

**FINAL ARCHAEOLOGICAL INVENTORY SURVEY REPORT
FOR SEVERAL PARCELS OF LAND SITUATED WITHIN
WAIKAPŪ AHUPUA`A; WAILUKU DISTRICT
PŪ`ALI KOMOHANA MOKU**

**TMK: [2] 3-6-002:003; [2] 3-6-004:003, [2] 3-6-004:006;
and [2] 3-6-005:007**

ISLAND OF MAUI

FOR: Waikapū Partners LLC., (msummers@planningconsultantshawaii.com

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***ARCHAEOLOGICAL SERVICES HAWAII, LLC.,
POB 1015; PU`UNĒNĒ, HI 96784***

"Protecting, Preserving, Interpreting the Past, While Planning the Future"

EXHIBIT " 32 "

EXECUTIVE SUMMARY

At the request of Waikapū Partners, LLC, of 1670 Honoa'pi'ilani Highway, Wailuku, HI 96793; Archaeological Services Hawaii (ASH) of Makawao, conducted an archaeological inventory survey (AIS) on an approximate 503.0 acre parcel in Waikapū *ahupua`a*, Pū`ali Komohana *Moku* (traditional district), Wailuku District, Island of Maui (TMK [2] 3-6-002:003 por; [2] 3-6-004:003 por, [2] 3-6-004:006; and [2] 3-6-005:007). The survey was performed in accordance to the rules and regulations set forth in the Hawaii Administrative Rules (HAR) §13-276.

Waikapū Partners landholdings total 1576 acres; however, only approximately 503 acres of the 1576 acres will be developed and thus included in the current AIS. The remaining acreage, located in a portion of TMK [2] 3-6-002:003 and [2] 3-6-004:003, is currently in sugarcane or small scale agriculture and will remain within the State Land Use Agricultural District. In the event future development is proposed in this remaining agricultural land, an AIS may be warranted under HAR 13-276, as well as a District Boundary Amendment (DBA).

Archaeological procedures were conducted intermittently from February through June 2013 by supervisor Ms. Diane Guerriero (B.A.) and archaeological personnel Ms. Rochelle Barretto. Overall supervision and coordination was performed by Ms. Lisa Rotunno-Hazuka (B.A.) and the Principal Investigator was Mr. Jeffrey Pantaleo (M.A.).

During the AIS procedures, five historic properties designated Sites 50-50-04-5197 and 50-50-04-7881 Features 1-18 through Site 50-50-04-7884 Features 1-3 were documented and consisted of features related to historic agriculture, historic habitation and World War II defensive positions. Sites 7881 Features 1-18 through 7884 Feature 1 were identified within Parcel 3 Mauka. Site 5197 extended north south and was a partial boundary between Parcels 6 and 7 and bisects Parcel 3 Waena east west. Site 7884 Feature 2 was positioned in Parcel 6 and Site 7884 Feature 3 was located in Parcel 7. Site 5197 was a Plantation ditch in good condition and comprised of a portion of the Waihe'e Ditch assessed a significance of Criteria "a" and "d"; Site 7881 consisted of a Plantation irrigation complex significant under Criteria "a", "d" and possibly "c" and included water containment, transportation and diversion features designated Features 1-18. Features 1-18 were in good condition and consisted of concrete lined ditches, sluice gates and dirt culverts with concrete lined headwalls. Site 7882 was in fair condition and consisted of a remnant historic rock retaining wall currently utilized for slope retention purposes for the concrete irrigation ditch (Site 7881 Feature 2); however it may have formerly functioned as an agricultural terrace for planting. Site 7883 comprised a military bunker in good condition from World War II that was utilized as a horizon aviation observation bunker and assessed an initial significance of

Criteria “a”, “c” and “d”. Site 7884 Features 1-2 were historic artifact scatters in a secondary context representative of historic habitation from 1940’s to 1950’s (Feature 1) and 1900’s to 1950’s (Feature 2) and Site 7884 Feature 3 identified during backhoe testing is a remnant marginal refuse deposit from the late 18th to early 19th century. Due to the lag time from the date of manufacture, to distribution and arrival in the Hawaiian Islands, the deposit likely dates to the early 19th century. Site 7884 is a marginal, disturbed site assigned a significance of Criterion “d”.

Based on the proposed development plans, Site 5197 Waihe`e Ditch will remain in operation, although portions of it will be buried during development. Site 50-50-04-7881 Features 1-18, a Plantation irrigation complex positioned along the northern boundary of the project area will not be affected by development and will continue to be utilized for agricultural purposes. Thus, this site will be preserved in place and the form of preservation will be appropriate cultural reuse. Site 7882, the historic retaining wall is located outside the proposed development area to the northeast and will remain in place. No further work is warranted for this feature. Site 7883, the WWII bunker will be preserved in place and the form of preservation is conservation (avoidance and protection) and interpretation. No further inventory level work is recommended for Site 7884 Features 1-3, the historic artifact scatters and refuse deposit; however the localities where these features were identified will be monitored during ground altering activities.

In the event that future development is proposed that may affect historic properties, Sites 50-50-04-5197, 7881 and 7883, currently recommended for preservation, additional mitigation may be warranted and comprised of architectural inventory procedures. However, no mitigation procedures shall be implemented without consultation and concurrence by SHPD.

The overall development plans will have an effect on significant historic properties. Thus, pursuant to §13-284-7, the effect determination is “Effect, with agreed upon mitigation commitments” and the mitigation commitments consist of (1) data recovery in the form of archaeological monitoring, (2) preservation for Sites 50-50-04-7881 and 7883, and (3) if Site 50-50-04-5197 is impacted, it will be further documented through architectural documentation; the nature of the architectural documentation will be determined in consultation with the SHPD.

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INTRODUCTION

At the request of Waikapū Partners, LLC, of 1670 Honoa'pi'ilani Highway, Wailuku, HI 96793; Archaeological Services Hawaii (ASH) of Makawao, conducted an archaeological inventory survey (AIS) on an approximate 503.0 acre parcel in Waikapū *ahupua`a*, Pū`ali Komohana *Moku* (traditional district), Wailuku District, Island of Maui (TMK [2] 3-6-002:003 por; [2] 3-6-004:003 por, [2] 3-6-004:006; and [2] 3-6-005:007) (Figures 1-11). The survey was performed in accordance to the rules and regulations set forth in the Hawaii Administrative Rules (HAR) §13-276.

Waikapū Partners landholdings total 1576 acres; however, only approximately 503 acres of the 1576 acres will be developed and thus included in the current AIS. The remaining acreage, located in a portion of TMK [2] 3-6-002:003 and [2] 3-6-004:003, is currently in sugarcane or small scale agriculture and will remain within the State Land Use Agricultural District (Figures 1 and 6). In the event future development is proposed in this remaining agricultural land, an AIS may be warranted under HAR 13-276, as well as a District Boundary Amendment (DBA) from agricultural to urban.

The scope of the work included a surface survey and subsurface testing within 503 acres to determine presence/absence, extent, and significance of historic properties that may be adversely affected by proposed development. The survey also assisted in formulating future mitigation measures for identified historic properties.

The proposed improvements include a combination of single and multi-family residential units, and commercial and civic properties. Agriculturally classified lands will be rezoned to urban and rural and developed creating a “complete country community” (see Figure 7). The majority of the project area has undergone compounded disturbances from previous commercial and small scale agriculture activities, animal husbandry and various enterprises related to the Maui Tropical Plantation (see Figure 5). Based on the presence of numerous *kuleana* lands (Land Commission Awards-LCA) and Grants, together with archival research and prior archaeological studies; the area was intensively settled from the pre-Contact period through the historic era (see Figures 2-4). Due to these expansive alterations across the subject area, subsurface investigations focused primarily in the former LCA boundaries, with a representative sampling throughout the parcel.

The survey resulted in the identification of five historic properties designated Sites 50-50-04-5197 and 50-50-04-7881 through 50-50-04-7884. These sites were comprised of features related to historic agriculture, historic habitation and World War II defensive positions (Figure 8). Site 5197 was a Plantation ditch comprised of a portion of the Waihe`e Ditch; Site 7881 consisted of a Plantation

irrigation complex comprised of water containment, transportation and diversion features designated Features 1-18. Features 1-18 included concrete lined ditches, sluice gates and dirt culverts with concrete lined headwalls. Site 7882 was a section of an historic rock retaining wall utilized for slope retention purposes or as an agricultural terrace and Site 7883 was an historic military site comprised of a World War II bunker utilized as a horizon aviation observation bunker. Site 7884 is a scatter of historic domestic artifacts and a refuse deposit from historic habitation in the area. These scatters and deposit were secondarily deposited at three localities and designated Features 1- 3. The subsurface testing program, consisting of 150 backhoe trenches, was primarily negative for buried cultural remains.

PROJECT AREA

The project area, comprised of approximately 503 acres is located on the northwestern alluvial slopes of the West Maui Mountains in Waikapū *ahupua`a* (Figure 1). It straddles Honoa`pi`ilani Highway in the area of the Maui Tropical Plantation, south of Waikapū Town proper (see Figures 2-7), and is bounded by Waikapū Stream to the north, portions of the Sandalwood Golf Course, an old rock Quarry (designated as “Pit” on TMK) and sugarcane fields to the south, sugarcane fields to the east, and a reservoir and the West Maui Forest Reserve to the west.

The project area steeply slopes from west to east ranging in elevation from 1080 ft. amsl to 230 ft. amsl. It contains a portion of the Waihe`e Ditch (Site 50-50-04-5197), extending north to south through the central portion of the project area, and a former ditch, Waikapū Ditch South (aka South Side Waikapū Ditch), extending west to east in the northwestern portion of the subject parcel. Another ditch in the vicinity of the project area is Everett Ditch which extends from the upper Waikapū valley on the north side of Waikapū Stream and eventually curves to the north following along the base of Wailuku Heights Subdivision (see Figures 1 and 1a). The USGS map also shows an un-named ditch, parallel to Everett Ditch, on the south side of Waikapū Stream that extends down slope, transporting water to the reservoir just above the project area to the northwest. This un-named ditch is also identified as Waikapū Ditch South on other maps such as the USDA soil survey. As exhibited on Figure 1a, Waikapū Ditch proper is located further north along Ī`ao Stream, and hence was also referred to as North Side Waikapū Ditch.

The project area extends to the southern edge of the Waikapū Stream. The proposed development will remain at least 100 feet from the stream to avoid the sugarcane access road and the steep to moderate slopes down to the stream’s edge. This buffer zone was mandated in 1992 by the State Land Use District Boundary Review for Maui, Molokai, Lanai, Honolulu where a 100-ft corridor on both sides of Waikapū Stream was placed into a Conservation District (Office of State Planning: 31).

As exhibited on Figure 4, approximately 95% of the project area has been disturbed by continuous sugar cane cultivation and the Maui Tropical Plantation with associated agricultural uses. The subject project area was divided into five zones corresponding to four TMK numbers, with the exception of TMK [2] 3-6-004:003, which was subdivided into two areas. These five zones consist of Parcel 3 Mauka and Parcel 3 Waena in TMK [2] 3-6-004:003; Parcel 3 Makai in TMK [2] 3-6-002:003; Parcel 6 in TMK [2] 3-6-004:006; and Parcel 7, which constitutes the Maui Tropical Plantation area at TMK [2] 3-6-005:007. These zones are further discussed below and shown on Figures 1, 2, 6 and 7.

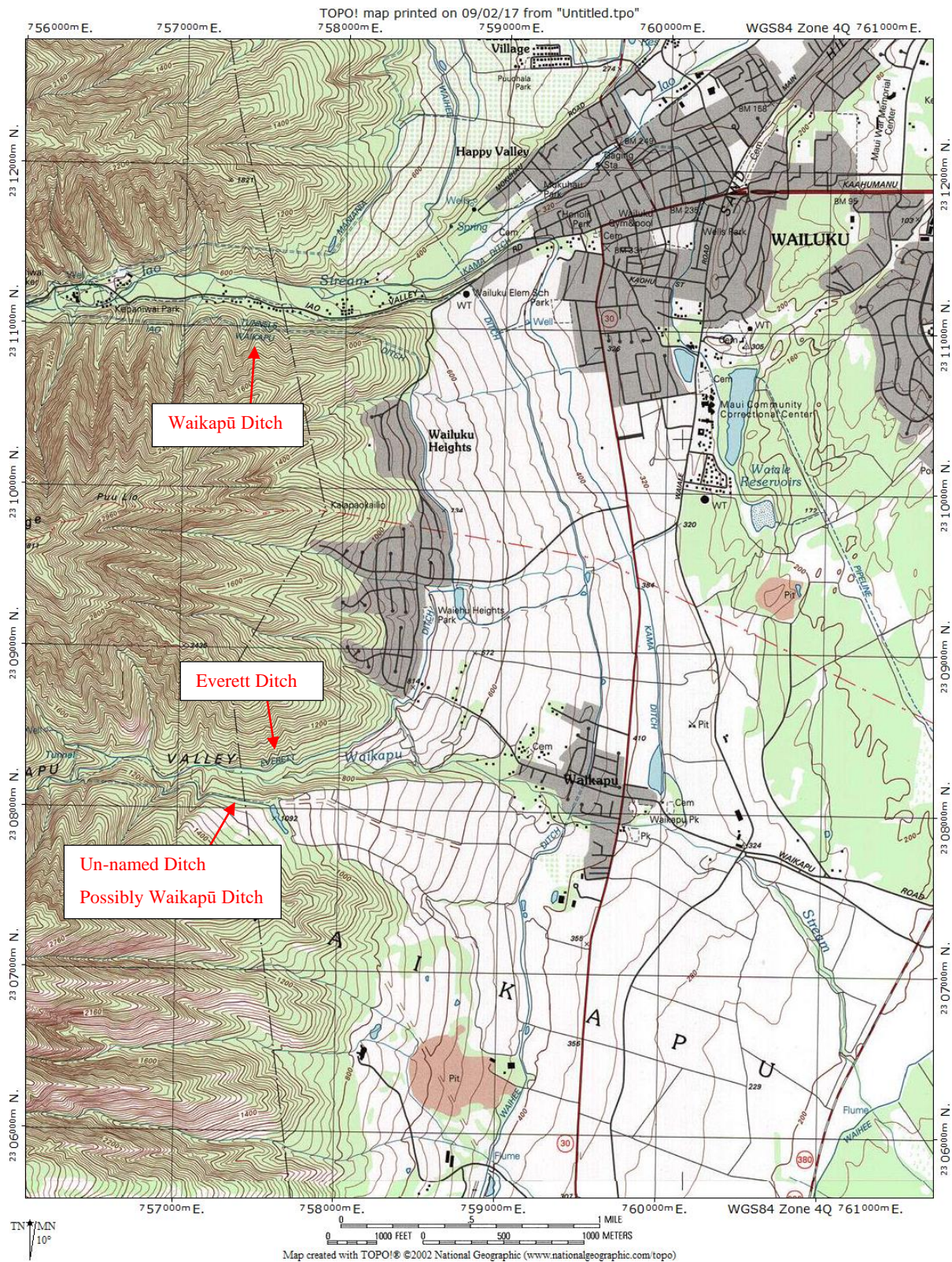


Figure 1a. USGS Wailuku Quadrangle Map Showing Waikapū Ditch, Everett Ditch and Un-named Ditch in Ī'ao and Waikapu Valleys

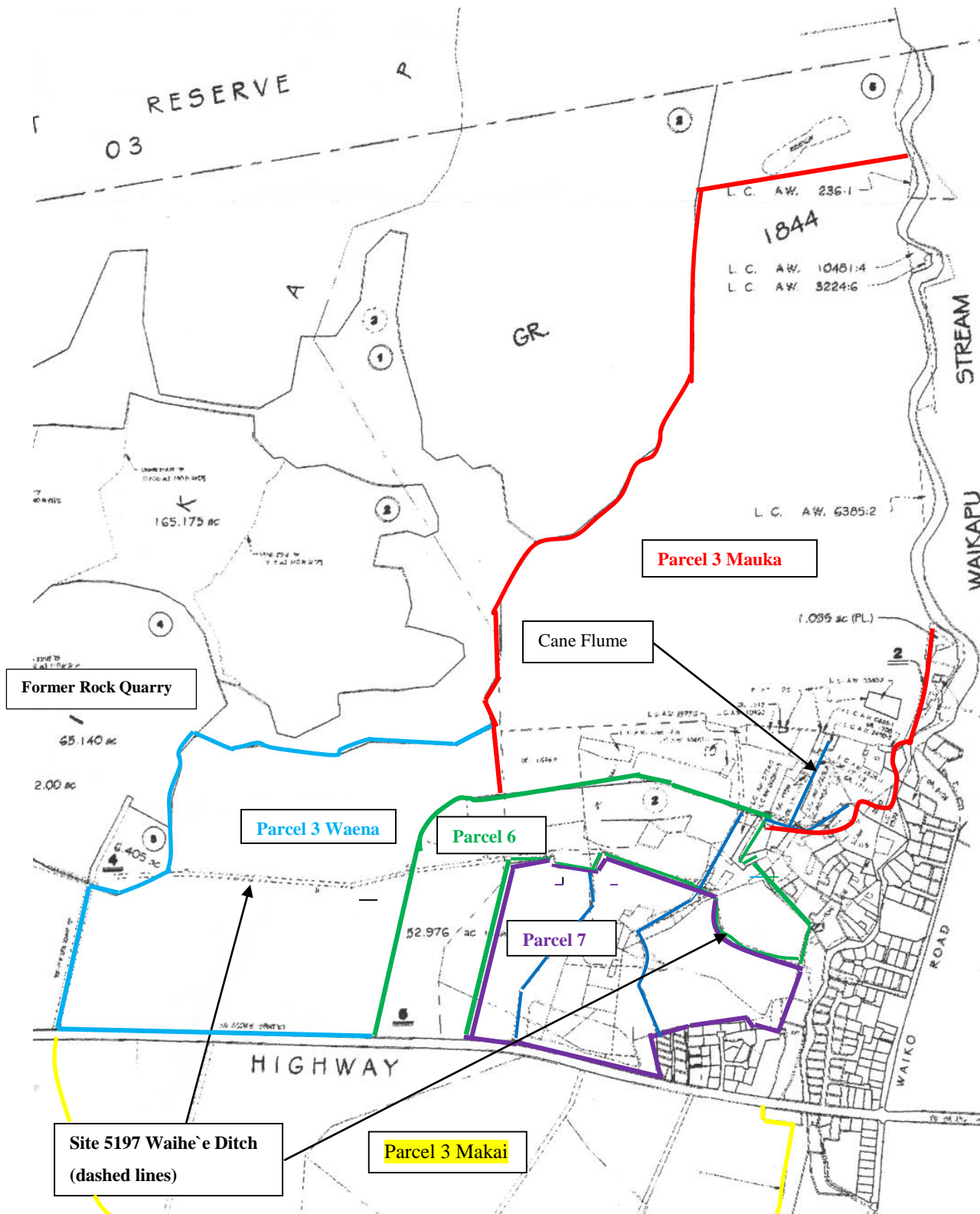


Figure 2. TMK [2] 3-6-004 Showing Project Areas-Parcel 3 Mauka and Parcel 3 Waena (TMK 3-6-004:003 pors.), Parcel 6 (TMK 3-6-004:006), Parcel 7 (different TMK 3-6-005:007), Parcel 3 Makai (TMK 3-6-002:003 Cane Flumes and Former Water Easements (dark blue)

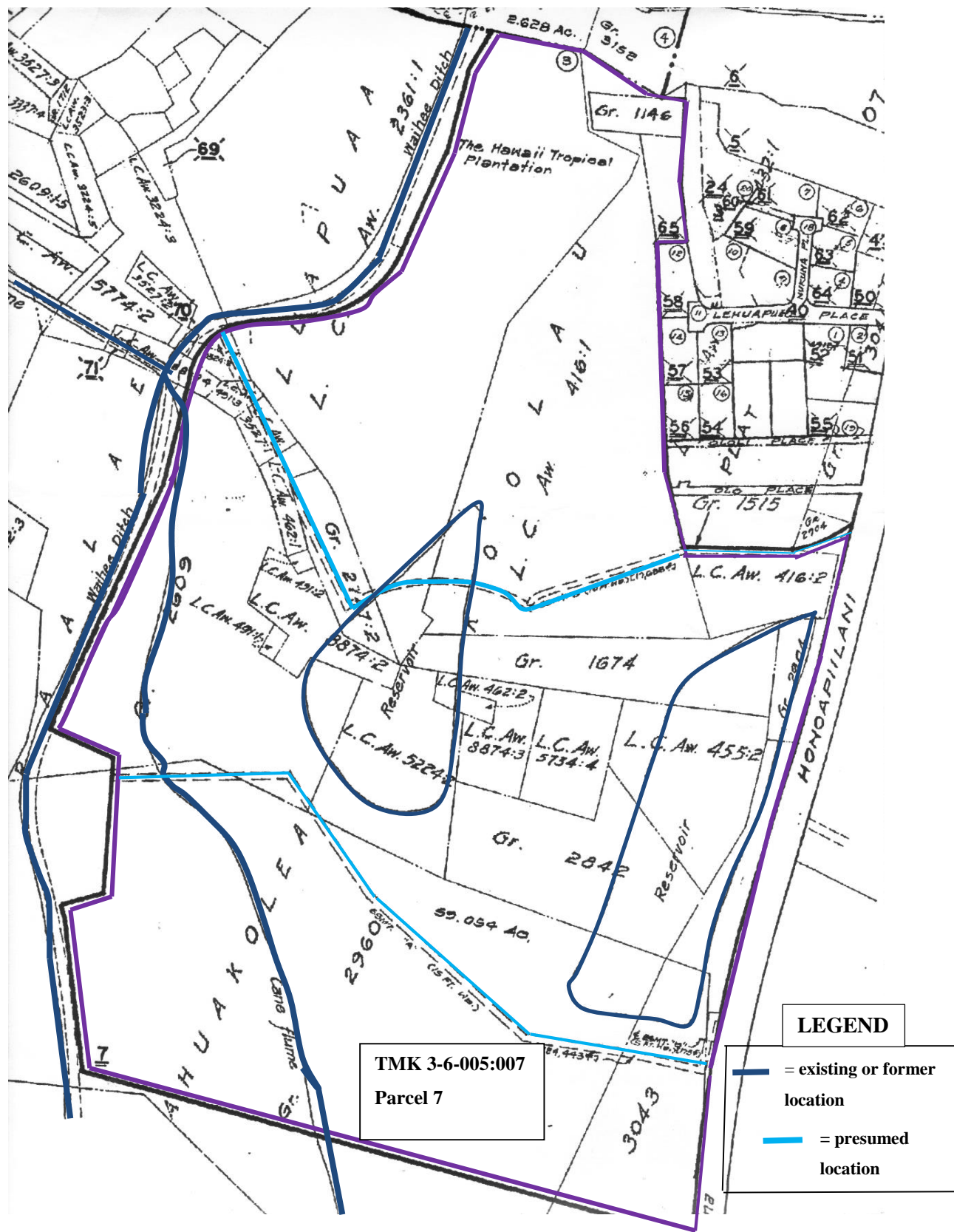
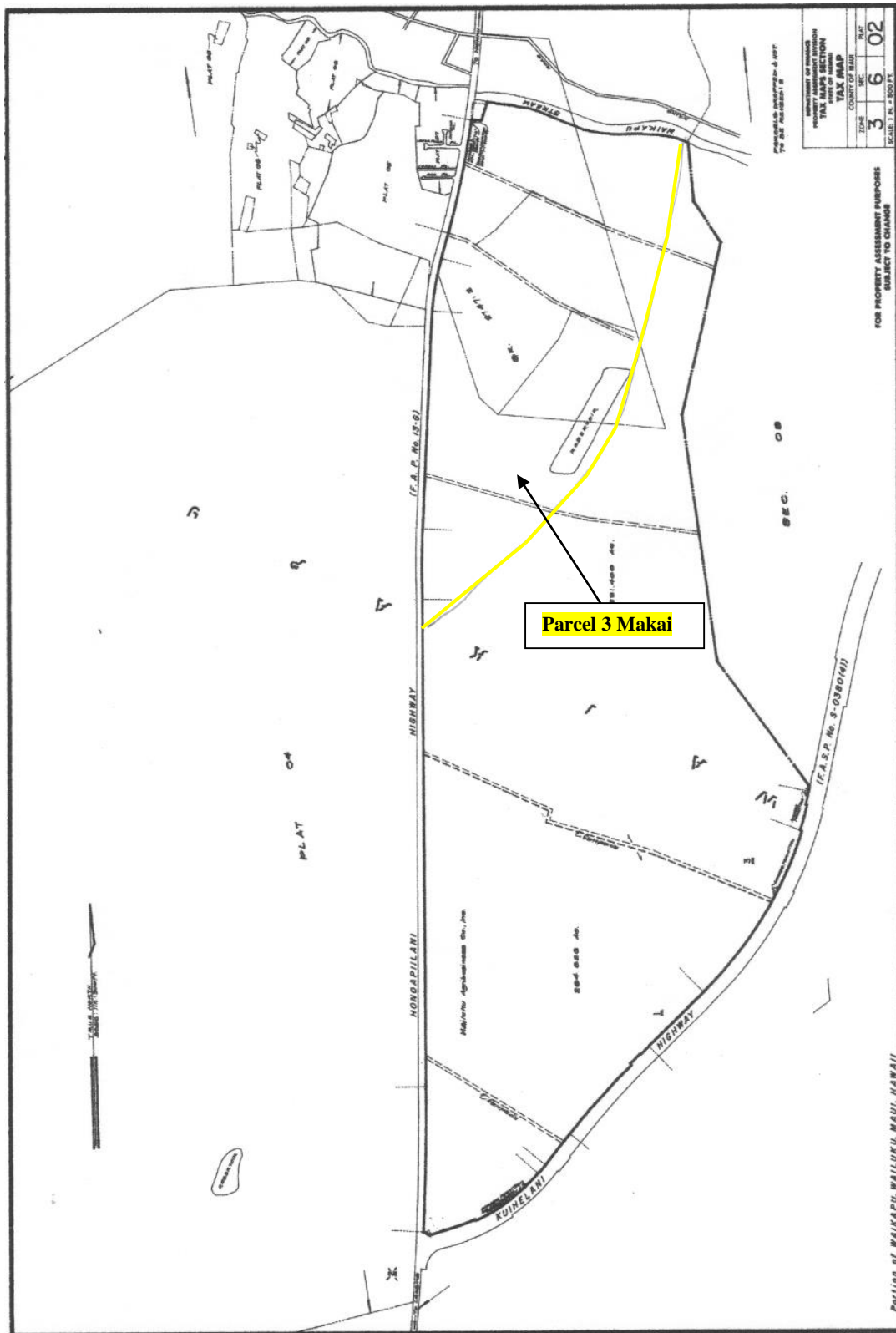


Figure 3. Enlarged Parcel 7 Showing Grants, LCA's, Flumes, Ditches and Reservoirs



Parcel 3 Mauka

Parcel 3 Mauka is located in the northern portion of TMK [2] 3-6-004:003 por. It is comprised of approximately 180 acres and defined the northwestern portion of the project area. It is bounded on the north by Waikapū Stream; on the west by reservoir and Waikapū Valley; on the northeast by rural residential development; on the south by portions of Sandalwood Golf Course and intermittent gulch to the southeast and Parcel 3 Waena and to the east by sugarcane fields of Parcel 6. As previously discussed, Waikapū Ditch South formerly bisected the property east/west near the existing cane access road. Parcel 3 Mauka is currently utilized as pastureland, but was formerly sugarcane. Approximately 75 acres of the 180 acres are slated for single and multi-family residential, and commercial and civic uses (schools and parks) (Figure 4). The remaining acreage will be utilized for agriculture, retention basins, hiking trails and open space.

Parcel 3 Waena

Parcel 3 Waena is located in the southern portion of TMK [2] 3-6-004:003 por. It is comprised of approximately 70 acres, and bounded on the west by Honoa'pi'ilani Highway (RT.30), on the southwest by Parcel 6, on the west by the Sandalwood Golf Course, and on the south by the former rock pit. Site 5197 (Waihe'e Ditch) extends through the parcel in a north/south direction (see Figures 1, 2, 6 and 7). Parcel 3 Waena is currently sugarcane, pastureland and small scale agriculture. The parcel is slated for large rural lots on 59-acres and open space and agriculture on approximately 12-acres.

Parcel 3 Makai

Parcel 3 Makai includes a portion of TMK [2] 3-6-002:003 por. It is comprised of approximately 250-acres (243.77 acres) bounded on the west by Honoa'pi'ilani Highway, on the north by Waikapū Stream and Waiko Road, and on the south and east by TMK 3-6-002:003. Parcel 3 Makai is cultivated in sugarcane and slated for commercial and civic (schools and parks) development and single- and multi-family residential use (see Figures 1, 4, 6 and 7).

Parcel 6

Parcel 6 is an L-shaped parcel designated TMK [2] 3-6-005:006. It is comprised of 53.63 acres and bounded on the west by Parcel 3 Mauka and Parcel 3 Waena, on the south by Parcel 3 Waena, on the east by a portion of Site 5197 (Waihe'e Ditch) and Parcel 7, and on the north by rural development. The northern third of Parcel 6 is pastureland that was formerly sugarcane; the central portion is small scale agriculture for vegetables and fruit trees; and the southern third is sugarcane.

Parcel 7

Parcel 7 is located in the central portion of the project area and consists of the 59.054 acres including TMK [2] 3-6-005:007 and the Maui Tropical Plantation. It is bounded on the west by Waihe'e Ditch, on the east by Honoa'pi'ilani Highway and residential development, on the north by existing rural and residential lots, and on the south by Parcel 6 (see Figures 1, 2, 6 and 7). Parcel 7 will be developed in commercial, multi-family and single-family units, parks and open space.



Figure 5. Aerial Photograph Showing Waikapū Country Town (WCT) Boundaries (yellow outline), Project Area (black outline), Extensive Sugarcane Fields and Tropical Plantation Property with Agricultural Uses along the Exterior

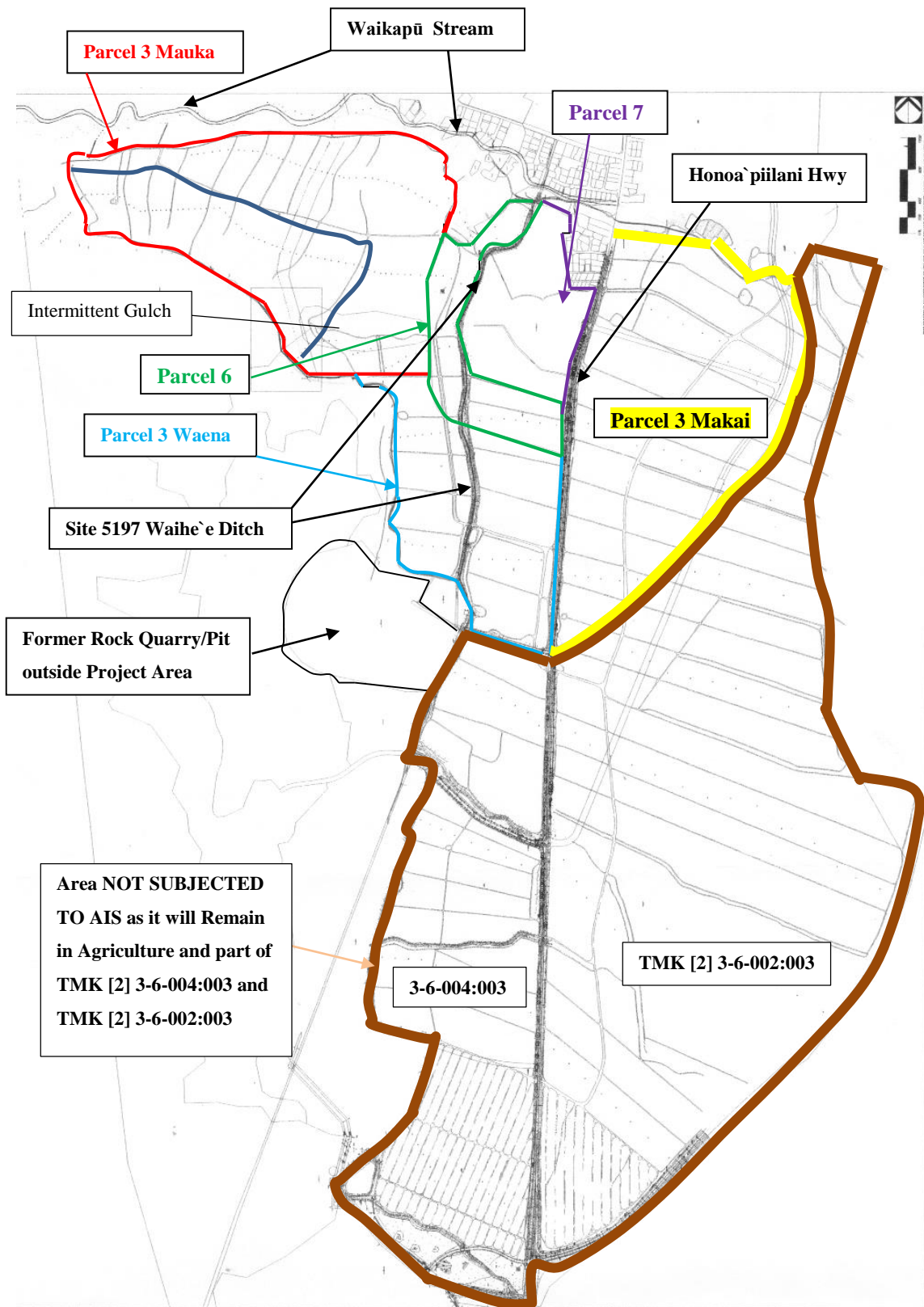


Figure 6. Location of Project Area including Parcel 3 Mauka (red), Parcel 3 Waena (blue), Parcel 3 Makai (yellow), Parcel 6 (green) and Parcel 7 (purple) on Topographic Map of Waikapū Partners Landholdings (note brown area not subjected to an AIS as it will remain in agriculture)

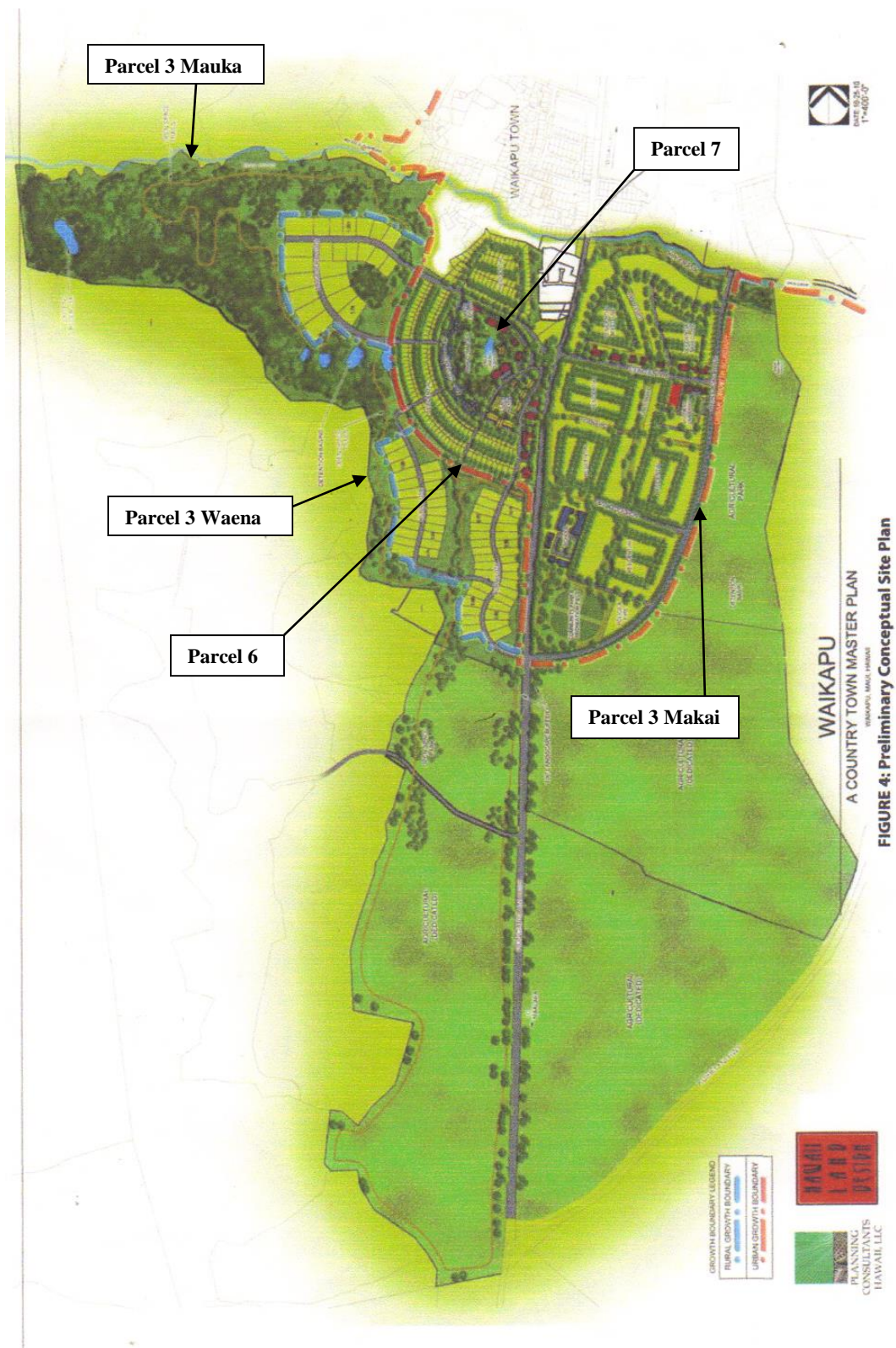


Figure 7. Waikapū County Town Conceptual Development Map

ENVIRONMENT

The project area is located on the slopes of the West Maui Mountains and northwestern periphery of the isthmus of Maui. The terrain slopes steeply in the western portion of Parcel 3 Mauka and gradually tapers to a gentle slope and level terrain along the eastern edge. It has been artificially altered by sugarcane cultivation, animal husbandry and commercial development. Due to these activities, the subject parcel contains clearing push piles, and a series of alternating berms and flat terraced areas.

Elevation of Parcel 3 Mauka ranges from approximately 1100 ft. above mean sea level (amsl) to 355 ft. amsl; Parcel 3 Waena ranges from approximately 600 ft. amsl to 360 ft. amsl; Parcel 6 ranges from 440 ft. amsl to 400 ft. amsl; Parcel 7 ranges from approximately 400 ft. amsl to 360 ft. amsl; and Parcel 3 Makai ranges from 360 ft. amsl to 230 ft. amsl.

Soils include Iao clay (IcB), 3-7% slopes; Wailuku silty clay (WvB), 3-7% slopes; Wailuku silty clay (WvC), 7-15% slope; Pūlehu cobbly silt loam (PrA), 3 to 7% slopes; Pūlehu cobbly clay loam (PtB), 0 to 3% slopes; and Pūlehu silt loam (PpB). These soils were developed in alluvium derived from basic igneous rock and are well-drained soils on smooth alluvial fans and valley fill. For Iao Series soils permeability is moderately slow, runoff is medium, and the erosion hazard is slight to moderate. This soil is for sugarcane and home sites (Foot et al. 1972). For Wailuku Series the substratum is gravelly and cobbly alluvium, permeability is moderate, runoff is slow to medium, and the erosion hazard is slight to moderate. Parcel 3 Mauka is located at the highest elevation and comprised of Wailuku soils (WvC). Parcel 3 Waena, Parcels 6 and 7 and portions of Parcel 3 Makai consist of Iao soils (IcB). The lower portion of Parcel 3 Makai includes Pūlehu series.

Vegetation in Parcel 3 Mauka, Parcel 3 Makai, Parcel 6, and Parcel 7 consists almost entirely of alien invasive species typical of previously disturbed areas and fallow sugarcane. Vegetation in Parcel 3 Mauka was previously identified by Allison Chun Ph.D., during a previous investigation:

...vegetation includes, “sparse clumpy alien grassland, such as giant guinea grass or (*Panicum mazimum*), natal redtop or (*Rhynchyletrum repens*), sourgrass or (*Digitaria insularis*), and numerous other noxious weedy invasive species, including castor bean (*Ricinis communis*), spiny amaranth (*Amaranthus spinosus*), apple of Peru (*Nicandra physaliodes*), coat buttons (*Tridax procumbens*), cherry tomato (*Leonotis nepetifolia*), bitter gourd (*Mormordica charantis*), rattlepod (*Crotalaria pallida*), lion’s ear (*Leonotis nepetifolia*), cow pea (*Macroptillion lathyroides*), partridge pea (*Chamaechrysta nitcitans*), hairy horsetail (*Conyza bonariensis*), telegraph weed (*Heterotheca grandiflora*), beggarweed (*Desmodium tortuosum*) and beggars tick (*Bidens pilosa*), sow thistle (*Sonchus oleraceus*), flora’s paintbrush (*Emilia fosbergii*), verbena (*Verbena litoralis*), swollen finger grass (*Chloris barbata*), balloon plant (*Asclepias physocarpa*), koa haole

(*Leucaena leucocephala*), and indigo (*Indigofera suffruticosa*). The weedy native ‘uhaloa (*Waltheria indica*) is also present. This assemblage is indicative of a highly disturbed ecosystem and typical of recently grubbed areas. The northern boundary along the top of Waikapū Stream has a more forested ecosystem that includes eucalyptus (*Eucalyptus spp.*), Christmas berry trees (*Schinus terebinthifolius*), guava (*Psidium guajva*), abutilon (*Abutilon grandifolium*), ironwood trees (*Casuarina spp.*) and morning glory (*Ipomoea spp.*).

Vegetation in Parcel 3 Makai consists of sugarcane by Hawaii Commercial and Sugar (HC&S), and alien invasive species, a few scattered Kiawe (*Prosopis sp.*), and koa-haole (*Leucaena glauca*) along the periphery of the cane fields the access roads and corridors.

Annual rainfall for the lower portions of the project area including Parcel 3 Waena, Parcel 3 Makai, and Parcels 6 and 7 is approximately 20 inches (500 mm). Annual rainfall for Parcel 3 Mauka located in the upper portion near the valley is 354 inches (9000 mm) (Creed Vol. I 1993:8).

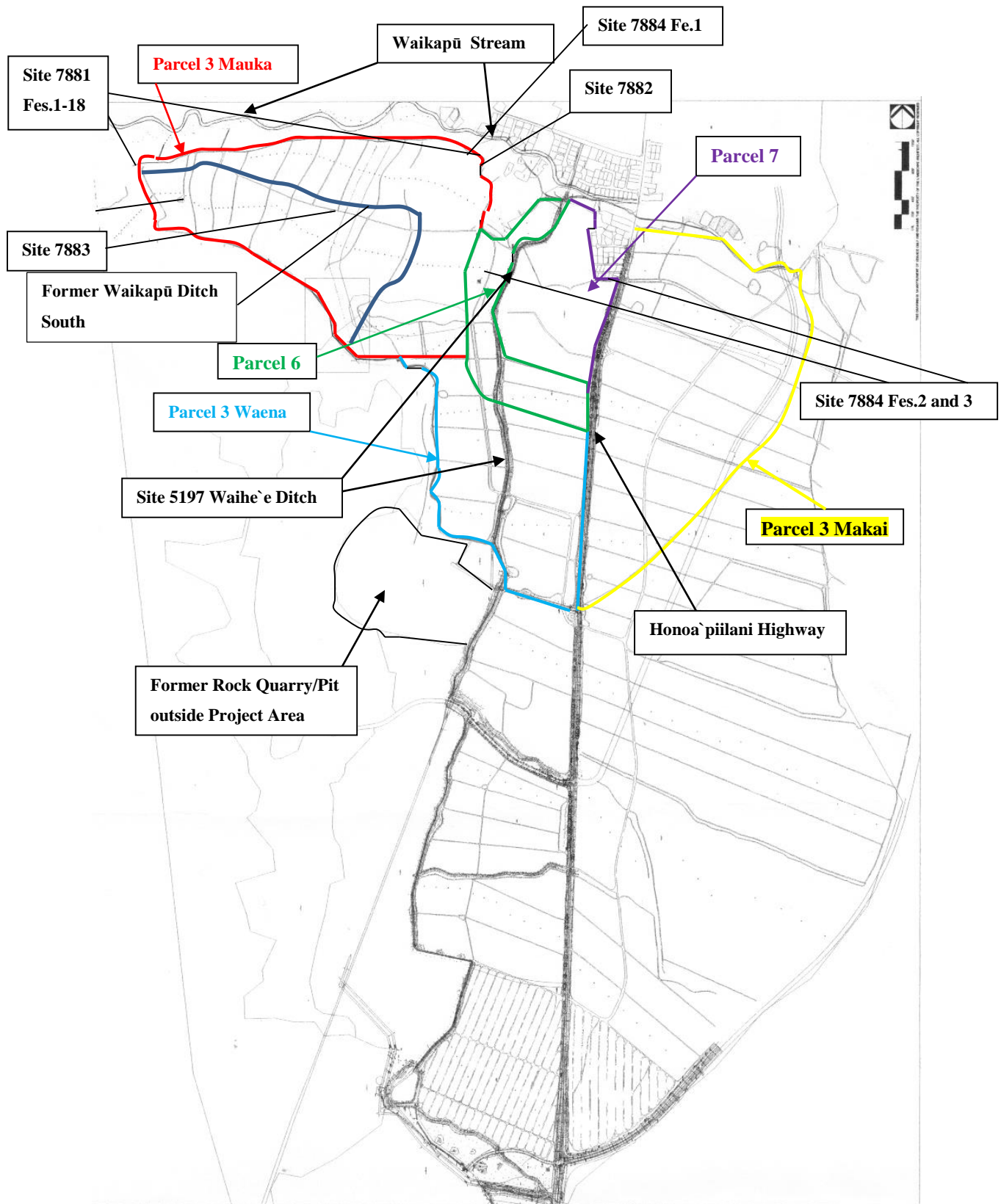


Figure 8. Location of Sites 50-50-04-5791, 50-50-04-7881 through 50-50-04-7884 within Parcels 3 Mauka, Waena and Makai, Parcel 6 and Parcel 7

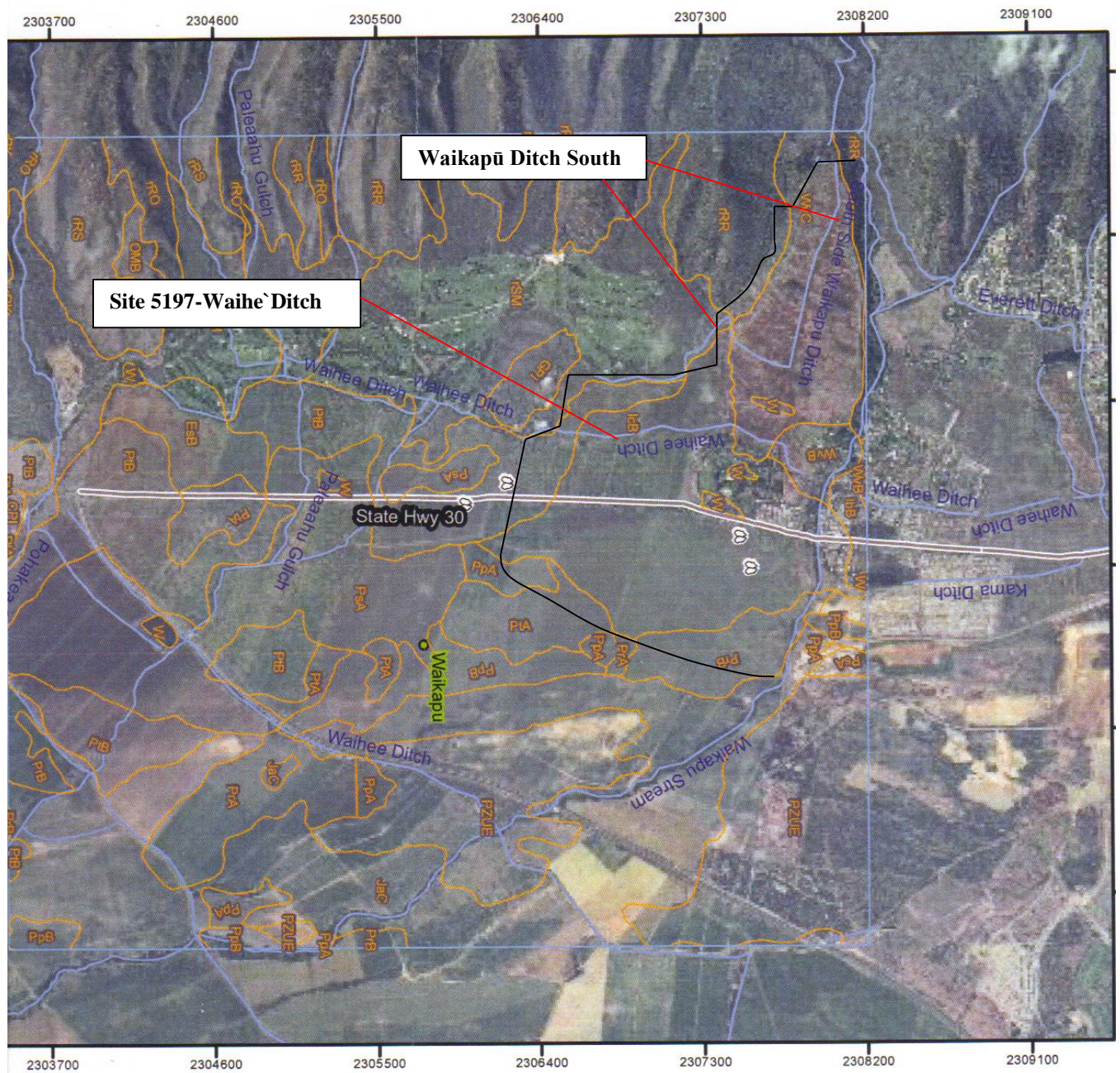


Figure 9. United States Department of Agriculture (USDA) Soils Map with Project Area denoted in black

TRADITIONAL AND HISTORICAL BACKGROUND

Historical background research Waikapu was conducted by Victoria Creed in *Settlement Pattern for Waikapū* (Creed 1993), and Engledow “*The History of Waikapū*”. The reader is referred to these reports for additional information pertaining to the history of Waikapu.

Mythological and Traditional Accounts

The Hawaiian creation chant (*Kumulipo*) describes Maui as a direct ancestor of the Hawaiian people and a descendant of Wakea on the Ulu line (Beckwith 1970:226). The island of Maui was named for the demi-god Maui, a well-known trickster hero throughout Polynesia. A synopsis of the ruling class in Hawai`i is provided below. According to oral traditions, Halo was one of the first chiefs of Maui who ruled the Wailuku District. By A.D. 1500 East Maui was ruled by a line of independent *Ali`i Nui*. Other lines of chiefly hierarchies emerged at this time, resulting in a rise in conflicts and competition. By A.D. 1600, Maui was unified by the Wailuku chief Pi`ilani (Fornander 1880:87). During the eighteenth century, the *mo`i* (a rank of chief) Kekaulike undertook raids against Hawai`i Island. Following the annexation of Hāna and Kipahulu Districts to Kamehameha I, Kahekili II first recaptured Hāna and Kipahulu from Kamehameha I and then conquered O`ahu and Molokai. Kaua`i was annexed through marriage (Pantaleo 2001).

The land divisions on Maui into *moku* (districts), *ahupua`a* (sub-districts), and *`ili* (smaller divisions) were said to have taken place “under a *kahuna* (priest) named Kalaihaohi`a (Hew the bark of the *ohia* tree) each ruled over by an agent appointed by the landlord of the next larger division, and the whole under the control of the ruling chief over the whole island” (Beckwith: 1970:383). Fornander suggests that this would have occurred at the end of the 15th century or beginning of the 16th century (Fornander 1916/17, Vol. 6:248).

According to Sterling, “The system of land tenure which prevailed in ancient times was radically changed during the reign of Kamehameha III by the Mahele of 1848, yet the boundaries of the ancient subdivisions of land remain unchanged to the present day. This applies particularly to the *ahupua`a* which has been termed the unit of land in Hawai`i” (Sterling 1998:3). These boundaries were said have been established approximately 20 generations back in Hawaiian tradition or 500 years ago according to Stokes’ basis of chronology. This land division (the *ahupua`a*) allowed the Native Hawaiian populace access to various ecosystems and resources from *mauka* to *makai*, which were essential for traditional living.

The project area is located in Waikapū *ahupua`a* within the traditional *Moku* (district) of Pū`ali Komohana (Figure 10-top); however, Sterling states that Waikapū originally belonged to no district:

“On Maui the lands of Waikapū and Wailuku appropriated almost the whole of the isthmus These two ahupua`a together with Waiehu and Waihe`e, which were independent, belonging to no Moku, were called Na Poko,” (Sterling 1998:63).

Currently, Waikapū *ahupua`a* is in the modern District of Wailuku (Figure 10-bottom). Pū`ali Komohana *moku* contained Waiehu, Waihe`e, Waikapū, and Wailuku *ahupua`a*, and Wailuku District is comprised of the following *ahupua`a*: Waihe`e, Waiehu, Waikapū, Wailuku and the western portion of Pūlehu Nui (Figure 10). Waikapū *ahupua`a* is bounded by Wailuku *ahupua`a* to the north, Waiehu to the northwest, Ukumehame to the west, and Pūlehu Nui to the south and east. It extends from Kapilau Ridge to the north and Ka`āpaokailio to the east (above Wailuku Heights) to the northeast corner at Pūlehu by Mokulele Highway (place name Kaopala), where it turns south terminating at the shore and encompassing the Keālia Ponds. The southern boundary is along Pohakea Gulch and follows the gulch to the east at Pu`uhele and extends south towards the Ma`alaea shoreline, terminating at the boat ramp. Given its wide expanse across the isthmus of Maui and *mauka* including Waikapu stream and Pohakea Gulch to *makai* encompassing the shoreline and Ma`alaea Bay, as well as the Keālia Ponds; Waikapū *ahupua`a* contained and afforded its inhabitants a wide variety of resources for subsistence. This *mauka* region is commonly known as *Nā Wai`ehā* (four waters), due to the four inland associated streams and valleys; Waihe`e, Waiehu, Wailuku (Wailuku River and `Īao Valley), and Waikapu (Pukui and Elbert 1986: 377) (see Figure 5). Due to this geologic landscape, the *moku* was extremely fertile with an abundance of water; thus, enabling large scale cultivation of *kalo* (taro). Agricultural terraces spilled over onto the slopes at the entrances of valleys...and taro was fed by mountain rains (Handy and Handy 1940:108).

Kirch proposed that the populace and political power on Maui was traditionally centered at Lāhainā and Wailuku (Kirch 1985). In Wailuku *ahupua`a* near `Īao Valley was the residence of the ruling king. During the time of Kahekili's reign, the residence in Wailuku was referred to as Lanikeha and also Kalani Hale (Sterling 1998 and Kamakau 1961). The importance of Wailuku in Hawaiian history is not only as a political center, but as an area of spiritual and religious significance. `Īao Valley was considered a *wahi pana*, a renowned or sacred place containing the royal burial cave, Kapela, where important rulers of Maui were buried. King Kaka`e whom reigned on Maui in the 1400's, designated `Īao Valley as his burial ground and for other chiefs who succeeded him (Sterling 1998). The importance of this region is further shown by the numerous *heiau* documented or discussed by Thrum and Walker. A total of 28 *heiau*, Walker Sites 28-56, were traditionally known in Wailuku *ahupua`a*; however, Sites 45-54 were not

relocated during Walker's survey (Figure 11). It is important to note that no *heiau* were recorded by Walker within Waikapū *ahupua`a*; however, Thrum claimed there were four in Waikapū, two at the shore and two at the ancient village.

Wailuku was the center of political and military power on Maui during the seventeenth and eighteenth centuries. Legendary battles were fought in Wailuku, including battles involving Kihapi`ilani, son of Pi`ilani, and Kalani`opu`u. The battle referred to as the Kalae`ili`ili Battle (1765) consisted of a revolt based upon what was perceived as an unfair distribution of resources by Chief Ke`eaumoku and other Molokai chiefs from the Waihe`e River Valley and the offshore marine resources. The Maui populace thought that these resources should provide ample food for them and they were being treated unfairly. Eventually, the Molokai chiefs were driven out of Waihe`e. Another war, which was fought in East Maui at Kaupō and called the Battle of Kaleoka`ilio, was between Kalaniōpu`u and Kahekili. Kalaniōpu`u was defeated and his warriors retreated to Hawaii Island; however, this loss seemed to set the precedence and intense desire for another war in Wailuku, the Battle of Kakanilua, which occurred within Waikapū and Wailuku *ahupua`a*. After returning to Hawai`i Island, Kalaniōpu`u prepared for a year to war against Kahekili. In 1776, Kalaniōpu`u with his wife, Chiefess Kalola (sister of Kahekili) and his chiefly armies `Alapa and Pi`ipi`i and 6 division of commoner armies comprised of some 800 men returned to Maui landing at Keone`ō`io at Honua`ula between Mākena and Kīhei and Kīhei puko`a at Keālia to Kapa`ahu. In Keone`ō`io the Hawaii warriors ravaged the countryside and the people fled to the bush. When Kahekili heard of this fighting, he prepared his warriors for battle, and enlisted the help of Oahu soldiers. The first altercation arose at Papawai Point (Mā`alaea) between Kamehameha and Kekuhaupi`o of Hawaii Island who engaged in a small battle with several of Kahekili's men. These two Hawai`i warriors held strong against the Maui warriors and the Maui warriors retreated but were most impressed with their skills. After this initial battle, both sides prepared for war again the next day. On this day, the battle was fought further inland along the Kama`oma`o plains on the sandhills southeast of Kalua. It was at this place that Kahekili, with the help of Oahu warriors hid like sand crabs in their holes and surprised the Hawai`i warriors who were severely defeated. Only two Hawai`i warriors escaped and retreated to Kalepolepo where Kalaniōpu`u and his wife, Kalola were waiting. Kalaniōpu`u was told how badly they were being defeated, but Kalaniōpu`u insisted on returning to battle the next day. The intent was for the Hawai`i warriors to enter Wailuku at Kakanilua but Kahekili's men were ready at the Kamaomao plains and Waikpu Turn where they surrounded and slew many Hawaii warriors again. Once Kalaniōpu`u realized his men were surrounded and defeated, he asked that Kalola intervene and discuss ending the war with her brother, Kahekili. Chiefess Kalola decided that Kiwalo, their son should go to his Uncle Kahekili to ask for forgiveness and stop the fighting. Thus, Kiwalo and two other attendants went to Kahekili who

was at his residence, Lanikeha or Kalani Hale in Wailuku, to request an end to the fighting. Kahekili agreed and Maui was victorious again. This slaughter or battle has been referred to as the Battle of the Sand Dunes, the Battle of Kakanilua and *Ahulau ka Pi`ipi`i I Kakanilua* (Pi`ipi`i and Alapa Heaped up at Kakanilua). Another famous battle fought in Wailuku *ahupua`a* during the early historic period was the Battle at `Īao or the Battle of Kepaniwai (the water dam) or the Battle of Kauwaupali (the precipice climbers). This war was fought between the Maui warriors under Kalanikupule and Kamehameha's Hawaii warriors with assistance from the foreigners and their weapons. Although there were many skilled Maui warriors, the Hawaii warriors were equally if not more skilled, an proficient with traditional weaponry such as the *pālau* (war clubs), *lei manō* (shark tooth weapon) and bone breaking (Hawaii skilled in bone breaking) but the foreigners muskets and cannons were too much for the Maui people. The Maui warriors were pushed back up into the narrow valley of `Īao trying to escape by climbing over the steep cliffs but to no avail. The slaughter was so great, and the valley so narrow that the bodies fell to the stream, filling it up and damning it with bodies. Kamehamameha's actions during this battle were not only remembered because of his skillful leadership in warfare, but he was embraced for his humanity and wisdom as once victorious, he immediately ceased the battle and encouraged the *ali`i* and *makā`inana* to live in peace and balance among one another (Desha 2000).

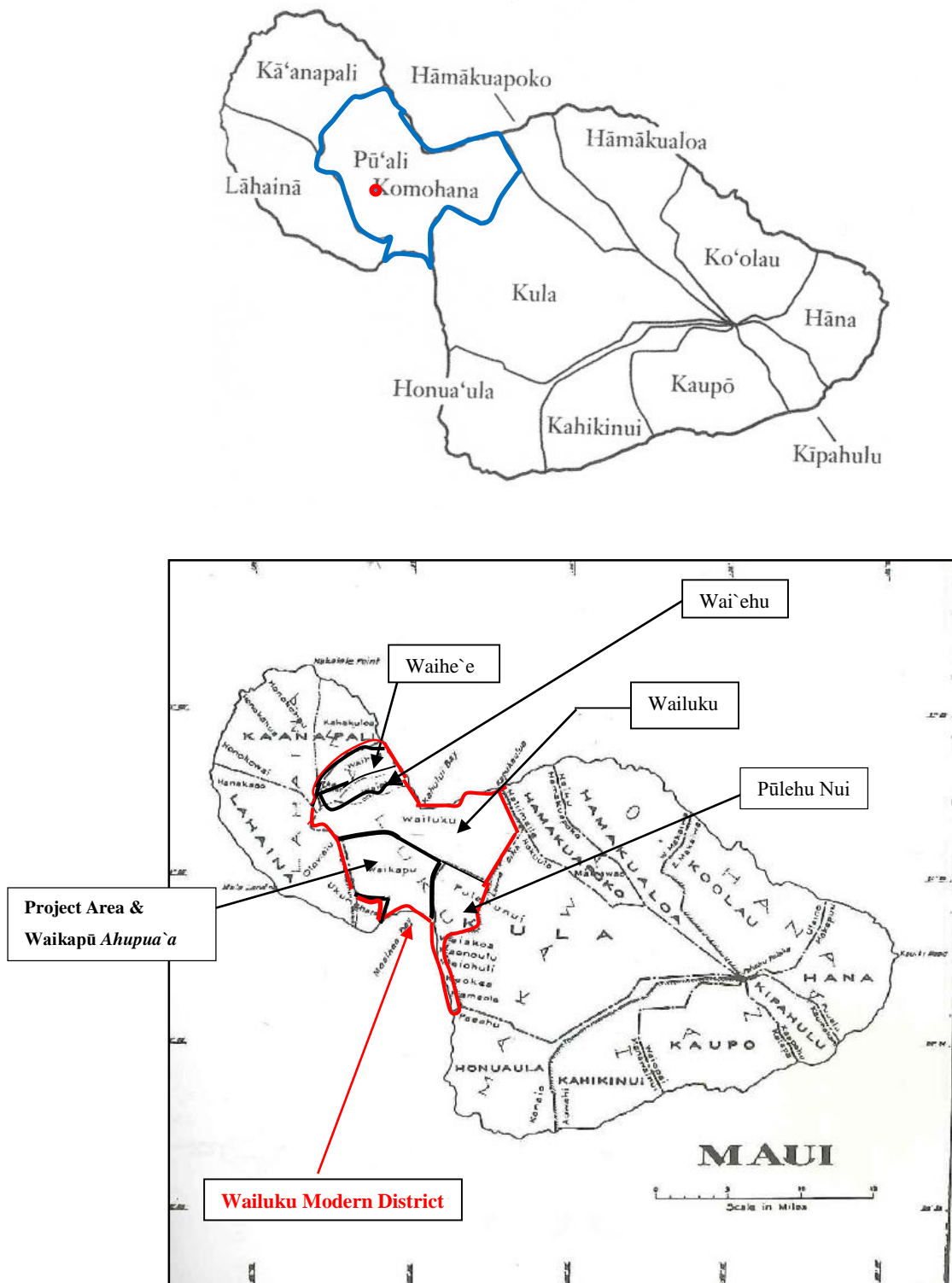


Figure 10. (top) Map of Maui Island Showing Traditional Moku (Districts) from Kame'lelehiwa (1992) and (bottom) Map Illustrating Project Area, Wailuku District and Ahupua'a Boundaries from John Wesley's *A Gazetteer of Territory of Hawai'i* (1935)

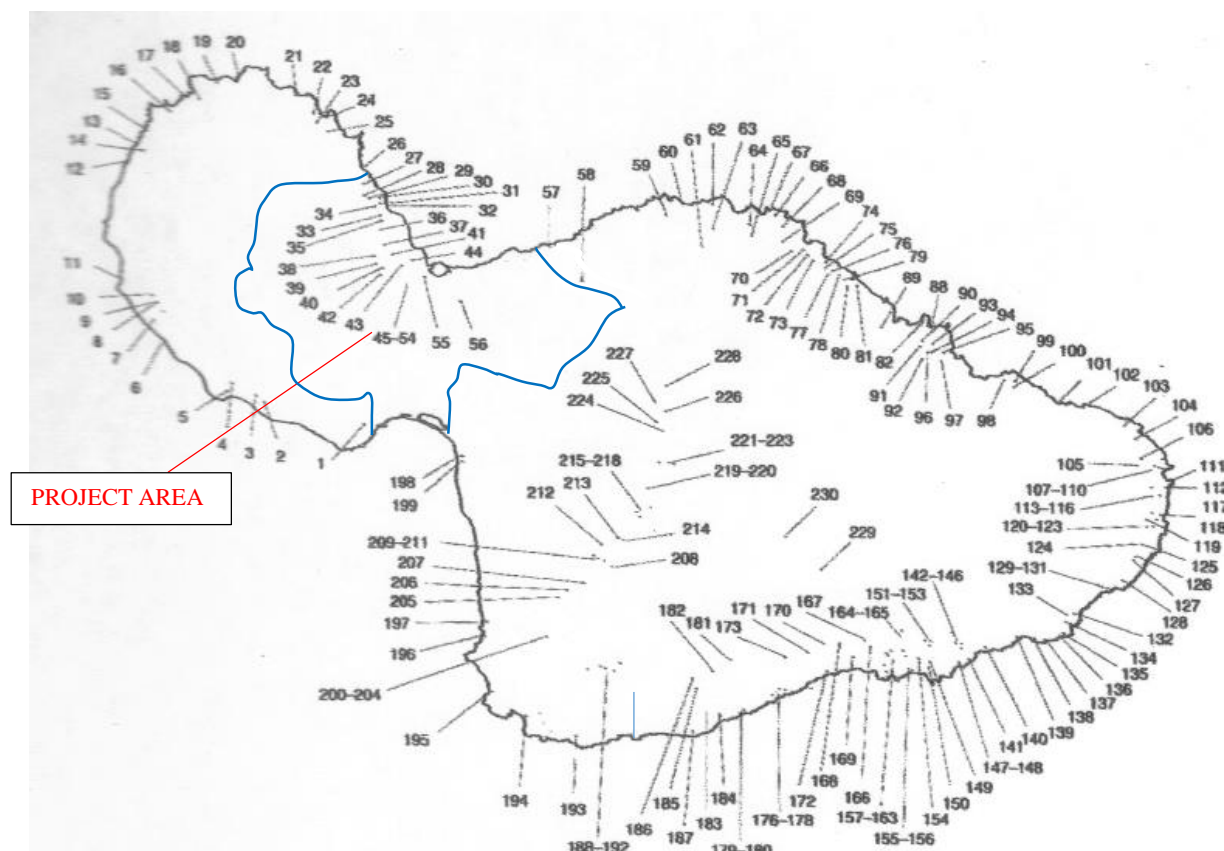


Figure 11. Walker's Site Map Showing Recorded *Heiau* and approximate Pu'ali Komohana District (blue)

Early Historic Period

At the time of European contact in A.D. 1778, Maui was united under a single political polity under the rule of *mo'i* Kahekili. By A.D. 1795, Kahekili ruled all of the islands apart from Hawai'i Island. Kamehameha I, *mo'i* of Hawai'i Island, attacked Maui, Molokai, and O'ahu islands. Keli'imaika, brother of Kamehameha I of Hawai'i Island, unsuccessfully attempted to retake Hana and Kipahulu. In 1790, Kamehameha I overpowered Kalanikupule's forces at the Battle of 'Iao Valley on Maui. Kalanikupule's ultimate defeat of the Battle of Nu'uuanu on O'ahu ascertained Kamehameha I as absolute ruler of the islands, with the exception of Kaua'i. Kamehameha I favorite wife, Hana-born Ka'ahumanu, served as his counselor (Pantaleo 2001).

After the death of Kamehameha I in 1819, Ka'ahumanu declared herself *kuhina* (premier) sharing of regal authority with the new young King Liholiho (Kamehameha II). It is suggested that she confronted the new king and implied that it was his father's wishes for her to share rulership of the land. From the time of Liholiho's departure for England in 1823, until Ka'ahumanu's death in 1832, she virtually ruled

the kingdom. It was during this time that the strength of the ancient *kapu* (prohibition) system began to fail. Ka`ahumanu, who disagreed with the restrictions of traditional *kapu* system, persuaded Liholiho to abolish it. “The train of circumstances leading up to the final act of abolition of the *kapu* and the old religious system cannot easily be traced in detail...Some authorities state that immediately after the installation of Liholiho as king, Ka`ahumanu proposed to him that the *kapu* be disregarded and she announced her own intention to disregard them” (Kuykendall 1938:66-67). With the overthrow of the *kapu* system she was free to exercise her political authority but this prohibition inadvertently cleared the way for the Christian missionaries in 1820. With the emergence of Christianity, the *heiau* (religious structures) associated with the native religious practices were destroyed and abandoned.

Ke`eaumoku, brother of Kamehameha I’s wives Kaheihei`maile and Ka`ahumanu, presided over Maui Island until his death in 1824. Ke`eaumoku was succeeded by the sister of Chief (Governor) Boki, Wahinepi`o. Hoapili succeeded Wahinepi`o and ruled Maui between 1826 until 1840, and was followed by Keoniana (John Young II). Lāhainā, located in West Maui, was the center of power in the Hawaiian Kingdom at this time. Kamehameha III (Kauikeaouli), the last son of Kamehameha I, rose to the throne when he was ten years old following the death of his older brother. During his younger years, Ka`ahumanu continued to govern with the assistance of a council of chiefly advisors. Kamehameha III reigned from 1825 to 1854, the longest period of power in the history of Hawai`i. During this period, he resided in Lāhainā from 1837 to 1845 (Pantaleo 2001).

In 1778, with the appearance of Captain James Cook in Kahului Bay on Maui, the post-contact documentation of the indigenous populace on Maui began. A comprehensive account of history of the Hawaiian Kingdom commencing from contact (1778) is provided in Kuykendall (1938). There were additional voyagers to Hawai`i subsequent to the arrival of Cook including La Perouse and Vancouver. By the early 1800s, whaling ships, merchants, and missionaries arrived. The arrival of foreigners severely impacted the demography of the Hawaiian people and caused a significant depopulation of the native people due to the introduction of Western diseases, in combination with the populace beginning to cluster around growing port towns. According to Kuykendall (1938:336), an early estimate of the population (made by missionaries) in 1823 was 142,050 and decreased to 86,593 by 1850. In 1832, the population of Waihe`e/Waiehu region was reported by the missionaries as 827, or approximately twenty percent of the populace in the *Nā Wai`ehā* District.

During the early to mid-1800’s with the arrival of Whaling Ships and concurrent California Gold Rush, the Irish Potato boom began causing a shift from principally the cultivation of sweet potatoes (*`uala*) to

Irish Potato (*`uala haole*). Another important event of the historic era was the Great Māhele, which was the introduction of the privatization of land. During the Māhele, the *maka`āinana* and foreigners could apply for land ownership by stating their *kuleana* claim to the Land Commissioners. It was during this process that the land use was recorded and settlement patterns could be inferred.

Historic Background Mid-1800 to Late-1800

In 1845, land reform legislation, which eventually developed into ‘The Great Māhele’, was introduced. During the *Māhele* in 1848, crown lands were divided between the Government, Royalty, and commoners (Figure 12). The Board of Commissioners to Quiet Land Titles received applications for land claims. When a land claim was validated, a Land Claim Award (LCA) was awarded and following payment of this claim, a Royal Patent (R.P.) was issued. The Māhele resulted in the division of lands according to a system of private ownership based on Western legal concepts. The concept of private land versus the custom of the *ahupua`a*, a communal section of land containing various ecosystems to be utilized, nurtured and cultivated by its inhabitants was completely unfamiliar to the Hawaiian people. This disassociation from the *`aina* resulted in many changes and negative effects to a traditional life style, as the connection to the land was not only for subsistence but intimately and intrinsically tied to religious and ceremonial ideologies, as well as the socio-economic and political structures of the native Hawaiian people. In the first phase of this process, Kamehameha III subdivided his lands among the highest *ali`i* (royalty) *konohiki* (chiefs), and some favored *haole* (foreigners). Following this phase, the *maka`āinana* (commoners) were then permitted to pursue legal title and ownership to land they had cultivated and inhabited, in addition to purchase government lands. At the end of the Māhele, naturalized foreign citizens were given the right to purchase land in Hawai`i. The ultimate result of this decision placed more land in the hands of non-Hawaiians than native Hawaiians between the years of 1850 and 1865 (Moffatt and Fitzpatrick 1995:51).

In 1848, there were approximately 88,000 Hawaiians, but only 14,195 applications were made...of the 14,195 *kuleana* claims, only 8,421 were actually awarded. The *Maka`āinana* received less than 1% of the land. Countless Native Hawaiians lost their land use rights as a result of the Great Mahele of 1848, with the establishment of a system of private land ownership. Many landless Native Hawaiians signed on as laborers in the emerging sugar industry, which began on Maui in the 1820s. Within a short time, large tracts of land were turned over to commercial agriculture, primarily sugarcane cultivation (Kame`eleihiwa 1992:295). In many cases, the purchases or leases to non-Hawaiians included entire *`ili* or *ahupua`a*.

In 1893, a Hawaiian Government Survey indicated that less than one percent of the total land in the Hawaiian Kingdom had been awarded as *kuleana* land (Moffatt and Fitzpatrick 1995:50-51) (see also Kame`eleihiwa 1992).

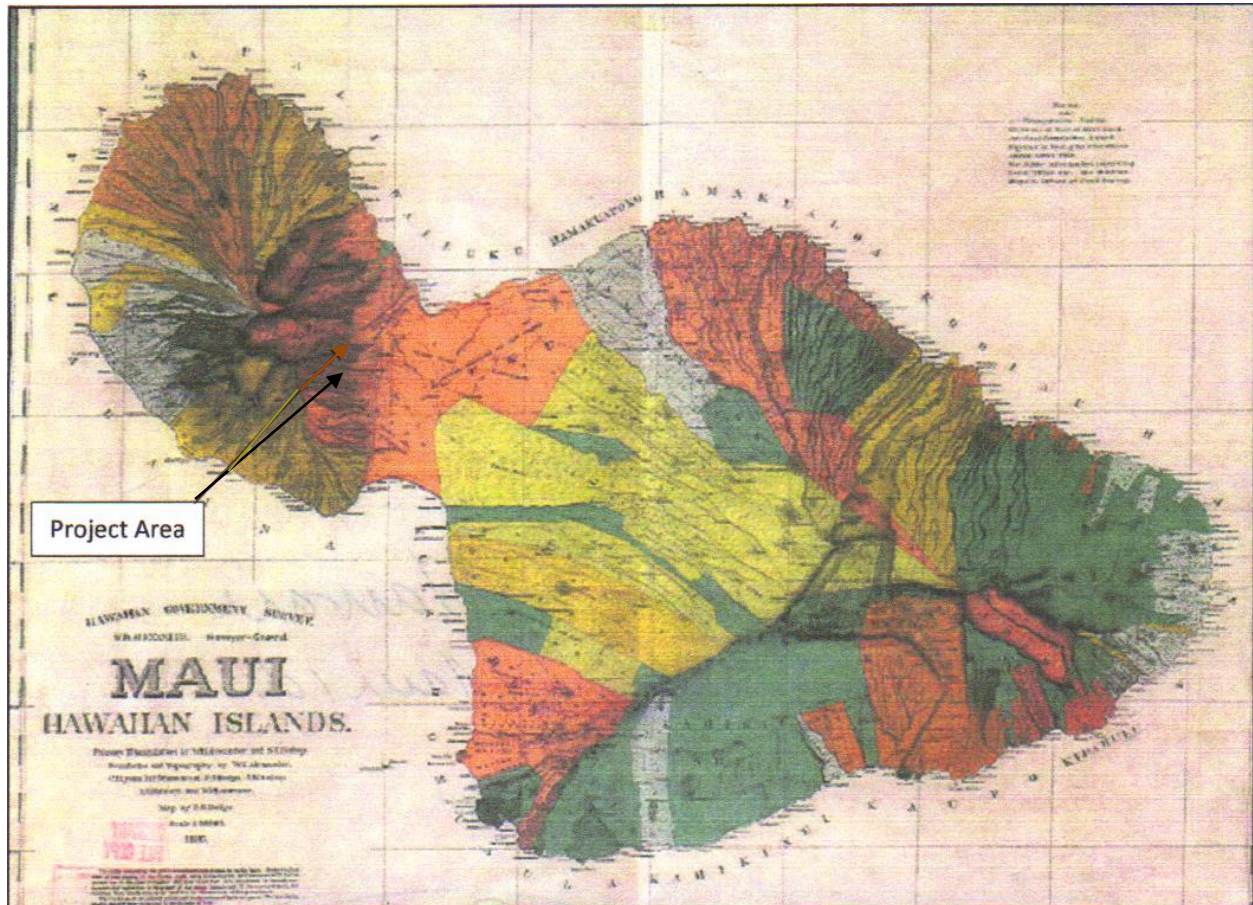


Figure 12. Dodge, F. S. and John M. Donn (1906) Hawaiian Government Survey Map of Maui (crown lands indicated in red & yellow; government lands green)

In the course of land distribution associated with the *Māhele*, frequent claims were granted along the streams for small plots of taro (*kalo*) cultivation. For example, Figures 2, 3, 14 and 15 shows narrow bands of LCA awards that extend through the *‘ili* of Olohe, Pikoku, Luapuaa, Kamauhali, Punia, Kaapala/Keopala, Paalae, Ahuakolea, and Koolau. The current flume and possible former *‘auwai* (ditch) may have emptied into a pond that reportedly was located south of the *‘ili* Luapuaa and presently located within the Maui Tropical Plantation, Parcel 7 (see Figure 3 and not two reservoirs on map).

PRIOR LAND USE

The Waikapū Stream supported major irrigation systems with numerous pondfields (*lo'i*) and irrigation canals/ditches (*'auwai*), as well as agricultural crops and animal husbandry practices evidenced by LCA testimony during the Mahele and early map documentation (Figure 13). Subsequently, by the late-1800s the Waikapū Stream utilizing the same *'auwai* irrigation systems contributed to sugarcane cultivation that expanded far beyond the valley. According to Creed:

The Waikapū stream ran thru the center of a huge *lo'i* 925+ acre field complex. From the stream in the upper part of the valley, one *'auwai* (ditch) historically named Everett ran thru the *mauka* periphery of the Waikapū village on the north towards Wailuku [see Figure 1]. And another *'auwai* (ditch) named Waikapū South [see Figures 1 and 9] ran east from the upper valley stream towards Ma'alaea thru the *'ili* of Pikoku, Punia, and Kalaupelu and probably extended *makai* at some earlier time and then rejoined the stream. Supporting evidence for this hypothesis is Monsarrat's 1882 map shows a late 19th century sugarcane ditch (the Waihe'e Ditch) dissects this area and LCA 411 in Kaumuilio (below the government road) to Poonui complains that his water had been cut off by the foreigners but remedies were then made so he could continue his cultivation. There may be other *'auwai* as well, such as the area below the Ohia Stream *'auwai* in the upper valley where the configuration of a narrow band of awards runs almost perpendicular through the middle of the *lo'i* fields of Ohia, Palama and Loaloa. This narrow band may define another ditch system although the map does not show one (Creed 1993:77).

The former Waikapū Ditch South, Waihe'e Ditch and Everett Ditch are within or in close proximity to the subject project area. Waikapū Ditch South appears to extend through or bisect Parcel 3 Mauka where it makes a 90 degree turn in a south direction outside the parcel (see Figures 1, 9, 13 and 14). Waihe'e Ditch extends north/south through the center of the project area between Parcels 6 and 7, and Everett Ditch extends from the upper valley outside the project boundaries along the north side of Waikapū Stream. Several cane flumes, *'auwai* and reservoirs, as well as areas formerly planted in cane were observed on historic maps (see Figure 13). Sections of these water ways were noted along the northern side of the project area and are further discussed in the Results section.

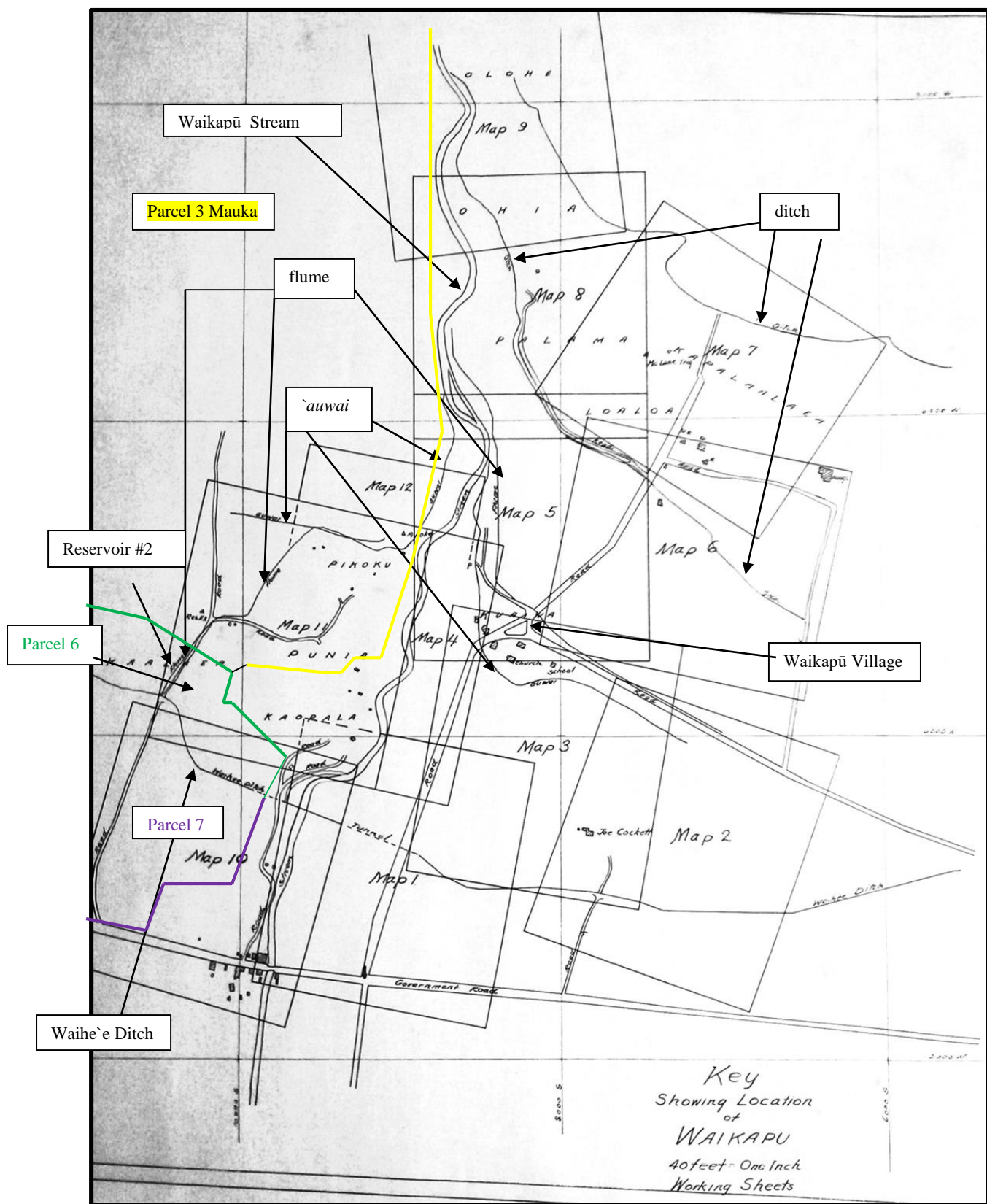


Figure 13. Map of Upper Waikapū Showing `ili, 'Auwai , Flumes, Ditches, Structures and Reservoir #2

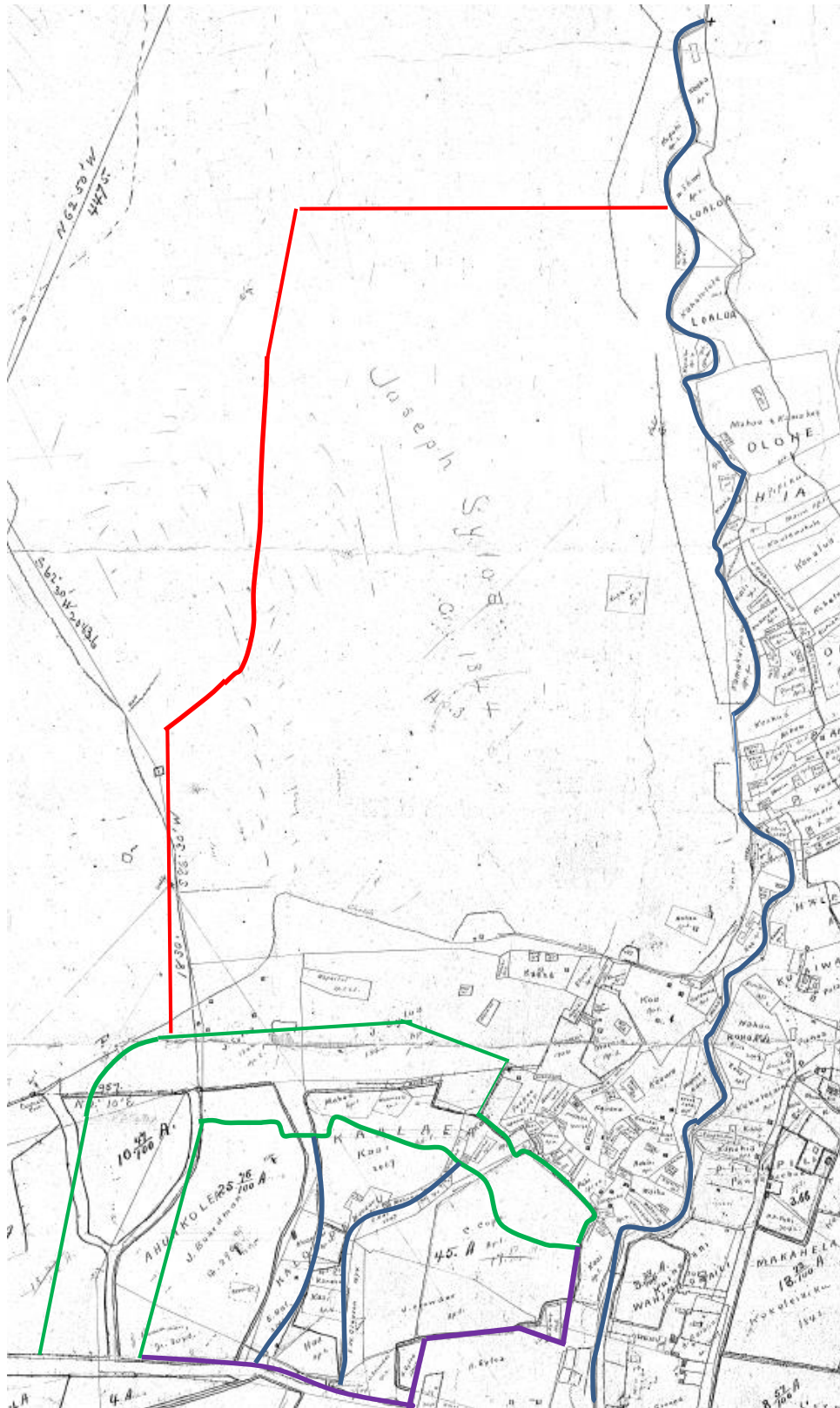


Figure 14. Register Map 0940 of Waikapū Showing Waikapū Stream, LCA & Grants and former water ditches (blue) within Parcel 3 Mauka and Parcels 6 and 7 (n.d.) (map from DAGS)

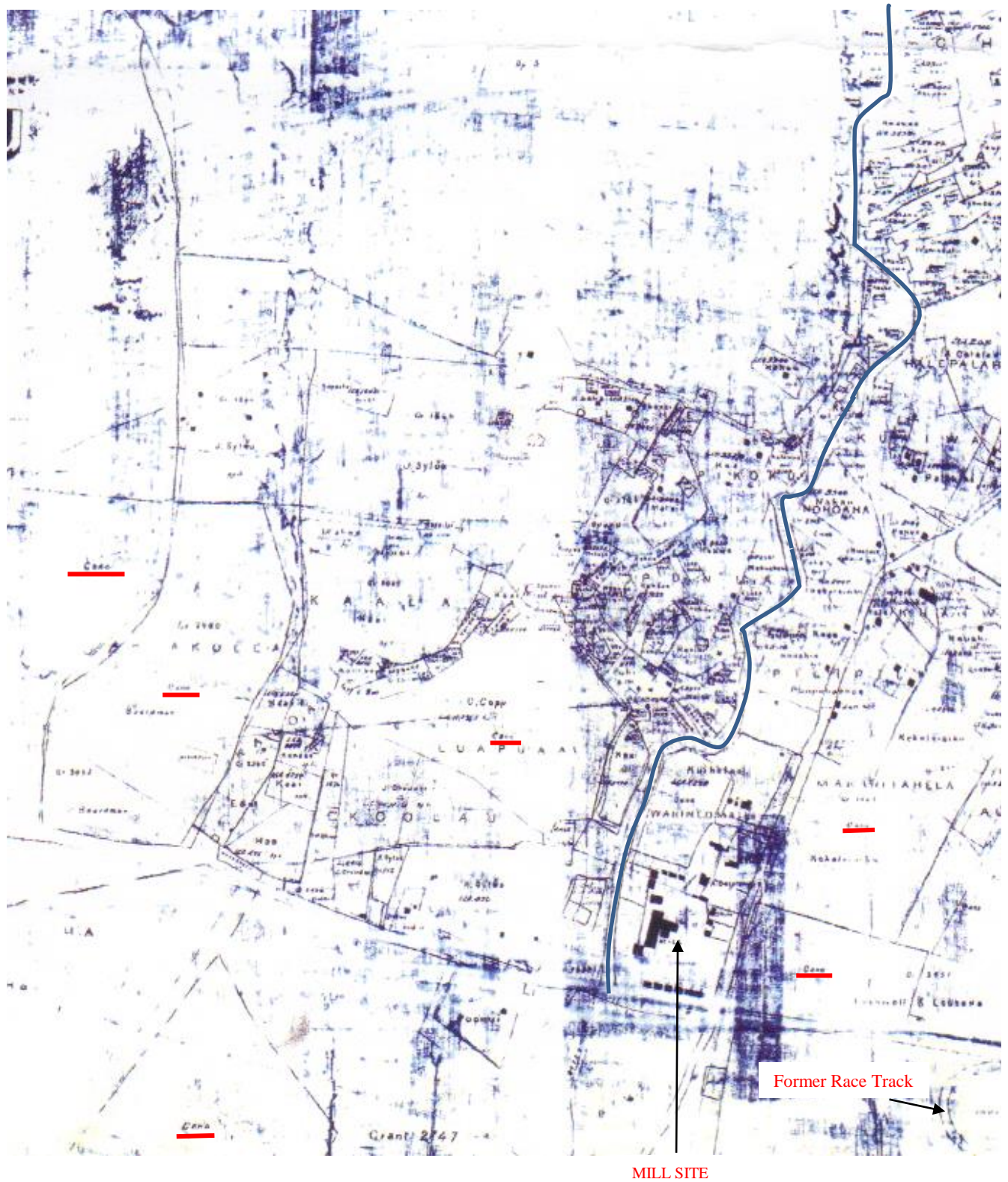


Figure 15. Enlarged Portion of Monsarrat Map (1882) Showing LCA, Grants and areas with Cane in Upper Waikapū

LAND TENURE

Waikapū *ahupua`a*, comprised of 15,684 acres, included 121 claims heard during the Mahele of 1845 (Creed 1993). Of these claims, 100 or 82% were awarded and the claimants listed in descending order the following land usage, *lo`i*, *kula*, house lot, salt, *wauke*, *hala*, potato, pig, sugar, fish, banana and a bull pen. Based on Creeds analysis, *lo`i* constituted the vast majority with 50%, *kula* 2 %, house lots 1.8% and other 46.2% which encompassed (salt, *wauke*, *hala*, unspecified, potato, pig, sugar, fish, banana and a bull pen).

In the subject project area, an analysis of the land tenure for the five specific project areas was conducted and assisted in the placement of backhoe trenches for subsurface testing.

In Parcel 3 Mauka, a total of twenty-eight (28) LCAs and seven (7) Grants were identified (Tables I-III). The majority of LCA claims were along Waikapū Stream and for *lo`i* (n=21), *kula* (n=11), house lots (n=5) and *hala* (n=5). For the seven grants, only two had land use including sugarcane at Grant 1844 Apana 1 and 2. Note that these aforementioned counts (n=#) are based on the presence or mention of a specific land use, not the actual number of times the item was presented within the parcel; hence if the testimony stated four *hala* trees, *hala* was documented as one.

In Parcel 3 Waena no LCA or Grants were documented, and in Parcel 3 Makai one (1) Grant was identified and consisted of a reservoir and sugarcane (see Figure 4 and Table IV).

In Parcel 6, a total of nineteen (19) LCAs and one (1) Grant was identified within this parcel (see Tables V-VII). Of the nineteen *Kuleana* claims, two had no information, and similarly to Parcel 3 Mauka, these LCA are in close proximity to water ways such as Waihe`e Ditch, cane flumes and former ditches (Figure 16). The land use represented sixteen (16) *lo`i*, *kula* (n=7), house lots (n=3) and one claim had no information (LCA 9524:2). The Grant (GR 3152) was to Cornwell but no land use information was available; however it may have been utilized for sugar and habitation as Henry Cornwell and James Louzada started Waikapu Plantation.

In Parcel 7, there were eleven (11) Land Commission Awards and eight (8) Grants. For the *Kuleana* claims there were *lo`i* (n=7), house lots (n=6), *kula* (n=2), sugarcane (n=1) and *`auwai* (n=1). Of the eight Grants, only 2 had information which consisted of sugarcane (see Figures 3 and Tables VIII-IX).

In summary, the analysis of *kuleana* lands within the project area was similar to the results as stated above by Creed. *Lo`i* represented 53% (44 out of 83), *kula* lands were 22%, *pa hale* or house lots represented 17%, *hala* constituted 6% and sugar and *`auwai* both represented 1%.

Table I. Summary of Land Commission Awards within Parcel 3 Mauka

LCA Parcel 3 Mauka	Hala	Lei Hala	House lot	Kula	Mo'o Kula	Taro Lo'i	Wauke	Taro Pauku
Charles Copp 236:1 Luapuaa and Kaluapuaa				2			1	
Ehunui 2499:3 Pikoku	1	4				7		
Makuakane 2522:1 Punia				1				
Makuakane 2522:2 Pikoku						3		
Makuakane 2522:3 Waikalulu				1				
Hakiki 2577:2 Olohe			1			7		
Hakiki 2577:3 Olohe			1			2		
Poepoe 2609:1 Kaalaea								1
Poepoe 2609:2 Olohe						2		
Poepoe 2609:3 Pikohu						1		
Poepoe 2609:4 Maalaea			2 in Maalaea					
Poepoe 2609:5 Kaalaea					1			
Makaio (Mataio) 3020:2 Kamaukalii /Kamauhali				1		6		
Kualaia 3110:3M Pikooku				1		4		
Kualaia 3110:3M:2 Ohia						2		

Table II. Continuation of Summary of Land Commission Awards within Parcel 3 Mauka

LCA Parcel 3 Mauka	Hala	Lauhala	House lot	Kula	Mo'o Kula	Potato Mo'o	Taro Lo'i	Taro Pauku
Nahanua 3340:2 Nohoana, Aweoweo luna		2			1		8	
Opunia 3224:6 Kaopala			1					
Koa 3528:2 Pikoku							4	
Kaai 5774:2 Luapuaa							6	
Kamakaipoa 6385:1 Pikoku (2.11acres)							6	
Kamakaipoa 6385:2 Kaloapelu Apana 2	1			1	2		5	
Kamakaipoa 6385:2 Kamaulalii (1.94 acres)	1							
Kamakaipoa 6385:2 Maluapuaa						2	3	
Napailoi 10481:2 Waihalulu			1	1				
Napailoi 10481:3 Waihalulu				1			8	
Napailoi 10481:4 Kaopala								1
Nalei 10460:1 Olohe							2	
Nalei:2 10460 Luapuaa							26	1

(Source: Creed 1993)

Table III. Summary of Grants within Parcel 3 Mauka

Grant Parcel 3 Mauka	Date	Issued to	Land Use
1513			
1704			
1706			
1711:1			
1844:1 Apana 1	Also extends down to Parcel 6	Joseph Sylva	Sugarcane
1844:2	Also extends down to Parcel 6	Joseph Sylva	Sugarcane
3527:2			

(Source: Creed 1993)

Table IV. Summary of Grants within Parcel 3 Makai

Grant Parcel 3 Makai	Date	Issued to	Land Use
2747:2		Eugene Bal	Reservoir and Sugarcane

(Source: Creed 1993)

Table V. Summary of Land Commission Awards within Parcel 6

RP	LCA	House lot	Kula	Mo'o Kula	Mo'o of Kalo	Taro Lo'i	Taro pauku	Ponds / Pools / Depressions
	Kaoahaliu 2361:1							
	Poepoe 2609:1 Kaalaeca						1	
	Poepoe 2609:2 Olohe					2		
	Poepoe 2609:3 Pikohu					1		
	Poepoe 2609:4 Maalaeca	2 in Maalaeca						
	Poepoe 2609:5 Kaalaeca		1 potato					
	Opunui 3224:3 Kaloaloe						1	
	Opunui 3224:5 Kaloaloe		1					
	Naanaa 3337:4 Kaalaeca					6		
3156	Kamohai 3527:1 Kaalaecapelu		1				1	
3156	Kamohai 3527:2 Kaalaeca			1		3		
	Kamohai 3527:3 Kaalaeca			1		6		
	Kekua 5551:1 Kainauhali					15		1
	Kekua 5551:2 Kaalaeca					2		
4014	Kaai 5774:2 Luapuaa					6		

Table VI. Continued Summary of Land Commission Awards within Parcel 6

LCA	Kalo	House lot	Kula	Ponds / Pools / Depressions	Mo'o of Kalo	Taro Lo'i	Taro pauku
Mahoe 10160:1 Ahuakolea 1.99 Ac.		1	1			1	
Napaeloi 10481:1 Paalae	1	1	1			31	1
Wahinealii 11022:3 Palama					1		
9524:2							

Table VII. Summary of Grant within Parcel 6

Grant	Date	Issued to	Land Use
Grant 3152	1878	Spreckles	Sugarcane and Reservoir

(Source: Creed 1993)

Table VIII. Summary of Land Commission Awards within Parcel 7

RP	LCA	‘Auwai	House lot	Mo’o Kula	Taro Lo’i	Taro pauku	Sugarcane / Ko
41	John Crowder 416:1 (7ac&1ac) Koolau	1	1				
41	John Crowder 416:2 (8.9ac) Aikanaka		1				
324	Haa 455:2 Kaaikanaka /Aikanaka? (35ac)		1				1
	Mahuka 462:1 Kaopala		1	1	6		
	Mahuka 462:2 Kaloapelu		1	1	10		
3139	Haawahine 491:1 Koloapelu / Kaleapelo / Kaloapelu?				4		
	Haawahine 491:2 Koloapelu/ Kaleapelo / Kaloapelu?				1		
	Haawahine 491:3 Koloapelu/ Kaleapelo/ Kaloapelu?				2		
	5224:2						
8874	Kaneae 8874:2 Kaloapelu		1			1	
	Kaneae 8874:3 Kaloapelu					1	
	Kaula LCA 5734:4	This is a claim for Waikele, Island of Oahu (TMK 3-6-05) 122					

Table IX. Summary of Grants within Parcel 7

Grant	Date	Issued to	Land Use
1146			
1674			
2842			
2904			
2609			
2747:2		Eugene Bal	Reservoir and Sugarcane
2960		Boardman	Sugarcane
3043		Boardman	Sugarcane

(Source: Creed 1993)

Based on archival research, the introduction of cattle and the ranching era, along with the commercial production of sugarcane was prominent from the mid to late 1800's. The earliest production of commercial sugar on Maui began in Wailuku in 1823 when Hungtai Sugar Works was founded by Chinese merchants. Wailuku Sugar Company was started in November of 1862 by James Robinson and Company, Thomas Cumming, J. Fuller, and C. Brewer and Company. Around this same time period (1862), Waikapu Plantation was started by James Louzada and Henry Cornwell. In 1865, C. Brewer and company acquired controlling interest of Wailuku Sugar Co. with Robinson and Company and Cumming as the minority stockholders. In 1894 bought the Waihe'e Sugar Company and the Waikapū Sugar Company. C. Brewer later changed the name to Wailuku Agribusiness in order to diversify agricultural production. In 1882, Princess Ruth sold one-half of the Crown Lands of Hawai'i to Claus Spreckels in order to settle her debts with him. Spreckels already held a lease (purchased from Henry Cornwell) for 16,000 acres of Wailuku *ahupua`a* (Waikapū Commons), dating from 1878 (R.P. 3152) and established Hawaiian Commercial & Sugar (HC&S). In 1898, control of HC&S passed from Claus Spreckels to that of S.T. Alexander and H.P. Baldwin. In 1895, the construction of a railroad was initiated to assist in the transportation and of sugar and laborers from the fields to the mills and Plantation Camps. This escalation of the sugar industry required and increased need for water (irrigation ditches) and imported labor in the form of Plantation Camps (Figures 17 and 18). Immigrants from around the world (Scandinavian, Scottish, Italian, German, Russian, Spanish, Hawaiian, Chinese, Portuguese, and Japanese) arrived on Maui to work on the sugar plantations; and several plantation camps and railroad spur lines were established in the Wailuku and Waikapū areas (Figure 18).

PREVIOUS ARCHAEOLOGY

The early archaeological studies conducted on Maui consisted of recording *heiau* (religious structures) sites along the coastline (Thrum 1909, Stokes 1916, and Emory 1920). An island-wide archaeological survey was executed in 1928 by Winslow Metcalf Walker (see Figure 11 and Table X). During this survey, the previously recorded sites of Thrum, Stokes, and Emory were revisited and new sites were recorded to produce the first island wide survey (1931). Walker's survey primarily focused on sites exhibiting substantial construction and *heiau* within the Wailuku District, none of which appeared to be within Waikapū *ahupua`a*. However, Thrum stated that four *heiau* were positioned within Waikapū *ahupua`a*, two in the village and two at or near the shore. It appears that he only saw portions of the larger one located in the village (Creed 1993).

Reaching the Wailuku section little that is new was gathered of a definite character, and much of what I have from early history is unknown to the old residents. Two heiaus were reported at Waikapū, formerly, one below the road abreast of T. Everett's, of large size, and one below the Catholic church, a small structure working probably in conjunction with the larger one. Portions of the large one was said to be still seen, but the small one was destroyed. The names of these were forgotten. Unfortunately no evidence was found in confirmation with this report nor anyone who had knowledge thereof. The same relates to an alleged heiau, each, formerly at Puuhele, at Maalaea, at Kihei and at Kalepolepo, of small size, and a larger one at Kulaihakoko, but no one else seems to have heard of them (Thrum 1909-1918:59).

According to Walker, an unnamed *heiau* and petroglyphs are located "a quarter mile from the village of Mā`alaea at the base of the foothills of the West Maui mountains" (Walker, 1931:43, 58-60, and 201-206). Creed suggested that it is not possible to infer the location of Walker's "ancient village". There appears to be confusion if he is referring to the location of the historic wharf and associated structures in Mā`alaea or to the area of the "house and shelter site" currently documented as State Site numbers 50-50-09-1441 and 1287 (Creed 1993:26).

Archaeological sites in the Mā`alaea Bay area included Site 50-50-04-1169 (former Site 50-50-04-1199), consisting of sixty petroglyphs on eleven boulders located inland and northwest of the harbor, and Site 50-50-04-1440 (Site 50-50-04-1286) comprised of a *piko* stone and a grinding stone located on the lawn of Buzz's Wharf (Figure 17). Site 50-50-04-1287 was documented as the Mā`alaea complex that extended from Mā`alaea to McGregor Point (same area that Walker describes shelters being located). Site 50-50-04-1441 contained three C-shapes and appeared to be located within the boundary of Site 1287 (Moore and Kennedy 1994:8 and 9).

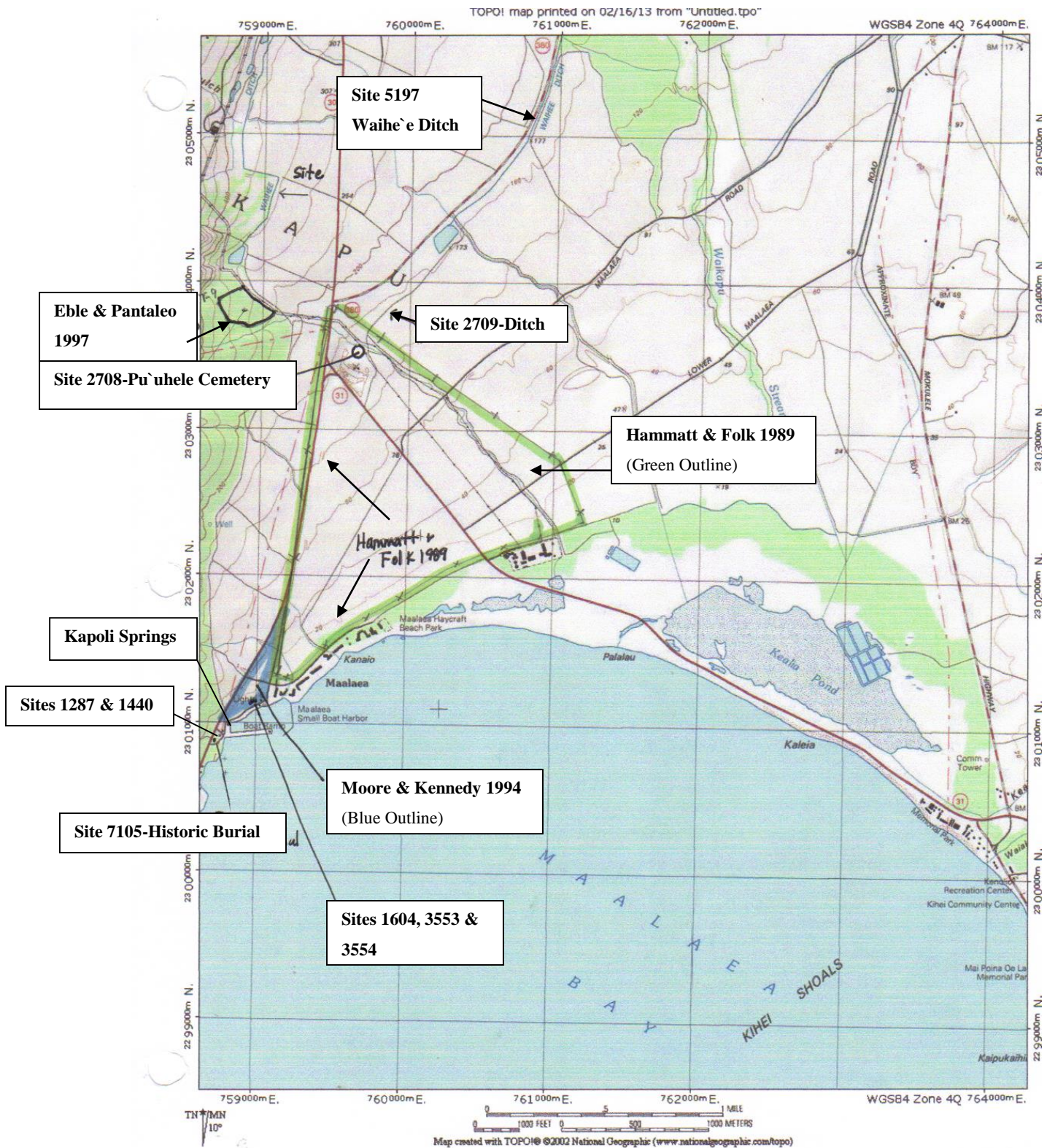


Figure 17. USGS Map Showing Location of Previous Archaeological Investigations and Historic Properties in Waikapū ahupua'a

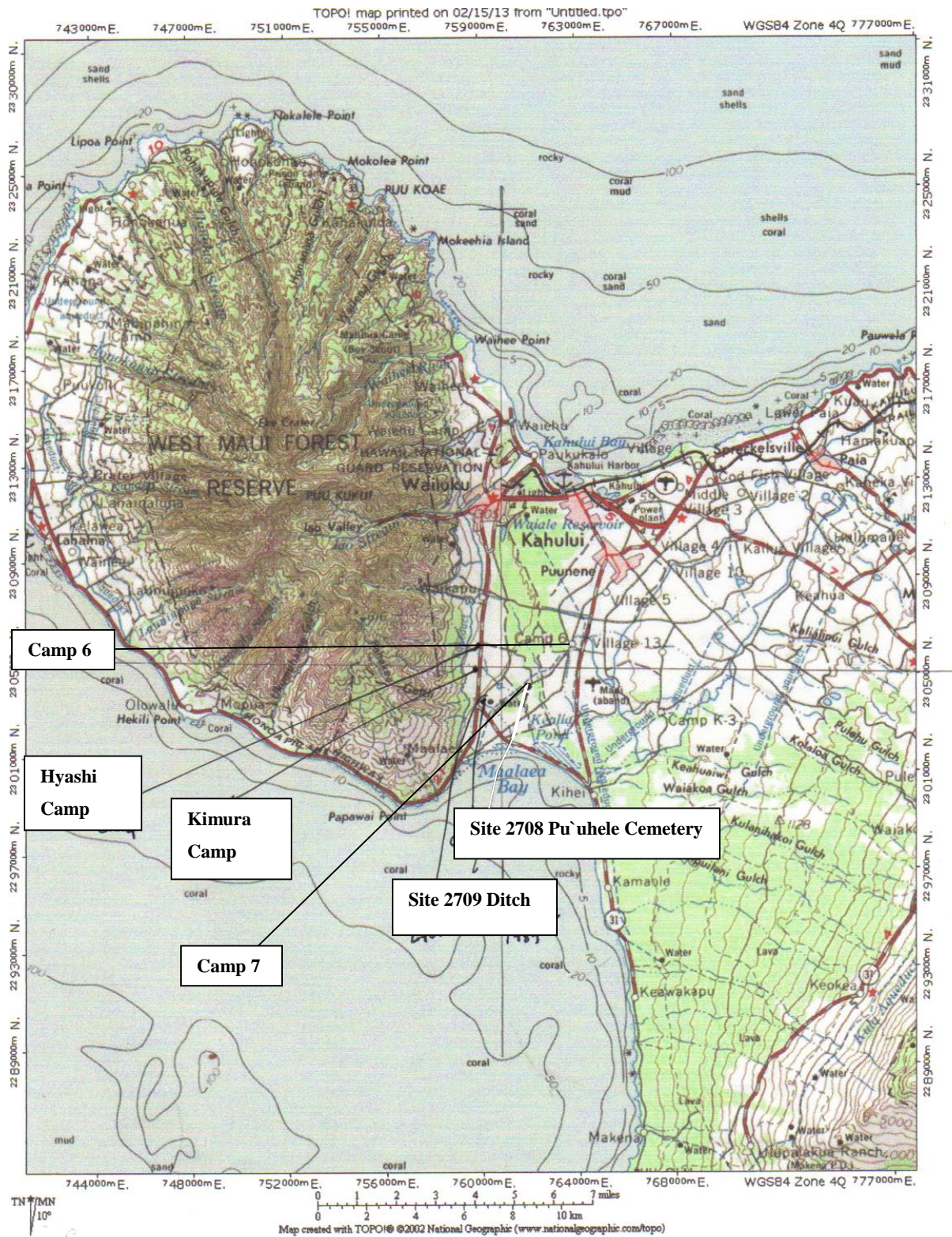


Figure 18. USGS Map Showing Location of Former Plantation Camps Properties in Waikapū Ahupua`a

Archaeological Research Conducted in the Environs of the Project Area

Since these earlier studies, numerous investigations have been conducted in the Waikapū and Wailuku *ahupua`a*. For those studies performed in Waikapū *ahupua`a* that are in close proximity to or within the boundaries of the subject parcel are discussed below and presented in Figures 17-21 and Table X. A significant portion of development has occurred in areas of fallow pineapple and sugarcane. The impact of commercial agriculture on surface historic properties has resulted in the almost complete removal of these surface structural remains from both the pre-Contact and post-Contact periods; however, remnant and or disturbed subsurface remains may have survived.

Cultural Surveys Hawai`i conducted an archaeological survey near Mā`alaea that resulted in the documentation of a historic plantation ditch (50-50-09-2709) and a post-contact cemetery (50-50-09-2708) Hammatt and Folk (1989). The plantation ditch was documented on 1900's plantation maps and referred to as Reservoir No. 13 (Figure 16). The cemetery at Pu`uhele contained at least seven burials with tombstones, two possible rock mound burials, and a single niche burial (Creed 1993:27).

In 1989 and 1991, PHRI completed a six hundred acre archaeological inventory survey within the Waikapū Mauka Partners Golf Resort. Haun's initial inventory survey (1989) suggested that the archaeological sites below the 500 feet amsl had been obliterated by intensive cultivation of sugarcane and pineapple (Figures 19 and 20). There were, however, pre-contact intact sites located above the 500 feet amsl. Nine archaeological sites (Sites 50-50-04-2019 through 50-50-04-2027) consisting of more than 46 features were documented. Haun concluded from excavation results that the majority of the archaeological features were agricultural (clearing mounds, terraces, cleared areas, walls, excavated depressions, and modified outcrops). In addition to these agricultural features, temporary habitation features (C-shapes and enclosures) were also present. During the data recovery component, permanent habitation sites were also documented and exhibited complex architectural designs (Brisbin et. al. 1991:28 and 32). Based on the numerous features identified during the two investigations, the authors concluded that two possible separate social units occupied this region concurrently with Group 1 in the northwestern portion of the project area between 700 and 800 ft. amsl and Group 2 positioned significantly lower between 400 ft. and 635 ft. amsl. They further postulated with increased elevation, an increase of agricultural features is noted, "with an inverse relationship between the density of agriculture and habitation related features between 500 and 700 ft." (1991:89). The agricultural features were primarily for dry-land agricultural activities; however wet land farming was noted in the gully bottoms and along gulches. In summary the authors concluded the following: from A.D. 1585 to A.D. 1665 there were multiple strata with interruptions and these breaks in the stratigraphic record may represent

abandonment or recurrent occupation, a catastrophic event that deposited sterile materials over the cultural strata and or the capping of pre-Contact layer by historic materials associated with ranching. During the early 19th century, the project area was reoccupied where several structures were modified or rebuilt, with the most intensive use during the initial 25 to 30 years. Following this intensive occupation, the area may have been intermittently utilized and or occupied from 1825 through 1910 in conjunction with ranching in the area. Radiocarbon dates ranged from the early A.D 1500 through the historic era. Background research pertaining to historic land use was also performed as part of the AIS procedures and noted that the southern half of the project area was utilized during the 1940's for activities that included a live grenade course, machine gun range and two anti-tank ranges (Wong Smith 1989:A-7).

An inventory survey was conducted by Archaeological Consultants of Hawai'i (ACH) on a parcel of land located directly to the west (*mauka*) of the site complexes recorded by Haun (1989) and Brisbin *et al.* (1991). During the inventory survey, eleven site complexes (Site 50-50-04-2753 through 2761, 2763 and 2764) were recorded that contained seventy-four related features and sub-features, in addition to seven additional single feature sites (Sites 50-50-04-62 and 50-50-04-65 through 50-50-04-70). Site complexes contained a variety of features: agricultural, habitation (both temporary and permanent), religious, and burials (Kennedy 1990 and Kennedy 1994). As previously noted, these archaeological sites appear to be a continuation of sites identified to the east; however they revealed much earlier radiocarbon dates that ranged from A.D. 1040 through 1950.

Two separate archaeological inventory surveys were conducted by Archaeological Consultants of Hawai'i for the proposed Waikapū Mauka water tank location in 1991 (see Figures 17 and 18). During the initial survey and subsurface testing for the water tank and access road, a residential complex with two associated agricultural features was documented. The revised water tank location boundaries partially overlapped the initial delineated boundaries. In conclusion, five features were documented within the boundaries of the two proposed water tank locations. Three features were documented in the first survey and two were documented during the second survey. Site 2904 contains three features: Feature-A (a habitation enclosure and a C-shape), Feature-B (two agricultural terraces and four clearing mounds), and Feature-C (an agricultural terrace). Subsurface testing within Feature-A produced a single piece of marine midden, *Kukui* shell, coral, and charcoal (Kennedy and Maigret 1991).

Archaeological Consultants of Hawai'i performed an archaeological inventory survey for the Maui Ocean Center located in Mā'alaea (Moore and Kennedy 1994). The surface survey identified one site of historic significance, the Mā'alaea Ebisu Jinja (State Site 50-50-09-1604). During the sub-surface testing,

twenty-five backhoe trenches were excavated and human burials were encountered and designated State Site 50-50-09-3553 and 3554 (Figure 17).

Aki Sinoto Consulting conducted an archaeological inventory survey consisting of thirteen backhoe trenches in a parcel which included the proposed Coral Wireless Waiko Baseyard location (Titchnel 1995). No cultural remains were encountered; however, due to the possibility of encountering human remains in the sand substrate monitoring was recommended for any future ground disturbing activities.

Garcia and Associates conducted an archaeological inventory survey of fifteen acres for a proposed base course production and composting facility located north of Pōhākea Gulch (Eble and Pantaleo 1997) (see Figures 17 and 20). The survey resulted in the identification of a single structural component. A historic wall segment that incorporated a wooden post and wire fencing material was documented and was possibly associated with Site 50-50-09-6062 or -6063 originally documented by PHRI in 1988 (Eble and Pantaleo 1997:9).

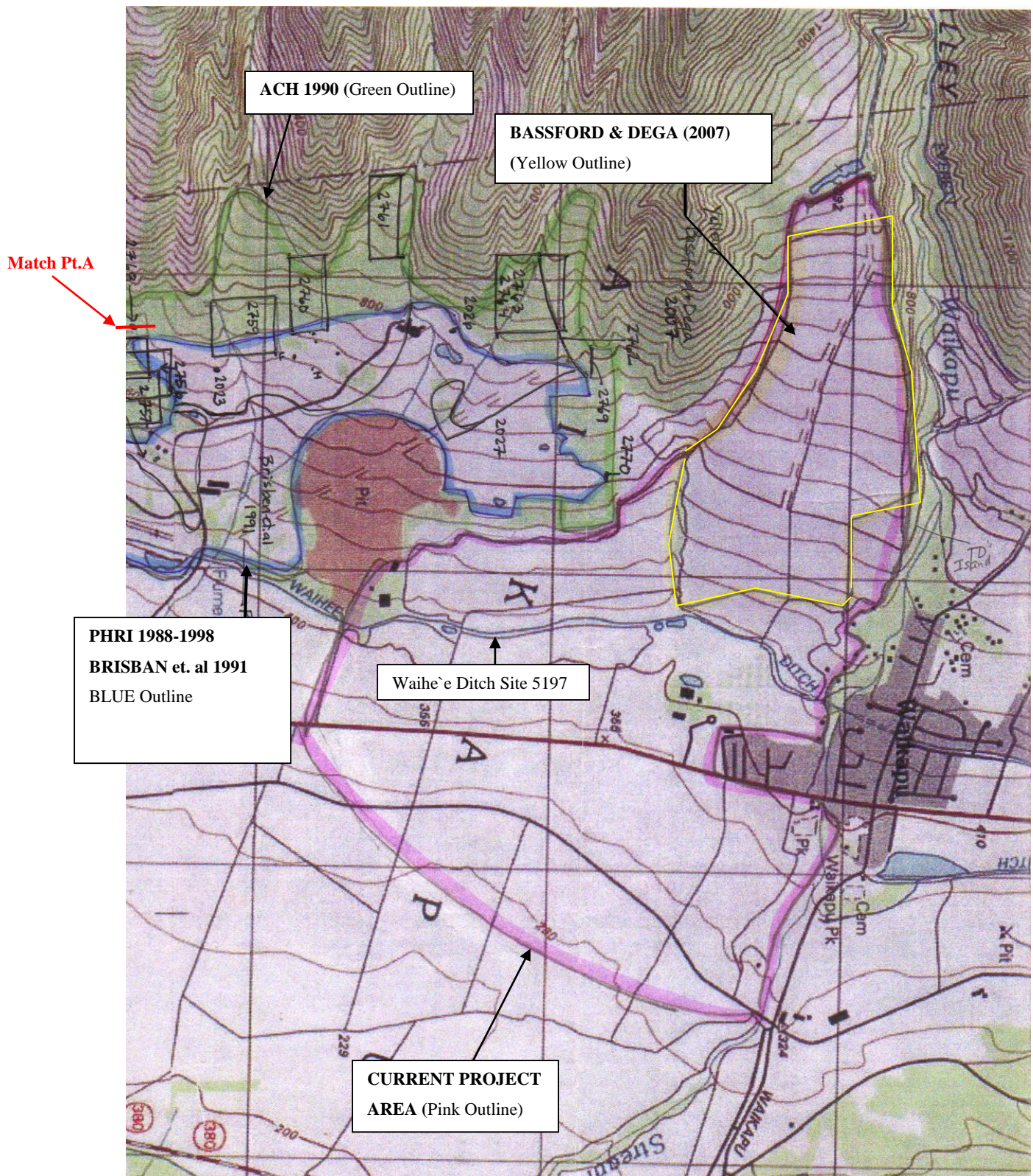


Figure 19. USGS Map Showing Location of Previous Archaeological Investigations in Upper Waikapu

An archaeological inventory survey was conducted by Scientific Consultant Services for five lots and a proposed road corridor in the Kehalani Mauka Subdivision (Dega 2003). There were three archaeological sites encountered: the Hopoi Reservoir (50-50-04-5473), the Kama Ditch (50-50-04-5474), and an isolated find basalt adze (50-50-04-5478). Subsurface testing consisted of eighteen trenches that were culturally sterile. A later inventory survey was conducted in the same Kehalani Mauka property and addressed lots not studied during the initial study. This later research documented six additional archaeological sites that consisted of several plantation clearing mounds (50-50-04-5492), a historic surface scatter (50-50-04-5491), a roadway (50-50-04-5489), previously recorded Waihe'e Ditch (50-50-04-5197), and a series of lesser ditches (50-50-04-5490 and -5493) (Dega 2004).

Scientific Consultants Services conducted an archaeological assessment in the Kehalani lands east of the Honoapi'ilani Highway. Subsurface testing resulted in recent agricultural debris located in Stratum II (Monahan 2003). There were no significant findings reported during this study.

Archaeological monitoring was implemented for the Kehalani Subdivision and off-site improvements along the Waiale Road by Scientific Consultant Services (Morawski, Shefcheck, and Dega 2006). Five sites were recorded and consisted of a historic road bed (50-50-04-5963), a sugarcane flume (50-50-04-5964), an *in situ* burial (50-50-04-5680), and two areas of isolated human remains (50-50-04-5965 and -5966). Remains associated with the isolated finds were encountered in a previously disturbed soil matrix that was most likely associated with the initial construction of the Waiale Road.

A 60-acre archaeological inventory survey was conducted by Scientific Consultant Services for the proposed Pōhākea Rock Quarry expansion project (Dagher and Dega 2007). This survey resulted in the re-identification and documenting six sites previously recorded by Paul H. Rosendahl, Inc. (PHRI) in 1988. During the preliminary survey, these sites were only designated temporary site numbers. The present study assigned State Inventory of Historic Properties (SIHP) numbers 50-50-09-6061 through -6065. One of the previously identified sites T-9 was re-evaluated during the 2007 study and was determined to be a natural unmodified boulder field. The other sites were all documented as historic ranching sites and complexes based on context and construction (Dagher and Dega, 2007:ii). During the 2007 survey, two additional sites were documented. An enclosure (50-50-09-6066) and a modified outcrop (50-50-09-6067) which were both presumed to be associated with historic ranching activities based on context and lack of traditional artifacts. This study resulted in the documentation of seven sites (five from initial study and two from later survey) containing twenty-three features.

In 2008 T.S. Dye and Colleagues, Archaeologist, Inc. conducted a historic properties assessment for the proposed Coral Wireless Waiko Baseyard cellular site. The objective of this archaeological investigation was to evaluate if the new antenna and equipment would have a negative effect on documented historic properties. The report concludes that due to significant ground altering activities previously conducted within the immediate APE and no historic properties documented in the proposed footprint that there will be no visual effect on historic properties. The report does recommend monitoring of any subsurface excavation during construction due to the possibility of encountering human remains in the sand substrate.

Previous Archaeological Research Conducted Within the Boundaries of the Project Area

An archaeological assessment was conducted on a 208 acre parcel of land by Scientific Consultant Services (Bassford and Dega, 2007). This parcel of land is located within the current project area's boundaries of Parcel 3 Mauka (Figures 19, 21 and Table X). A pedestrian survey only resulted in the documentation of modern commercial agricultural debris and no historically significant sites, features, or artifacts. Thus, neither the WWII bunker (Site 50-50-04-7883), nor the Plantation era irrigation features (Site 50-50-04-7881) were noted; which were identified during the current phase of work by ASH. The subsurface testing consisted of thirty-one backhoe trenches that were negative for significant buried cultural remains. As exhibited on Figure 21, the trenches were distributed throughout the project area with a focus on the western two-thirds and the extreme eastern perimeter. Due to the negative findings of the pedestrian survey and subsurface explorations, the archaeological inventory survey was reclassified as an archaeological assessment.

CONSULTATION

Informal discussions were performed with SHPD to determine if AIS procedures were warranted in areas not proposed for future development, and how these areas should be further identified besides the TMK (i.e. a phasing designation). It was determined that no inventory level procedures were warranted at this time, as no impending development was planned, and no phasing designation should be utilized.

Consultation was also performed with Mr. Avery Chumbley of Wailuku Agribusiness (former landowners) to discuss various structures on the property, past land use and if any known burial sites were located on the property. Mr. Chumbley advised that the Wailuku Agribusiness records indicated that a right-of-entry was signed by the military in the 1940's so that they could utilize the property. This information was similar to that provided by Ms. Helen Wong Smith in the historical background section of Haun (1989), where the military had occupied these *mauka* regions for various purposes including training exercises. Mr. Chumbley also indicated that there were no known burials on the property.

Informal discussions were initiated with a few landowners surrounding the project area as one lessee, Mr. Riechers indicated that he knew of burials in the northeastern vicinity of the project area by Parcel 3 Mauka and Parcel 6. Further inquiries with local residents and the current landowner confirmed that an historic grave is located within private land outside the project area to the northeast.

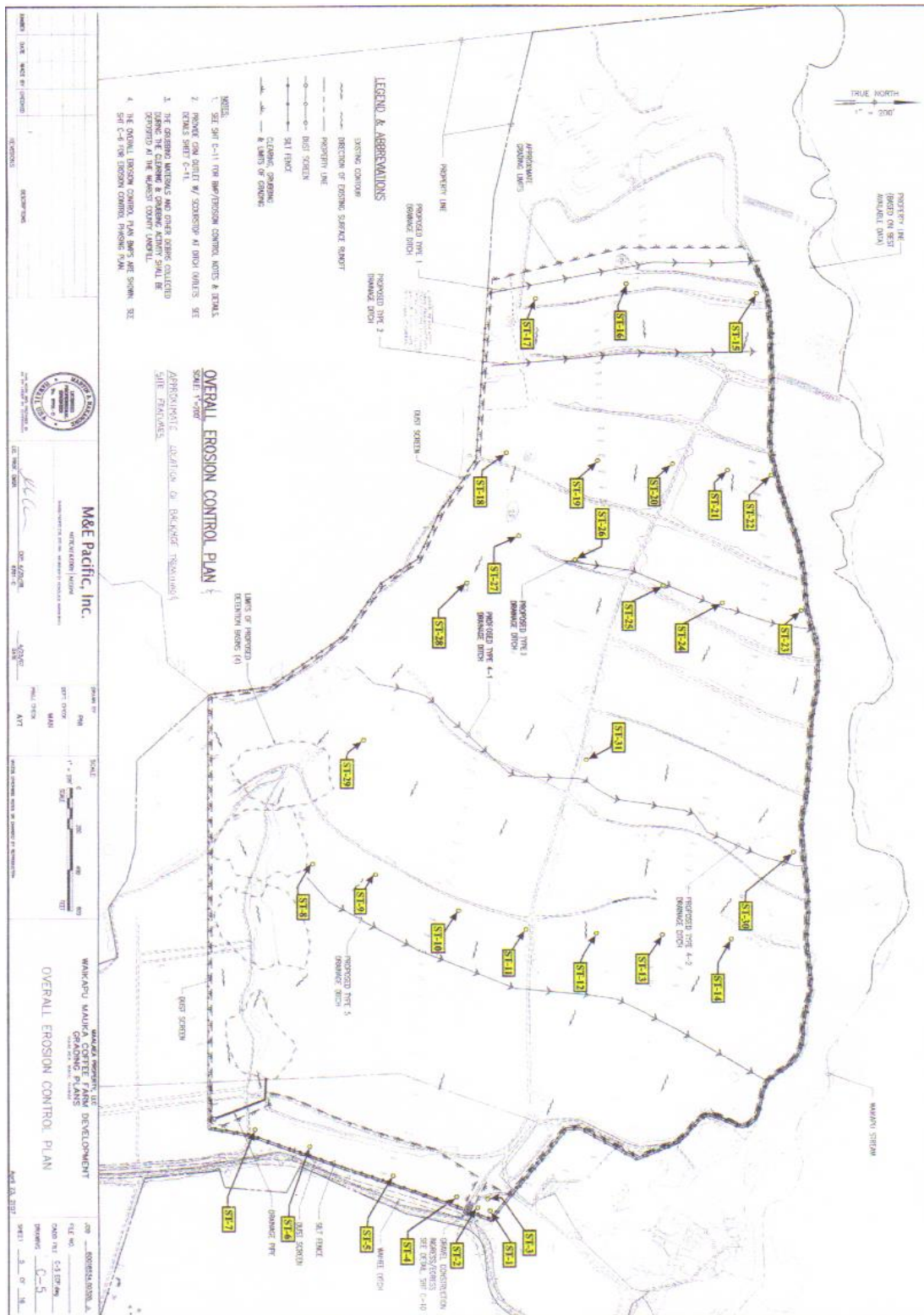


Figure 21. Plan View Map of SCS Project Area Showing Trench Locations ST1-31 within Current Parcel 3 Mauka and Parcel 6

Table X. Previous Archaeological Studies Conducted in the Waikapū Ahupua`a

DATE	AUTHOR/COMPANY	LOCATION	NATURE OF STUDY	FINDINGS
1909	Thrum	Maui Island	Coastal <i>heiau</i> survey	Study involved recording <i>heiau</i> (religious structures) sites along the coastline. Thrum recorded four <i>heiau</i> in the Waikapū Ahupua`a, two in the village and two at or near the shore.
1916	Stokes	Maui Island	<i>Heiau</i> survey	Added <i>heiau</i> sites to Thrum's list
1920	Emory	Maui Island	<i>Heiau</i> survey	Added <i>heiau</i> sites to Thrum's list
1928	Walker	Maui Island	Reconnaissance Survey	Revisited previously documented sites and recorded new sites (with substantial construction) to produce an island wide survey. In reference to Waikapū, Walker notes an unnamed <i>heiau</i> and petroglyphs located "a quarter-mile from the village of Mā`alaea at the base of the foothills of the West Maui mountains" (Walker 1931:43, 58-60 and 201-206).
1931				
1989	Hammatt and Folk (Cultural Surveys Hawai`i)	Waikapū Ahupua`a (near Ma`alaea)	A 600 acre archaeological inventory survey	Two sites [historic plantation ditch (50-50-09-2709) and a post-contact cemetery (50-50-09-2708)]
1989/ 1991	Haun (1989)/Brisbin, Haun, and Jensen (1991) (PHRI)	Waikapū Mauka Partners Golf Resort	A 600 acre archaeological inventory survey	9 sites with 46+ fes. documented and consisted of: ag. Fes. (clearing mounds, terraces, cleared areas, walls, excavated depressions, and modified outcrops) temporary habitation features (C-shapes and enclosures) and permanent habitation
1991	Kennedy and Maigret (Archaeological Consultants of Hawai`i)	Waikapū Mauka water tank location	Two separate archaeological inventory surveys	Site 2904, Feature-A (a habitation enclosure and a C-shape), Feature-B (two agricultural terraces and four clearing mounds), and Feature-C (an agricultural terrace).
1989 rev. 1992	Kennedy (Archaeological Consultants of Hawai`i)	Waikapū Ahupua`a in parcel of land directly west of site complexes recorded by Haun (1989) and Brisbin <i>et al.</i> (1991).	An archaeological inventory survey	Eleven sites comprised of seventy-four features and sub-features, in addition to seven additional single feature sites. Features consisted of: agricultural, habitation, religious, and burials Radiocarbon dates ranged from A.D. 1040 through 1950.
1994	Moore and Kennedy (Archaeological Consultants of Hawai`i)	Waikapū Ahupua`a Maui Ocean Center located in Ma`alaea	An archaeological inventory survey	The surface survey identified one site of historic significance, the Mā`alaea Ebisu Jinja) (State Site 50-50-09-1604). During the sub-surface testing, twenty-five backhoe trenches were excavated and human burials were encountered (State Site 50-50-09-3553 and -3554).
1995	Titchenal (Aki Sinoto Consulting)	Waikapū Ahupua`a WaikoBaseyard	An archaeological inventory survey	Sub. test of 13 backhoe TR's in a parcel incl. proposed Coral Wireless loc. Negative findings
1997	Eble and Pantaleo (Garcia and Associates)	Waikapū Ahupua`a north of Pōhākea Gulch	An archaeological inventory survey of fifteen acres	The survey resulted in the identification of a historic wall segment that was possibly associated with Site 50-50-09-6062 or -6063 originally documented by PHRI in 1988
2003	Dega (Scientific Consultant Services)	Waikapū Ahupua`a in the Kehalani Mauka Subdivision	An archaeological inventory survey was conducted for five lots and a proposed road corridor	There were three archaeological sites encountered: the Hopoi Reservoir (50-50-04-5473), the Kama Ditch (50-50-04-5474), and an isolated find basalt adze (50-50-04-5478). Subsurface testing consisted of eighteen trenches that were culturally sterile.

<u>DATE</u>	<u>AUTHOR/COMPANY</u>	<u>LOCATION</u>	<u>NATURE OF STUDY</u>	<u>FINDINGS</u>
2004	Dega (Scientific Consultant Services)	Waikapū <i>Ahupua`a</i> in the Kehalani Mauka Subdivision	An archaeological inventory survey was conducted in the lots not studied during the initial study.	This later research documented six additional archaeological sites that consisted of several plantation clearing mounds (50-50-04-5492), a historic surface scatter (50-50-04-5491), a roadway (50-50-04-5489), previously recorded Waihe`e Ditch (50-50-04-5197), and a series of lesser ditches (50-50-04-5490 and -5493)
2003	Monoham (Scientific Consultant Services)	Waikapū <i>Ahupua`a</i> in the Kahalani lands east of the Honoapi`ilani Highway	Archaeological assessment	Subsurface testing resulted in recent agricultural debris located in Stratum II--There were no significant findings reported during this study.
2004 and 2006	Rotunno-Hazuka and Pantaleo (Archaeological Services Hawai`i)	Waikapū <i>Ahupua`a</i> in the WaikoBaseyard	Prepared two monitoring plans for the construction of the WaikoBaseyard and a warehouse and associated utilities.	No surface or sub-surface cultural deposits were encountered during ground altering activities.
2006	Morawski, Shefcheck, and Dega (Scientific Consultant Services)	Waikapū <i>Ahupua`a</i> in the Kehalani Subdivision along the Waiale Road	Archaeological monitoring	Five sites were recorded and consisted of a historic road bed (50-50-04-5963), a sugarcane flume (50-50-04-5964), an in situ burial (50-50-04-5680), and two areas of isolated human remains (50-50-04-5965 and -5966).
2007	Bassford and Dega (Scientific Consultant Services)	Waikapū <i>Ahupua`a</i> (located within boundaries of current study)	208 acre parcel archaeological inventory survey	Surface and subsurface (thirty-one backhoe trenches) study yielded no significant findings
2007	Dagher and Dega (Scientific Consultant Services)	Waikapū <i>Ahupua`a</i>	A 60 acre archaeological inventory survey for the proposed Pohakea Rock Quarry expansion	This survey resulted in the re-identification and documenting six sites previously recorded by Paul H. Rosendahl, Inc. (PHRI) in 1988. During the preliminary survey, these sites were only designated temporary site numbers. The present study assigned State Inventory of Historic Properties (SIHP) numbers 50-50-09-6061 through -6065. One of the previously identified sites determined to be natural. The other sites were all documented as historic ranching. Two additional sites were documented [an enclosure (50-50-09-6066) and a modified outcrop (50-50-09-6067)] presumed to be associated with historic ranching activities.
2008	T.S. Dye and Colleagues, Archaeologist	Waikapū <i>Ahupua`a</i> in the WaikoBaseyard	Evaluate if the new antenna and equipment would have a negative effect on documented historic properties	No negative effect

SETTLEMENT PATTERNS

The current project area is situated along the foothills of the West Maui Mountains in Waikapū *ahupua`a*. Previous archaeological investigations, coupled with the history of the area focusing on previous land use, topographic features and ethno-historic accounts, can be used to develop a general predictive model for traditional Hawaiian settlement and subsistence patterns for this project area. The general region, including and encompassing the current project area, is referred to and appears to have been part of a large wetland taro production:

A hypothetical model for traditional Hawaiian settlement was developed by Kirch (1985) and Cordy (1978). According to this postulation, the project area would have been an ideal setting for early Hawaiian permanent habitation. Utilizing dates from other Hawaiian Islands, Cordy postulated that initial pre-Contact settlement in lower valleys and coastal regions occurred from 300 to 600 A.D. and by 1000 A.D. fishponds, protected bays, and religious structures.

From the studies conducted in the adjoining *mauka* properties to the south by Kennedy (1990), Haun (1989) and Brisbin et. al. (1991) evidence of pre-Contact occupation comprised of permanent and temporary habitation structures, religious sites, burials and extensive agricultural features ranging from A.D. 1040 to A.D. 1665 were recorded. The area was again intensively re-utilized from the early 1800's to the 1830's, and several structures were reconstructed and modified. After this reoccupation period, the area continued to be utilized intermittently with a focus on habitation related to the ranching operations in the area. From the mid-19th and 20th centuries, in reaction to the explosion of the sugar industry, historic settlement was prevalent along the intermediate zone of the *ahupua`a* (or isthmus) with numerous plantation camps and historic (plantation era) burials at Pu`uhele (see Figure 18).

The geologic landscape and presence/absence of various environmental zones also affected the way a population is distributed across a particular landscape. For the subject area and overall Waikapū *ahupua`a*, Waikapū Stream and its associated valleys and flatlands along with the shoreline at Mā`alaea Bay containing the Keālia Fishponds and Kapoli Springs would have provided an extremely hospitable environment in which to live. The stream with its rich alluvial soils and adjoining *mauka* areas provided favorable conditions for agricultural practices, habitation, animal husbandry, ceremonial and hunting and gathering for subsistence and religious practices. Towards the shoreline, the aforementioned fresh water and brackish water sources Waikapū Stream, Kapoli Springs, the Keālia Fishponds or Keālia wetlands and coastline would have supported agricultural and aquacultural practices along with marine exploitation of the coast including the collection of salt from the Keālia salt pans (Figure 17). Furthermore, to continue these subsistence activities at the coast, temporary habitation and ceremonial and or religious structures would have been constructed. Lastly, a review of the historic records (i.e. Mahele, entho-historic accounts and maps) provided a written account of land use at that particular period in history, and from these written records, the historic settlement of a population is easily discerned. The pre-Contact record in particular, traditional settlement patterns is merely inferred from the archaeological data and historic records. The use of the historic record in which to make inferences about pre-Contact life is based on the premise that an indigenous culture at the time of contact does not automatically change overnight, rather the response and effects of foreign impacts and influence develops overtime. By analyzing the various

land uses from the Mahele record for the project area exhibited that *lo`i* was the dominant land use and constituted 53% of the total and was followed by *kula* lands that comprised 22%; *pa hale* or house lots represented 17%, *hala* constituted 6% and sugar and *`auwai* both comprised 1%. These statistics were similar to the analysis performed by Victoria Creed for the entire *ahupua`a* of Waikapū where 50% of the land use was in taro.

Based on the foregoing archaeological record and hospitable environmental zones and or geologic landscape, traditional settlement along the *mauka* and *makai* regions would have been concurrent permanent habitation and or seasonal/recurrent with semi-permanent residences in both localities. The upland and coastal environs were linked by trail systems that extended across the isthmus or the intermediate/barren zone of the *ahupua`a*. Since both the upland zone of Waikapū *ahupua`a* and the coastal component were productive for their varying resources, the occupation of these areas would exemplify a dual pattern of resource utilization.

The presumed settlement patterns, coupled with the prior investigations assist in determining the types of historic properties to be expected. However due to the compounded disturbances across the project area from sugar cane cultivation, sand mining and the construction of the retention ditch, the likelihood that historic properties have survived is low but would comprise Native Hawaiian burial features with remnant agricultural (terraces) and or habitation (cultural layers) sites. Since no LCA were present within the subject parcel, historic period sites may comprise agricultural features and refuse sites and or remnant features from WWII.

SITE EXPECTABLY

Based on the aforementioned background information, consultation with knowledgeable individuals from the area and the predictive model of settlement, the type of sites and/or features that may have been encountered had the area not been subjected to large scale clearing and grading activities would comprise the following: traditional and historic permanent habitation (small and large enclosures, platforms), temporary habitation (terraces, c-shapes, modified outcrops), agricultural (*`auwai*, mounds, terraces, modified outcrops, enclosures) and animal husbandry (large enclosures) sites. Un-marked or marked burial sites from the pre and post-Contact periods may also have been extant. Additional features related to Plantation era sites would comprise remnant waterways, flumes, ditches and reservoirs.

Unfortunately, since 95% of the project area has been extensively altered through grading activities associated with sugarcane cultivation and the construction of the Maui Tropical Plantation commercial

buildings, no surface structural remains associated with the pre-Contact and historic eras are anticipated; however architectural features associated with sugarcane cultivation and the military may be encountered. Furthermore, remnant subsurface historic properties associated with habitation and agriculture (rock alignments, cultural deposits, refuse pits and human burials), may be extant but the likelihood of encountering these subsurface features would be dependent upon the depth of the sugarcane till zone.

METHODS AND PROCEDURES

Archaeological procedures were conducted intermittently from February through June 2013 by supervisor Ms. Diane Guerriero (B.A.) and archaeological personnel Ms. Rochelle Barretto. Over 500 person hours were expended in the field. Overall supervision and coordination was performed by Ms. Lisa Rotunno-Hazuka (B.A.) and the Principal Investigator was Mr. Jeffrey Pantaleo (M.A.).

DOCUMENT REVIEW

Document review included examination of archival sources, historic maps, previous archaeological reports from the SHPD and ASH libraries, historic photographs, the Waihona `Āina online data base and multiple online sources. These references were accessed in order to formulate a predictive model of the types of historic properties that may be encountered in the area, and to ascertain the most productive placement of test trenching

FIELD METHODOLOGY

The perimeter of the project area was established by comparing current landmarks (streets, access cane field roads, structures, fence lines and water ways), the natural topography and information provided on various maps, historic photographs and survey points provided by the licensed survey crew. Once the boundaries of each respective parcel were determined, a systematic pedestrian survey was performed to determine if surface historic properties were extant, and to assist in future placement of the backhoe trenches. The pedestrian survey was executed in areas that were open and devoid of dense sugarcane. For these open areas, transects were spaced five to ten meters apart, and for sections with dense, tall sugarcane, the pedestrian survey was only feasible through the cane haul roads. The cane haul roads were traversed and gaps in the sugarcane were accessed through these roads. As potential historic properties were identified, they were marked with flagging tape and assigned a temporary site number (TS). Once the pedestrian survey was complete, the temporary sites and/or features were recorded through scaled plan view drawings utilizing tape and compass, photographs and feature description forms. Features and trenches were located with a tape and compass from known survey points and with a Garmin GPS.

Since approximately 95% of the project area was subjected to compounded disturbances from sugar cane cultivation, subsurface testing through mechanical trench excavations was deemed appropriate in all areas

with no extant and or intact structural or cultural remains. Backhoe testing was performed in all future development areas and monitored by archaeological personnel. The primary goal of testing was to focus on areas containing LCA's and Grants, particularly those *kuleana* lands utilized as house lots and or for *lo'i* as these localities had the highest potential to contain buried cultural and or structural remains. The secondary goal was to obtain a representative sample of the subsurface conditions across the parcel zones outside the LCA's and Grants for the presence absence of cultural remains. This proposed sampling technique for the placement of the trenches was systematic random sampling, where the areas to be analyzed are chosen at random with a subsequent pre-determined strategy (Hester et. al. 2009). "Use of this sample technique guarantees more uniform coverage of an area than would likely occur with simple random sampling" (Hester et. al. 2009:29). Simple random sampling, as defined by Hester et. al., means that "each sample unit has an equal chance to be selected (Hester et. al. 2009:29)," therefore, if randomly chosen, all sample units or test trenches could occur within one section.

The backhoe test trenches were number sequentially per project area moving *mauka* to *makai*. Parcel 3 Mauka was labeled TR's 400-415, Parcel 3 Waena contained TR's 1-27 and 01-015, Parcel 6 was TR's 200-225, Parcel 7 trenches were designated TR's 300-324 and Parcel 3 Makai TR's 100-141. Trenches were recorded through photographs, stratigraphic profiles and overall dimensions. A stratigraphic profile of a representative column for each trench was recorded and the soil profile was to scale with soil color and texture recorded. If intact and or remnant cultural or structural remains were identified, controlled manual test units would be performed on the subsurface feature adjacent to the trench. During the course of this project, all accepted standard archaeological procedures and practices were followed.

Site boundaries were based on spatial relationships of features and presumed chronological and or functional contemporaneity of the features. Features numbers were assigned sequentially under each site number and were given a numeric value. If associated subsurface features, (such as fire-pits) and or subcomponent features (such as a series of stepped slope terraces) were identified, an alphanumeric designation was assigned. One site, Site 7884 was comprised of three localities (Features 1-3) which contained historic artifact scatters in a secondary context. These features were subsumed under one site number based on the similar function and age, and not based on spatial extent.

All temporary site numbers (i.e. TS 4 and 21-25) retained and discussed in the report have little to no integrity from recent disturbances and or do not meet any significance criteria. These features were presented and discussed in the report to note that they were identified and the reasons for not assigning a and that

LAB WORK

All soil samples collected in the field were in stored in plastic bags, labeled with trench number, associated zone, provenience data and date collected. Soil samples were then processed and accessioned at the lab and recorded utilizing the Munsell color system, and soil texture using USDA soil terminology. All artifacts were accessioned, sorted, cleaned, analyzed and photographed. All soil samples, recovered artifacts as well as field notes, maps, and photographs generated in connection with the current project are curated at Archaeological Services Hawaii, LLC, in Wailuku and Makawao Maui.

RESULTS OF SURVEY AND SUBSURFACE TESTING

During the course of the current fieldwork, a total of five historic properties designated Sites 50-50-04-5197 (Waihe`e Ditch) and 50-50-04-7881 through 7884 comprised of 24 features were identified during the pedestrian survey and or subsurface testing (see Figure 8 and Table XI). Site 5197 was a section of a Plantation ditch, Waihe`e Ditch; Site 7881 consisted of a Plantation irrigation complex comprised of water containment, transportation and diversion features designated Features 1-18. Features 1-18 included concrete lined ditches, sluice gates and dirt culverts with concrete lined headwalls. Site 7882 was a section of an historic rock retaining wall utilized for slope retention purposes or as an agricultural terrace and Site 7883 was a WWII military site comprised of a bunker specifically utilized as a horizon aviation observation bunker. Site 7884 is an historic habitation site comprised of secondarily deposited domestic artifacts and a refuse deposit dispersed at three localities and designated Features 1- 3. The subsurface testing program, consisting of 150 backhoe trenches, was primarily negative for buried cultural remains.

Additionally, a several low rock agricultural clearing mounds (TS21- 25) and a historic concrete slab (TS4) were documented in Parcel 3 Mauka and Parcel 3 Waena; however these features did not meet any significance criteria evaluation.

Since the majority of the property has been graded and or is currently cultivated, a total of 150 backhoe trenches were executed within the five zones with nominal findings in Parcel 6 TR 218; Parcel 7 TR's 323 and 324.

SITE 50-50-04-7881

Site 7881 is comprised of Plantation era water diversion, transportation and catchment features associated with sugar cane cultivation. The site is in good condition and measured 1,372.0 m long (E/W) by 12.2 m wide (N/S) and is situated along portions of the eastern and northern boundary of Parcel 3 Mauka and consists of Features 1-18, a series of ditches, culverts, sluice gates (water diversion and overflow) and a reservoir (Figures 22 and 23). Features 1 and 3-6 are positioned outside the project area near the western boundary and northwest corner and were recorded due to the close proximity to the subject parcel and inter-relationship of these features with the remaining Features 7-18 of Site 7881.

Table XI. Summary of Historic Properties Site 50-50-04-7881 through Site 50-50-04-7884

SITE/FE	TEMP.	LOCATION	FEATURE	FUNCTION	AGE
50-50-04-	SITE		TYPE		
5197		bndry between Parcels 6 & 7	ditch	Ag. water transportation	Historic
7881/Fe.1	TS1	Outside proj. along NW corner	ditch	Ag. water transportation	Historic
7881/Fe.2		North side Parcel 3 Mauka	ditch	Ag. water transportation	Historic
7881/Fe.3		Outside Proj. Area on East	reservoir	Ag. water catchment	Historic
7881/Fe.4		Outside Proj. along NW corner	mod. sluice gate	Ag. water div. & transp.	Modern
7881/Fe.4a		Outside Proj. along NW corner	concrete culvert	Ag. water div. & transp.	Historic
7881/Fe.5		Outside proj. along NW corner	concrete culvert	Ag. water div. & transp.	Historic
7881/Fe.6		Outside proj. along NW corner	concrete culvert	Ag. water div. & transp.	Historic
7881/Fe.7		N. bndry W. end Parcel 3 Mauka	sluice gates	Ag. water div. & transp.	Historic
7881/Fe.8		N. bndry W. end Parcel 3 Mauka	sluice gates	Ag. water div. & transp.	Historic
7881/Fe.9		N. bndry W. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.10		N. bndry W. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.11		N. bndry Cntrl. pors Par. 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.12		N. bndry Cntrl. pors Par. 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.13		N. bndry Cntrl. pors Par. 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.14		N. bndry E. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.15		N. bndry E. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.16		N. bndry E. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.17		N. bndry E. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7881/Fe.18		N. bndry E. end Parcel 3 Mauka	culvert	Ag. water div. & transp.	Historic
7882	TS3	along NE pors Parcel 3 Mauka	ret. wall/soil terrace	Agricultural	Historic
7883	TS4	Central pors. of Parcel 3 Mauka	WWII bunker	Military	Historic
7884/Fe.1	TS2	NE pors. of Parcel 3 Mauka	marginal art. scatter	Habitation	Historic
7884/Fe.2		N. central pors. Of Parcel 6	marginal art. scatter	Habitation	Historic
7884/Fe.3	TS5	NE pors. of Parcel 7	marg. refuse deposit	Habitation	Historic to Mod.
Mod. =modern					
Ag. = Agricult transp. = transportation					
div. = diversion					

Site 7881 Feature 1

Feature 1 is one of two ditches that originates and or intersects from the un-named ditch, probably Waikapū Ditch South in the upper Waikapū Valley (Figures 22-23). The total length of the Waikapū Ditch South from the origin of the water source in the upper valley to Feature 3-reservoir is approximately 1.6 km (1 mile) long. Waikapū Ditch South in the upper valley is an open earthen canal and at the point that it becomes improved and concrete lined, it is designated as Feature 1 (Figures 24 and 25). This improved portion (Feature 1) flows in a west/southeast direction (J-shaped) down slope towards the reservoir (Feature 3) for a length of 21.2 meters at an elevation of approximately 1017 AMSL. Feature 1 is concrete reinforced along the base of the banks and measures 21.2 m long by 1.6 m wide by 1.0 deep with exterior concrete bank heights of 0.30 m on the west and 1.2 m on the east. The service trail/access

road which bounds the project area to the north and is parallel to Waikapū Stream on the north bisects Feature 1 at 15.7 m just before it curves to the south and empties into Feature 3 (reservoir) (Figure 26). The bridge measures 5.3 m in width east/west by 2.44 m in length northeast/southwest with an interior height of 0.30 m and exterior height of 0.55 m. Southeast of this service trail road bridge are three water diversion features (Features 4-6) or sluice gates, which intersect with Feature 1 and are discussed in detail below. Feature 4 is located 2.3 m southeast of the bridge, Feature 4a and Feature 5 are 4.1 m and Feature 6 is 7.7 m southeast of the bridge. Features 5 and 6 are abandoned and no longer divert water; however Features 4 and 4a re-channelize a portion of Feature 1 water east to another *`auwai* designated Feature 2 (see Figure 25). Feature 2 flows east, parallel along the south and north sides of the dirt access road bounding Parcel 3 Mauka, and Feature 1 continues south emptying into the Feature 3 reservoir (see Figure 23 below).

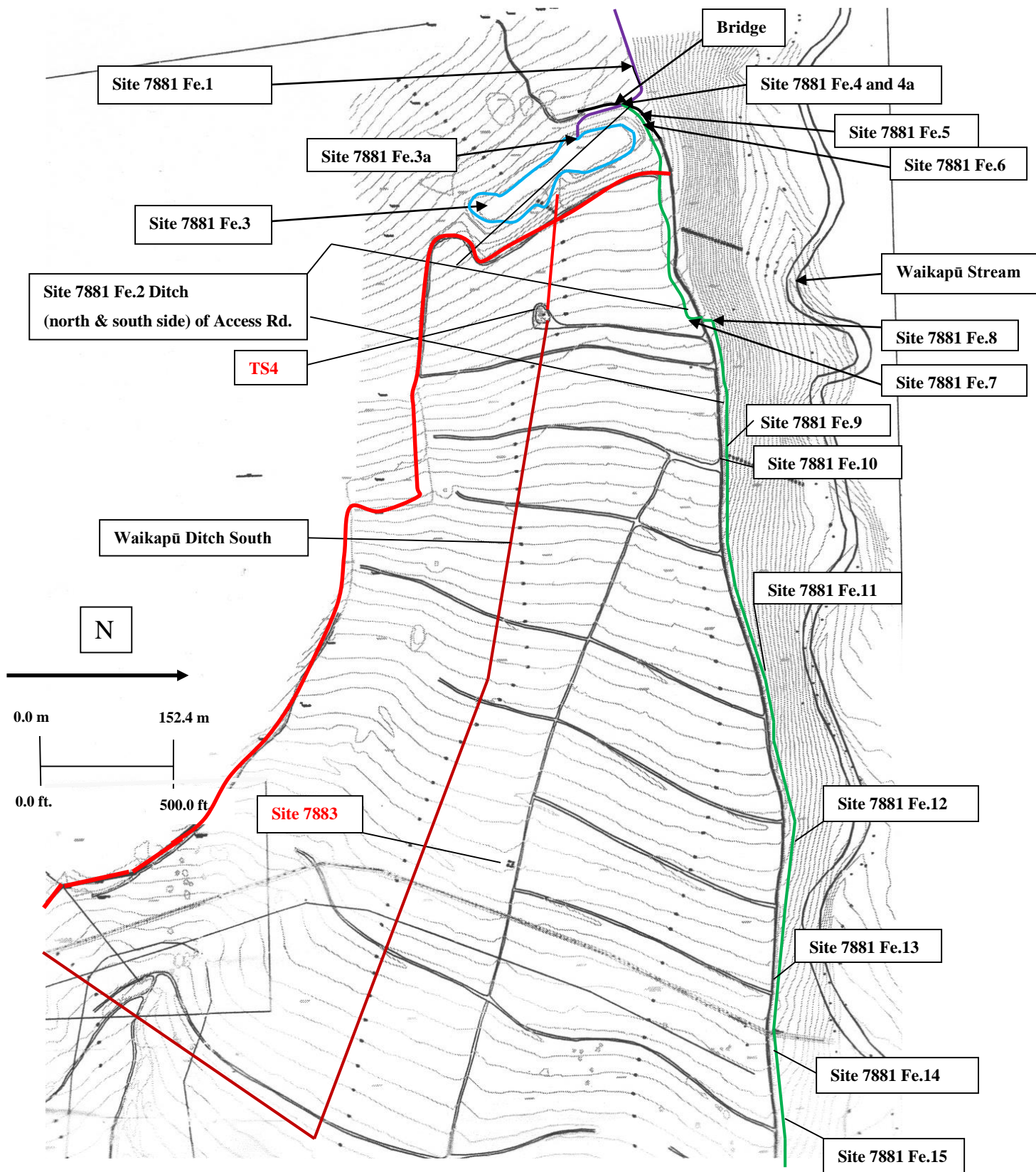


Figure 22. Plan View Map of a portion of Parcel 3 Mauka Showing Location of 7881 Features 1-15 and Site 7883 Features 2 and 3

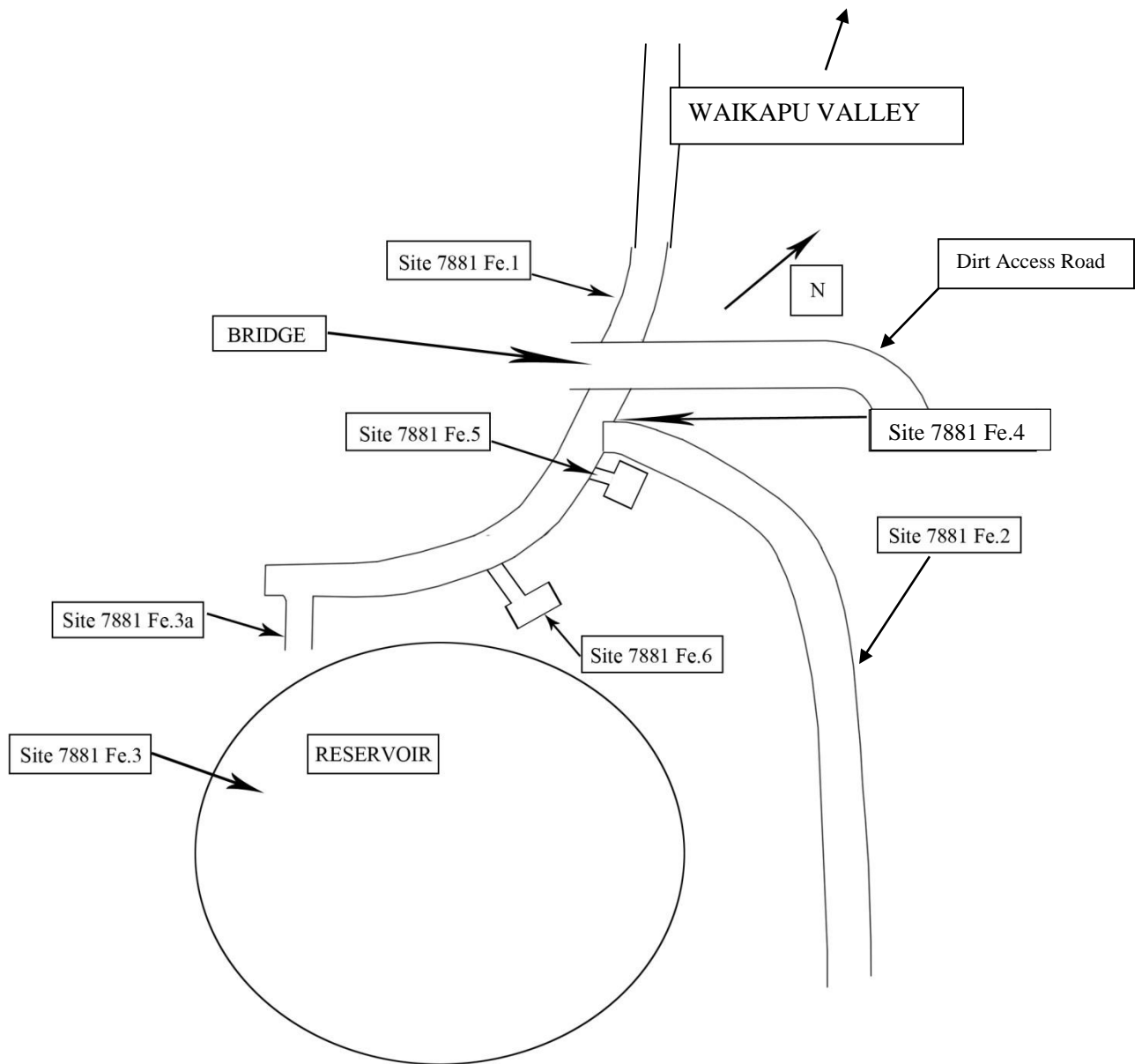


Figure 23. Plan View Map Showing Relationship of Site 7881 Features 1-6 (not to scale)



Figure 24. Site 7881 Feature 1 View to Northwest towards Upper Valley



Figure 25. Site 7881 Feature 1, View to North with Feature 6 on Right



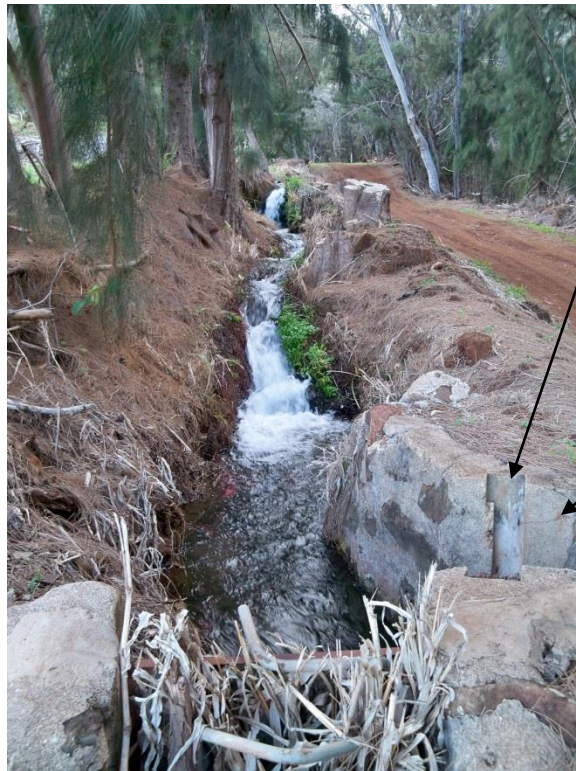
Figure 26. Site 7881 Feature 1 Emptying into Reservoir (Feature 3) through modernized Chute (Feature 3a) (View to South)

Site 7881 Feature 2

Feature 2 is the primary ditch of Site 7881 that is parallel to the service access road that bounds the north side of Parcel 3 Mauka. It is oriented east-west and runs along the south side of the access road and eventually crosses under the road through Features 7 and 8 culverts and runs along the north side of the service access road from Feature 8 to Feature 18 (see Figures 6 and 22). Feature 2 contains water diverted from Feature 1 (Waikapū South in the valley) through a sluice gate (Feature 4) and water chute (Feature 4a). This ditch appears to be much older and in a dilapidated condition when compared with Feature 1. It is narrower, approximately 0.65 m in width, and comprised primarily of earthen banks with sporadic concrete and mortared rock lining along portions of the banks with concrete partially lining the base of the ditch (Figures 27-28). Feature 2 averages 0.60 m deep and continues for an approximate 214.0 m along the south side of the dirt access road, where it enters another diversion feature, Feature 7 (see Figure 28).



Figure 27. Site 7881 Feature 2 Ditch with Feature 5 in the foreground right (View to West)



Note incised concrete for
former rails and associated
sluice gates

Feature 7

Figure 28. 7881 Feature 2 Ditch at juncture with Feature 7 diversion feature in foreground (View to West)

Site 7881 Feature 3

Feature 3 is the reservoir that is located just outside of the project area at the top (western) edge of Parcel 3 Mauka at an elevation of 1017 AMSL (see Figures 22 and 30). Feature 1, the improved portion of Waikapū Ditch South empties into the reservoir on the west (see Figure 26). The water source originates from the upper the Waikapū Valley and flows through various `auwai and sluice gates to provide water to the agricultural endeavors below.



Figure 29. Site 7881 Feature 3 Reservoir, View to South

Site 7881 Feature 3a

Feature 3a is modernized chute that empties directly into (Feature 3) Reservoir from Feature 1 (see Figure 23). This feature utilizes wooden sluice gates with metal chains and locks, reinforced fiberglass chute walls with an 8-inch PVC piping that funnels the ditch (Feature 1) water into the reservoir.



Figure 30. Overview Photograph of Feature 1 (Left) and Feature 3a (Right)

Site 7881 Feature 4

Feature 4 is the water diversion feature comprised of a sluice gate and concrete box culvert which directs water from Feature 1 ditch to Feature 2 ditch. The sluice gate is a modern wooden gate located along the northeast side of Feature 1 approximately 2.3 m northeast from the bridge (see Figures 22, 23 and 31). It is secured with chains and a key lock and diverts water to the east through the associated concrete box culvert. The concrete culvert measures 1.2 m E/W by 1.2 m N/S, with an interior height of 1.35 m N/S and an exterior height of 1.1 m to 1.2 m that appears to have been connected to Feature 5, an abandoned concrete containment and diversion box culvert to the south further discussed below (Figure 32).

Site 7881 Feature 5

Feature 5 is an abandoned concrete water diversion and containment feature situated 1.8 m at 36° NE of Feature 4 and shown in Figures 31-33. It is a formed concrete structure with a box shaped, intake well that measures 1.2 m long by 1.2 m wide by 1.0 m high on the interior and 1.1 to 1.2 m on the exterior and an adjoining concrete culvert that measures 1.35 N/S long by 1.25 m E/W wide by 1.2 m high. If operational, Feature 5 would have diverted water into Feature 2, the down slope eastern channel.



**Figure 31. Photograph of Site 7881 Features 1 and 2 ditches and diversion structures Features 4, 4a and 5
(View to South)**



Figure 32. Photograph of Site 7881 Features 4, 4a and 5 Water Diversion Features (Bottom)



**Figure 33. Site 7881 Feature 1 (ditch), Feature 5 (Water Containment Feature) and Feature 4 (Sluice Gate)
(View to North)**



**Figure 34. Site 7881 Feature 2 ditch flowing East from Feature 4 concrete culvert with portion of Feature 5
bottom right (View to East)**

Site 7881 Feature 6

Feature 6 is the last abandoned water diversion feature also situated along the east side of Feature 1 outside the project area. It is an L-shaped structure similar to the other water features made of formed concrete which contains large aggregate gravel inclusions (Figures 35 and 36). The intake and out take walls range from 0.96 to 1.2 m long by 0.62 m to 1.1 m wide by 1.0 m to 1.4 m high with a concrete cap measuring 0.90 m long (north/south) by 0.80 wide m wide and 1.1 m high. Incised into the concrete out take walls are metal railroad rails in which the sluice gate could slide up and down along the rails to control the flow of water. The embedded rails were observed within several sluice gate or water diversion features in the area. Feature 6 would have diverted water east into another *`auwai* (ditch) that flowed further down slope to irrigate sugarcane.



Figure 35. Photograph of Site 7881 Feature 6 foreground with Feature 1 ditch background (View to North)

Site 7881 Feature 7

Feature 7 is one of two sluice gates associated with Feature 2 ditch. It is located 214 m east of the juncture from Features 2 and 4 (sluice gate). Feature 7 has concrete lined walls with two chutes, one is open and water flows under the service road to Feature 8 on the north side of the service access road. The other chute is closed with a metal sluice gate and appears to have been closed for some time (Figure 37).



Figure 36. Photograph of Site 7881 Feature 1-Ditch (left) and Feature 6-Water Diversion (right) (View to North)

Site 7881 Feature 8

Feature 8 is another sluice gate associated with Features 2 and 7 located along the north side of the service access trail. It is an L-shaped structure comprised of formed concrete walls with large cobble inclusions and a modern sluice gate which empties towards Waikapū Stream and Feature 2 main ditch. Indentions for former railroad rails are present along the out take chute to the east (Figures 38 and 39).



Figure 37. Site 7881 Feature 7 Sluice Gate in Foreground and Feature 8 Background (View to Northeast)



Figure 38. Photograph of Site 7881 Feature 8 showing Two Channels, Feature 2 Ditch continues East and Overflow beyond Sluice Gate to Waikapū Stream (View to North)



Figure 39. Up-Close Photograph of Feature 8 (View to east)

Site 7881 Features 9-18

Features 9 through 18 are a series of culverts along the north side of the service access road which continue to divert water underground within the Feature 2 ditch system along the north side. These features will not be affected by the proposed improvements and will be preserved in place at this time. These features are briefly described below.

Site 7881 Feature 9

Feature 9 is a culvert associated with Feature 2 ditch which continues to direct water downslope to the east, with overflow directed to the north into Waikapū Stream. The intake chute on the west contains a 12” metal pipe, reinforced at the opening by the construction of a rock and mortared faced wall. The wall is comprised of basalt water-worn and sub-angular cobbles held together with mortar and concrete containing large grained sand and large angular gravel approximately 1.5 m wide and 0.95 m deep. Along the east side is an open earthen ditch which intersects with Feature 2 on the north and directs any excess flow of water into the Waikapū Stream.



Figure 40. Photograph of Site 7881 Feature 9 Intake on West side (View to North)



Figure 41. Photograph of Site 7881 Feature 9 Out take on East (View to North)

Site 7881 Feature 10

Feature 10 is another culvert within the Feature 2 east flowing ditch on the north side of the access service road. The water flows into an underground culvert on the west, approximately 15.5 long, and emerges on the east. It is constructed similarly to Feature 9 with a 12" metal pipe, and concrete basalt water-worn and sub-angular cobbles placed against the wall around the pipe and measures 1.4 m long by 0.90 m deep. Another earthen ditch, like Feature 9, is present along the west side for overflow of water which will be directed to Waikapū Stream.



Figure 42. Photograph of Site 7881 Feature 10 Intake on West (View to East)



Figure 43. Site 7881 Feature 2 Ditch along the north side of access road are remnant retention walls, mortar and water-worn cobbles and sub-angular basalt cobbles, section before Site 7881 Feature 10, View to North

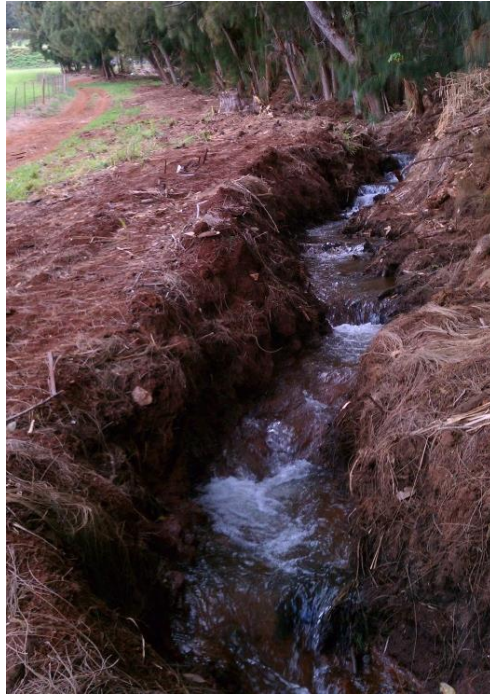


Figure 44. Feature 2 Ditch flowing into Site 7881 Feature 10 Culvert (View to West)

Site 7881 Feature 11

Feature 11 is another culvert on the north side of the access road constructed similarly to Features 9 and 10. The water from the west flows into an underground 12” metal pipe culvert approximately 14.5 long and emerges on the east (Figures 45 and 46). The intake (west) side contains the same reinforced wall of basalt water-worn and sub-angular cobbles with concrete faced 1.2 m wide and 1.0 m deep. An open earthen ditch is present on the east for overflow of high volume water which will empty into the Waikapū Stream.

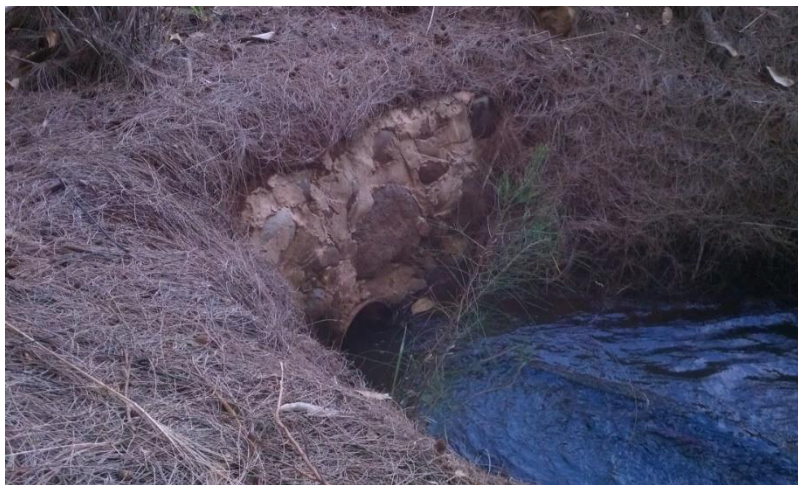


Figure 45. Photograph of Site 7881 Feature 11 Intake on West (View to East)



Figure 46. Photograph of Site 7881 Feature 11 Out-take (View to West)

Site 7881 Feature 12

Feature 12 culvert is approximately 15.5 m long and comprised of a 12” metal pipe. The intake (west) side opening is faced with concrete and basalt water-worn and sub-angular cobbles which measures 1.4 m wide and 0.90 m deep (Figure 47). The overflow earthen ditch is present along the east out-take side and directs the high volume of water into the Waikapū Stream on the north.



Figure 47. Overview Photographs of Site 7881 Feature 12 Intake (View to East) left and Feature 12 Out-take (View to West) right

Site 7881 Feature 13

Feature 13 culvert for Feature 2 ditch on the north side of the access service road consists of a 12" PVC pipe which measures approximately 13.5 m long and emerges on the east (Figure 48). The pipe on the west side contains a concaved, concrete faced lining which measures 1.3 m wide by 0.70 m deep. The earthen open ditch is present on the east side and utilized for all excess water which will be re-directed to Waikapū Stream.



Figure 48. Photographs of Site 7881 Feature 13 Intake (View to East) left; Feature 13 Out-take (View to West) right

Site 7881 Feature 14

Feature 14 is another culvert situated along the north side of the dirt access road. This culvert, like Feature 13 is comprised of a 12" PVC pipe which runs underground for approximately 13.5 m. At the opening around the intake, the earth is reinforced and lined with concrete which measures 1.6 m wide and 0.80 m deep (Figure 49). The open earthen ditch is present along the east side and re-directs high volume water flow to the north into Waikapū Stream.

Site 7881 Feature 15

Feature 15 culvert is situated on the north side of the service access road and runs underground for approximately 18.0 m. The culvert consists of a 12" PVC pipe with concrete and rock facing along the west intake side (Figure 50). The reinforced wall around the opening measures 1.4 m wide by 1.0 m deep. The out take side contains the open earthen ditch for overflow of excess water.



Figure 49. Overview Photographs of Site 7881 Feature 14 Intake (View to East) left; Feature 14 Out-take (View to West) right

Site 7881 Feature 16

Feature 16 culvert is larger and comprised of a 24” metal pipe which runs underground for approximately 6.2 m and emerges on the east (Figure 51). This culvert does not contain a reinforced faced wall along the intake west side, but may have at one time. An open earthen ditch is present on the east for the over flow of water which will empty into Waikapū Stream.



Figure 50. Photographs of Site 7881 Feature 15 In-take (View to East) left and Feature 15 Out-take View to West (right)



Figure 51. Photographs of Site 7881 Feature 16 Intake, View to Southeast (left) Out-Take, View to West

Site 7881 Feature 17

Feature 17 is another culvert comprised of two intake PVC pipes, a 6'' and 12'' approximately 3.3 m long which emerges on the east into an open rectangular concrete drainage box that measures 1.55 m E/W long by 1.4 m wide N/S by 0.65 m high. Adjacent to the drainage box, the water is further channelized by

aligned hollow-tile block walls which extend from the drainage box 1.27 m long by 1.3 m wide 0.25 m high (Figures 52 and 53). Approximately 5.0 m east from the out take east side are two 2 inch pipes with valves which are present within the ditch (Figure 54).



Figure 52. Overview Photographs of Site 7881 Feature 17 Intake (View to East) left and Feature 17 Out-take (View to East)



Figure 53. Photograph of Site 7881 Feature 17 Out-take (View to South)



Figure 54. Photograph of Site 7881 Feature 17 Valves (View to South)

Site 7881 Feature 18

Feature 18 is the last culvert in a series of underground drainage ditches associated with Feature 2 open ditch along the north side of the service access road. This culvert is comprised of a 12” metal pipe which runs approximately 11.0 m long emerging on the east. Feature 18 culvert also contains a 4-inch PVC pipe which extends from the west and goes through the metal pipe and extends out on the east side. The PVC pipe follows Feature 2 ditch for some distance and then extends out over the south bank of the ditch (Figure 55). The ditch and culvert on the west side are reinforced with a concrete, basalt water-worn and sub-angular cobbles faced wall that measures 1.4 m wide and 0.70 m deep. No open earthen overflow ditch was apparent and the PVC pipe may assist in excess flow. Atop the culvert is an access road utilized to cross Waikapū Stream.



Figure 55. Overview Photographs of Site 7881 Feature 18 intake and faced concrete and cobble wall (left photo) (View to Northeast); Feature 18 east side out take (right photo) (View to East)

SUMMARY OF SITE 50-50-04-7881

Site 7881 Features 1-18 is a Sugar Plantation era site comprised of water retention (reservoir), transportation (concrete lined ditches, earthen ditches and culverts) and diversion features (sluice gates, culverts) situated along the northern boundary of Parcel 3 Mauka. The water is transported by gravity with Features 1-6 located at the uppermost *mauka* extent of the project area. Features 1 and 3-6 are outside the project area boundaries but were documented due to the close proximity to the parcel and inter-relationship with Features 2 and 7-18. Feature 2, the main ditch, and Features 7-18 (culverts and sluice gates) extend east, sequentially along the slope and northern property line terminating near the northeastern corner.

Site 7881 will not be affected by the proposed development activities and will be preserved in place at this time. The proposed form of preservation will be through appropriate cultural use. In the event, that future development will affect Site 7881, additional architectural inventory procedures may be warranted; however all future mitigation measures will be discussed with SHPD. An initial significance of Criteria “a”, “d” and possibly “c” has been assessed for Site 50-50-04-7881 due to its association with the Sugar Era, potential to yield important historical information and exhibits the distinct characteristics of a type and or method of construction.

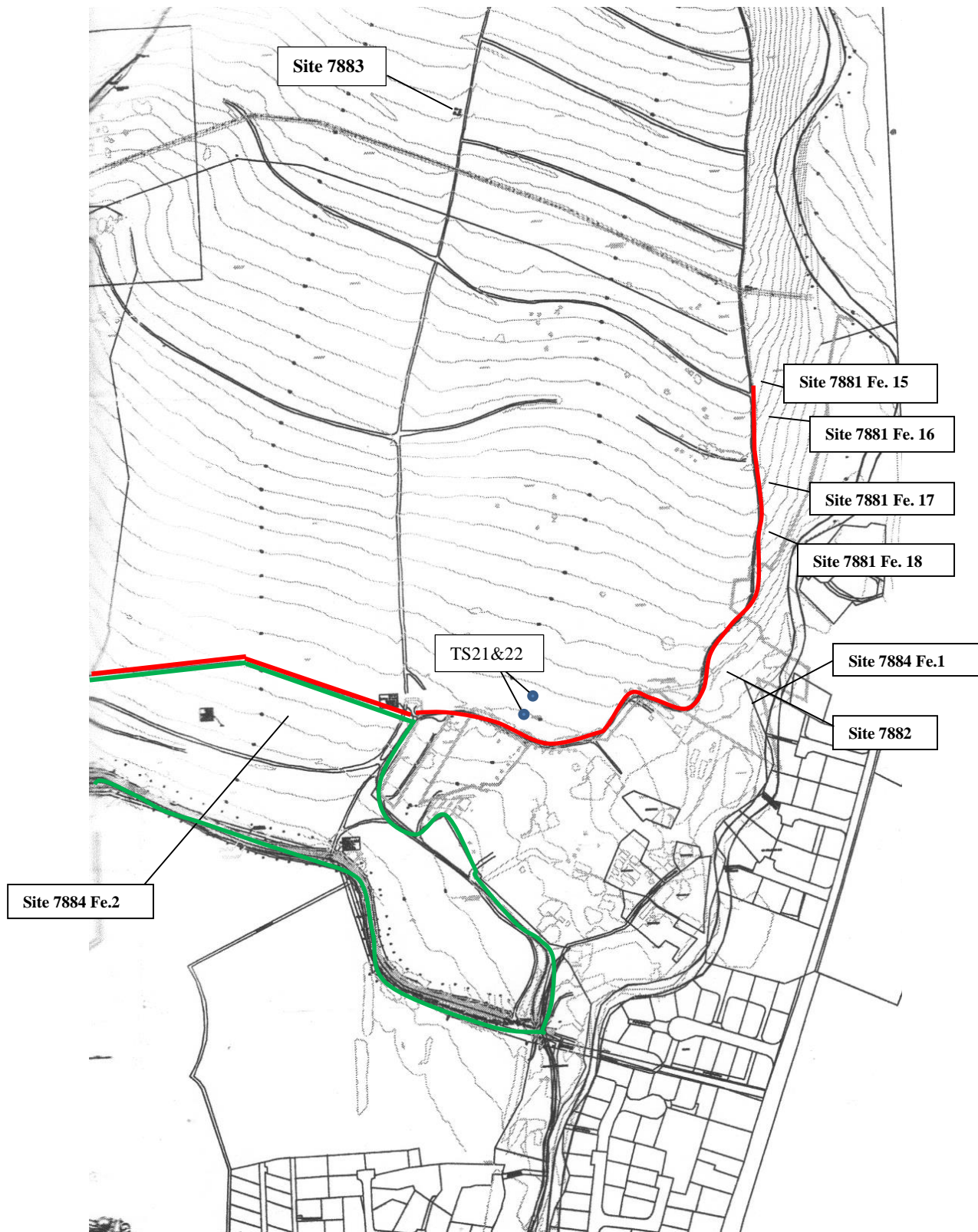


Figure 56. Plan View Map of Parcel 3 Mauka and Portions of Parcel 6 and 7 Showing Location of 7881 Features 15-18, Site 7882, Site 7883 and Site 7884 Features 1-2

SITE 7882 (TS2)

Site 7882 is a disturbed remnant L-shaped retaining wall or former rock-faced, soil-filled terrace in fair condition. It is located 5.0 m north of Site 7881 Feature 2 ditch and south of the Waikapū Stream (see Figure 56). It encompasses approximately 8.0 sq. meters and appears to be near the boundary line of the project area within LCA 2522. As presented in Table I, LCA 2522 exhibited land use of *kula* and *lo`i kalo* (wetland taro). Site 7882 is constructed along the contour of the slope and retains a small level surface area to the north (Figures 57-60). It incorporates the outcrop into its construction on the east, and is stacked and faced, 6 courses high (1.5 m) with water-worn basalt small boulders and cobbles. The longer leg measures 4.0 m and is oriented east/west and the shorter leg is 1.5 m north/south retaining a level surface area measuring from 0.80 m to 1.0 m. Collapse is present on the east adjacent to the outcrop. Based on the former land use presented in Table I, Site 7882 may have been a remnant terrace utilized during the historic period for the cultivation of taro, or it may have been constructed against the slope to retain the soil for the ditch, Site 7881 Feature 2. Additionally, this site may have been constructed during the pre-Contact period, and renovated during historic times.

Site 7882 is designated as a remnant historic retaining wall and assessed a significance of Criterion “d”. It is located outside the proposed development area and will be preserved in place at this time. In the future, if development plans change that may alter Site 7883, discussions will be performed with the SHPD to determine if inventory level testing is warranted.



Figure 57. Overview Photograph of Site 50-50-04-7882 an L-shaped Retaining Wall, View to Southeast



Figure 58. Overview Photograph of Cross-Section of Site 7882, View to East



Figure 59. Overview Photograph of Site 7882, View to Southwest

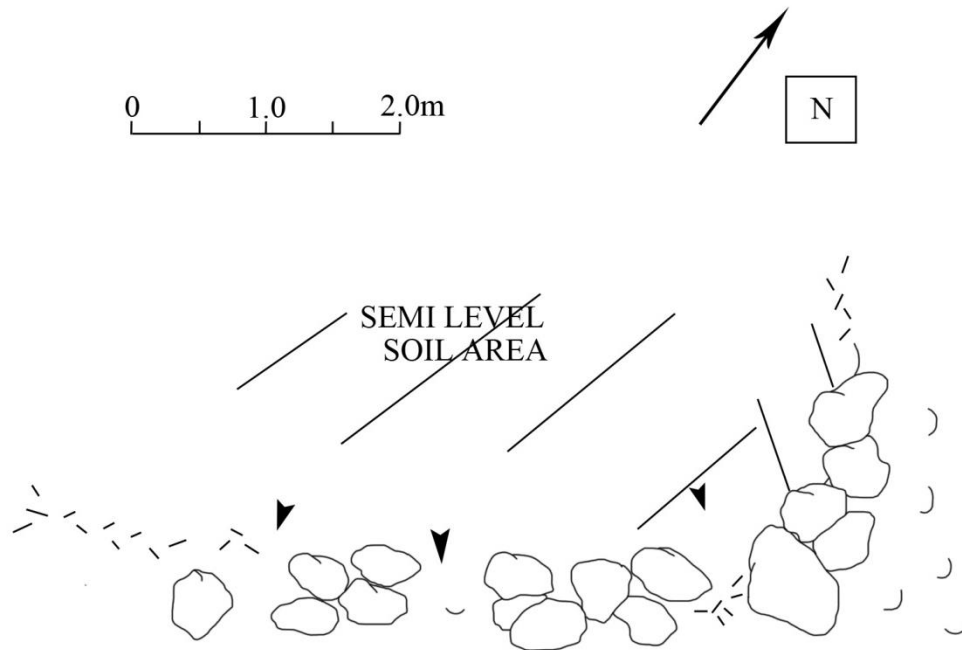


Figure 60. Plan View Map of Site 50-50-04-7882

Site 50-50-04-7883 (TS3)

Site 7883 is a World War II bunker, specifically designated as a horizon aviation observation bunker situated in the east central portion of Parcel 3 Mauka. It is in good condition positioned mid-slope at approximately 740 AMSL adjacent to the south side of the main access road that bisects Parcel 3 Mauka east/west (see Figure 56). Site 7883 is a square-shaped enclosure constructed of formed concrete walls and roof, atop a concrete slab/foundation. The concrete contains large aggregate gravel inclusions and is reinforced with metal re-bars. The base of the structure was partially built into the slope, and partially buried by pushing and mounding up soil around the exterior (Figures 61 and 62). The bunker measures 5.35 m (E/W) by 5.35 (N/S) along the exterior and occupies an area approximately 8.5 m by 8.5 m that includes the mounded up soil along the exterior. The structure is 1.58 m above the existing surface on the northeast, 1.45 m on the southeast, 1.1 m along the northwest, and 0.8 m above surface on the southwest. The concrete walls are 0.23 m thick bounding an interior area of 4.89 m² with an interior ceiling height of 3.0 m. Centered atop the roof is a square concrete base measuring 0.50 m² by 0.13 m thick with a threaded metal pipe 0.15 m (diameter) extending through the center, 0.37 m above this concrete pedestal. The metal pipe also extends through the roof to the interior of the enclosure and this internal end of the pipe is threaded and contains large corroded bolts.

Along the eastern exterior wall is a narrow opening or embrasure (opening for gun fire) that measures 0.91 m long by 0.23 m wide and 1.7 m above the existing surface (Figure 63-top). The architectural design and function of an embrasure typically allows weapons to be fired out from the interior while providing maximum coverage for the rifleman. Since this bunker was designated as a horizon aviation observation bunker the embrasure or opening also provided a protected view of the shoreline. Along the northern edge of the embrasure is a concrete encased metal pipe, 0.22 m in diameter and 0.90 m above the existing surface and 0.18 m below the top of the roof. The pipe extends subterranean into the interior of the structure and may have functioned as a possible vent. Access to the interior of the structure is atop the southwest corner of the roof, measuring 0.75 m² square, and 0.80 m above the exterior existing surface, the interior floor is 2.5 m below the opening (Figure 63-bottom). The concrete hatch/door belonging to the opening has collapsed inside the bunker; however it was designed to be inset into the roof (see Figure 63) and therefore level and or flush with the exterior roof. Presently the interior contains modern trash, the foundation is deteriorated and the interior walls contain modern graffiti.

Pursuant to discussions with former landowner Mr. Avery Chumbley, the bunker was constructed at this locality as it has commanding views and a good vantage point of the isthmus including Kahului and Ma`alaea Bays (Figure 64). This bunker is a specific type called a horizon aviation observation bunker. It is indeterminate whether Site 7883 was constructed before the December 7, 1941 attack on Pearl Harbor, after the invasion of Kahului Harbor on December 15, 1941, or during the years of 1943-44 when military presence on Maui was estimated to be 100,000+.

Site 7883 is a WWII bunker that will be preserved in place through conservation (avoidance and protection) and interpretation. Based on this sites association with the WWII Era, potential to yield important historical information and embodies the distinct characteristics of a period and or type of bunker, Site 50-50-04-7883 is assessed an initial significance of Criteria “a”, “c” and “d”.

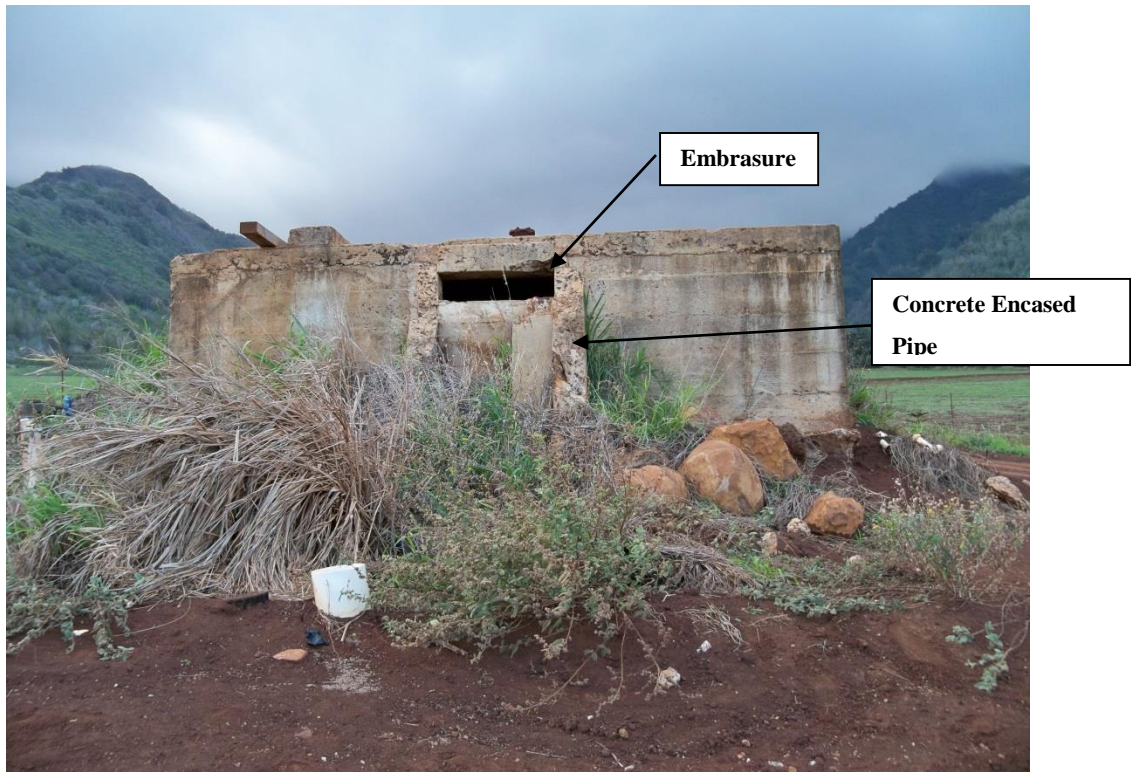


Figure 61. Overview Photograph of Site 7883 (TS3), View to West (top) View to East (bottom)

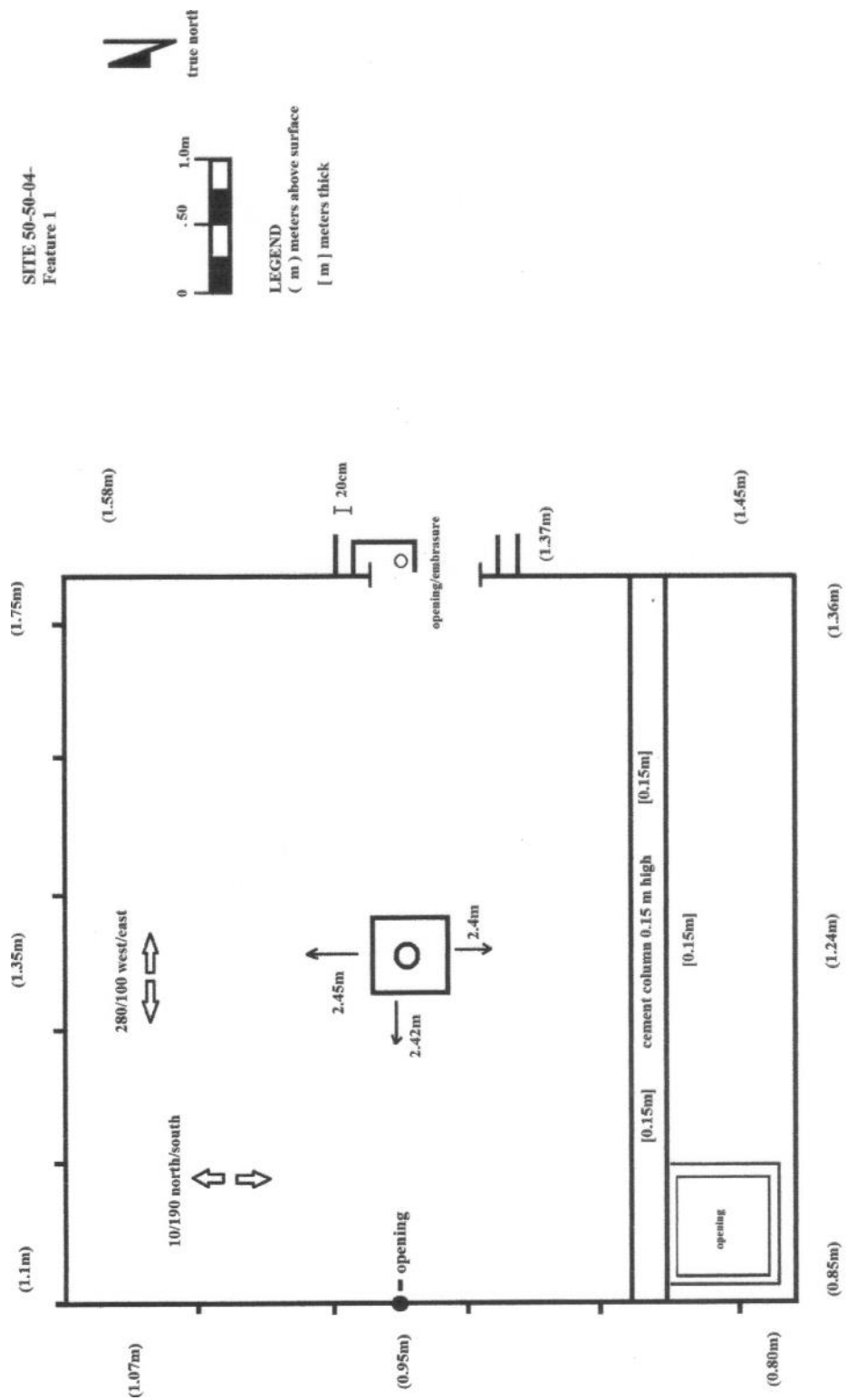


Figure 62. Plan View Map of Site 7883 World War II Bunker



**Figure 63. Overview Photograph of Embrasure with Concrete Encased Pipe to Right (top) View to West;
Photograph of Access into Site 7883 (TS3) (bottom) View to West**



Figure 64. Overview Photograph of Isthmus from Site 7883 (TS3), View to East

Site 50-50-04-7884 Feature 1

Site 7884 Feature 1 is one of three secondarily deposited historic refuse scatters and or deposit located adjacent to; south and west of Feature 2 ditch near the northeastern corner of Parcel 3 Mauka. The refuse deposit covers an area of approximately 4.0 m and appears to have been re-deposited by anthropogenic or alluvial forces (Figures 65-68). Therefore, the materials may have been tossed down slope from the dirt access road or it may have been washed down during heavy flow re-depositing the materials along the sides and within the ditch. Historic materials included bottle glass fragments and ceramic plate sherds.

Site 7884 Feature 1 has been adequately documented and requires no further work. Based on its disturbed context, it minimally meets a significance of Criterion D. Site 7884 Features 2 and 3 are discussed further below within sections Parcel 6 and Parcel 7.



Figure 65. Site 7884 Feature 1 Historic Scatter along Feature 2 Ditch, View to West



Figure 66. Site 7884 Feature 1 (TS2) Secondary Deposit of Historic Refuse



Figure 67. Overview Photograph of Site 7884 Feature 1 Historic Material



Figure 68. Photograph of Ceramic Assemblage

Temporary Site 4

Temporary Site 4 is located within the subject parcel along the western portion of Parcel 3 Mauka at an elevation of 1017 AMSL orientated at 76° by and positioned 81.0 m east, *makai* of the reservoir (Site 7881 Feature 3) and west (*mauka*) of Site 7883. It consists of a rectangular shaped concrete slab atop CMU blocks on the downslope (east) side and flush with ground surface on the upslope (west) side (Figures 69 and 70). The slab is constructed of concrete with large aggregate gravel inclusions and likely dates to the early to mid-1900 (see Figures 9 and 22). TS4 measures 8.8 m long by 6.1 m wide by 0.53 high (east side) by 161 degrees. To the west and east of the slab are recent, add-on structures which contain CMU block encasing and encircling PVC piping and metal valves. The western modern structure is a small rectangular CMU concrete structure and to the east is an additional small slab. Discarded historic and modern materials were observed in the area and atop the concrete slab and consist of tar shingles, a “coke” bottle, metal pipe fittings and PVC pipe fragments (Figures 71 and 72). The shingles may represent the remains of a former roof although no indication of perimeter walls were evident within the slab. TS4 is positioned atop the possible former location of Site 7881 Feature 1 (Waikapū Ditch South) that extends roughly east/west along the central portion of Parcel 3 Mauka. TS4 may have housed a former water diversion structure; however this supposition is indeterminate.

No formal SIHP number was assigned to TS4, an historic concrete slab with recent additions, as it does not meet any significance criteria. TS4 has been adequately documented and requires no further work beyond construction monitoring if removed.



Figure 69. Overview Photograph of Temporary Site 4 (TS4), View to West



Figure 70. Overview Photograph of Temporary Site 4 (TS4) with Modern PVC Valves (View to East)

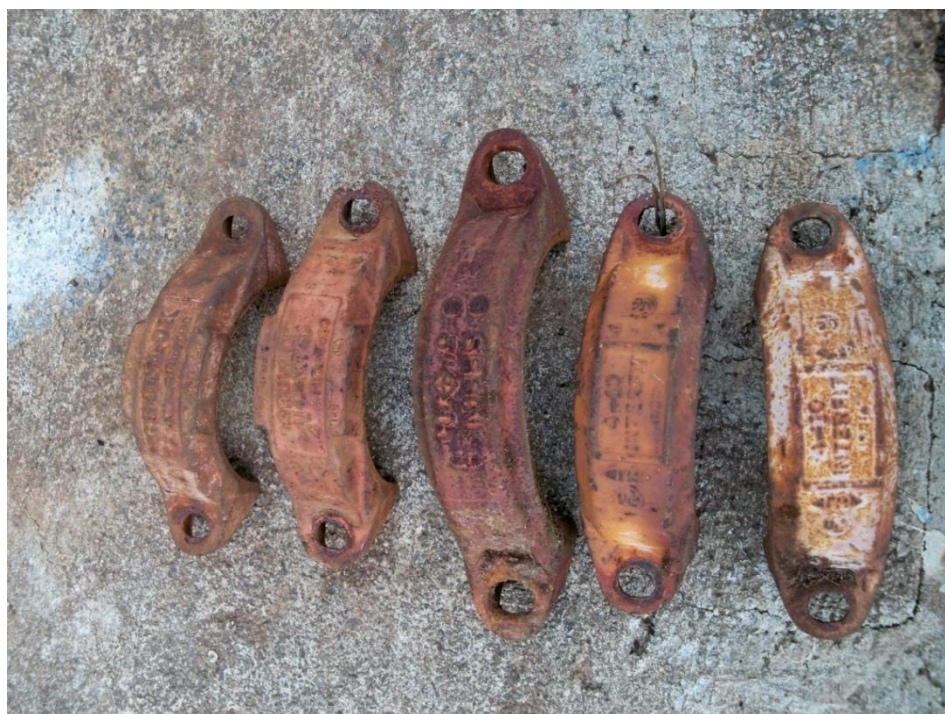


Figure 71. Site 7883 Feature 1 Pipe Fittings



Figure 72. Photograph of Coca-Cola Bottle

Temporary Sites 21 and 22

Temporary Sites 21 and 22 are situated within Parcel 3 Mauka and consists of small and large rock and soil mounds presumed to be push/clearing piles for agricultural activities. Other rock mounds assigned Temporary Sites 23-25 are located within Parcel 3 Waena and are further discussed below. These mounds were not assigned a State site number as they do not meet any of the significance evaluations as they appear to have been recently altered as exposed soil with no vegetation growth is present and pushed up against the rock mounds perimeter (Figures 73 and 74). These mounds are located within GR1704; however no land use information was available for this Grant. One backhoe trench, TR 401, was executed in close proximity to these mounds and contained a three layer stratigraphic sequence which was negative for cultural remains.

Temporary Site 21

Temporary Site 21 is one of two rock mounds associated with sugarcane clearing. It measures 13 m in diameter by 2.8 m in height and is comprised primarily of large and small boulders with soil and several small. The rocks are concentrated within the center of the pile and along the base of the rock mound, pushed up soil with discarded irrigation drip-lines and PVC pipes are mixed throughout (Figures 73 and

74). During the initial survey, discussions were undertaken in the field with a lessee of land in close proximity to the project area, Mr. Ron Riechers. Mr. Riechers pointed in the direction of the rock mounds and stated that burials were located “over there” near the rock mounds. Further inquiries with local residents and the landowner ascertained that burials were present in the general vicinity; however they were situated northeast outside the subject parcel within private land (see Figure 56). TS21 clearing pile is located at the eastern border of Parcel 3 Mauka near Parcel 6 boundary approximately 2.0 m west of the access road and 10.0 m southeast of TS 22 rock mound. As previously discussed, these rock mounds are located within a portion of Grant 1704, yet no land use was available.

Temporary Site 22

Temporary Sites 22 is the second rock mound presumed to be a sugarcane clearing/push pile comprised primarily of large basalt boulders, cobbles and pushed soil (see Figure 75). This feature is smaller than TS21 and measures 8.0 m in diameter by approximately 1.5 m high.



Figure 73. Photograph of Temporary Site 21 Rock Mound and Temporary Site 22 in background within Parcel 3 Mauka, View to Northwest



Figure 74. Overview Photograph of Temporary Sites 21 and 22 within Parcel 3 Mauka, View to Northwest



Figure 75. Photograph of Temporary Site 22 Rock Mound within Parcel 3 Mauka, View to Northwest

PARCEL 3 MAUKA PEDESTRIAN SURVEY DISCUSSION

Parcel 3 Mauka contained portions of four historic properties designated Sites 50-50-04-7881 Features 2 and 7-18, 7882, 7883 and 7884 Feature 1. Site 7882 is an historic L-shaped retaining wall or remnant rock-faced, soil-terrace situated within the northeastern corner of the subject parcel. It appears to be within an LCA utilized for *kula* lands and *lo`i kalo*. Kula lands are generally referred to as open space which may be utilized for agriculture, and *lo`i kalo* for irrigated taro. Since Site 7882 is located near the concrete lined ditch, Site 7881 Feature 2, it either retained the steep slope along the ditch, or functioned as a terrace for *kalo*. Site 7882 is located outside the proposed development boundaries and will be preserved in place in place at this time. Similar to Site 7881, if development plans change and Site 7882 will be altered, consultation with SHPD will be performed. Site 7883 is a WWII bunker located in the east, central portion of Parcel 3 Mauka. This site was utilized as an aviation observation structure and will be preserved in place through conservation (avoidance and protection) and interpretation. Site 7884 Feature 1 is a secondary deposit of historic materials situated along the northern edge of the parcel outside of the proposed development boundaries. It has been adequately documented and requires no further work.

BACKHOE TESTING RESULTS

During the subsurface testing, a total of 150 trenches were excavated and recorded through photographs, overall dimensions and stratigraphic profiles within the five zones. Two additional features, subsumed under Site 7884 were recovered during the trenching. Site 7884 is comprised of secondarily deposited historic materials recorded at three localities (Features 1-3); Site 7884 Feature 1 is within Parcel 3 Mauka by the concrete ditch, Feature 2 is at Parcel 6 around Trench 218 and Feature 3 within Parcel 7 at Trenches 323 and 324.

At Parcel 3 Mauka (TMK [2] 3-6-004:003 pors.) situated within the northwestern portion of the project area, fifteen (15) trenches were executed within the eastern end of the parcel and designated TR 400-414. A total of 31 trenches negative for significant cultural materials were previously excavated by SCS, Inc., during a prior investigation. In Parcel 3 Waena (TMK [2] 3-6-004:003 pors.), located in the southwestern portion of the subject area, a total of forty-two (42) trenches were undertaken. As Parcel 3 Waena was bisected north-south by Site 5197 (Waihe`e Ditch), twenty-seven (TR 1-27) were placed *mauka* (west) of Waihe`e Ditch (Site 5197) and fifteen (TR 01-015) were positioned *makai* (east) of the ditch. At Parcel 6 (TMK [2] 3-6-004:003), positioned in the north central section of the project area, twenty-six trenches assigned TR 200-225 were performed and for Parcel 7 (TMK [2] 3-6-005:007) which is the Maui Tropical Plantation parcel, twenty-five (25) trenches assigned TR300-324 were excavated. Lastly, in

Parcel 3 Makai (TMK 3-6-002:003 pors) located adjacent to the east side of Honoa`pi`ilani Highway forty (40) trenches designated TR 100-139 were executed.

As previously discussed in the methods and procedures section, the placement of the trenches was determined by utilizing a combination of random and pre-determined sampling strategies. The goal of the testing was focused on the LCA's and Grants in the five zones, while collecting information about the subsurface conditions across the project area, outside the LCA's and Grants. The trenches averaged 4.8 m long by 1.45 m wide by 1.7 m deep, and all trenches terminated upon decomposing bedrock (saprolitic), and/or within sterile sub-strata. A summary of the trench descriptions is presented below within each of the five zones (Tables XI-XX).

PARCEL 3 MAUKA

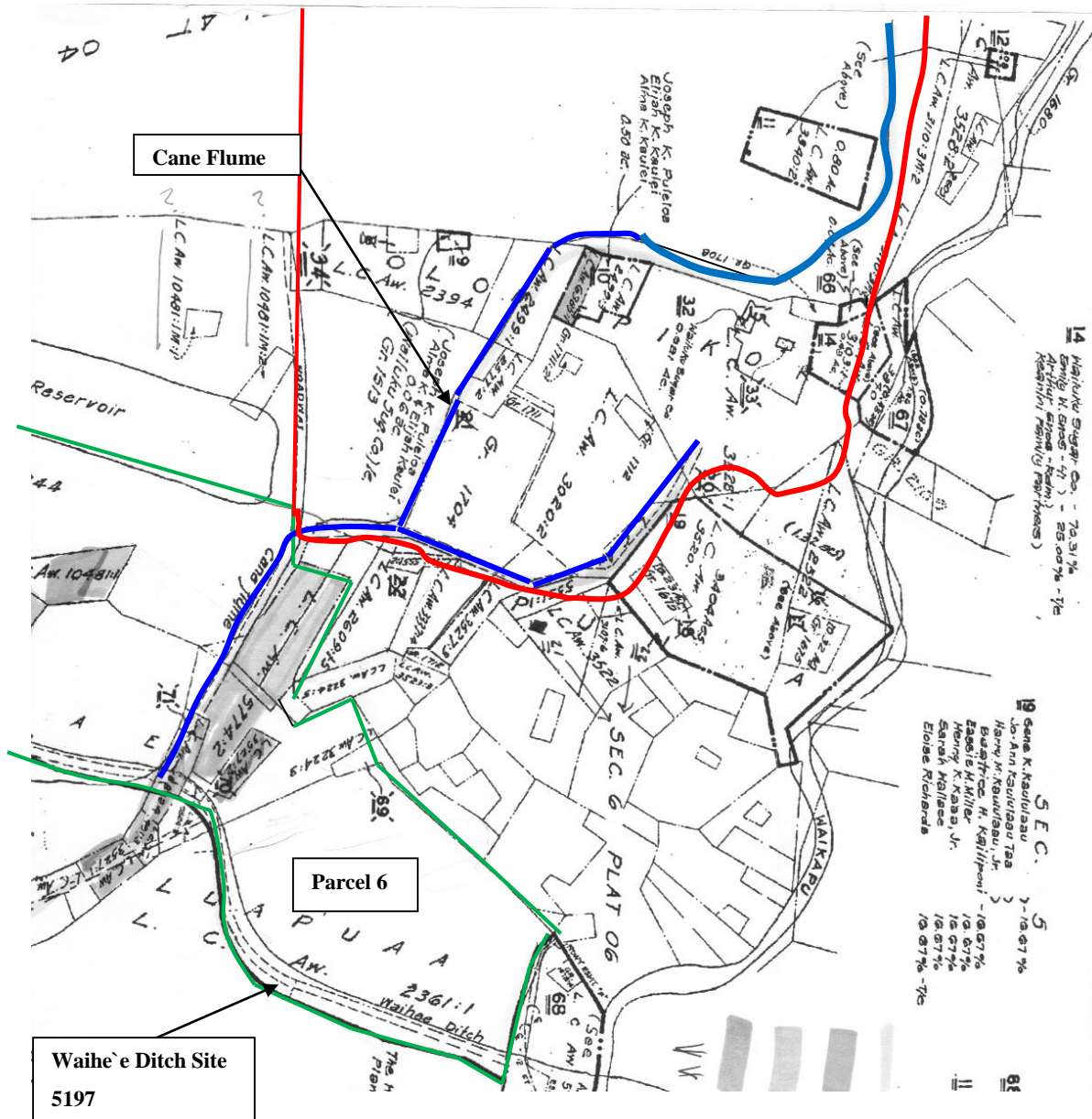
Parcel 3 Mauka is comprised of approximately 210-acres of fallow sugarcane and currently utilized as pastureland for cattle. In 2007, SCS excavated thirty-one (31) stratigraphic trenches (ST), all of which were negative for cultural remains (see Figure 21). ST's 8-31 were located within Parcel 3 Mauka, and ST's 1-7 were placed within Parcel 6. For the current undertaking, fifteen (15) trenches (TR 400-414) were excavated within the northeastern portion of this zone as this area contained the majority of LCA's and Grants within Parcel 3 Mauka and was not subjected to intensive testing during the prior investigations by SCS (Figures 76 and 77).

TR's 400-411 were excavated within the eastern fenced portion of the parcel and TR 412-TR 414 were excavated within an open level fallow field outside the fenced area along the south side of Waikapū Stream (Figures 78-79 and Table XII). Most of the trenches exhibited a similar soil profile, TR's 400-402 and TR 405-410 contained a clay loam soil, and TR's 403, 404 and 411-414 consisted of a silty loam. A two to three layer stratigraphic sequence with Layer I comprising the agricultural plow/till zone in most localities. The general stratigraphic sequence recorded at Parcel 3 Mauka is presented below with representative stratigraphic profiles and photos presented below in TR's TR 400, TR 406, TR 409, and TR 412.

OVERALL STRATIGRAPHY PARCEL 3 MAUKA

Layer I consisted of an upper loamy silt layer, usually a dark brown, or a clay loam, usually a dark reddish brown (2.5YR 3/3) and varied from 60 to 70 cm thick. This was the plow zone from previous cultivation activities, currently the parcel is utilized as pastureland. Layer I was typically a disturbed layer with mixed with deteriorated black plastic drip-lines, plastic PVC irrigation pipes, and concrete with gravel aggregate pieces that had been used during the previous commercial sugarcane cultivation era. There was a low density of rocks in this layer and varied from high density to low density of roots from surface vegetation.

Layer III consisted of a clay loam to a silty clay and in a few identified trenches contained decomposing bedrock, and varied from a brown to strong brown (7.5YR 4/4-4/6) to a dark reddish brown (5YR 3/3-3/4) with the absence of roots and a medium to high frequency of rocks, decomposing bedrock and saprolitic bedrock.



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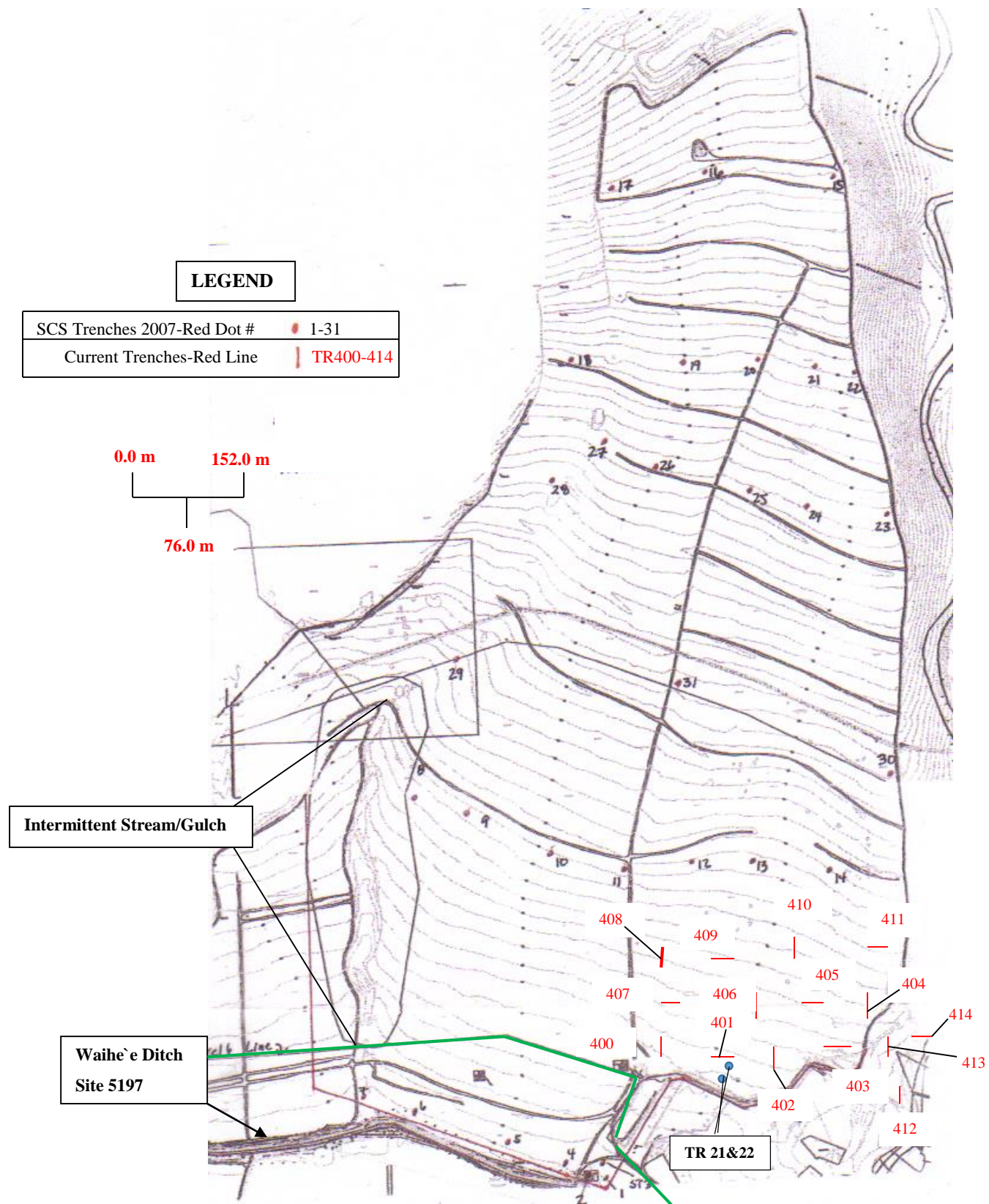


Figure 77. Parcel 3 Mauka Map Showing SCS TR's 1-31 and ASH TR's 400-414



Figure 78. Overview of Parcel 3 Mauka North from TR-401, View to Northeast



Figure 79. Overview Parcel 3 Mauka North, View to East

Table XII. Summary of Summary of Backhoe Trenches Parcel 3 Mauka North

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
400	Base of Slope	4.9m x 1.45m x 1.81m	270° x 90°	Layer I-III	Non-Cultural
401	Base of Slope, within Grant 1704	4.8m x 1.44m x 1.76m	270° x 90°	Layer I-III	Non-Cultural
402	Base of Slope, within LCA 3020:2	4.8m x 1.45m x 1.77m	270° x 90°	Layer I-II	Non-Cultural
403	Base of Slope, within LCA 3520	4.9m x 1.43m x 1.75m	270° x 90°	Layer I-II	Non-Cultural
404	South of Waikapū Stream within LCA 3528:1	4.9m x 1.4m x 1.8m	270° x 90°	Layer I-III	Non-Cultural
405	Base of Slope, Grant 1712	4.8m x 1.45m x 1.78m	360° x 180°	Layer I-II	Non-Cultural
406	Base of Slope, within LCA 3020:2 & Grant 1711	4.8m x 1.4m x 1.75m	270° x 90°	Layer I-II	Non-Cultural
407	Base of Slope	4.8m x 1.4m x 1.75	360° x 180°	Layer I-II	Non-Cultural
408	Along Slope, Western Portion of Test Area	4.9m x 1.45m x m	360° x 180°	Layer I-II	Non-Cultural
409	Along Slope, Near Grant 1513	4.8m x 1.41m x 1.8m	360° x 180°	Layer I-III	Non-Cultural
410	West of Waihe'e Ditch, within LCA 3528:1	4.6m x 1.4m x 1.75m	360° x 180°	Layer I-II	Non-Cultural
411	Within Grant 1708 and LCA 3109:1	4.6m x 1.45m x 1.75m	360° x 180°	Layer I-II	Non-Cultural
412	Within LCA 2522	4.9m x 1.44m x 1.81m	360° x 180°	Layer I-II	Historic clear glass bottle fragment found in Layer I
413	Within Grant 1675	4.7m x 1.45m x 1.86m	270° x 90°	Layer I-II	Non-Cultural
414	Within Grant 2109 LCA 2522 or LCA 3840	4.8m x 1.4m x 1.8m	360° x 180°	Layer I-II	Historic ceramics (2) found on surface

Trench 400

Trench 400 was positioned in the southeast corner of Parcel 3 Mauka at the base of the slope and south of Waikapū Stream (see Figure 77). No LCA or Grant designation information was present on the TMK map; thus no land use data was available. As exemplified on Figure 76, GR 1513 appears to fall within

this area but is actually pointing to a smaller 0.06 acre lot near TR 409. TR 400 measured 4.9 m long by 1.4 m wide by 1.81 m deep and was oriented at 90°. It contained a tripartite stratigraphic sequence with excavations terminating in sterile soil and saprolitic bedrock (Figure 80). No cultural materials were observed within TR 400.

Layer I (0-56cmbs): is a dark reddish brown (2.5yr 3/3), clay loam, pastureland and previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, with a low frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (56-158cmbs): is a dark reddish brown (2.5yr 3/4), clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard. No cultural materials were observed in this layer.

Layer III (158-BOE) consisted of a clay loam strong brown (7.5YR 4/4) overlying decomposing bedrock.

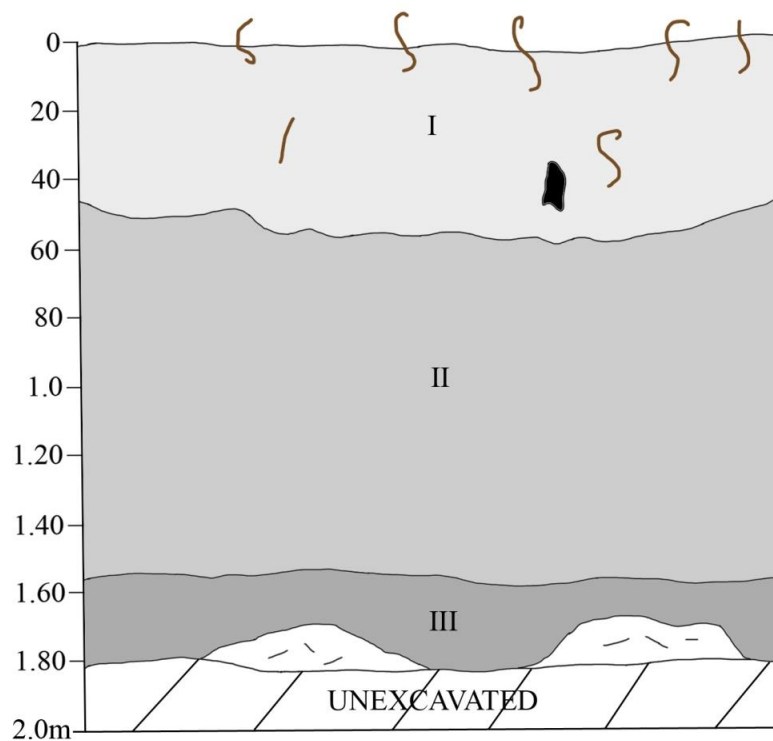


Figure 80. Stratigraphic Profile of TR 400 North Wall

Trench 406

Trench 406 was centrally located at the base of the slope in Parcel 3 Mauka, south of Waikapū Stream (see Figure 77). It was placed within LCA 3202:2 and possibly within GR 1711 (see Figure 76 and Table XII). LCA 3202:2 claimed land use of kula and *lo'i kalo*; however no evidence of this land use was observed within the trench. TR 406 contained a two-layer stratigraphic sequence with excavations terminating in sterile soil (Figure 81). It measured 4.8 m long by 1.4 m wide by 1.75 m deep, and was oriented at 90°. No cultural materials were observed within TR 406.

Layer I (0-62cmbs): is a dark reddish brown (2.5yr 3/3), clay loam, pastureland and previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, with a low frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (59-175cmbs): is a dark reddish brown (2.5yr 3/4), clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard. No cultural materials were observed in this layer.

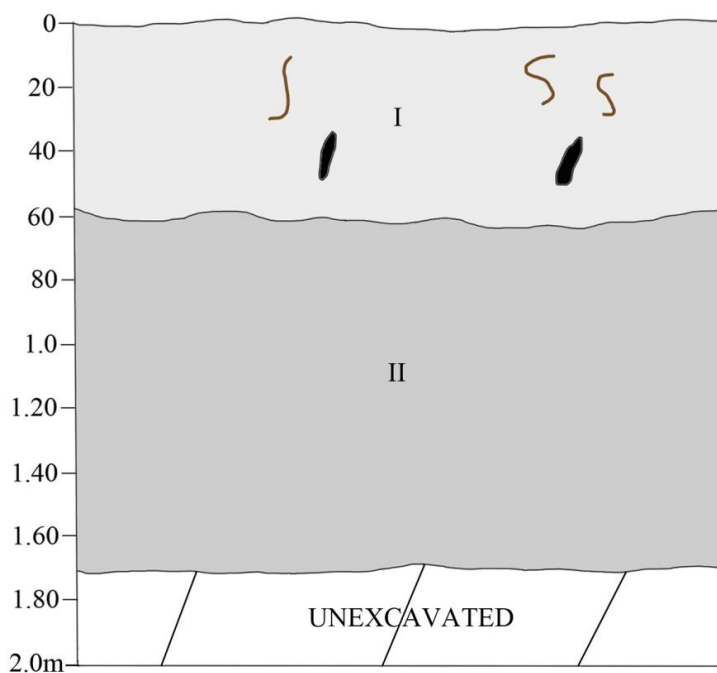


Figure 81. Photograph of TR406 South Wall (Top); Stratigraphic Profile of TR406 South Wall (Bottom)

Trench 409

Trench 409 was located in the southwest portion of Parcel 3 Mauka within GR 1513; south of Waikapū Stream (see Figures 76 and 77). No land use data was available for this Grant, thus trench excavations were performed to ascertain presence/absence of cultural materials. TR 409 measured 4.8 m long by 1.4 m wide by 1.80 m deep and was oriented at 180°. It contained a three layer stratigraphic sequence with excavations terminating in sterile soil and saprolytic bedrock (Figure 82). No cultural materials were observed within TR 400.

Layer I (0-42cmbs): is a dark reddish brown (2.5yr 3/3), clay loam, pastureland and previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, with a low frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (42-121cmbs): is a dark reddish brown (2.5yr 3/4), clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard. No cultural materials were observed in this layer.

Layer III (121 cmbs-BOE) consisted of a clay loam strong brown (7.5YR 4/4) overlying decomposing bedrock.

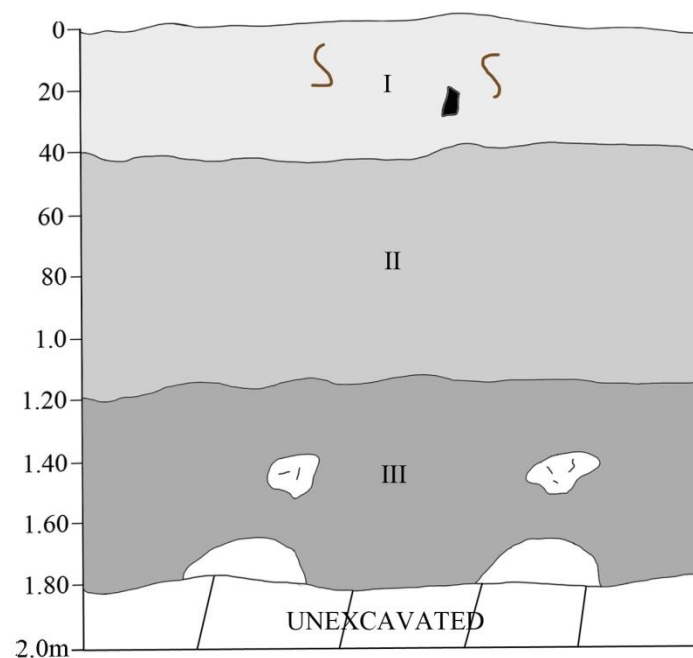


Figure 82. Stratigraphic Profile of TR 409 East Wall

Trench 412

Trench 412 (TR 412) was located in the northeastern portion of Parcel 3 Mauka, south of Waikapū Stream, within LCA 2577:2 and GR 1675 (see Figures 76, 77, 82 and Table XII). This section contained a two layer stratigraphic sequence with excavations terminating within sterile soils containing medium and

large sized boulders (Figures 83 and 84). A 4.9 m long by 1.44 m wide by 1.81 m deep, oriented 180° by 360° section of this area was recorded and is further described below. A single clear glass bottle fragment was recovered approximately 30 cmbs within TR 412.

Layer I (0-78cmbs): is a dark brown (7.5yr 3/3), silt loam, previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, with a high frequency of roots. Boundary was clear and wavy overlying Layer II. A clear glass fragment was recovered.

Layer II (60-181cmbs): is brown (7.5yr 3/4), silt loam, slightly-plastic, slightly-sticky, friable, fine to medium grain, blocky, slightly hard. High frequency of decomposing bedrock and large boulders were noted at base of Layer II. No cultural materials were observed in this layer.



Figure 83. Overview of TR 412 within Parcel 3 Mauka, View to East

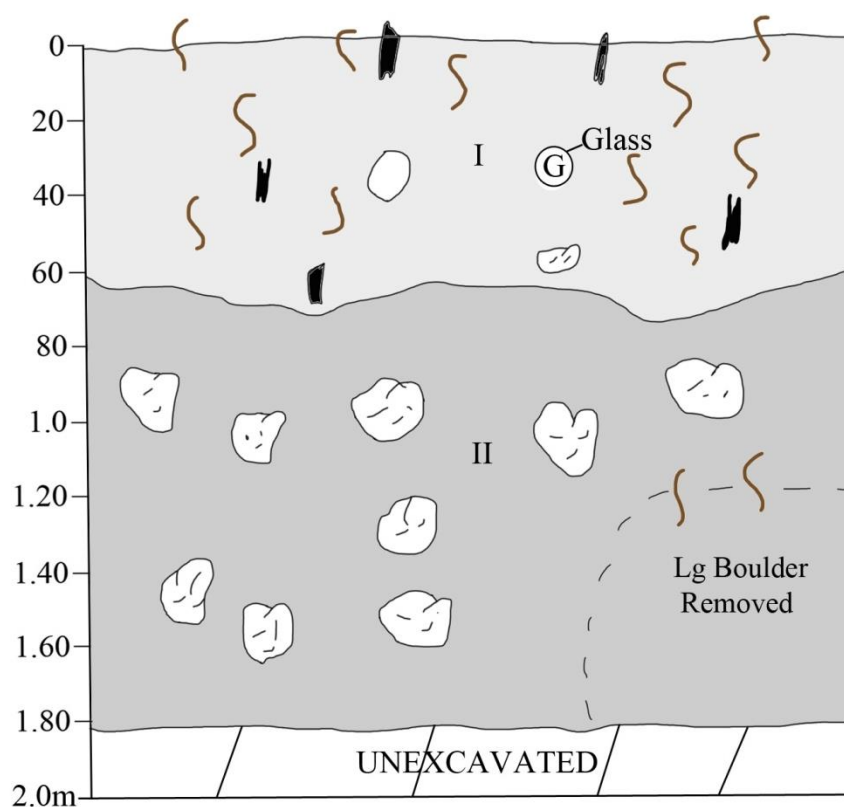


Figure 84. Photograph of TR 412 South Wall (top); and Stratigraphic Profile of TR 412 South Wall (bottom)

DISCUSSION PARCEL 3 MAUKA BACKHOE TRENCHING

Several LCA's and Grants were documented within this northeastern portion of Parcel 3 Mauka. Thus, eleven (11) trenches were excavated to ascertain presence/absence of buried remains. All trenches were negative for cultural materials with the exception of TR's 412 and 414. TR 412 contained 1 piece of clear glass within the till zone and 2 ceramic shards were on the surface at TR 414. Due to the sparse cultural materials within a disturbed context, no feature designation was warranted. All future ground disturbing activities proposed in this area will be monitored according to an accepted archaeological monitoring plan (AMP).

PARCEL 3 WAENA

Parcel 3 Waena (TMK 3-6-004:003 pors.) is comprised of approximately 72-acres situated adjacent to the west (*mauka*) side of Honoa`pi`ilani Highway and the south side of an intermittent stream or gulch (between Parcel 3 Mauka and Waena) with Site 5197 (Waihe`e Ditch) which has bisected this zone north-south (see Figures 6 and 7). The lands to the west (*mauka*) of Waihe`e Ditch (western section) and east (*makai*-eastern section) are comprised of fallow cane fields and small agricultural plots leased by individuals for various fruit and vegetable cultivation (Figure 85). A total of twenty-seven (27) trenches (TR 1-27) were excavated and recorded within the western section and a total of fifteen (15) trenches (TR 01-015) in the eastern portion (Figure 86 and Tables XIII, XIV and XV). Since no LCA's and or Grants were noted in the eastern or western sections of Parcel 3 Waena, backhoe test trenches were spaced to provide a representative sample. Scattered fragments of concrete with large gravel aggregate inclusions were identified at various location and may represent discarded rubbish or demolished foundations and/or irrigation ditches that were utilized during prior sugarcane operations by HC&S. These concrete fragments are the same material that was used in the construction of Site 7883 (WWII bunker). Three clearing piles (Temporary Sites 23-25) currently utilized were observed and briefly described below (Figures 87 and 88). Also noted was a small reservoir adjacent to Waihe`e Ditch (Site 5197).



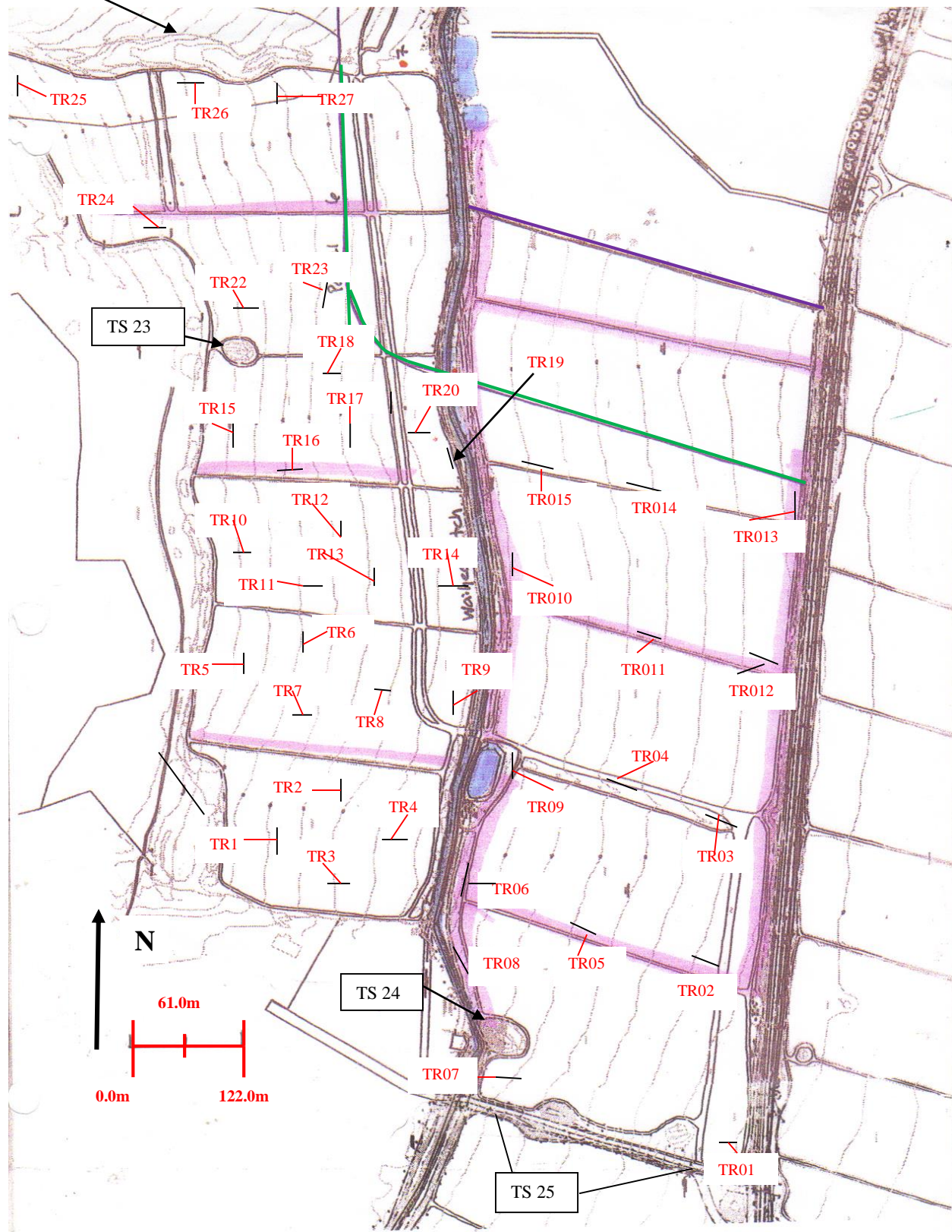
Figure 85. Overview Photograph of Parcel 3 Waena Eastern Section with Clearing Pile Site 7884 Feature 3 in the background, View to Northwest

Temporary Sites 23-25

TS 23-25 are a continuation of the rock piles identified within Parcel 3 Mauka. TS 23 is a rock pile situated near the northwestern corner of Parcel 3 Waena western (*mauka*) section. It measures 38.10 m (125 ft.) long (E/W) by 27.45 m (90 ft.) wide (N/W) and is comprised of pushed cobbles, boulders soils and vegetation. TS 24 is located in the eastern (*makai*) section within the southwestern corner along the cane haul road. This feature measures 61.0 m (200 ft.) long (NE/SW) by 45.75m (150 ft.) wide and is comprised of the same materials as TS 23. TS 25 is an elongated rock pile consisting of two mounds pushed together. It is situated along the southern boundary of the western section and measures 500 ft. long and ranges from 15.24 m (50 ft) to 30.48 m (100 ft.) wide.

TS 23-25 are agricultural clearing/push mounds associated with sugarcane cultivation. As previously discussed, these rock piles do not meet any of the criteria under significance evaluations, and were not assigned a State site number.

Intermittent Stream/Gulch



**Figure 86. Plan View Topographic Map Showing Trench's 1-27 and 01-015 and TS 23-25 within Parcel 3
Waena Site**



Figure 87. Overview Photograph of Parcel 3 Waena from TR 22 with Temporary Site 23 Rock Mound, View to Southeast



Figure 88. Overview Photograph of Parcel 3 Waena (Western Section) from Reservoir, View to South

During the testing program, the trenches within the western and eastern sections exhibited a similar stratigraphy. The western section contained a three to six layer/lens soil profile and representative profiles are presented below in TR's 1, 11, 14 and 23 and in Appendix A (Figures 89-98 and Table XIII and XIV). For the eastern portion, a two to seven layer/lens stratigraphic sequence was recorded and exhibited in TR's 08, 011 and 015 and presented in Appendix A (Figures 99-104 and Table XV). An overall summary of the stratigraphic record for the western and eastern sections are presented below in the following paragraphs.

OVERALL STRATIGRAPHY FOR WESTERN SECTION OF PARCEL 3 WAENA

Layer I generally consisted of an upper loamy silt layer, usually a dark brown, or a very dark grayish brown (10 YR 3/3, 3/2), and varied from 30 to 40 cm thick. This was the plow zone from current and previous sugarcane cultivation activities. Layer I was typically a disturbed layer mixed with deteriorated black plastic drip-lines, plastic PVC irrigation pipes, and concrete with gravel aggregate pieces that had been used during the previous commercial sugarcane cultivation era. There was a low frequency of rocks in this layer, but a high frequency of roots from surface vegetation.

Layer II generally consisted of a silt loam, silt or a storm wash stony silt layer, usually a brown to dark brown (7.5Yr 4/2, 3/2), and varied from 20 to 140 cm thick and in a few identified trenches contained a dark brown (10YR 2/2 to 7.5YR 3/2) stony silt deposit that varied 60 to 150 cm thick, to a dark reddish brown (5YR 3/3, 3/4) with a low density to absence of roots and a medium to high frequency of rocks. These trenches exhibited the same stratigraphy with a few trenches exhibiting slight variations in color hues. Much of the stony and storm wash deposits appeared to represent alluvial and colluvial deposition.

Layer III ranges from a grayish brown (10YR5/2), silt loam, slightly-plastic, slightly-sticky, blocky, slightly hard, fine to medium grain, with a low frequency of rounded pebbles and gravel. No cultural materials observed in this layer. **To a streambed,** non-plastic, non-sticky, medium to coarse grain, with a low frequency of roots, structureless, weakly coherent with a high frequency of rounded cobbles, pebbles and gravel. No cultural materials observed in this layer.

OVERALL STRATIGRAPHY FOR EASTERN SECTION OF PARCEL 3 WAENA

Layer I consisted of an upper loamy silt layer, that varied from a dark brown, brown or a very dark gray brown (7.5YR 3/2, 3/3 or 10YR 4/3), and varied from 50 to 60 cm thick. This was the plow zone from previous cultivation activities. Layer I was typically mixed with torn black plastic drip-lines, PVC plastic irrigation hoses, and concrete aggregate pieces that had been used during the previous commercial sugarcane cultivation. There was a low frequency of rocks in this layer, but a high frequency of roots from surface vegetation.

Layer II generally consisted to be a silt loam and/or stony silt loam, brown, dark brown, very dark gray brown (10YR 3/2, 4/3, 7.5YR 3/3, 3/4), and varied from 44-127 cm thick, with a low density of roots and a medium frequency of rocks and/or decomposing bedrock. Trenches excavated towards the northwestern end of the project area exhibited a color that tended to be browner or more yellow second layer, which ranged in color from dark brown (7.5 YR 3/4 loam to mottled dark (7.5YR 3/4) and dark reddish brown (5 YR 3/4) silt loam. There was usually a distinct transition between this layer and the plow zone above, as this layer never had any materials from commercial sugarcane cultivation mixed within it and generally appeared less disturbed and contained saprolitic rock.

Layer III was present in two of the trenches. Layer III generally ranged in color from brown to dark yellowish brown (7.5 YR 4/3, 4/4) to dark grayish brown (10 YR 4/2) silt loam, streambed gravel with silt, to gravel with a higher density of pebbles than the upper layers as a result of decomposing bedrock. Layer

III has a low density of roots and with a higher density of pebbles than the upper layers as a result of streambed and storm-wash inclusions, along with decomposing bedrock mixed with saprolytic bedrock. No cultural materials were observed in this layer.

Six of the trenches exhibited a two layer profile, two (2) exhibited a tripartite sequence, thirteen (13) trenches contained a four layer sequence, seven (7) trenches a five layer sequence, and one (1) trench exhibited six strata.

Table XIII. Summary of Trench Descriptions for (TR's 1-20) Western Section of Parcel 3 Waena

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
1	In the extreme southwest corner	4.7m x 1.4m x 1.4 m	360° x 180° x	I-IV/sand	Non-Cultural
2	In the extreme southern portion	4.6m x 1.41m x 1.66m	270° x 90° x	I-IV	Non-Cultural
3	In the extreme southwest corner	4.7m x 1.41m x 1.9m	360° x 180° x	I-IV	Non-Cultural Charcoal Flecks in Layer IV
4	In the extreme southeast corner	4.6m x 1.42m x 1.8m	270° x 90°	I-IV	Non-Cultural
5	In the western portion	4.6m x 1.42m x 1.9m	360° x 180°	I-IV Layer IV on the east	Non-Cultural
6	In the south central portion	4.7m x 1.41m x 2.3m	270° x 90°	I-V	Non-Cultural
7	In the south central portion	4.7m x 1.42m x 2.0m	360° x 180°	I-V	Non-Cultural
8	In the southeastern central portion	4.7m x 1.43m x 2.3m	270° x 90°	I-IV	Non-Cultural
9	In the southeastern portion	4.7m x 1.41m x 1.4m	360° x 180°	I-V	Non-Cultural
10	In the southwestern portion	4.6m x 1.45m x 2.24m	270° x 90°	I-IV	Non-Cultural
11	In the central southwestern portion	4.7m x 1.42m x 2.32m	270° x 90°	I-IV	Non-Cultural
12	In the central portion	4.6m x 1.42m x 2.08m	270° x 90°	I-IV	Non-Cultural
13	In the central portion	4.6m x 1.45m x 2.24m	360° x 180°	I-IV	Non-Cultural
14	In the eastern central portion	4.6m x 1.42m x 2.3m	270° x 90°	I-VI	Non-Cultural
15	In the northwestern portion	4.7m x 1.45m x 2.34m	360° x 180°	I-V	Non-Cultural
16	In the northwestern central portion	4.6m x 1.44m x 2.2m	270° x 90°	I-IV	Non-Cultural
17	In the northwestern central portion	4.7m x 1.45m x 2.0m	360° x 180°	I-IV	Non-Cultural
18	In the northeastern central portion	4.6m x 1.43m x 1.84m	270° x 90°	I-IV	Non-Cultural

19	In the northeastern portion	4.6m x 1.43m x 1.92m	360° x 180°	I-III	Non-Cultural
20	In the northeastern portion	4.6m x 1.45m x 2.2m	360° x 180°	I-IV	Non-Cultural

Table XIV. cont'd Summary of Trench Description for (TR's 21-27) Western Portion of Parcel 3 Waena

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
21	In the north central portion	4.6m x 1.45m x 1.96m	270° x 90°	I-III	Non-Cultural
22	In the northwestern portion	4.7m x 1.42m x 1.84m	270° x 90°	I-II	Non-Cultural
23	In the northwestern portion	4.7m x 1.4m x 1.76m	360° x 180°	I-II	Non-Cultural
24	In the northwestern portion	4.6m x 1.41m x 1.84m	360° x 180°	I-II	Non-Cultural
25	In the extreme northwestern portion	4.7m x 1.42m x 1.12m	360° x 180°	I-II	Non-Cultural
26	In the north central portion	4.7m x 1.41m x 1.85m	270° x 90°	I-II	Non-Cultural
27	In the extreme northeastern portion	4.7m x 1.42m x 1.84m	360° x 180°	I-II	Non-Cultural

Trench 1

Trench 1 (TR 1) was situated in the extreme southwestern portion of Parcel 3 Waena, east of Kamehameha Golf Course and north of the abandoned rock quarry (see Figure 86). It contained deep soil deposits consisting of a four layer soil profile with excavations terminating in sterile soils (Figure 89-91 and Tables XIII and XIV). At 1.10mbs a sand lens was identified on the north and east wall directly below Layer III, the deposit was discontinuous and appears to be a previous disturbance or import. No buried pipes were in the vicinity which would utilize sand for pipe bedding. TR 1 measured 4.7 m long by 1.4 m wide by 1.4 m deep and was oriented 360°. No cultural materials were observed within TR 1.

Layer I (0-52cmbs): is a very dark grayish brown (10yr 3/2), silt loam, currently a fallow cane field and previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, friable, with a medium frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (41-88cmbs): is a very dark grayish brown (10yr 3/2), stony silt loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, friable with a medium frequency of rocks, cobbles and gravel. No cultural materials were observed in this layer.

Layer III (82-117cmbs): is a dark yellowish brown (10yr 4/4), riverbed stony silt, weakly coherent, non-plastic, non-sticky, loose, single grain to fine to medium grain, with a high frequency of rocks, cobbles and medium to large boulders. Boundary was clear and wavy overlying Layer IV and Layer IIIa along the north, northwest and west section (Figures 90 and 92) overlying Layer IV. No cultural materials were observed in this layer.

Lens/Layer IIIa at 110cmbs a light yellowish brown (10yr 6/4) a fine to medium grain sand deposit was observed in a disturbed context in the north/northeast corner, overlying a sandy gravel extending 1.5 mbs on the north and east, overlying Layer IV on the north, northwest, non-plastic, non-sticky, loose, single grain, structureless, boundary abrupt and broken. No cultural materials were observed in this layer.

Layer IV (115-140cmbs): is a dark yellowish brown (10yr 4/6), gravel silt, observed on the northwestern portion and western portion of trench profile (Figure 92), loose, structureless. No cultural materials were observed in this layer.



Figure 89. Overview Photograph of TR 1 North Wall Profile

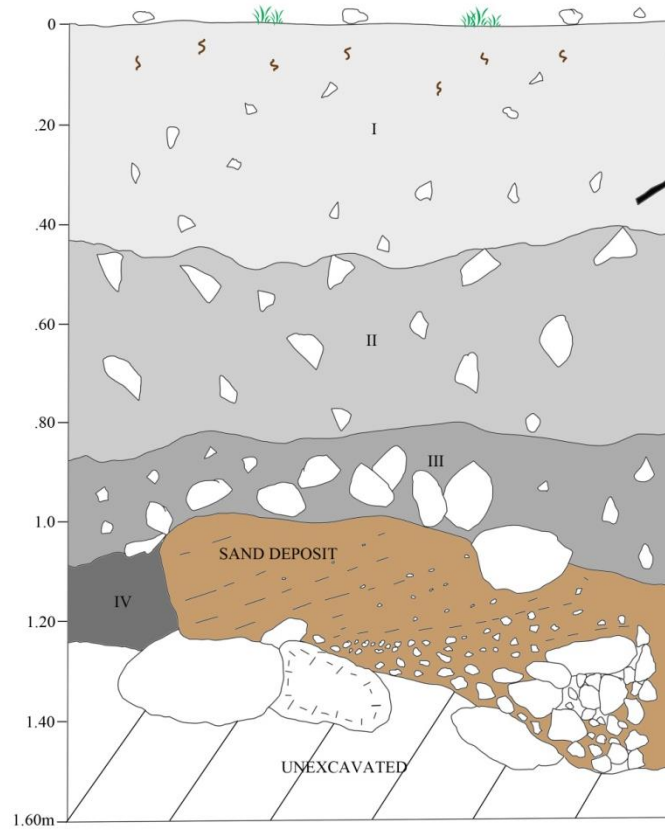


Figure 90. Stratigraphic Profile of TR 1 North Wall Profile



Figure 91. Up Close Photograph of Sand Deposit within TR 1, View to North

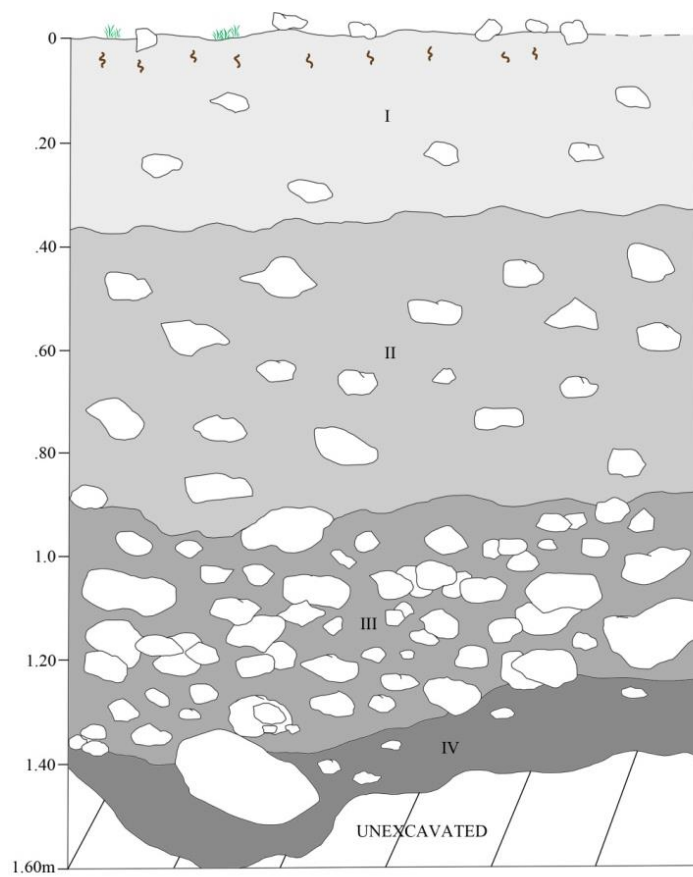


Figure 92. Stratigraphic Profile of TR 1 West Wall Profile

Trench 11

Trench 11 (TR 11) was situated in the central southwestern portion of Parcel 3 Waena, east of Kamehameha Golf Course and west of Site 5197 (Waihe'e Ditch) in an area currently utilized for individual agricultural pursuits (see Figure 86 and Table XIII). It contained a four layer stratigraphic sequence with excavations terminating within sterile streambed soils (Figure 93 and 94). TR 11 measured 4.7 m long by 1.42 m wide by 2.32 m deep, oriented 190°. No cultural materials were observed within Trench 11 (TR 11).

Layer I (0-60cmbs): is a dark brown (7.5yr 3/2), silt loam, currently a fallow cane field and previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, with a medium frequency of roots and rocks. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (58-121cmbs): is a dark brown (10yr 3/3), silt loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, friable, with a medium frequency of rocks, cobbles and gravel. Boundary was clear and smooth overlying Layer III. No cultural materials were observed in this layer.

Layer III (116-212cmbs): is a brown (10yr 4/3), silt loam, weak, slightly hard, slightly-plastic,

slightly-sticky, single grain with a high frequency of medium to large boulders. Boundary was clear and wavy overlying Layer IV streambed. No cultural materials were observed in this layer.
Layer IV (202-232cmbs): is a dark grayish brown (10yr 4/2), streambed, gravel silt, loose, fine to large grain, structureless, cobbles, pebbles and gravel. No cultural materials were observed in this layer.



Figure 93. Photograph of Stratigraphic Profile of TR 11 South Wall

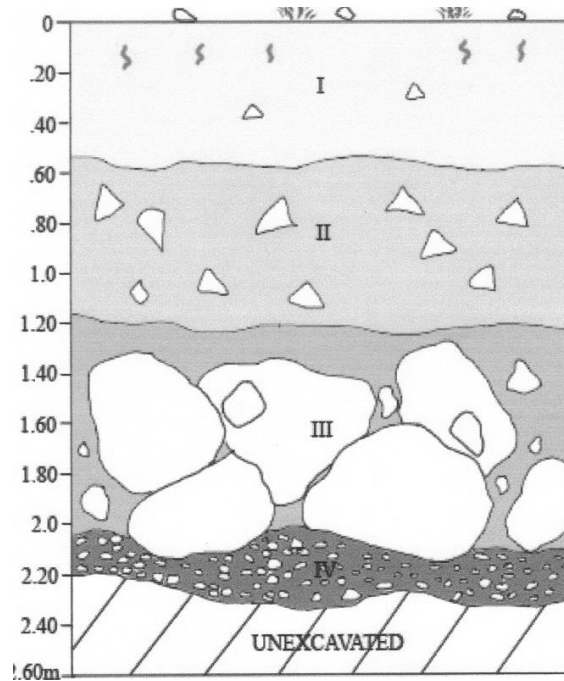


Figure 94. Stratigraphic Profile of TR 11 South Wall

Trench 14

Trench 14 (TR 14) was situated along the eastern boundary of Parcel 3 Waena, west of Waihe'e Ditch and the associated access road (see Figure 86 and Table XIII). It contained a six layer/lens stratigraphic sequence with excavations terminating in sterile soils (Figures 95 and 96). Storm wash episodes were identified between 0.65-1.46 mbs and designated Layers Va-Vc. TR14 measured 4.6 m long by 1.42 m wide by 2.3 m deep, oriented 270°. No cultural materials were observed within Trench 14.

Layer I (0-25cmbs): is a dark brown (7.5yr 3/3), silt loam, currently a fallow cane field and previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, friable with a medium frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (24-48cmbs): is a brown (10yr 4/3), silt loam, slightly-plastic, slightly-sticky, weak, very fine to fine grain, blocky, slightly hard, friable with a medium frequency of rocks, cobbles and gravel. Boundary was abrupt and wavy overlying Layer III. No cultural materials were observed in this layer.

Layer III (44-56cmbs): is a dark grayish brown (10yr 4/2), stony silt, storm wash, weakly coherent, non-plastic, non-sticky, loose, fine to medium grain, with a high frequency of rounded cobbles, pebbles and gravel. Boundary was abrupt and wavy overlying Layer IV. No cultural materials were observed in this layer.

Layer IV (52-70cmbs) is a brown (10yr 4/3) silt loam, slightly-plastic, slightly-sticky, very fine grain, non-plastic, non-sticky, loose, single grain, structureless, boundary was abrupt and wavy overlying Layer Va. No cultural materials were observed in this layer.

Layer/lens Va (65-98cmbs): is a dark grayish brown (10yr 4/2), riverbed stony silt, weakly coherent, non-plastic, non-sticky, compact, medium to coarse grain, structureless, with a low to medium frequency of bedded rounded cobbles, pebbles and gravel overlying Layer Vb storm wash episode. Boundary was clear and wavy. No cultural materials were observed in this layer.

Layer Vb (90-130cmbs): is a dark grayish brown (10yr 4/2), riverbed stony silt, non-plastic, non-sticky, structureless, with medium frequency of bedded rounded cobbles, pebbles and gravel overlying Layer Vc storm wash episode, boundary was clear and wavy. No cultural materials were observed in this layer.

Layer Vc (106-146cmbs): is a dark grayish brown (10yr 4/2), riverbed stony silt, non-plastic, non-sticky, structureless, with a high frequency of bedded rounded cobbles, pebbles and gravel overlying Layer VI. Boundary was abrupt and wavy. No cultural materials were observed in this layer.

Layer VI (138-230cmbs): At 110cmbs is a brown (10yr 4/3), silt loam, weak, blocky, slightly-plastic, slightly-sticky, compact, fine grain. No cultural materials were observed in this layer.



Figure 95. Photograph of Stratigraphic Profile of TR 14 South Wall

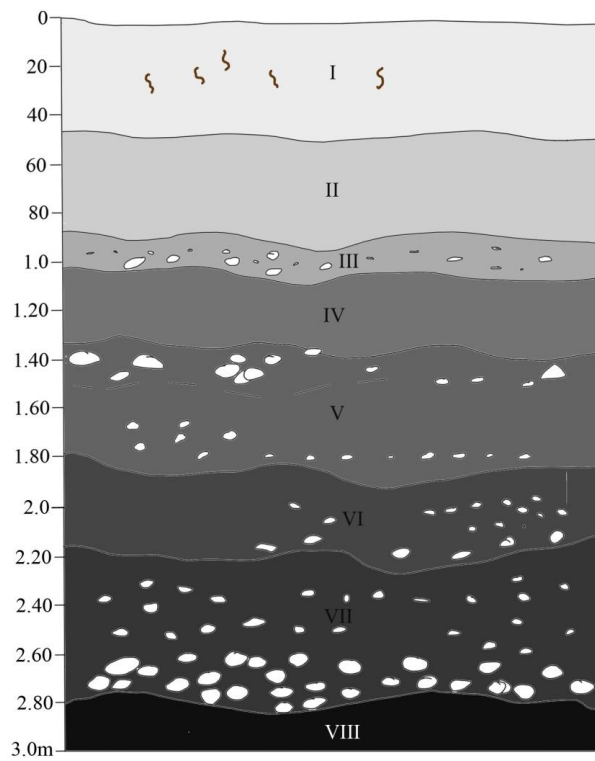


Figure 96. Stratigraphic Profile of TR 14 South Wall

Trench 23

Trench 23 (TR 23) was situated in the extreme northeastern portion of Parcel 3 Waena, juxtaposed by Parcel 3 Mauka and Parcel 6 to the north (see Figure 86). It contained a two layer stratigraphic sequence with excavations terminating in decomposing bedrock (Figures 97 and 98). Trench 23 measured 4.7 m long by 1.4 m wide by 1.76 m deep, oriented 360° by 180° section of this area was recorded and is further described below. No cultural materials were observed within Trench 23 (TR 23).

Layer I (0-64cmbs): is a dark brown (7.5yr 3/3), silt loam, within a previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, friable with a medium frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (64-184cmbs): is a dark brown (7.5yr 3/4), stony silt, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, friable with a medium frequency of rocks, and decomposing bedrock. No cultural materials were observed in this layer.



Figure 97. Photograph of Stratigraphic Profile of TR 23 East Wall

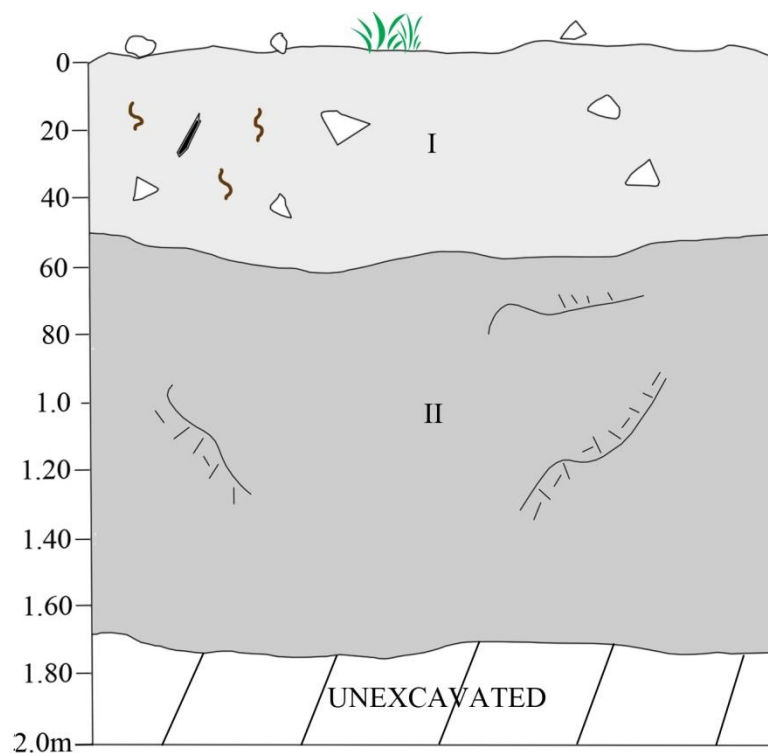


Figure 98. Stratigraphic Profile of TR 23 East Wall

Table XV. Summary of Trench Description for Western Portion of Parcel 3 Waena

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
01	Southeast Portion	4.7m x 1.42m x 1.76m	360° x 180°	I-IV	Non-Cultural
02	North of TR-01	4.6m x 1.41m x 1.52m	270° x 90°	I-IV	Non-Cultural
03	North of TR-01 & TR-02	4.6m x 1.42m x 1.8m	360° x 180°	I-III	Non-Cultural
04	East of Reservoir	4.6m x 1.42m x 1.86 m	270° x 90°	I-II	Non-Cultural
05	East of Reservoir	4.6m x 1.41m x 2.04m	270° x 90°	I-II	Non-Cultural
06	South of Reservoir	4.7m x 1.51m x 1.7m	360° x 180°	I-II Terminated / Irrigation Lines	Non-Cultural 8" H2O PVC Irrigation Line Present
07	East of Rock Quarry	4.6m x 1.42m x 1.08m	360° x 180°	I-II	Non-Cultural
08	East of Reservoir	4.6m x 1.43m x 1.58m	360° x 180°	I-IV	Non-Cultural
09	East of Reservoir	4.7m x 1.65m x 1.48m	360° x 180°	I-III	Non-Cultural 12" H2O PVC Irrigation Line Present

010	East of Waihe'e Ditch	4.6m x 1.4m x 1.84m	360° x 180°	I-III	Non-Cultural
011	East of Waihe'e Ditch	4.6m x 1.41m x 1.8m	270° x 90°	I-III	Non-Cultural
012	East of Waihe'e Ditch	4.6m x 1.4m x 1.74m	270° x 90°	I-III	Non-Cultural
013	West of State Highway 30	4.7m x 1.42m x 1.6m	270° x 90°	I-III	Non-Cultural
014	West of State Highway 30	4.6m x 1.41m x 1.83m	270° x 90°	I-II	Non-Cultural
015	West of State Highway 30	4.6m x 1.41m x 1.8m	270° x 90°	I-IV	Non-Cultural

Trench 08

Trench 08 (TR 08) was centrally located within the project area and contained a four layer/lens stratigraphic sequence with an alluvium layer noted at Layer II (Figures 86, 99 and 100). It measured 4.6 m long by 1.41 m wide by 1.8 m deep and was oriented at 270°. Excavations were terminated within a sterile stratum and no cultural materials were observed within TR 08.

Layer I (0-36cmbs): is a dark brown (7.5yr 3/2), silt loam, agricultural plow zone, slightly-plastic, slightly-sticky, blocky, fine to medium grain, with a medium frequency of roots. No cultural materials were observed in this layer. Boundary was clear and broken overlying Layer IIa on the north and Layer III on the south.

Layer IIa (29-56cmbs): is a brown (7.5yr 3/2), streambed, non-plastic, non-sticky, medium to coarse grain, with a low frequency of roots, structureless, weakly coherent with a high frequency of rounded cobbles, pebbles and gravel. No cultural materials observed in this layer. Boundary was clear and broken overlying Layer III.

Layer IIb (60-104cmbs): is a brown (7.5yr 3/2), streambed, non-plastic, non-sticky, medium to coarse grain, with a low frequency of roots. structureless, weakly coherent with a high frequency of rounded cobbles, pebbles and gravel. No cultural materials observed in this layer. Boundary was clear and broken overlying Layer III on the north and Layer IV on the south.

Layer III (24-100cmbs): is a brown (7.5yr 3/2), streambed, non-plastic, non-sticky, medium to coarse grain, with a low frequency of roots. structureless, weakly coherent with a high frequency of rounded cobbles, pebbles and gravel. No cultural materials observed in this layer. Boundary was clear and a plane overlying Layer IV.

Layer IV (92-160cmbs): is a brown (7.5yr 4/2), silt, slightly-plastic, slightly-sticky, blocky, slightly hard, medium grain, with a low frequency of rock and the absence of roots. No cultural materials observed in this layer.



Figure 99. Photograph of Stratigraphic Profile of TR 08 West Wall

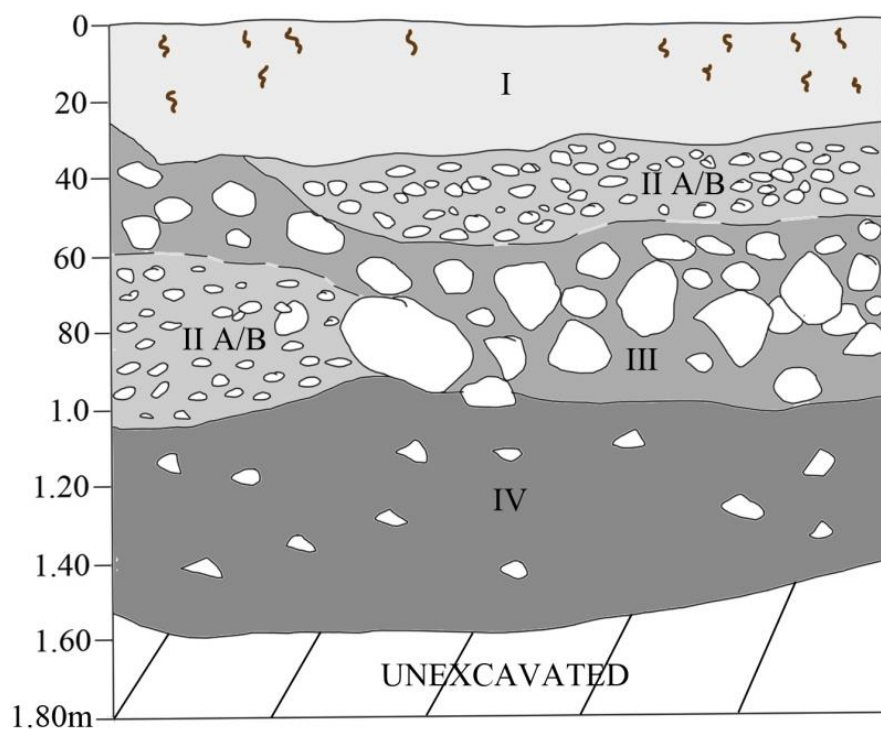


Figure 100. Stratigraphic Profile of TR 08 West Wall

Trench 011

Trench 011 (TR 011) was situated within the central portion of the project area and contained a tripartite stratigraphic sequence (see Figures 86, 101, 102 and Table XIV). It measured 5.0 m long by 1.41 m wide by 1.8 m deep, oriented at 270° where no cultural materials were observed. A section along the south wall was recorded and further described below.

Layer I (0-30cmbs): is a dark brown (7.5yr 3/2), silt loam, agricultural plow zone, slightly-plastic, slightly-sticky, blocky, fine to medium grain, with a medium frequency of roots. No cultural materials were observed in this layer. Boundary was clear and broken overlying Layer IIa on the north and Layer III on the south.

Layer II (28-157cmbs): is a brown (7.5yr 4/2), silty loam, slightly-plastic, slightly-sticky, blocky, slightly hard, medium to coarse grain, with a high frequency of rounded pebbles and gravel. No cultural materials observed in this layer. Boundary was clear and wavy overlying Layer III.

Layer III (157-180cmbs): is a brown (7.5yr 3/2), streambed, non-plastic, non-sticky, medium to coarse grain, with a low frequency of roots. structureless, weakly coherent with a high frequency of rounded cobbles, pebbles and gravel. No cultural materials observed in this layer.



Figure 101. Photograph of Stratigraphic Overview of TR 011 South Wall

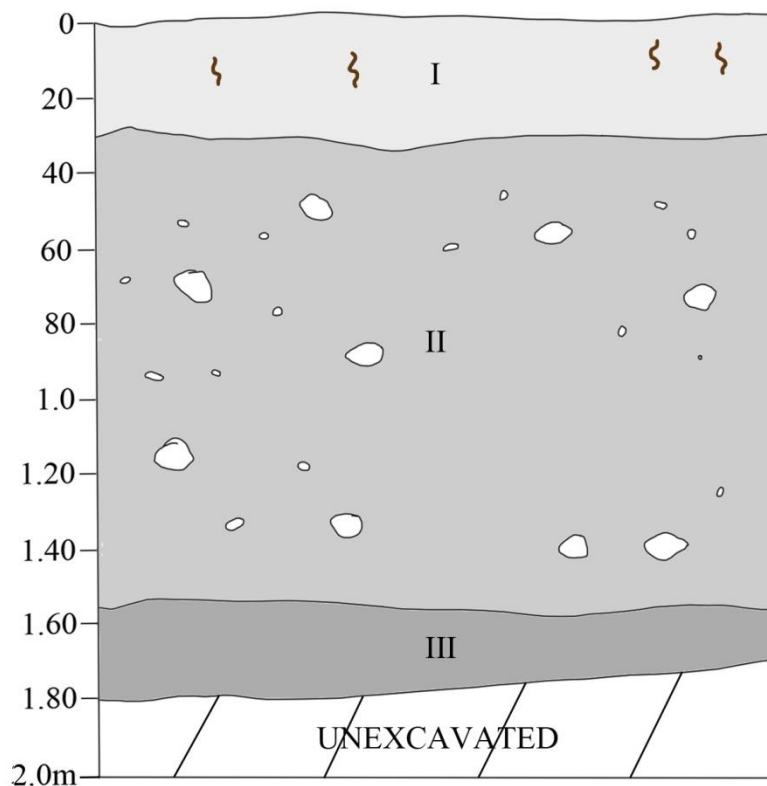


Figure 102. Stratigraphic Profile of TR 011 South Wall

Trench 015

Trench 015 (TR 015) was situated within the northwestern portion of the project area adjacent to the western edge of an active sugarcane field (see Figure 86). A four layer stratigraphic sequence which contained alluvial episodes and sterile soils was recorded for TR 015. It measured 4.8 m long by 1.41 m wide by 1.8 m deep and was oriented at 270°.

Layer I (0-32cmbs): is a very dark brown (7.5yr 2.5/2), silt loam, agricultural plow zone, slightly-plastic, slightly-sticky, blocky, fine to medium grain, with a medium frequency of roots. No cultural materials were observed in this layer. Boundary was clear and wavy overlying Layer III on the north and Layer III on the south.

Layer IIa (24-90cmbs): is a brown (7.5yr 4/2), silty loam, slightly-plastic, slightly-sticky, blocky, friable, fine grain, with a low frequency of rounded pebbles and gravel. No cultural materials observed in this layer. Boundary was clear and a plane overlying Layer IIb.

Layer IIb (90-110cmbs): is a dark grayish brown (10yr 4/2), streambed, non-plastic, non-sticky, medium to coarse grain, with an absence of roots, structureless, with a high frequency of rounded cobbles, pebbles and gravel. No cultural materials observed in this layer. Boundary was clear and a plane overlying Layer III.

Layer III (100-180cmbs): is a grayish brown (10yr 5/2), silt loam, slightly-plastic, slightly-sticky, blocky, slightly hard, fine to medium grain, with a low frequency of rounded pebbles and gravel. No cultural materials observed in this layer. No cultural materials observed in this layer.



Figure 103. Photograph of Stratigraphic Profile of TR 015 North Wall Profile

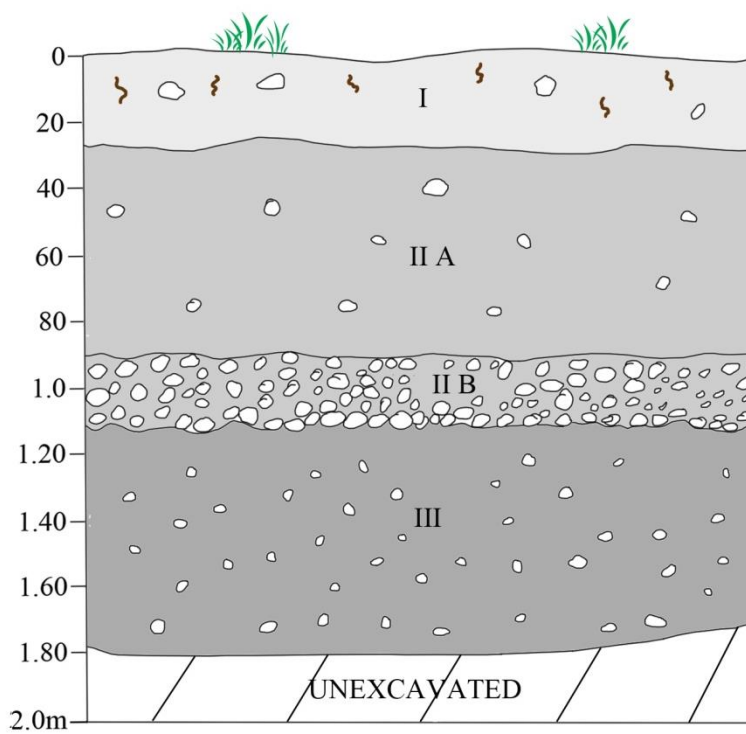


Figure 104. Stratigraphic Profile of TR 015 North Wall Profile

DISCUSSION PARCEL 3 WAENA BACKHOE TRENCHING

No cultural materials were recovered within the 27 trenches excavated within the western portion of Parcel 3 Waena. Although the absence of material is noteworthy, most of the information is geologically related. Ten (10) trenches exhibited an alluvium stratum (water deposited layer and/or lens). For the western section of the parcel, TR`s 5, 6, 11 in the southern section and TR`s 15, 16, 18 located to the north contained a deep streambed layer. TR`s 9, 10, 12, and 14 contained episodic storm wash or colluvial deposition in the form of water affected pebbles and gravel layers and/or lens, juxtaposed by silt layers above and below. These trenches are located in the central portion of the parcel between the aforementioned streambed trenches, and are oriented west/east. Six (6) trenches (TR 22-27) excavated along the northwestern portion of the project area, adjacent to large agricultural clearing piles exhibited a distinct stratigraphy consisting of a much grayer colored, extremely rocky Layer I and Layer II, particularly within the lower undisturbed stratum. Although these trench profiles show an upper plow-zone layer and a distinct lower layer, they consisted of mainly of decomposing bedrock and/or saprolytic rock and were likely extensively bulldozed or previously mined of topsoil, leaving the underlying layers close to the surface. Furthermore, these trenches are located near a fairly deep ravine or gulch that was devoid of water. The remaining eleven (11) trenches, (TR 1-4, TR 7, TR 8, TR 13, TR 17, TR 19, TR 21, and TR 2) contained a deep soil deposit, with TR 1 containing a fairly thick sand deposit approximately 1.0 mbs (see Figure 86). No buried utility lines were noted in the area where the sand would be interpreted as pipe bedding. Although, the sand layer does not appear to be native, it contained the cross-bedding lines indicative of aeolian deposition.

A total of 15 negative test trenches were executed on the eastern side of the parcel. Five (5) trenches (TR 07-010 and TR 015) were placed along the western boundary, parallel with Site 5197 (Waihe`e Ditch) and exemplified storm wash episodes in the form of water-affected basalt cobbles, pebbles and gravel layers and lenses (see Figure 86). Five (5) trenches (TR 01-03, TR 012 and TR 013) excavated along the eastern boundary, parallel with State Highway 30 (RT30) exhibited a high frequency of rock in both Layers II and Layer III silty loam. TR`s 04-06, and TR 011 contained a deep soil deposit. Underground irrigation utilities were encountered in TR`s 06 and 09 and thus indicative of prior disturbances.

PARCEL 3 MAKAI

Parcel 3 Makai (TMK [2] 3-6-002:003) consisted of approximately 245 acres cultivated in commercial sugarcane adjacent and west of Honoa`pi`ilani Highway (RT 30). Waikapū Stream and Waiko Road are located to the north and an active sand mining borrow pit and Kuihelani Highway (RT 380) are to the east. A total of forty-two (42) trenches (TR`s 100-141) were positioned within this parcel to determine presence absence of buried cultural remains (Figure 105 and Tables XV and XVI). Six trenches (TR`s

110, 113, 116, 119, 127 and 140) were located in the central portion of this zone within Grant 2747:2, formerly used for sugarcane, and a reservoir (see Figure 105). Most of the trenches exhibited a similar stratigraphy with a three to four layer soil profile. Representative stratigraphic profiles with photos are presented below for TR's 100, 102, 110, 116, 121, 125 and 137 and the remaining are within Appendix A.

OVERALL GENERAL STRATIGRAPHY

Layer I generally consisted of an upper loamy silt layer, usually a dark brown, or a very dark grayish brown (10 YR 3/3, 3/2), and varied from 50 to 80 cm thick. This was the plow zone from previous cultivation activities. Layer I was typically a disturbed layer mixed with deteriorated black plastic drip-lines, plastic PVC irrigation pipes, and concrete with gravel aggregate pieces that had been used during the previous commercial sugarcane cultivation era. There was a low density of rocks in this layer, but a high density of roots from surface vegetation.

Layer II generally consisted of a fine silt, loamy silt, and in a few identified trenches contained a silt clay and/or a silt gravel, and varied from a brown, dark brown, very dark grayish brown, and a dark grayish brown (10YR 4/3, 3/2, 3/2, 4/2) or a dark reddish brown (5YR 3/3) and/or brown, dark brown, strong brown (7.5YR 3/2, 3/4, 4/3,4/6) with a low density of roots and medium-sized cobbles to medium-sized boulders.

Layer III generally consisted to be very fine silt loam and/or clay with a low density of roots and medium-sized cobbles to large-sized boulders. Trenches excavated along the north eastern end of the project area exhibited an orange or strong brown layers, which ranged in color from dark brown (7.5YR 3/4, 5/6, 4/6) that may be a result of soil oxidation or chemicals used in sugarcane cultivation.

Eleven (11) trenches exhibited a two layer sequence, sixteen (16) trenches exhibited a three layer sequence, ten (10) trenches exhibited a four layer sequence, four (4) trenches exhibited a five layer sequence and one (1) trench exhibited a six layer sequence.

Table XVI. Summary of Backhoe Trenches Parcel 3 Makai East of State Highway 30

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
100	Northeastern Boundary	4.7m x 1.41m x 1.5m	270° x 90°	Layer I-IV	Non-Cultural
101	Northeastern Boundary	4.7m x 1.40m x 1.36m	270° x 90°	Layer I-III	Non-Cultural
102	Northeastern Portion	4.7m x 1.42m x 1.5m	270° x 90°	Layer I-III	Non-Cultural
103	Northeastern Portion	4.7m x 1.41m x 1.8m	360° x 180°	Layer I-III	Non-Cultural
104	East of TR-103	4.6m x 1.43m x 1.5m	270° x 90°	Layer I-III	Non-Cultural
105	Northeastern Boundary	4.7m x 1.42m x 1.32m	270° x 90°	Layer I-III	Non-Cultural
106	North Central	4.6m x 1.41m x 0.92m	270° x 90°	Layer I-II	Non-Cultural
107	East of TR-106	4.7m x 1.42m x 1.2m	270° x 90°	Layer I-II	Non-Cultural
108	Northeastern Portion	4.7m x 1.41m x 1.8m	270° x 90°	Layer I-III	Non-Cultural
109	Northeastern Boundary	4.6m x 1.42m x 2.0m	270° x 90°	Layer I-III	Non-Cultural
110	Central	4.7m x 1.43m x 1.6m	270° x 90°	Layer I-IV	Non-Cultural
111	East of TR-110	4.7m x 1.42m x 1.64m	270° x 90°	Layer I-IV	Non-Cultural
112	Central Eastern Boundary	4.7m x 1.41m x 1.76m	270° x 90°	Layer I-III	Non-Cultural
113	Central	4.7m x 1.43m x 1.8m	270° x 90°	Layer I-II	Non-Cultural
114	East of TR-113	4.7m x 1.45m x 1.7m	270° x 90°	Layer I-VI	Non-Cultural
115	Central Eastern Boundary	4.6m x 1.44m x 1.6m	270° x 90°	Layer I-II	Non-Cultural
116	Central Southern Grant 2747:2	4.7m x 1.45m x 2.0m	360° x 180°	Layer I-III	Non-Cultural
117	East of TR-116	4.7m x 1.46m x 1.8m	270° x 90°	Layer I-IIa	Non-Cultural
118	Southeastern Boundary	4.7m x 1.43m x 1.6m	270° x 90°	Layer I-IV	Non-Cultural
119	South Central	4.6m x 1.45m x 1.6m	270° x 90°	Layer I-III	Non-Cultural
120	East of TR-119	4.7m x 1.44m x 1.6m	270° x 90°	Layer I-III	Non-Cultural

Table XVII. cont'd Summary of Backhoe Trenches Parcel 3 Makai East of State Highway 30

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
121	Southeastern Boundary	4.7m x 1.44m x m	270° x 90°	Layer I-IV	Charcoal Lens in Layer III
122	Southeastern Boundary	4.8m x 1.43m x m	270° x 90°	Layer I-V	Non-Cultural
123	Southeastern Boundary	4.7m x 1.44m x m	270° x 90°	Layer I-V	Non-Cultural
124	Southern Boundary	4.8m x 1.44m x m	360° x 180°	Layer I-V	Non-Cultural
125	Southern Boundary	4.9m x 1.43m x m	360° x 180°	Layer I-IV	Non-Cultural
126	Southwestern Boundary	4.9m x 1.45m x m	270° x 90°	Layer I-IIa	Non-Cultural
127	Western Boundary	4.7m x 1.43m x m	270° x 90°	Layer I-II	Non-Cultural
128	West of TR-110	4.8m x 1.44m x m	270° x 90°	Layer I-IV	Non-Cultural
129	East of TR-138	4.8m x 1.42m x 1.62m	270° x 90°	Layer I-III	Non-Cultural
130	East of TR-137	4.7m x 1.41m x 1.45m	270° x 90°	Layer I-III	Non-Cultural
131	Southeast of TR-133	4.8m x 1.42m x 1.31m	270° x 90°	Layer I-II	Non-Cultural
132	Northern Boundary	4.8m x 1.45m x 1.75m	270° x 90°	Layer I-V	Charcoal lens in Layer II
133	Northern Boundary	4.6m x 1.41m x 0.81 m	270° x 90°	Layer I-II	Non-Cultural
134	South of TR-135	4.7m x 1.42m x 1.41m	270° x 90°	Layer I-II	Non-Cultural
135	Northern Boundary	4.7m x 1.41m x 1.21m	270° x 90°	Layer I-III	Non-Cultural
136	Northwestern Boundary	4.8m x 1.43m x 1.39m	270° x 90°	Layer I-II	Non-Cultural
137	Southeast of TR-138	4.8m x 1.44m x 1.52m	270° x 90°	Layer I-IV	Non-Cultural
138	Western Boundary	4.7m x 1.41m x 1.17m	360° x 180°	Layer I-III	Non-Cultural
139	Western Boundary	4.8m x 1.40m x 1.65m	270° x 90°	Layer I-IV	Non-Cultural
140	Western Boundary	4.8m x 1.45m x 1.29m	270° x 90°	Layer I-IV	Non-Cultural
141	East of TR-40	4.9m x 1.44m x 1.8m	270° x 90°	Layer I-III	Non-Cultural

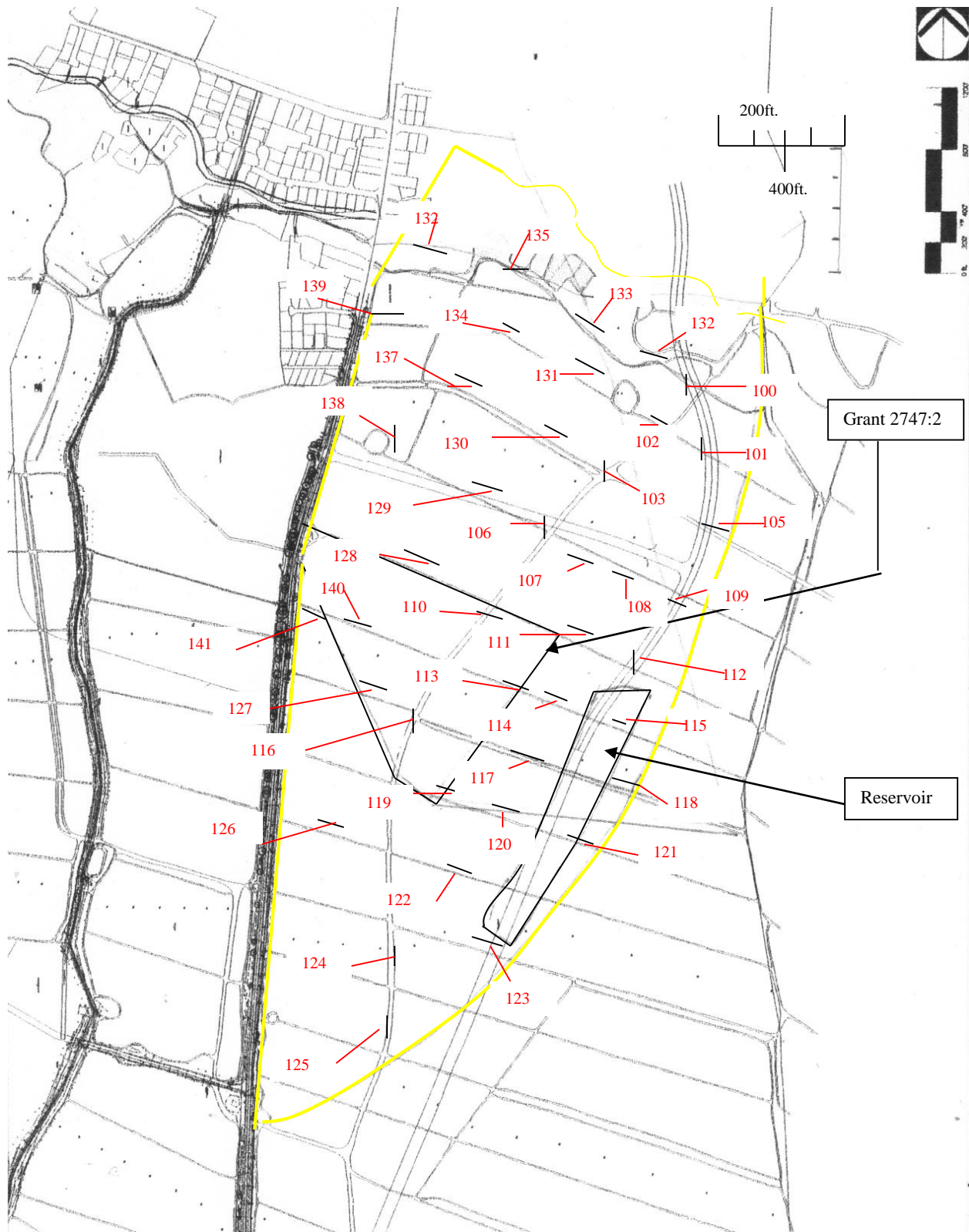


Figure 105. Plan View Topographic Map of Parcel 3 Makai (Yellow) Showing Location of Trenches 100-141, Grant and Reservoir

Trench 100

Trench 100 (TR 100) was situated in the northeastern portion of the project area along the western edge of a cultivated sugarcane field (see Figure 86 and Table XVI). This section contained a four layer stratigraphic sequence with excavations terminating in sterile streambed soils (Figures 106 and 107). No cultural materials were observed within TR 100 which measured 4.7 m long by 1.41 m wide by 1.5m deep.

Layer I (0-68cmbs): is a dark brown (10yr 3/3), loamy silt, plow zone, non-plastic, non-sticky, fine to medium grain, with a medium frequency of roots. No cultural materials were observed in this layer. Boundary was clear and wavy overlying Layer II on the east and Layer III streambed on the west.

Layer II (33-132cmbs): is a very dark brown (10yr 3/2-3/3), silty loam, non-plastic, slightly-sticky, very fine grain. No cultural materials observed in this layer. Boundary was clear and abrupt overlying Layer IV on the east and Layer III on the west.

Layer III (58-150cmbs): is a dark yellowish brown 10 YR 3/6), imported gravelly silt, non-plastic, slightly-sticky, medium to coarse grain. No cultural materials observed in this layer. Boundary was clear and abrupt overlying Layer II.

Layer IV (130-150cmbs): is a dark brown (7.5yr 3/3) sandy loam with sub-rounded small basalt cobbles and lithified sand stone peds, non-plastic, slightly-sticky, fine to medium grain, with a low frequency of roots. No cultural materials were observed in this layer. Boundary was clear and broken abutting Layer III on the west.



Figure 106. Photograph of Stratigraphic Profile of Trench 100 South Wall with Streambed Deposit

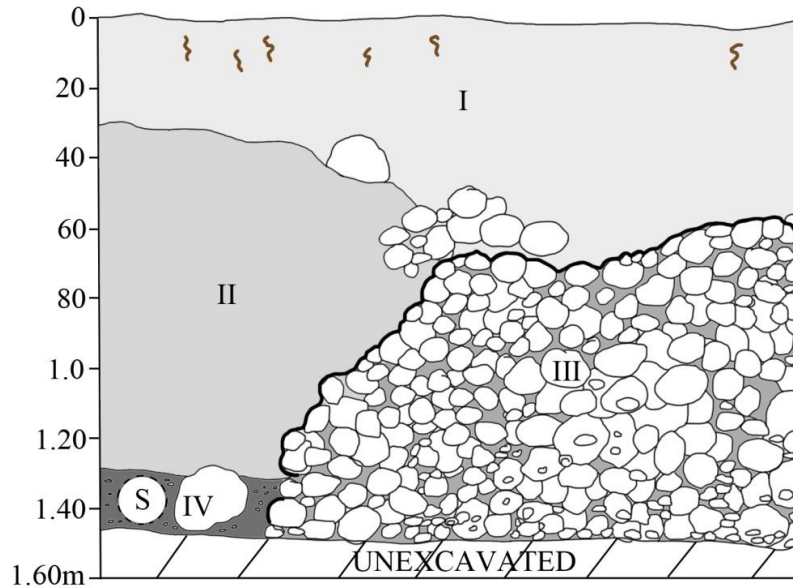


Figure 107. Stratigraphic Profile of Trench 100 South Wall

Trench 102

Trench 102 (TR 102) was located in the northeastern portion of the project area within an access road and the edge of a cultivated sugarcane field (see Figure 86 and Table XVI). This trench contained a three layer stratigraphic sequence with excavations terminating in sterile silty soil (Figures 108 and 109).

Trench 102 was non-cultural and measured 4.7 m long by 1.42 m wide by 1.5m deep.



Figure 108. Photograph of Stratigraphic Profile of Trench 102 with Streambed Deposit, View to West

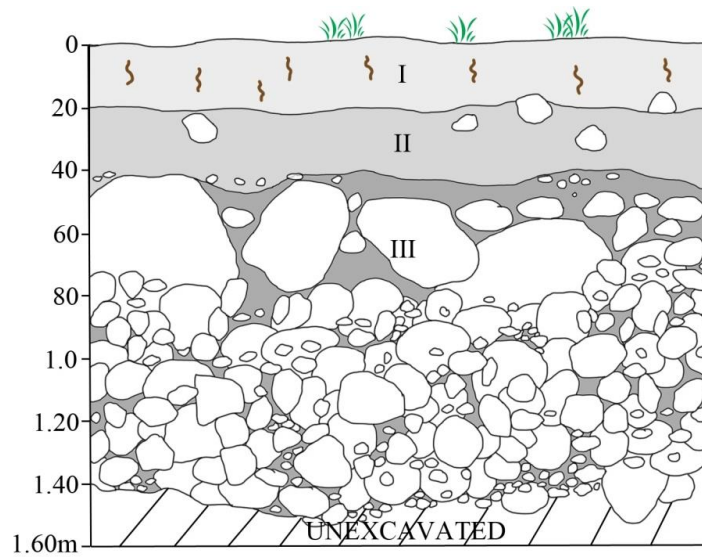


Figure 109. Stratigraphic Profile TR 102 South Wall

Trench 110

TR 110 was situated in the central portion of the project area within Grant 2747:2 to Eugene Bal (see Figure 86 and Table XVI). Land use for the grant was listed as sugarcane and a reservoir. The stratigraphic record for TR110 contained four layers which were the similar to TR's 108-109 (Figures 110 and 111). No cultural materials or evidence of the reservoir were observed within the trench which measured 4.7 m long by 1.43 m wide by 1.6 m deep.

Layer I (0-38cmbs) is the till zone it is a dark grayish brown (10YR5/2), loamy silt, non-plastic, non-sticky, fine to medium grain, with medium frequency of roots, and black plastic irrigation. No cultural materials were observed in this layer. Layer I has a clear, smooth boundary with underlying Layer II.

Layer II (38-78 cmbs) consisted of a dark grayish brown (10YR5/2), loamy silt with cobble inclusions, non-plastic, non-sticky, fine to medium grain, low frequency of fine roots. Layer II is similar to Layer I but contains small cobble sub angular rocks and devoid of irrigation piping. Layer II is non-cultural. Boundary is abrupt and smooth.

Layer III (78-101/118 cmbs) is a reddish brown silty clay (5YR3/3), compact, non-plastic slightly sticky, with gravel inclusions. Layer III is non-cultural and has an abrupt, smooth boundary.

Layer IV (118-BOE cmbs) is a dark reddish brown (7.5YR4/6) gravelly silty clay with mottling of Layer III saprolitic rock. No roots, linear gravel inclusions and sub angular rock. Layer IV is non-cultural and excavations terminated within this layer.



Figure 110. Photograph of South Wall of Trench 110

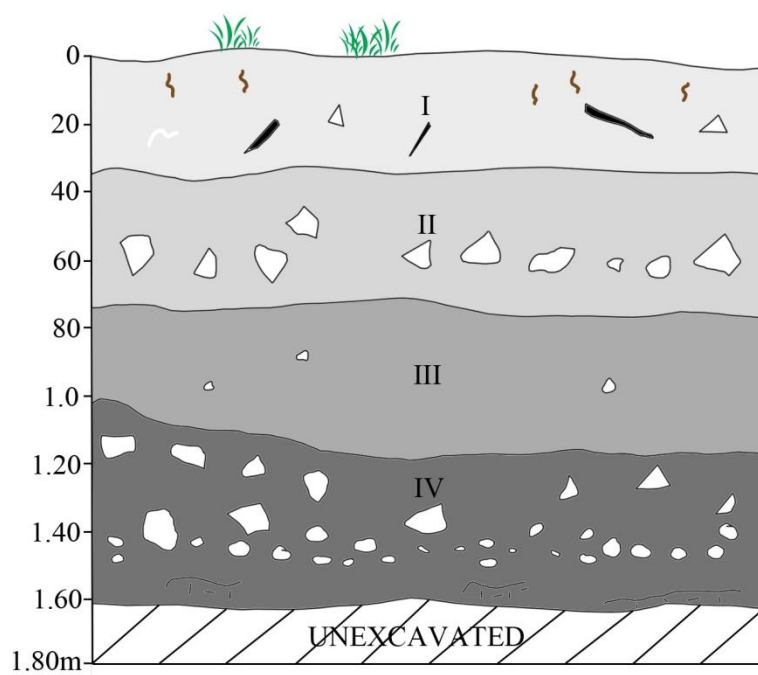


Figure 111. Stratigraphic Profile of South Wall of Trench 110

Trench 116

Trench 116 (TR 116) was situated in the central portion of the project area also within Grant 2747:2 which was formerly utilized as sugarcane and a reservoir (see Figure 86 and Table XVI). The stratigraphic record for TR116 contained four layers including one sand lens which interrupted the upper portion of Layer II (Figures 112 and 113). No cultural materials were observed within this trench which measured 4.7 m long by 1.45 m wide by 2.0m deep.

Layer I (0-25cmbs) is a light grayish brown (10YR5/2), loamy silty clay with gravel for access road, non-plastic, non-sticky, fine to medium grain, with low to medium frequency of roots. No cultural materials were observed in this layer. Layer I has abrupt clear boundary with underlying sand lens (Layer Ia).

Layer II (25-160) generally consisted of a fine silty clay, dark reddish brown (5YR 3/3) with grayish brown and gravel inclusions, non-plastic, non-sticky, fine to medium grain, low quantity of fine roots with clay ped inclusions. Layer II is non-cultural. Boundary is clear and wavy and overlies Layer III.

Layer IIa (42/45-55/57 cmbs) is a sand lens which was likely aeolian deposited. Layer IIa is non-cultural.

Layer III (150-200 cmbs) is a dark brown, strong brown (7.5YR3/2, 4/3, 4/6) very fine silt loam, non-plastic, non-sticky, fine to medium grain, with a low density of roots. Layer III is non-cultural and excavations terminated within this layer.



Figure 112. Photograph of West Wall of Trench 116, View to West

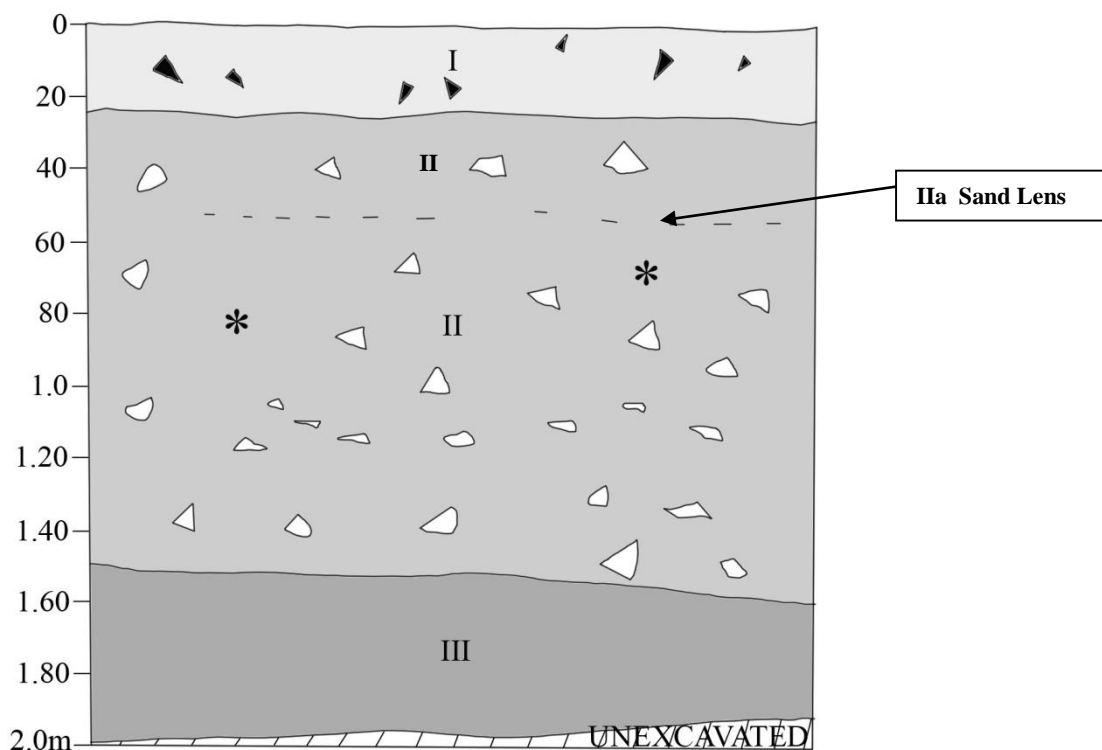


Figure 113. Stratigraphic Profile TR 116 West Wall

Trench 121

Trench 121 (TR 121) was located along the eastern edge of the parcel in the southeast portion along an east-west trending cane haul access road (see Figure 86 and Tables XVII). This trench contained a four-layer stratigraphic sequence with a gravel lens indicative of alluvial deposition, as well as a charcoal stained lens near the base of the trench (Figures 114-116). All layers were non-cultural with the charcoal staining likely due to past cane burning activities. Excavations terminated within Layer IV and TR 121 measured 4.7 m long by 1.45 m wide by 1.66 m deep.

Layer I (0-22 cmbs) consisted of the till zone and is a grayish brown (10YR5/2) loamy silt layer, non-plastic, non-sticky, fine to medium grain. It is disturbed with deteriorated black plastic drip-lines. Layer I contains medium density of rootlets with few rocks. Layer I was non-cultural with clear, smooth boundary overlying Layer II.

Layer II (22-60/75 cmbs) comprised of a loamy silt, brown (10YR 4/3) non-plastic, non-sticky, fine to medium grain, with sparse gravel and a low density of roots and medium-sized cobbles to medium-sized boulders. Layer II is non-cultural and contains a clear wavy boundary overlying Layer III.

Layer III (60/75-148) is a very fine silt, dark brown (10YR 4/2, 4/3) few to no roots, non-plastic, non-sticky, fine to medium grain, with gravel lenses identified at 90, 100 and 140 cmbs. No cobble inclusions. Near the bottom of Layer III, the soil becomes finer with depth and charcoal stained lens is apparent at 144 to 148 cmbs, which is the beginning of Layer IV. Layer III is non-cultural with a clear abrupt boundary.

Layer IIIa (148-BOE) is similar to Layer III but appears to be a finer material. It is comprised of dark brown (10YR 4/2.5) very fine silt and contains the linear charcoal staining at the transition with Layer III. Layer IIIa is non-cultural.



Figure 114. Overview Photograph of Trench 121, View to South



Figure 115. Close-up Photograph of South Wall of TR 121 Showing Charcoal Staining

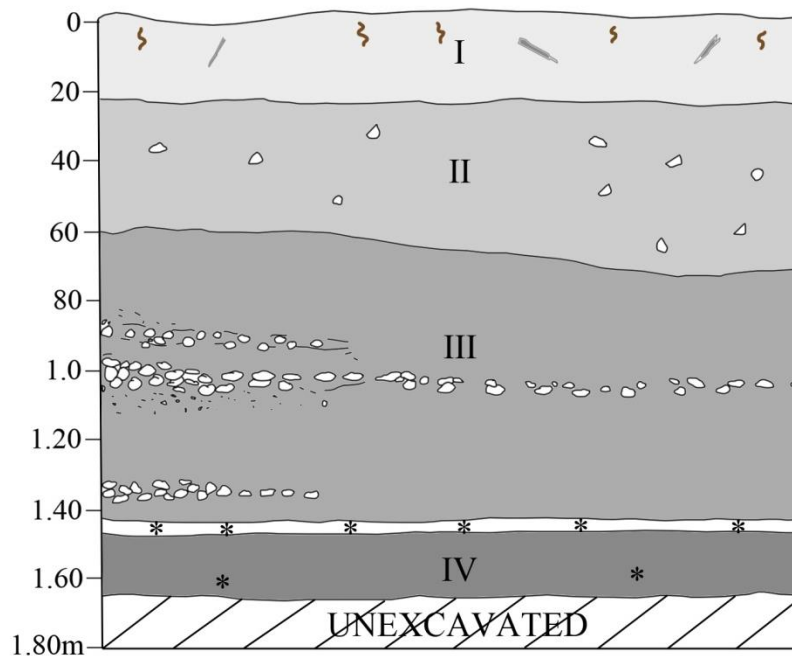


Figure 116. Stratigraphic Profile of South Wall of Trench 121

Trench 125

Trench 125 (TR 125) was located in the southeastern corner the northern side of a cane haul access road (see Figure 86 and Tables XVII). It contained a four-layer stratigraphic sequence with a storm/flood wash layer represented in stratum 2 (Figures 117 and 118). TR 125 was oriented at 360 and measured 4.9 m long by 1.43 m wide by 1.80 m deep and was non cultural.

Layer I (0-20/30 cmbs) is the edge of roadbed and consisted of a light gray imported (10YR5/2) gravel layer. Layer I was non-cultural with clear, smooth boundary overlying Layer II.

Layer II (20/30-60/70 cmbs) is a light grey, non-plastic, non-sticky, fine to medium grain, alluvial deposit comprised of silt and rounded pebbles and small cobbles. Layer II appears to be an *in situ* alluvial deposit which has been utilized as the sub-base for the road bed. It is non-cultural and has an abrupt, smooth boundary overlying Layer III.

Layer III (60/70-142/160 cmbs) is a reddish brown (7.5YR4/6) compact silty clay, non-plastic, slightly-sticky, fine to medium grain, with a few sub-angular and rounded small cobbles. Layer III is non cultural with no roots and has a clear, smooth boundary with Layer IV.

Layer IV (142/160-BOE) is similar to Layer III but is more compact, and comprised of a very fine, reddish brown silt which is devoid of rock inclusions. Layer IV is non-cultural and B.O.E. is at 180 cmbs.



Figure 117. Photograph of West Wall of Trench 125, View to West

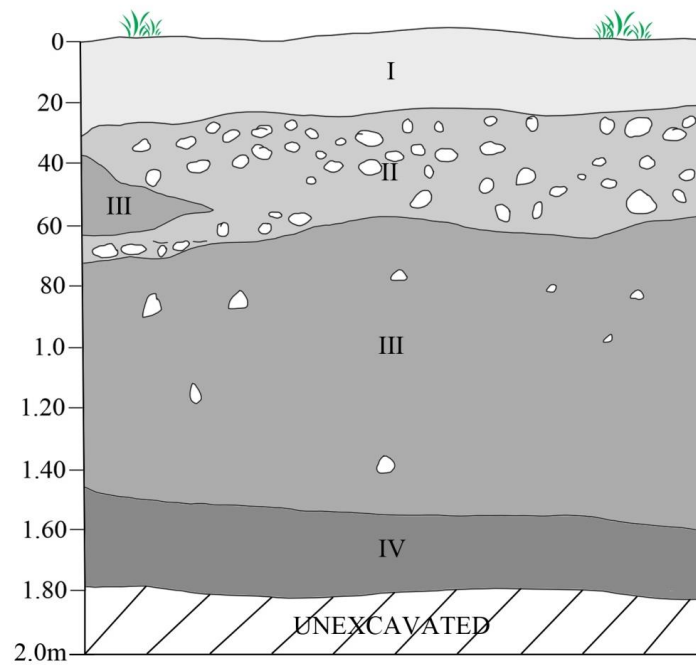


Figure 118. Stratigraphic Profile of West Wall of Trench 125

Trench 137

Trench 137 (TR 137) was located in the northwestern corner near a utility storage shed along the northern side of an access road (see Figure 86 and Tables XVII). It contained a four-layer stratigraphic sequence comprised of alluvial deposition that terminated in decomposing basalt (Figures 119 and 120). TR 137 measured 4.8 m long by 1.44 m wide by 1.50 m deep and was non cultural.

Layer I (0-18/22 cmbs) is the till zone and consisted of a grayish brown (10YR5/2) loamy silt layer with a few rounded pebble and cobbles inclusions. It is disturbed and contains few roots and Layer I was non-cultural with clear, smooth boundary overlying Layer II.

Layer II (22-30/60 cmbs) comprised of a dark reddish brown (5YR 3/3) (7.5YR 3/2, 3/4) loamy silt non-plastic, slightly sticky, fine to medium grain, with large cobble inclusions. Layer II is non-cultural and contains a clear wavy boundary overlying Layer III.

Layer III (30/60-122) is a yellowish brown (10YR4/3) gravelly silt with pockets of reddish brown silty clay. Many small and large cobbles with a few medium sized boulders and saprolitic rock, non-plastic, non-sticky, fine to medium grain. Layer III is non cultural with no roots. Layer III is non-cultural has a clear, smooth boundary with Layer IV.

Layer IV (122-BOE) is comprised of decomposing bedrock and smaller cobbles and pebbles with yellowish brown (10YR4/3) fine silt.



Figure 119. Photograph of South Wall of Trench 137

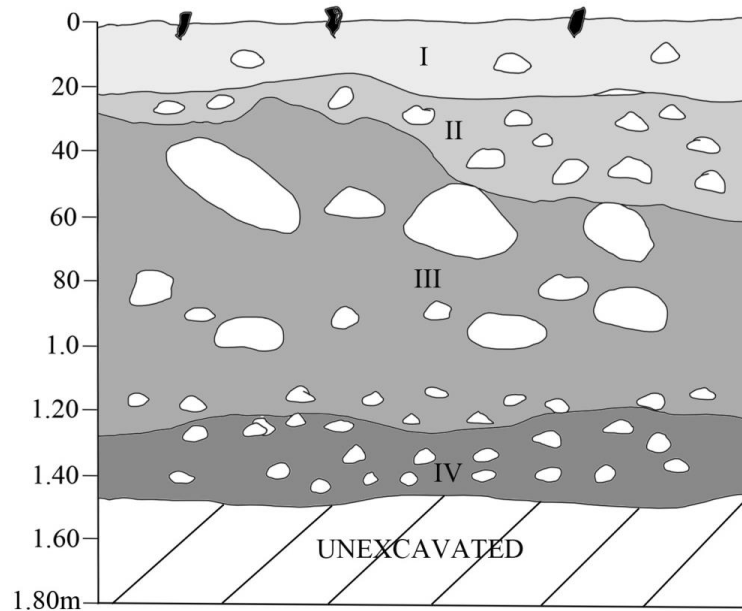


Figure 120. Stratigraphic Profile of Trench 137 South Wall

DISCUSSION PARCEL 3 MAKAI BACKHOE TRENCHING

TR's 100 and 102 were excavated in the extreme northeastern portion of the parcel and exhibited sand inclusions intermixed within streambed deposits. The US Soil Survey noted that (PZUE) Pu'uone sand deposits were present in the adjacent property to the east; however only the above trenches (TR's 100 and 102) contained sand inclusions. Twenty-three (23) trenches (TR's 100-102, 105, 111, 114, 122, 124, 128-133, 135 and 137-139) contained a thick alluvial deposit, likely from a meandering Waikapū Stream as the majority of these trenches were located in the northern portion, in close proximity to the Waikapū Stream. TR's 120, 121, 123, 125, and 126 are located in the southern portion of the parcel in the vicinity of the former reservoir and exhibited storm wash episodes in the form of water affected pebbles and gravel layers and/or lens imbedded above and below Layer III silt. Eight trenches (TR 104, 106-108, 112, 134, 136 and 141) contained bedrock in either Layer II or III. The remaining trenches exhibited a deep silt deposit overlying large boulders.

PARCEL 6

Parcel 6 (TMK [2] 3-6-004:006) is comprised of 52 acres located within the central portion of the overall project area (see Figure 1, 2 and 6). It is an L-shaped parcel which is partially bounded to the east by Site 5197 (Waihe'e Ditch) and Parcel 7 the Maui Tropical Plantation (see Figure 6). To the north are undeveloped and developed agricultural lands, to the south and southwest is Parcel 3 Waena, and to the west is Parcel 3 Mauka. Parcel 6 was once cultivated entirely in sugarcane; however portions of the north

and west are currently fallow with small scale commercial agricultural activities and the southern portion is in active sugarcane by HC&S (Figures 121-123). The subject parcel is slated for small residential lots less than 10,000 sq. ft. in size (see Figure 7).

During the course of the current fieldwork, a total of twenty-six (26) trenches (TR's 200-225) were excavated and recorded (Figure 124 and Tables XVII and XVIII). The trenches exhibited a similar stratigraphy ranging from three to four layers with Layer I being the agricultural till zone. Trenches 200 (TR 200 -203) were placed within the active sugarcane along the southern portion of the parcel and TR's 204-225 (TR 204-225) were situated across the parcel to provide a representative sample of the subsurface conditions, and to test areas that contained LCA's, Grants and flumes (Figure 125 and Tables V, VI, XVII and XVIII) along the western and northern portion of the project area.

OVERALL GENERAL STRATIGRAPHY

Layer I generally consisted of an upper loamy silt layer, usually dark brown, a very dark grayish brown (10 YR 3/3, 7.5 YR 3/3, 4/3) that varied from 30 to 60 cm thick. This was the plow zone from previous cultivation activities and current agricultural activities. Layer I was typically a disturbed layer with mixed with deteriorated black plastic drip-lines, plastic PVC irrigation pipes, and concrete with gravel aggregate pieces that had been used during the previous commercial sugarcane cultivation era. There was a low density of rocks in this layer, but a high density of roots from surface vegetation.

Layer II generally consisted of a dark brown (10YR 2/2 to 7.5YR 3/2) to a dark reddish brown (5YR 3/3, 3/4) stony silt loam and clay loam deposit that varied 60-150 cm thick with a few trenches containing decomposing bedrock, with a low density of roots and a medium frequency of rocks.

Layer III generally consisted of a very fine clay loam to a silty clay and varied from a brown to strong brown (7.5YR 4/4-4/6), dark grayish brown (10YR 3/2) and dark reddish brown (5YR 3/3-3/4) with the absence of roots and contained a gravelly stony silt with decomposing bedrock, and medium-sized cobbles with decomposing bedrock.

Four (4) trenches exhibited a two layer sequence, twenty (20) trenches exhibited a three layer sequence, and two (2) trenches exhibited a four layer sequence. All trenches were culturally sterile with the exception of Trench 221 (TR 221) where an isolated clear bottle glass fragment was found on the surface. Representative stratigraphic profiles and photographs are presented below and exemplified in TR's 202, 208, 218 and 222 are (see Figure 121).



Figure 121. Overview Photograph of Parcel 6 Showing Commercial Agricultural Activities, View to Northeast



Figure 122. Overview Photograph of Parcel 6 Showing Fallow Sugarcane and Proposed Location of TR 212, View to East



Figure 123. Overview Photograph of Parcel 6 after Mature Sugarcane was Removed, View from TR 223 and to Northwest

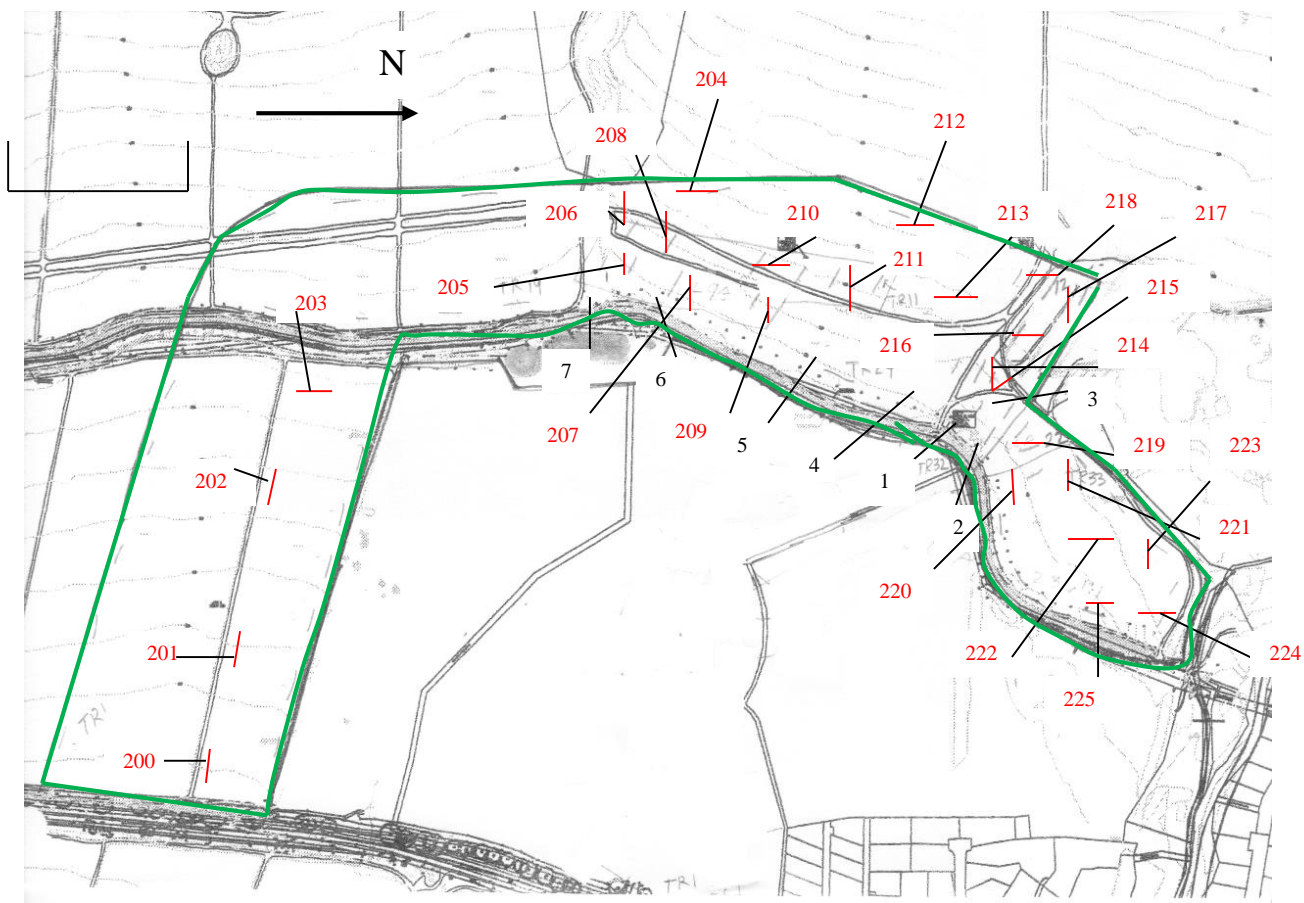


Figure 124. Topographic Map Showing Location of Former Trenches 1-7 (Black), Current Backhoe Test Trenches 200-225 (Red) within Parcel 6 (Green)



Table XVIII. Summary of Backhoe Trenches Parcel 6

TRENCH	LOCATION (Land Use)	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
200	West of State Highway 30	4.6m x 1.4m x 2.0m	270° x 90°	I-III	Non-Cultural
201	East of Waihe'e Ditch in cane field	4.6m x 1.41m x 1.8m	270° x 90°	I-III	Non-Cultural
202	Grant 2960 for sugarcane	4.6m x 1.4m x 2.0m	270° x 90°	I-III	Non-Cultural
203	East of Waihe'e Ditch in cane field	4.7m x 1.41m x 1.6m	360° x 180°	I-III	Non-Cultural
204	West of Waihe'e Ditch, within Grant1844	4.9m x 1.45m x 1.86m	360° x 180°	I-III	Non-Cultural
205	West of ditch, LCA 10160:1 (house lot, kula, lo'i)	4.9m x 1.44m x 1.78m	270° x 90°	I-III	Non-Cultural
206	West of ditch, LCA 10160:1 ((house lot, kula, lo'i)	4.8m x 1.44m x 1.75m	270° x 90°	I-III	Non-Cultural
207	West of ditch, LCA 10160:1 (house lot, kula, lo'i)	4.9m x 1.43m x 1.81m	270° x 90°	I-III	Non-Cultural
208	Grant 1844 poss, within LCA 10160:1	4.8m x 1.44m x 1.81m	270° x 90°	I-IV	Non-Cultural
209	West of ditch, LCA 11022:3(house lot, kula, lo'i)	4.8m x 1.45m x 1.81m	270° x 90°	I-V	Non-Cultural
210	West of Waihe'e Ditch, within LCA 11022:3	4.9m x 1.44m x 1.71m	360° x 180°	I-III	Non-Cultural
211	West of Waihe'e Ditch, within LCA (house lot, kula, lo'i) 10481:1	4.8m x 1.42m x 1.7m	360° x 180°	I-III	Clear glass bottle fragment recovered from surface pre-excavation
212	West of Waihe'e Ditch, Grant1844(sugarcane)	4.9m x 1.44m x 1.79m	360° x 180°	I-III	Non-Cultural
213	West of Waihe'e Ditch, Grant1844 (sugarcane)	4.8m x 1.45m x 1.4m	360° x 180°	I-III	Non-Cultural
214	Within LCA 5774:2 for Lo'i	4.9m x 1.44m x 1.78m	270° x 90°	I-III	Non-Cultural
215	West of ditch, within LCA 5774:2 (lo'i)	4.9m x 1.45m x 1.78 m	270° x 90°	I-II	Non-Cultural
216	West of the ditch, LCA 5774:2 (lo'i)	4.8m x 1.44m x 1.81m	360° x 180°	I-III	Non-Cultural
217	West of ditch, within LCA 5774:2 (lo'i)	4.8m x 1.43m x 1.78m	270° x 90°	I-III	Non-Cultural

Table XIX. cont'd Summary of Backhoe Trenches Parcel 6

TRENCH	LOCATION (Land Use)	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
218	West of Waihe'e Ditch, Cane Flume Esmnt LCA 5774:2 claimed for lo'i	4.9m x 1.45m x 1.79m	360° x 180°	I-III	Ceramic Sherd 2ndry Deposit surface Site 7884Fe2
219	West of ditch, LCA 3527:3 (kula, taro)	4.8m x 1.44m x 1.58m	360° x 180°	I-III	Non-Cultural Concrete frag. LI
220	West of Waihe'e Ditch, within LCA 3527:3	4.9m x 1.45m x 1.79m	360° x 180°	I-III	Non-Cultural
221	West of Waihe'e Ditch, within LCA 2361:1 (no info)	4.6m x 1.4m x 1.81m	270° x 90°	I-III	Non-Cultural
222	West of Waihe'e Ditch, within LCA 2361:1	4.6m x 1.41m x 1.75m	360° x 180°	I-II	Non-Cultural
223	West of Waihe'e Ditch, within LCA 2361:1	4.8m x 1.44m x 1.4m	360° x 180°	I-II	Non-Cultural
224	West of Waihe'e Ditch, within LCA 2361:1	4.9m x 1.45m x 1.75m	360° x 180°	I-II	Non-Cultural
225	West of Waihe'e Ditch, within LCA 2361:1	4.9m x 1.44m x 1.76m	360° x 180°	I-III	Non-Cultural

Trench 202

TR 202 was situated within the south, central portion of Parcel 6 along a cane access road within an area currently utilized for sugarcane (see Figures 121 and 125). TR 202 was placed within Grant 2960 which was granted to Boardman for Sugarcane (see Table VIII and Figure 125). This section contained a tripartite stratigraphic sequence terminating on saprolitic bedrock (Figures 126 and 127). TR 202 was oriented east/west and measured 4.6 m long by 1.40 m wide by 2.00 m deep. No cultural materials were observed within Trench 202 which is further presented below.

Layer I (0-21 cmbs) is a loamy silt, very dark grayish brown (10 YR 3/3, 7.5 YR 3/3, 4/3) till zone. Low to medium density of rootlets from surface vegetation and subangular rocks, non-plastic non sticky. Layer I is non-cultural and has an abrupt smooth boundary overlying Layer II.

Layer II 21-88/140 cmbs) compact very fine silt clay yellowish to dark brown (10YR 4/3 and 3/2), low density of roots and a low frequency of subangular and rounded rocks. Layer II is non-plastic, slightly sticky, non-cultural. Layer II boundary is abrupt and wavy overlying Layer III.

Layer III (88/140-1.80/194 cmbs) very fine silty clay, dark reddish brown (5YR 3/3-3/4). No roots medium frequency of subangular cobbles with decomposing bedrock at the base. Excavations terminated on the discovery of saprolitic rock (Layer IV).



Figure 126. Photograph of North Wall near Base of Excavation of Test Unit 202

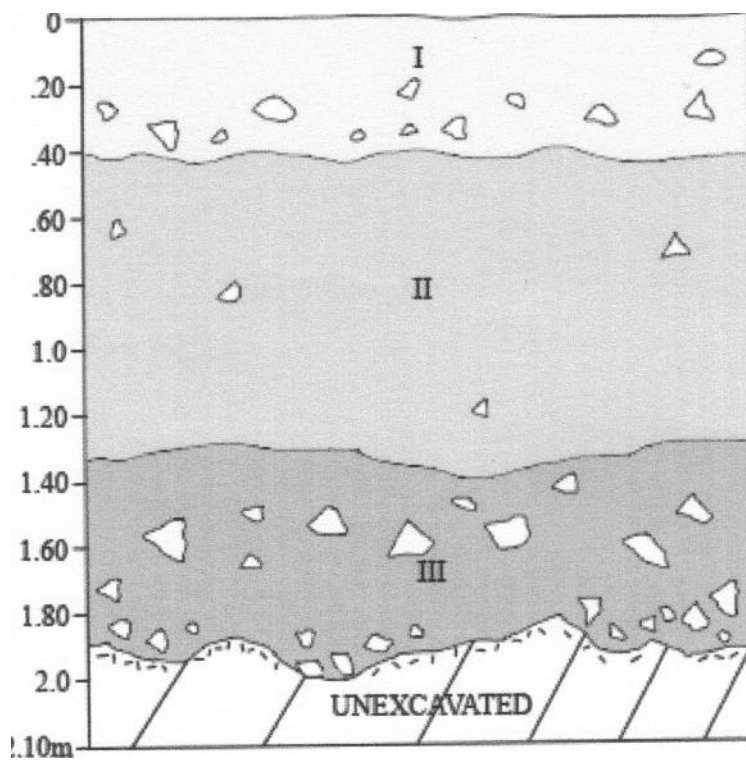


Figure 127. Stratigraphic Profile of North Wall of Test Unit 202

Trenches 205, 207 and 209

TR's 205, 207 and 209 were placed within LCA's 10160:1, 11022:3 and 10481:1, respectively and these *kuleana* were utilized as house lots (10160:1 and 10481:1), *lo'i kalo* and *kula* lands. The trenches contained a similar three layer stratigraphic sequence, yet TR's 207 and 208 contained more yellowish brown mottling (Figures 128-130). One glass fragment was found on the surface of TR 208 but was secondarily deposited. Thus, no clear evidence of domestic or agricultural activities (beyond sugarcane) was recorded.

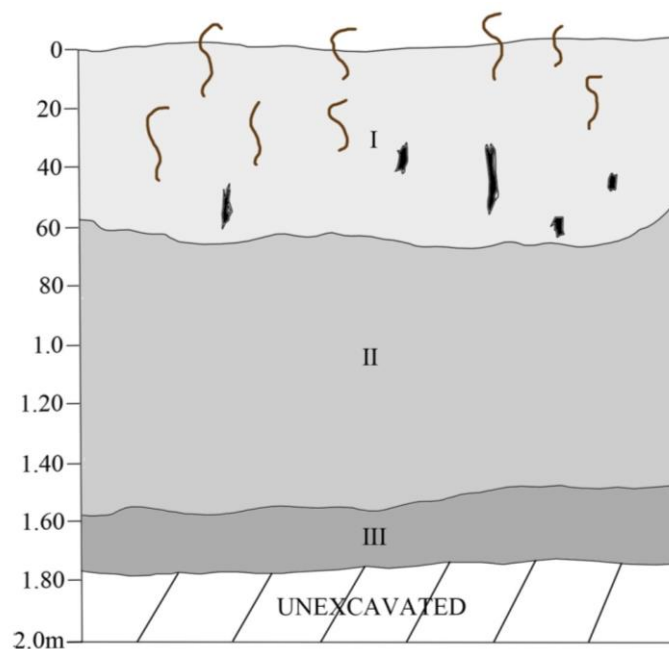


Figure 128. Photograph of South Profile of TR 205 (top); Stratigraphic Profile of South Wall TR 205



Figure 129. Photograph of South Wall of TR 207



Figure 130. Photograph of South Wall of TR 209

Trench 208

Trench 208 (TR 208) was situated within the central portion of Parcel 6 within Grant 1844 and possibly within LCA 10160:1 currently utilized for small scale commercial agriculture (see Figures 121, 125 and 128 and Table XVII). The grant was used for sugarcane and the LCA House lot, kula, *lo`i*) This section contained a four layer stratigraphic sequence with excavations terminating within sterile soils (Figures 131 and 132). A 4.8 m long by 1.44 m wide by 1.81m deep, oriented 270° by 90° section of this area was recorded and is further described below. No cultural materials were observed within TR 208.

Layer I (0-62cmbs): is a dark reddish brown (2.5yr 3/3), silt loam, agricultural plow zone, with deteriorated black drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, with a medium frequency of roots. No cultural materials were observed in this layer. Boundary was clear and wavy overlying Layer II.

Layer II (58-160cmbs): is a very dark brown to dark reddish brown (2.5yr 3/3), clay loam, disturbed layer, mottled with decomposing bedrock inclusions, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky. No cultural materials observed in this layer. Boundary was clear and wavy overlying Layer III.

Layer III (110-160cmbs): is a dark brown (7.5yr 3/3), clay loam, mottled with yellowish brown (10YR4/3), slightly-plastic, slightly-sticky, medium to coarse grain, slightly hard, and friable. No cultural materials observed in this layer. Boundary was clear and wavy overlying Layer IV.

Layer IV (119-181cmbs): is a strong brown (7.5yr 4/6) silty clay, weak, fine to medium grain, blocky, slightly hard, friable, slightly-plastic, slightly-sticky, with a low frequency of decomposing bedrock. No cultural materials were observed in this layer.



Figure 131. Overview Photograph of Trench 208 Pre-excavation within Parcel 6, View to East



Figure 132. Photograph of Stratigraphic Profile of Trench 208 (TR 208), North Wall

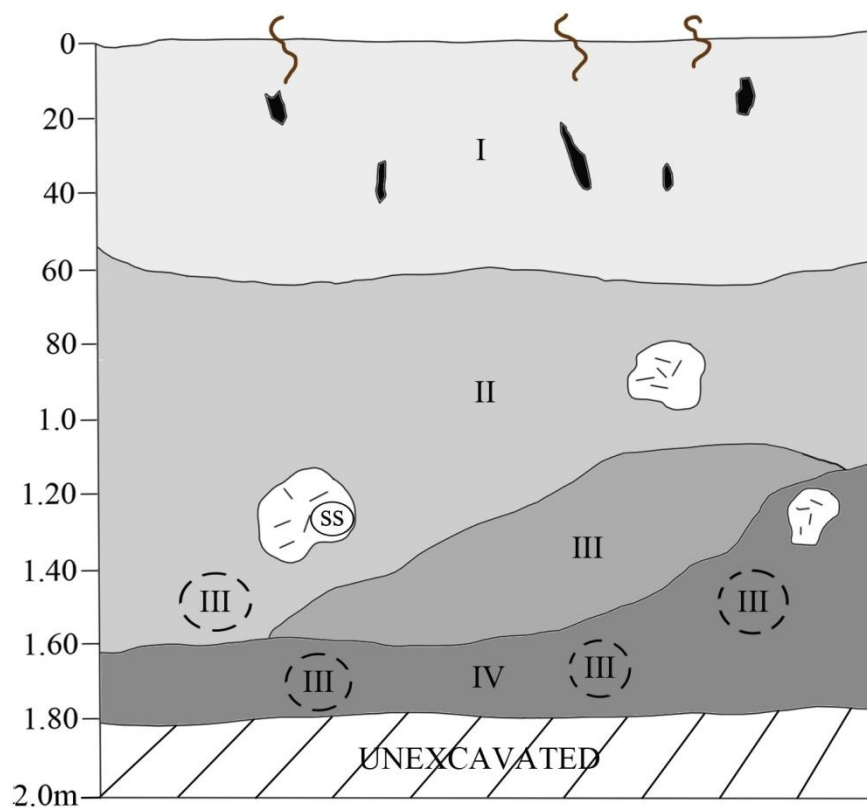


Figure 133. Stratigraphic Profile of North Wall of Trench 208 (TR 208)

Trench 218

Trench 218 (TR 218) was situated within the extreme northwestern portion of Parcel 6, within LCA 5774:2 award, utilized for *lo`i kalo*, and a portion of the cane flume easement (see Figures 121, 125 and Table XVIII). TR 218 measured 4.9 m long by 1.45 m wide by 1.79m deep and was oriented 360° by 180°. No *in situ* cultural materials were observed; however secondarily deposited domestic items (bottle base, comb and rice bowl sherds) were recovered from the surface area around TR 218 and assigned Site 7884 Feature 2 (Figure 134). These materials may have been from the house lots LCA's to the south where TR's 205, 207 and 209 were placed. Trench 218 contained a tripartite stratigraphic sequence with excavations terminating in sterile soils and decomposing bedrock (Figure 135).

Surface-Historic artifact scatter in a secondary context.

Layer I (0-52cmbs): is a dark reddish brown (2.5yr 3/3), silt loam, agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, with a medium frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (41-138cmbs): is a dark red (2.5yr 3/6), clay loam, mottled with a high frequency of decomposing bedrock inclusions, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky. Boundary was clear and wavy overlying Layer III. No cultural materials were observed in this layer.

Layer III (138-179cmbs): is a brown (7.5yr 4/4) silty clay, weak, fine to medium grain, blocky, slightly hard, weakly coherent, slightly-plastic, slightly-sticky, with a high frequency of medium and large boulders. No cultural materials were observed in this layer.



Figure 134. Photograph of Site 7884 Feature 2 Secondarily Deposited Historic Materials around TR 218

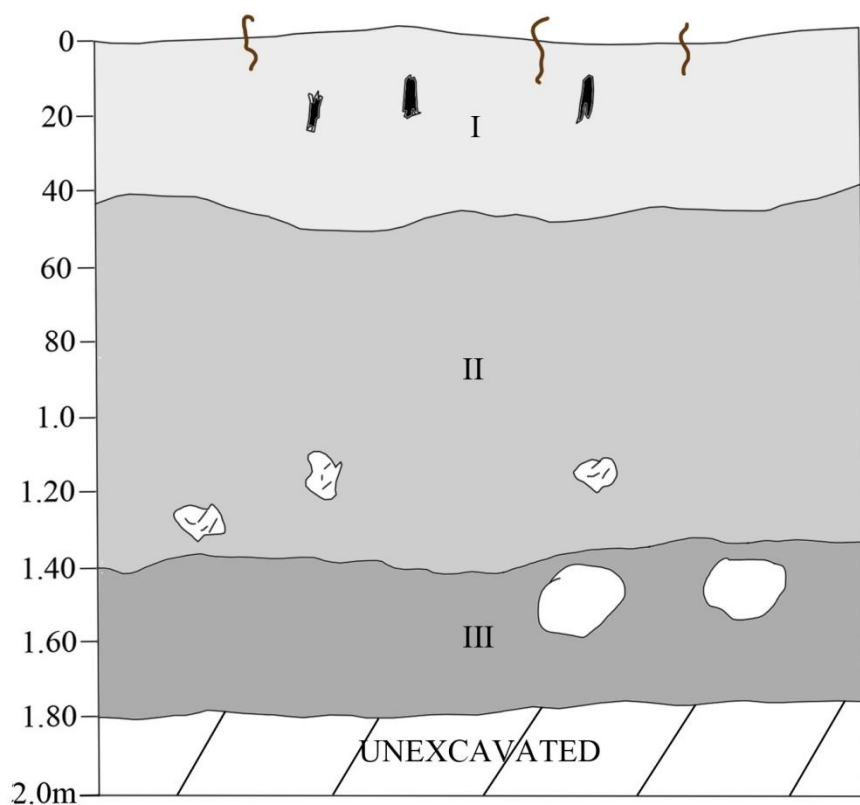


Figure 135. Photograph of West Wall of Trench 218 (top) Stratigraphic Profile of Trench 218 (TR 218) West Wall

Trench 222

Trench 222 (TR 22) was situated within the northern portion of Parcel 6, within fallow sugarcane field (see Figures 121, 125 and Table XVIII). The trench contained a two layer stratigraphic sequence with excavations terminating within decomposing bedrock (Figures 136 and 137). TR 222 measured A 4.9 m long by 1.45 m wide by 1.79m deep, oriented at 360° and was non-cultural and is further described below.

Layer I consisted of a loamy silt very dark grayish brown (7.5 YR4/3) till zone from sugarcane cultivation activities Layer I contained numerous roots and irrigation black plastic drip-lines with few rocks. The soil was slightly sticky, slightly plastic, blocky texture. Boundary was clear and wavy overlying layer II.

Layer II dark reddish brown (5YR 3/3, 3/4) stony silt loam and clay loam deposit that varied 60-150 cm thick with a few trenches containing decomposing bedrock, with a low density of roots and a medium frequency of rocks.



Figure 136. Photograph of West Wall of Trench 222 within Parcel 6

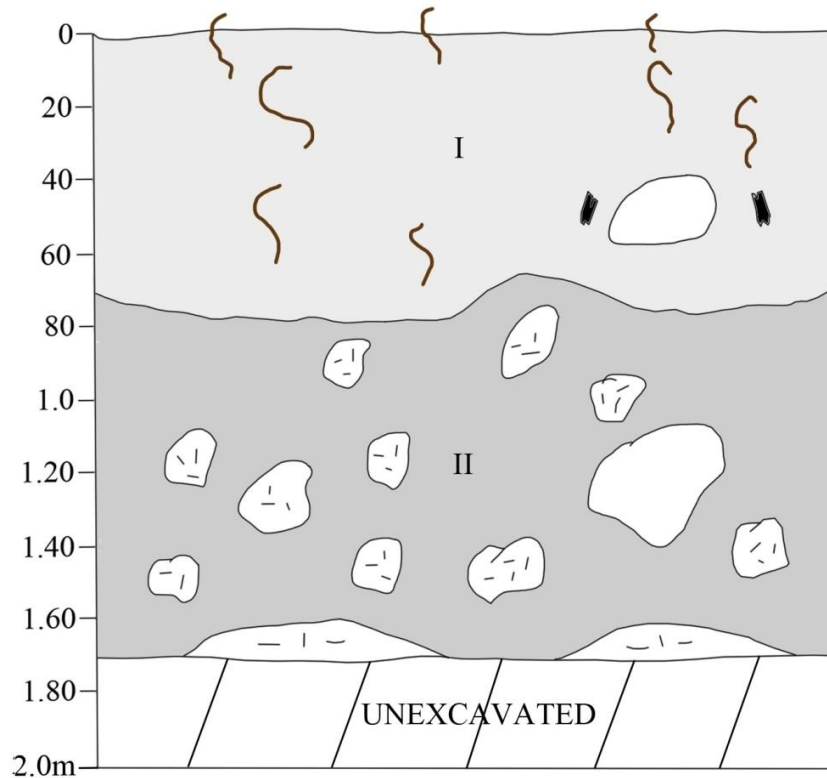


Figure 137. Stratigraphic Profile of West Wall of Trench 222

DISCUSSION PARCEL 6 BACKHOE TRENCHING

A total of twenty-six (26) trenches were excavated within Parcel 6, and no intact cultural layer or deposit was noted. The majority of the LCA's and Grant are located in the central portion by Waihe'e Ditch (Site 5197) and the north, central portion around the cane flume easement (see Figure 124). Testing was also performed throughout the remaining portion of the parcel to the north and southeast. Trenches 200-203 were excavated in the southern portion along a cane access road within active sugarcane near Parcel 3 Waena (see Figure 125). These trenches exhibited the same stratigraphy that was identified in Parcel 3 Waena. Trenches 205-211 were excavated in the central portion by the LCA's utilized for *lo'i kalo*, *kula* and taro (possibly dry land taro since it's not designated as *kalo*) and were negative for cultural and structural remains. TR's 204, 212 and 213 were placed in Grant 1844 (no land use) and were also negative. TR's 214-219 were situated in the northern portion within LCA's utilized for a house lot, *kalo* and *kula* along the cane flume easement. All trenches were negative; however a scatter of historic domestic artifacts (bottle base, comb and rice bowl sherds) were observed on the surface at TR 218 and assigned Feature 2 and subsumed under Site 7884. Trenching at 218 only produced negative subsurface results. TR's 220-225 were placed at the north end and produced negative results.

PARCEL 7 MAUI TROPICAL PLANTATION

Parcel 7 (TMK [2] 3-6-005:007) is an improved parcel and the current site of the Maui Tropical Plantation located within the central portion of the overall project area (see Figures 1, 2 and 6). It contains a total of 59 acres bounded to the west by Site 5197 (Waihe`e Ditch) and Parcel 6; to the north by residential development; to the east by Honoa`pi`ilani Highway and to the south by active sugarcane within Parcel 3 Waena. Since the subject parcel has been developed with agricultural fields (botanical gardens, private and commercial plantings, landscaping), open fields, a reservoir and several ancillary buildings (Figures 138-140). Test trenches were excavated within the open areas among the agricultural fields and around the periphery of the buildings.

During the current undertaking, a total of twenty-five (25) trenches designated TR's 300-324 were excavated within Parcel 7 to provide a representative sample of the subsurface conditions, and to test areas along flumes and within LCA's and Grants (Figure 141 and Tables VII, VIII, XIX and XX). Most of the trenches contained three to four stratigraphic layers with Layer I designated as the former till/agricultural zone and or grass lawn. Trenches 300 (TR 300 -303) were placed within the southern portion of the parcel, TR 305-309 were placed within the west central section of the project area along the former cane flume and numerous LCA's, TR's 311-316 were placed in the northern portion of the subject parcel where most of the maintenance buildings and storage facilities are located, and TR's 317-324 were situated in the east central portion along the same cane flume easement as TR's 305-309 in the vicinity of several LCA's and Grants.



Figure 138. Overview Photograph of Parcel 7 in area of TR 300-303, View to West



Figure 139. Overview Photograph of Parcel 7 in area of TR-320, View to East



Figure 140. Overview Photograph of Parcel 7 in area of TR 318, View to West

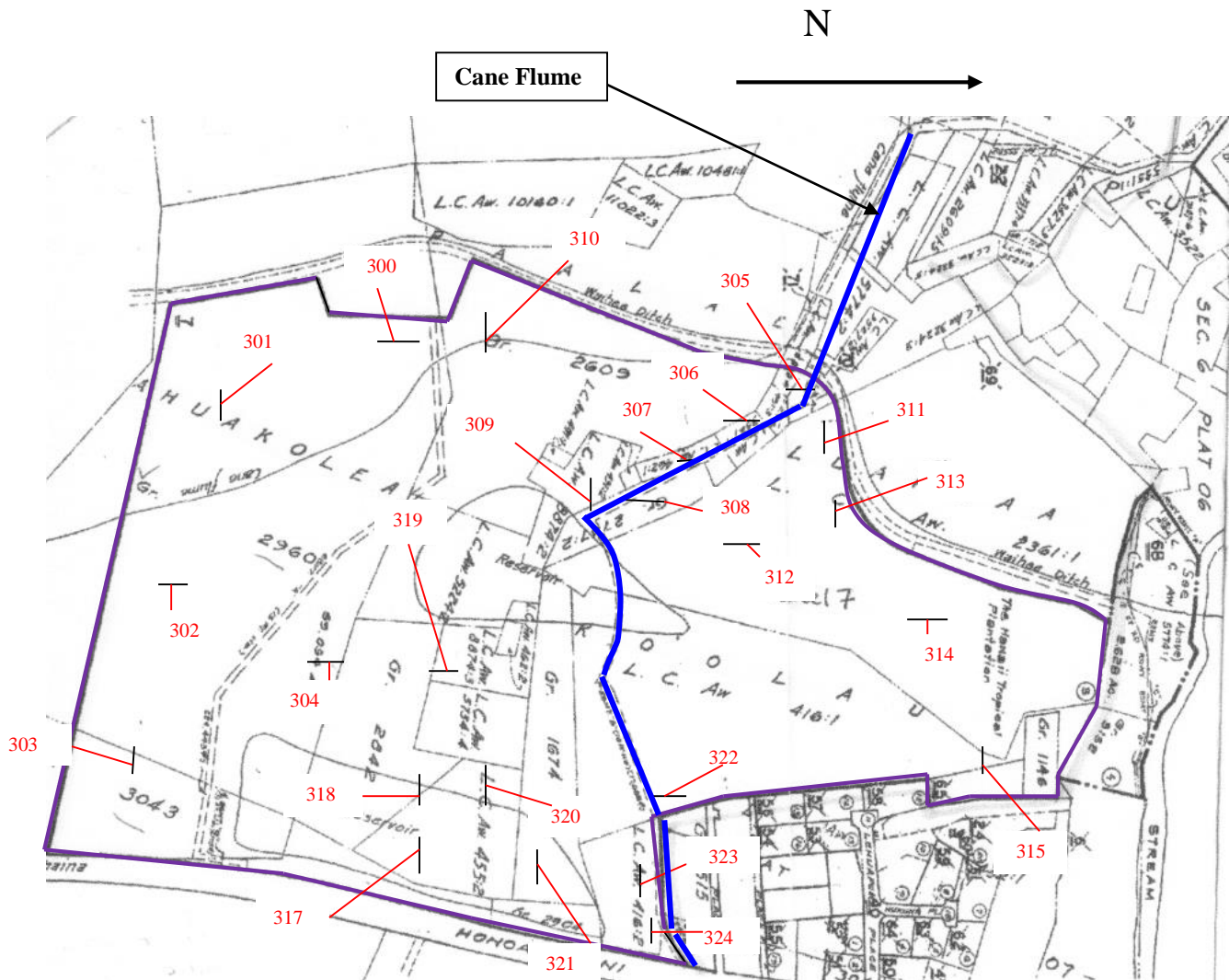


Figure 141. Tax Map Key of Parcel 7 Showing Location of Trenches 300-324, LCA's and Grants

OVERALL GENERAL STRATIGRAPHY

Trenches 300-303 were placed in the open field within Grants 2960 and 3043 surrounding the Maui Tropical Plantation on the south; TR's 300 and 304 were located near the southern cane flume easement and GR 2960 and TR's 305-309 and 322-324 were situated along the northern cane flume easement and locality of numerous LCA's and a few Grants. Trenches 311-316 and 322-324 were located in the northwestern and eastern portions of the parcel. The trenches exhibited similar soil profiles within the respective zones of which they were excavated. All trenches were non-cultural and the stratigraphic sequences are presented below.

Layer I generally consisted of an upper loamy silt layer, that varied from a dark brown, brown or a very dark gray brown (7.5 YR 3/2, 3/3 or 10YR 4/3), and varied from 40 to 60 cm thick. This was the plow zone from previous cultivation activities. Layer I was typically mixed with torn black plastic drip-lines, PVC plastic irrigation hoses, and concrete aggregate pieces that had been used during the previous commercial sugarcane cultivation. There was a low frequency of rocks in this layer, but a high frequency of roots from surface vegetation.

Layer II generally consisted of a silt loam layer, that varied from a dark reddish brown, brown (2.5yr 3/4, 7.5yr 4/4) or a silt clay loam, that varied from a dark reddish brown, dark brown (2.5yr 2.5/4, 7.5 YR 3/4), and varied from 30 to 150 cm thick. There was usually a distinct transition between this layer and the plow zone above, as this layer never had any materials from commercial sugarcane cultivation mixed within it and generally appeared less disturbed and contained medium frequency of rocks. In a few trenches excavated previous disturbances were identified and contained Layer I inclusions and materials from commercial sugarcane cultivation mixed within it.

Layer III generally consisted of a silt loam and/or clay loam layer that varied from a dark reddish brown (2.5yr 3/3, 5 YR 3/4), strong brown (7.5yr 4/6) and/or dark yellow brown (10yr 4/4). Layer III varied from streambed and/or storm wash deposits and in a few identified trenches contained decomposing bedrock, Layer III varied from 30 to 160 cm thick overlying Layer IV or terminated in decomposing bedrock or saprolitic bedrock with a medium to high frequency of rocks with the absence of roots. The streambed and/or storm wash deposits consisted of water-affected cobbles, pebbles and gravel.

Layer IV generally consisted of a silt loam and/or clay loam layer that in a few excavated trenches varied from exhibited a water deposited layer and/or lens, that varied from dark reddish brown, strong brown (2.5yr 2.5/4 to 7.5yr 4/6). Layer IV varied from streambed and/or storm wash deposits and in a few identified trenches contained decomposing bedrock or saprolitic bedrock with a medium to high frequency of rocks, with the absence of roots.

Six (6) trenches 305, 312, 314, 320, 323, and 324 exhibited an alluvium deposition recorded as a layer and/or lens which may be attributed to a meandering stream or episodic flood and or storm wash events. This deposition was primarily alluvium in the form of water affected cobbles, pebbles, and colluvium represented as gravel, imbedded between silt layers. Three of these trenches are located in the eastern portion of the parcel and three are located on the western portion. These six trenches were intentionally excavated in LCA's or Grants and are as follows: TR 305 in LCA's 9324 and 5824, TR 312 in LCA 2361:1, TR 314 in LCA 2361:1, TR 320 in LCA 455:2, TR 323 and 324 in LCA 416:2 (see Figure 141 and Tables VII and VIII). The land use for these areas was primarily unknown with the exception of House lot and sugarcane for LCA 455:2 and House lot for LCA 416:2.

Nine (9) trenches (TR's 300-304, 315, 317-319) exhibited a darker soil that contained a clay loam or silty clay. Five of these trenches are located in the southern portion of the parcel, three are in the eastern section and the remaining solitary trench was in the extreme southeastern area. Trenches that were intentionally excavated in known LCAs or Grants are as follows: TR's 300-302 are within Grant 2960, TR 303 in Grant 3043, TR 304 within Grant 2842 and TR 315 partially within LCA 416:1. Trenches 317 and 318 in LCA 455:2, TR 319 in LCA 5734:4 and TR 320 within LCA 455:2. Former land use for these Grants is unknown; however the LCA's were a house lot (455:2) and house lot and *'auwai* (416:1).

Eleven (11) trenches TR 306-311, 313, 315, 316, 321, and 322) exhibited a distinct stratigraphy that tended to have reddish and yellowish hues. Trenches that were intentionally excavated in known LCAs or Grants are as follows: TR 306 in LCA 491:3 was utilized for *lo`i* and LCA 3527:1 for *kula and lo`i*; TR 307 in LCA 462:1 for house lot, *kula* and *lo`i* and Grant 2747:2 (reservoir and sugarcane); TR 308 in Grant 2747:2, TR 309 in LCA 8874:2 (house lot and *lo`i*) and Grant 2747:2, TR 310 in Grant 2609, TR 311 in LCA 2361:1, TR 312 in LCA 2361:1, TR 313 in LCA 2361:1, TR 315 in LCA 2361:1 and LCA 416:1 house lot and *`auwai*, TR 316 in LCA 2361:1, TR 321 in Grant 2904 (no land use info), TR 322 within LCA 416:1.

As previously discussed and exhibited in blue on Figure 141, several of the above LCA follow the linear, and curvilinear cane flume easement. Testing was concentrated along this easement to ascertain presence/absence of historic residential use; as well as evidence of traditional use. Prior to this waterway being utilized historically for sugarcane and residential use, it is surmised that this path may follow an ancient watercourse or *auwai*. Unfortunately, no evidence of traditional or historic habitation was noted during the test trench excavations.

Two (2) trenches exhibited a two layer sequence, sixteen (16) trenches exhibited a three layer sequence, and seven (7) trenches exhibited a four layer sequence.

Table XX. Summary of Backhoe Trenches Parcel 7

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
300	Open Field, within Grant 2960	4.8m x 1.45m x 1.8m	360° x 180°	Layer I-III	Non-Cultural
301	Open Field, within Grant 2960	4.8m x 1.44m x 1.82m	270° x 90°	Layer I-III	Non-Cultural
302	Open Field, within Grant 2960	4.9m x 1.44m x 1.8m	360° x 180°	Layer I-III	Non-Cultural
303	Open Field, within Grant 2960 and 3043	4.8m x 1.43m x 1.82m	270° x 90°	Layer I-III	Non-Cultural
304	South of Parking Lot within Grant 2842	4.9m x 1.45m x 1.81m	360° x 180°	Layer I-III	Non-Cultural
305	Within LCA 5824 and/or 9824	4.8m x 1.44m x 1.7m	360° x 180°	Layer I-III	Non-Cultural
306	Within LCA 491:3 (lo`i) and 3527:1 Kula and Lo`i	4.8m x 1.45m x 1.81m	360° x 180°	Layer I-III	Non-Cultural, charcoal flecks in Layer III
307	Within LCA 462:1 and Grant 2747:2 House lot, kula lo`i	4.8m x 1.44m x 1.78m	360° x 180°	Layer I-III	Non-Cultural
308	North of (MTP) Buildings within Grant 2747:2	4.9m x 1.46m x 1.82m	360° x 180°	Layer I-III	Non-Cultural
309	North of Buildings within LCA 8874:2 and Grant 2747:2	4.8m x 1.45m x 1.75m	270° x 90°	Layer I-III	Non-Cultural
310	East of Site 5197-Waihe`e Ditch, within Grant 2609	4.9m x 1.45m x 1.75m	270° x 90°	Layer I-III	Non-Cultural
311	East of Site 5197-Waihe`e Ditch, within LCA 2361:1	4.8m x 1.46m x 1.61m	360° x 180°	Layer I-II	Non-Cultural
312	East of Waihe`e Ditch, within LCA 2361:1	4.9m x 1.45m x 1.6m	360° x 180°	Layer I-IV	Non-Cultural
313	South of Waihe`e Ditch, within LCA 2361:1	4.9m x 1.46m x 2.2m	270° x 90°	Layer I-VI	Non-Cultural
314	Maintenance/Auxiliary Buildings Area Within LCA 2361:1	4.9m x 1.45m x 1.8m	360° x 180°	Layer I-III	Non-Cultural
315	Maintenance/Auxiliary Buildings Area in LCA's 2361:1 and 416:1 House lot and `auwai	4.8m x 1.43m x 1.78m	270° x 90°	Layer I-III	Non-Cultural

Table XXI cont'd . Summary of Backhoe Trenches Parcel 7

TRENCH	LOCATION	DIMENSIONS	ORIENTATION	STRATIGRAPHY	COMMENTS
316	Within the (MTP) Parking lot within LCA 2361:1	4.9m x 1.44m x 1.78m	360° x 180°	Layer I-III	Non-Cultural
317	West of State Highway 30 and within LCA 455:2 House lot and Ko	4.8m x 1.31m x 1.85m	270° x 90°	Layer I-IV	Non-Cultural
318	West of State Highway 30 and within LCA 455:2 and Grant 2842	4.8m x 1.32m x 1.85m	270° x 90°	Layer I-III	Non-Cultural
319	West of Highway 30 within LCA's 8874:3 5734:4 House lot	4.9m x 1.33m x 1.75m	360° x 180°	Layer I-III	Non-Cultural
320	West of State Highway 30 and within LCA's and 455:2 House lot and Sugarcane	4.9m x 1.45m x 1.81m	270° x 90°	Layer I-III	Non-Cultural
321	West of State Highway 30 and within Grant 2904	4.9m x 1.44m x 1.79m	270° x 90°	Layer I-IV	Non-Cultural
322	West of State Highway 30 and within LCA 455:2 House lot and Sugarcane	4.9m x 1.45m x 1.55m	360° x 180°	Layer I-IV	Non-Cultural
323	West of State Highway 30 and within LCA 416:2 house lot	4.9m x 1.45m x 1.78m	270° x 90°	Layer I-IV	Non-Cultural
324	West of State Highway 30 and within LCA 416:2 house lot	4.8m x 1.43m x 1.55m	270° x 90°	Layer I-IV	Historic Materials, Glass and Metal

Trench 302

Trench 302 (TR 302) was situated within the open fields of the southern portion of Parcel 7 within former Grant 2960 (see Figures 141 and 142). No land use information was available for this Grant; however TR 302 contained a three layer stratigraphic sequence with excavations terminating at 1.82 mbs (Figures 143-144). No cultural materials were observed within TR 302 which measured 4.9 m long by 1.44 m wide by 1.8 m deep and was oriented north south. The stratigraphic sequence is further described below.

Layer I (0-51cmbs): is a dark brown (7.5yr 3/3), silt loam, agricultural plow zone, slightly-plastic, slightly-sticky, blocky, fine to medium grain, with a high frequency of coconut roots and a high frequency of rocks. No cultural materials were observed in this layer. Boundary was clear and wavy overlying Layer II.

Layer II (40-143cmbs): is a dark brown (7.5yr 3/4), clay loam, slightly-plastic, slightly-sticky, blocky, weak, fine to medium grain, with a low frequency of rocks and a high frequency of coconut roots. No cultural materials were observed in this layer. Boundary was clear and a plane overlying Layer III.

Layer III (140-182cmbs): is a brown (10yr 4/3), clay loam, slightly-plastic, slightly-sticky, blocky, slightly hard, fine to medium grain, with a low frequency of roots and a high frequency of rocks and decomposing bedrock. No cultural materials were observed in this layer.



Figure 142. Overview Photograph of Trench 302 Pre-Excavation within Parcel 7, View to East



Figure 143. Photograph of East Wall of TR 302 within Parcel 7

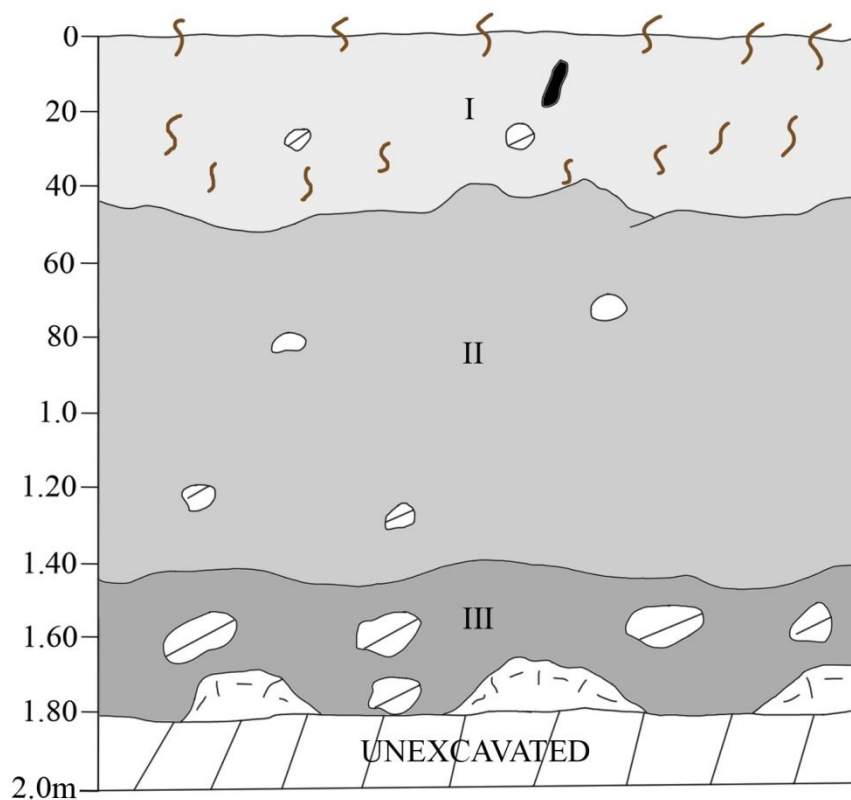


Figure 144. Stratigraphic Profile of TR 302 East Wall

Trench 306

Trench 306 (TR 306) was situated within the north eastern portion of the project area along the cane flume easement within LCA's 491:3 and 3527:1 (see Figures 141 and 146 and Table XX). LCA 491:3 was for *lo'i* and 3527:1 was claimed for *kula* and taro *pauku*. This section contained a four layer stratigraphic sequence within an area that contained silt and clay dark soil loams (Figures 147 and 148). A 4.8 m long by 1.45 m wide by 1.45 m deep, oriented at 360°. The testing within TR 306 was negative for cultural materials.



Figure 145. Overview Photograph of TR 306 Pre-Excavation, View to South

Layer I (0-30cmbs): is a dark reddish brown (2.5yr 3/3), silt loam, within a previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine grain, blocky, friable with a medium frequency of roots. Boundary was clear and a plane overlying Layer II. No cultural materials were observed in this layer.

Layer II (25-110cmbs): is a dark reddish brown (2.5yr 3/4), with dark grey brown silt clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, a low frequency of roots and rocks. Boundary was clear and wavy overlying Layer III.

Layer III (99-123cmbs): is a dark reddish brown (2.5yr 2.5/3), clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, with a low frequency of roots and rocks. Boundary was clear and wavy overlying Layer III. Charcoal flecks were noted scattered in layer.

Layer IV (120-155cmbs): is a dark reddish brown (2.5yr 2.5/4), clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, with a low frequency of roots with a high frequency of rocks and yellowish brown decomposing bedrock along the northern edge. No cultural materials were observed in this layer.



Figure 146. Photograph of East Wall of TR 306

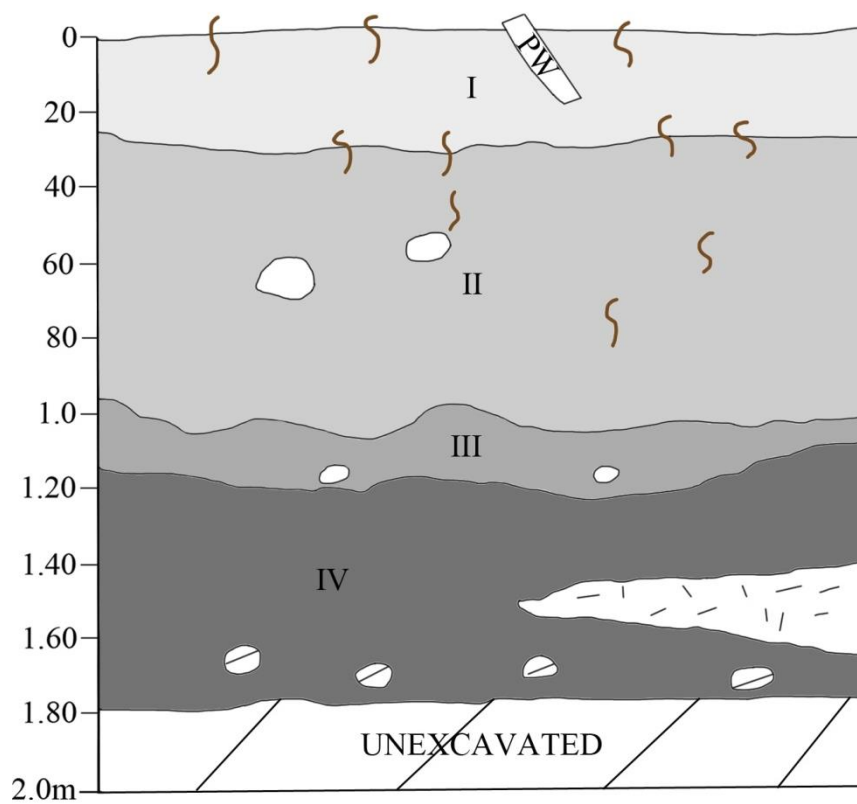


Figure 147. Stratigraphic Profile of TR 306 East Wall

Trench 309

Trench 309 (TR 309) was situated within the north eastern portion of the project area along the cane flume easement in the vicinity of 305-308 within LCA's 8874:2 and Grant 2747:2 (see Figures 141 and 146 and Table XX). LCA 8874:2 was for a house lot and taro *pauku* (section) and Grant 2747:2 was claimed for sugarcane and reservoir. TR 309 contained a tripartite layer stratigraphic sequence that was negative for cultural remains (Figures 148 and 149). A 4.8 m long by 1.45 m wide by 1.75 m deep, oriented at 360°. The testing within TR 309 was negative for cultural materials.

Layer I (0-21cmbs): very dark gray brown (10YR4/3) silt loam within a previous agricultural plow zone, slightly-plastic, slightly-sticky, weak, fine grain, blocky, friable with a medium to high frequency of roots and low frequency of rock. Boundary was clear and smooth overlying Layer II. No cultural materials were observed in this layer.

Layer II (21-77cmbs): is a dark gray brown (7.5 YR 3/2) with dark reddish brown (2.5yr 3/4) silt clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly compact, a low frequency of roots and rocks. Boundary was clear and wavy overlying Layer III. Non-cultural.

Layer III (77-175cmbs): is a dark reddish brown (2.5yr 2.5/3), clay loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, with a low frequency of rocks and decomposing bedrock.



Figure 148. Photograph of South Wall of Trench 309

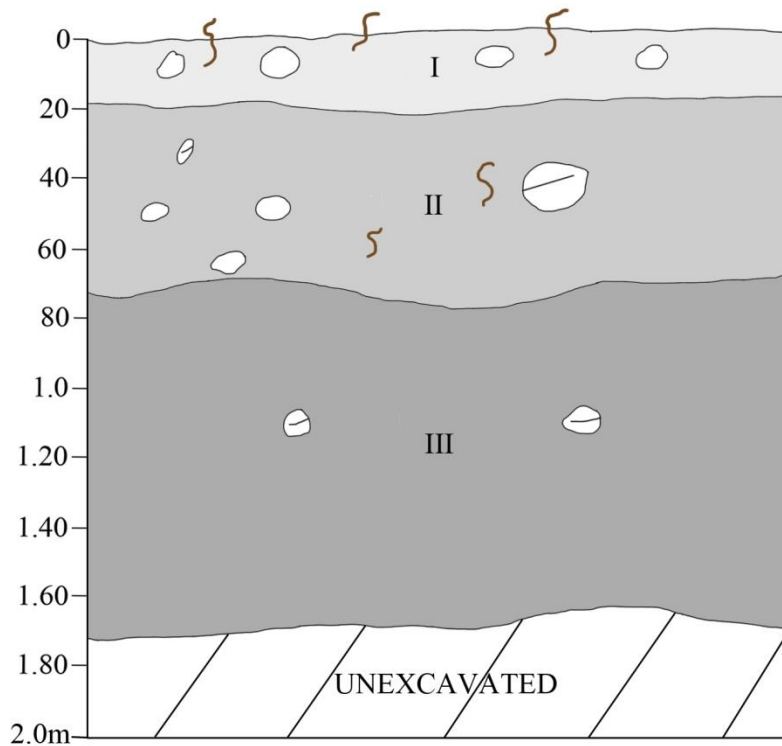


Figure 149. Stratigraphic Profile of South Wall of Trench 309

Trench 310

Trench 310 (TR 309) was situated near the western boundary and Waihe`e Ditch within the southwestern quadrant and Grant 2609 (see Figure 141 and Table XXI). There was no land use information about this Grant however no cultural materials were noted in any of the strata. TR 310 contained a three-layer soil profile with Layers I and II exhibiting a gradual transition between the lower boundaries (Figures 150 and 151). It measured 4.9 m long by 1.45 m wide by 1.75 m deep, oriented east/west.

Layer I (0-18cmbs) consisted of a loamy silt layer, very dark gray brown (10YR 4/3) probable former till zone, now portion of grass lawn. A high frequency of roots from surface vegetation and a few rocks. Soil is non-plastic, non-sticky, blocky, boundary is gradual and wavy. Layer I is non-cultural.

Layer II (18-41 cmbs) is a silt loam, reddish brown to yellowish brown (2.5yr ¾ to 10YR4/3). It contained low frequency of rocks and roots, non-sticky, non-plastic, slightly compact. Boundary is gradual and smooth.

Layer III (41-BOE) consisted of a silty clay brown to yellowish brown (10YR3/4 and 4/3) with saprolitic rock and decomposing bedrock.



Figure 150. Photograph of South Wall of Trench 310

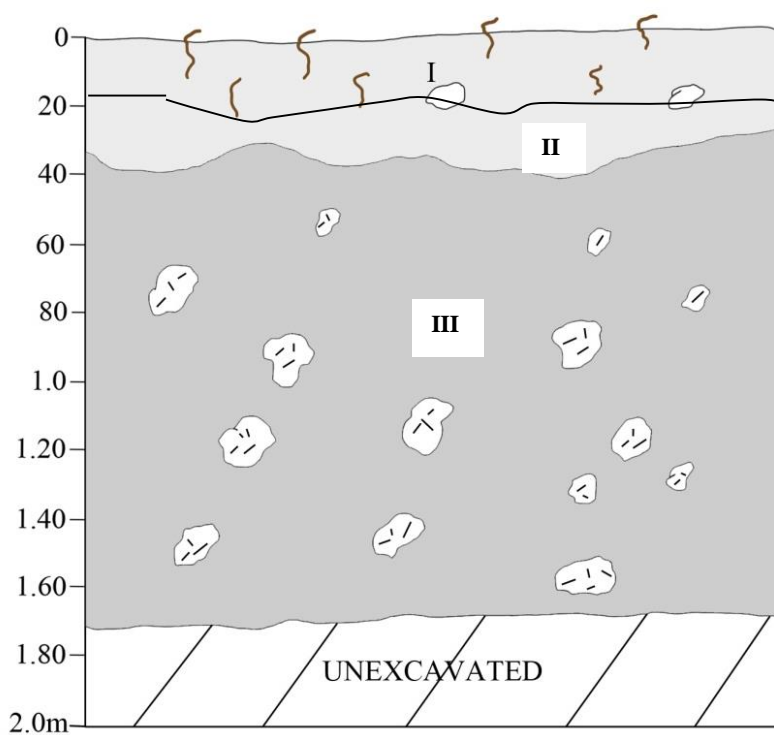


Figure 151. Stratigraphic Profile of South Wall of Trench 310

Trench 318

Trench 318 (TR 318) was situated along the southern side of the entrance road within LCA 455:2 and Grant 2842 (see Figures 141, 152 and Table XXI). LCA 455:2 was claimed as a house lot and for sugarcane; although no land use information was available for Grant 2842 a “pie shaped” reservoir was noted on the tax map key in the area of TR 318 and 317 (see Figure 141). TR 318 measured 4.8 m long by 1.32 wide by 1.85 m deep and was oriented east/west. It contained a four layer stratigraphic sequence (Figures 153 and 154) which included lenses of alluvium gravel designated Layer III. No cultural materials were observed within the soil profile.

Layer I is a disturbed loamy silt layer, dark gray brown (10YR 4/3), which contained a grass lawn. The layer has a high frequency of roots and rocks which are sub rounded cobbles, non-plastic, slightly sticky. Boundary is clear and smooth overlying Layer II.

Layer II disturbed and consisted of a silty clay loam dark reddish brown (2.5YR 3/4) that contained a medium frequency of rocks and high frequency of roots. Very slightly, plastic, slightly sticky, granular and crumbly, non-cultural. Layer II had a clear wavy boundary. Near the base an intrusive lens or pocket of grayish brown gravel. Very abrupt, smooth boundary within Layer II.

Lens/Layer III disturbed gravelly silt (10YR 4/3) numerous roots, low frequency of sub rounded cobbles, high frequency of pebbles, appears to be an alluvial deposit possibly from a streambed or the former reservoir. The deposit was thickest in the central portion tapering at both ends.

Layer IV is a silty clay, dark reddish brown (2.5YR 3/4), slightly plastic, slightly sticky, few sub rounded cobbles and gravel, very low frequency of roots. Non-cultural. Layer IV is similar to Layer II in color and soil texture but not content (rock and roots) and may represent an undisturbed portion of Layer II.



Figure 152. Overview Photograph of Trench 318 Base of Excavation



Figure 153. Photograph of South Wall of Trench 318

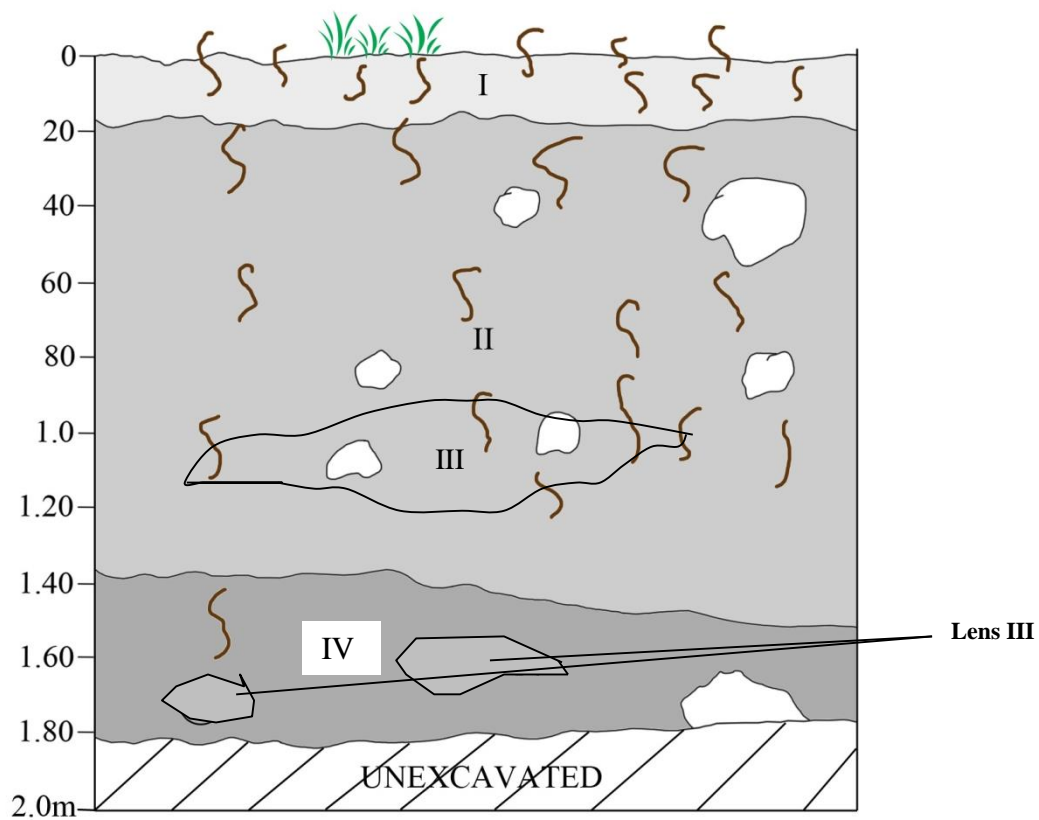


Figure 154. Stratigraphic Profile of South Wall of Trench 318

Trench 319

Trench 319 (TR 319) was situated along the southern side of the entrance road to capture a portion of LCA 8874:3 which stated *lo`i* for land use and LCA 5734:4 that had no information (see Figures 141, 156 and Table XXI). Unfortunately, the entire area was previously disturbed as evidenced by the numerous roots and presence of a cable near the base of the trench (see Figure 156). No cultural materials or gleyed soils indicative of *lo`i kalo* were recorded. TR 319 measured 4.9 m long by 1.33 wide by 1.75 m deep and was oriented north/south. It contained three layers, of which Layers I-II and upper portion of III were disturbed.



Figure 155. Photograph of TR 319 West Wall

Trench 324

Trench 324 (TR 324) was placed along in the northeastern corner of Parcel 7 within LCA 416:2 which was claimed as a house lot (see Figure 141, 156 and Table XXI). It contained a four layer stratigraphic sequence within an area where alluvial deposits (stream and or flood episodes) were documented within TR 320, 322 and 323 (Figure 157). At the interface of Layers I and II, a small historic trash deposit was identified from 20-40 cmbs and designated Site 7884 Feature 3. This refuse deposit contained marginal amounts of glass shards from the same bottle and a few pieces of ceramics, metal and charcoal and was presumed to be a portion a trash pit that was burned (Figures 158-159). Layers III and IV were comprised of rounded small cobbles and boulders, interspersed with smaller pebbles and gravel surmised to be from an intermittent streambed or episodic flood events. TR 324 measured 4.8 m long by 1.43 m wide by 1.55

m deep and was oriented east west. The cultural materials were sparse and considered domestic, utilitarian items possibly associated with the LCA but more likely the adjoining residential area with neighbors throwing trash over the property line.

Layer I (0-20cmbs): is a dark brown (7.5yr 3/3), silt loam, within a previous agricultural plow zone, with deteriorated drip-lines, slightly-plastic, slightly-sticky, weak, fine to medium grain, slightly hard, blocky, friable with a medium frequency of roots. Boundary was clear and wavy overlying Layer II. No cultural materials were observed in this layer.

Layer II (22-120cmbs): is a brown (7.5yr 4/4), is a disturbed layer a silt loam, slightly-plastic, slightly-sticky, weak, fine to medium grain, blocky, slightly hard, a low frequency of rocks. Cultural materials were observed in this layer at 20-40cmbs in the form of a burned deposit of bottle glass and ceramics identified along the north eastern profile. At ca. 102-118cmbs and 120 to 130cmbs water affected pebbles, gravel and cinder were identified along the northwestern wall. Boundary was clear and broken overlying Layer III on the west and overlying Layer IV on the east

Layer III (82-117cmbs): is a dark yellowish brown (10yr 4/4), riverbed stony silt, structureless, non-plastic, non-sticky, loose, single grain to fine to medium grain, with a high frequency of rocks, cobbles. Boundary was clear and wavy overlying bedrock. No cultural materials were observed in this layer.

Layer IV (120-155cmbs): is a dark yellowish brown (7.5/6), riverbed stony silt, weakly coherent, non-plastic, non-sticky, loose, single grain to fine to medium grain, with a high frequency of rocks, cobbles, structureless. No cultural materials were observed in this layer.



Figure 156. Overview Photograph of TR 324 Pre-excavation, View to East



Figure 157. Photographs of North Wall of TR 324 (top); and Close-up of Gravel/Cinder Deposit along North Wall

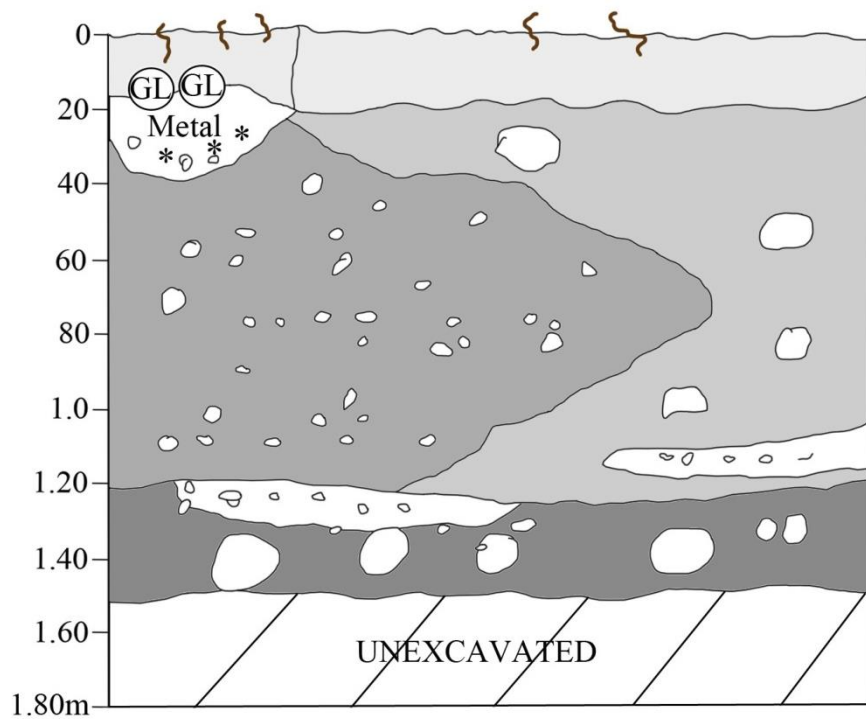


Figure 158. Stratigraphic Profile of Trench 324 North Wall



Figure 159. Historic Material from Site 7884 Feature 3 (TR 324) North Wall

SITE 5197 WAIHE`E DITCH

Site 5197 Waihe`e Ditch (Waihe`e Canal) is in good condition and was built by the Maui Agricultural Company (MA) in cooperation with the Wailuku Sugar Company for the irrigation of sugarcane. The construction started in June 1905 and was completed in May 1907. The water source for the Waihe`e Ditch originates in the upper Waihe`e Valley from the Waihe`e stream, the water intake from the stream follows a course from the north towards the south thru Waihe`e, Waichu, Iao Valley, and Waikapu (Na Wai `Eha – the four great waters) with water intake along its route, thru tunnels, flumes, open ditches, reservoirs and penstocks terminating into the West Maui reservoir (Figures 160 and 161). The Spreckles Ditch also originates in the upper portion of the Waihe`e Valley and follows a similar southerly direction at a lower elevation and empties into the Waiale Reservoirs.

Within the boundaries of the larger project area the Waihe`e Ditch (Site 5197) flows from the north towards the south along the central portion encompassing an area approximately 2,440.0 m long N/S by 15.25 m wide E/W. Specifically, beginning in the northern property boundary the Waihe`e Ditch (Site 5197) defines the western boundary of Parcel 7 and the eastern boundary of Parcel 6. Along the southern half of the parcel, Site 5197 bisects Parcel 3 Waena east/west.

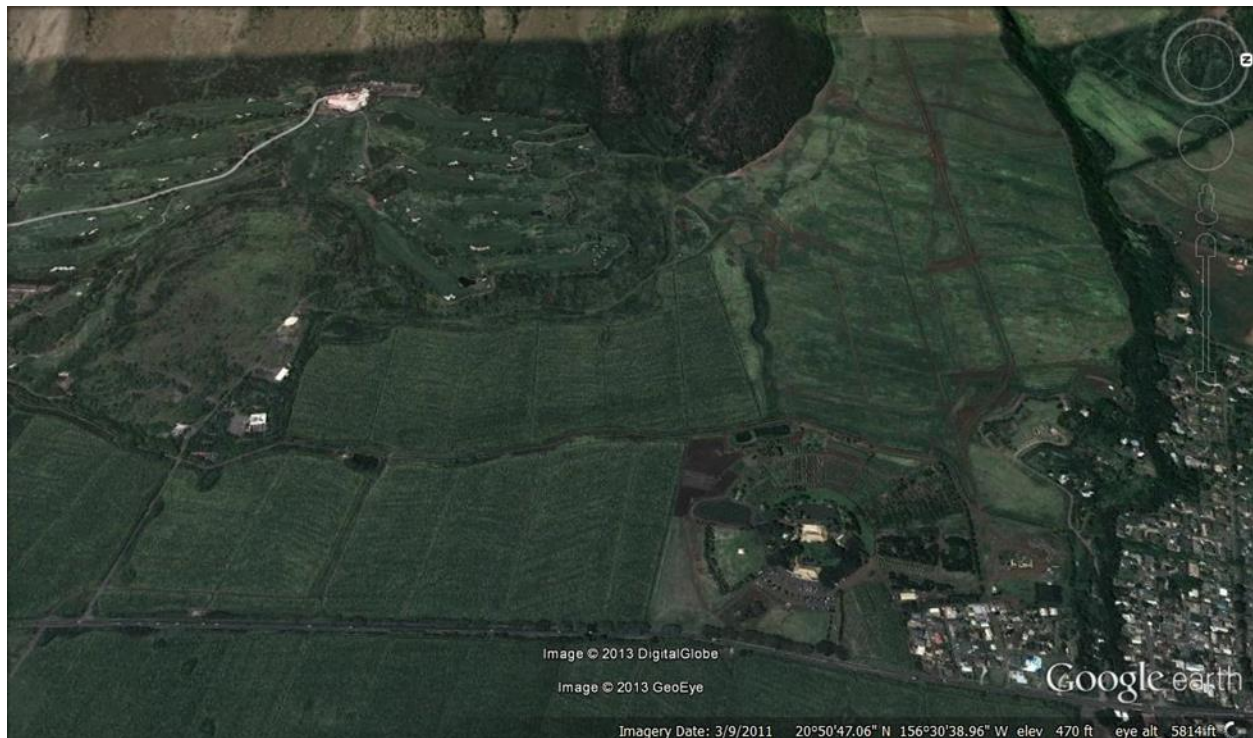


Figure 160. Overview Photograph of Site 50-50-04-5197 Waihe`e Ditch Extending North to South thru the Waikapū Tropical Plantation Land Holdings (Google earth 2013)

At the extreme northern property boundary the Waihe'e Ditch (Site 5197) emerges from an earthen underground tunnel (Figure 162) from an adjoining parcel that is located adjacent to the Waikapū Stream. It is at this juncture that Waihe'e Ditch (Site 5197) emerges into an open earth ditch on the south for a length of 6.0 m and continues thru a basalt keystone arched and faced tunnel for a length of 8.5 m and emerges on the south from an arched basalt keystone and faced tunnel (Figures 163-164). This tunnel appears to have supported a possible bridge in the past as it is covered with a dirt access road. The tunnel measures 3.1 m wide and 2.2-2.4 m in high above the active water course. The keystone faced arch is constructed of keystone cut basalt blocks that measure 45 cm in length and 40 cm in width. The interior of the tunnel is concrete lined. The southern section of the Waihe'e Ditch following the southern end of the tunnel for a distance of 29.5 m is presumably original construction consisting of a concrete lined ditch with the upper slopes stacked, faced, basalt water-worn and sub-angular cobbles, four courses high, measuring 1.3 m above the cement lined base that measures 1.1 m above the water level (Figures 165-166). The width at this juncture measures 2.1 m to 3.1 m. The ditch transitions from stacked, faced sides into being completely cement lined, (a modern modification) measuring 2.1 m wide, and 1.1 m in height above the water level with sections along the southern water course containing remnants of previous construction of rock faced sides.

Bridges are located along the central and southern sections of the ditch within the project area crossing over to Parcel 3 Mauka. Figures 167 and 168 depict the construction of concrete and re-bar reinforced, metal beamed and wooden bridges, the last being the more recently constructed.

Site 5197 is in good condition and is maintained by HC&S. The ditch remains consistent in terms of construction all along the water course towards the southern terminus of the project area beginning after the first 44 m from the northern section. The first 44 meters beginning from the northern property boundary is the only area of the ditch that exhibits a difference in construction, that being, an earlier original construction with stacked rock and faced sides and a tunnel with keystone arches. The continuing ditch along the southern portion of the project area clearly exhibits modern modifications and modern penstocks (PVC pipes, sluice gates and pipe valves) to existing irrigation routes and reservoirs. Tee bars are located atop the ditch as reinforcements and are primarily located along the southern sections as depicted on Figures 169-170. Along the southern route of the ditch are remnants of older penstocks, drainage culverts and shut-off valves that are predominately located near the bridges. Figures 171-174 show these areas.

Sites 5197 (Waihe'e Ditch) has been assessed an initial significance of Criterion "a" and "d" due to its association with the Sugar Era and may yield important information on the history of the area. The site

has been previously documented in adjoining lands which have been developed and thus impacted at those locations. Currently Site 5197 will remain in operation but will be covered in certain localities for safety reasons. Discussions will be performed with the landowner to ascertain how the site will be covered and secured and to determine if any adverse impacts will occur that need to be mitigated.

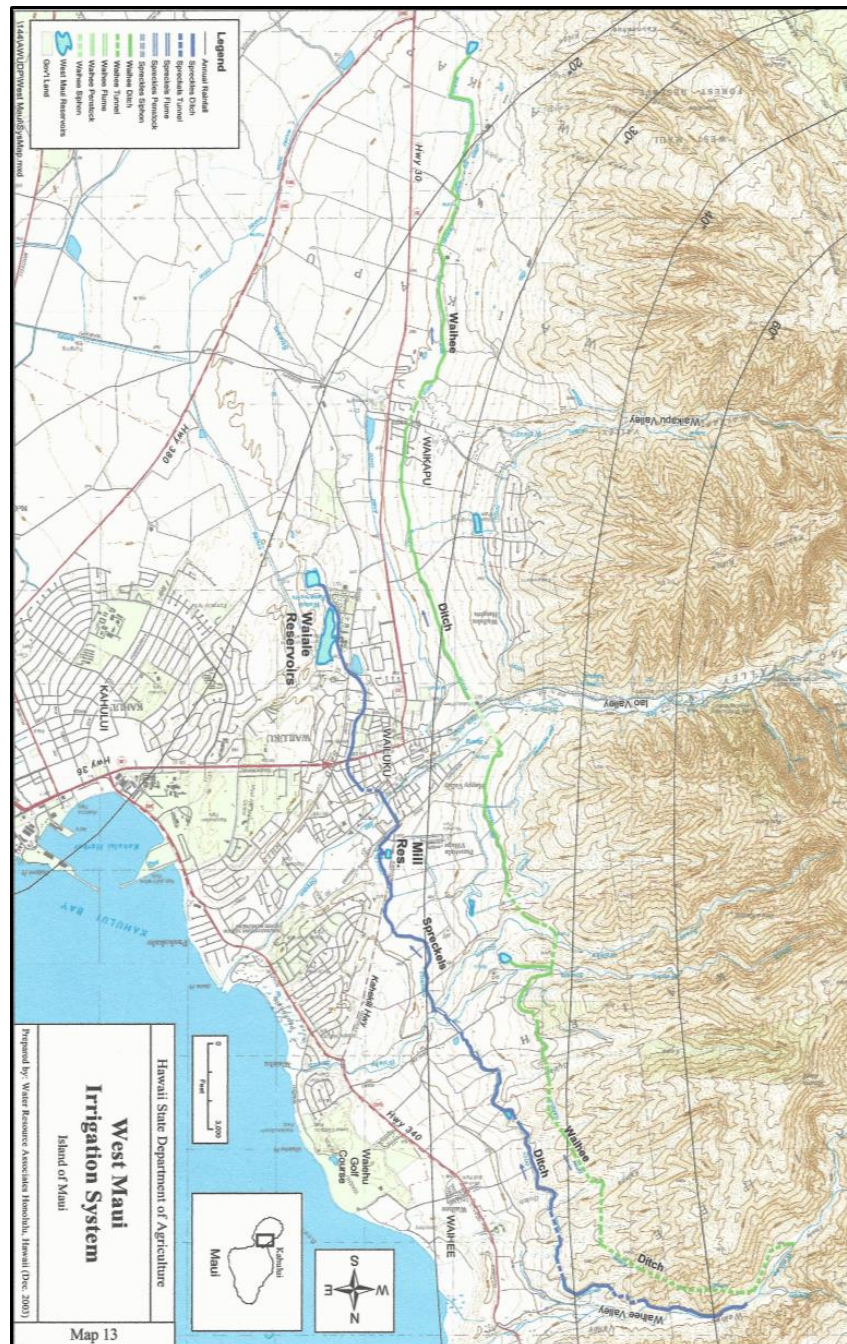


Figure 161. State Department of Agriculture Map Showing Site 5197 Waihe`e Ditch and Spreckels Ditch



Figure 162. Overview Photograph Site 5197 Waihe'e Ditch Emerging from an Underground Culvert from the Northern Property Boundary, View to North



Figure 163. Overview Photograph of Waihe'e Ditch from an Underground Keystone Tunnel/Bridge, View to South



Figure 164. Overview Photograph of Keystone Arched Tunnel/Bridge, View to South



Figure 165. Overview Photograph of Site 5197 Waihe`e Ditch Showing two Types of Construction along the Ditch (photo from atop the keystone arched tunnel/bridge), View to South



Figure 166. Overview Photograph of Site 5197 Waihe'e Ditch Showing Older Construction with Stacked Rock Atop the Concrete Lined Ditch (View of Western Side Wall



Figure 167. Overview Photograph of Second Bridge from the North, Metal Beam and Cement Construction (background), Older Drainage Culvert (foreground), View to Northeast



Figure 168. Photographic Overview Second Bridge, Metal Beam and Concrete Construction, View to West



Figure 169. Photographic Overview from Second Bridge with Tee-Bar Reinforcements Across Ditch, View to Southwest



Figure 170. Overview Photograph of Third Bridge from North, Cement Construction with PVC Drainage, View to North



Figure 171. Overview Photograph of Third Bridge with Older Penstock with Metal Shut-off Valve (left), View to South



Figure 172. Overview Photograph of Fourth Bridge from North, West of Maui Tropical Plantation and Reservoir with Modern Wooden Construction, View to North



Figure 173. Overview Photograph of Site 5197 Waihe'e Ditch with Modern Concrete Lining, View to Northeast

DISCUSSION OF PARCEL 7

Parcel 7 currently contains commercial structures, subsurface utilities, a large reservoir, botanical gardens and ancillary buildings for lessee's and the Maui Tropical Plantation. As exhibited on Figure 141, the subject parcel formerly contained numerous LCA's and Grants due in part to the presence of cane flumes (in blue) and reservoirs, as well as the proximity to Old Waikapū Town. Portions of the cane flume easements and concrete lined ditches were also noted on the LCA maps in Parcels 3 Mauka and Waena and may have been prior non-commercial waterways and or *`auwai* during the pre-Contact period. Today, a shallow, narrow concrete lined swale (Figure 174) approximately 48 to 60 cm wide by 10 cm deep is present along portions of the curvilinear and linear cane flume easement noted in blue on Figure 141; however most cane flumes noted on the maps are either buried, or were removed. Site 5197 Waihe'e Ditch is prevalent and utilized for current agricultural activities along its north-south route.

Although several LCA's and Grants were present within the subject property, the backhoe test excavations were primarily negative with the exception of a small historic trash dump, Site 7884 Feature 3, near the surface of TR's 323 and 324 in the northeast corner of the parcel. The negative results are likely due to several factors, consisting of the compounded disturbances across the parcel from prior sugarcane cultivation, the development of the Maui Tropical Plantation and the inherent bias from backhoe sampling.

Sites 5197 (Waihe`e Ditch) has been assessed an initial significance of Criterion “a” and “d” due to its association with the Sugar Era and may yield important information on the history of the area. The site will remain in operation but will be covered in certain localities for safety reasons. Discussions will be performed with the landowner to ascertain how the site will be covered and secured and to determine if any adverse impacts will occur that need to be mitigated.



Figure 174. Overview Photographs of Extant Concrete Swales along Designated Cane Flume Easements in Parcel 7

CULTURAL MATERIALS

During the archaeological investigations, a relatively small assemblage of historic artifacts was recovered (Figures 160-165). The majority of these artifacts consisted of utilitarian ware and was recovered from a secondary context either from the surface or within disturbed soil layers during backhoe test trenching. Trenches which contained fragments of historic artifacts consist of the following: from Parcel 6 TR 218; Parcel 7 TR 324. The surface finds noted within Parcel 3 Mauka designated Site 7884 Feature 1, is a scatter of historic materials was noted around the open ditch, Site 7881 Feature 2, in between Waikapū Stream to the north and the access service road to the south. These materials may have washed down from further upslope, or may have been dumped with various other trash from the service road. Site 7884 Feature 1 assemblage is from the late 1940's to the early 1950's. The historic artifacts from Parcel 6 assigned Site 7884 Feature 2 comprises a secondary deposit of historic domestic items from the early to mid-1900's. Parcel 7, TR 324 designated Site 7884 Feature 3 is probably the earliest deposit dating from the late 18th to early 19th century based on diagnostic traits of the bottle glass. Based on the lag time from the time of manufacture, distribution and arrival to the Hawaiian Islands, the deposit likely dates to the early 19th century. This trench was located in an LCA 416:2 that claimed a house lot in the award.

Ceramics

The ceramic assemblage consists of fragments that primarily represent three vessel forms: bowls, plates, cups including rice bowls and tea cups fragments. Three general material classes were present, including earthenware, porcelains, and stone-wares. From TR 324, an Italian scene was depicted around the perimeter of the plate and consisted of blue on white floral design, and a gondola. The rice bowl shards contained a greenish glaze with an Asian motif depicting Koi fish. Two ceramic sherds that were recovered from the surface area surrounding the upper reservoir by a picnic table and old tree growth belonged to a crock pot. This earthen ware contained a blue stenciled stamp that is typical of English crock pots. It contained a partial makers' mark that appears to have "sell" and maybe a portion of a ribbon design after the letter "s". The ceramics recovered from Site 7884 Feature 2 were plates and bowls. The plates are blue glazed and are from the "Fiesta Wear" type and the other plate was white glazed and had a discontinuous makers mark that appeared to say "Adam Stewa" and the rest was not discernible but likely Stewart.

Glass

Dating analysis was based on the key manufacturing techniques developed during the 19th century. Manufacturing techniques changed considerably during the 19th and early 20th century, and at the end of the 19th century, mechanization began. The manufacturing technique utilized for most of the bottle types recovered was mechanization. The bottle openings from TR 324 are applied lips and a blown in mold for

the dark olive green colored wine bottle had a push up bottom with a pontil scar, and the aqua colored bottle was machine made molds for the body. Bottle types include medicinal, wine or whiskey and unidentifiable. The colors were dark brown, dark olive green, olive green, aqua and clear.



Figure 175. Photograph of a Dark Olive Green Wine Bottle from Site 7884 Feature 3 at Parcel 7 TR324

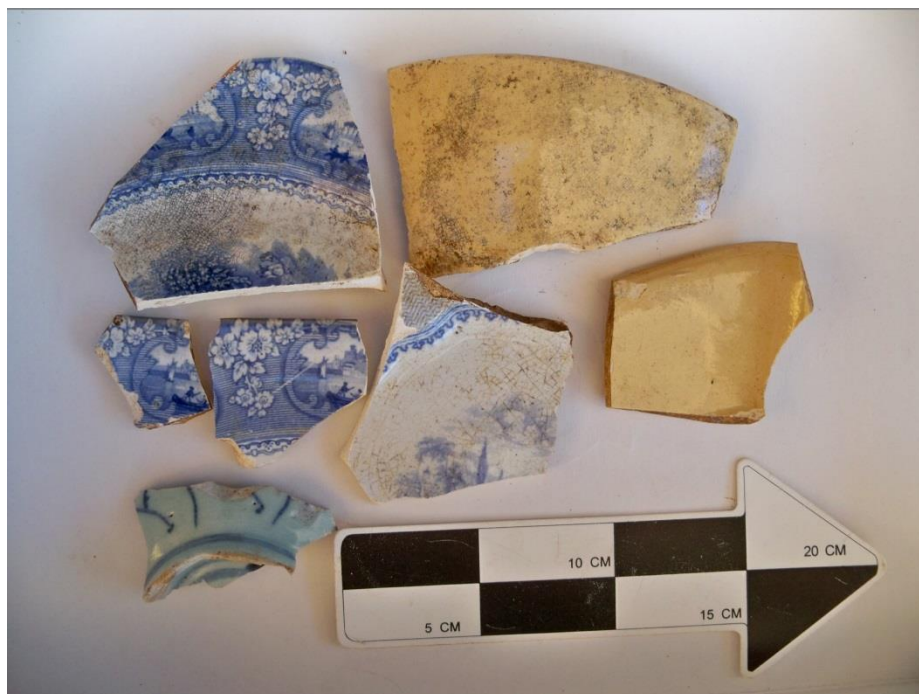


Figure 176. Photograph of Site 7884 Feature 3 from Parcel 7 TR324 Ceramic Assemblages



Figure 177. Photograph of Glass Assemblages from Site 7884 Feature 3 Parcel 7 TR324

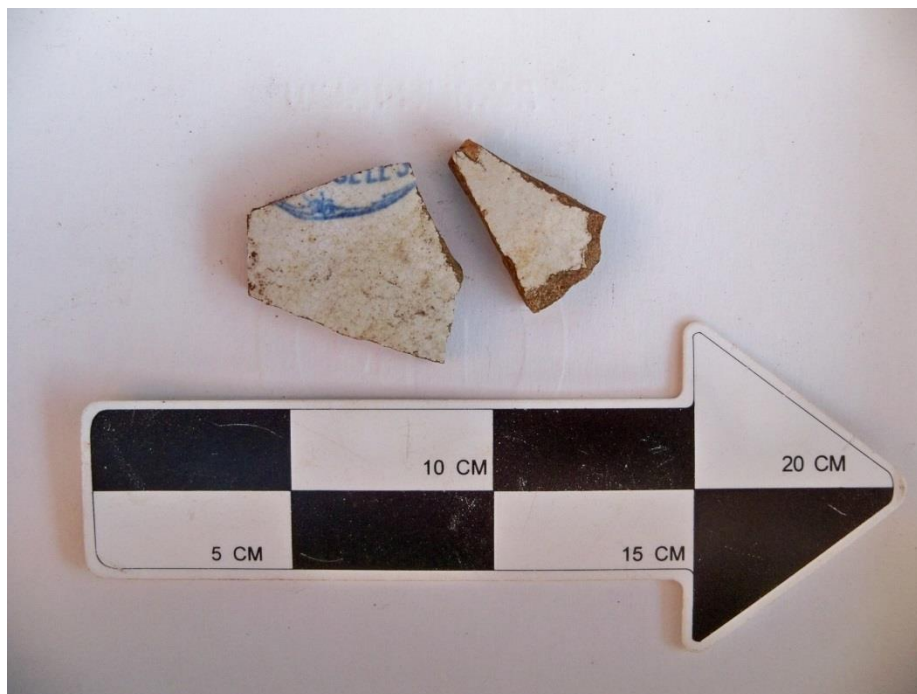


Figure 178. Photograph of Ceramic Sherds on Surface by Site 7881 Feature 3 (Reservoir) Parcel 3 Mauka



Figure 179. Photograph of Site 7884 Ceramics within Parcel 3 Mauka

INITIAL SIGNIFICANCE ASSESSMENT

Pursuant to Hawaii Administrative Rules §13-284-6, to be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and shall meet one or more of the following criteria:

Criterion a: associated with events that have made an important contribution to the broad patterns of our history;

Criterion b: associated with the lives of persons important in our past;

Criterion c: embody the distinctive characteristics of a type, period, or method of construction; represents the work of a master; or possesses high artistic value;

Criterion d: have yielded, or is likely to yield, information important for research on prehistory or history; and

Criterion e: have an important traditional cultural value to the native Hawaiian people or to another group of the state due to associations with traditional 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 groups history and cultural identity.

Based on the above and as presented in Table XXII, several historic properties are significant under multiple criteria. Site 5197 Waihe'e Ditch is assessed a significance of Criteria "a" and "d"; Site 7881, the Sugar Plantation irrigation complex is considered significant under Criteria "a" and "d" and possibly "c", as it is associated with events that have made an important contribution to our history, may yield important information for research on history of the area and may exhibit or embody a distinct type or method of construction during a certain era. Similarly, Site 7883, the WWII bunker, is assessed an initial significance of Criteria "a", "c" and "d" for the same reasons as Site 7883 and Sites 50-50-04-7882 and 7884 are assessed a significance of Criterion "d" as they have yielded, or have the potential to yield significant information pertaining to the prehistory and or history of the area (Table XXII).

**Table XXII. Initial Significance Assessments and Mitigation Recommendations for
Sites 50-50-04-7881 through 50-50-04-7884**

SITE NO.	SITE TYPE FUNCTION	SITE AGE	SITE SIGNIFICANCE	MITIGATION RECOMMENDATIONS
50-50-04-7881	Sugar Plantation Irrigation/Agriculture	Historic	a, c and d	Preserve/Monitoring
50-50-04-7882	Remnant Retaining Wall/Slope Retention or Ag.	Historic	d	Preserve/Monitoring
50-50-04-7883	Military/Defensive	Historic	a, c and d	Preserve/Monitoring
50-50-04-7884	Artifact Scatter & Refuse Deposit/Habitation	Hist. to Mod.	d	NFW/Monitoring
50-50-04-5197	Plantation Ditch/Ag.	Historic	a and d	Portions Preserved
NFW-No Further	Work			

DISCUSSION AND RECOMMENDATIONS

An AIS comprised of a pedestrian survey and subsurface testing through mechanical trenching was performed in advance of proposed development within approximately 503-acres in upper Waikapū *ahupua`a*. The project area had been extensively disturbed from former sugar cane cultivation where approximately 95% of the surface had been impacted. The purpose of the investigation was to determine if surface and subsurface sites were extant and to ascertain the extent and significance of these historic properties. Due to the large project area encompassed by several TMK's, the subject area was divided into five arbitrary zones which correspond to the four separate TMK's. Parcel 3 Mauka and Parcel 3 Waena were positioned within a portion of TMK [2] 3-6-004:003; Parcel 3 Makai was in a portion of TMK [2] 3-6-002:003; Parcel 6 encompassed TMK [2] 3-6-004:006; and Parcel 7 was within TMK [2] 3-6-005:007 (see Figures 1, 2, 6 and 7).

Parcel 3 Mauka encompassed the highest elevation in the northwest portion of the project and radically slopes west (*mauka*) to east (*makai*) with Waikapū Stream adjacent to the north. Parcel 3 Waena, Parcel 6 and Parcel 7 (Maui Tropical Plantation) were all fairly level, sloping gently west and east and occupied a position laterally along the base of the West Maui Mountains. These parcels contain or are in close proximity to an intermittent gulch on the north side of Parcel 3 Waena and Waihe`e Ditch (Site 5197) which bisects Parcels 6 and 7 east/west. Parcel 3 Makai, situated on the east side of Honoa`pi`ilani Highway, encompassed the lowest elevation and abuts Waikapū Stream to the north.

During the AIS procedures, five historic properties designated Sites 50-50-04-5197 and 50-50-04-7881 Features 1-18 through Site 50-50-04-7884 Features 1-3 were documented and consisted of features related to historic agriculture, historic habitation and World War II defensive positions. Sites 7881 Features 1-18 through 7884 Feature 1 were identified within Parcel 3 Mauka. Site 5197 extended north south and was a partial boundary between Parcels 6 and 7 and bisects Parcel 3 Waena east west. Site 7884 Feature 2 was positioned in Parcel 6 and Site 7884 Feature 3 was located in Parcel 7. Site 5197 was a Plantation ditch in good condition and comprised of a portion of the Waihe`e Ditch assessed a significance of Criteria "a" and "d"; Site 7881 consisted of a Plantation irrigation complex significant under Criteria "a", "d" and possibly "c" and included water containment, transportation and diversion features designated Features 1-18. Features 1-18 were in good condition and consisted of concrete lined ditches, sluice gates and dirt culverts with concrete lined headwalls. Site 7882 was in fair condition and consisted of a remnant historic rock retaining wall currently utilized for slope retention purposes for the concrete irrigation ditch (Site 7881 Feature 2); however it may have formerly functioned as an agricultural terrace for planting. Site 7883 comprised a military bunker in good condition from World War II that was utilized as a horizon aviation observation bunker and assessed an initial significance of

Criteria “a”, “c” and “d”. Site 7884 Features 1-2 were historic artifact scatters in a secondary context representative of historic habitation from 1940’s to 1950’s (Feature 1) and 1900’s to 1950’s (Feature 2) and Site 7884 Feature 3 identified during backhoe testing is a remnant marginal refuse deposit from the late 18th to early 19th century. Due to the lag time from the date of manufacture, to distribution and arrival in the Hawaiian Islands, the deposit likely dates to the early 19th century. Site 7884 is a marginal, disturbed site assigned a significance of Criterion “d”.

The subsurface testing program, consisted of 150 backhoe trenches executed within the five arbitrary zones. Since the background research noted numerous LCA’s and Grants within the project area, the testing was focused on the *kuleana* lands as these localities were more likely to contain cultural materials. In addition to the testing the above localities, backhoe trenches were also executed at areas outside the LCA’s and Grants to obtain a representative sampling of subsurface soil conditions and or presence absence of material culture. Analysis of the stratigraphic record across the project area exhibited no evidence of traditional Hawaiian occupation and only marginal evidence of historic human intervention and or occupation was documented. Mostly the soil profiles noted geologically and or environmentally related information. Specific anthropogenic impacts comprised the grading activities for sugar cane which removed most of the surface evidence and disturbed the subsurface (till zone) up to 0.70 mbs (TR 323). Human occupation was evident due to the presence of nominal cultural materials recovered at Site 7884. The stratigraphic record exemplified alluvial (represented by rounded pebbles, cobbles and silts) and colluvial deposits (angular to subangular cobbles and gravel) indicative of a meandering streambed, flood episodes and slope wash. Episodic flood and storm wash events were exhibited by alluvial and colluvial layers and lenses that were mixed and interspersed between homogenous soil layers or lenses. The primarily negative results of the testing program was likely due to the compounded disturbances associated with sugar cane cultivation (harvesting and replanting every 22 months for over a century) which has removed and or disturbed most of the archaeological record.

The background research, coupled with the presence of a fresh water source at Waikapū Stream and other water ways (*`auwai*, ditches and flumes) noted on historic maps, exhibited that the area, prior to intensive sugar cane cultivation, was a favorable environment for habitation, agricultural pursuits and religious purposes. The Mahele record exhibited intensive use of the land for *kalo*, and other agricultural and animal husbandry endeavors. Archaeological investigations in the adjoining *mauka* properties to the south identified both permanent and temporary habitation, extensive agricultural features and burials with radiocarbon dates from A.D. 1040 to A.D. 1655 to the historic period (Brisbin et. al. 1991 and Kennedy 1994). Additionally, the investigations noted an intermittent, reoccupation of several traditional features which were presumed to be related to the historic ranching activities in the area.

Based on the proposed development plans, Site 5197 Waihe`e Ditch will remain in operation, although portions of it will be buried during development. Site 50-50-04-7881 Features 1-18, a Plantation irrigation complex positioned along the northern boundary of the project area will not be affected by development and will continue to be utilized for agricultural purposes. This site will be preserved in place and the form of preservation will be appropriate cultural reuse. Site 7882, the historic retaining wall is located outside the proposed development area to the northeast and will remain in place. No further work is warranted for this feature. Site 7883, the WWII bunker will be preserved in place and the form of preservation is conservation (avoidance and protection) and interpretation. No further inventory level work is recommended for Site 7884 Features 1-3, the historic artifact scatters and refuse deposit; however the localities where these features were identified will be monitored during ground altering activities.

In the event that future development is proposed that may affect historic properties, Sites 50-50-04-5197, 7881 and 7883, currently recommended for preservation, additional mitigation may be warranted and comprised of architectural inventory procedures. However, no mitigation procedures shall be implemented without consultation and concurrence by SHPD. Furthermore, the AIS was conducted within 503 acres that are proposed for development and positioned within a larger acreage (1576 acres) retained by the same land owner, Waikapū Partners. The remaining acreage, not slated for development, will continue in agriculture and is located in a portion of TMK [2] 3-6-002:003 and [2] 3-6-004:003 encompassed by the State Land Use Agricultural District. If development plans change and improvements are proposed in this remaining agricultural land, an AIS may be warranted under HAR §13-276, as well as a District Boundary Amendment (DBA).

The overall development plans will have an effect on significant historic properties. Thus, pursuant to §13-284-7, the effect determination is “Effect, with agreed upon mitigation commitments” and the mitigation commitments consist of (1) data recovery in the form of archaeological monitoring, (2) preservation for Sites 50-50-04-7881 and 7883, and (3) if Site 50-50-04-5197 is impacted, it will be further documented through architectural documentation; the nature of the architectural documentation will be determined in consultation with the SHPD.

REFERENCES

Armstrong, R.W., J.A. Bier, and S. Chang

- 1983 *Atlas of Hawaii*, University of Hawaii Press, Honolulu.

Bassford, Q.S., and M. Dega

- 2007 *An Archaeological Assessment Report for 208 Acres in Waikapū Ahupua'a, Wailuku District, Island Maui, Hawaii, [TMK: (2) 3-6-04:03 por. And :por.]*. Prepared for Steven Kikuchi. Scientific Consultant Services Inc. Honolulu.

Board of Commissioners

- 1929 *Indices of Awards Made by the Board of Commissioners to Quiet Land Titles in the Hawaiian Islands*. Commission of Public lands, Territory of Hawaii. Honolulu.

Brisbin, J., and A.E. Haun

- 1991 *Archaeological Data Recovery Excavation Waikapū Mauka Partners Golf Resort Project Area, Land of Waikapū , Wailuku District, Island of Maui*. Prepared for Waikapū Mauka Partners. Paul H. Rosendahl, Ph.D., Inc. Hilo.

Buffum, A., and M. Dega

- 2001 *Archaeological Inventory Survey of 7.5 Acres in Waikapū Ahupua'a, Wailuku District, Island of Maui, Hawai'i (TMK: 3-5-04:92)*. Scientific Consultant Services, Inc., Honolulu.

Creed, Victoria

- 1993 *Settlement Pattern for Waikapū , Wailuku District, Maui, Hawaii, Vol. I*. Cultural Surveys Hawaii.

- 1993 *Vol. II: LCAs for the Ahupua'a Wailuku, Maui, Hawaii*. Cultural Surveys Hawaii.

Dega, M.F.

- 2003 *Archaeological Inventory Survey in the Intermediate Dry Zone of Wailuku, Wailuku Ahupua'a, Wailuku (Kula) District, Maui Island Hawai'i (TMK:3-5-001:portion of 100)*. Scientific Consultant Services, Inc. SCS Report No. 385-2, Honolulu.

- 2004 *An Intermediate Zone Archaeology Inventory Survey Located in Wailuku, Wailuku Ahupua'a, Wailuku (Kula) District, Maui Island, Hawai'i (TMK: 3-5-001: portion of 001)*. SCS Report N. 396-2. Prepared for Stanford Carr. On file at SHPD, Kapolei, Hawaii.
- Denham, T., J. Kennedy, and L. Reintsema
- 1992 *Inventory Survey with Subsurface Testing Report for a Property at TMK:3-503:01, Wailuku Ahupua'a, Wailuku District, Island of Maui*. Archaeological Consultants of Hawaii, Inc., Haleiwa. On file as report M-395 at SHPD, Kapolei, Hawaii.
- Donham, T.K.
- 1991 *Field Inspection of a Water Pipeline Easement Across Waikapū Stream, Waikapū, Maui TMK 3-5-04:14 and 3-6-04:2*. On file as report M-347 at SHPD, Kapolei, Hawaii.
- 1995 *Field Inspection of the Richardson Family Cemetery (50-50-04-4001), Kukuialamaka, Waikapū, Wailuku District, Island of Maui (TMK:3-5-04:22)*. SHPD. Kapolei, Hawaii.
- 1996 *A Summary of Archaeological Finds in Wailuku Showing Settlement Patterns*. Paper Presented at the 9th Annual conference for the Society of Hawaiian Archaeology in Wailea, Maui.
- Gibson, Erica
- 2011 *Ceramic Maker's Marks*. Left Coast Press, Inc. Walnut Creek Ca. 94596
- Google Earth
- 2013 Data USGS, Geoeye, Image 2013 Digital Globe, Data S/O, NOAA, U.S. Navy, NGA GEBCO.
- Fornander, Abraham
- 1880 *An Account of the Polynesian Race*. Vol. 2. Reprint, Rutland, VT: Charles E. Tuttle, 1969.
- Foote, D., E.L. Hill, S. Nakamura, and F. Stephens
- 1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai*. U.S.D.A. Soil Conservation Service, U.S. Government Printing Office, Washington, D.C.
- Handy, Craighill E.S.
- 1940 *The Hawaiian Planter – Vol. I*. Bishop Museum Bull. 161. Honolulu: Bishop Museum Press.
- Handy, E.S. Craighill, and Elizabeth Green Handy
- 1972 *Native Hawaiian Planter in Old Hawaii; their life, lore and environment*. Bishop Museum Bull. 233. Honolulu: Bishop Museum Press.

<http://ags.hawaii.gov/survey/map-search/>

Kennedy, Joseph

- 1994 *Inventory Survey & Subsurface Testing Results for Waikapu Mauka Partners Proposed Residential Project Located at Waikapu, Wailuku District, Island of Maui, TMK: 3-9-022:2 (Por.) & TMK: 3-6-04:2 (Pors.) Addendum including Results of Subsurface Testing of Suspected Burial Features.* Prepared for Waikapu Mauka Partners. Archaeological Consultants of Hawaii, Inc. Haleiwa, Hi.

Munsell Color

- 1974 *Munsell Soil Color Charts.* MacBeth Division, Kollmorgan Corporation, Baltimore.

Neal, M.C.

- 1965 *In Gardens of Hawaii.* Bishop Museum Special Publication 50. Honolulu: Bishop Museum Press.

Pantaleo, Jeffrey

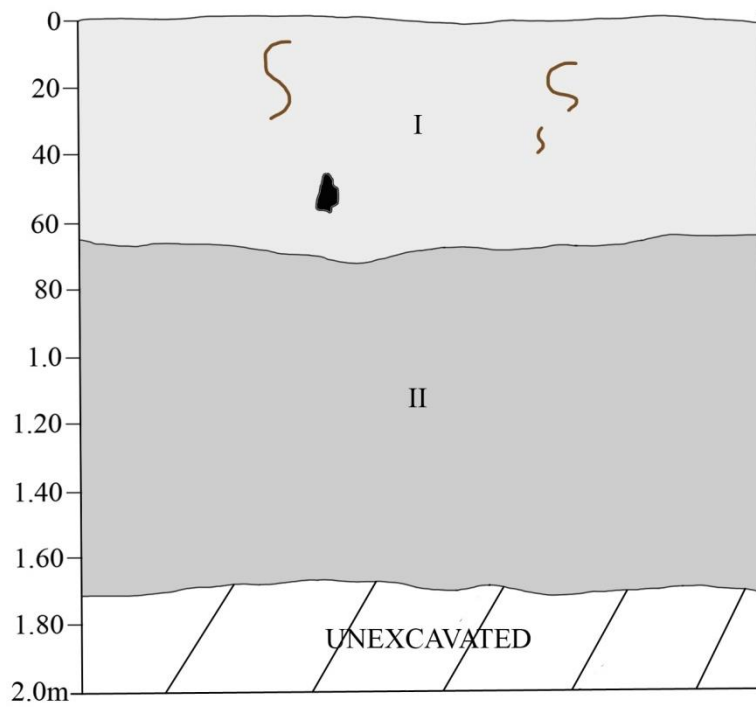
- 2005 *Archaeological Inventory Survey Report of an Approximate 3-Acre Parcel, Waikapū Ahupua'a, Wailuku District, Island of Maui TMK 3-6-07:2.* For Mark Miller. Archaeological Services Hawaii, Wailuku.

Wilcox, Carol

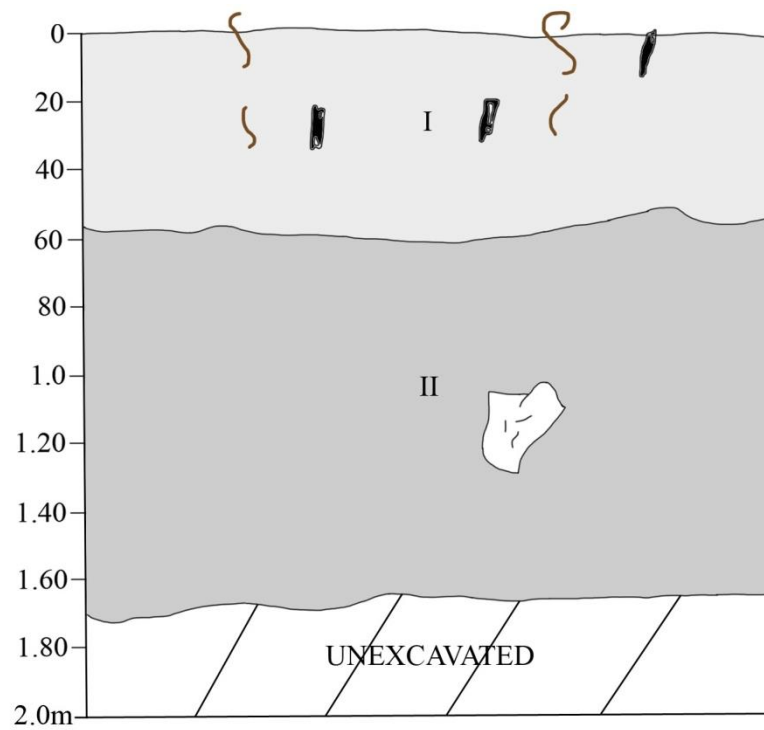
- 1996 *Sugar Water Hawaii's Plantation Ditches.* University of Hawaii Press, Honolulu.

APPENDIX A

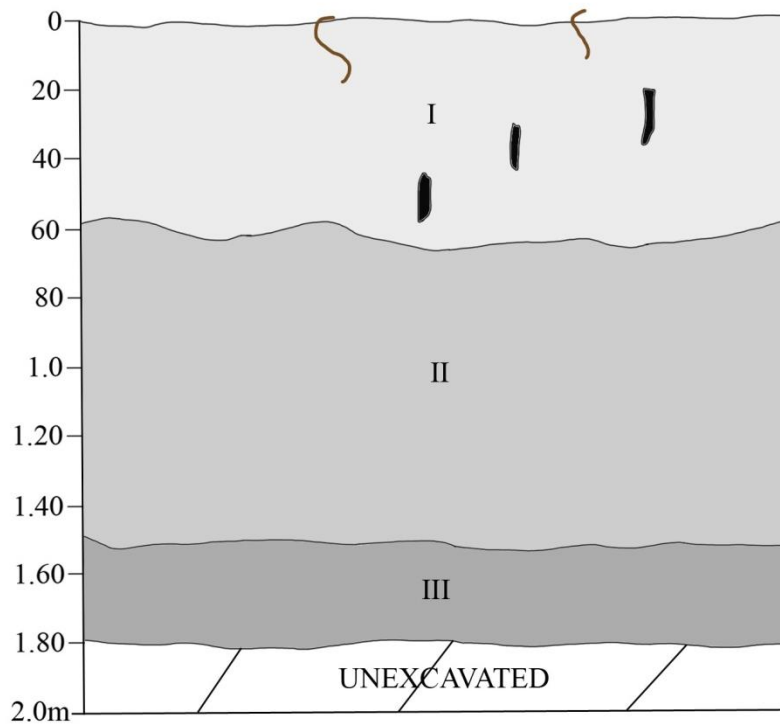
PARCEL 3 MAUKA



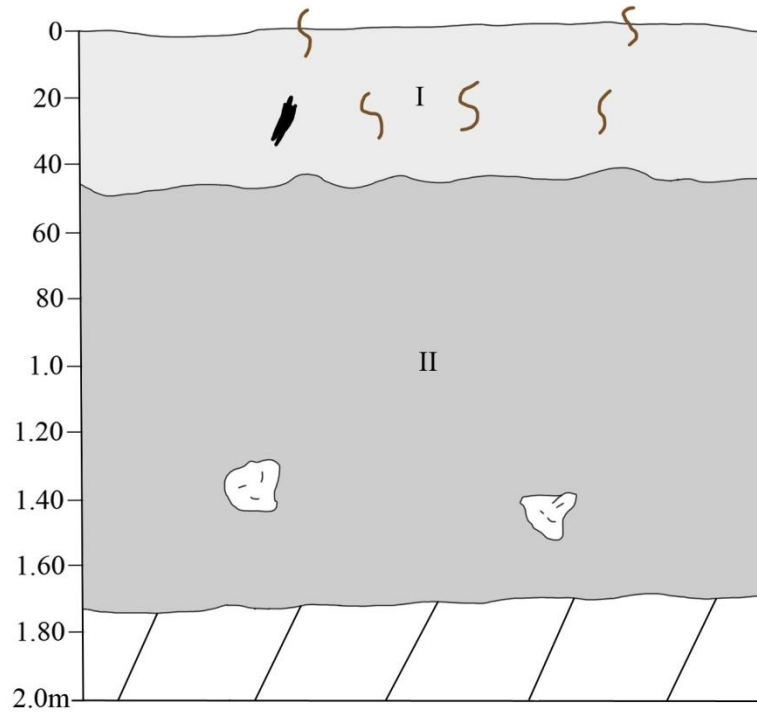
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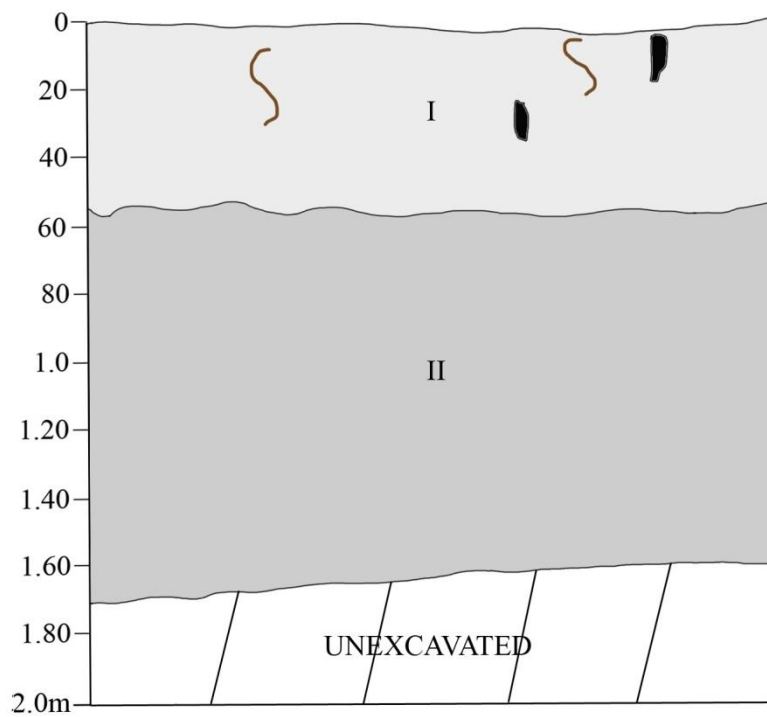
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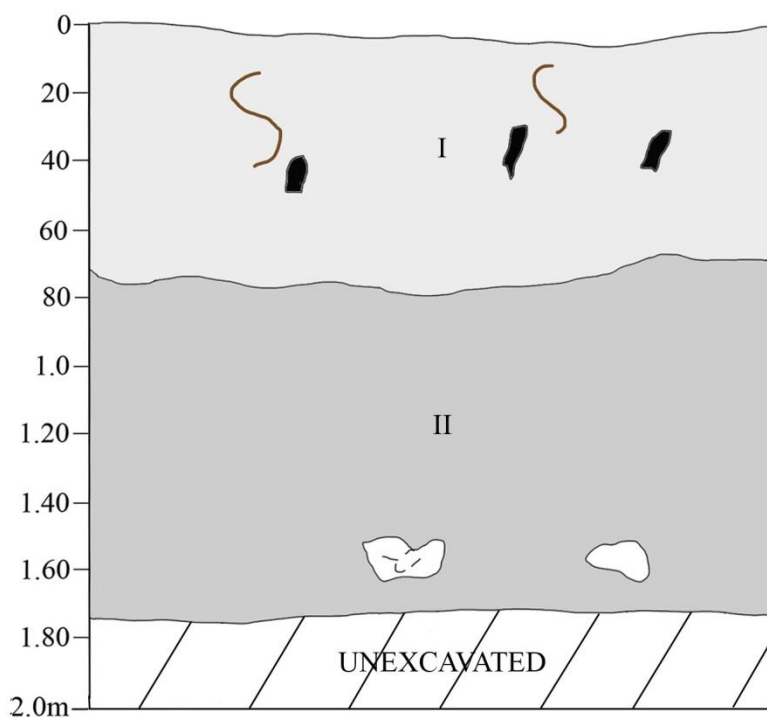
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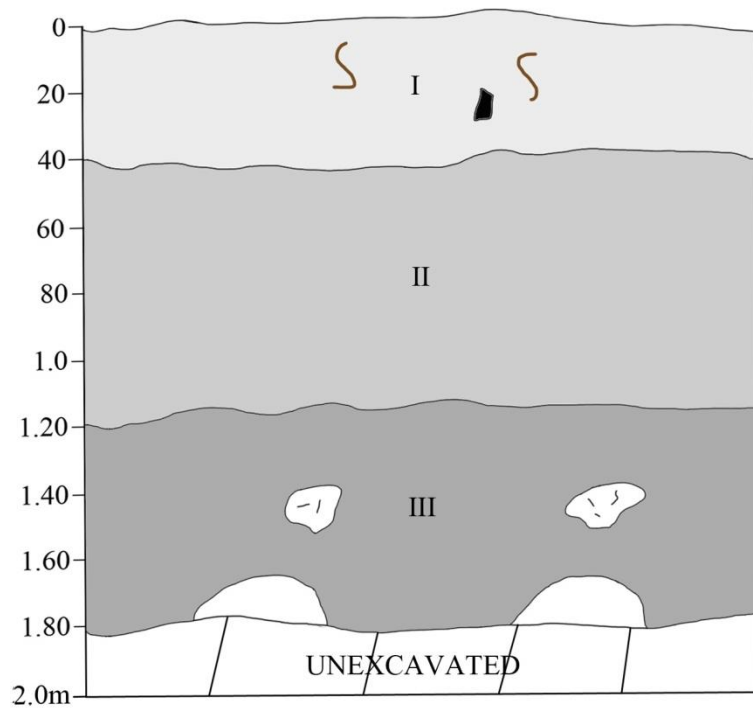
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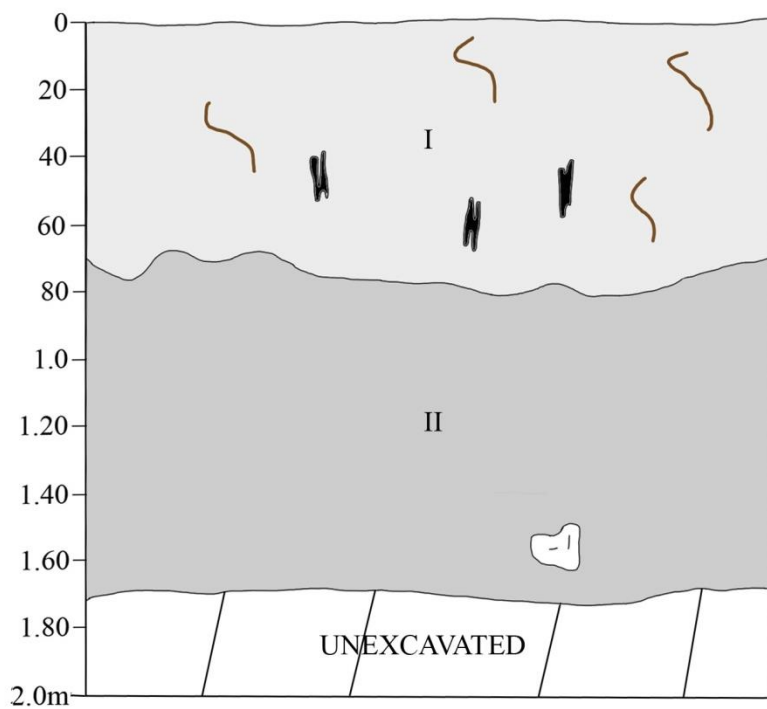
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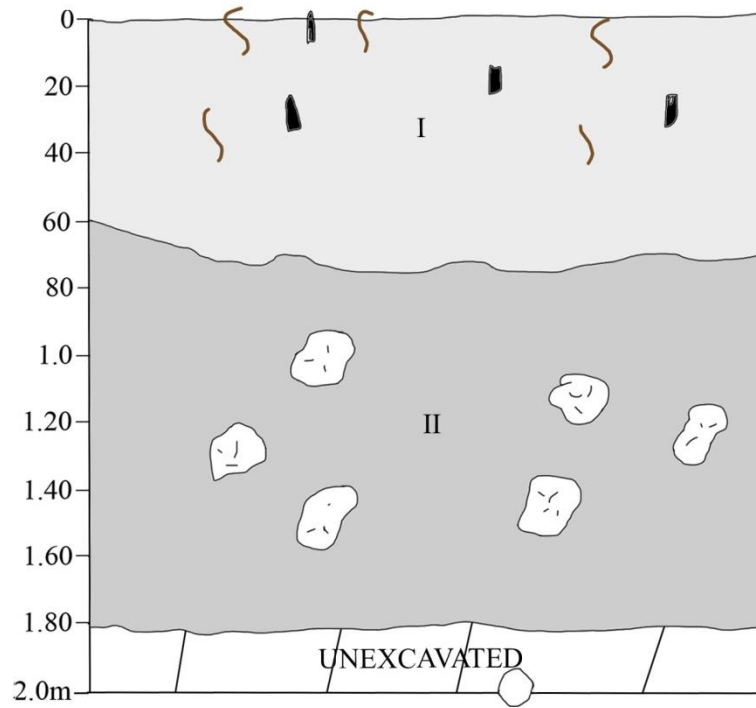
Trench 408



Trench 409

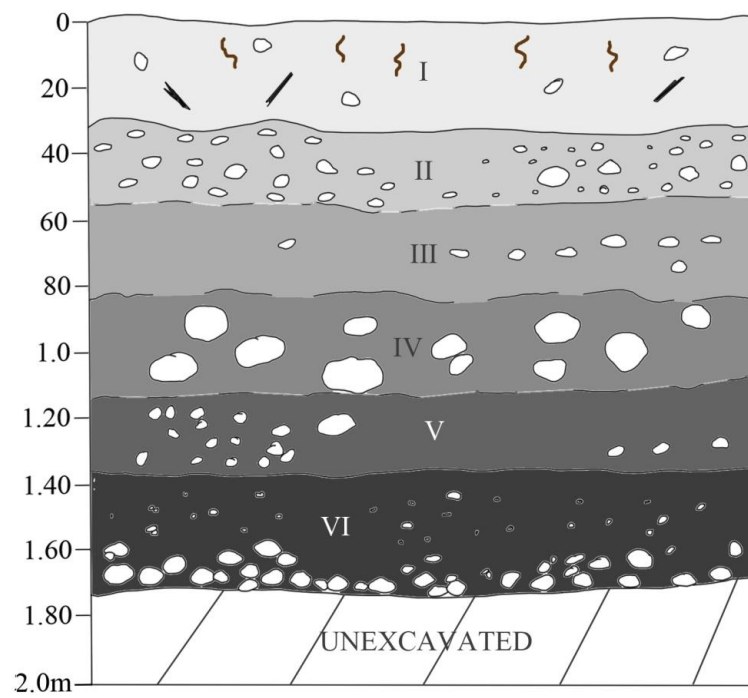


Trench 411

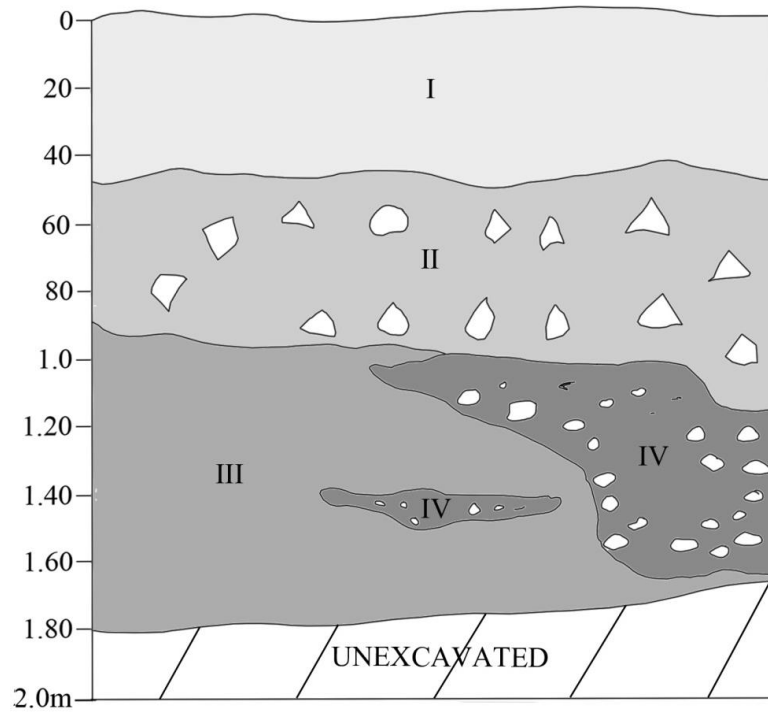


Trench 413

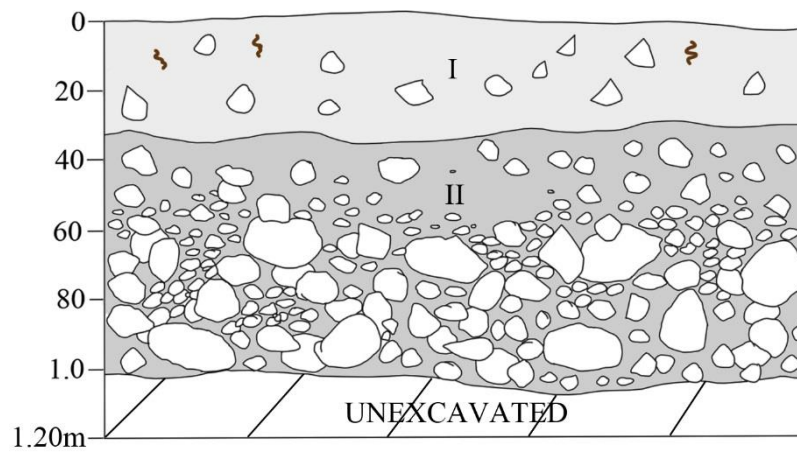
PARCEL 3 WAENA



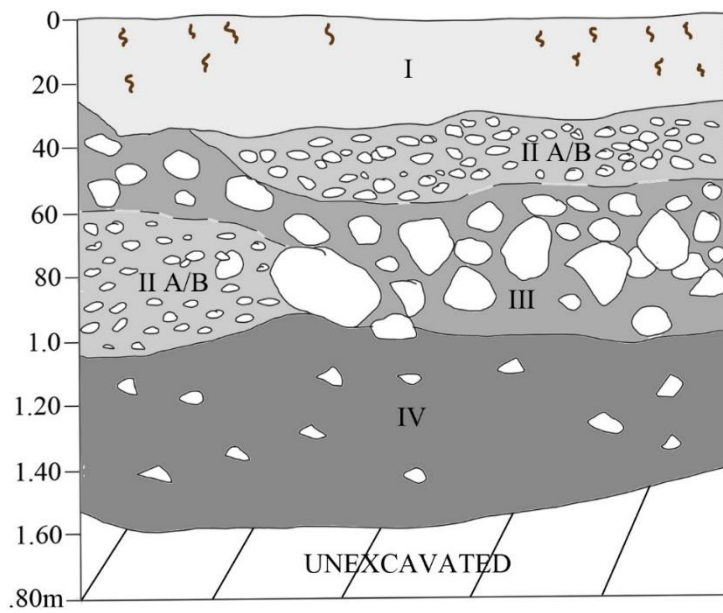
Trench 01



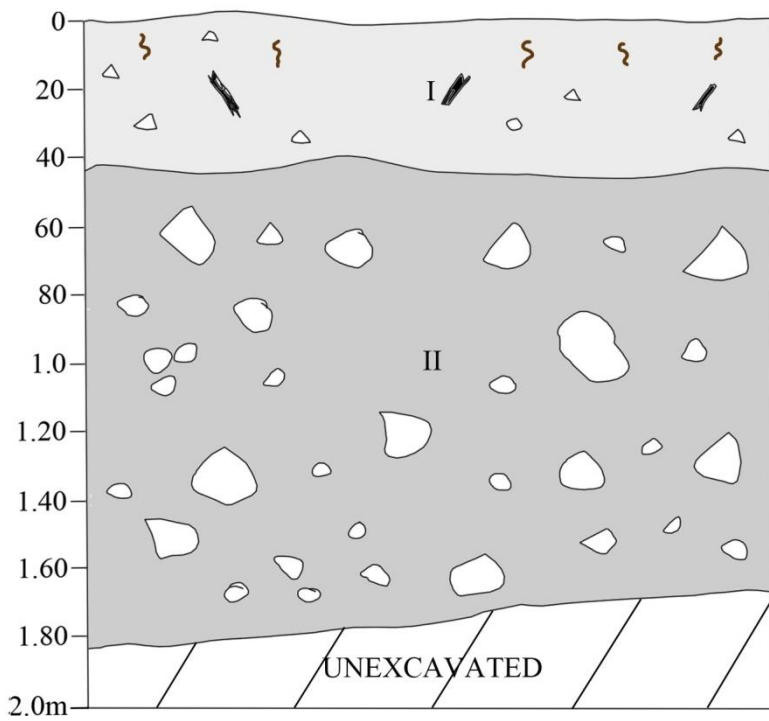
Trench 03



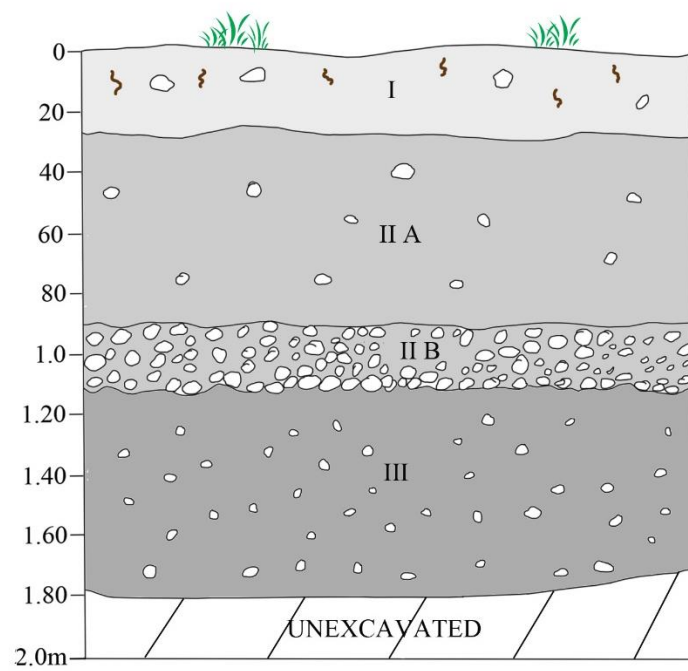
Trench 07



Trench 08

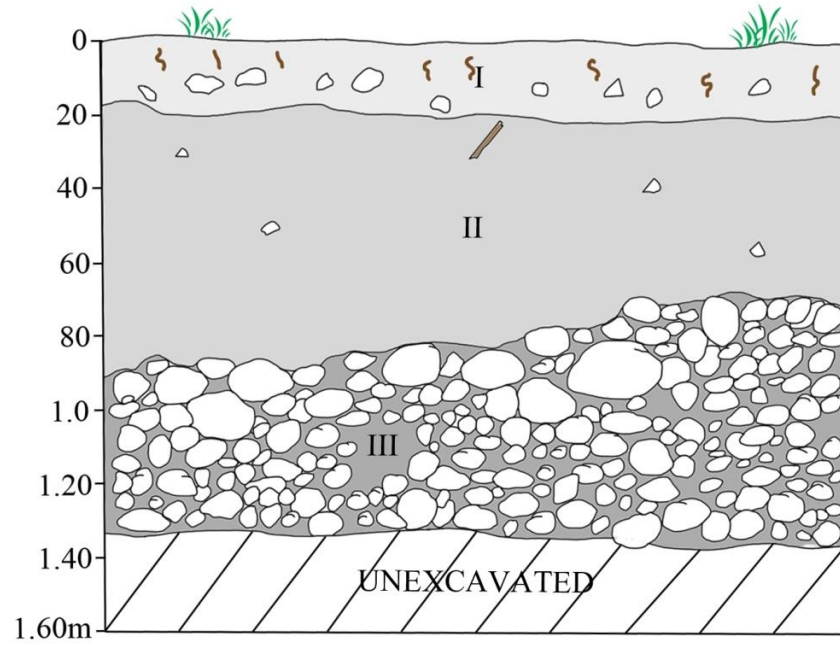


Trench 011

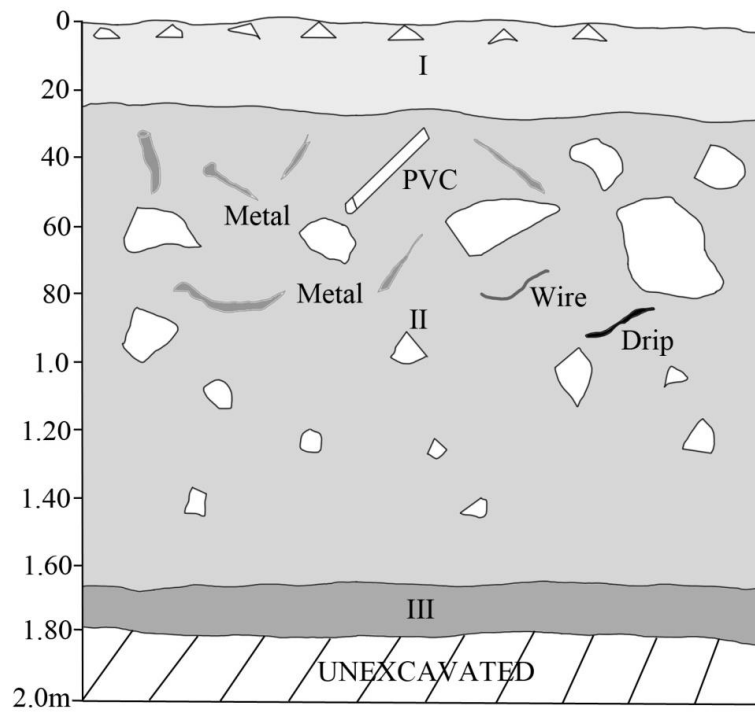


Trench 015

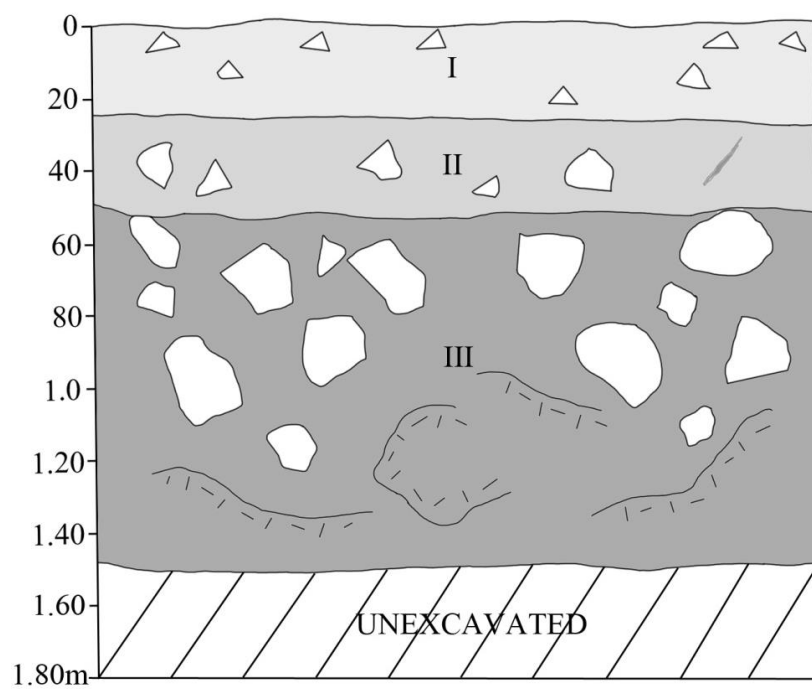
PARCEL 3 MAKAI



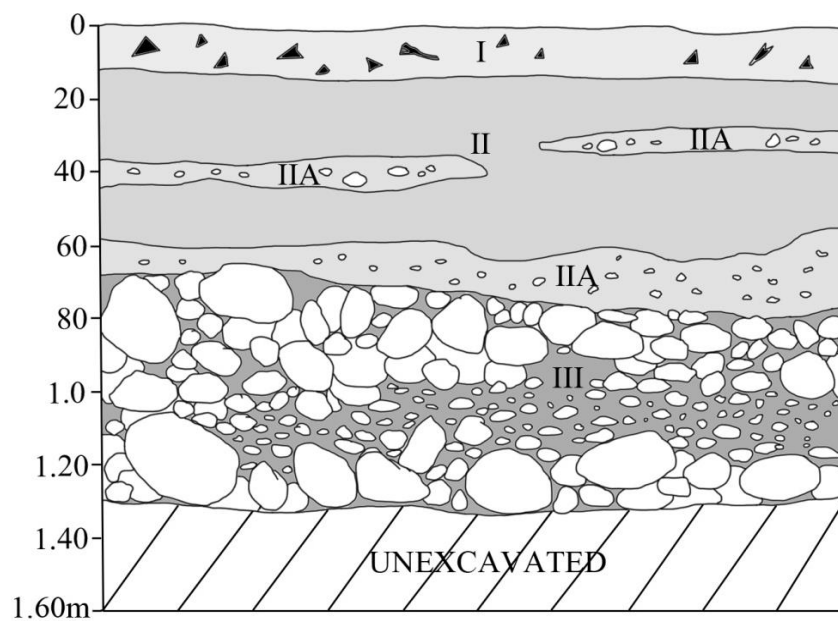
Trench 101



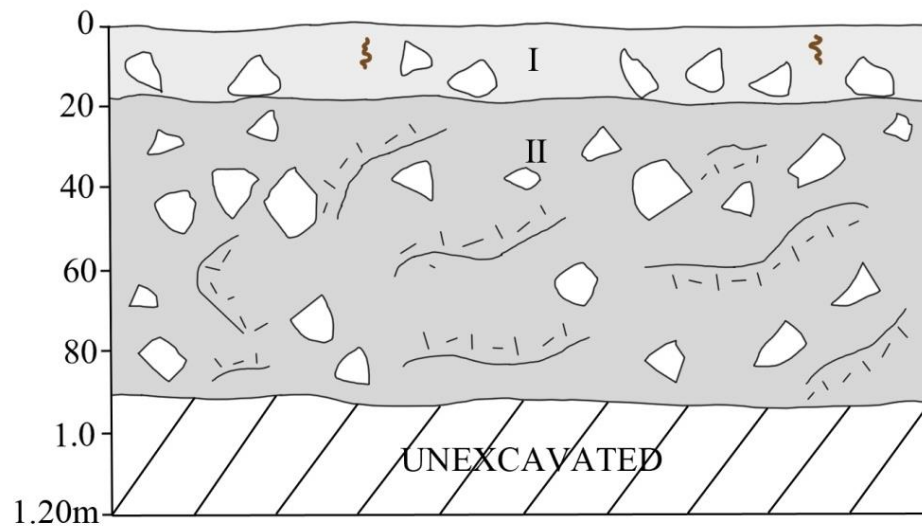
Trench 103



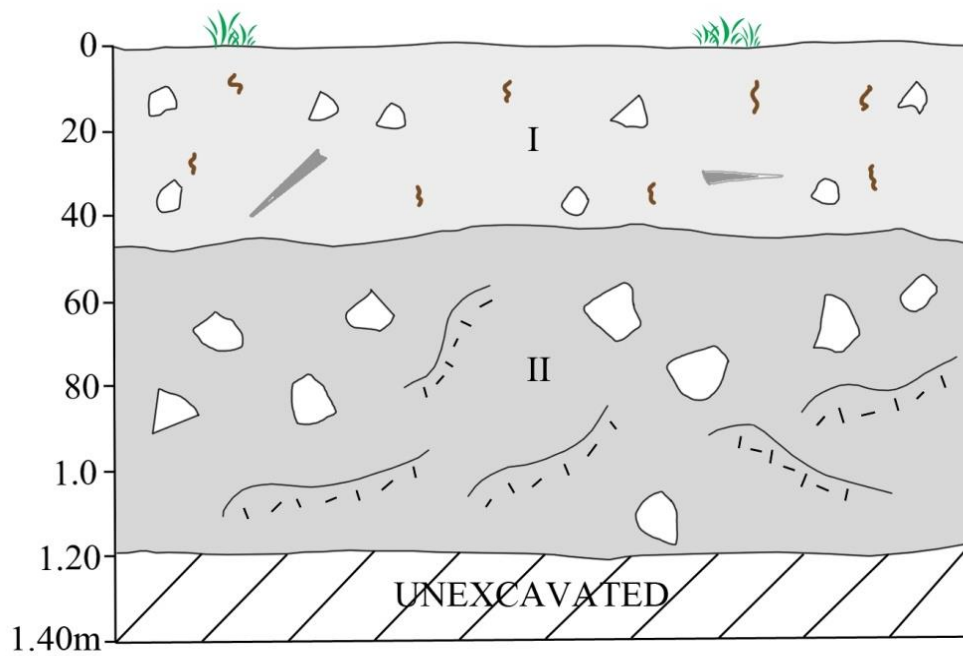
Trench 104



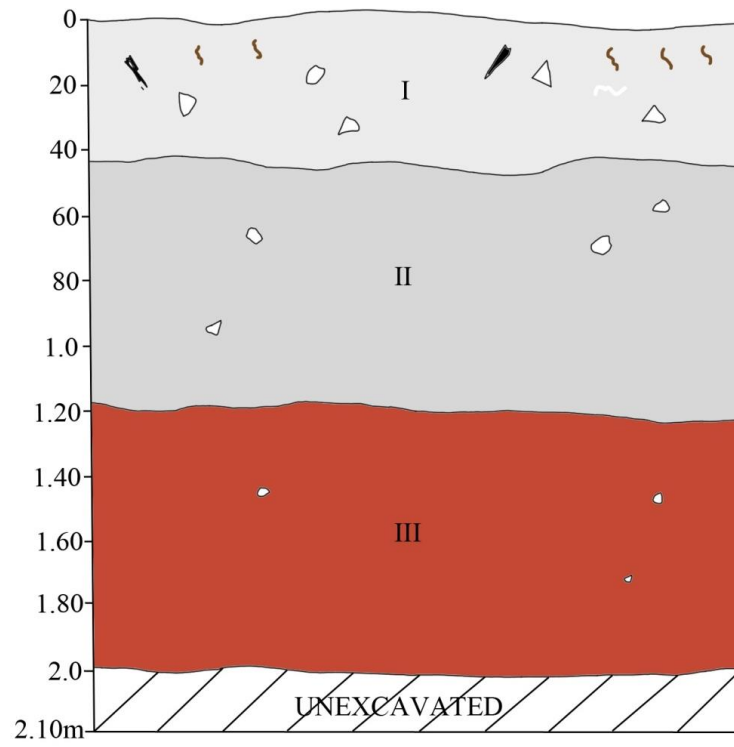
Trench 105



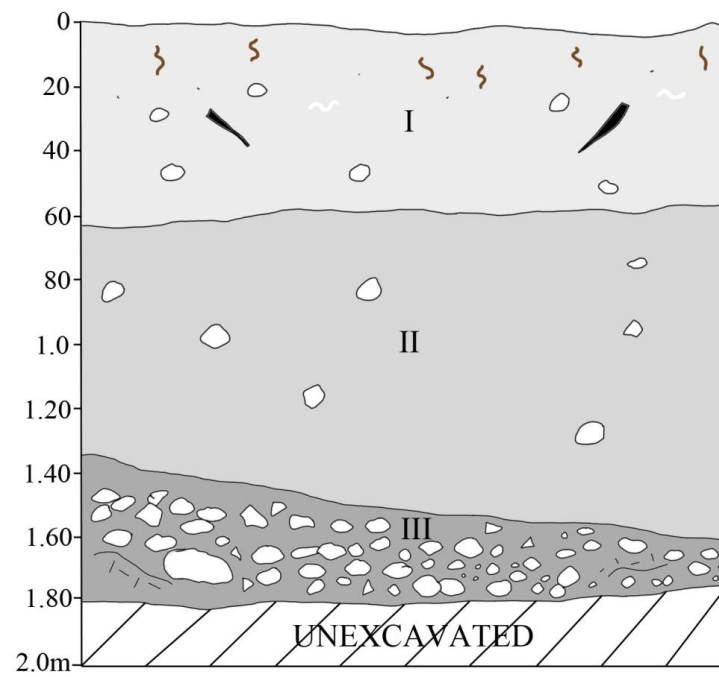
Trench 106



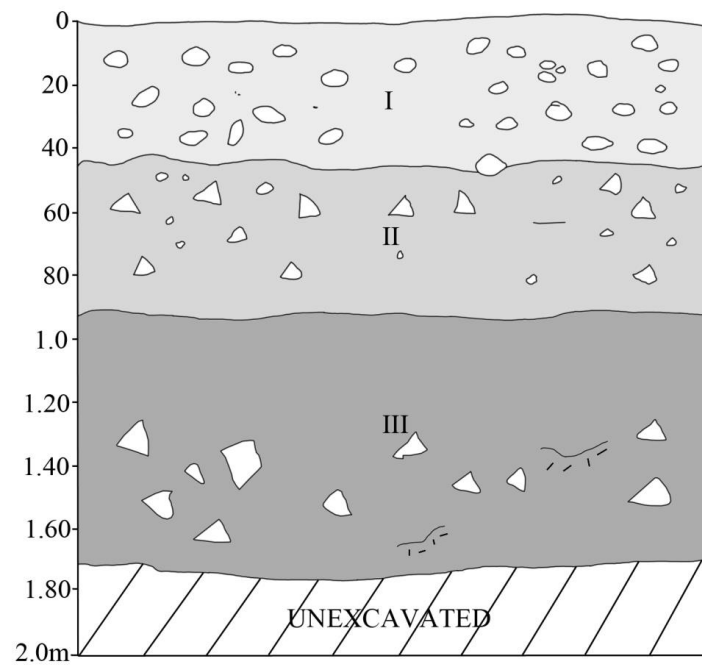
Trench 107



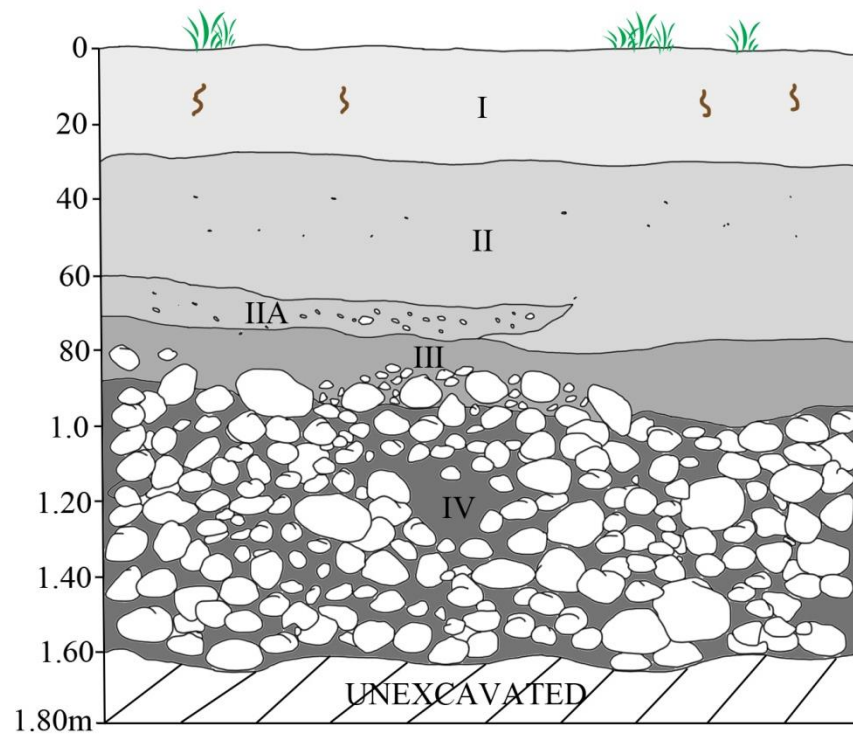
Trench 109



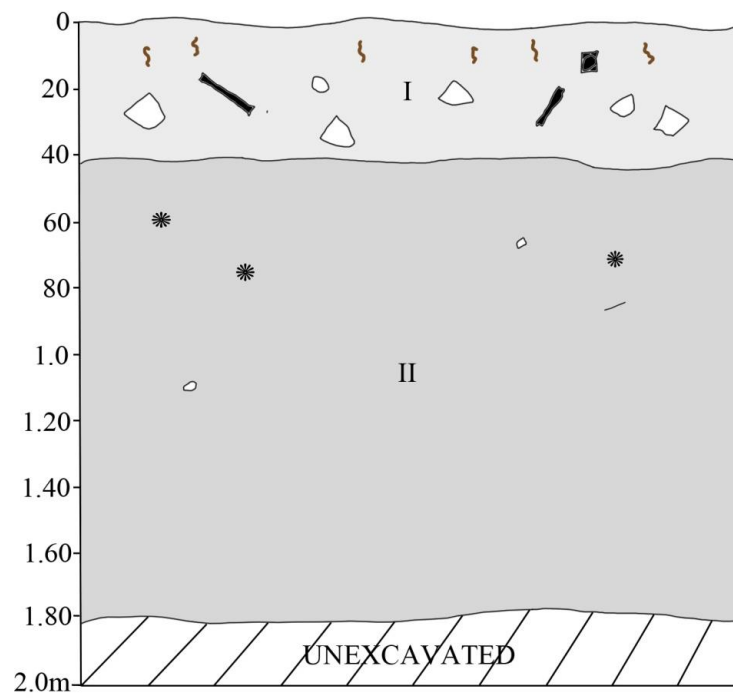
Trench108



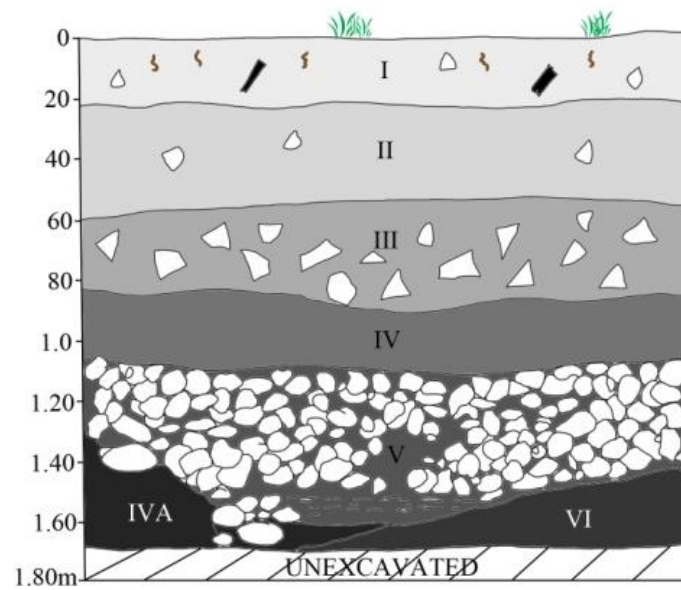
Trench 112



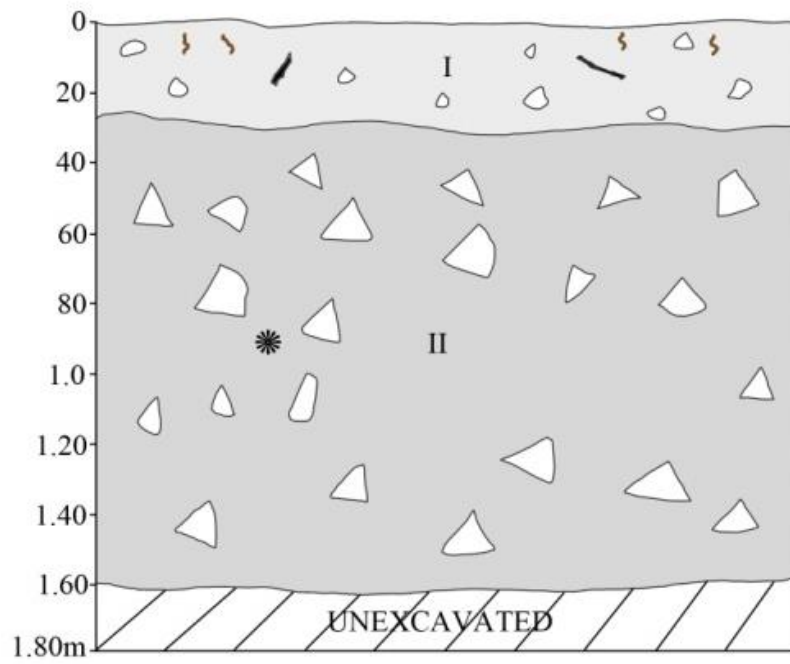
Trench 111



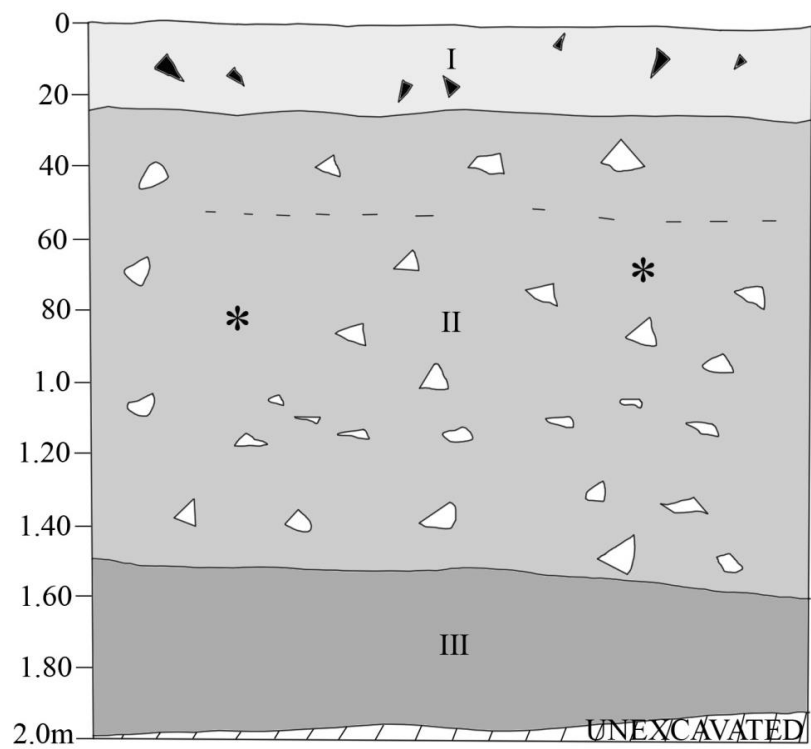
Trench 113



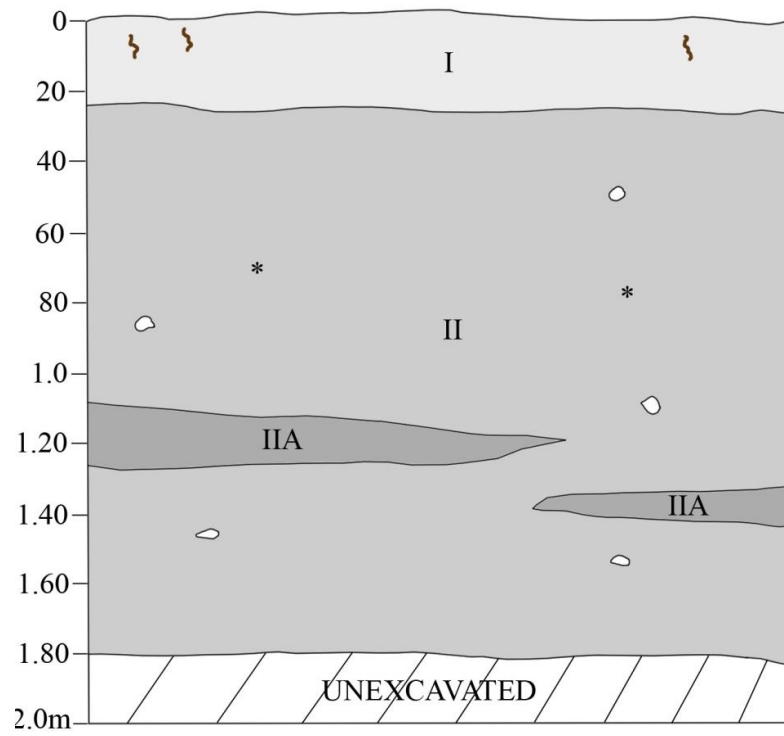
Trench 114



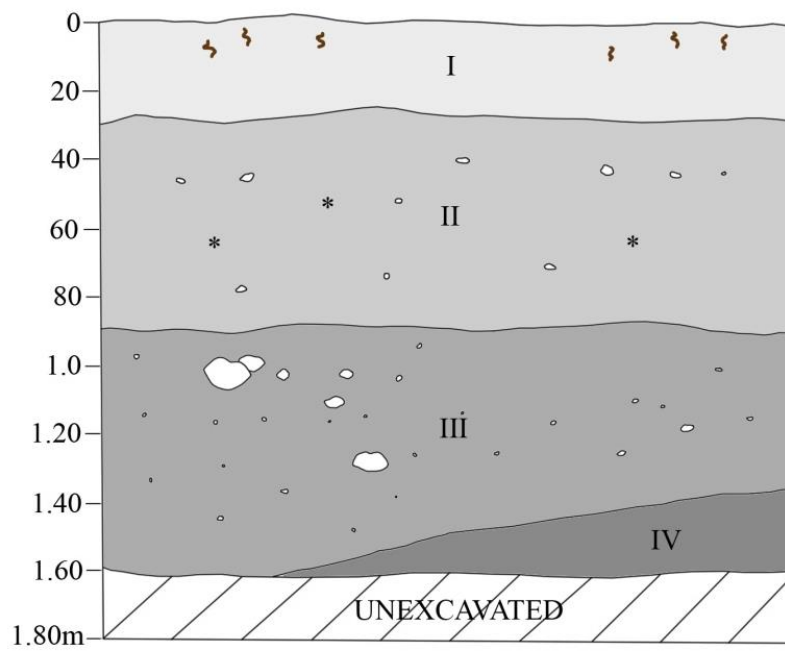
Trench 115



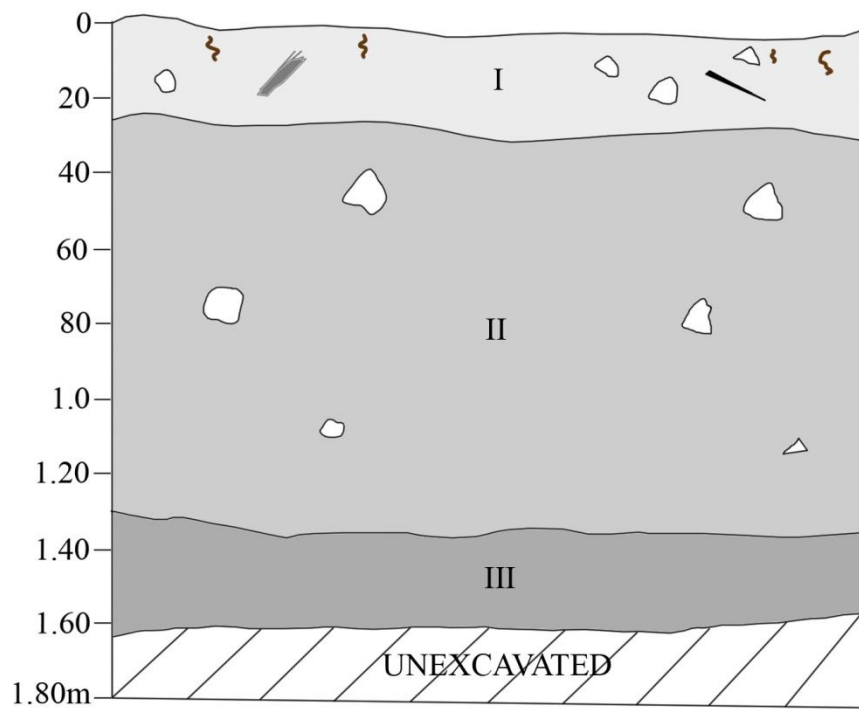
Trench 116



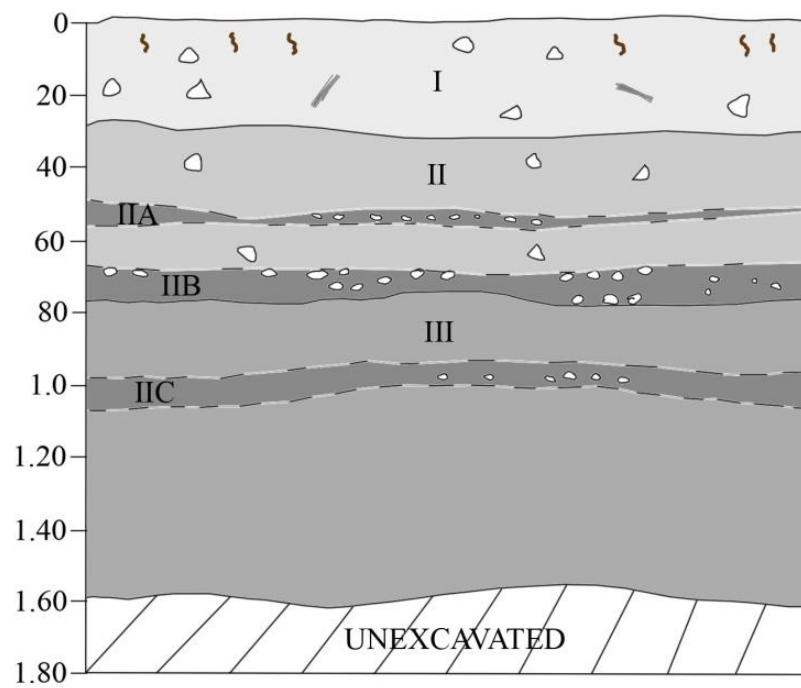
Trench 117



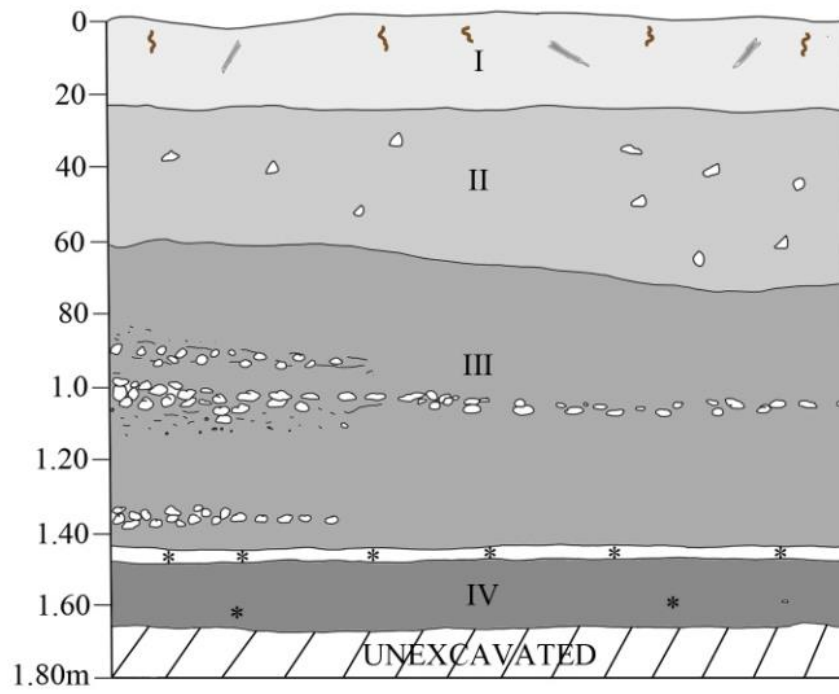
Trench 118



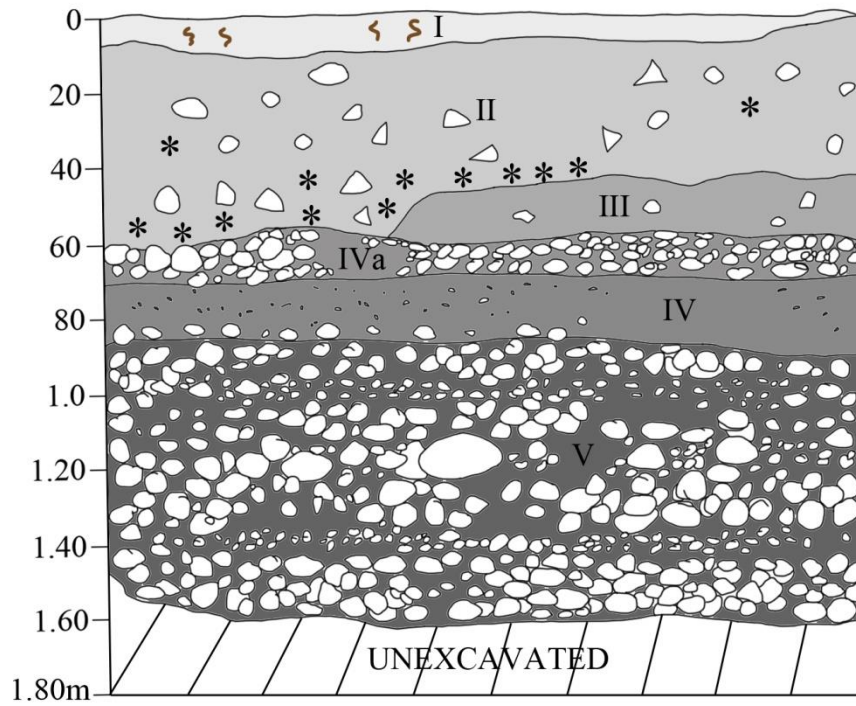
Trench 119



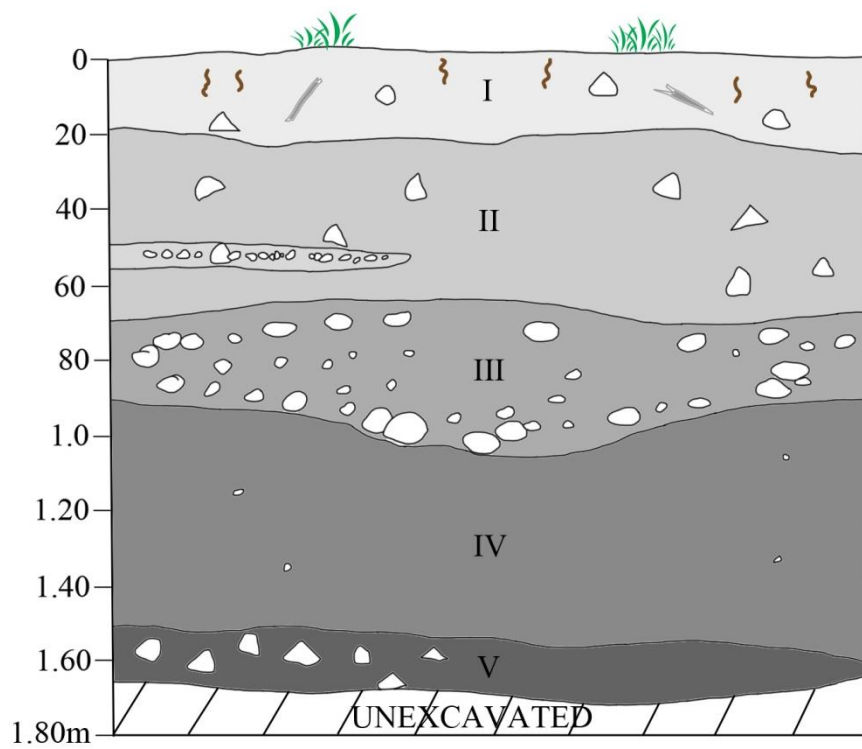
Trench 120



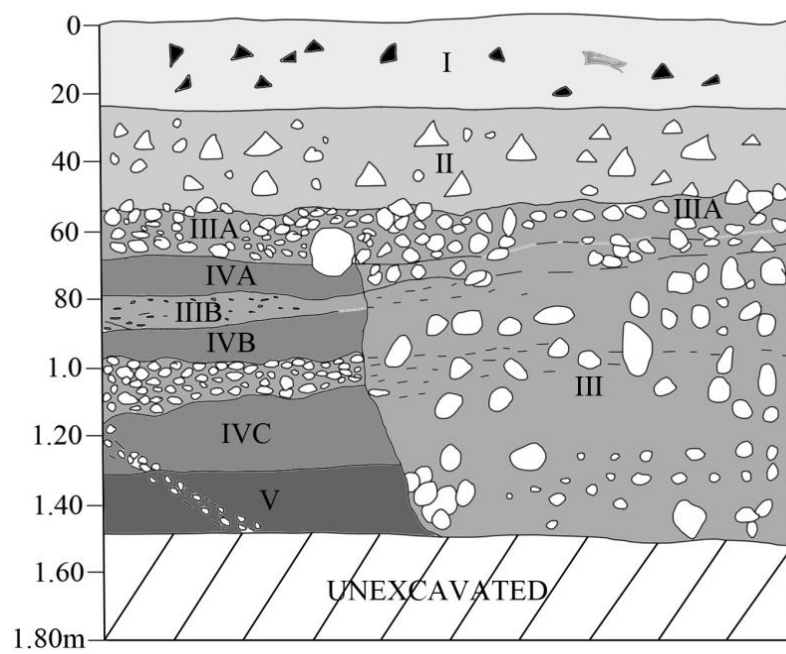
Trench 121



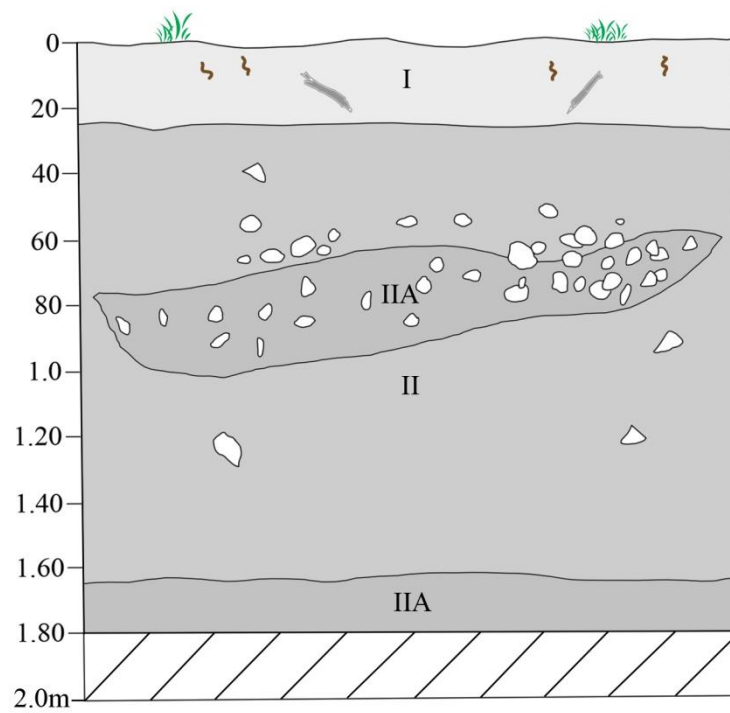
Trench 122



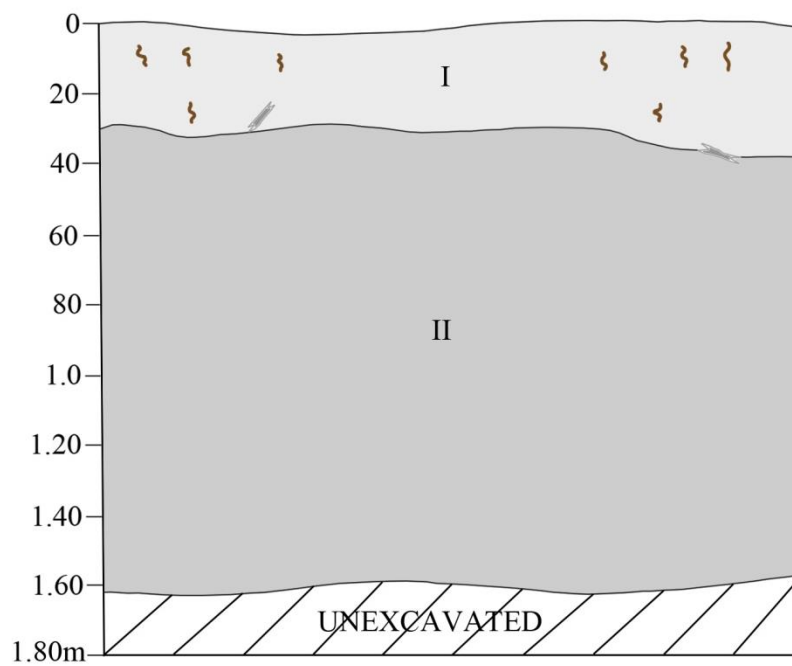
Trench 123



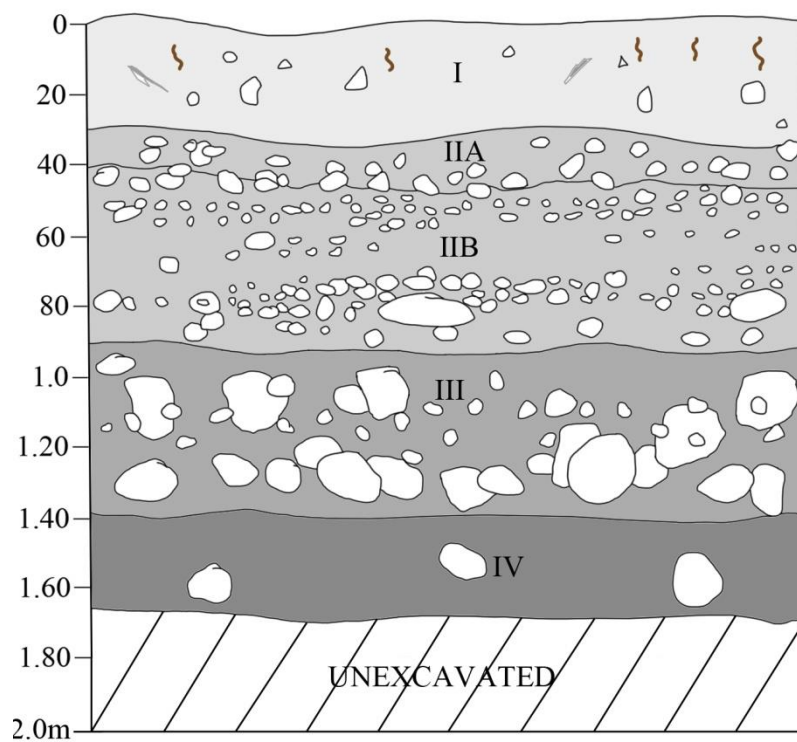
Trench 124



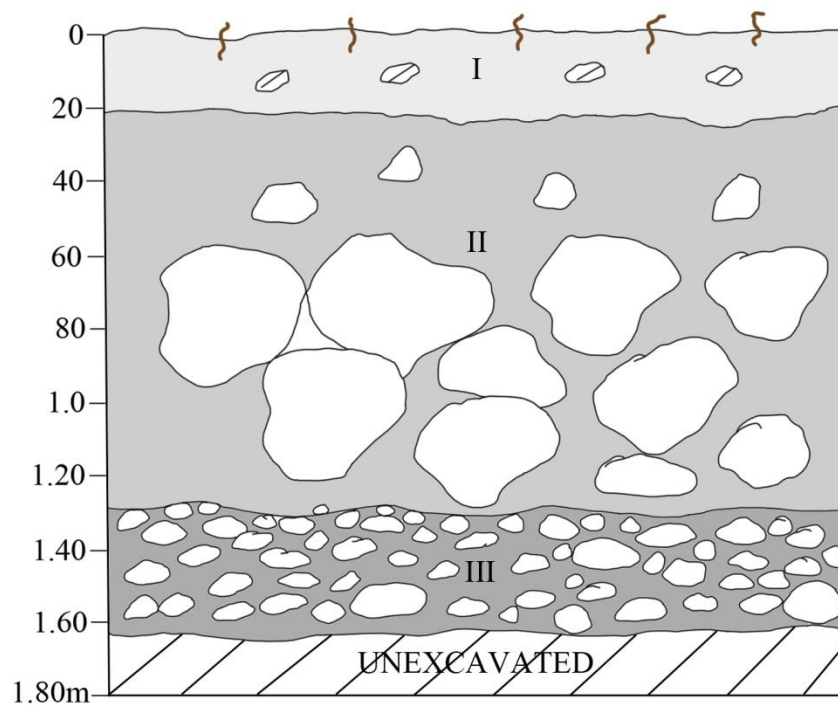
Trench 126



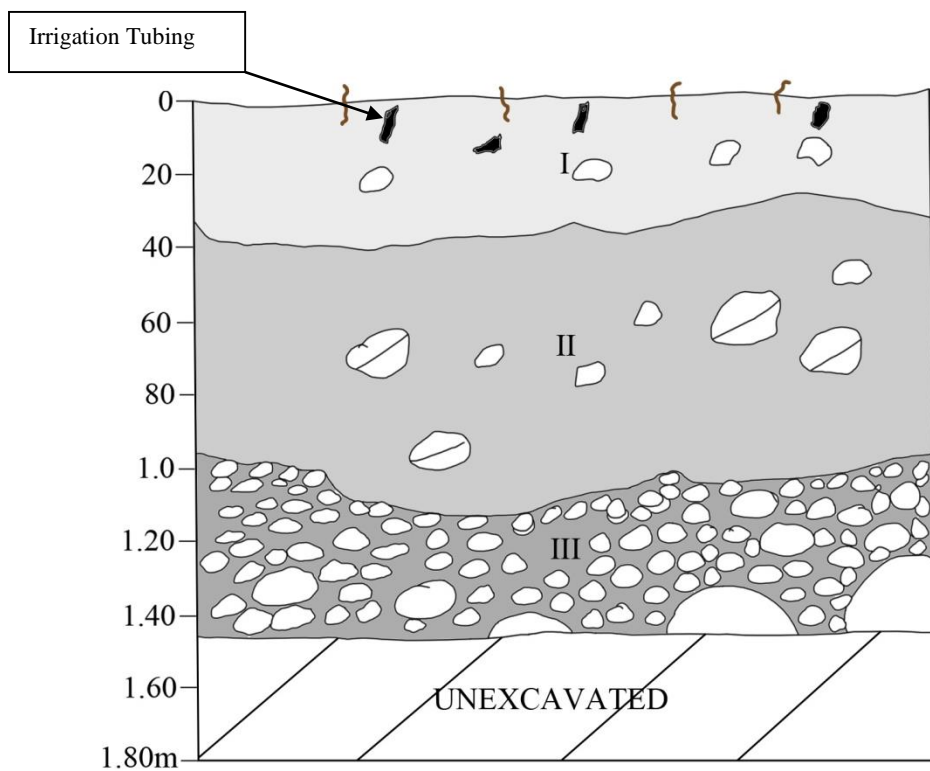
Trench 127



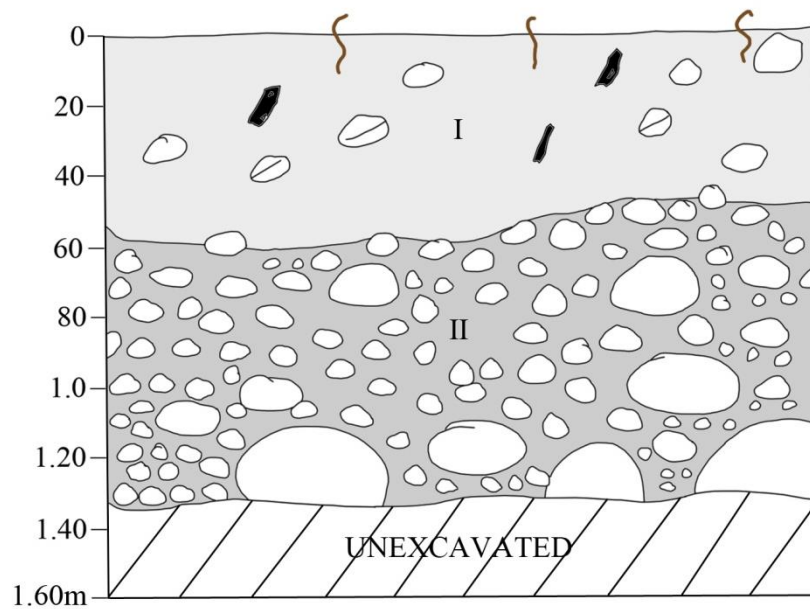
Trench 128



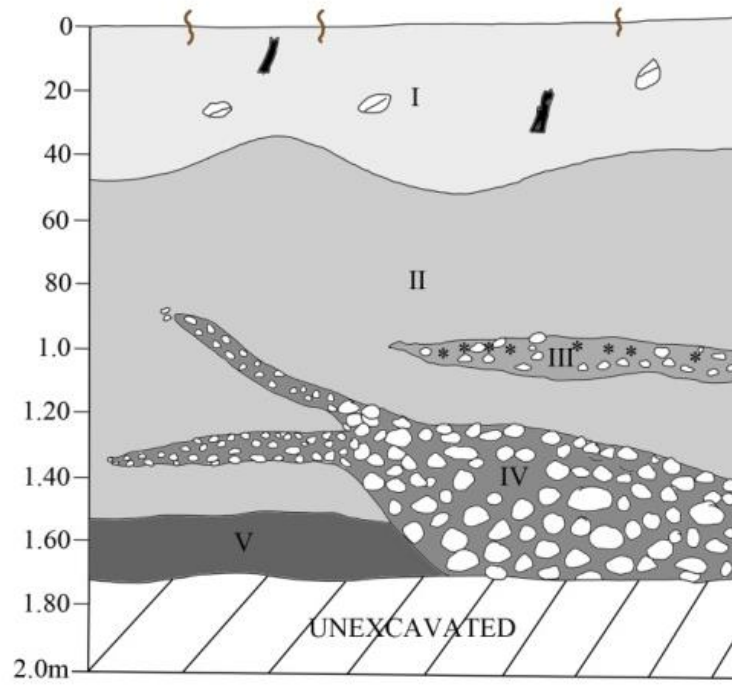
Trench 129



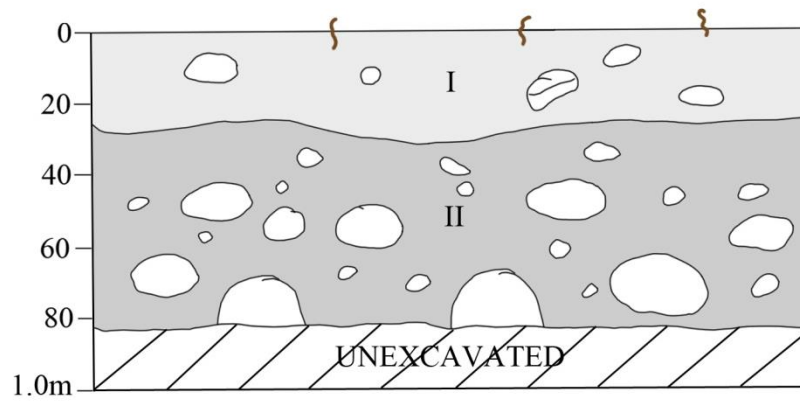
Trench 130



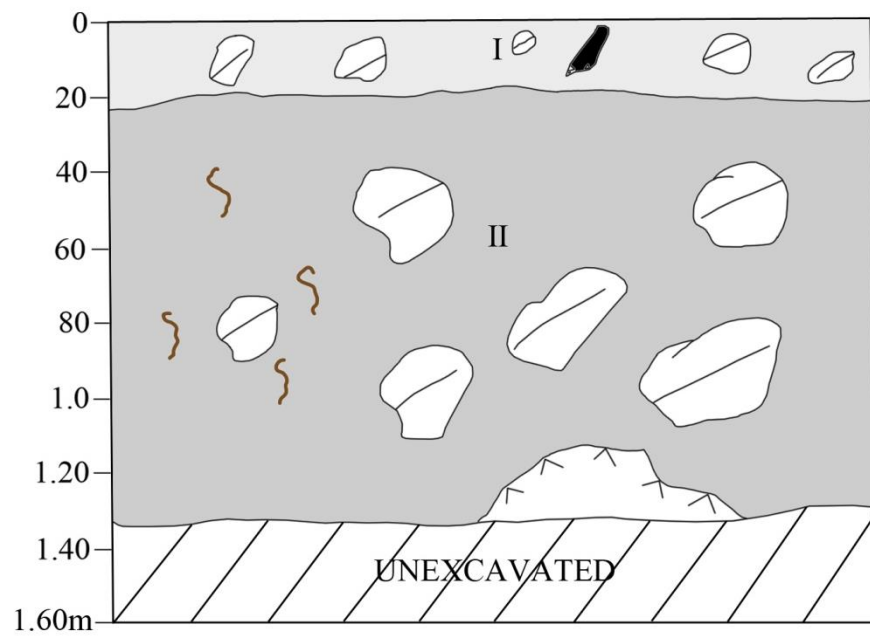
Trench 131



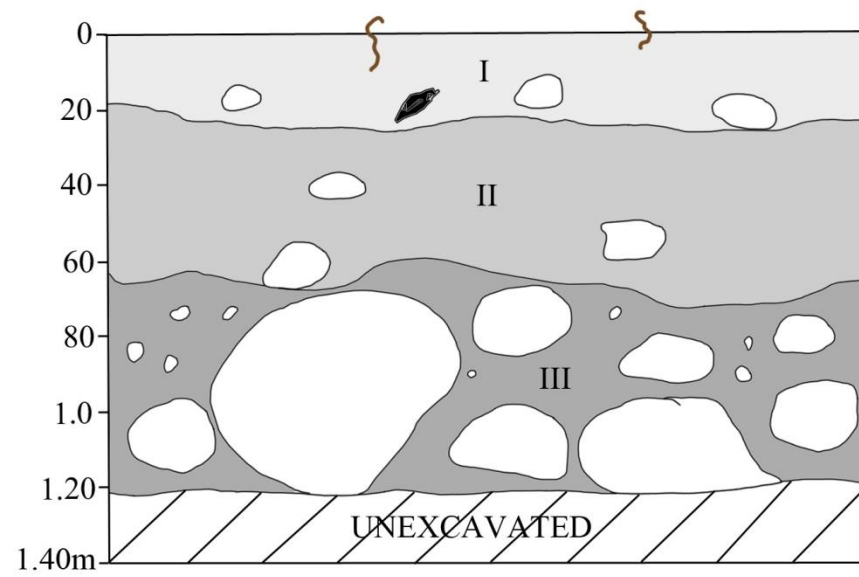
Trench 132



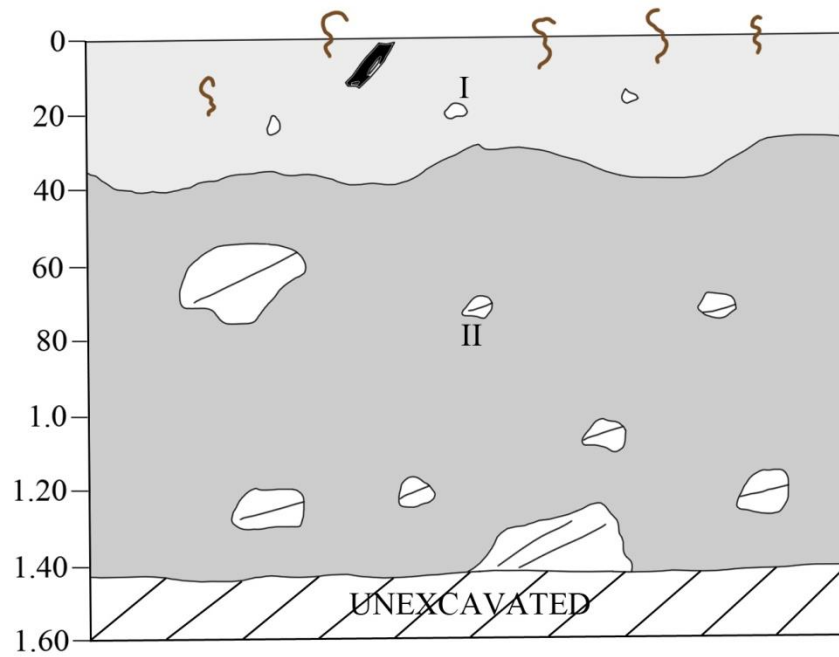
Trench 133



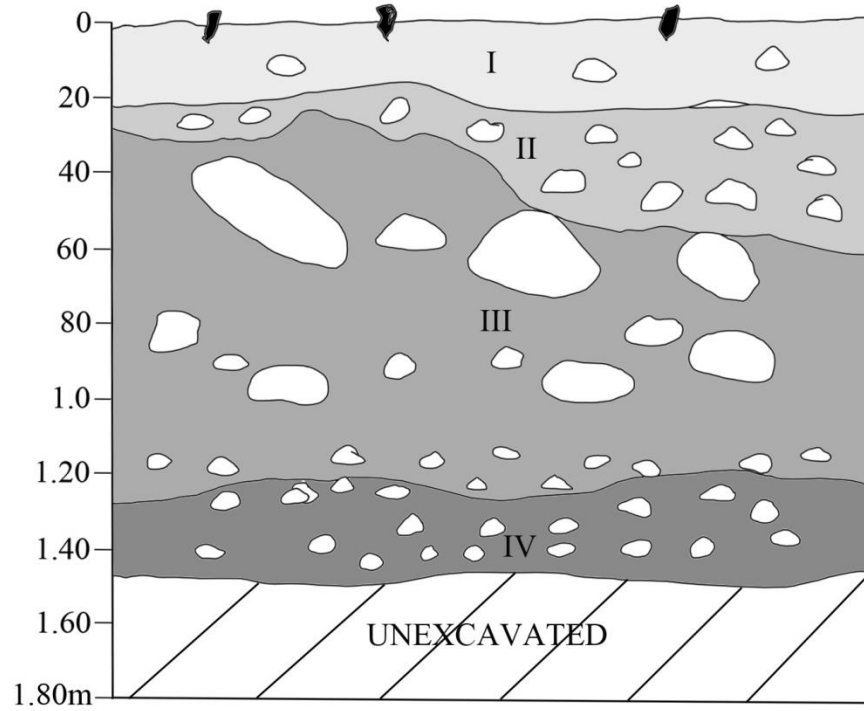
Trench 134



Trench 135

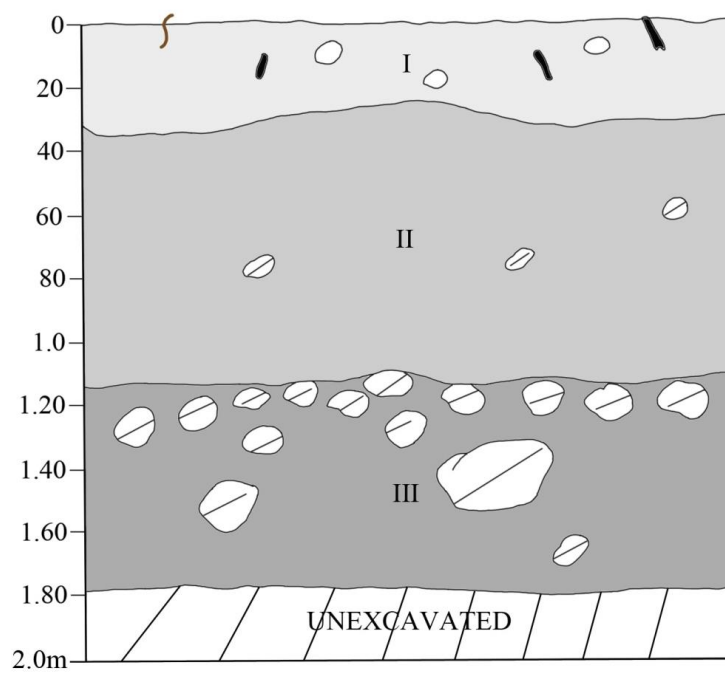


Trench 136

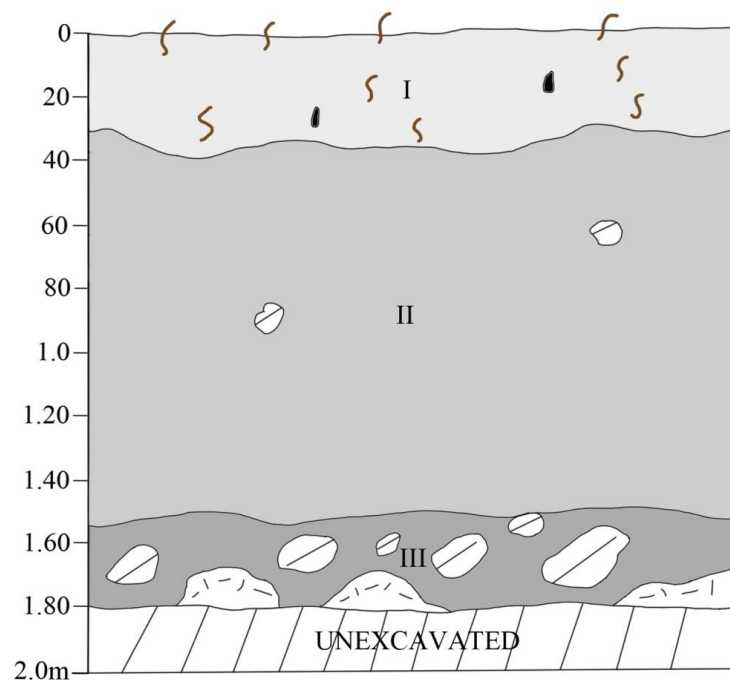


Trench 137

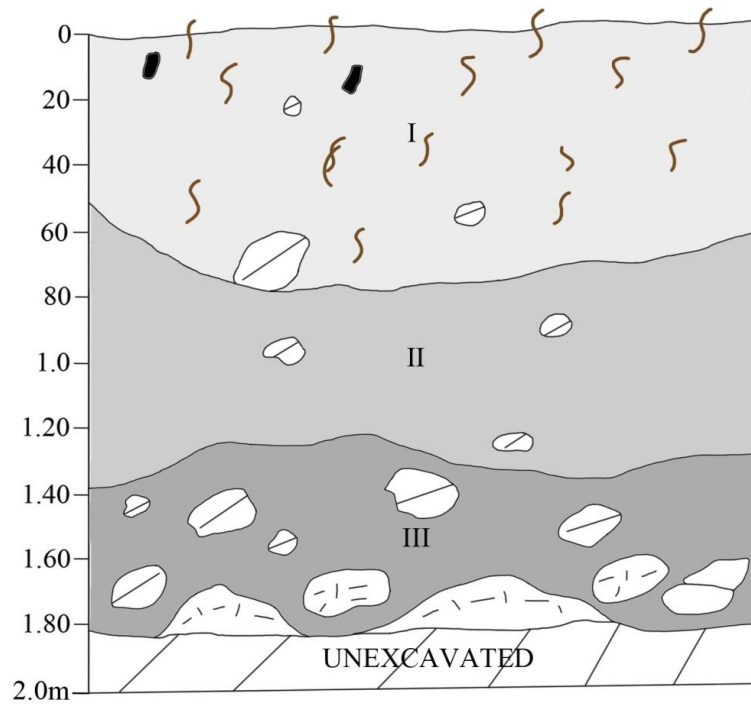
PARCEL 7 TRENCHES



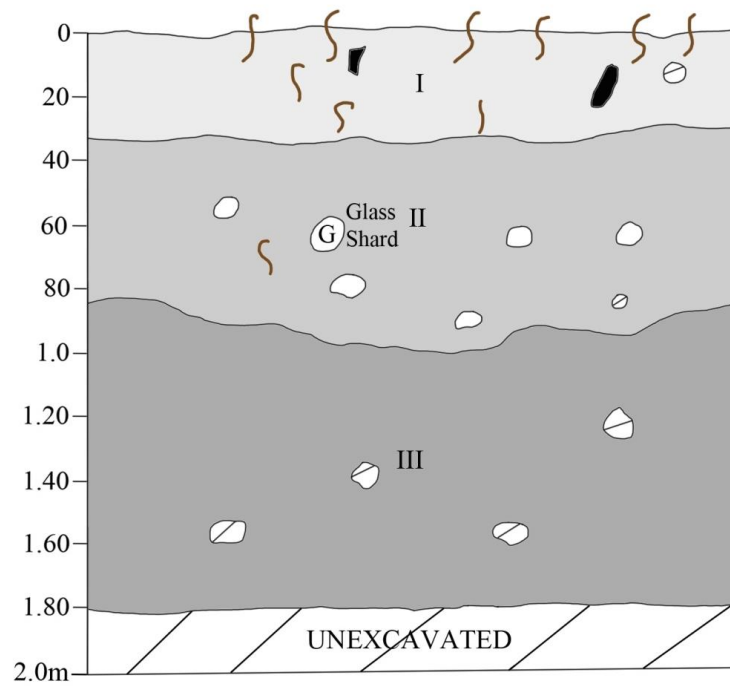
Trench 300



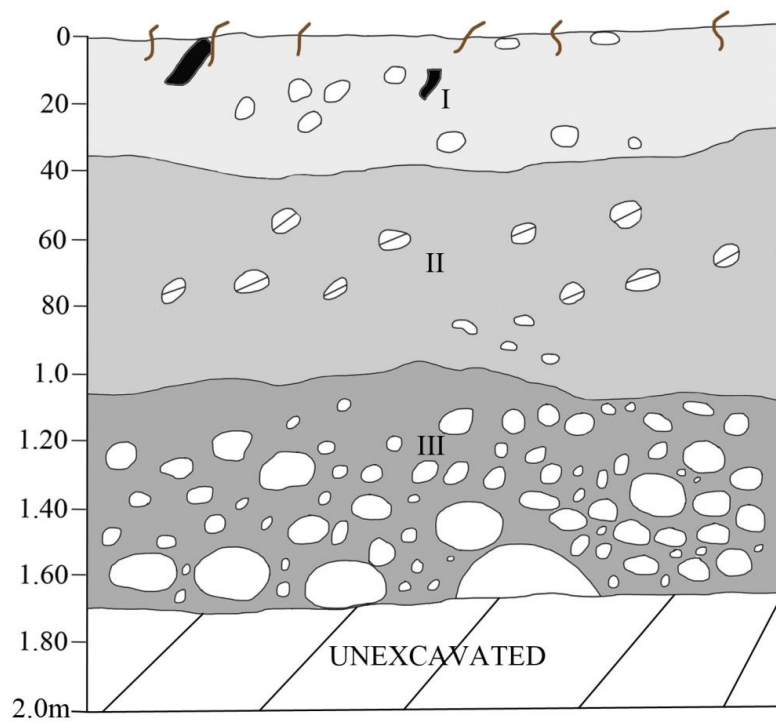
Trench 301



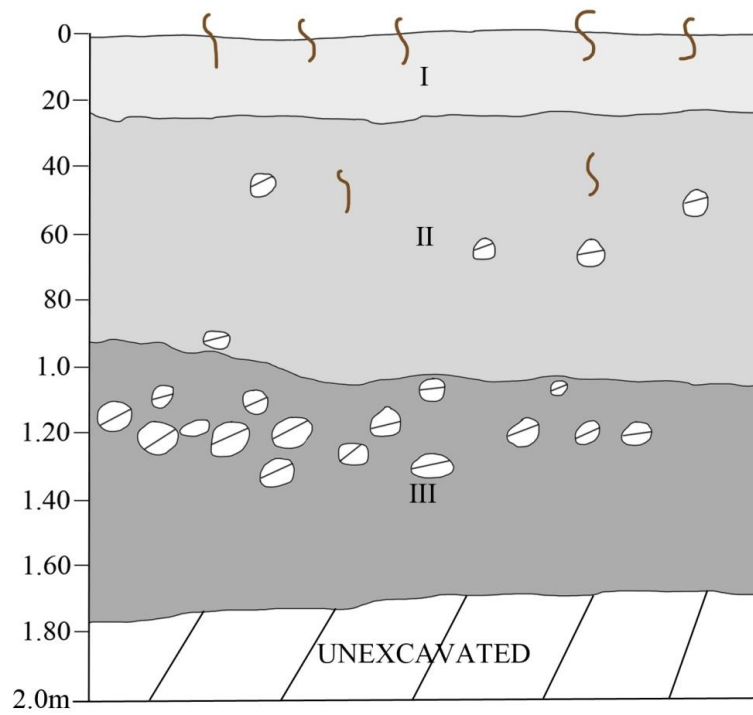
Trench 303



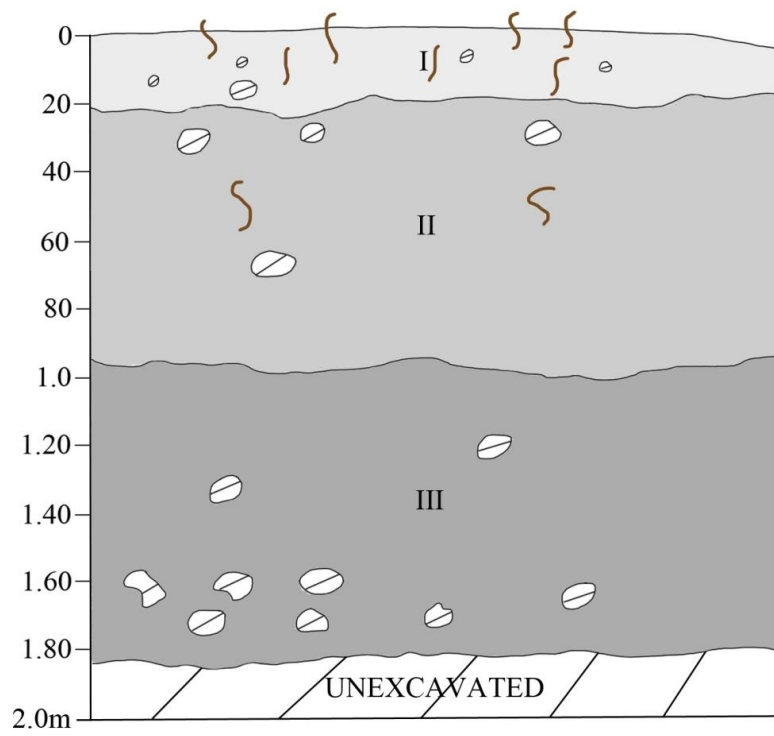
Trench 304



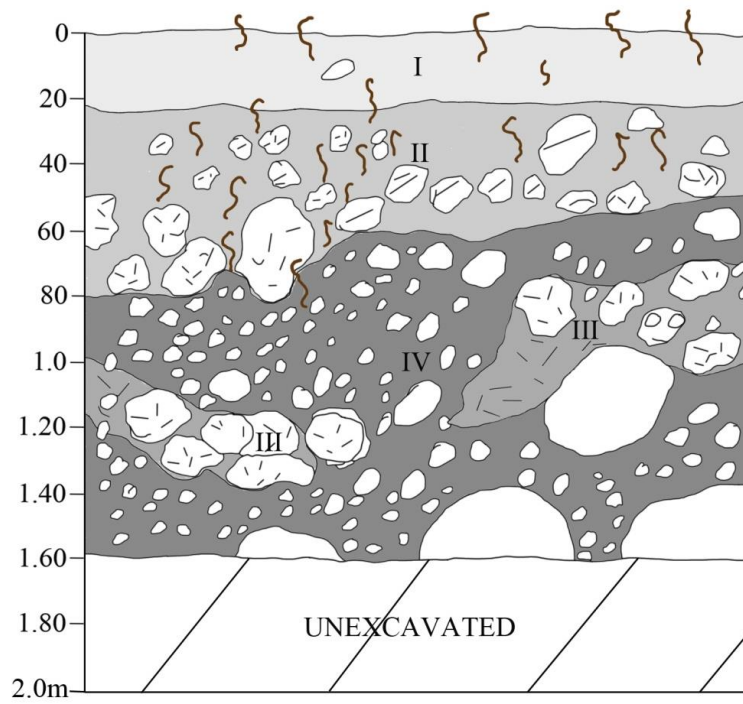
Trench 305



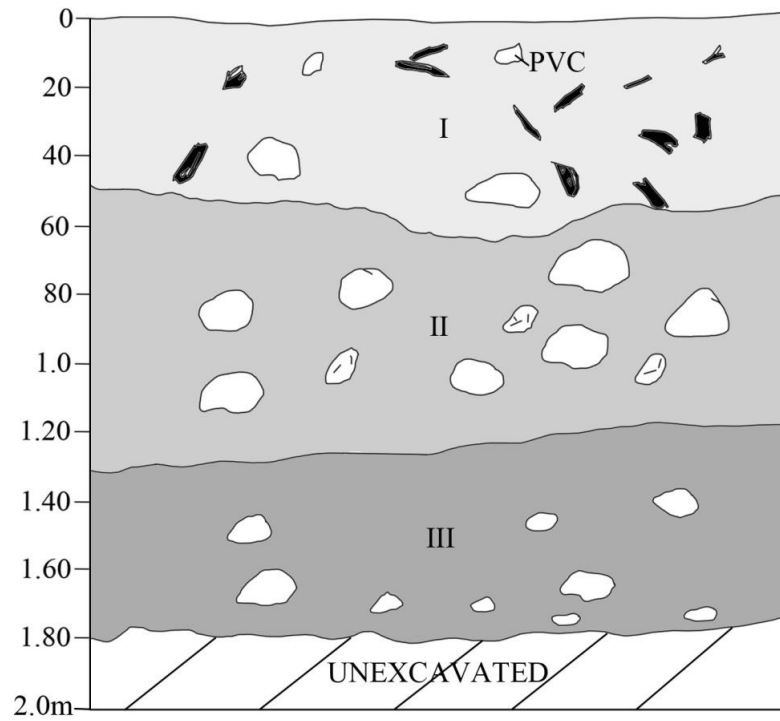
Trench 307



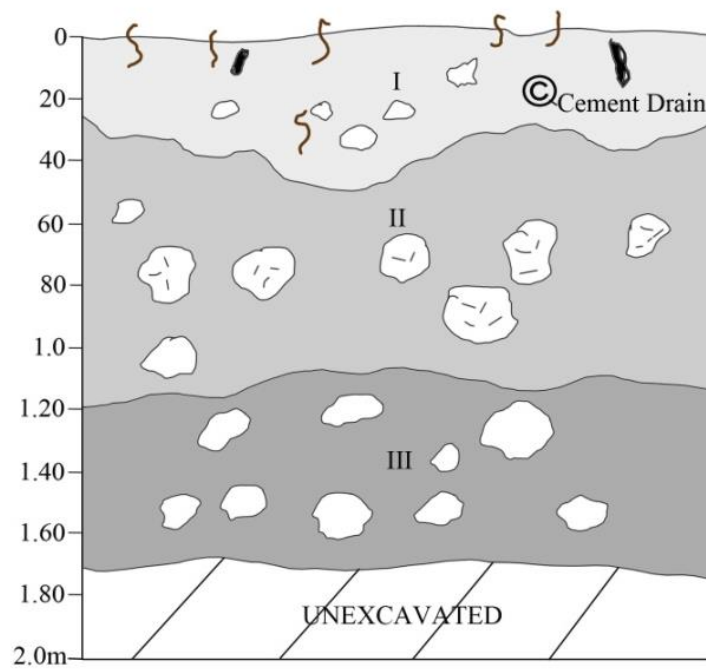
Trench 308



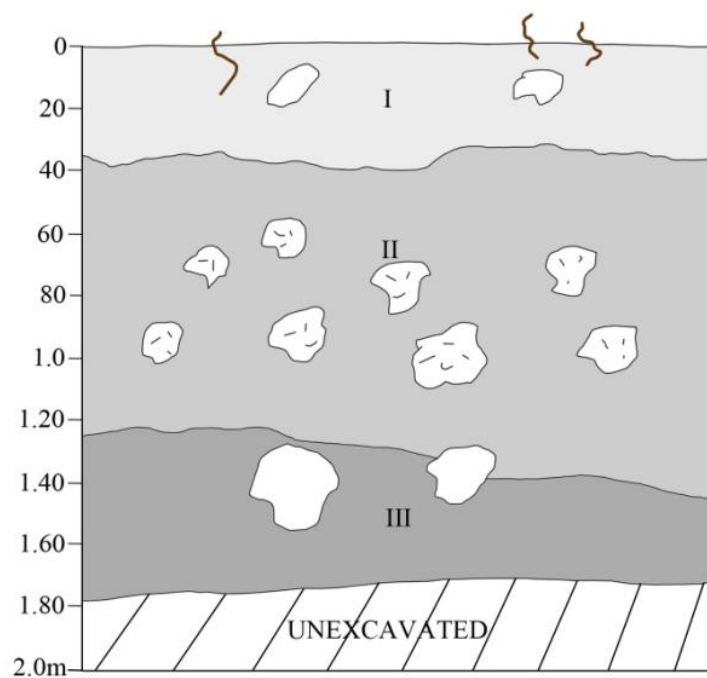
Trench 312



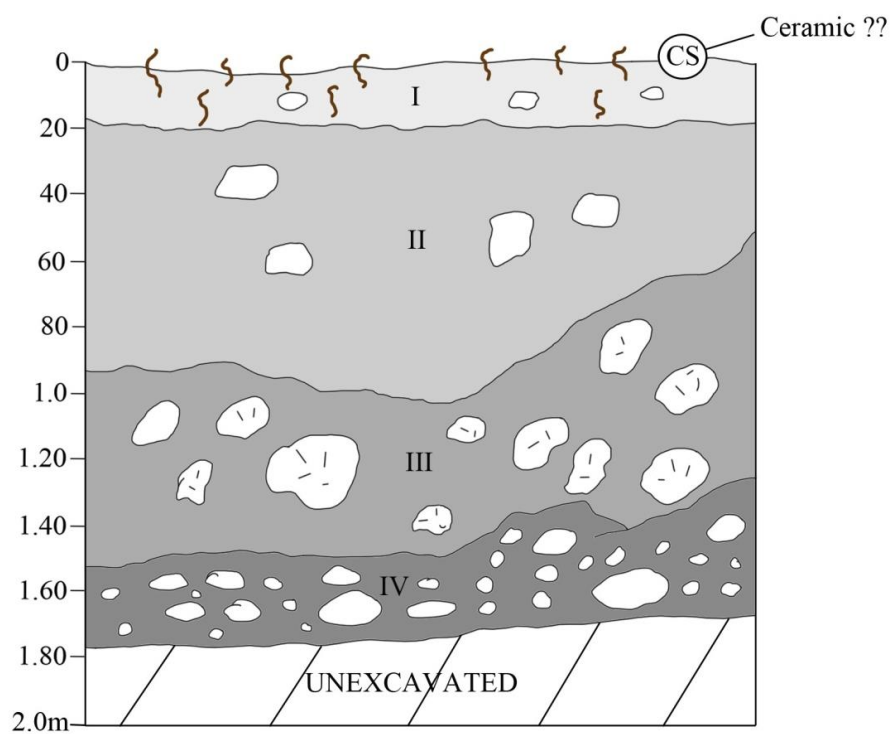
Trench 314



Trench 315



Trench 316



Trench 323