 2
Sroat et al. 2012	9-1, 9-4, 9-6, 9-7/ Honolulu High-Capacity Transit Corridor	Archaeological Inventory Survey	-	No sites near Area 2
Thurman et al. 2012 ¹	9-4-006:011, 026; 9-6-004:001, 004, 016; 9-6-005:001-009, 013, 014/ 3,600 Acres east of H-2 Fwy	Archaeological Inventory Survey	-	Petroglyphs
Monahan 2015	9-6-004:024	Archaeological Preservation Plan	02273	Irrigation complex
Shideler and Hammatt 2018	9-6-003:048/ Leeward Community College	Archaeological Field Inspection and Literature Search	-	No significant finds

*SIHP (Statewide Inventory of Historic Places)

Site 03761. The human remains were covered in rice sacking filled with pillow stuffing. It was speculated that the individuals were Asian based on a skull being wrapped in red fabric (Bath 1988:1). A clear glass disc, possibly from a lantern was also present. The following is a summary from the osteological report by Pietrusewsky and Mahoney (1988):

An unusual assortment of human bones including three adult crania, four adult sacra, ilia of a child and an infant, wrist and ankle bones, first cervical vertebra and upper sternums are described.

Minimally, six individuals are represented, four are adult and two are subadult. The maximum number of individuals may be much higher (N = 18). None of the infracranial remains can be associated with any of the crania. Measurements and non-metric features were recorded in these remains. Morphological characteristics of the cranium and the association of red cloth and a clear glass disk suggest east Asian (possibly Chinese) ancestry [Pietrusewsky and Mahoney 1988:5].

In 1995, two human burials were inadvertently discovered during excavation of a sewer line at the Leeward Community College (Jourdane 1995). The burial site was designated Site 05302. Materials present with the burials included historic period glass bottles, nails, and metal pieces. The first burial consisted of a coffin burial representing one individual, and the second burial represented a minimum of five individuals in a tumbled pit burial. Based on the presence of a Buffalo Nickel dated 1917, the coffin burial post-dates the coin's age. The individuals in the pit burial possibly predated the coffin burial; the coffin may have caused their displacement when it was interred (Chaffee and Spear 1995:8–9). Ethnicity was not determined.

In 1991, an archaeological reconnaissance and inventory survey was conducted on 3,600 acres in Waiawa and Waipi'o Ahupua'a by the Bishop Museum (Goodman and Nees 1991). A portion of this project area was previously surveyed by Barrera (1987), which had identified four sites associated with Oahu Sugar Company. These sites, Sites 01469, 01470, 01471, and 01472, are all over 500 meters from Area 2. The survey by Goodman and Nees (1991) relocated the four sites, and in total identified seventeen historic properties: Sites 01469 to 01472, and 02261 to 02273. Four pre-Contact sites were identified by Goodman and Nees (1991), which included a rockshelter complex, a mound complex, a trail, and a lithic scatter. The remaining 13 sites were associated with historic period plantation and WWII military infrastructure. Four of the sites identified by Goodman and Nees (1991) are located within 500 meters of Area 2.

Two pre-Contact sites are located 60 to 100 meters east of the Area 2 APE (see Figure 29). Site 02263 is a rockshelter complex that comprises three rockshelters, petroglyph panels, and seven terraces. Site 02264 is a traditional Hawaiian trail. Site 02263 and 02264 were recommended for in situ preservation.

Site 02270 is an irrigation complex comprising 35 features. A portion of the site map from the archaeological report is shown in Figure 30. Of the 35 features, Features 3 (Metal Siphon 10), 11 (reservoir), and 18 through 24 (straight ditches) are within 500 meters of Area 2. No further work was recommended for Site 02270.

Site 02273 is a road/railway system comprising 44 features. A portion of the site map from the archaeological report is shown in Figure 31. Of these 44 features, Feature 5.1, an abandoned roadbed, and Features 30, 31, 34, and 36, paved and unpaved roads, are within 500 meters of Area 2. No further work was recommended for Site 02273.

¹ Report not available. Report not submitted to the SHPD. Cited in Kamehameha Schools 2019; citation not listed in reference section of *Āina Inventory*.

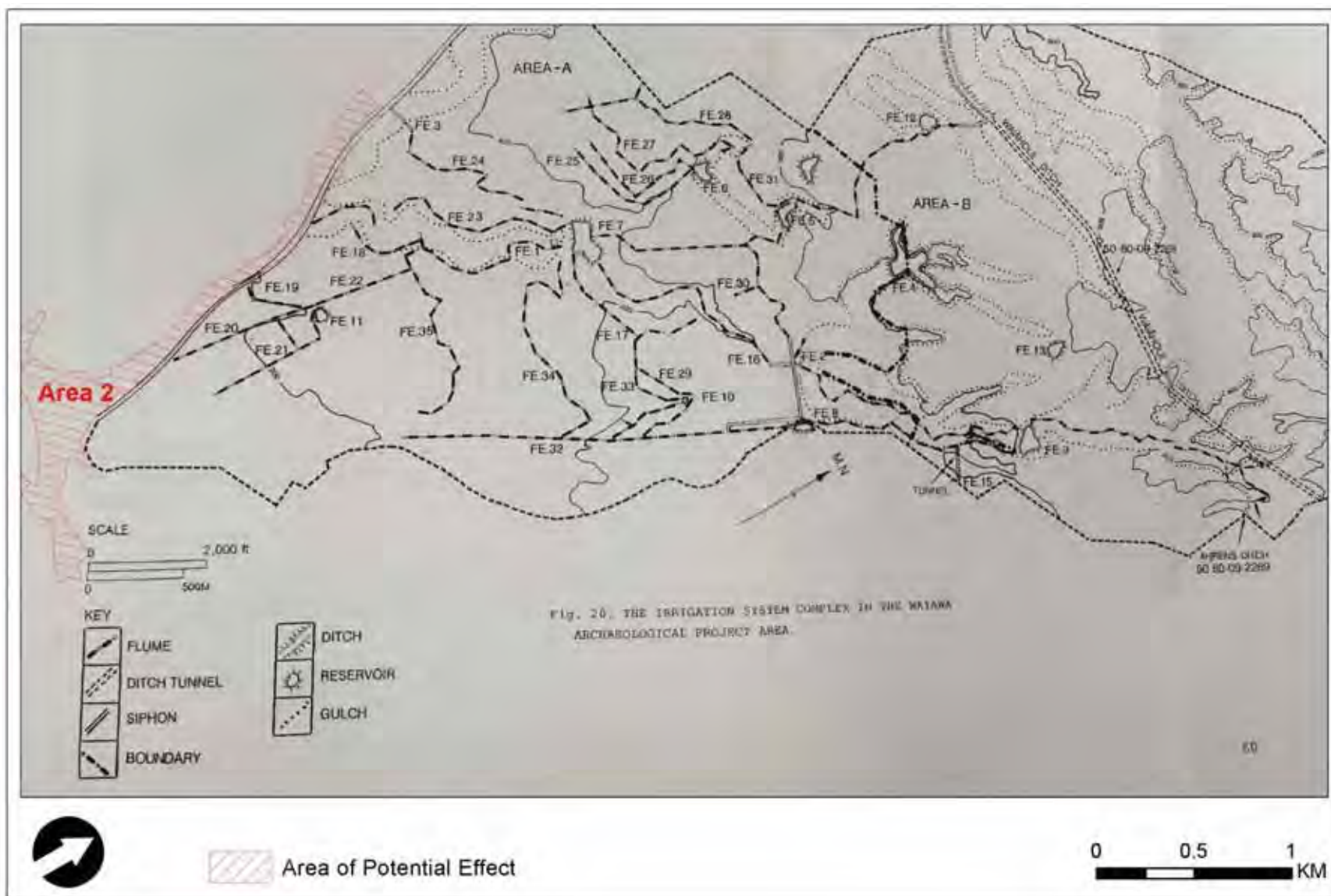


Figure 30. Location of Site 50-80-09-02270 near the Area 2 APE (Goodman and Nees 1991: Figure 20).



Figure 31. Location of Site 50-80-09-02273 near the Area 2 APE (Goodman and Nees 1991:Figure 34).

Additional survey has been conducted within the Goodman and Nee's (1991) project area within the last decade. Cultural Surveys Hawai'i (Thurman et al. 2012²) resurveyed a 1,680 acre-portion of the previously investigated parcel for Kamehameha Schools. One new pre-Contact site was identified. The site comprises three small petroglyphs on rock outcrops in a dry gulch and is located approximately 90 meters east of Area 2 (Kamehameha Schools 2019:172). No SIHP site number has been assigned. In addition to the new survey, a preservation plan was prepared for four features of Site 02273, a road/railroad system (Monahan 2015).

An archaeological assessment was conducted for approximately 138.5 acres to the east of Waiawa IC (McGerty and Spear 1995). It was determined that although there was pre- and post-Contact land use, as well as military activities in the area, no significant historic sites were present.

In 1998, an archaeological assessment was conducted for the Ewa Drum and Fuel Storage Area (Rechtman and Henry 1998). No historic properties were identified. However, a subsequent archaeological field inspection and literature search (Rainalter et al. 2006) and an archaeological inventory survey (Rainalter et al. 2005) for the construction of a proposed second access road for Leeward Community College identified the facility as a historic property. It was designated Site 06764, and after Navy consultation it was concluded that the site was likely eligible for listing on the National Register of Historic Places.

An archaeological assessment was conducted for the corridor along H-1 from Halawa to the Waiawa IC (Hammatt and Chiogioji 1998). No surface archaeological sites were observed. Several historic buildings, including wood-frame houses, the Pearl City Fire Station, and the Pearl City Hongwanji Buddhist temple were identified, but no historic properties were identified in vicinity of Area 2.

Archaeological monitoring was conducted in 2004 along the Waiau Fuel Pipeline corridor from the HECO Barbers Point Tank Farm to the Waiau Generating Station (Rasmussen and Tomonari-Tuggle 2006). The corridor mostly ran parallel to the O.R. & L. right-of-way and was in the vicinity of Sites 03761 (Secondary Burial) and 05302 (Coffin and pit burials). No previously unidentified historic properties were encountered.

An archeological inventory survey was conducted for Construction Phase I (Hammatt 2010) and II (Sroat et al. 2012) of the Honolulu High-Capacity Transit Corridor Project (HHCTCP). The project traversed Waiawa, Manana, Waimano, Waiau, Waimalu, Kalauao, 'Aiea, and Halawa Ahupua'a. No new historic properties were identified near Area 2.

Archaeological literature review and field inspection was carried out for work at a 5.6-acre parking area on the north side of the Leeward Community College (Shideler and Hammatt 2018). It was determined that the project area was not a location of pre- and post-Contact activities. No further work was recommended.

AREA 2 RECONNAISSANCE SURVEY

PCSI archaeologists Keola Nakamura and Katie Shiroma, conducted an archaeological reconnaissance of the Area 2 APE on May 28, 2019. The purpose of the survey was to ensure that no historical or pre-Contact archaeological materials or features were present on the surface. Figure 32 presents photographs of portions of the Area 1 APE. No surface traditional Hawaiian or post-Contact historic properties were observed within the project area during the archaeological reconnaissance survey.

² Report not available. Report not submitted to the SHPD. Cited in Kamehameha Schools 2019; citation not listed in reference section of *Āina Inventory*.



View to West



Facing East

Figure 32. Overview Photograph of the Area 2 APE.

ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

Previous archaeological investigations and historical records indicate that traditional Hawaiian settlement, aquaculture, and intensive agriculture occurred in the lowlands around Pearl Harbor in Waiawa and Waipi'o Ahupua'a. Additionally, the upland areas would have offered forest resources for collecting medicinal plants and *kula* lands for dry land agriculture (Tulchin et al. 2009:34). LCAs in the vicinity of Area 2 were clustered around Waiawa Stream and Pearl Harbor.

Oahu Sugar Company began operations in the vicinity of Area 2 during the nineteenth century. By 1925, lands within and adjacent to Area 2 were under cultivation. Extensive land modifications followed later in the twentieth century when plantation operations ceased and modern urban development spread north from Waipahu town.

All previously identified human burial sites within 500 meters of Area 2 are south of the H-1 Freeway. These sites include Site 03761, a secondary human burial dating to the historic period, and Site 05312, which comprises a historic period coffin burial and a tumble pit burial that includes five individuals. Both sites are nearly 500 meters from Area 2.

Three traditional Hawaiian sites are between 60 and 100 meters from the east side of Area 2 along the H-2 Freeway. Site 02263 is a rockshelter complex that comprises three rockshelters, petroglyphs, and seven terraces. Site 02264 is a traditional Hawaiian trail. These sites were recommended for preservation (see Goodman and Nees 1991). The third site was recorded by Thurman et al. (2012) and consists of three small petroglyphs on rock outcrops in a dry gulch.

A majority of the historic properties in the vicinity of Area 2 are related to the Oahu Sugar Company's activities during the historic period. Site 02270, an irrigation complex comprising 35 features, and Site 02273, a road/railway complex, are spread across a large swath of undeveloped land east of the H-2 Freeway (see Barrera 1987; Goodman and Nees 1991; Monahan 2015; Thurman et al. 2012). None of these sites are within Area 2.

Sugarcane cultivation during the historic period, followed by episodes of grading, leveling, and filling associated with freeway construction most likely destroyed or buried any evidence of both pre- and post-Contact land use within Area 2. Therefore, pursuant to the National Historic Preservation Act, as amended, and its implementing regulations at CFR § 800.5(d)(2), and in accordance with Chapter 6E-8, Hawaii Revised Statutes, and its implementing regulations at HAR §13-275-7(2), a determination of "no historic properties affected" is recommended for work activities in Area 2. No further work (such as archaeological monitoring) is recommended; however, in the event that historic properties (e.g., human remains) are found during project activities, it is recommended that the contractor stop work immediately, protect the find, and notify the SHPD.

AREA 3: H-1– WAIKELE TO PAIWA INTERCHANGE

Area 3 totals 29.68 ac (12.01 ha) and includes the Paiwa IC and the H-1 Freeway to Waikele. Figure 33 shows the location of Area 3 on a 2017 USGS Waipahu Quadrangle Map. Figure 34 presents an aerial image of Area 3. Proposed work, listed in Table 9, includes trenching 2.0 to 3.0 ft (0.6 to 0.91 m) wide and 4.0 to 8.0 ft (1.21 to 2.44 m) deep for installation of conduits and splice cabinets, and trenching 4.0 ft (1.21 m) wide and 15.0 to 25.0 ft (4.57 to 7.62 m) deep for excavations for installation of a single traffic camera pole for a CCTV with a deep foundation.

Table 9. List of Proposed Project Activities in Area 3.

PROPOSED ACTIVITY	ANTICIPATED DEPTH OF GROUND DISTURBANCE
Conduit trenching	4.0 to 8.0 ft (1.21 to 2.44 m)
Splice cabinet installation	4.0 to 8.0 ft (1.21 to 2.44 m)
Traffic camera pole installation for a single CCTV	15.0 to 25 ft (4.57 to 7.62 m)

ENVIRONMENTAL SETTING

Area 3 is within Waikele and Waipi'o Ahupua'a on the leeward side of O'ahu. These two *ahupua'a* extend from the Ko'olau mountain range through the coastal plain to the shoreline at Pearl Harbor. The toponym Waikele translates as "muddy water" (Pukui et al. 1974). In the past, the stream may have appeared muddy because of the presence of upland soils; these soils could have been carried by the Waikakalaua and Kipapa streams as they flowed across the Schofield Plateau before converging at Waikele Stream in the lowland portion of the *ahupua'a* (Hammatt 2010:15).

Area 3 is on the northern border of Waipahu, which was formerly a sugar plantation town. The toponym Waipahu is from Waipahu Spring, "spouting water" (Pukui and Elbert 1986:380), which irrigated many of the traditional *lo'i* on the Waikele flood plain and the rice and sugar cane crops that followed (O'Hare et al. 2011:9). The town and plantation expanded across the *makai* portions of Hō'ae'ae and Waikele Ahupua'a, and the area has since been known as Waipahu. According to a resident of the area:

"Waipahu"...is not a tract of land, but only a spring located in Waikele. The Oahu Railway Company is the culprit responsible for misuse and confusion, when it built its station at Kaohai and called [it] "Waipahu Station" The Oahu [Sugar Plantation] Mill is situated on the plateau of "Keonekuilimalaulaoewa" (the arm-in-arm-plateau of ewa), Waikele [Nawaa 1956 in Sterling and Summers 1978:1].

Area 3 is situated on a moderately sloping to level area approximately 40 to 50 m (131.2 to 164.0 ft) amsl. Soils include Molokai silty clay loam with 3 to 7 percent slopes (MuB), 7 to 15 percent slopes (MuC), and 15 to 25 percent slopes (MuD), and Waipahu silty clay with 2 to 6 percent slopes (WzB) (Soil Survey Staff et al. 2019). The locations of these soil units are shown in Figure 35.

The Molokai series consists of very deep, well-drained soils that formed in material weathered from basic igneous rock (Foote et al. 1972:96–97). Found on uplands, they have been used for pasture, the production of pineapple and irrigated sugarcane, and for wildlife

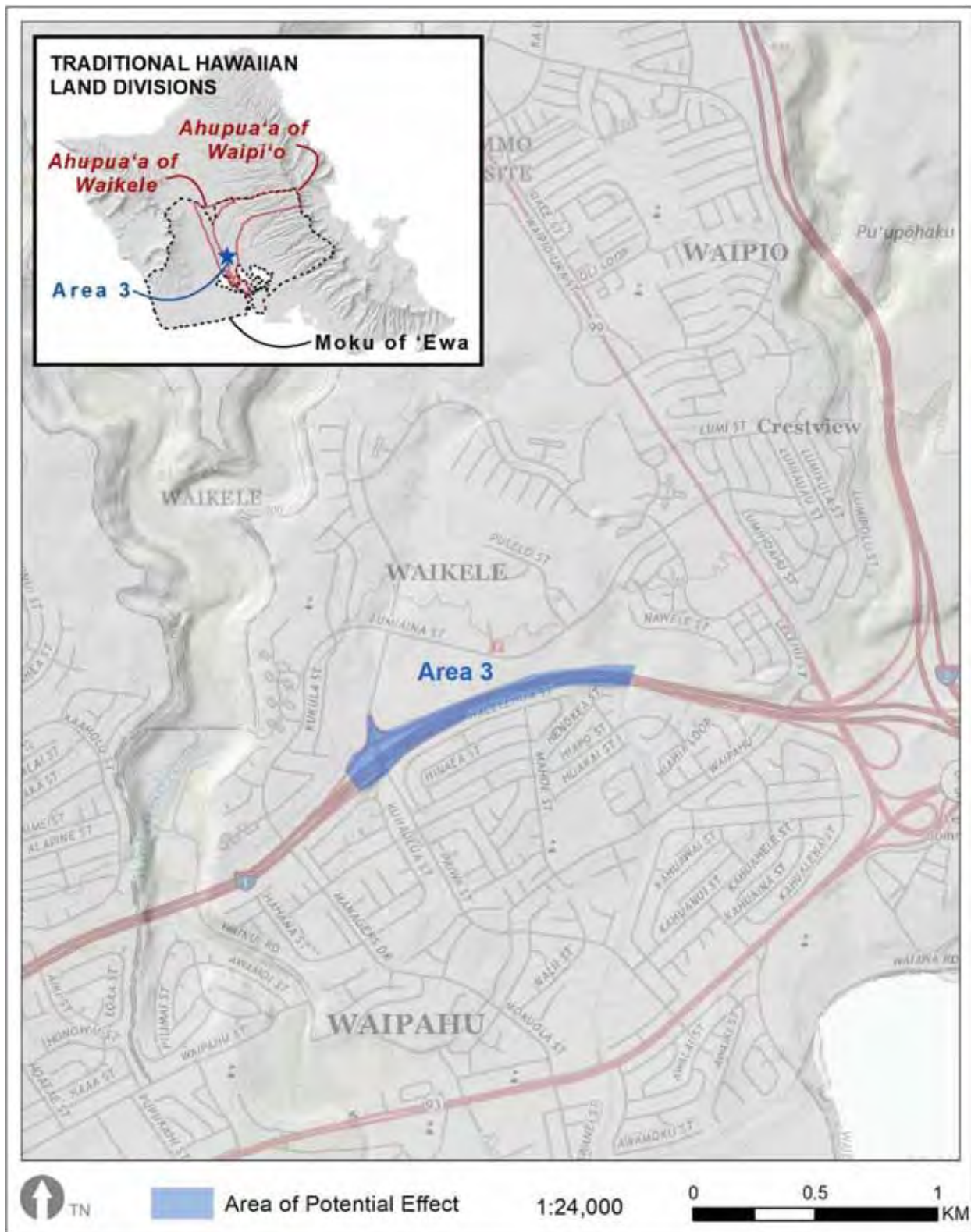


Figure 33. Location of the Area 3 APE on a 7.5-Minute Series USGS Waipahu Topographical Quadrangle (2017b), FMS Phase 3, Unit 1, H-1 Freeway from Waikele to the Paiwa Interchange.

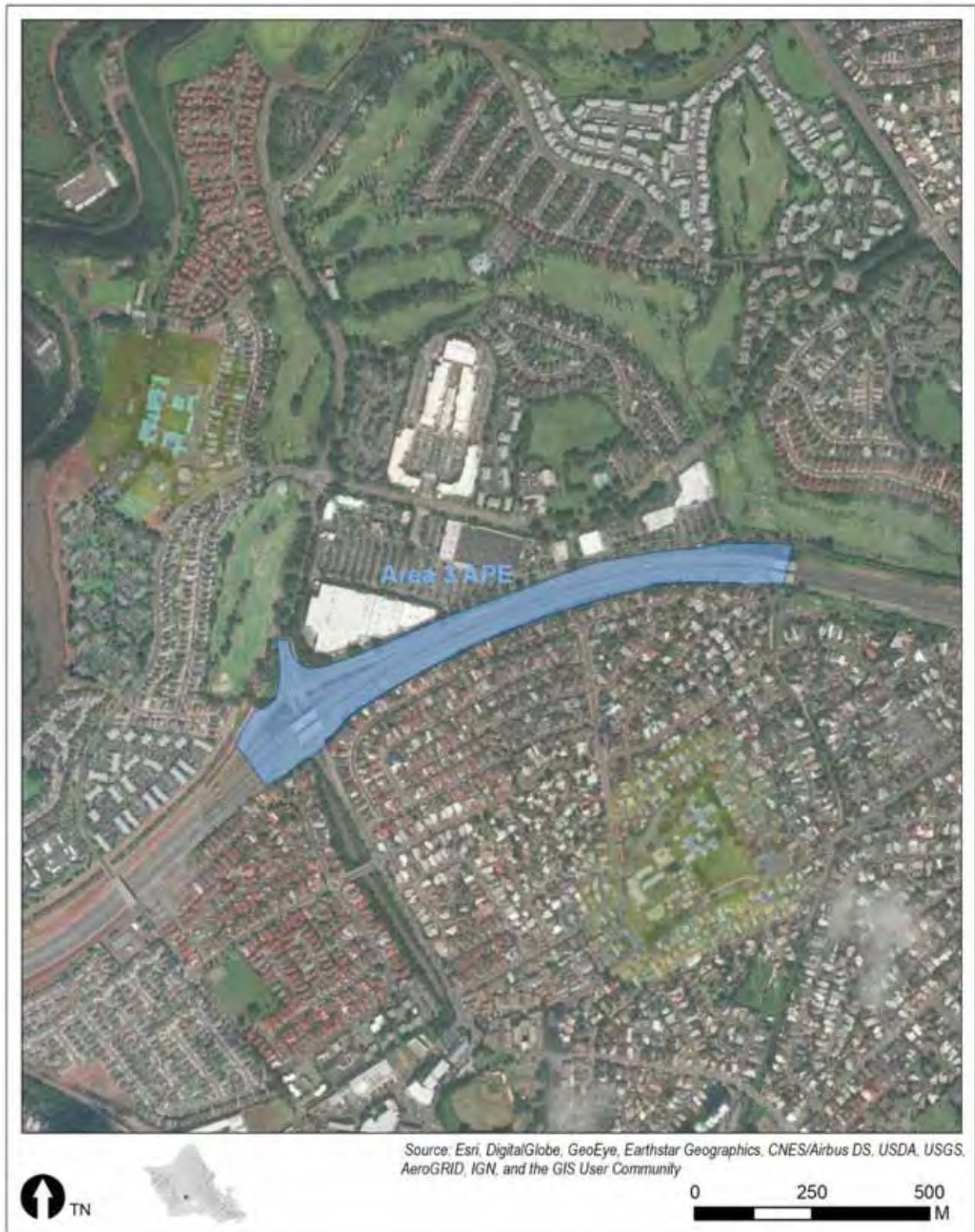


Figure 34. Location of the Area 3 APE on an Aerial Image (Esri et al. 2019), FMS Phase 3, Unit 1, H-1 Freeway from Waikēle to the Paiwa Interchange.

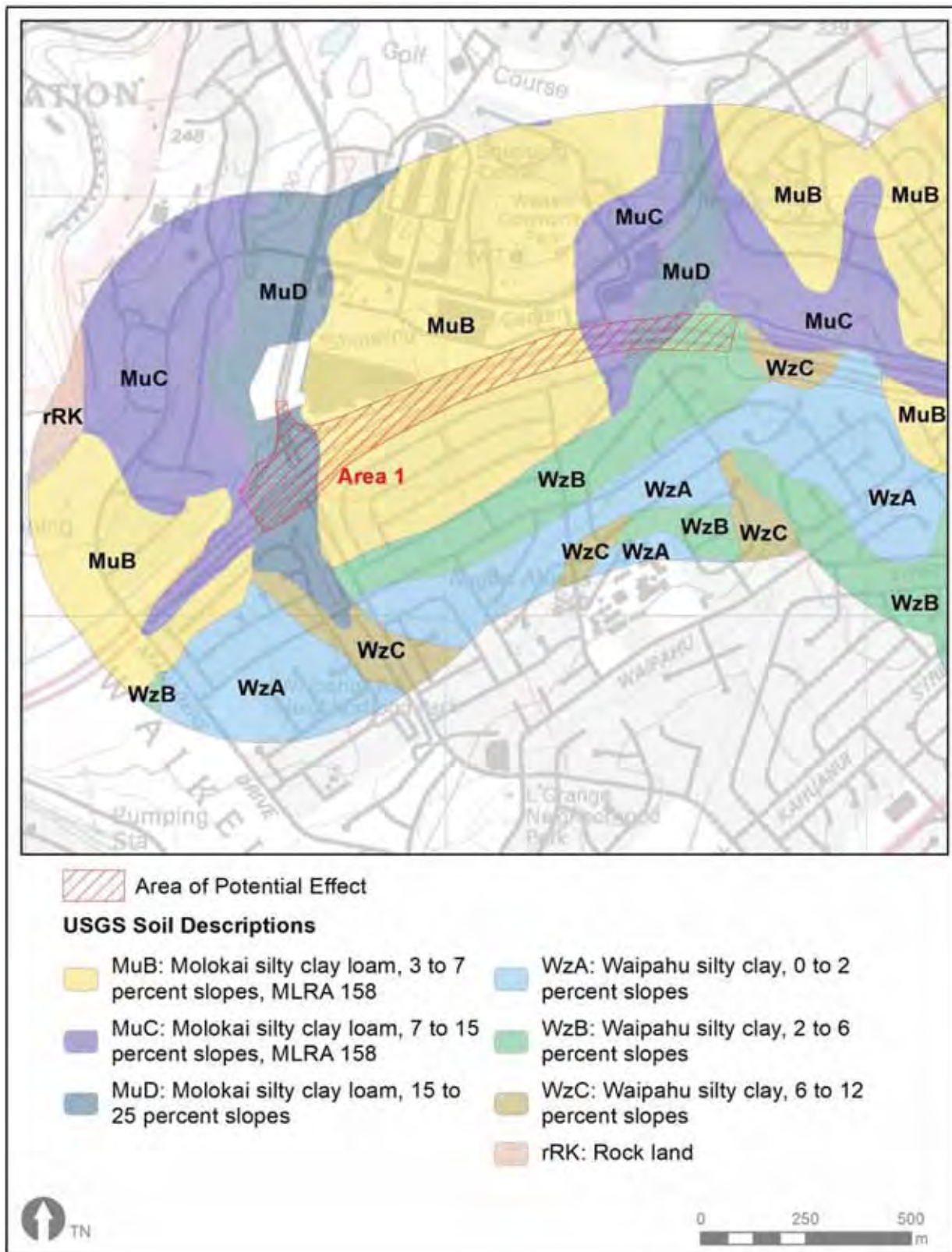


Figure 35. Soil Units within and near the Area 3 APE (Soil Survey Staff et al. 2019; USGS 2017b).

habitat. Vegetation may consist of *kiawe* (*Prosopis pallida*), pitted beardgrass (*Bothriochloa barbinodis perforatus*), feather fingergrass (*Chloris virgata*), lantana (*Lantana camara*), *ilima* (*Sida cordifolia*), and buffelgrass (*Cenchrus ciliaris*).

The Waipahu series are well-drained soils situated on marine terraces. They developed in old alluvium formed from igneous rock. Waipahu silty clay has been used for sugarcane production and residential construction (Foote et al. 1972:135).

Annual rainfall in the vicinity of Area 3 averages about 635.7 mm (25.03 in) per year, with most rain falling in the winter months between November and March (Giambelluca et al. 2013). Area 3 is in a modern built-environment that includes the H-1 Freeway, with commercial and residential developments to the north and south.

HISTORICAL BACKGROUND

This section presents the ethno-historical and archaeological background information of Area 3. Data from the background research were compiled to create an overview of traditional Hawaiian and historic-era land use and subsistence practices. Previous archaeological research is reviewed and anticipated archaeological findings are discussed.

Traditional History

In Waikele, several *wahi pana* are in the *makai* portion of the *ahupua'a*. At Waipahu Spring in Waikele, Ka'ahupahau, the shark goddess of Pearl Harbor, used the spring for bathing (Sterling and Summers 1978:25). Northwest of Waipahu Spring was a rock face called *Pōhaku-pili* (clinging stone), which was said to have been placed there by the Hawaiian pig-god, Kamapua'a (Mauricio 1997:7). Two of the four *heiau* in Waikele, Mokoula and Hapupu, were once located in the lowland area, approximately one kilometer west of Area 3. They were destroyed sometime before the early twentieth century (McAllister 1933:106).

A *mo'ōlelo* from Waikele tells of how the warrior Palila encountered Kamaika'ahui, a man who could take the form of a shark (Fornander 1918:136–153, 372–375). Palila possessed a supernatural war club. He could fly along the club's path by keeping hold of it when thrown. Ahapau, the King of O'ahu, promised to make king anyone who could rid the land of Kamaika'ahui. Kamaika'ahui lived both in Hāna, Maui, and in Waikele. He was a horrible nuisance because in his human form he had the mouth and teeth of a shark on his back. He would secretly transform into a shark form to kill and eat unwary swimmers. When Palila arrived in Waikele, Kamaika'ahui ran to the sea at the sight of the war club. Palila threw his war club repeatedly as Kamaika'ahui tried to escape until finally he killed the shark-man.

A second *mo'ōlelo* from Waikele occurred at Waipahu Spring and concerns a board used for pounding *kapa* (bark cloth) (Sterling and Summers 1978:25–26). A woman in Kahuku on O'ahu left her *kapa* board at a pool after cleaning it one day and it went missing. She searched the windward districts of the island but could not hear its ringing sound. Months later, she traveled to the leeward side of O'ahu:

She went from Kahuku on the Koolau side to Kaneohe where she spent the night. There was no sign of the anvil in Koolau, because the sign she sought was the sound it made. . . . She went on and spent the night at Wailupe but did not find hers. She heard other anvils but they were not hers. The night turned into day and she went on to Kapalama where she slept but did not hear what she sought till she came to Waipahu [Ka Loea Kalaiaina 1899 in Sterling and Summers 1978:25].

Hearing the sound of her own board at Waipahu Spring, she followed it to the uplands of Waikele, where she found a woman beating *kapa* on her board. The woman had found the

board floating at a spring near her home. The explanation for the board's relocation from the windward to the leeward side of the island is the traditional Hawaiian belief that underground streams and passages existed across the island. After reclaiming her board, one version of this story tells how the people of 'Ewa followed her to Kahuku, where the board was wrapped in ti leaves and placed in the pool near her house. Returning to 'Ewa, the people saw that the same board appeared a few days later in Waipahu at the spring. From this story, Waipahu spring was called Ka-puka-na-wai-o-Kahuku, which means "Outlet of water from Kahuku" (Sterling and Summer 1978:26).

Several *mo'ōlelo* of Waipi'o concern the *makai* portion of the *ahupua'a*. On Waipi'o Peninsula there was a cave named Kapuna. A riddle associated with the cave was: "*No Kapuna ka hale noho ia e ke kai*, or "To Kapuna belongs the house, the sea dwells in it" (Sterling and Summers 1978:24).

This cave is on the Waipio side and a sea passage separates Waipio and Waikele and Waikele and Honouliuli. The passage is obstructed by three small islands, a middle one and Manana and Laulaunui. These small islands in the middle of the passage to Honouliuli and inside and outside of these small islands is the sea of Kaihuopalaai [Hawaiian name for West Loch] where mullet lived till they whitened with age [Ka Loea Kālai'āina in Sterling and Summers 1978:24].

A *mo'ōlelo* that is associated with both Waipi'o and Waikele tells of the events that followed a famous battle between Kahahawa'i, the war chief of Kahekili, King of Maui, and the O'ahu ruling chief Kahahana. When O'ahu was invaded, Kahahana, his wife, and a friend fled into the forests and hid for two and a half years (Cordy 2002:19):

Upon the arrival here at Oahu of Kahekili, Kahahana fled, with his wife Kekuapoi, and friend Alapai, and hid in the shrubbery of the hills. They went to Aliomanu, Moanalua, to a place called Kinimakalehua; then moved along to Keanapuaa and Kepookala, at the lochs of Puuloa, and then from there to upper Waipio; thence to Wahiawa, Helemano, and on to Lihue [upper plain of Honouliuli, Ho'ae'ae, and Waipi'o]; thence they came to Poohilo, at Honouliuli, where they first showed themselves to the people and submitted themselves to their care [Thrum 1907:213–214].

Near Wailele at Waikele was one of the last places they hid before Kahahana was betrayed by a local resident at Pō'ohilo, Honouliuli:

... report thereof was made to Kahekili, the king, who thereupon sent Kekuamanoha, elder brother of Kekuapoi, the wife of Kahahana, with men in double canoes from Waikiki, landing first at Kupahu, Hanapouli, Waipio, and had instructions to capture and put to death Kahahana, as also his friend Alapai, but to save alive Kekuapoi. When the canoes touched at Hanapouli, they proceeded thence to Waikele and Hoaeae, and from there to Poohilo, Honouliuli, where they met with Kahahana and party in conference. At the close of the day Kekuamanoha sought by enticing words to induce his brother-in-law to go with him and see the father king and be assured of no death condemnation, and by skilled flattery he induced Kahahana to consent to his proposition, whereupon preparation was made for the return. On the following morning, coming along and reaching the plains of Hoaeae, they fell upon and slew Kahahana and Alapai there, and bore their lifeless bodies to Halaulani, Waipio, where they were placed in the canoes and brought up to Waikiki and placed up in the coconut trees by King Kahekili and his priests from Maui, as Kaopulupulu had been. Thus was fulfilled the famous saying of the Oahu priest in "all its truthfulness" [Thrum 1907:214–215].

After Kahahana died in Waikele during the battle in 1783, the chiefs of Maui ruled O'ahu (Cordy 1981:207). Chiefs from the O'ahu districts of 'Ewa and Kona, including Kahahana's

father, 'Elani, began plotting to murder the new rulers. When the Maui chiefs became aware of the scheme, the primary instigators, the chiefs of Waipi'o, convinced Kahekili that the conspiracy originated on Kaua'i. This is the origin of the phrase, *Waipi'o kīmopU*; "Waipi'o of the secret rebellion" (Pukui 1983:319). Later, the true culprits were revealed, which lead to the following events:

the districts of Kona and 'Ewa were attacked, and men, women, and children were massacred, until the streams of Makaho and Niuhelewai in Kona and of Kahoa'ai'ai in 'Ewa were choked with the bodies of the dead, and their waters became bitter to the taste, as eyewitnesses say, from the brains that turned the water bitter. All the O'ahu chiefs were killed and the chiefesses tortured [Kamakau 1992:138].

This account indicates that Waipi'o would have lost a large portion of its population in the 1780s. Kahekili died in 1794 at Waikīkī and the next year his son, Kalanikūpule, was defeated by Kamehameha at the battle of Nu'uuanu. Kamehameha distributed the land of O'ahu among his followers, causing the displacement of many families:

Land belonging to the old chiefs was given to strange chiefs and that of old residents on the land to their companies of soldiers, leaving the old settled families destitute [Kamakau 1992:376–377].

Traditional Land Use

As noted in the background section for Area 2, 'Ewa was a densely populated area that would have offered abundant resources. Based on Cordy's (1996) study of resources and population, Waikele's large floodplain, irrigated fields along the lower Waikele Stream and the inland Waikakalaua Stream, and the medium-sized fishery along the west shore of West Loch, the *ahupua'a* would have had a medium-sized population relative to the other *ahupua'a* in 'Ewa.

During E. Craighill Handy's survey of remaining agricultural land in the 1930s he wrote of Waikele:

In the flatland, where the Kamehameha Highway crosses the lower valley of Waikele Stream, there are the remains of terraces on both sides of the road, now planted to bananas, beans, cane, and small gardens. For at least 2 miles upstream there were small terrace areas [Handy 1940:82].

Historical Land Use

There were no *kuleana* awards granted in or near Area 3; however, Area 3 is situated within Royal Patent Grant 712 in Waikele Ahupua'a, and LCA 8241 to John Papa 'Ī'i in Waipi'o Ahupua'a, as shown in Figure 36. Royal Patent Grant 712 was a 228.24-hectare parcel retained by Keholo (or Kaholo) in the *'ili* of Ahualii (also known as Aualii or Kahualii). Kaholo had made Claim 5751 for Awakapo 'Ili in Kau, Hawaii, but relinquished that claim in order to keep the 1/3 of Ahuaili the government had interest in.

A 1902 map, shown in Figure 37, indicates Area 3 was grazing land (outlined in orange), while taro or rice was being cultivated to the south (shown in blue). At the end of the nineteenth century, as with Waipi'o and Waiawa, the *lo'i* in the *makai* portion of Waikele were converted to rice fields, while *mauka* lands were under pineapple and sugar cultivation (Tulchin et al. 2009:17; Conde and Best 1973:313–317).

The Oahu Sugar Company began operations in Area 3 in the late 1890s. Figure 38 shows a map of the company's sugarcane fields with railroads and roadways crossing Area 3. In the mid-twentieth century, residential areas south of Area 3 began to expand north toward the H-1 Freeway. An aerial photograph from 1978, presented in Figure 39, shows sugarcane fields



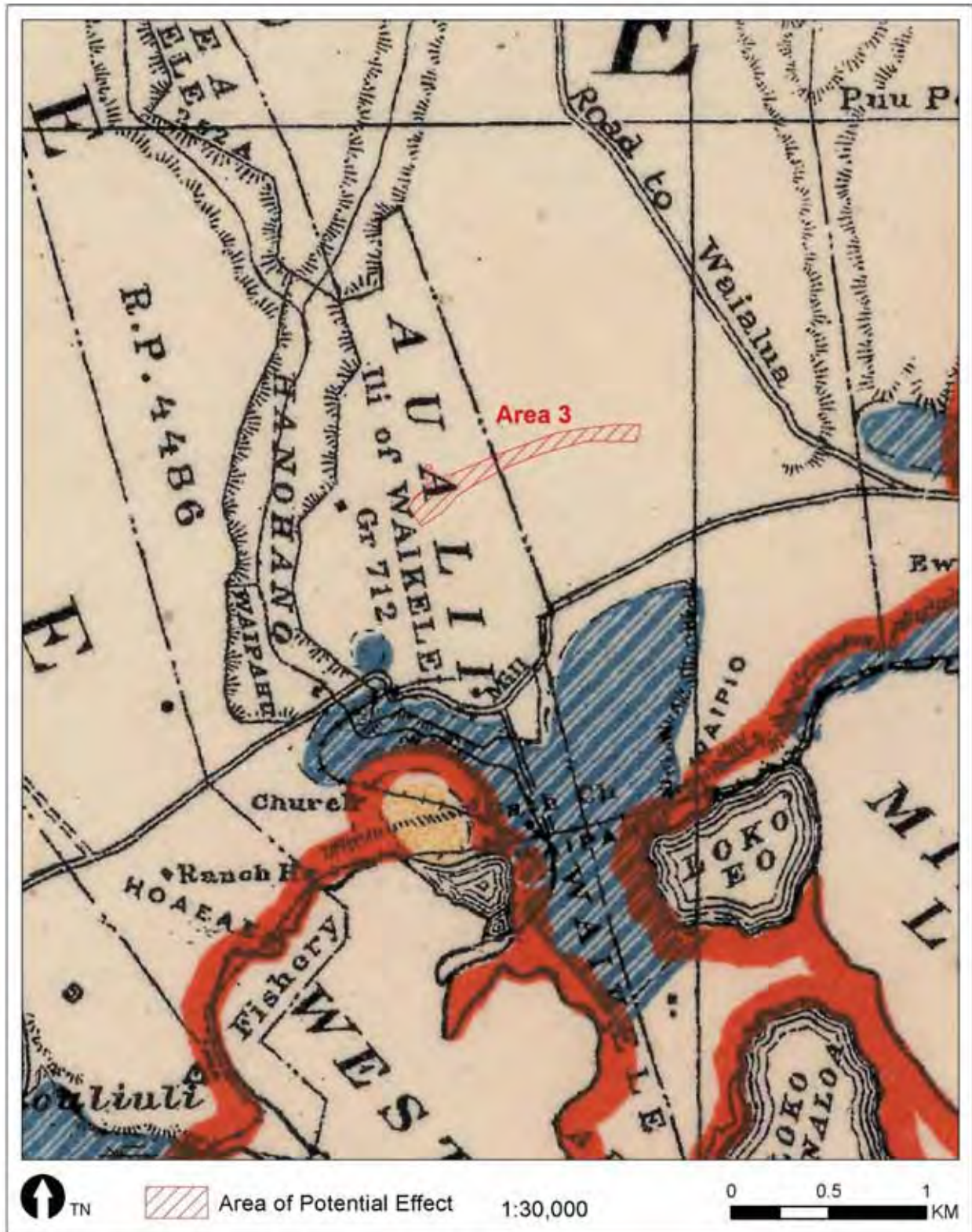


Figure 37. Portion of 1902 Map Showing the Area 3 APE within Grazing Land (Donn 1902).

Figure 38. Portion of ca 1920 Map Showing the Area 3 APE within Oahu Sugar Company Fields (Monsarrat ca 1920).

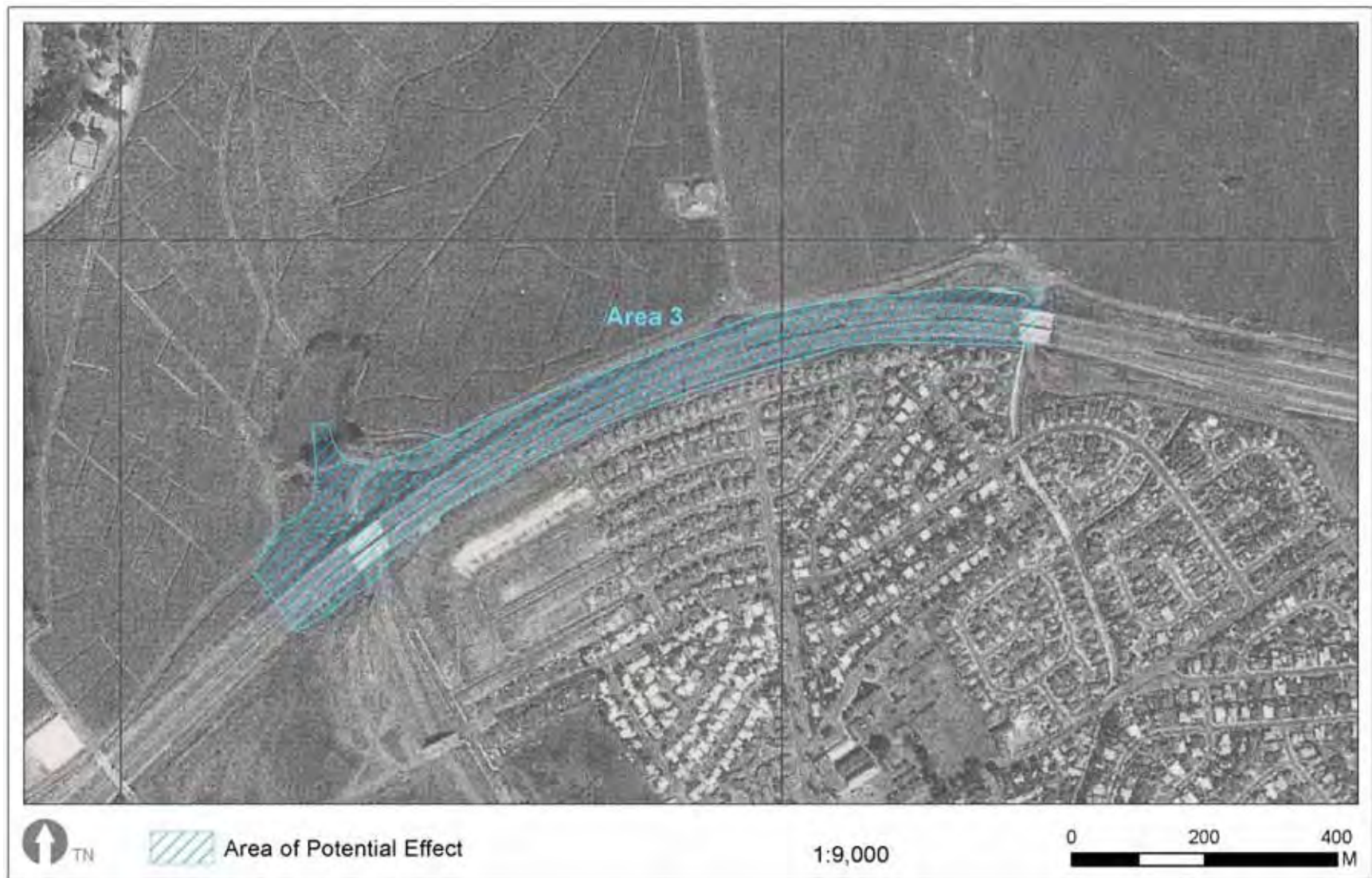


Figure 39. Portion of an Aerial Photograph Dated 1978 Showing Sugarcane Fields and Residential Developments Bordering the Area 3 APE (USGS 1978).

on the north side of the freeway and residential developments bordering the south side of the newly constructed H-2 Freeway. Since then, the land on the north side of Area 3 has been transformed into a retail shopping complex.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Few archaeological investigations have been conducted in the immediate vicinity of Area 3. Previous work has included archaeological reconnaissance and inventory survey. No inadvertent discoveries of human remains have occurred, and no archaeological sites have been identified within 500 m of Area 3. Figure 40 shows the locations of previous archaeological investigations and a summary of these investigations is presented in Table 10.

The earliest archaeological investigation near Area 3 was conducted by McAllister (1933) in the early 1930s. No archaeological sites were recorded in the vicinity. He did note that several sites in Waikele had been destroyed by sugarcane cultivation and development in Waipahu, including a *heiau* approximately one kilometer to the southwest of Area 3.

In 1985, Barrera (1985) carried out an archaeological reconnaissance survey in Waikele. The survey covered approximately 237 ha immediately north of Area 3. Findings indicated that sugarcane agriculture had removed all evidence of past land use.

In 2000, archaeological inventory survey was conducted in an area measuring 16 ha located west of Managers Drive and south of H-1 Freeway in Waipahu (Hammatt et al. 2000). All identified historic properties were over 500 meters from Area 3.

An archaeological and cultural assessment was carried out south of Area 3 for Waipahu Drainage Improvements (Hammatt et al. 2004). The study area measured approximately 30 acres and was entirely urban. No significant cultural resources were identified.

In 2009, an archaeological inventory survey was carried out along six kilometers of road corridor in Waikele and Waipi'o Ahupua'a (Tulchin et al. 2009). A majority of the project area consisted of asphalt paving or dirt roads, along with abandoned fields. One historic property (Site 06959) was identified, which is associated with Historic Plantation era irrigation infrastructure; however, this site is located more than two kilometers north of Area 3.

AREA 3 RECONNAISSANCE SURVEY

PCSI archaeologists Keola Nakamura and Katie Shiroma, conducted an archaeological reconnaissance of the Area 3 APE on May 28, 2019. The purpose of the survey was to ensure that no historical or pre-Contact archaeological materials or features were present on the surface. Figure 41 presents photographs of portions of the Area 3 APE. No surface traditional Hawaiian or post-Contact historic properties were observed within the project area during the archaeological reconnaissance survey.

ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

Previous archaeological investigations and historical records indicate that traditional Hawaiian settlement, aquaculture, and intensive agriculture in Waikele and Waipi'o Ahupua'a occurred in the lowlands around streams, such as Waikele, and around Pearl Harbor. There were no *kuleana* awards made in the vicinity of Area 3 and this portion of the two *ahupua'a* was unlikely to have been heavily used during the pre-Contact and early post-Contact periods due to the distance from the coast and freshwater streams.

During the nineteenth century, the project area was used for grazing livestock. Then in the late 1890s, Oahu Sugar Company began operations in Waikele and Waipi'o. By 1925, Area

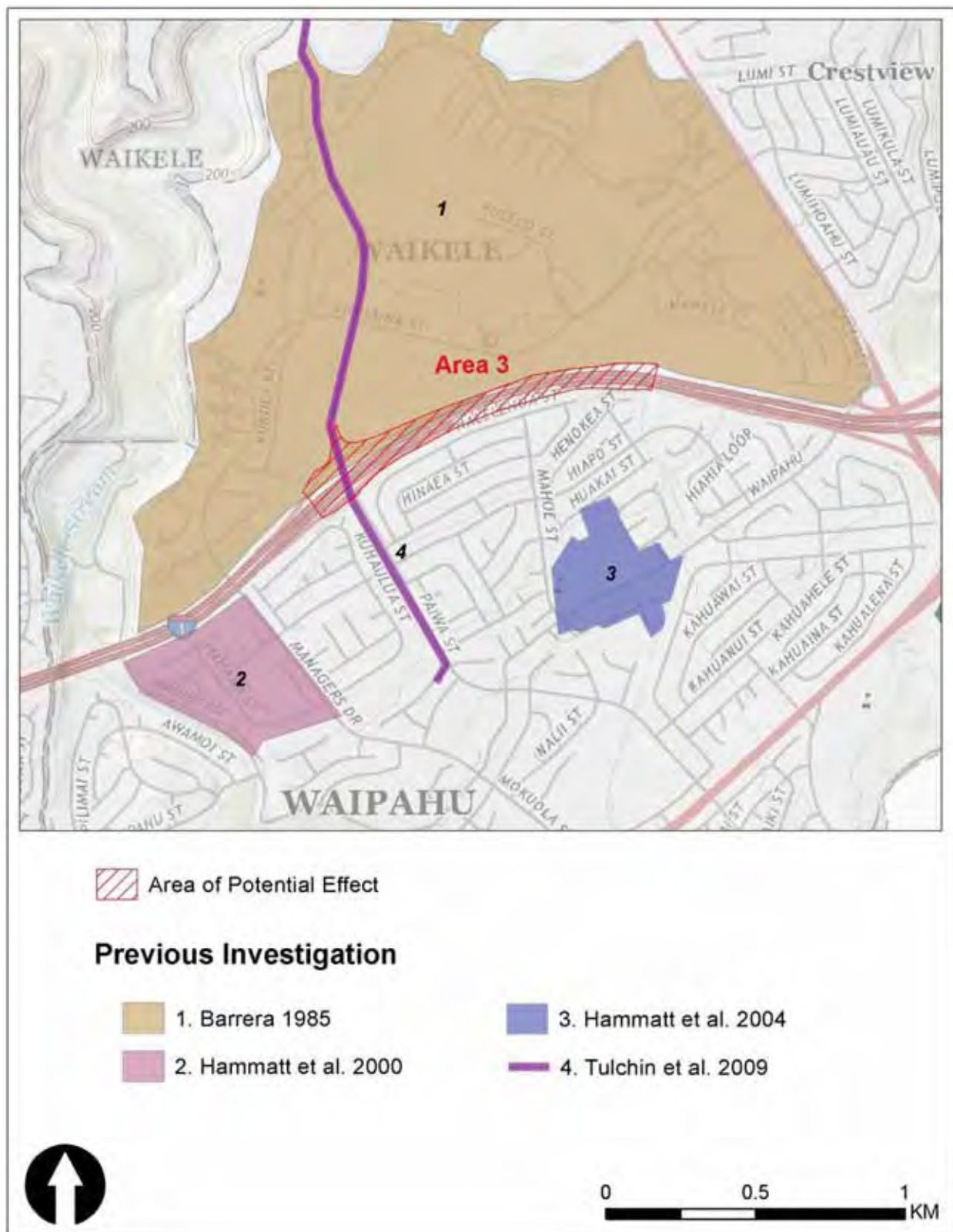


Figure 40. Previous Archaeological Investigations near the Area 3 APE (USGS 2017b).



View to Northeast



View to North.

Figure 41. Overview Photographs of the Area 3 APE.

Table 10. List of Previous Archaeological Studies near Area 3.

Author Year	TMK (1)	Nature of Study	SIHP* No. 50-80-09-	Site Description
McAllister 1933	<i>Makai</i> portions of Waikele and Waipi'o	Island-wide Archaeological Survey	-	No sites near Area 3
Barrera 1985	9-4-007:var. & 9-4-014:var./ Waikele north of H-1 Fwy	Archaeological Reconnaissance Survey	-	No significant finds
Hammatt et al. 2000	9-4-002:005/ 16 acres south of H-1 Fwy, west of Managers Dr.	Archaeological Inventory Survey	-	No sites near the Area 3
Hammatt et al. 2004	9-4-009, 9-4-059:72-74/ Waipahu Town	Archaeological and Cultural Assessment	-	No significant finds
Tulchin et al. 2009	9-4-002:024, 9-4-005: por. 074, 9-4-006: por. 005, 9-4-007, 011,013, 014, 015, 017, 020, 026,160,& 9-4-096: 149	Archaeological Inventory Survey	-	No sites near Area 3
*SIHP (Statewide Inventory of Historic Places)				

Chapter 6E-8, Hawaii Revised Statutes, and its implementing regulations at HAR §13-275-7(2), a determination of “no historic properties affected” is recommended for work activities in Area 3. No further work (such as archaeological monitoring) is recommended; however, in the event that historic properties (e.g., human remains) are found during project activities, it is recommended that the contractor stop work immediately, protect the find, and notify the SHPD.

SUMMARY OF FINDINGS

Areas 1, 2, and 3 of the FMS project, Unit 1, are all locales that have been subject to historic and modern urban development, including freeway and urban roadway construction. Area 1 overlaps within portions of the fishpond Loko Weli (Site 00075), LCA 818 and its fishpond Panahana, and LCA 10498. The area was also heavily used during the late historic period for industrial activities and it is adjacent to the former Kalihi Hospital and Detention Station. Area 2 is adjacent to Waiawa Stream, which was also the site of *kuleana* awards containing *pahale* and *loK*. During the late historic period and into the modern era Area 2 was cultivated in sugarcane. Area 3 is unlikely to have been intensively used until the late historic

This Page Left Blank Intentionally