Two of the metal objects (Acc. #s 23 and 54) that were collected from the surface of SIHP # -09165 were identified as rail spikes (Figure 192). A rail spike, also known as a cut spike, is a large nail with an off-set head that is used to secure rails and base plates to railroad ties. The first recorded use of railroad spikes was in 1832.

The remaining metal fragments collected during this AIS were generally very heavily corroded and unidentifiable (Figure 193 through Figure 195).

5.1.4 Miscellaneous Artifacts

Two miscellaneous artifacts include a fragment of furnace “cane” slag and a small fragment of a brick (Table 6). Blast furnace slag that is a byproduct of commercial sugarcane production, commonly referred to as cane slag, was observed scattered throughout the surface of the study area. This material, which, to the untrained eye, can resemble volcanic glass, was historically dumped within agricultural fields along with bagasse ash for disposal and possible soil fortification. Due to its association with SIHP # -08805 Feature C, one fragment of cane slag (Acc. # 1) was collected within TE-7 amongst glass, ceramic, and metal fragments (Figure 196). The presence of cane slag within the feature supports the interpretation that the deposit is associated with commercial agriculture.

A small fragment of a red clay brick (Acc. # 24) was collected within TE-169 (see Figure 196). This isolated fragment lacks additional defining characteristics.

Figure 192. Accession #s 54 (1) and 23 (2) railroad spikes

Figure 193. Accession #s 6 (1), 7 (2) and 10 (3), various hardware, metal and corroded

Figure 194. Representative unidentifiable fragments of Accession #s 17 (1) and 11 (2)

Figure 195. Accession # 92, metal object, flat and square, with perforation

Table 6. Analysis of miscellaneous artifacts

Acc. #	TE-#	Depth (cmbs)	SIHP # 50-50-04	Description
1	73	0-130	-08805 Feature C	Sugar cane slag
24	169	Surface	-	Brick fragment, red clay, smooth on external edge

Figure 196. Accession #s 1, slag, and 24 (2), brick fragment

5.2 Faunal Analysis

5.2.1 Vertebrate

The vertebrate faunal assemblage is composed largely of cow (*Bos taurus*) remains in addition to pig (*Sus scrofa*), fish (Osteichthyes), bird (Aves), and a mouse or vole (Rodentia) (Table 7). Each of the species is only represented by a small number of elements, except for the partial remains of a field mouse or vole that was collected among the fragments of a cow cranium.

Vertebrate faunal remains were collected from four test trenches including within two features designated as components of a historic property, SIHP # -08805, Features C and D, historic subsurface cultural deposits. Within TE-73, SIHP # -08805 Feature C contained remains of a pig, fish, and a small bird. These faunal remains likely represent historic food refuse.

Within TE-171, SIHP # -08805 Feature D contained a partial cow cranium. Additional fragments appearing to be of cow origin were collected from TE-182 and TE-205. The cow remains likely represent historic food refuse. Small rodent bones associated with the cow cranium indicate natural burrowing and nesting within the cow skull. The common mouse species on Maui is the house mouse (*Mus musculus*).

5.2.2 Invertebrate

The invertebrate faunal assemblage is composed of weathered fragments of marine shell, terrestrial snail shell, and a coral fragment (Table 8). Terrestrial snail shell fragments (7.6 g) were identified within TE-73 in association with SIHP # 50-50-04-08805 Feature C along with historic artifacts and vertebrate faunal material. Indeterminate fragments of marine shell (0.4 g) were identified and collected on the surface of SIHP # -09165. The remainder of the invertebrate faunal remains were collected during the excavation of TE-93 (1.6 g), TE-140 (0.8 g), and TE-227 (15.4 g). The collected material does not appear to be indicative of food refuse (midden), but more likely the result of natural deposition or importation of fill material that included these remains.

Table 7. Analysis of vertebrate faunal remains

TE-#	Depth (cmbs)	SIHP # 50-50-04-	Mass (g)	Species	Description
73	65-130	-08805 Feature C	1.5	Pig (*Sus scrofa*)	Four fragments of a cervical vertebra
			0.2	Fish (Osteichthyes)	A vertebral body, a portion of a spine-shaped bone, and three fragments possibly from a dentary
			0.1	Bird (Aves)	Carpometacarpus (17 mm long) and possible proximal end of an ulna from a small bird
171	152	-08805 Feature D	767.0	Cow (*Bos taurus*)	Extremely fragmented cranium; likely less than 50% complete and excludes teeth; recent fragmentation due to brittleness
			0.1	Mouse or vole (Rodentia)	Partial cranium, right hemimandible, left and right femora with an unfused distal end, left scapula, right tibia with fused fibula
182	Backdirt	-	2.0	Likely cow (*Bos taurus*)	Cortical fragment, likely from a large long bone with a smooth, flat surface area; relatively thick and dense with longitudinal, fine cracks from weathering
205	70	-	51.8	Cow (*Bos taurus*)	Highly fragmented thoracic vertebra (7 larger pieces and many small fragments)

Table 8. Analysis of invertebrate faunal remains

TE-#	Depth (cmbs)	SIHP # 50-50-04	Mass (g)	Species	Description
73	0-130	-08805 Feature C	7.6	Land snail (*Achantinellidae*)	30 fragments, weathering and sun bleaching evident on surface
93	125	-	1.6	Unknown	Water-rounded, branch coral fragment
140	146	-	0.8	Land snail (*Achantinellidae*)	3 fragments, weathering and sun bleaching evident on surface
227	43-77	-	14.2	Unknown	5 fragments, water-rounded
227	178	-	1.2	Turbinidae	1 fragment, chalky white
Surface	0	-09165	0.4	Unknown	1 fragment, water-rounded

Section 6 Historic Property Descriptions

The AIS identified a total of four historic properties located within the AIS study area (see Figure 27 and Figure 28). These historic properties include one previously documented subsurface cultural deposit (SIHP # 50-50-04-08805) and three newly identified sites that include: a historic cement and concrete alignment or remnant ditch (SIHP # 50-50-04-09164); a historic artifact scatter related to the former HC&S Camp Seven (SIHP # 50-50-04-09165); and a historic concrete remnant foundation for a flume or ditch (SIHP # 50-50-04-09166).

6.1 SIHP # 50-50-04-08805

FORMAL TYPE:	Complex
FUNCTION:	Refuse deposit
NUMBER OF FEATURES:	4
AGE:	Historic (Commercial Agriculture)
TAX MAP KEY:	[2] 3-8-005:002 por.
LAND JURISDICTION:	Private; MP West LLC
PREVIOUS DOCUMENTATION:	Yucha et al. (2021)

SIHP # 50-50-04-08805 is a subsurface cultural deposit complex that was initially documented during the AIS for the AES Kuihelani Solar Plus Storage Project (Yucha et al. 2021) located north of the current study area. Yucha et al. (2021) identified two subsurface features (Feature A and Feature B) in association with the historic property. The current AIS has identified two additional features (Feature C and Feature D) within the current study area. Overall, SIHP # -08805 includes four locations of buried deposits associated with the use or improvement of the land for commercial agriculture (Figure 197 and Figure 198).

Yucha et al. (2021:211) described SIHP # -08805 Feature A as follows:

> SIHP # -8805 Feature A is a buried cultural deposit that was identified during subsurface testing in Testing Area 2 within TE-79, TE-82, TE-87, TE-89, and TE-97 [Figure 199 through Figure 208]. The deposit consists of a fill stratum of slurry sediment that was pumped or trucked into settling ponds within the project area and left to settle and evaporate. The slurry sediment contains charcoal flecking, organic matter, and historic refuse. In profile, the sediment is identified by micro-stratigraphic bands that form during the settling process in stagnant water. This micro-stratigraphy is also observed in hydraulic land reclamation fill in leeward O‘ahu and is similar in nature to natural varved deposits at the bottom of lakes. Following the settling process, it is believed that the slurry material was plowed under to enrich the low-grade agricultural soils within the project area. The portions of the slurry stratum observed during subsurface testing survived the repeated plowing process. [Yucha et al. 2021:211]

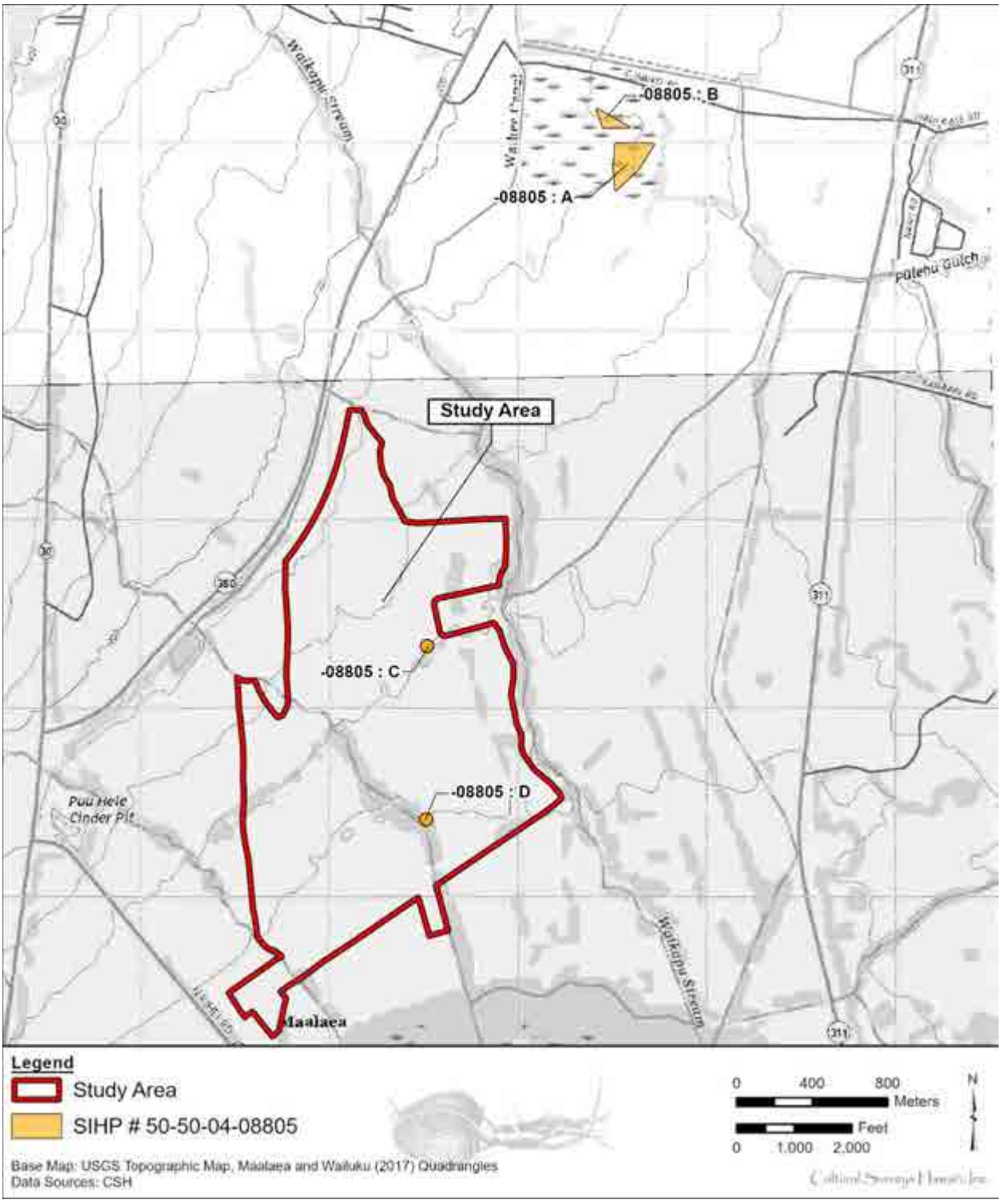


Figure 197. Portion of the 2017 Maalaea and 2017 Wailuku USGS 7.5-minute topographic quadrangles showing the full extent of SIHP # 50-50-04-08805 in relation to the current study area (U.S. Geological Survey 2017a, 2017d)

Figure 198. Aerial photograph showing the full extent of SIHP # 50-50-04-08805 in relation to the current study area (EagleView Technologies Inc. 2023)

Figure 199. TE-79 from Yucha et al. (2021:212), oblique view of west wall, view to northwest

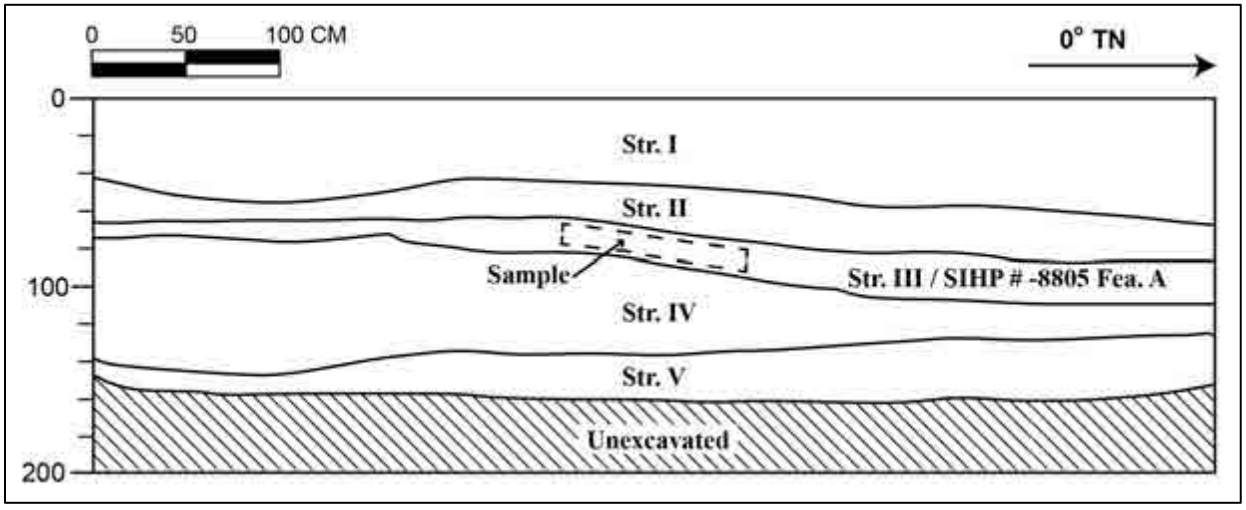


Figure 200. TE-79 from Yucha et al. (2021:212), stratigraphy of west wall showing sampled area

Figure 201. TE-82 from Yucha et al. (2021:213), close-up of east wall showing SIHP # -08805 Feature A, view to east

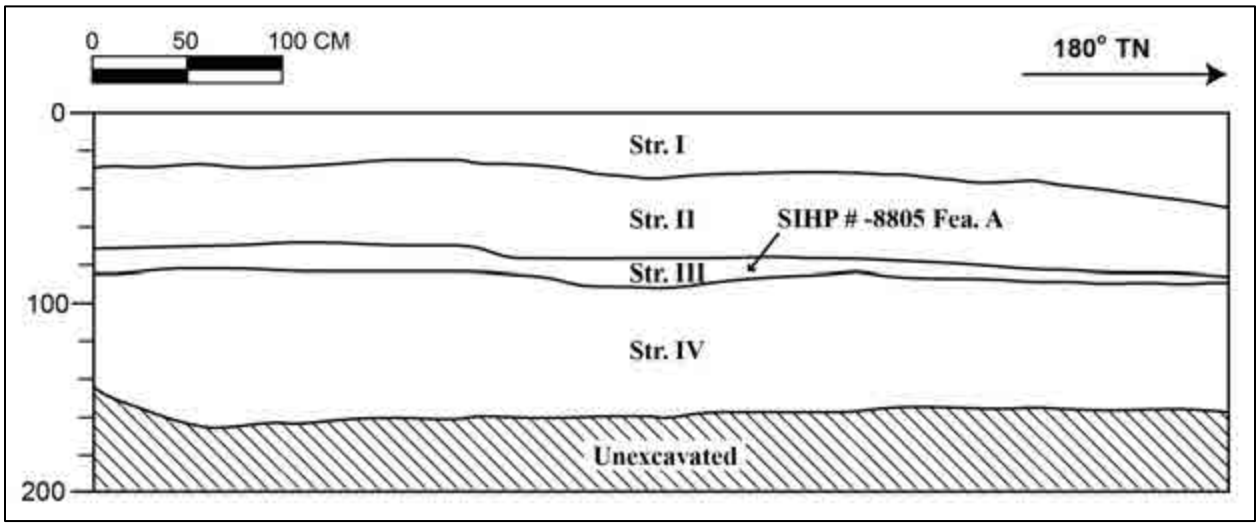


Figure 202. TE-82 from Yucha et al. (2021:212), stratigraphy of east wall

Figure 203. General view of the east wall of TE-87 from Yucha et al. (2021:215), showing SIHP # -08805 Feature A, the bottom stratum, view to south

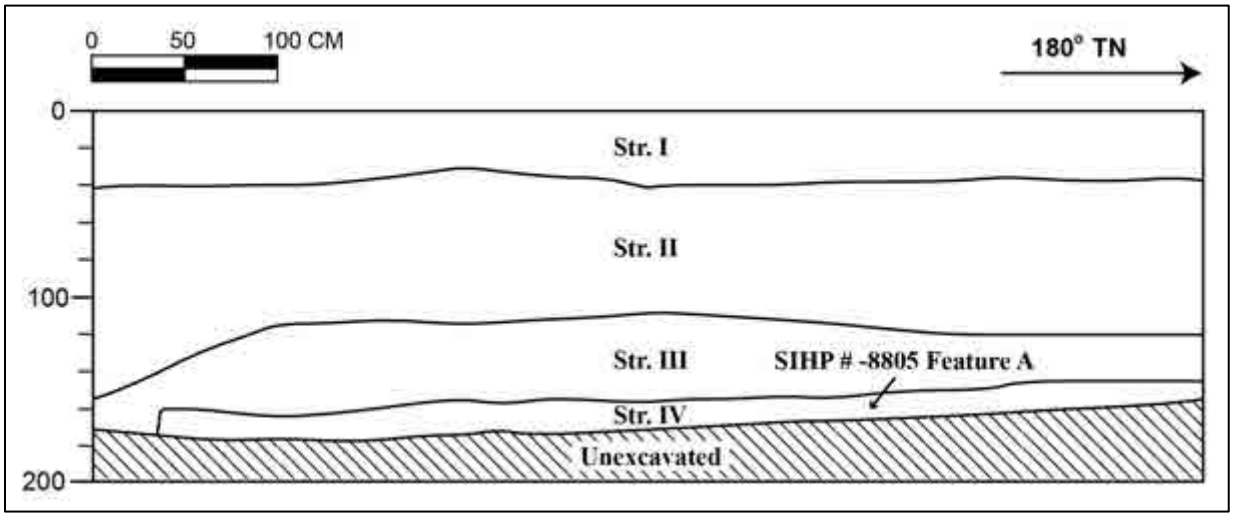


Figure 204. TE-87 from Yucha et al. (2021:216) showing Stratum IV as SIHP # -08805 Feature A

Figure 205. General view of west wall of TE-89 from Yucha et al. (2021:217) showing SIHP # -08805 Feature A along the base in the southern half of the excavation, view to northwest

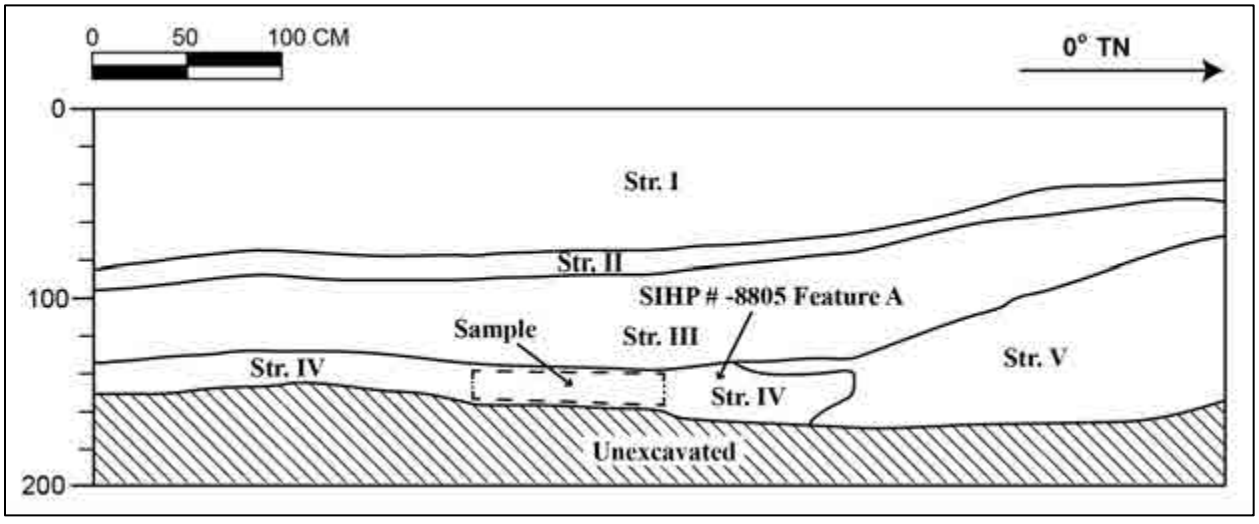


Figure 206. Profile map of TE-89 from Yucha et al. (2021:218) showing Stratum IV as SIHP # -08805 Feature A

Figure 207. TE-97 from Yucha et al. (2021:219), close-up of east wall, showing SIHP # -08805 Feature A, view to east

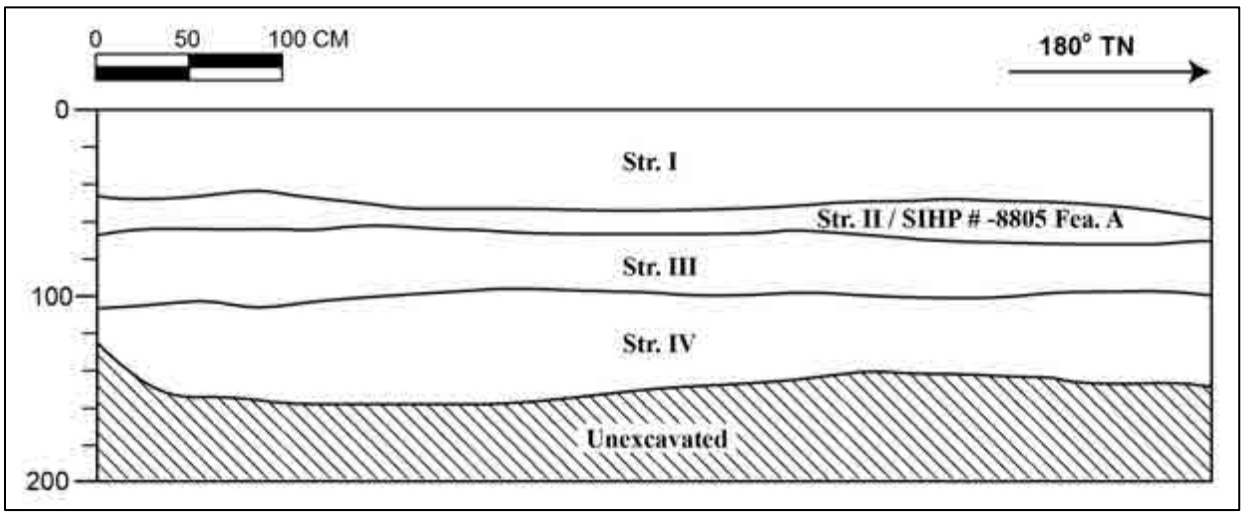


Figure 208. TE-97 from Yucha et al. (2021:219), stratigraphy of east wall showing SIHP # -08805 Feature A

Yucha et al. (2021:211) described SIHP # -08805 Feature B as follows:

> SIHP # -8805 Feature B is a buried cultural deposit that was identified during subsurface testing in Testing Area 2 within TE-63, TE-63A, TE-70, and TE-72 [Figure 209 through Figure 216]. The deposit consists of a stratum and berms comprised of sandy loam fill sediment mixed with large amounts of historic refuse with manufacture dates spanning the 1920s to 1980s. The refuse included whole and fragmentary glass bottles, ceramic vessels, metal objects, metal wire, bricks, concrete fragments, and other household items. There is no evidence of historic habitation in the vicinity of Feature B; therefore, the deposits containing historic artifacts are considered to have been imported from elsewhere. The sediment berms are believed to be remnants of the settling ponds that were used to contain slurry material for enrichment of the low-grade agricultural soils within the project area. [Yucha et al. 2021:211]

The newly identified SIHP # -08805 Feature C is a buried cultural deposit that was identified during subsurface testing within TE-73 (Figure 217 and Figure 218). The deposit included broken concrete rubble, seven metal artifacts including two nails (Acc. #s 6-11 and 17), five glass fragments (Acc. #s 2-5 and 18), a ceramic porcelain insulator spacer (Acc. # 12), one fragment of cane slag (Acc. # 1), and faunal remains representing terrestrial snail, pig, fish, and bird. All of the cultural material, with the exception of the concrete rubble, was collected for laboratory analysis.

The newly identified SIHP # -08805 Feature D is a buried cultural deposit that was identified during subsurface testing within TE-171 (Figure 219 through Figure 222). The deposit included one glass bottle fragment (Acc. # 20) and faunal remains representing cow and mouse or vole. All of the material observed within the excavation was collected for laboratory analysis, however it should be noted that the cow skeletal material extended into the eastern and southern trench sidewalls and could not be safely removed. No pit outlines or other characteristics were observed in association with the feature.

As noted by Yucha et al. (2021:211), background research indicates that the cultural material and faunal remains associated with SIHP # -08805 appear to be related to historic dumping of material throughout the sandy agricultural fields of Central Maui in order to level and improve soil characteristics. Sediment and debris cleaned from irrigation ditches or removed via devices such as the “hydroseparator” in the Wailuku River (Figure 223) were hauled to the study area, dumped into piles or low areas, and then spread by plowing. This process appears to have continued into modern times as evidenced by the cluster of mounds present within the current study area in 2013 before the area was replanted with sugarcane (Figure 224).

SIHP # 50-50-04-08805 was previously assessed by Yucha et al. (2021) as significant pursuant to HAR §13-284-6, Criterion “d” (have yielded, or is likely to yield, information important for research on prehistory or history). The additional findings of SIHP # -08805 Feature C and Feature D during the current AIS support this assessment. The historic property retains the integrity of location, setting, materials, and workmanship, and has provided information important to research on historic land use, soil treatment, and refuse disposal within the study area. SIHP # -08805 is evaluated as eligible for listing in the Hawai‘i Register of Historic Places (HRHP).

Figure 209. East wall of TE-63 from Yucha et al. (2021:220) showing SIHP # -08805 Feature B, view to east

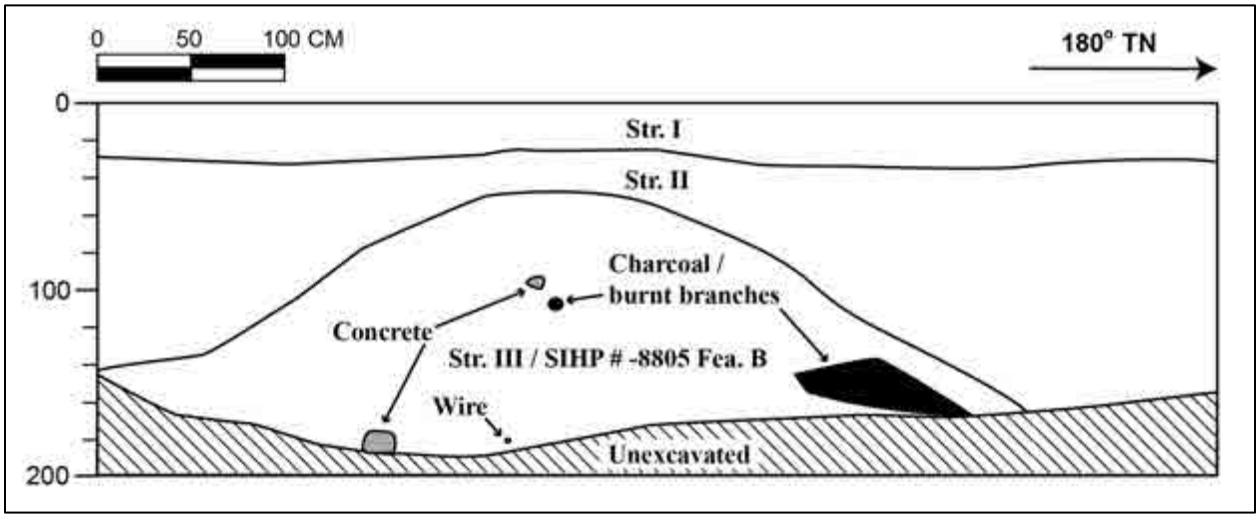


Figure 210. East wall of TE-63 from Yucha et al. (2021:220) showing Stratum III as SIHP # -08805 Feature B

Figure 211. TE-63A from Yucha et al. (2021:221) containing SIHP # -08805 Feature B at the base in the northern half of the excavation, view to northeast

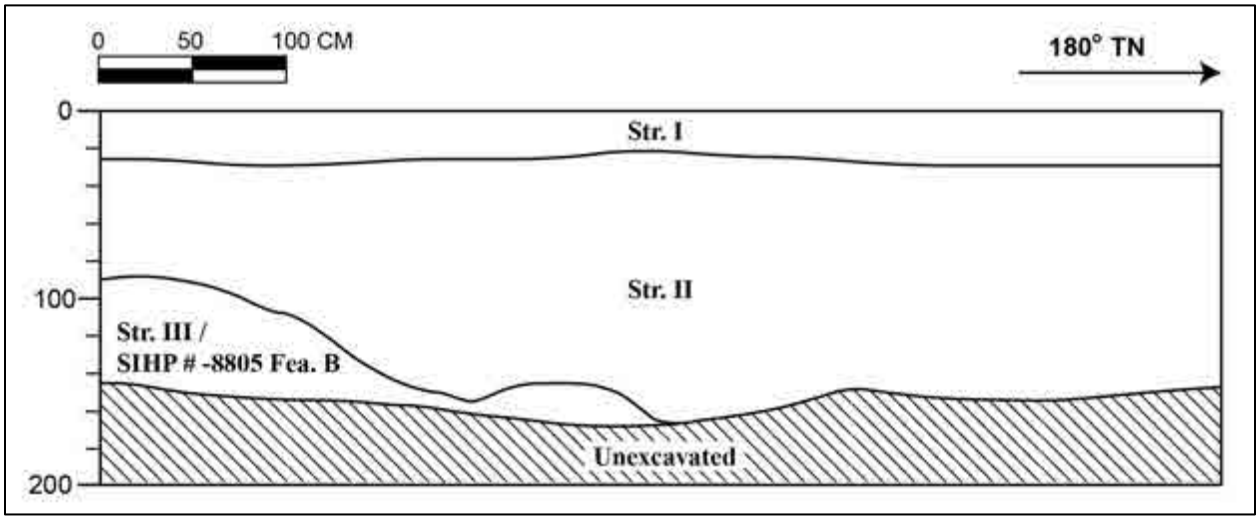


Figure 212. TE-63A from Yucha et al. (2021:221), stratigraphy of east wall, Stratum III was designated as SIHP # -08805 Feature B, containing historic and plantation-era debris

Figure 213. TE-70 from Yucha et al. (2021:222), close-up of west wall, view to west

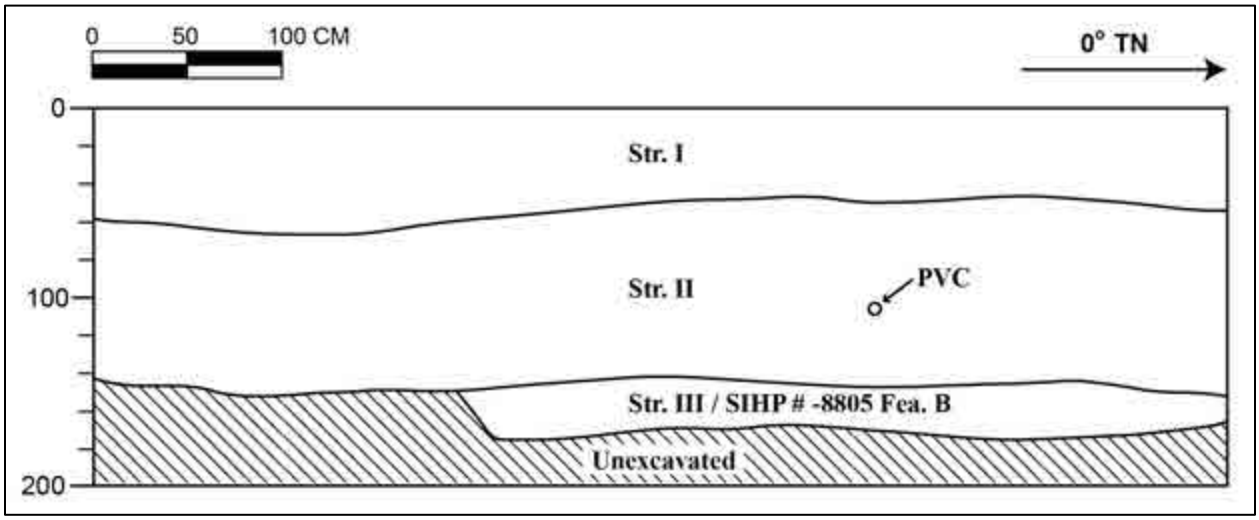


Figure 214. TE-70 from Yucha et al. (2021:222), stratigraphy of west wall; Stratum III was designated as SIHP # -08805 Feature B, containing historic and plantation-era debris

Figure 215. Overview of TE-72 from Yucha et al. (2021:223) containing SIHP # -08805 Feature B, view to northeast

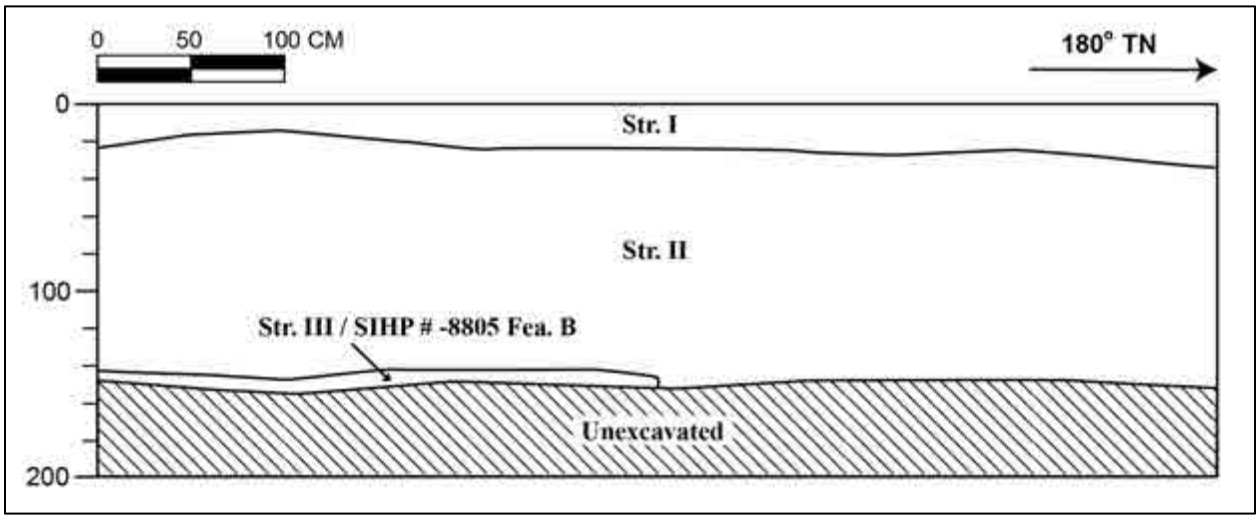


Figure 216. East wall of TE-72 from Yucha et al. (2021:224) showing Stratum III as SIHP # -08805 Feature B

Figure 217. Oblique profile view of the southern half of TE-73 containing SIHP # -08805 Feature C (concrete fragments in background, artifact/faunal location above north arrow), view to southeast

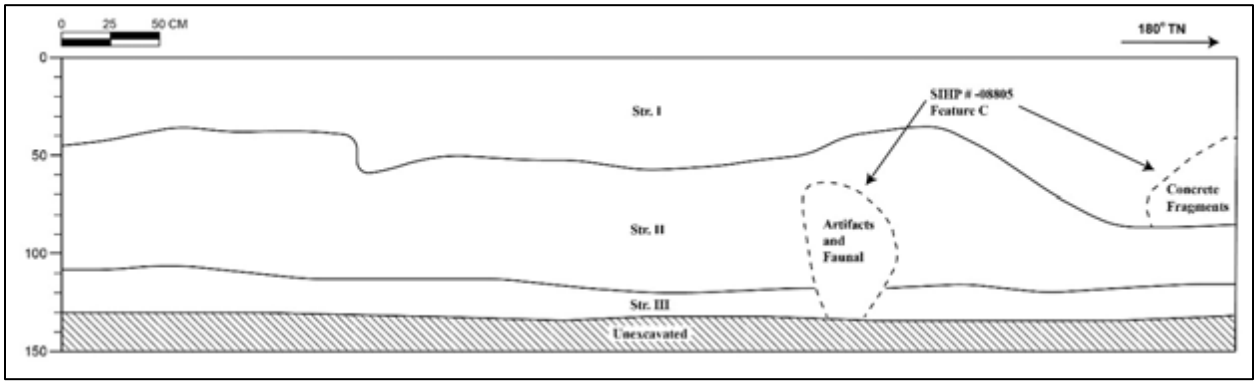


Figure 218. East wall of TE-73 showing SIHP # -08805 Feature C

Figure 219. Oblique profile view of TE-171 depicting the stratigraphy observed overlying SIHP # -08805 Feature C, view to northwest

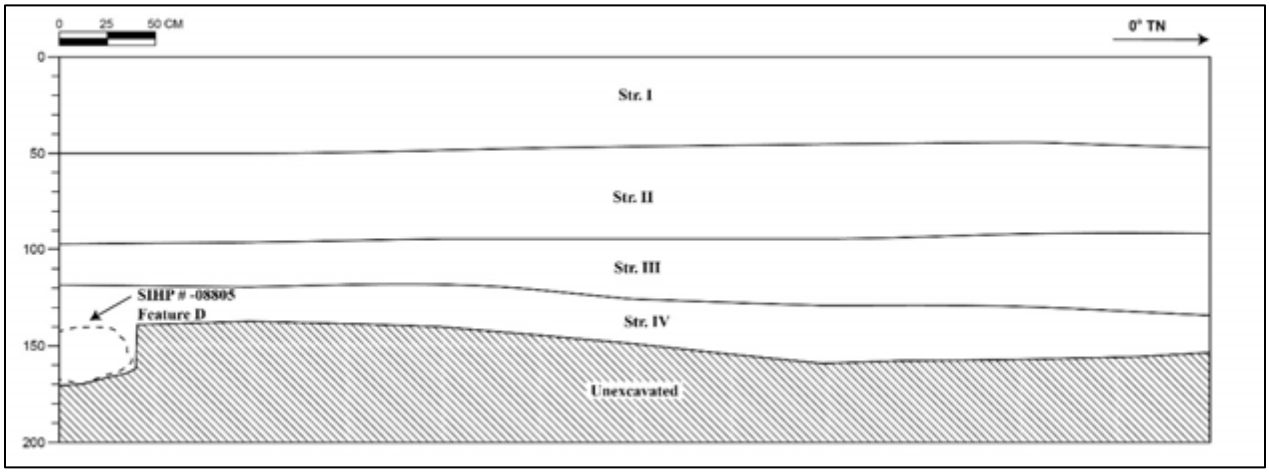


Figure 220. West wall of TE-171 showing SIHP # -08805 Feature D

Figure 221. Closeup plan view of SIHP # -08805 Feature D within TE-171, view to east

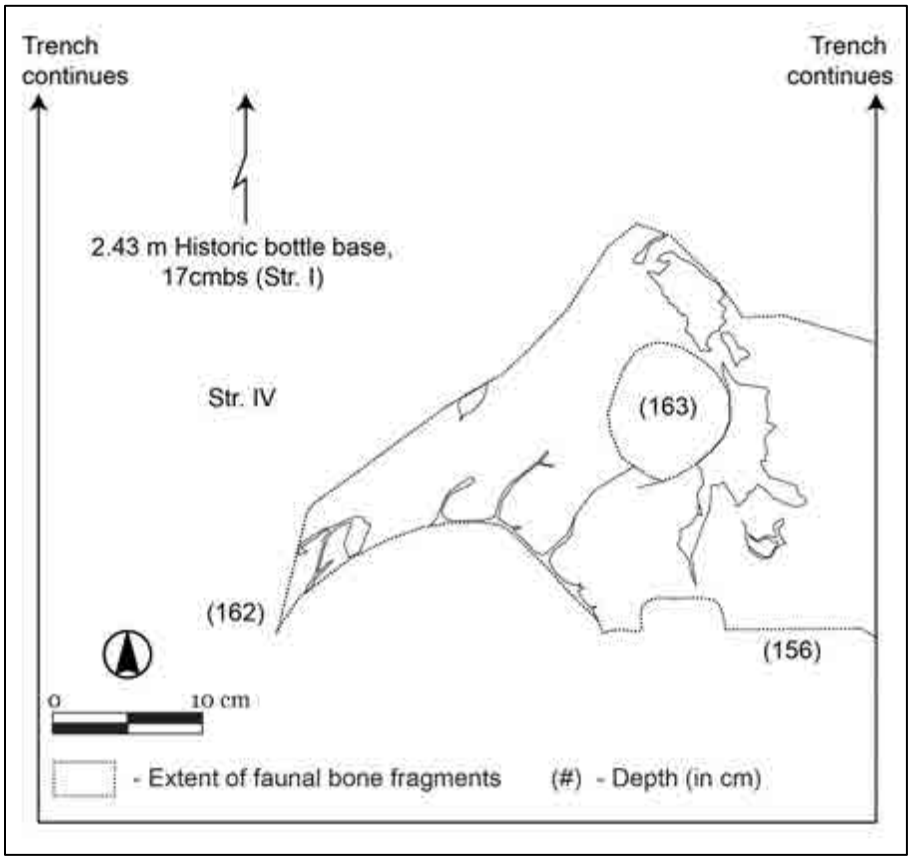
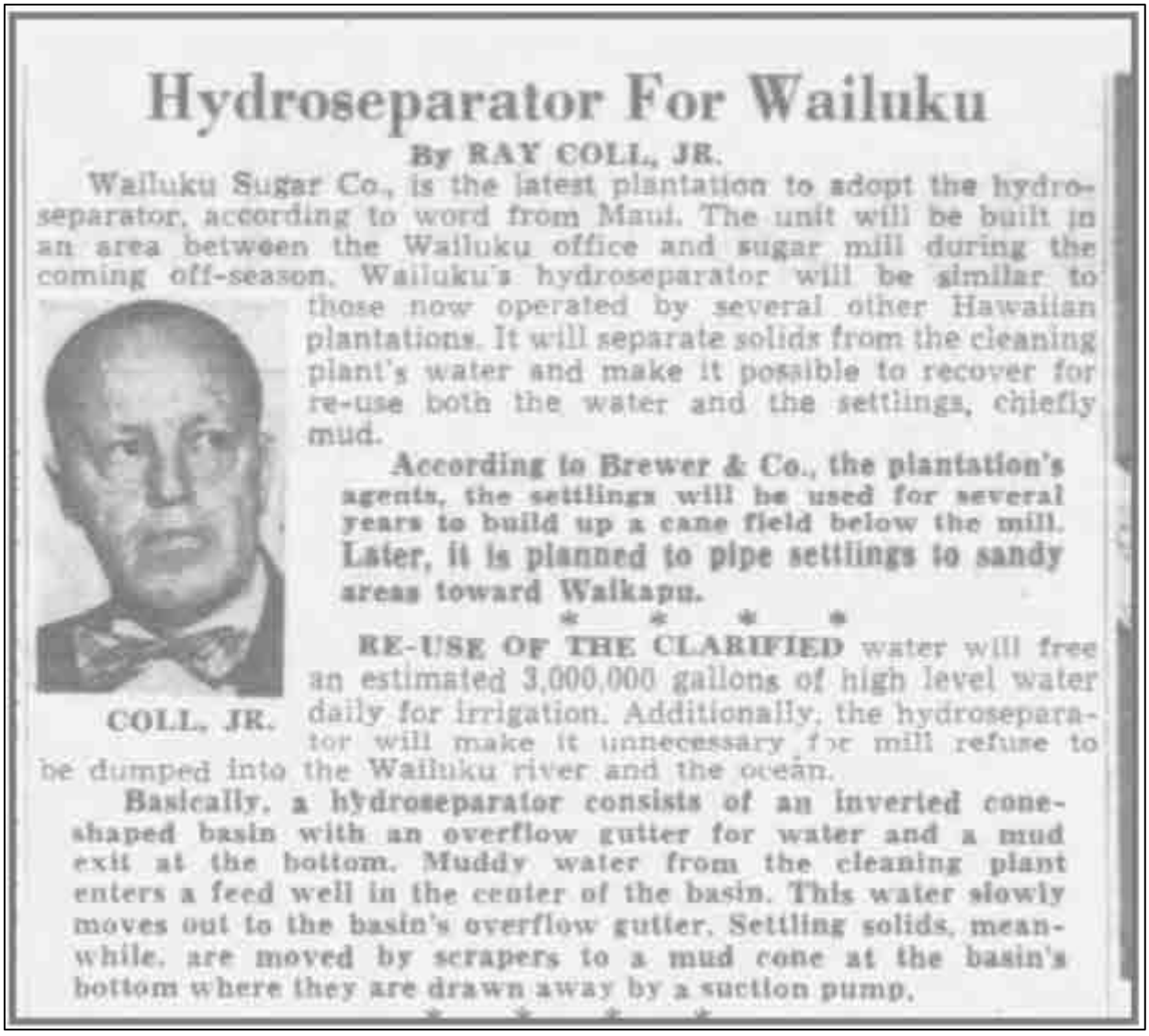


Figure 222. SIHP # -08805 Feature D plan map



Hydroseparator For Wailuku

By RAY COLL, JR.

Wailuku Sugar Co., is the latest plantation to adopt the hydroseparator, according to word from Maui. The unit will be built in an area between the Wailuku office and sugar mill during the coming off-season. Wailuku's hydroseparator will be similar to those now operated by several other Hawaiian plantations. It will separate solids from the cleaning plant's water and make it possible to recover for re-use both the water and the settlings, chiefly mud.

COLL, JR.

According to Brewer & Co., the plantation's agents, the settlings will be used for several years to build up a cane field below the mill. Later, it is planned to pipe settlings to sandy areas toward Waikapu.

* * * *

RE-USE OF THE CLARIFIED water will free an estimated 3,000,000 gallons of high level water daily for irrigation. Additionally, the hydroseparator will make it unnecessary for mill refuse to be dumped into the Wailuku river and the ocean.

Basically, a hydroseparator consists of an inverted cone-shaped basin with an overflow gutter for water and a mud exit at the bottom. Muddy water from the cleaning plant enters a feed well in the center of the basin. This water slowly moves out to the basin's overflow gutter. Settling solids, meanwhile, are moved by scrapers to a mud cone at the basin's bottom where they are drawn away by a suction pump.

* * * *

Figure 223. 22 May 1954 Honolulu Advertiser newspaper clipping describing the hydroseparator process (Coll Jr. 1954)

Figure 224. 2013 aerial image showing a cluster of sediment mounds within the study area in the vicinity of SIHP # -08805 Feature D providing evidence of the importation of sediment to supplement the topsoil (Google Earth 2013)

6.2 **SIHP # 50-50-04-09164**

FORMAL TYPE:	Ditch (remnant)
FUNCTION:	Water control
NUMBER OF FEATURES:	1
AGE:	Historic (Commercial Agriculture)
TAX MAP KEY:	[2] 3-8-005:002 por.
LAND JURISDICTION:	Private; MP West LLC
PREVIOUS DOCUMENTATION:	None

SIHP # 50-50-04-09164 is a remnant cement and concrete ditch that was identified in the northwestern portion of the study area within the alignment of an unimproved field road (see Figure 27 and Figure 28). The ditch remnant appears to be partially buried or filled with sediment. The only exposed portions of the ditch consist of the top of one or both sidewalls (Figure 225 through Figure 228). The exposed portion measures 351.5 m long with a width ranging between 0.6 and 0.8 m. The ditch may have connected to the nearby Reservoir #91 that is fed from the Spreckels/Waihe‘e Ditch Complex (SIHP # 50-50-04-01508) and appears to have minimally extended to Upper Mā‘alaea Road. The ditch does not appear on historic maps or aerial photographs, indicating that it may have been a temporary or expedient structure. The construction of the ditch with thin walls comprised predominately of cement also indicates expedient construction.

SIHP # 50-50-04-09164 is a remnant water control structure that is assessed as significant pursuant to HAR §13-284-6, Criterion “d” (have yielded, or is likely to yield, information important for research on prehistory or history). The historic property retains the integrity of location, setting, design, materials, and workmanship, and has provided information important to research on historic land use and water control strategies of the study area. SIHP # -09164 is evaluated as eligible for listing in the HRHP.

Figure 225. General view of SIHP # 50-50-04-09164, view to northwest

Figure 226. Close-up of SIHP # 50-50-04-09164, view to southeast

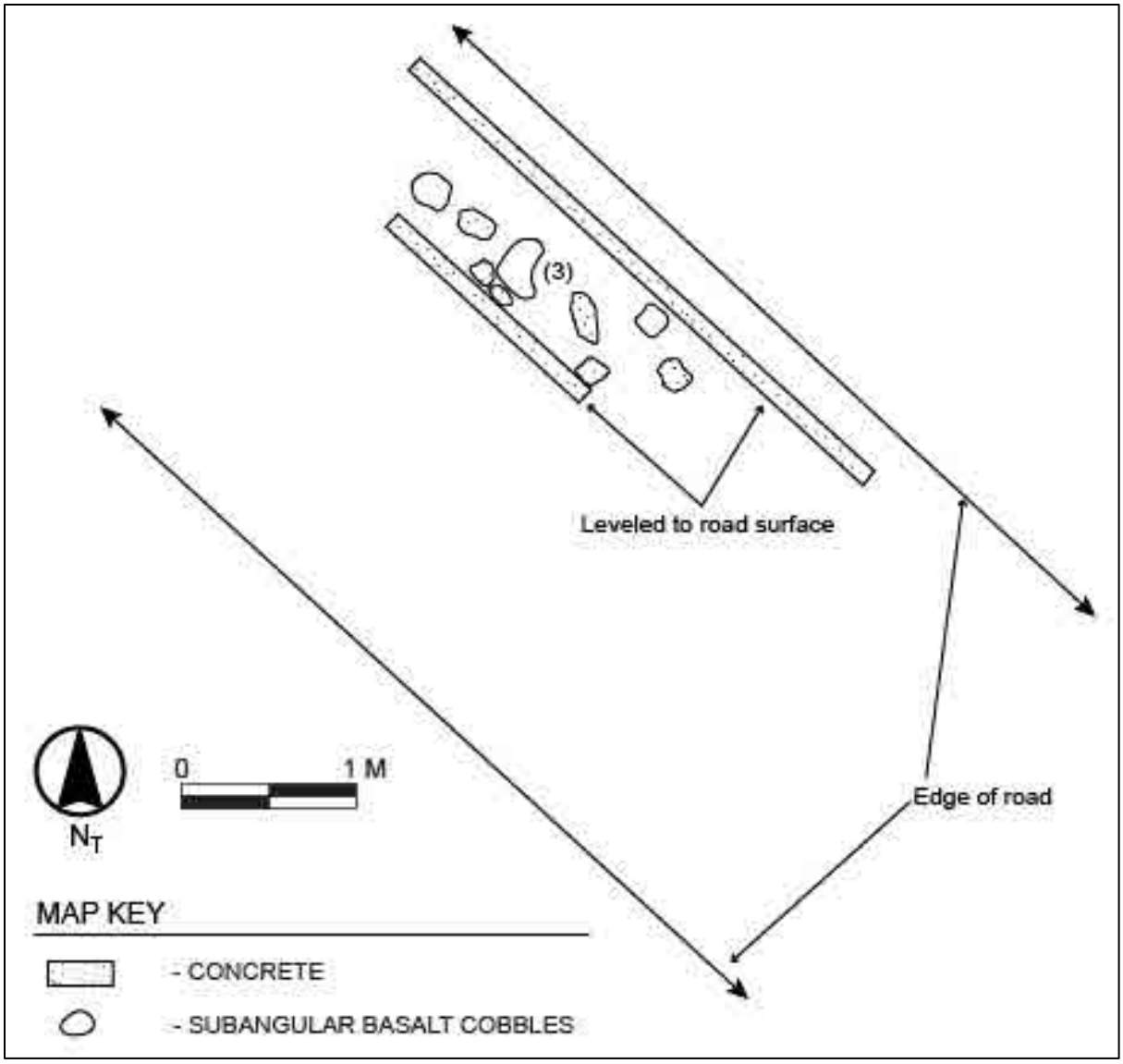


Figure 227. SIHP # 50-50-04-09164, Section 1, plan map

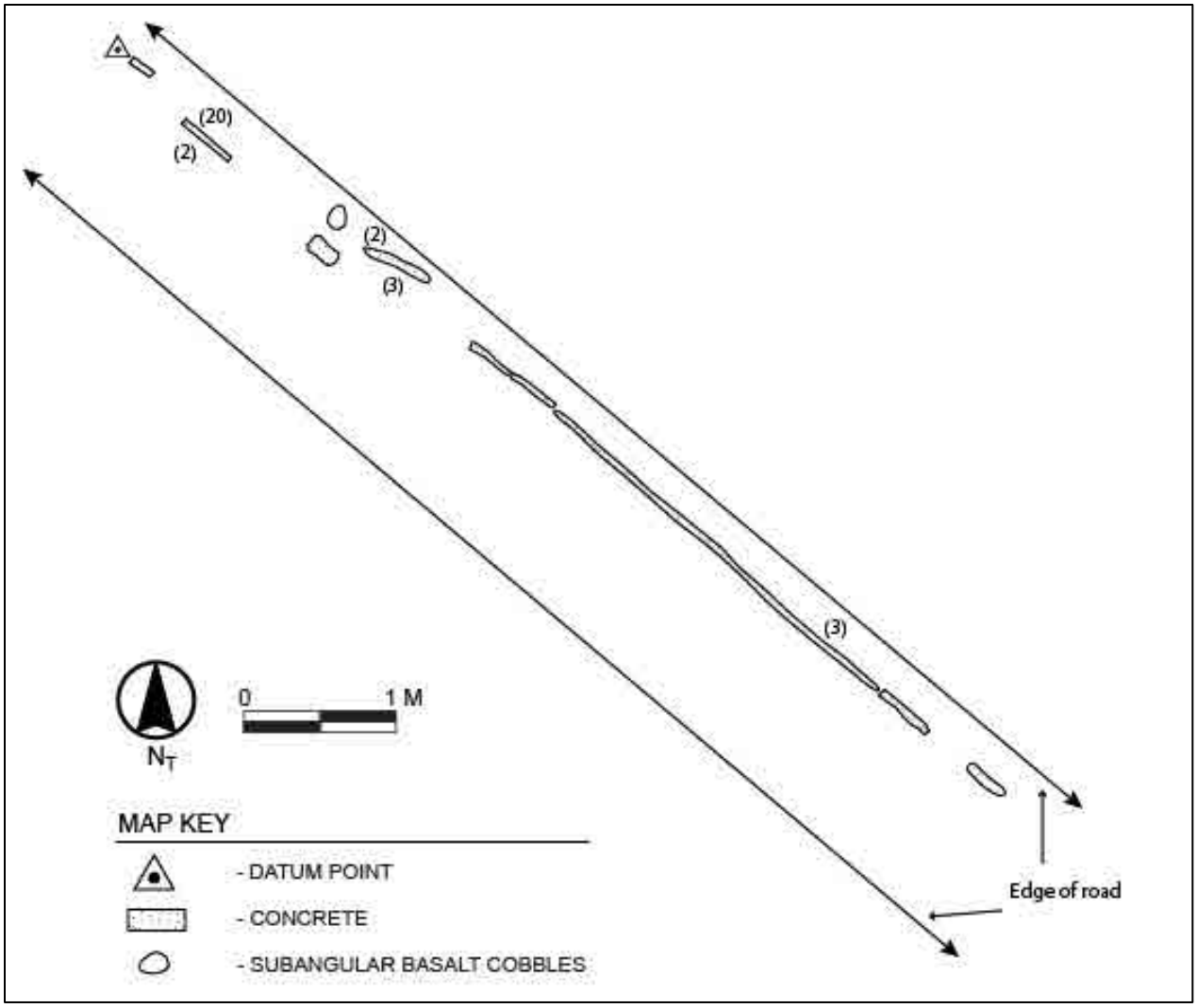


Figure 228. SIHP # 50-50-04-09164, Section 2, plan map

6.3 **SIHP # 50-50-04-09165**

FORMAL TYPE:	Artifact Scatter (HC&S Camp Seven)
FUNCTION:	Habitation
NUMBER OF FEATURES:	1
AGE:	Historic
TAX MAP KEY:	Historic (Commercial Agriculture)
LAND JURISDICTION:	Private; MP West LLC
PREVIOUS DOCUMENTATION:	Folk and Hammatt (1991)

SIHP # 50-50-04-09165 is an artifact scatter that was identified throughout the surface and during subsurface testing within the footprint of the former Camp Seven in the northwestern portion of the study area (see Figure 27 and Figure 28). Camp Seven is one of the former HC&S plantation camps that was established for the workers assigned to agricultural fields in and around the current study area (Figure 229). Camp Seven was previously documented by CSH during an archaeological surface survey of approximately 600 acres of land at Mā‘alaea (Folk and Hammatt 1991; see Section 3.2.8). Folk and Hammatt (1991:30) describe Camp Seven as follows:

> H.C.& S. Camp Seven housed plantation workers who maintained, at a minimum, portions of fields L, and M, and all of field O in the project area. There are no structural remains of Camp Seven above ground except for fragments of concrete, culvert pipe, and rails that have been bulldozed up into the berm along the bank of Pōhākea Gulch. A portion of the main housing area, the *luna*'s house. The stable area and the possible site of the "old" Camp Seven are not planted in cane at present.
>
> Two lemon eucalyptus trees were observed growing on the ground of the *luna*'s house lot, but no other cultigens or ornamental plants were noted. All of the areas associated with the former Camp Seven were covered in dry grass and weeds with kiawe and *ēkoa* trees along the gulch – all indicators of previous bulldozing. No State site number was assigned to the former Camp Seven site due to the absence of observable surface remains. [Folk and Hammatt 1991:30]

During the current AIS, portions of the footprint of the former Camp Seven had been recently plowed, which increased surface visibility (Figure 230 and Figure 231). A pedestrian inspection of the surface of SIHP # -09165 identified a total of 57 historic artifacts comprised of glass bottle fragments, domestic ceramic vessel fragments, and metal objects that were collected for laboratory analysis (see Section 5.1). Subsurface testing within the footprint of the former camp identified 26 additional artifacts within TE-151 and TE-164 that were collected (see Section 5.1). Additionally, scattered building materials, like cut basalt stones and bricks were observed on the surface and protruding from a berm of bulldozer push that extends approximately 200.0 m along the southern side of Upper Mā‘alaea Road within the footprint of the former camp. These building materials were noted and photographed, but not collected (Figure 232 and Figure 233).

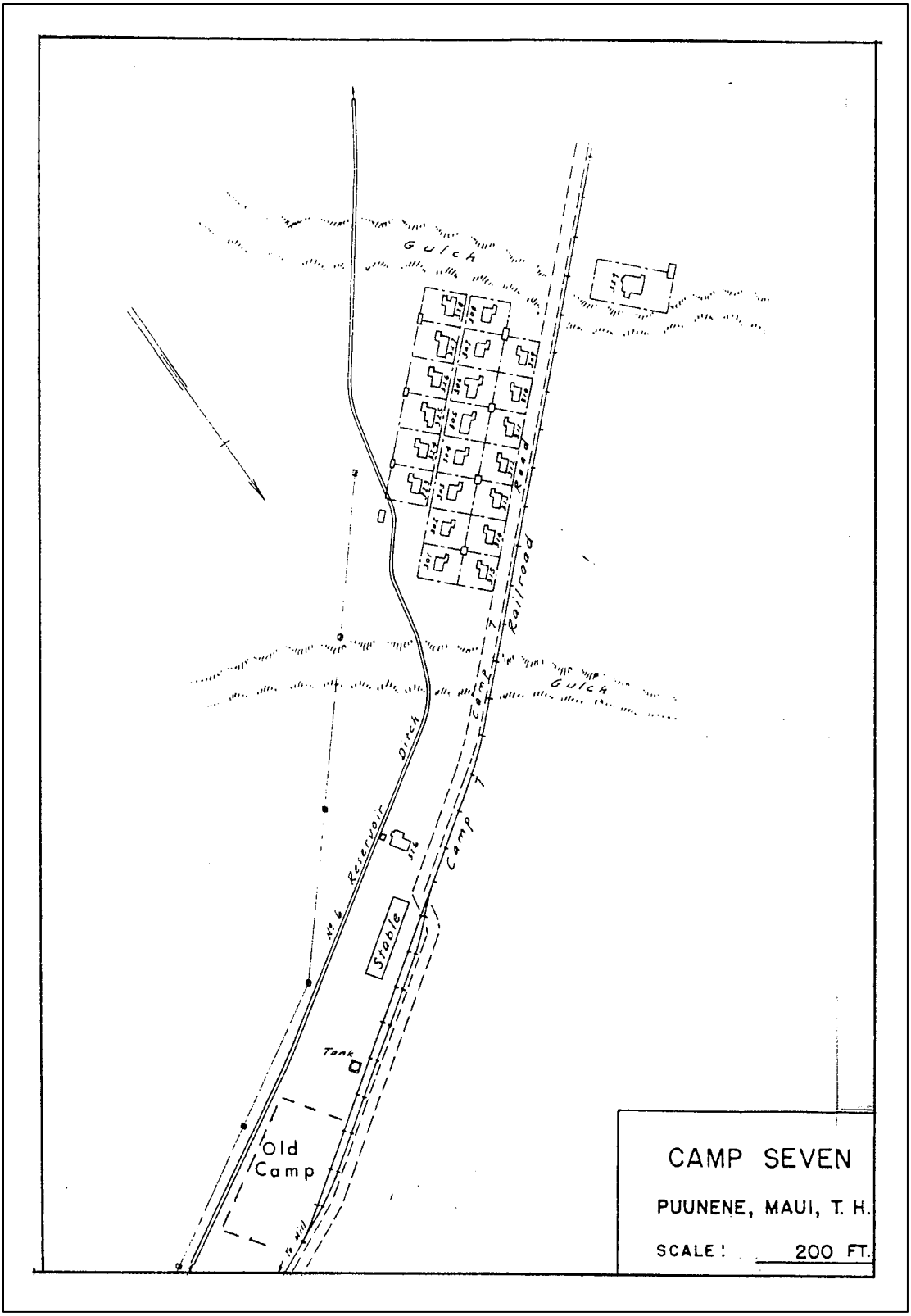


Figure 229. HC&S map of Camp Seven (Folk and Hammatt 1991:31)

Figure 230. General view of the surface of SIHP # 50-50-04-09165 within the current study area, view to southwest

Figure 231. Close-up view of the surface of SIHP # 50-50-04-09165 within the current study area showing a portion of the artifact scatter, view to northeast

Figure 232. Close-up view of a cut basalt stone on the surface of SIHP # 50-50-04-09165, view to north

Figure 233. Close-up view of a red brick and larger metal debris located on the surface of the bulldozer push berm within SIHP # 50-50-04-09165, view to southeast

A review of historic maps indicates that Camp Seven was constructed prior to 1910, as it appears on a 1910 HC&S field map of Puunene, Maui (Figure 234). The camp is also depicted on the 1930 and 1942 U.S. Geological Survey map series (see Figure 17 and Figure 18), but is no longer present on the 1953 HC&S field map nor on later maps and aerial imagery (see Figure 19 through Figure 24). The review of historic maps supports the assertion by Folk and Hammatt (1991:19) that Camp Seven and the adjoining railroad system were demolished following the end of World War II as the transportation of sugarcane to the mill transitioned from railroads to tournahauler roads.

While no *in situ* foundations or structural remnants of the camp were identified, the presence of the artifact scatter throughout the footprint provides enough information to consider these surface remains as a significant historic property in accordance with the reasoning stated by Folk and Hammatt (1991:30). The historic property boundary was determined based on the extent of the artifact scatter and berm along with the extent of structures shown on historic maps of Camp Seven. The historic property is 260.0 m long (east-west) by 110.0 m wide (north-south).

The significance of Camp Seven is illuminated by the stories shared by its inhabitants in the interviews and responses published by Folk and Hammatt (1991:63-67). Interviews conducted with Mr. Tokusei Gususkuma, Mrs. Tsugie Okada, and Mr. Noburo Hashiro provide incredible details regarding the life and people of Camp Seven. It should also be noted that Folk and Hammatt (1991) documented SIHP # 50-50-09-02708, a cemetery that is located approximately 600.0 m west of, and outside of, the current study area. According to information provided by Mr. Hashiro in his interview, the cemetery (SIHP # -02708) was used by the people of Camp Seven, which provides some assurance that graves are unlikely to be present within the footprint of the camp.

SIHP # 50-50-04-09165 is an artifact scatter representing the remnants of HC&S Camp Seven that is assessed as significant pursuant to HAR §13-284-6, Criterion “d” (have yielded, or is likely to yield, information important for research on prehistory or history). The historic property retains the integrity of location, setting, materials, feeling, and association, and has provided information important to research on historic land use of the study area as well as domestic households among plantation camps. SIHP # -09165 is evaluated as eligible for listing in the HRHP.

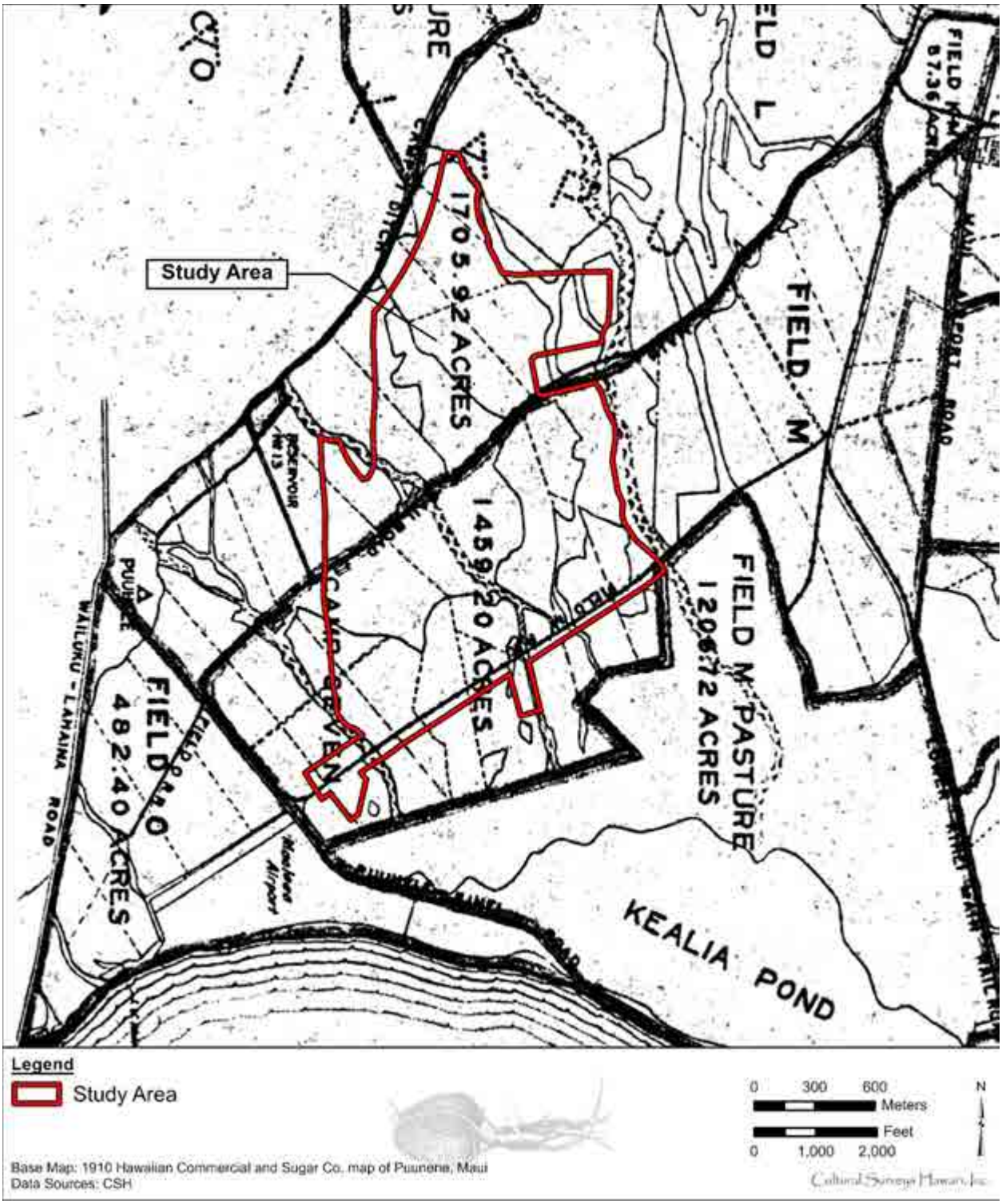


Figure 234. Portion of 1910 HC&S map of Puunene, Maui showing the location of Camp Seven (HC&S 1910)

6.4 **SIHP # 50-50-04-09166**

FORMAL TYPE:	Ditch or Flume Foundation (remnant)
FUNCTION:	Water control
NUMBER OF FEATURES:	1
AGE:	Historic (Commercial Agriculture)
TAX MAP KEY:	[2] 3-8-005:002 por.
LAND JURISDICTION:	Private; MP West LLC
PREVIOUS DOCUMENTATION:	None

SIHP # 50-50-04-09166 is a buried concrete ditch or flume foundation remnant that was identified during the excavation of TE-148 within the southeast corner of the study area (see Figure 27 and Figure 28). The concrete remnant was observed at 0.42 m below surface, underlying the plow zone (Figure 235 through Figure 238). No surface remnants of the ditch were identified during an inspection of the area. The remnant is interpreted as a ditch or flume foundation due to its concave surface, indicating that it was either the base of a ditch or the foundation of a surface flume pipe that could have been used to pull water from nearby Waikapū Stream or from the surrounding network of buried irrigation lines. The observed portion of the historic property was 8.0 m long by 0.5 m wide. The remnant does not appear on historic maps or aerial photographs, indicating that it may have been a temporary or expedient structure. The construction style of the remnant, utilizing a thin application of concrete over soil with no compacted base course surface also indicates expedient construction.

SIHP # 50-50-04-09166 is a remnant water control structure that is assessed as significant pursuant to HAR §13-284-6, Criterion “d” (have yielded, or is likely to yield, information important for research on prehistory or history). The historic property retains the integrity of location, design, setting, materials, and workmanship, and has provided information important to research on historic land use and water control strategies of the study area. SIHP # -09166 is evaluated as eligible for listing in the HRHP.

Figure 235. General view of SIHP # 50-50-04-09166, view to north

Figure 236. Close-up view of SIHP # 50-50-04-09166 showing concave surface, view to south

Figure 237. Close-up view of broken fragments of SIHP # 50-50-04-09166 showing concave surface, view to southwest

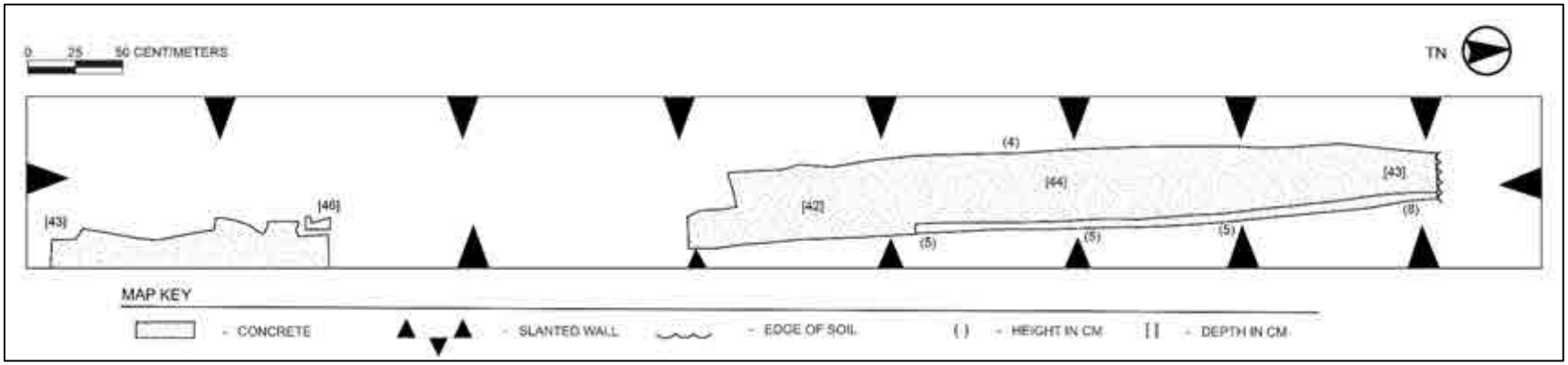


Figure 238. SIHP # 50-50-04-09166 plan map within TE-148

Section 7 Summary and Interpretation

This AIS investigation fulfills the requirements of HAR §13-276 and was conducted in accordance with an SHPD-accepted AIS fieldwork strategy (see Appendix A). Fieldwork was accomplished between 22 January and 29 April 2024 by CSH archaeologists Jonas Madeus, B.A., Elwyn Leibold, B.A., Trevor Yucha, B.S., Allyson Ueki, M.A., and James C. Lansche, M.A., under the general supervision of principal investigators Josephine Yucha, M.S., and Hallett H. Hammatt, Ph.D. This work required approximately 203 person-days to complete.

The study area is located on former sugarcane agricultural fields in the southern portion of the isthmus of Maui and southeast of Kuihelani Highway (Route 380). According to the USDA (2001) and soil survey data gathered by Foote et al. (1972), soils within the study area predominately include Jaucas sand, 0 to 15 percent slopes (JaC), Pulehu cobbly clay loam, 3 to 7 percent slopes (PtB), Pulehu cobbly silt loam, 0 to 3 percent slopes (PrA), Pulehu cobbly silt loam, 3 to 7 percent slopes (PrB), and Pulehu silt loam, 3 to 7 percent slopes (PpB) The study area is located on the periphery of the inland dune system of Central Maui and immediately west of Waikapū Stream.

Traditional historical information on the study area is sparse in comparison to the rich history of the upland valleys of Nā Wai ‘Ehā. The study area is located in the central plain of the isthmus that was traditionally referred to as Ke Kula o Kama‘oma‘o, a region known as a wandering place of the souls (Beckwith 1970). There are few records of traditional land use within the study area, however, the central isthmus has been documented through historical and ethnographic accounts as a place of warfare between the forces of Maui and Hawai‘i Island.

During the Māhele, the lands surrounding Waikapū Commons were sold by the Department of Education in ten parcels, each amounting to more than 1,317 acres, and had Royal Patents issued for the sales in 1854. Later, all ten of these Royal Patents were surrendered and cancelled, and the land was quit-claimed back to the Board of Education in August 1860. In 1875, the Board of Education sold the lands extending out from Waikapū Valley to the northwestern boundary of Pulehunui Ahupua‘a to Mr. Henry Cornwell (The Pacific Commercial Advertiser 1879:5). Cornwell acquired the lands in fee-simple under Royal Patent No. 3152. The current study area is situated entirely within this land grant. No *kuleana* awards were recorded near the current study area. The lands purchased by Cornwell were added to the holdings of the Waikapū Sugar Plantation before the plantation was sold in 1876. In 1878, Claus Spreckels bought an undivided interest in 12,000 acres of the Waikapū Commons from W.H. Cornwell and leased an additional 24,000 acres of adjacent Wailuku Commons crown lands from the government (Wilcox 1996:61). These lands would form a large portion of HC&S. Most of the area across the isthmus was covered with sugarcane by the mid-nineteenth century. Waikapu Sugar Company operated from 1862 to 1894, when it was purchased and incorporated into the holdings of Wailuku Sugar Company (Kaukali and Subica 2010).

A review of previous archaeological studies in the region indicates that only a portion of the southwestern corner of the current study area was previously surveyed. In October 1990, CSH completed an archaeological surface survey of approximately 600 acres of land at Mā‘alaea in Waikapū Ahupua‘a (Folk and Hammatt 1991). Fieldwork included a survey of the area excluding mature cane fields. Two historic properties were identified within the study area, but both are located outside of the current study area (see Figure 24). SIHP # 50-50-09-02708 includes a

minimum of seven burials with tombstones as well as other possible burial locations. The tombstones have Japanese *kanji* inscriptions, and the graves appear to be associated with HC&S Camp Seven (Folk and Hammatt 1994:i). SIHP # -02709 is a large ditch that extends from Pōhākea Gulch to North Kīhei Road within the surveyed area. This portion of the ditch is constructed of mortar and exhibits a U-shaped cross-section with a maximum width of approximately 2.00 m and a maximum depth of approximately 1.25 m. The ditch was no longer active at the time of the survey, and no further work was recommended for the feature within the study area. The study recommended archaeological monitoring for the former area of Camp Seven and another uncultivated area in the southern portion of the study area. Options for preservation or disinterment of the graves at SIHP # -02708 were presented.

Throughout the twentieth century, the lands within the current study area remained under commercial sugarcane cultivation and relatively unchanged until the closing of HC&S sugar operations on Maui in December 2016. The majority of the fallow sugarcane fields within the study area were burned by a large brush fire on 11 July 2019.

In March 2023, CSH conducted a reconnaissance-level field inspection of an approximate 1,380-acre (558-hecture) study area, including the current AIS study area, to develop preliminary information of the types and locations of historic properties that may be present on the surface. The results of the field inspection were presented within the project's LRFI report (Yucha et al. 2023). CSH identified historic properties primarily related to the former use of the area for commercial agriculture. The LRFI recommended the completion of an AIS as the next step in the historic preservation review process in order to formally document and assess each historic property.

In January 2024, CSH began AIS fieldwork with a 100 percent coverage pedestrian inspection of the 729.6-acre (295.3-hectare) AIS study area, a subset of the 1,380-acre (558-hecture) LRFI study area. The survey was completed using pedestrian transects that were spaced every 10-15 m depending upon ground visibility. The AIS pedestrian inspection identified a linear cement and concrete remnant ditch related to historic through modern commercial agricultural operations (SIHP # 50-50-04-09164) and an artifact scatter representing the remnants of HC&S Camp Seven (SIHP # 50-50-04-09165).

CSH utilized GPR survey during the AIS in an effort to increase survey coverage throughout the study area without further increasing the amount of invasive testing. In accordance with the project's AIS fieldwork strategy, CSH completed 12 GPR transects (GPR-1 through GPR-12) that were randomly distributed throughout the study area. No historic properties or potential archaeological anomalies were identified during the GPR survey for this AIS.

From 2 February 2024 through 23 February 2024, CSH observed geotechnical boring and test excavation operations conducted by FGE at 56 locations throughout the study area. Stratigraphic profiles were not recorded due to the methodology of the cores. Observation of the geotechnical boring and excavation testing provided additional documentation of the general types and variation of stratigraphy within the study area, which includes a mix of aeolian sand, alluvially deposited basalt cobbles/gravels, and alluvial loams.

Subsurface testing for this AIS included the excavation of 230 test excavations (TE-1 through TE-230) that were distributed throughout the study area in a systematic gridded pattern. During

the subsurface testing portion of the AIS fieldwork, CSH identified two additional features of a previously documented historic property, SIHP # 50-50-04-08805 Features C and D, and a buried concrete remnant that appears to have been a foundation for a ditch or flume associated with historic commercial agriculture (SIHP # 50-50-04-09166).

Excavations throughout the study area have identified complex stratigraphic sequences that were deposited by overlapping episodes of alluvial and aeolian deposition and with occasion stable sterile soil horizons. The entirety of the natural deposits observed within the study area are overlain by introduced topsoil to promote the growth of commercial sugarcane. Background research suggests that the practice of sediment enrichment in the study area may have originated in the late 1950s with the construction of a hydroseparator in Wailuku and the transport of waterlogged, nutrient-rich soils from the Wailuku Sugar Company ditch system to the dry, sandy soils of Waikapū. Aerial images indicate that this practice was on-going into the mid-1980s utilizing interconnected rows of settling ponds to capture slurry sediment.

The findings of this AIS are consistent with evidence of long-term use of the study area for commercial sugarcane agriculture. No pre-Contact historic properties or deposits were identified during the survey.

Section 8 Significance Assessments

Historic property significance is evaluated and assessed based on the five State of Hawai‘i historic property significance criteria. To be considered significant, a historic property must possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and meet one or more of the following broad cultural/historic significance criteria (in accordance with HAR §13-284-6):

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

b. Be associated with the lives of persons important in our past;

c. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value;

d. Have yielded, or is likely to yield, information important for research on prehistory or history; or

e. Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

Four historic properties were identified within the current study area. Table 9 lists the historic properties along with their significance/eligibility assessments and mitigation recommendations. Significance assessments are included in this AIS for the review and concurrence of the SHPD.

SIHP # 50-50-04-08805 was previously assessed by Yucha et al. (2021) as significant pursuant to HAR §13-284-6, Criterion "d" (have yielded, or is likely to yield, information important for research on prehistory or history). The additional findings of SIHP # -08805 Feature C and Feature D during the current AIS support this assessment. The historic property retains the integrity of location, setting, materials, and workmanship, and has provided information important to research on historic land use, soil treatment, and refuse disposal within the study area. The historic property is evaluated as eligible for listing in the HRHP.

SIHP # 50-50-04-09164 is a remnant water control structure that is assessed as significant pursuant to HAR §13-284-6, Criterion "d" (have yielded, or is likely to yield, information important for research on prehistory or history). The historic property retains the integrity of location, setting, design, materials, and workmanship, and has provided information important to research on historic land use and water control strategies of the study area. The historic property is evaluated as eligible for listing in the HRHP.

SIHP # 50-50-04-09165 is an artifact scatter representing the remnants of HC&S Camp Seven that is assessed as significant pursuant to HAR §13-284-6, Criterion "d" (have yielded, or is likely to yield, information important for research on prehistory or history). The historic property retains the integrity of location, setting, materials, feeling, and association, and has provided information

important to research on historic land use of the study area as well as domestic households among plantation camps. The historic property is evaluated as eligible for listing in the HRHP.

SIHP # 50-50-04-09166 is a remnant water control structure that is assessed as significant pursuant to HAR §13-284-6, Criterion “d” (have yielded, or is likely to yield, information important for research on prehistory or history). The historic property retains the integrity of location, design, setting, materials, and workmanship, and has provided information important to research on historic land use and water control strategies of the study area. The historic property is evaluated as eligible for listing in the HRHP.

Table 9. Archaeological historic property integrity, significance, and mitigation recommendations

SIHP # 50-50-04-	Test Excavation (TE)	Formal Type/ # of Features	Integrity							Significance	Mitigation Recommendation
			Location	Design	Setting	Materials	Workmanship	Feeling	Association		
08805	73, 171 (current AIS) 63, 63A, 70, 72, 79, 82, 87, 89, 97 (Yucha et al. 2021)	Subsurface cultural deposit complex (4)	Y	N	Y	Y	Y	N	N	d	Archaeological monitoring
09164	N/A	Water control ditch remnant	Y	Y	Y	Y	Y	N	N	d	No further work
09165	151, 164	Artifact scatter (HC&S Camp Seven)	Y	N	Y	Y	N	Y	Y	d	Archaeological monitoring
09166	148	Water control ditch or flume foundation remnant	Y	Y	Y	Y	Y	N	N	d	No further work

Section 9 Project Effect and Mitigation Recommendations

9.1 Project Effect

A total of four significant historic properties have been identified within the study area. The project has the potential to affect one or more significant historic properties within the study area. In accordance with HAR §13-284-7, the effect recommendation for this project is “effect, with agreed upon mitigation commitments.”

It is anticipated that SIHP # -09165 and -08805, Feature C, will be impacted by grading and installation of project components, while SIHP # -08805, Feature D, is expected to be avoided. Additionally, SIHP # -09164 and -09166 are located outside of the footprint of project-related ground disturbance and will be avoided.

9.2 Mitigation Recommendations

As described in HAR §13-284-8, “If a project will have an “effect” (impact) on significant historic properties, then a mitigation commitment proposing the form of mitigation to be undertaken for each significant historic property shall be submitted by the agency to the SHPD for review and approval.” Mitigation recommendations are included in this AIS for the review and approval of the SHPD.

9.2.1 Archaeological Monitoring

As described in HAR §13-279-3, “archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities which may adversely affect historic properties.”

It is recommended that an archaeological monitoring program be developed to minimally include the following objectives:

- On-site archaeological monitoring for all project-related ground disturbance within the SIHP # 50-50-04-08805 historic property boundary (TE-73 and TE-171 locations). On-site archaeological monitoring will provide an opportunity to gather additional information important for research on the history of this subsurface cultural deposit.
- On-site archaeological monitoring for all project-related ground disturbance within the SIHP # 50-50-04-09165 historic property boundary. On-site archaeological monitoring will provide an opportunity to gather additional information important for research on the history of Camp Seven.
- On-site archaeological monitoring for open excavations that extend more than 4.0 ft (1.2 m) below the current ground surface. On-site archaeological monitoring of deep, open excavations that extend beneath the agricultural plow zone will be conducted for identification purposes to ensure that any additional subsurface features or potential historic properties are promptly identified and mitigated. Project-related open excavations that are anticipated to extend more than 4.0 ft (1.2 m) below the current ground surface are anticipated to include trenching for some of the subsurface conduit and excavation or grading for the installation of concrete battery pads or structures.

- On-call archaeological monitoring for shallow excavations that are less than 4.0 ft (1.2 m) below the current ground surface as well as the mechanical installation of the single-axis tracker posts that are driven into the ground without excavation or exposure of sediment. An archaeologist will remain on-call and available to conduct archaeological monitoring in the event of significant findings.

Archaeological monitoring shall be undertaken in accordance with an archaeological monitoring plan that shall be reviewed and accepted by the SHPD prior to the monitoring project in accordance with HAR §13-279-4.

9.2.2 No Further Work

No further mitigation is recommended for SIHP # 50-50-04-09164 and SIHP # 50-50-04-09166. These two historic properties have been assessed as significant for their information content pursuant to HAR §13-284-6, Criterion “d” and their potential to yield information important for research on history has been achieved with the documentation provided in this AIS report.

Section 10 References Cited

Abbott, Isabella Aiona
1992 *La‘au Hawai‘i: Traditional Hawaiian Uses of Plants*. Bishop Museum Press, Honolulu.

Anderson, Rufus
1865 *The Hawaiian Islands: Their Progress and Condition under Missionary Labors.* Third ed. Gould and Lincoln, Boston.

Athens, J. Stephen, Ward V. Jerome, and M.J. Tomonari-Tuggle
1996 *Archaeological Inventory Survey and Paleoenvironmental Coring for Kiosks, Boardwalk and Parking Areas, Keālia Pond National Wildlife Refuge, Kihei, Maui, Hawaii*. International Archaeological Rsearch Institute, Inc., Honolulu, Hawai‘i.

Athens, J. Stephen, Jerome V. Ward, and M.J. Tomonari-Tuggle
1994 *Archaeological Inventory Survey and Paleoenvironmental Investigations at Ma'alaea Power Plant, Maui Electric Co, Ltd., Waikapu Ahupua'a, Ma'alaea, Maui*. International Archaeological Research Institute, Inc., Honolulu, Hawai‘i.

Baldwin, E. D.
1930 *Map of the Ahupuaa of Waikapu, Wailuku District, Maui* Hawaii Territory Survey. Hawai‘i

Barrera, William, Jr.
1976 *Archaeological Survey at Waiale, Maui*. Chiniago, Inc., Kamuela, Hawai‘i.

Beckwith, Martha W.
1932 *Kepelino's Traditions of Hawaii*. Translated by Mrs. Mary Wiggin Pukui. Translation of Hawaiian traditions from hand-written notes of Bishop Maigret, founder of the Catholic mission in Hawai‘i . Bernice Pauahi Bishop Museum, Honolulu.

1970 *Hawaiian Mythology*. University of Hawai‘i Press, Honolulu.

Bingham, Hiram
1824 Excursion of Messrs. Bingham and Richards. In *The Missionary Herald for the Year 1824*, Vol 20, edited by American Board of Commissioners for Foreign Missions, pp. 111-112. Samuel T. Armstrong, Boston.

Brisbin, Joel, Alan Haun, and Peter Jensen
1991 *Archaeological Data Recovery Excavations Waikapu Mauka Partners Golf Resort Project Area Land of Waikapu, Wailuku District Island of Maui*. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai‘i.

Burgett, Berdena, and Robert L. Spear
1997a *An Inventory Survey of Proposed Maui Electric Company, Limited's Waena Generating Station and Transmission Line Corridors Wailuku and Makawao Districts, Island of Maui, Hawai‘i (TMK: 2-5, 3-*8). Scientific Consultant Services, Inc., Honolulu.

1997b *Inventory Survey of Puunene Bypass/Mokulele Highway Improvments Corridor Pulehunui and Wailuku Ahupua'a, Wailuku District, Island of Maui, Hawai'i TMK: 3-8-:04, 05, 06, 07*. Scientific Consultant Services, Inc., Honolulu, Hawai'i.

Burns, Irma Gerner
1991 *Maui’s Mittee and the General, A Glimpse into the Lives of Mr. and Mrs. Frank Fowler Baldwin*. Ku Pa‘a Inc., Honolulu.

Chinen, Jon J.
1958 *The Great Mahele: Hawaii's Land Division of 1848*. University of Hawai‘i Press, Honolulu.

Coll Jr., Ray.
1954 Hydroseparator for Wailuku. *The Honolulu Advertiser* Saturday, May 22:12. Honolulu.

Cummings, George C.F.
1881 The Largest Extinct Volcano. (An Ascent of Haleakala.) *Scribner's Monthly, An Illustrated Magazine for the People*: 272-275.

Cunningham, Kevin
2002 *William Strickland Plantation Site. Intersite Analyses and Interpretations: Domestic Economy and Social Economic Context - Ceramics and Foodways*. Delaware Department of Transportation, Dover, Delaware.

Dagan, Colleen, and Hallett H. Hammatt
2006 *An Archaeological Due Dilligence Letter Report and Field Inspection for the Maui Scrap Yard Project, Waikapu Ahupuaa, Wailuku District, Maui Island TMK (2) 3-8-007:105*. Cultural Surveys Hawai‘i, Inc., Wailuku, Hawai‘i.

Dean, Arthur L.
1950 *Alexander & Baldwin, Ltd. and the Predecessor Partnerships*. Alexander & Baldwin Ltd. and Advertiser Publishing Company, Honolulu.

Devereux, Thomas, Brian Colin, and Hallett H. Hammatt
1997 An Archaeological Monitoring Report for the Ma‘alaea to Lahaina 3rd 69 KV Transmission Line, Island of Maui, Hawaii. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Dietz, Robert Edwin; Dietz, Frederick
1914 *1913, A Leaf From The Past: Dietz, Then and Now; Origin of the Late Robert Edwin Dietz, His Business Career and Some Interesting Facts about New York*. R.E. Dietz Company, New York City, NY.

Dodge, F.S.
1885 *Maui, Hawaiian Islands. Registered Map 1268*, 1:90,000. Hawaiian Government Survey. Library of Congress Geography and Map Division Washington, D.C. 20540-4650.

Donham, Theresa K.
1991 *Field Inspection of a Water Pipeline Easement Across Waikapu Stream, Waikapu, Maui TMK 3-5-04: 14 and 3-6-04: 2*. State of Hawai‘i Department of Land and Natural Resources, State Historic Preservation Division, Wailuku, Hawai‘i

Dorrance, William H., and Francis Swanzy Morgan
2000 *Sugar Islands : The 165-year Story of Sugar in Hawai‘i*. Mutual Publishing, LLC, Honolulu.

Drolet, Robert, and Aki Sinoto
1998 *An Archaeological Inventory Survey of the Proposed Army National Guard Planning Area Pulehunui Ahupua'a, Wailuku, Maui [THK: 3-8-08:Por. 1]*. Aki Sinoto Consulting, Honolulu, Hawai`i.

EagleView Technologies Inc.
2023 *Aerial Image*. EagleView Technologies, Inc. Bellevue, WA.

Edwards, Bela Bates
1832 *The Missionary Gazetteer: Comprising a Geographical and Statistical Account of the Various Stations of the American and Foreign Protestant Missionary Societies of all Denominations, with their Progress in Evangelization and Civilization.* William Hyde & Co., Boston.

Emerson, Nathaniel B.
1993 *Pele and Hiiaka: A Myth from Hawaii* Honolulu Star-Bulletin, Ltd., Honolulu.

Evening Bulletin.
1888 Kamehameha V announced arrival on Maui. *Evening Bulletin* Friday, November 9:3. Honolulu.

Folk, William H., and Hallett H. Hammatt
1991 *Archaeological Survey at Mā‘alaea in Waikapū, Maui*. Submitted to Cultural Surveys Hawai‘i, Kailua, Hawai‘i.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens
1972 *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. Soil Conservation Service, United States Department of Agriculture, Washington, D.C.

Fornander, Abraham
1969 *An Account of the Polynesian Race: Its Origins and Migrations*. Charles Tuttle, Rutland, Vermont.

Fredericksen, Eric, and Demaris Fredericksen
2004 *Archaeological Inventory Survey for Waikapu Affordable Housing Subdivision Waikapu Ahupua‘a, Wailuku District Island of Maui (TMK: 3-5-02: por. 01 and 3-8-07: 101)*. Xamanek Researches, Pukalani, Hawai‘i.

Fredericksen, Erik M.
2007 *An Archaeological Monitoring Report for the Proposed Waiale Well No. 1 Project, Waikapu Ahupua‘a, Wailuku District, Island of Maui (TMK: (2) 3-8-007: Portion of 101)*. Xamanek Researches, LLC, Pukalani, Hawai‘i.

Frey, Jennifer J., and Erik M. Fredericksen
2008 *An Archaeological Inventory Survey of an 80-Acre Portion of Land along Mokulele Highway, Located in Pulehunui and Waikapu Ahapua‘a Wailuku District, Maui, Hawai‘i TMK: (2) 3-8-08:036 (portion)*. Xamanek Researches, LLC, Pukalani, Hawai‘i.

Giambelluca, Thomas W., Q. Chen, A.G. Frazier, J.P. Price, Y.L. Chen, P.S. Chu, J.K. Eischeid, and D.M. Delparte
2013 Online The Rainfall Atlas of Hawai‘i. In *Bull. Amer.Meteor. Soc.*, pp. 313-316. Vol. 94. University of Hawai‘i at Mānoa, Honolulu.

Giambelluca, Thomas W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger
2014 Evapotranspiration of Hawai‘i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai‘i. University of Hawai‘i at Mānoa, Honolulu.

Gilmore, Abner Blanks
1936 The Hawaii Sugar Manual, New Orleans.

Google Earth
2013 "Waikapu Valley". In *4Q 757978.72mE and 2308388.84mN*. Google Earth vols, 1/12/2013.

Guerriero, Diane, Andre‘e Conley-Kapoi, and Jeffrey Pantaleo
2017 *Archaeological Inventory Survey Report for Several Parcels of Land Situated within Waikapū Ahupua`a; Wailuku District Pū`ali Komohana Moku Located at TMK: [2] 3-6-002:003; 3-6-004:003; and 3-6-005:007; Island of Maui*. Archaeological Services Hawaii, LLC, Pu`unene, Hawai‘i.

Guerriero, Diane, Lisa Rotunno-Hazuka, and Jeffrey Pantaleo
2004 *Archaeological Inventory Survey of a 50-Acre Parcel of Land, Waikapu and Wailuku Ahupua`a; Wailuku District, Maui Island TMK: 3-5-02: por. 001*. Archaeological Services Hawaii, LLC, Pu`unene, Hawai‘i.

Hammatt, Hallett H. , Ian A. Masterson, and Thomas Devereux
1996 *Archaeological Inventory Survey of Access Roads Adjacent To The Ma‘alaea-Lahaina Third 69KV Transmission Line Corridor*. Cultural Surveys Hawaii, Honolulu, Hawai‘i.

Handy, E.S. Craighill, Elizabeth Green Handy, and Mary Kawena Pukui
1991 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Revised ed. Bernice P. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.

Haun, Alan E.
1989 *Interim Report: Summary of Findings, and General Significance Assessments and Recommended General Treatments: Archaeological Inventory Survey Waikapu Mauka Parners Golf Resort Project Area Land of Waikapu, Wailuku District, Island of Maui*. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai‘i.

Hawaii Department of Survey, Bureau of Government Surveying
1903 *Report of the Survey to the Governor of the Territory of Hawaii for the Year Ending June 30, 1902*. The Hawaiian Gazette Co., Honolulu.

Hawaii Supreme Court
1896 *Hawaiian Case Reports: Cases Decided in the Supreme Court of the Hawaiian Islands* Submitted to Hawaiian Gazette Company, Honolulu.

Hawaii TMK Service
2014 *Tax Map Key [2] 3-8-005*. Hawaii TMK Service. Honolulu.

HC&S
1910 *Map of Plantation, Puunene, Maui, Ter. Hawaii*. Hawaiian Commercial and Sugar Company.

Head, Lou.
1960 Old Maui Church To Be Restored. *The Honolulu Advertiser* Sunday, March 13:29. Honolulu.

Hill, Robert R., Tanya Lee-Greig, and Hallett H. Hammatt
2008 *Achaeological Monitoring Report for the Cesspool Conversion Project at Pu‘unēnē School, Wailuku Ahupua‘a, Wailuku District, Maui Island [TMK: (2) 3-8-06: 08]*. Copies available from Inc. Cultural Surveys Hawai‘i, Wailuku, Hawai‘i.

Hill, Robert R., Tanya L. Lee-Greig, and Hallett H. Hammatt
2006 A Cultural Impact Evaluation Report for a 15.20-Acre Parcel located at Pūlehu Nui Ahupua‘a, Wailuku District, Maui Island TMK (2) 3-8-08: 001. Cultural Surveys Hawai‘i, Inc., Wailuku, Hawai‘i.

2007 *An Archaeological Literature Review and Field Inspection Report for an 81.50-Acre Parcel located at Pūlehu Nui and Waikapū Ahupua‘a, Wailuku District, Maui Island TMK (2) 3-8-008: 7 por., 8 por.* Cultural Surveys Hawai‘i, Inc., Wailuku, Hawai‘i.

2009 *An Archaeological Literature Review and Field Inspection Report for a 39.267-Acre Parcel located at Pūlehu Nui Ahupua‘a, Wailuku District, Maui Island [TMK (2) 3-8-008:001 por.]*. Cultural Surveys Hawai‘i, Inc., Wailuku, Hawai‘i

Honolulu Star Bulletin.
1952 In Waikapu District. *Honolulu Star Bulletin* Thursday, January 17. Honolulu.

Hoyt, Helen P.
1976 *The Night Marchers*. The Hawaiian Bicentennial Library. 14 vols. Island Heritage Limited, Norfolk Island, Australia.

Kamakau, Samuel Mānaiakalani
1992 *Ruling Chiefs of Hawaii*. Revised ed. The Kamehameha Schools Press, Honolulu.

Kaukali, Edwin L., and Wayne A. Subica
2010 *Hawaii Plantations Pay System & History about the Old Days*. Second ed. History. Memories of Hawaii - Big Island.

Kennedy, Joseph
1988 Preliminary Archaeological Survey of Phase IA of the Waikapu Master Plan TMK 3-5-04:por. 25.

1990 *Archaeological Walk-Through Reconnaissance Survey of the Proposed Hawaiian Cement Puunene Quarry, Located at Pulehunui, Wailuku, (Kula), Maui, TMK: 3-8-04:01 (por.) and 3-8-04:02 (por.).* Archaeological Consultants of Hawaii, Haleiwa, Hawai‘i.

1991 *Inventory Survey & Subsurface Testing Results for Waikapu Partners Proposed Residential Project Waikapu, Wailuku District, Island of Maui TMK: 3-6-02:2(por.) & TMK: 3-6-04:2(por.) Revised March 1991 Subsurface Testing of Suspected Burial Features Addendum December 1991*. Archaeological Consultants of Hawaii, Haleiwa, Hawai‘i.

1992 Inventory Survey & Subsurface Testing Results for Waikapu Mauka Partners Proposed Residential Project Located at Waikapu, Wailuku District, Island of Maui TMK: 3-6-02:2 (POR.) & TMK 3-6-04:(POR.) Addendum Including Results of Subsurface Testing of Suspected Burial Features. Archaeological Consultants of Hawaii, Inc., Haleiwa, HI.

1994 *Inventory Survey & Subsurface Testing Results for Waikapu Mauka Partners Proposed Residential Project Located at Waikapu, Wailuku District, Island of Maui, TMK: 3-6-02:2 (por.) & TMK: 3-6-04:2 (por.) Addendum Including Results of Subsurface Testing of Suspected Burial Features*. Archaeological Consultants of Hawaii, Haleiwa, Hawai‘i.

Kennedy, Joseph, and Patrick Trimble
1992 *Archaeological Inventory Survey Located At Ma'alaea, Ahupua'a of Ukumehame, Wailuku District, Island of Maui, TMK: 3-6-01:18 (POR)*. Munekiyo Consulting Co., Wailuku, Hawai‘i.

Kennedy, Stanley C.
1937 America's Most Westerly Domestic Airline *Pan-Pacific*: 17-18.

Kuykendall, R.S.
1938 *The Hawaiian Kingdom: 1778-1854, Foundation and Transformation*. University of Hawaii Press, Honolulu.

Lee-Greig, Tanya L., Todd MCCurdy, Robert R. Hill, and Hallett H. Hammatt
2011 An Archaeological Inventory Survey Report for an Agricultural Subdivision of Approximately 3165 Acres Pulehu Nui Ahupua'a, Wailuku District, Maui Island TMKs: (2) 3-8-04:002, 020, and 024 2 Volumes. Cultural Surveys Hawai'i, Inc., Wailuku, Hawai'i.

Lindsey, Bill
2010 Historic Glass Bottle Identification & Information Website - Bottle/Glass Colors Page. Society for Historical Archaeology and Bureau of Land Management.

MacLennan, Carol A.
1997 Hawai‘i Turns to Sugar: The Rise of Plantation Centers, 1860-1880. *The Hawaiian Journal of History* 31.

Madeus, Jonas K., Tanya L. Lee-Greig, and Hallett H. Hammatt
2010 *Archaeological monitoring for the Development of Lane’s Parcel within the Industrial Park in Waikapu Ahupua‘a, Wailuku District, Island of Maui, TMK: [2] 3-8-094: 030 (preliminary), (formerly 3-8-07: 89 & por. of 102)*. Cultural Surveys Hawai‘i, Inc., Wailuku, Hawai‘i.

Moffat, Riley M., and Gary L. Fitzpatrick
1995 *Surveying the Mahele: Mapping the Hawaiian Land Revolution*. Palapala‘āina. Editions Limited, Honolulu.

2004 *Mapping the Lands and Waters of Hawai‘i*. Palapala‘aina. Editions Ltd., Honolulu.

Morawski, Lauren, Donna M. Shefcheck, and Michael F. Dega
2006 An Archaeological Monitoring Report for Kehalani Subdvision and Offsite Improvements, Wailuku and Waikapu Ahupua'a, Wailuku District, Island of Maui, Hawai'i [TMK:3-5-02:01 Portion and TMK:3-5-01:17 Portion]. Scientific Consultant Services, Inc., Honolulu.

Nellist, George F.
1925 *The Story of Hawaii and Its Builders*. Honolulu Star Bulletin, Honolulu.

Nelson, Lee H.
1968 Nail Chronology as an Aid to Dating Old Buildings. *History News American Association for Stte and Local History* 23(11):15-26.

Pantaleo, Jeffrey, and Aki Sinoto
1996 Archaeological Subsurface Sampling of the Proposed Maui Lani Development Phases 1 and 1a Wailuku Ahupua'a, Wailuku District, Maui Island (TMK 3-8-07:2, 110). Aki Sinoto Consulting, Honolulu.

Pellegrino, Hokuao.
2009 Traditional Place Names in the Ahupua‘a of Wailuku. *Maui News* December 15, 2009. Wailuku, HI.

Perzinski, David, and Michael F. Dega
2010 *Archaeological Inventory Survey Report for the Waiale Road Extension and Waiko Road Improvement Project in Waikapu Ahupua'a, Wailuku District, Maui Island, Hawaii [TMK: (2) 3-5-002:014; 888; 3-5-027:021; 3-6-002:033 and 3-8-005:999]*. Scientific Consultant Services, Inc., Honolulu, Hawai‘i.

Pestana, Elizabeth, and Michael F. Dega
2008 *An Archaeological Monitor Report for the Consolidated Baseyards Subdivision Industrial Park Development, Waikapu Ahupua‘a, Wailuku District, Maui Island, Hawai‘i [TMK (2) 3-8-07:89, 143, and 144]*. Scientific Consultant Services, Inc., Honolulu.

Pogue, Dennis J.
1994 Slave Lifeways at Mount Vernon An Archaeological Perspective. Mount Vernon, Virginia.

Pukui, Mary Kawena, and Samuel H. Elbert
1986 Hawaiian Dictionary Hawaiian-English English-Hawaiian. Revised and Enlarged ed. University of Hawai‘i Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther T. Mookini
1974 *Place Names of Hawaii*. Revised and Enlarged ed. University Press of Hawaii, Honolulu.

Richards, William
1831 “Intelligence from the Sandwich Islands,”. In *Missionary Herald*, Vol Vol. XXVII [27]. Crocker and Brewster, Boston.

Robins, Jennifer J., William H. Folk, and Hallett H. Hammatt
1994 *An Archaeological Inventory Survey of an Approximately 14.7 Mile Proposed Transmission Line, from Ma‘alaea to Lahaina, Maui, Hawai‘i*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Rotunno-Hazuka, Lisa, and Jeffrey Pantaleo
2004a *Archaeological Interim Monitoring Report for Hawaiian Cement Sand Mining Operations at TMK: 3-8-07:101 pors., Wailuku Ahupuaa; Wailuku District; Island of Maui*. Archaeological Services Hawaii, Wailuku, Hawai‘i.

2004b *Archaeological Interim Monitoring Report for the Construction of Consolidated Baseyards at TMK:3-8-7:89 & 102 pors. Waikapu Ahupua‘a; Wailuku District; Island of Maui*. Archaeological Services Hawaii, LLC., Wailuku, Hawai‘i.

2005 *Archaeological Assessment Report for Maui Lani Elementary School in Wailuku Ahupua‘a, Wailuku District Island of Maui TMK 3-8-07: por. 131*. Archaeological Services Hawaii, LLC, Wailuku, Hawai‘i.

Rotunno-Hazuka, Lisa, Lonnie Somer, Stephan D. Clark, and Boyd Dixon
1995 Archaeological Testing of Four Sites on the Maui Lani Property in Wailuku Ahupua'a, Wailuku District, Island of Maui, Hawai'i. Bishop Museum, Honolulu.

Rotunno-Hazuka, Lisa, Lonnie Somer, Krista Flood, Darrin Lazzaro, Stephan D. Clark, and Boyd Dixon
1995 *Historical Research for the Proposed Maui Lani Project and Test Excavations at Site 50-50-04-2797, Wailuku, Maui*. Bernice Pauahi Bishop Museum, Honolulu.

Rotunno, Lisa J., and Paul L. Cleghorn
1990 *Archaeological Reconnaissance Survey of TMK 3-8-07: 2 and 110 Wailuku, Maui*. Bishop Museum, Honolulu.

Saito, Norman
2009 Aviation History, Wailuku, HI.

Schmitt, Robert C.
1973 *The Missionary Censuses of Hawaii*. Pacific Anthropological Records No. 20. Bernice Pauahi Bishop Museum, Department of Anthropology, Honolulu.

Sinoto, Aki
1990a Post-Field Summary, Maui Lani Borrow Site, Wailuku, Maui Island TMK 3-8-07:103. Pauahi Bishop Museum, Honolulu.

1990b Interm Field Summary Report-Archaeological Subsurface Assessment and Continuing Monitoring of a Portion of the Maui Lani Sand Borrow Parcel, TMK 3-8-07:103. Bernice Pauahi Bishop Museum, Honolulu, Hawaii 96817-0916.

1993 *Results of Archaeological Monitoring of Sand Borrowing Activities at Maui Lani, Wailuku, Maui TMK: 3-8-07:103*. Aki Sinoto Consulting, Honolulu.

Sinoto, Aki, and Jeffrey Pantaleo
1992 *Archaeological Inventory Survey of the East Maui Waterline Project, Wailuku and Makawao, Maui Island (TMK 2-5-03 thru 05; 2-7-03; 2-7-07 thru 11; 2-7-13, 2-7-16 thru 20; 3-8-01; 3-8-06 thru 07, 3-8-59; 3-8-61, 3-8-71)*. Aki Sinoto Consulting, Honolulu.

Sinoto, Aki, Lisa Rotunno-Hazuka, and Jeffrey Pantaleo
2004 *Archaeological Inventory Survey of the Proposed Industrial Park Development Area, Waikapu, Wailuku, Maui Island TMK: 3-8-07:89 and por. 102*. Aki Sinoto Consulting, Honolulu.

Sinoto, Aki, and Paul Titchenal
2003 *Archaeological Inventory Survey Proposed Phase VII Residential Project Maui Lani Development Area, Wailuku, Maui Island (TMK: 3-8-07: por. 131)*. Aki Sinoto Consulting, Honolulu.

Speakman, Cummins E.
1978 *Mowee: An Informal History of the Hawaiian Island*. Peabody Museum of Salem, Salem, Massachusetts

Stearns, Harold T., and Gordon A. Macdonald
1942 *Geology and Ground-Water Resources of the Island of Maui, Hawaii*. Bulletin 7 vols. Territory of Hawaii, Division of Hydrography, Advertiser Publishing Company, Honolulu.

Sterling, Elspeth P.
1998 *Sites of Maui*. Bishop Museum Press, Honolulu.

Stokes, John F.G.
1917 Report on the Heiau of Maui. In *Hawaiian Alamanac and Annual for 1913 The Reference Book of Information and Statistics Relating to the Territory of Hawaii, of Value to Merchants, Tourists and Others.*, edited by Thomas G. Thrum, pp. 125. Thos. G. Thrum, Honolulu.

The Honolulu Advertiser.
1886 Interment of the Late Mr. Henry Cornwell. *The Honolulu Advertiser* Monday, February 15:3. Honolulu.

1903 Col. WM. H. Cornwell Dies At Waikapu Ranch. *The Honolulu Advertiser* Thursday, November 19:8. Honolulu.

1916 In the Days of Kalakaua. *The Honolulu Advertiser* Sunday, June 11. Honolulu.

The Pacific Commercial Advertiser.
1879 Excerpts on Cornwell Land Holdings in Waikapu. *The Pacific Commercial Advertiser* 27 December 1879:5.

Thrum, Thomas G.
1874 Notes on the History of the Sugar Industry of the Hawaiian Islands. *The Sugar Cane* VI(54):1-4.

1900 Lowrie Irrigating Canal. In *Hawaiian Almanac and Annual for 1901*. Hawaiian Gazzette Company, Honolulu.

1922 Hawaiian Place Names. In *A Dictionary of the Hawaiian Language*, edited by Henry H. Parker, pp. 625-674. The Board of Commissioners of Public Archives of the Territory of Hawaii, Honolulu.

Thurston, Lorrin A. .
1906 Sugar: Its Status and Development in Hawaii. *The Louisiana Planter and Sugar Manufacturer* July 21, 1906. New Orleans.

Titchenal, Paul, and Aki Sinoto
2010 *Archaeological Assessment Survey: Lot 1-A Kopa'a Subdivision No. 2 Waikapu, Wailuku District, Maui Island TMK: (2) 3-8-07:105*. Aki Sinoto Consulting, LLC, Honolulu.

Tome, Guerin, and Michael Dega
2010 *An Archaeological Inventory Survey of Approximately 607 Acres of Land in Waiale, Wailuku and Waikapu Ahupuaa, Wailuku District, Island of Maui, Hawaii. TMK: (2) 3-8-005:023 (por.), 37 and (2) 3-8-007:71, 101, 102, 104*. Scientific Consultant Services Inc., Honolulu.

Tomonari-Tuggle, M.J., H. David Tuggle, Dawn Deunsing, Coral Magnuson, and Usha Prasad
2000 *Fire on the Land: Archaeology, Architecture, and Oral History of Former Naval Air Station Pu‘unene, Pulehunui, Maui*. International Archaeological Research Institute, Inc., Honolulu.

U.S. Department of Agriculture, Natural Resources Conservation Service
2001 Soil Survey Geographic (SSURGO) database for Island of Maui, Hawaii (hi980). U.S. Department of Agriculture, Natural Resources Conservation Service.

U.S. Geological Survey
1930 *Topographic Map of the Island of Maui Maui County, Hawaii*, 1:62500. Department of the Interior U.S. Geological Survey and Territory of Hawaii.

1942 *USGS Geologic and Topographic Map, Island of Maui, Hawaii (1942)*. U.S. Geological Survey.

1977a *Orthophotoquad, Maalaea (1977) Quadrangle*. United States Geological Survey.

1977b *Orthophotoquad, Wailuku (1997) Quadrangle*. United States Geological Survey.

1992 *Puu o Kali Quadrangle, Hawaii*, 1:24,000. United State Department of the Interior, USGS. Reston.

1996 *Maalaea Quadrangle, Hawaii [map]*, 1:24,000. United State Department of the Interior, USGS. Reston, Virginia.

1997a *Paia Quadrangle*, 1:24,000. United State Department of the Interior, USGS. Reston, Virginia.

1997b *Wailuku Quadrangle, Hawaii*, 1:24,000. United State Department of the Interior, USGS. Reston.

2017a *Maalaea Quadrangle, Hawaii*. United States Department of the Interior.

2017b *Paia Quadrangle, Hawaii*. United States Department of the Interior.

2017c *Puu O Kali Quadrangle, Hawaii*. United States Department of the Interior.

2017d *Wailuku Quadrangle, Hawaii*. United States Department of the Interior.

USDA
1965 *Aerial Imagery*. United States Department of Agriculture. Washington, D.C.

Waihona ‘Aina
2000 Mahele Database. Waihona ‘Aina Corporation.

Waikapū Community Association
2018 About Waikapū: Waikapū Today http://waikapumaui.org/about-waikapu/, accessed July, 2019.

Walker, Winslow
1931 *Archaeology of Maui*. Bernice Pauahi Bishop Museum, Honolulu.

Westervelt, W.D.
1910 *Legends of Ma-ui - A Demi-God of Polynesia and of His Mother Hina*. The Hawaiian Gazette Company, Honolulu.

Wilcox, Carol
1996 *Sugar Water: Hawaii's Plantation Ditches*. University of Hawai‘i Press, Honolulu.

Wilson, Jon, and Michael F. Dega
2005 *Archaeological Inventory Survey on 215.800 Acres Located in Waikapu Ahupua'a, Wailuku District, Maui Island, Hawaii [TMK (2) 3-5-02: 02 and 03*. Scientific Consultant Services, Inc., Honolulu.

Winn, Michelle
2007 Asian ceramics of an East Walnut Grove site: Transfer Print. Sacramento State Department of Anthopology Archaeology Lab, Sacramento, CA.

Wyllie, R.C.
1854 Report of the Committee on Coffee 2:26-41. Honolulu.

Yucha, Trevor M., and Hallett H. Hammatt
2018 *Archaeological Literature Review and Field Inspection for the Maui Electric Company Retention Basin Project, Waikapū Ahupua‘a, Wailuku District, Maui, TMK: [2] 3-8-005:025 por.* Cultural Surveys Hawai‘i, Inc., Wailuku, Hawai‘i.

Yucha, Trevor M., Josephine M. Yucha, and Hallett H. Hammatt
2021 Archaeological Inventory Survey Report for the AES Kuihelani Solar Plus Storage Project, Waikapū Ahupua‘a, Wailuku District, Maui, TMK: [2] 3-8-005:002 por. Cultural Surveys Hawai'i, Inc., Wailuku, Hawai'i.

2023 *Archaeological Literature Review and Field Inspection Report for the Kuihelani Phase 2 Solar Project, Waikapū Ahupua‘a, Wailuku District (Pū‘ali Komohana Moku), Maui, TMK: [2] 3-8-005:002 por.* Cultural Surveys Hawai'i, Inc., Wailuku, Hawai'i.

Appendix A AIS Fieldwork Strategy

CULTURAL SURVEYS HAWAI`I

ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL DOCUMENTATION SERVICES SINCE 1982

O'ahu Island
P.O. Box 1114
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Ph: (808) 262-9972
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Maui Island
1860 Main Street
Wailuku, Hawai'i 96793
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Hilo, Hawai'i
Kona, Hawai'i
Lāwai, Kaua'i

January 9, 2023

State Historic Preservation Division
Department of Land and Natural Resources
130 Mahalani Street
Wailuku, HI 96793
(808) 652-1510

Subject: Early Consultation for Archaeological Inventory Survey Fieldwork Strategy for the AES Kuihelani Solar Phase 2 Project, Waikapū Ahupua'a, Pū'ali Komohana District, Maui Island, TMK: (2) 3-8-005:002 por.

CSH Job Code: WAIKAPU 54
HICRIS Project: TBD
Permits: TBD

Aloha:

On behalf of AES Clean Energy, Cultural Surveys Hawai'i, Inc. (CSH) would like to consult with the State Historic Preservation Division (SHPD) regarding an appropriate archaeological inventory survey (AIS) testing strategy for the AES Kuihelani Solar Phase 2 Project. Due to the project timeline and other factors, consultation with the SHPD on an appropriate AIS strategy is being requested prior to the engagement of a government permitting agency during the permit application process. We hope to be able to obtain SHPD approval to conduct an AIS with a subsurface testing component so that we can begin this work prior to initiation of the SHPD permit review process.

Project Background

AES Clean Energy is proposing to develop a 40 MW AC PV and 160 MWh battery energy storage system within an approximate 250-acre portion of a 734-acre study area within TMK: (2) 3-8-005:002 located within Waikapū Ahupua'a, Pū'ali Komohana District, Maui (Figure 1). The proposed study area extends south from the footprint of an existing solar plus storage energy project that is currently under construction (AES Kuihelani Solar Plus Storage). Access to the project site will be provided by existing paved agricultural roads. No project-related ground

disturbance is expected within the access roads nor within a condominium unit (A&B Condo Unit) that borders the study area (see Figure 1).

Numerous studies were conducted as part of the AES Kuihelani Solar Plus Storage Project that is located immediately north of the current proposed AES Kuihelani Solar Phase 2 Project. CSH completed a preliminary archaeological literature review and field inspection (Yucha et al. 2018), preliminary ground penetrating radar survey (Yucha and Hammatt 2019), cultural impact assessment (Spencer and Hammatt 2021), AIS plan (Yucha et al. 2019), AIS (Yucha et al. 2021a), and archaeological monitoring plan (Yucha et al. 2021b). While these studies do not cover the current project area, their findings are applicable. No human burials or human skeletal remains were identified during archaeological surveys or project-related ground disturbance within the AES Kuihelani Solar Plus Storage Project. The only identified historic properties were associated with historic agriculture and agricultural water diversion.

Similar findings to those identified during the AES Kuihelani Solar Plus Storage Project are anticipated within the current study area, which is located further south from Central Maui's inland sand dune complex, an area that is archaeologically and ethnographically associated with pre- and early post-Contact human interment. While the entire footprint of the current study area was previously used for commercial sugarcane cultivation, subsurface testing will confirm the presence/absence of historic properties that may be located beneath the agricultural plow zone. In order to identify historic properties and any potential cultural impacts or concerns related to the proposed project, CSH is proposing to conduct an AIS that utilizes the subsurface testing strategy and methodologies outlined herein as well as a cultural impact assessment that will include outreach and consultation with persons knowledgeable about the project area's history.

Pedestrian Inspection

The AIS fieldwork will include a 100 percent coverage pedestrian survey of the surface of the study area to identify any surface historic properties that may be present. The survey will be completed by a team of archaeologists conducting pedestrian transects. Transect spacing will depend on ground visibility. For open, plowed fields where ground visibility is excellent, spacing will be 10.0 m. For vegetated or unmaintained areas where ground visibility is poor, spacing will be 5.0 m. All surface historic properties will be located using a GPS receiver that is capable of sub-meter accuracy.

Documentation of Surface Historic Properties

If surface archaeological historic properties are identified, these properties will be inventoried and documented in accordance with Hawai'i Administrative Rules (HAR) 13-276-5(d) and other pertinent law. Documentation will generally include photographs (with scale and north arrow), written descriptions, scaled plan or profile maps, and sub-meter accurate GPS location.

If architectural historic properties are identified, CSH proposes to document these historic properties to be consistent with the documentation of archaeological historic properties. This

documentation can then be used by the SHPD Architecture Branch or a qualified architectural historian to complete an assessment of significance.

Geotechnical Testing

As part of the project's engineering process, geotechnical test boring will be conducted throughout the study area. CSH proposes to observe this geotechnical excavation and include the results of observation within the project's AIS report. Copies of the geotechnical report will also be submitted to the SHPD if they are available during the review process. Archaeological observation of geotechnical testing will provide additional information regarding stratigraphy at depths beyond standard archaeological test excavations. The strategy of archaeological observation of geotechnical testing is consistent with the AIS strategy that was completed as part of the previous AIS for the AES Kuihelani Solar Plus Storage Project (Yucha et al. 2021a).

Ground Penetrating Radar

CSH will utilize ground penetrating radar (GPR) survey during the AIS in an effort to increase survey coverage throughout the project area without further increasing the amount of invasive testing. CSH proposes to complete 12 GPR transects (GPR 1 through GPR 12) that each measure 100.0 m long by 1.0 m wide (Figure 2 and Figure 3). The results of the GPR survey will be included within the AIS report and compared to the findings of geotechnical testing and subsurface test excavation. If GPR anomalies are identified that may be interpreted as potential subsurface historic properties, these anomalies may be subject to archaeological testing to confirm their identity. The strategy of GPR survey is consistent with the AIS strategy that was completed as part of the previous AIS for the AES Kuihelani Solar Plus Storage Project (Yucha et al. 2021a).

Subsurface Testing

No previous archaeological testing has been conducted within the subject study area. A review of previous archaeological studies conducted in the vicinity of the project area indicates that there is a potential to identify subsurface historic properties in this region that include human burials within sand deposits (SIHP # 50-50-04-02755, -02756, -02757, -03553, -03554, -04480, and -05504), fire pit/*imu* features within sand deposits (SIHP # 50-50-04-06578) and cultural deposits containing historic refuse within fill sediment (SIHP # 50-50-04-08805).

In an effort to identify subsurface historic properties, CSH proposes to complete systematic sampling throughout the portions of the study area that have been identified for potential project-related ground disturbance. The proposed sampling strategy will require the excavation of 230 mechanically-assisted test excavations (T-1 through T-230) that have been placed in a systematic gridded pattern throughout the study area (see Figure 2 and Figure 3). The proposed AIS testing grid is placed in general cardinal alignment with the proposed direction of the solar arrays that will be constructed within the project area. Each AIS excavation will be of equal size and measure 0.6 by 6.1 m (2 by 20 ft), constituting 3.66 sq m (40 sq ft). Each AIS excavation will extend to culturally sterile soil or bedrock. The proposed sampling strategy is consistent with the sampling

strategy that was completed as part of the previous AIS for the AES Kuihelani Solar Plus Storage Project (Yucha et al. 2021a).

Fieldwork will be directed by CSH principal investigator and qualified osteologist, Josephine Yucha, M.S. along with a field crew of 2-3 archaeologists. A backhoe contractor will be used to slowly excavate and backfill each trench. If sand deposits or other potentially significant deposits are encountered, these deposits will be excavated in short draws and 6-inch lifts using the backhoe in order to minimize any potential disturbance to subsurface historic properties.

Documentation of Subsurface Historic Properties

Documentation of each excavation will include the recordation of soils, a stratigraphic profile of the entire length of the excavation, plan view maps, photographs, and sub-meter accurate GPS location. If non-burial subsurface historic properties are identified, then CSH will document these historic properties in accordance with HAR 13-276-5(d) and other pertinent law. Once identified, non-burial historic properties will be exposed using hand excavation and any sediment matrix associated with the historic property will be screened through 1/8th inch wire mesh. If human skeletal remains are identified, they will be treated as previously identified finds. CSH will stop work, notify the SHPD and representatives of the Maui/Lāna'i Islands Burial Council (MLIBC), and ensure that the remains are preserved in place pending an MLIBC treatment determination.

Following each excavation, the area will be backfilled, compacted, and restored to near original condition. At the conclusion of fieldwork, CSH will prepare and submit a draft AIS report for the review and acceptance of the SHPD.

If you have any questions or comments regarding this strategy, please feel free to call me at (808) 242-9882 on Maui or toll free at 1-800-599-9962. You may also reach me by e-mail at tyucha@culturalsurveys.com.

Sincerely,

Trevor Yucha
Cultural Surveys Hawai'i, Inc.

To: SHPD **Page 5**

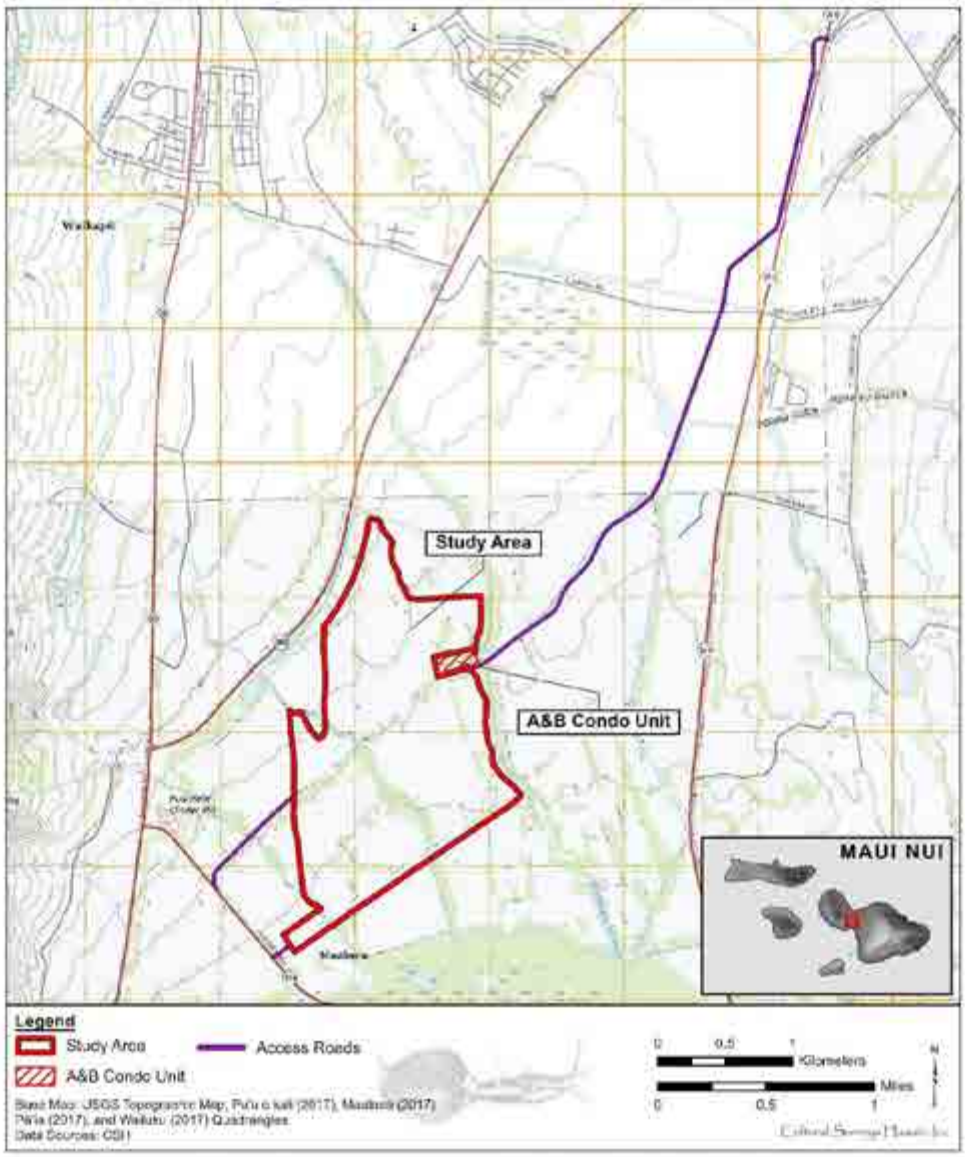

Figure 1. Portions of the 2017 Maalaea, Pu'u o kali, Pā'ia, and Wailuku U.S. Geological Survey 7.5-Minute Topographic Quadrangles depicting the location of the current study area (red); note that no project-related ground disturbance is planned within the access roads (purple) or A&B Condo Unit (red hatch)

Re: AES Kuihelani Solar Phase 2 Project

CULTURAL SURVEYS HAWAI‘I

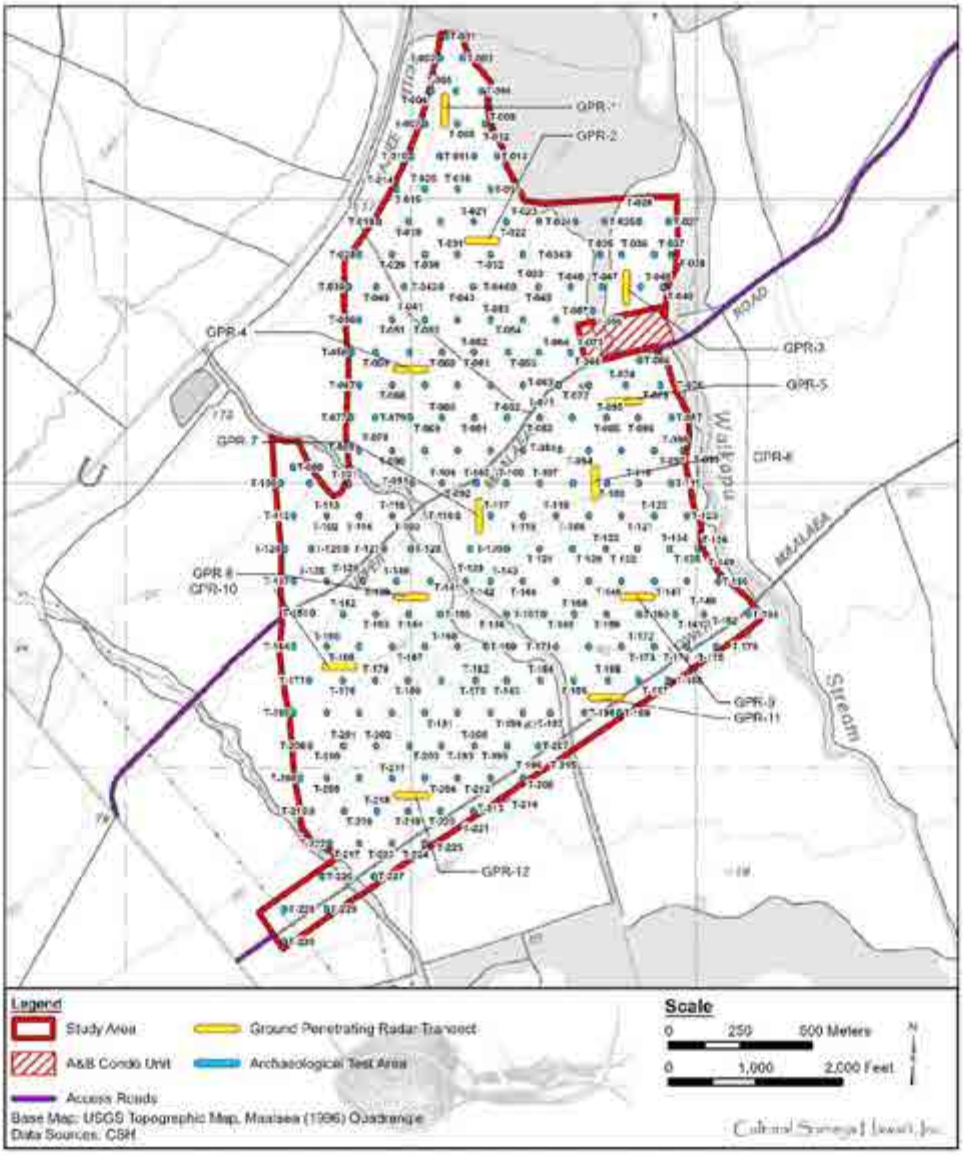

Figure 2. Portions of the 1996 Maalaea U.S. Geological Survey 7.5-Minute Topographic Quadrangles depicting the proposed location of 230 AIS test excavations (blue) and 12 GPR transects (yellow) within the study area (red); note that no project-related ground disturbance is planned within the access roads (purple) or A&B Condo Unit (red hatch)

Re: AES Kuihelani Solar Phase 2 Project

CULTURAL SURVEYS HAWAI'I

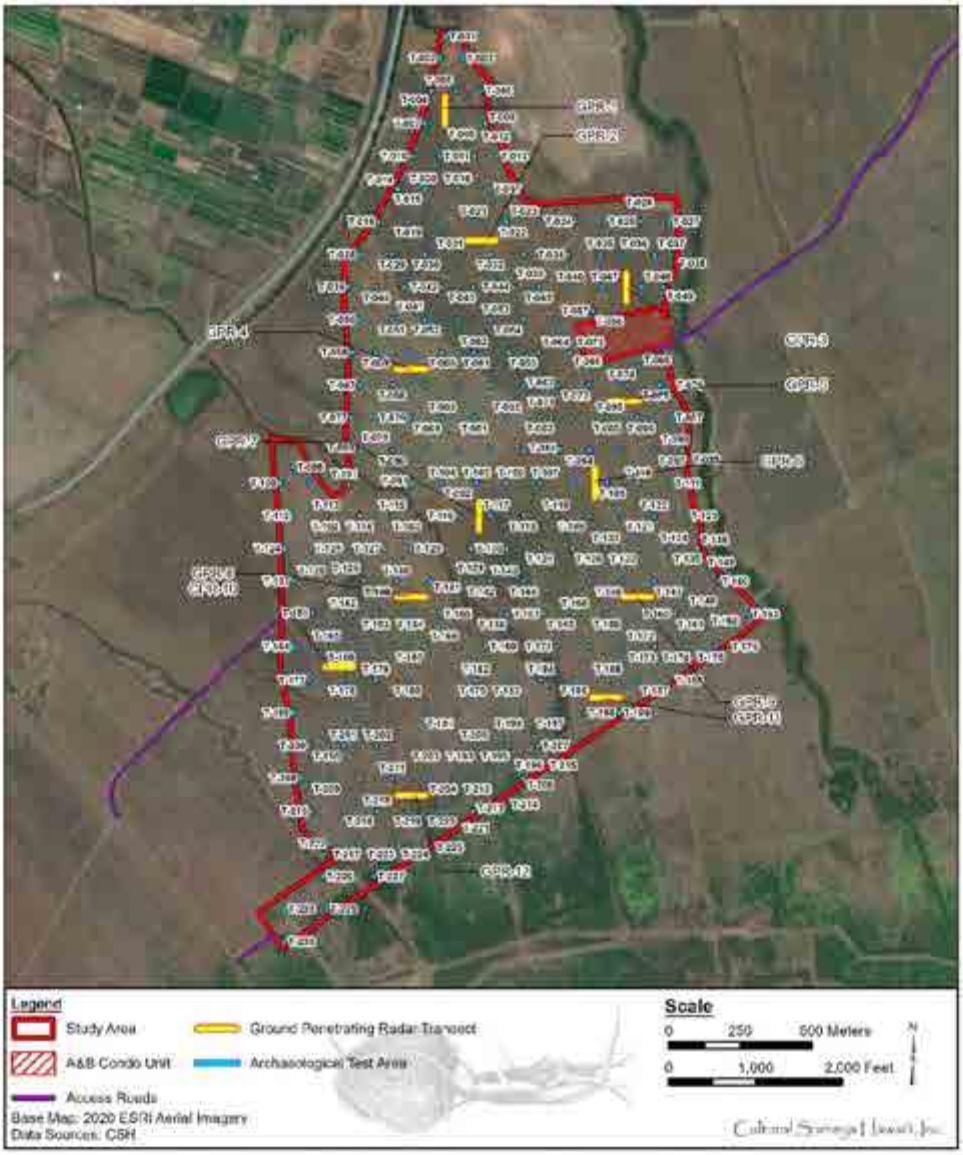

Figure 3. 2020 aerial photograph depicting the proposed location of 230 AIS test excavations (blue) and 12 GPR transects (yellow) within the study area (red); note that no project-related ground disturbance is planned within the access roads (purple) or A&B Condo Unit (red hatch)

Appendix B Laboratory Analysis Master Catalogue

Acc. #	TE-#	Depth (cmbs)	SIHP # 50-50-04	Material	Description	Mass (g)
1	73	0-130	-08805 Feature C	Slag	Sugarcane slag	15.4
2	73	0-130	-08805 Feature C	Glass	Colorless glass bottle glass fragment, slightly concave	8.2
3	73	0-130	-08805 Feature C	Glass	Colorless glass, bottle glass fragment	6.4
4	73	0-130	-08805 Feature C	Glass	Colorless glass fragments, interior striation pattern identical in both fragments	3.2
5	73	0-130	-08805 Feature C	Glass	Fragments of colorless glass	13.6
6	73	0-130	-08805 Feature C	Metal	Heavily corroded metal, wire-like and shaped into loops (3)	13.6
7	73	0-130	-08805 Feature C	Metal	Very corroded metal fragments (3), thin, wire-like	10.1
8	73	0-130	-08805 Feature C	Metal	Round nail, round flat head, heavily corroded	10.0
9	73	0-130	-08805 Feature C	Metal	Round nail, round flat head, heavily corroded	2.4
10	73	0-130	-08805 Feature C	Metal	Sheared-off head of a construction bolt or fastener	4.2
11	73	0-130	-08805 Feature C	Metal	Heavily corroded flat and folded metal fragments (3)	44.6
12	73	0-130	-08805 Feature C	Ceramic	White ceramic porcelain insulator spacer fragment	14.6
13	73	65-130	-08805 Feature C	Vertebrate	Four fragments of a pig cervical vertebra	1.5
14	73	65-130	-08805 Feature C	Vertebrate	Fish vertebral body, a portion of a spine-shaped bone, and three fragments possibly from a dentary	0.2
15	73	65-130	-08805 Feature C	Vertebrate	Carpometacarpus (17 mm long) and possible proximal end of an ulna from a small bird	0.1
16	73	0-130	-08805 Feature C	Invertebrate	Endemic land snail - Achantinellidae sp.	7.6
17	73	0-130	-08805 Feature C	Metal	Heavily corroded flat and folded metal fragments (3)	364.0

18	73	0-130	-08805 Feature C	Glass	Colorless glass tubular fragment	1.6
19	93	125	—	Coral	Water-rounded, branch coral fragment	1.6
20	171	25	-08805 Feature D	Glass	Aqua, glass bottle fragment, base and partial heel fragment, embossed; "W" on base	94.0
21	227	178	—	Invertebrate	Turbinidae shell fragment, chalky white	1.2
22	227	43-77	—	Invertebrate	5 marine shell fragments, water-rounded	14.2
23	Surface	0	-09165	Metal	Railroad spike, square shaft, flat head, bi-faced point	47.6
24	169	0	—	Brick	Brick fragment, red clay, smooth on external edge	12.0
25	140	146	—	Invertebrate	Endemic land snail - Achantinellidae sp.	0.8
26	151	0-20	-09165	Glass	Olive glass bottle glass, shoulder fragment, beverage use	9.6
27	151	0-20	-09165	Glass	Colorless glass fragment, faint aqua hue, slightly concave, unknown use	7.2
28	151	0-20	-09165	Glass	Colorless glass fragment, slightly concave	3.6
29	151	0-20	-09165	Glass	Colorless glass fragment, slightly concave	3.0
30	151	0-20	-09165	Glass	Colorless flat glass fragments (2)	6.2
31	151	0-20	-09165	Glass	Colorless flat glass fragments	1.6
32	151	0	-09165	Ceramic	Whiteware, holloware, rim to body fragment, transparent glaze, underglaze blue botanical print design on exterior	9.0
33	151	0	-09165	Ceramic	Whiteware, holloware, rim to body fragment, transparent glaze, no decoration on fragment	4.2
34	151	0	-09165	Ceramic	Whiteware, holloware, rim to marly fragment, transparent glaze, underglaze brown unknown pattern	1.8
35	151	0	-09165	Ceramic	Whiteware, unknown body fragment, transparent glaze, underglaze blue bird pattern	1.8

36	151	0	-09165	Ceramic	Whiteware, unknown rim to body fragment, transparent glaze, underglaze blue botanical pattern	1.6
37	151	0	-09165	Ceramic	Whiteware, unknown body fragment, transparent glaze, underglaze blue unknown pattern	0.8
38	151	0	-09165	Ceramic	Whiteware, unknown body fragment, transparent glaze, underglaze blue geometric pattern	0.4
39	151	0	-09165	Ceramic	Whiteware holloware, foot ring and waist fragment, transparent glaze, underglaze faded blue unknown pattern	22.2
40	151	0	-09165	Ceramic	Whiteware holloware, foot ring and waist fragment, transparent glaze, underglaze faded blue stripe around foot and unknown pattern	7.6
41	151	0	-09165	Ceramic	Whiteware holloware, rim to waist fragment, transparent glaze, underglaze faded blue geometric pattern around rim	5.4
42	151	0	-09165	Ceramic	Whiteware holloware, rim to waist fragment (2), transparent glaze, underglaze blue geometric pattern	4.2
43	151	0-20	-09165	Glass	Lavender bottle glass, lip to neck, partial shoulder fragment, vertical mold lines, bead finish	24.6
44	151	0-20	-09165	Glass	Aqua glass bottle fragments, round base fragment and body fragment, Embossing "C O / 2 3" on base	52.6
45	151	0-20	-09165	Glass	Greenish aqua glass bottle base to heel fragment, embossed "W" or "M" on base, likely soda bottle	38.8
46	151	0-20	-09165	Glass	Amber (brown) glass bottle, base fragments, (2) embossed with a dot on base	22.4
47	151	0-20	-09165	Glass	Aqua glass bottle, body fragment	4.0
48	151	0-20	-09165	Glass	Greenish aqua glass bottle, body fragment	5.6

49	Surface	0	-09165	Glass	Colorless glass bottle body fragment	3.4
50	Surface	0	-09165	Glass	Lavender glass, possible bottle fragment, curved at one end	4.2
51	151	0	-09165	Ceramic	Whiteware tableware, body fragment, transparent glaze, brown linear pattern underglaze on exterior	0.6
52	151	0	-09165	Ceramic	Whiteware tableware body fragment, transparent overglaze, light blue linear pattern underglaze	0.8
53	164	0	-09165	Ceramic	Whiteware, tableware, foot ring, marley and cheek fragment, transparent glaze, underglaze blue geometric pattern	11.4
54	Surface	0	-09165	Metal	Railroad spike, square shaft, flat head	151.8
55	Surface	0	-09165	Glass	Olive green glass bottle base and partial body fragment, round base, arched base	157.6
56	Surface	0	-09165	Glass	Amber glass bottle base, heel and body fragment, round base, embossed "J A P A / 4" on base, probable Sake bottle	120.2
57	Surface	0	-09165	Glass	Olive/amber glass bottle, neck fragment, partial collar/lip	37.6
58	Surface	0	-09165	Glass	Colorless glass bottle, complete, round base, square body, wide mouth twist-off, embossed "16 FL. OZ. (ONE PINT)" on shoulder, "443-16A / (Ball-Icon logo) / H4" on base (logo is an "i" inside a "B")	262.0
59	Surface	0	-09165	Glass	Lavender glass fragment, decorative item, round shaped	62.6
60	Surface	0	-09165	Glass	Lavender glass fragment, decorative item, round shaped, scalloped design	21.8
61	Surface	0	-09165	Glass	Lavender glass fragment, decorative item	27.2

62	Surface	0	-09165	Glass	Colorless glass bottle base and partial body fragment, embossed "W" or "M" on base	43.2
63	Surface	0	-09165	Glass	Clear aqua blue glass bottle base fragment, round base	24.6
64	Surface	0	-09165	Glass	Light aqua glass bottle neck and lip fragment, grooved ring finish	29.2
65	Surface	0	-09165	Glass	Colorless glass fragment, internal cracks	36.6
66	Surface	0	-09165	Glass	Slight lavender, decorative glass item, possible decanter lid, scalloped edges, round	26.4
67	Surface	0	-09165	Glass	Milk glass jar fragment, lip to body fragment, threaded finish, octagonal body shape	14.2
68	Surface	0	-09165	Glass	Milk glass jar fragment, body to base fragment, embossed with Japanese writing on base, octagonal body shape	15.0
69	Surface	0	-09165	Ceramic	Whiteware holloware, foot to rim fragment, transparent glaze, underglaze polychrome (blue and brown), alternating horizontal bands on exterior	44.0
70	Surface	0	-09165	Ceramic	Whiteware holloware, foot, well, to cheek fragment, transparent glaze, underglaze monoglaze (light green), on exterior	17.6
71	Surface	0	-09165	Ceramic	Whiteware tableware, unknown vessel, body fragment, transparent glaze, underglaze brown random spot design on exterior	7.0
72	Surface	0	-09165	Ceramic	Whiteware unknown vessel, body fragment, transparent glaze, underglaze (gray), flower design on exterior	8.4

73	Surface	0	-09165	Ceramic	Whiteware tableware, unknown vessel, body fragment, transparent glaze, underglaze (green), partial structure in design, exterior	1.8
74	Surface	0	-09165	Ceramic	Whiteware, unknown function, base fragment, round base, bottom of base is unglazed	22.6
75	Surface	0	-09165	Ceramic	Stoneware, unknown function, body fragment, Albany slip glaze (brown) interior and exterior	7.4
76	Surface	0	-09165	Ceramic	Whiteware, holloware, cup, cheek, to body to rim fragment, transparent glaze, underglaze monochrome (blue), botanical design (water lilies), exterior	29.2
77	Surface	0	-09165	Ceramic	Whiteware, holloware, body fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical design, exterior	8.8
78	Surface	0	-09165	Ceramic	Whiteware, holloware, body to rim fragment, transparent glaze, underglaze monochrome (blue), transfer print, geometric design, exterior and interior	5.0
79	Surface	0	-09165	Ceramic	Whiteware, flatware, rim to marley fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical design, exterior and interior	7.6
80	Surface	0	-09165	Ceramic	Whiteware, holloware, cheek to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical design, exterior	20.2
81	Surface	0	-09165	Ceramic	Whiteware, tableware, rim fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical and geometric design, exterior and interior	22.2

82	Surface	0	-09165	Ceramic	Whiteware, flatware, well foot, to marley fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical and geometric design, exterior and interior	54.0
83	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, band around foot, exterior	47.4
84	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, partial unknown design, double band around foot, exterior	36.8
85	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical design, exterior	21.2
86	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, botanical design, exterior	25.0
87	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, geometric design, lines around foot and on base, exterior	15.8
88	Surface	0	-09165	Ceramic	Whiteware, holloware, cheek to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, geometric and floral design, exterior	9.6

89	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze monochrome (blue), transfer print, Makers Mark, "Trade Mark" with a sunrise design, used on pieces after the Tradesmark Act in 1862	20.8
90	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, no design on fragment, Makers Mark, "Trade Mark" with a sunrise design, used on pieces after the Tradesmark Act in 1862	12.2
91	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, blue blob design on fragment	11.6
92	Surface	0	-09165	Metal	Flat, square sheet of metal, perforation along one side	380.4
93	Surface	0	-09165	Invertebrate	Unknown marine shell fragment, water-rounded	0.4
94	Surface	0	-09165	Glass	Colorless bottle glass, body fragment, Embossing: "TZ / UBULAR / ORK U.S.A." Possible glass lantern cover from R.E. Dietz Company from New York City, USA, est. 1840	15.8
95	Surface	0	-09165	Glass	Amber glass bottle fragment, body fragments (2)	26.4
96	Surface	0	-09165	Glass	Light blue glass fragment	3.0
97	Surface	0	-09165	Glass	Aqua glass fragment	3.4
98	Surface	0	-09165	Glass	Aqua glass fragment	1.2
99	Surface	0	-09165	Glass	Light aqua glass fragment	0.6
100	Surface	0	-09165	Glass	Colorless glass fragment	1.8
101	Surface	0	-09165	Ceramic	Whiteware, holloware, foot to body fragment, transparent glaze, underglaze (blue) transfer print, geometric design exterior	4.8

102	Surface	0	-09165	Ceramic	Whiteware, body fragment, transparent glaze, no pattern on fragment	9.0
103	Surface	0	-09165	Ceramic	Whiteware flatware, foot to marly fragment, transparent glaze, no pattern on fragment	7.4
104	Surface	0	-09165	Ceramic	Whiteware holloware, body to rim fragment, transparent glaze, no pattern on fragment	3.2
105	Surface	0	-09165	Ceramic	Whiteware holloware, body fragment, transparent glaze, underglaze (blue) transfer print, design not recognizable, exterior	5.2
106	Surface	0	-09165	Ceramic	Whiteware holloware, body fragment, transparent glaze, underglaze (blue) transfer print, design not recognizable	3.0
107	Surface	0	-09165	Ceramic	Whiteware holloware, body fragment, transparent glaze, underglaze (blue) transfer print, design not recognizable, interior and exterior	1.0
108	Surface	0	-09165	Ceramic	Whiteware unknown, body fragment, transparent glaze, underglaze (light blue) no design on fragment	1.6
109	Surface	0	-09165	Ceramic	Yellowware, unknown body fragment, transparent glaze, underglaze (white exterior, yellow interior) no design on fragment	2.8
110	Surface	0	-09165	Ceramic	Whiteware, rim fragment, transparent glaze, underglaze (light gray) no design on fragment	0.4
111	171	152	-08805 Feature D	Vertebrate	Cow; extremely fragmented cranium; likely less than 50% complete and excludes teeth; recent fragmentation due to brittleness	767.0

112	171	152	-08805 Feature D	Vertebrate	Mouse or vole; partial cranium, right hemimandible, left and right femora with an unfused distal end, left scapula, right tibia with fused fibula	0.1
113	182	Backdirt	—	Vertebrate	Likely cow; cortical fragment, likely from a large, long bone with a smooth, flat surface area; relatively thick and dense with longitudinal, fine cracks from weathering	2.0
114	205	70	—	Vertebrate	Cow; highly fragmented thoracic vertebra (7 larger pieces and many small fragments)	51.8

Final

Archaeological Inventory Survey Report for the AES Kuihelani Solar Phase 2 Project, Waikapū Ahupua‘a, Wailuku District, (Pū‘ali Komohana Moku), Maui Island, TMK: [2] 3-8-005:002 por.

Volume II of III

Prepared for
Kuihelani Solar Phase 2, LLC
and
County of Maui, Department of Planning

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Section 1 Results of Fieldwork

Volume II of the AIS report for the AES Kuihelani Solar Phase 2 Project contains the descriptions of Trenches 1 through 100, which were distributed throughout the northern half of the study area (Figure 1 and Figure 2). See Volume I for the ground penetrating radar (GPR) and geotechnical boring results, along with the background research, field methods, laboratory results, historic property descriptions, significance assessments, project effect, and mitigation recommendations. See Volume III for the descriptions of Trenches 101 through 230, which were distributed throughout the southern half of the study area.

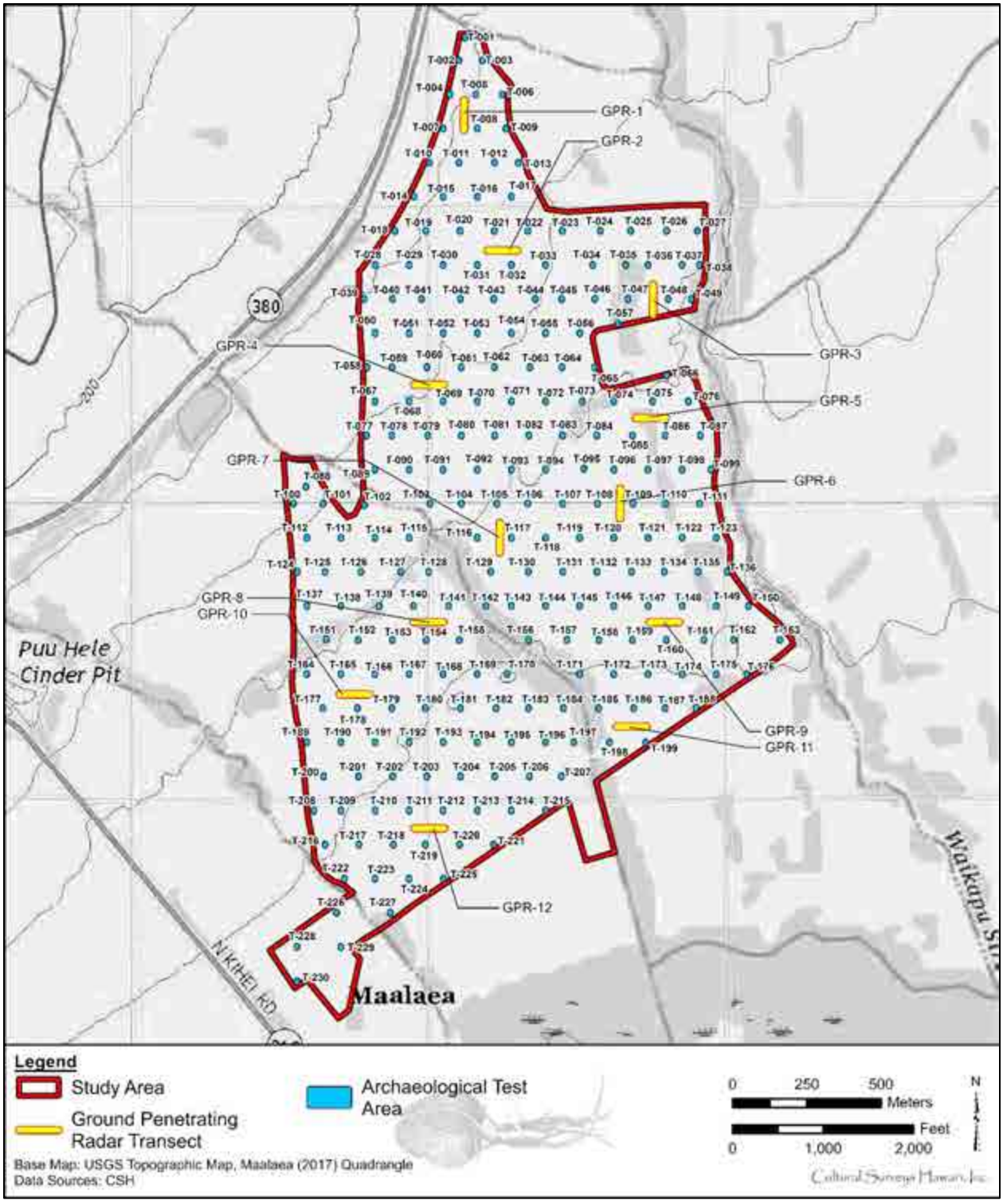

Figure 1. Portion of the 2017 Maalaea USGS 7.5-minute topographic quadrangle showing the location of the AIS test excavations and GPR survey transects within the study area (U.S. Geological Survey 2017)

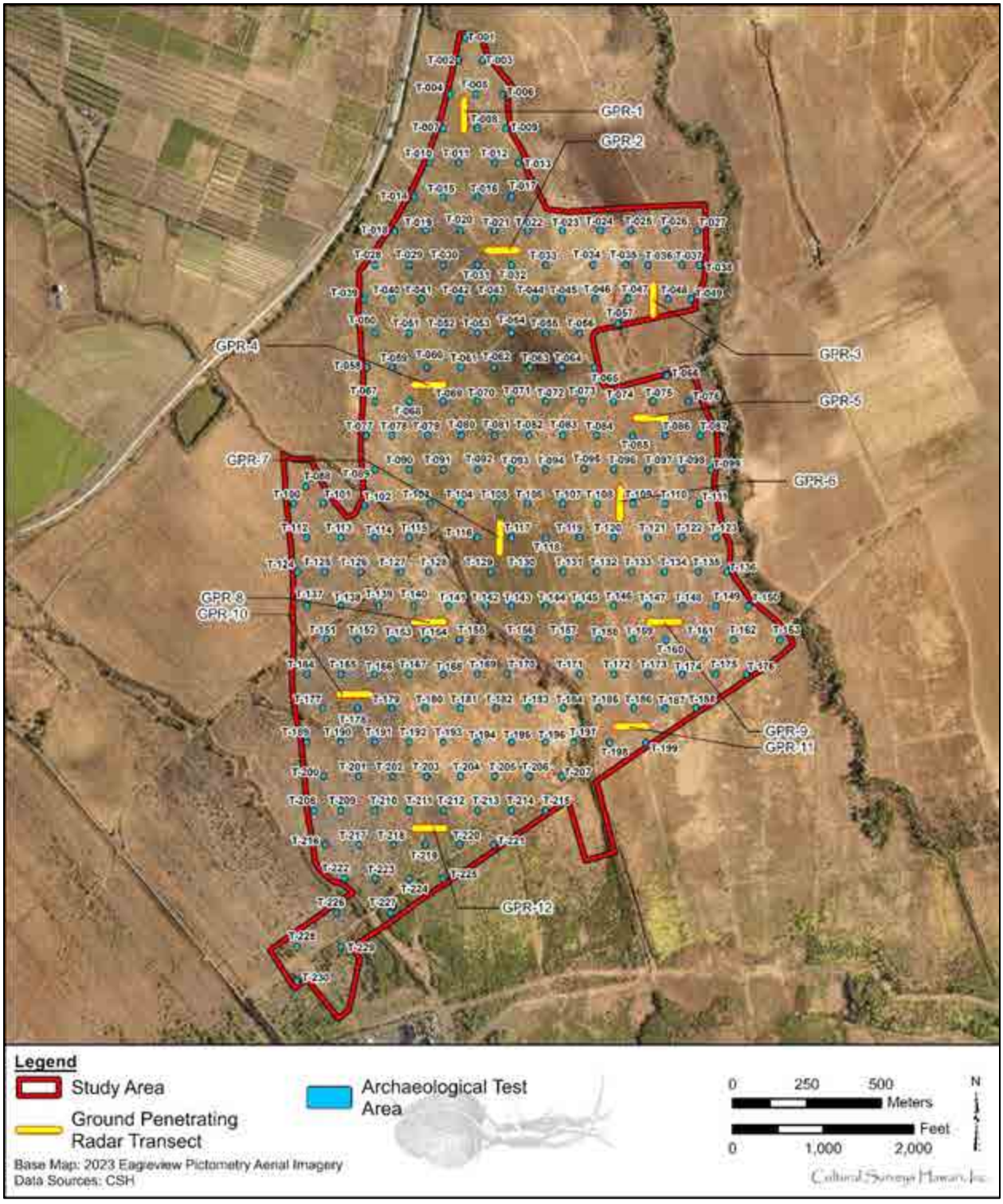

Figure 2. Aerial image showing the location of the AIS test excavations and GPR survey transects within the study area (EagleView Technologies Inc. 2023)

1.1.1 Test Excavation 1 (TE-1)

TE-1 was at the northernmost tip of the study area (Figure 3). The excavation was 6.00 m long by 1.00 m wide with a maximum depth of 1.00 mbs within a sterile natural deposit. The stratigraphy of TE-1 consisted of a reddish black silty clay loam developing A horizon (Stratum I) and a dusky red, silty clay loam Ap horizon (Stratum II) overlying very dark brown, previously disturbed natural gravelly silty clay loam (Stratum III) and a dark brown, natural very cobbly silty clay stream deposit (Stratum IV) (Figure 4 through Figure 6 and Table 1). Stratum II contained a large piece of concrete and pieces of black plastic irrigation drip tape that were not collected.

Figure 3. TE-1, overview of the general location, view to southeast

Figure 4. TE-1, close-up of the west wall, view to northwest

Figure 5. TE-1, overview of the west wall, view to southwest

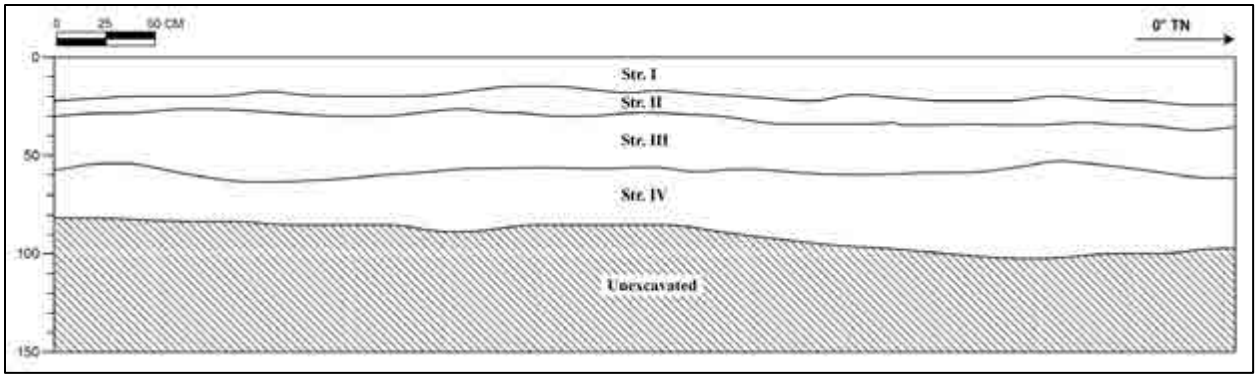

Figure 6. TE-1, stratigraphy of the west wall

Table 1. TE-1 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–25	Developing A horizon; 2.5YR 2.5/1, reddish black; silty clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, smooth lower boundary
II	15–37	Ap horizon; 2.5YR 3/2, dusky red; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, smooth lower boundary; contained a large piece of concrete and black plastic irrigation drip tape pieces (not collected)
III	25–65	Previously disturbed natural; 7.5YR 2.5/2, very dark brown; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; diffuse, smooth lower boundary
IV	54–100	Natural; 7.5YR 3/3, dark brown; very cobbly silty clay; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; lower boundary not observed; stream deposit; contained water rounded basalt gravel and cobbles and few fine to coarse mottles of 7.5YR 4/3, brown, silty clay

1.1.2 Test Excavation 2 (TE-2)

TE-2 was near the western border of the northern tip of the study area (Figure 7). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 0.94 mbs. The stratigraphy of TE-2 consisted of very dark brown, cobbly silty clay loam Ap horizon (Stratum I) overlying very dark gray, natural gravelly silty clay loam (Stratum II) and a dark brown, natural extremely gravelly silty clay stream deposit (Stratum III) (Figure 8 through Figure 10 and Table 2). Stratum I contained pieces of black plastic irrigation drip tape that were not collected. No other cultural materials were observed.

Figure 7. TE-2, overview of the general location, view to southeast

Figure 8. TE-2, close-up of the west wall, view to west

Figure 9. TE-2, overview of the west wall, view to northwest

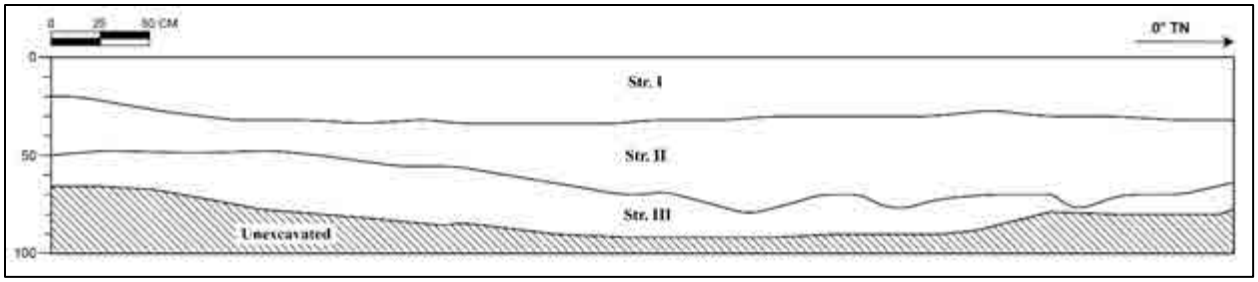

Figure 10. TE-2, stratigraphy of the west wall

Table 2. TE-2 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–34	Ap horizon; 10YR 2/2, very dark brown; cobbly silty clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, smooth lower boundary; contained black plastic irrigation drip tape pieces (not collected)
II	20–78	Natural; 7.5YR 3/1, very dark gray; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; diffuse, smooth lower boundary
III	48–92	Natural; 7.5YR 3/2, dark brown; extremely gravelly silty clay; moderate, fine granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; stream deposit

1.1.3 Test Excavation 3 (TE-3)

TE-3 was near the eastern border of the northern tip of the study area (Figure 11). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 0.88 mbs. The stratigraphy of TE-3 consisted of a very dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying very dark brown, previously disturbed, natural gravelly silty clay loam (Stratum II) and a dark brown, natural extremely cobbly sandy clay loam stream deposit (Stratum III) (Figure 12 through Figure 15 and Table 3). No cultural materials were encountered.

Figure 11. TE-3, overview of the general location, view to southeast

Figure 12. TE-3, close-up of the northern end of the west wall, view to west

Figure 13. TE-3, close-up of the southern end of the west wall, view to west

Figure 14. TE-3, overview of the west wall, view to northeast

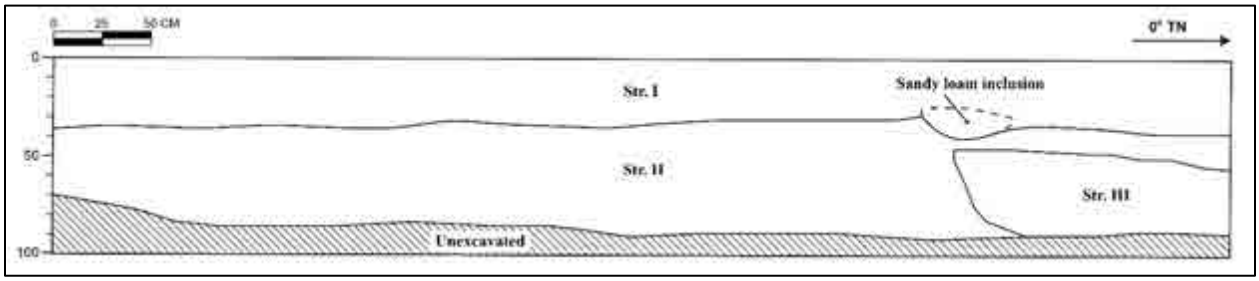

Figure 15. TE-3, stratigraphy of the west wall

Table 3. TE-3 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–37	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; diffuse, smooth lower boundary; contained an inclusion of 10YR 3/6, dark yellowish brown, gravelly sandy loam
II	30–90	Previously disturbed natural; 7.5YR 2.5/2, very dark brown; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; lower boundary not observed; alluvial deposit
III	47–88	Natural; 7.5YR 3/2, dark brown; extremely cobbly sandy clay loam; weak, medium granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; stream deposit

1.1.4 Test Excavation 4 (TE-4)

TE-4 was near the western border of the northern tip of the study area (Figure 16). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.37 mbs. The stratigraphy of TE-4 consisted of a dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying very dark brown, natural very cobbly silt loam (Stratum II) and brown, natural cobbly silty clay (Stratum III) (Figure 17 through Figure 20 and Table 4). Root moulds from Stratum I intruded through Stratum II and into Stratum III. No cultural materials were encountered.

Figure 16. TE-4, overview of the general location, view to west

Figure 17. TE-4, overview of the west wall, view to northwest

Figure 18. TE-4, overview of the west wall, view to northwest

Figure 19. TE-4, close-up of the west wall, view to west

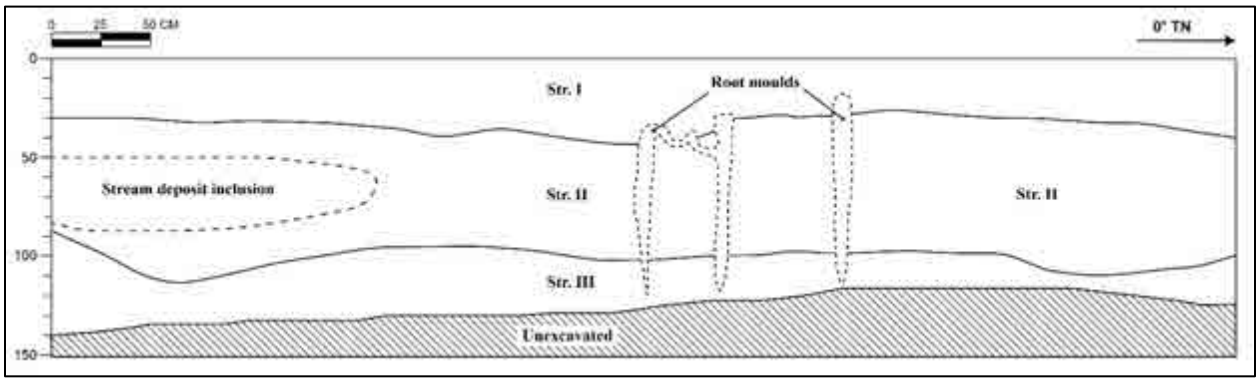

Figure 20. TE-4, stratigraphy of the west wall

Table 4. TE-4 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–42	Ap horizon; 7.5YR 3/2, dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, smooth lower boundary; contained coarse root moulds filled with 10YR 5/3, brown; silty clay intruding through Strata II and III
II	26–113	Natural; 10YR 2/2, very dark brown; very cobbly silt loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, smooth lower boundary; alluvial deposit
III	87–137	Natural; 10YR 4/3, brown; cobbly silty clay; weak, very fine platy structure; moist, firm consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; lower boundary not observed

1.1.5 Test Excavation 5 (TE-5)

TE-5 was in the northern tip of the study area (Figure 21). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.25 mbs. The stratigraphy of TE-5 consisted of a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying dark brown, natural very gravelly silty clay loam (Stratum II); brown, natural gravelly silt loam (Stratum III); and a dark gray, natural extremely cobbly sandy loam stream deposit (Stratum IV) (Figure 22 through Figure 24 and Table 5). No cultural materials were encountered.

Figure 21. TE-5, overview of the general location, view to south

Figure 22. TE-5, close-up of the east wall, view to east

Figure 23. TE-5, overview of the east wall, view to northeast

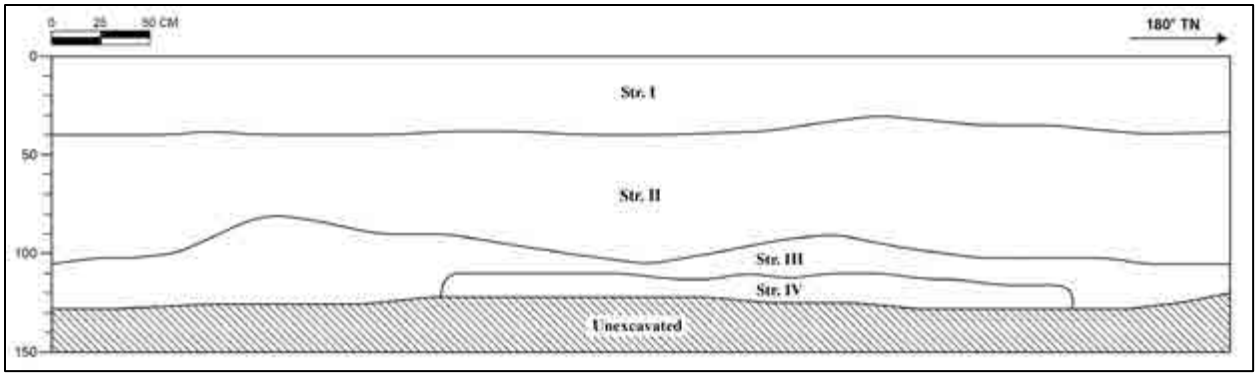

Figure 24. TE-5, stratigraphy of the east wall

Table 5. TE-5 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–40	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, smooth lower boundary
II	32–105	Natural; 7.5YR 3/3, dark brown; very gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, wavy lower boundary
III	78–120	Natural; 7.5YR 4/4, brown; gravelly silt loam; weak, very fine platy structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed
IV	107–125	Natural; 7.5YR 4/1, dark gray; extremely cobbly sandy loam; weak, medium granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; stream deposit

1.1.6 Test Excavation 6 (TE-6)

TE-6 was near the eastern border of the northern tip of the study area (Figure 25). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.40 mbs. The stratigraphy of TE-6 consisted of a dark reddish brown silty clay loam Ap horizon (Stratum I) overlying very dusky red, natural gravelly silty clay loam (Stratum II) and dark reddish brown, natural very gravelly silty loam (Stratum III) (Figure 26 through Figure 28 and Table 6). No cultural materials were encountered.

Figure 25. TE-6, overview of the general location, view to southeast

Figure 26. TE-6, close-up of the west wall, view to west

Figure 27. TE-6, overview of the west wall, view to northeast

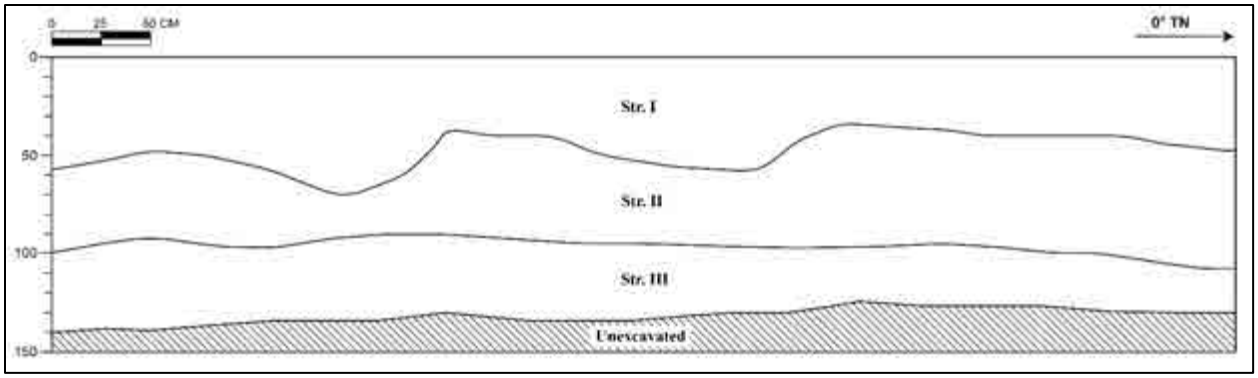

Figure 28. TE-6, stratigraphy of the west wall

Table 6. TE-6 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–70	Ap horizon; 5YR 2.5/2, dark reddish brown; silty clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine roots; clear, wavy lower boundary
II	35–106	Natural; 2.5YR 2.5/2, very dusky red; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; diffuse, clear lower boundary
III	90–140	Natural; 5YR 3/4, dark reddish brown; very gravelly silty loam; weak, very fine granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed

1.1.7 Test Excavation 7 (TE-7)

TE-7 was near the western border of the northern tip of the study area (Figure 29). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.43 mbs. The stratigraphy of TE-7 consisted of a very dark brown, very gravelly sandy clay loam Ap horizon (Stratum I) overlying dark reddish brown, natural gravelly clay loam (Stratum II) and brown, natural cobbly silty clay (Stratum III) (Figure 30 through Figure 32 and Table 7). No cultural materials were encountered.

Figure 29. TE-7, overview of the general location, view to southeast

Figure 30. TE-7, close-up of the west wall, view to west

Figure 31. TE-7, overview of the west wall, view to northwest

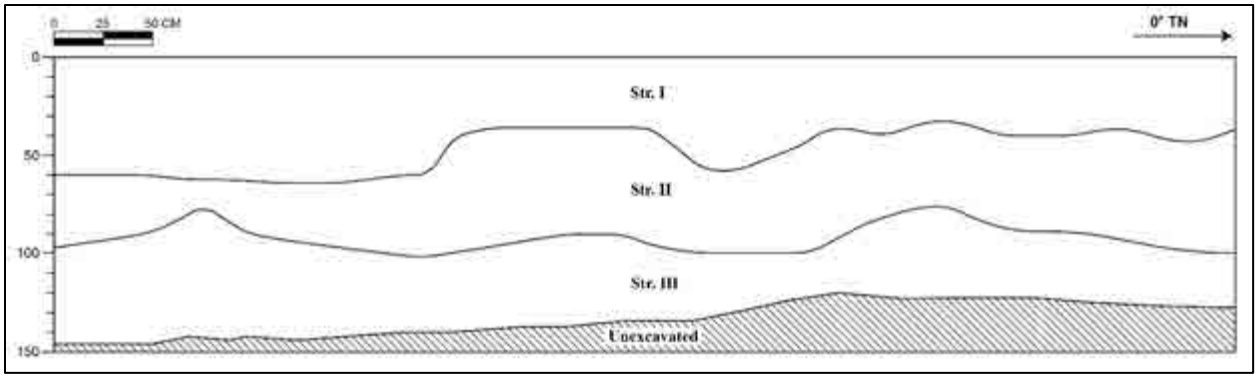

Figure 32. TE-7, stratigraphy of the west wall

Table 7. TE-7 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–62	Ap horizon; 7.5YR 2.5/2, very dark brown; very gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; many fine to medium roots; abrupt, wavy lower boundary; contained a concentration of 7.5YR 3/2, dark brown, extremely gravelly silt loam near the lower boundary
II	32–98	Natural; 5YR 2.5/2, dark reddish brown; gravelly clay loam; moderate, very fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; very abrupt, wavy lower boundary; alluvial deposit
III	73–143	Natural; 7.5YR 4/3, brown; cobbly silty clay; moderate, very fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; no roots; lower boundary not observed

1.1.8 Test Excavation 8 (TE-8)

TE-8 was in the central portion of the northern tip of the study area (Figure 33). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.30 mbs. The stratigraphy of TE-8 consisted of a reddish black sandy clay loam Ap horizon (Stratum I) overlying dark reddish brown, natural silty clay loam (Stratum II) and dark yellowish brown, natural cobbly silt loam (Stratum III) (Figure 34 through Figure 36 and Table 8). Stratum III contained several inclusions of basalt cobbles and grayish brown silt loam stream deposits. No cultural materials were encountered.

Figure 33. TE-8, overview of the general location, view to southeast

Figure 34. TE-8, close-up of the east wall, view to east

Figure 35. TE-8, overview of the east wall, view to northeast

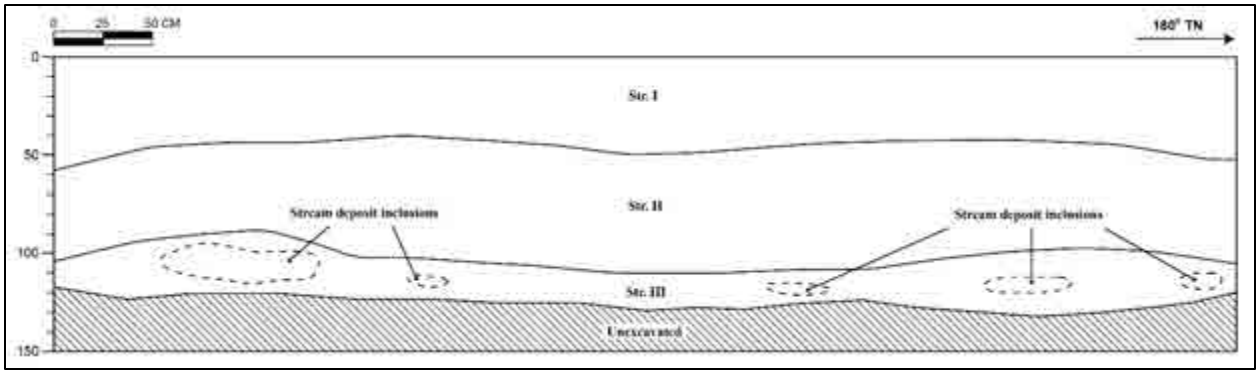

Figure 36. TE-8, stratigraphy of the east wall

Table 8. TE-8 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–58	Ap horizon; 2.5YR 2.5/1, reddish black; sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, smooth lower boundary
II	40–110	Natural; 5YR 2.5/2, dark reddish brown; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; abrupt, wavy lower boundary
III	87–130	Natural; 10YR 4/4, dark yellowish brown; cobbly silt loam; weak, very fine granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; contained fine to coarse inclusions of basalt cobbles and 10YR 5/2, grayish brown silt loam stream deposits

1.1.9 Test Excavation 9 (TE-9)

TE-9 was near the eastern border of the northern tip of the study area (Figure 37). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.51 mbs. The stratigraphy of TE-9 consisted of very dark brown, sandy clay loam Ap horizon (Stratum I) overlying a dark gray, natural very cobbly silt loam stream deposit (Stratum II); dark reddish brown, natural silty clay loam (Stratum III); and dark reddish brown, natural silt loam (Stratum IV) (Figure 38 through Figure 40 and Table 9). No cultural materials were encountered.

Figure 37. TE-9, overview of the general location, view to south

Figure 38. TE-9, close-up of the northern end of the west wall, view to west

Figure 39. TE-9, overview of the west wall, view to southwest

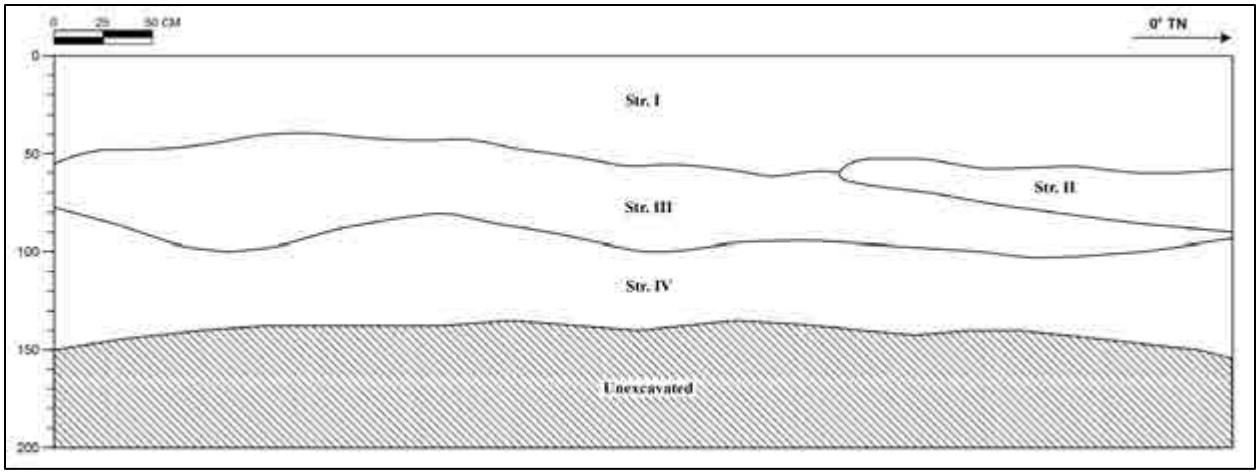

Figure 40. TE-9, stratigraphy of the west wall

Table 9. TE-9 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–57	Ap horizon; 7.5YR 2.5/2, very dark brown; sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; gradual, wavy lower boundary
II	55–88	Natural; 7.5YR 4/1, dark gray; very cobbly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; clear, discontinuous lower boundary; stream deposit
III	40–101	Natural; 5YR 2.5/2, dark reddish brown; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; clear, wavy lower boundary
IV	77–151	Natural; 5YR 3/3, dark reddish brown; silt loam; weak, very fine platy structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed

1.1.10 Test Excavation 10 (TE-10)

TE-10 was near the western border of the northern tip of the study area (Figure 41). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.50 mbs. The stratigraphy of TE-10 consisted of a very dark brown, very gravelly sandy clay loam Ap horizon (Stratum I) overlying dark reddish brown, natural gravelly silty clay loam (Stratum II) and brown, natural cobbly silt loam (Stratum III) (Figure 42 through Figure 44 and Table 10). No cultural materials were encountered.

Figure 41. TE-10, overview of the general location, view to southeast

Figure 42. TE-10, overview of the west wall, view to northwest

Figure 43. TE-10, overview of the west wall, view to southwest

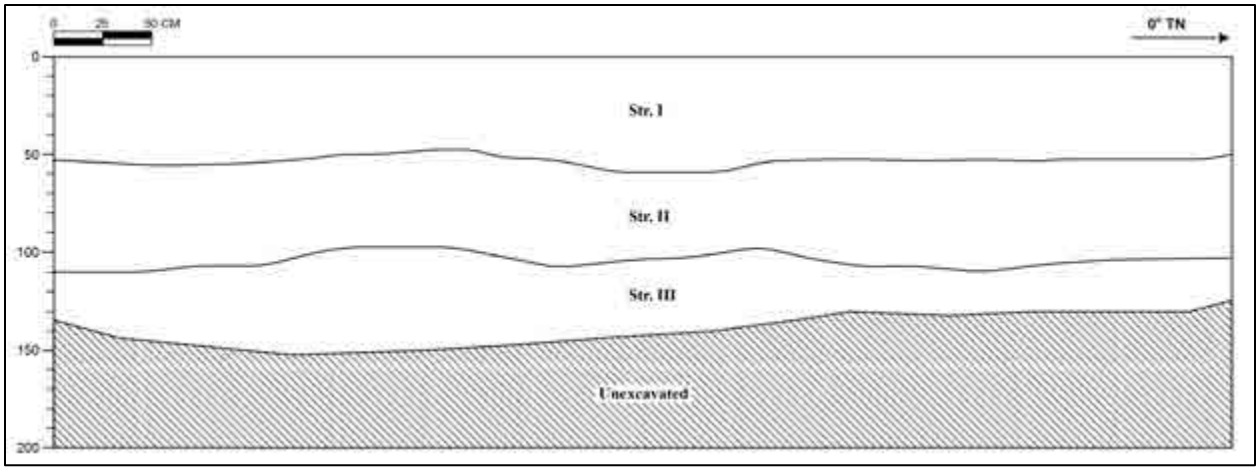

Figure 44. TE-10, stratigraphy of the west wall

Table 10. TE-10 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–58	Ap horizon; 7.5YR 2.5/2, very dark brown; very gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, wavy lower boundary
II	48–108	Natural; 5YR 2.5/2, dark reddish brown; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine roots common; clear, wavy lower boundary
III	94–150	Natural; 7.5YR 4/3, brown; cobbly silt loam; weak, very fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed

1.1.11 Test Excavation 11 (TE-11)

TE-11 was in the central portion of the northern tip of the study area (Figure 45). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.40 mbs. The stratigraphy of TE-11 consisted of a very dark brown, very gravelly sandy clay loam Ap horizon (Stratum I) overlying dark yellowish brown, natural gravelly silty clay loam (Stratum II); a very dark grayish brown, natural extremely cobbly sandy loam stream (alluvial) deposit (Stratum III); and brown, natural gravelly silt loam (Stratum IV) (Figure 46 through Figure 49 and Table 11). The agricultural plow zone (Stratum I) contained pieces of black plastic irrigation drip tape that were not collected. No other cultural materials were observed.

Figure 45. TE-11, overview of the general location, view to southeast

Figure 46. TE-11, close-up of the east wall, view to east

Figure 47. TE-11, overview of the east wall, view to southeast

Figure 48. TE-11, overview of the east wall, view to northeast

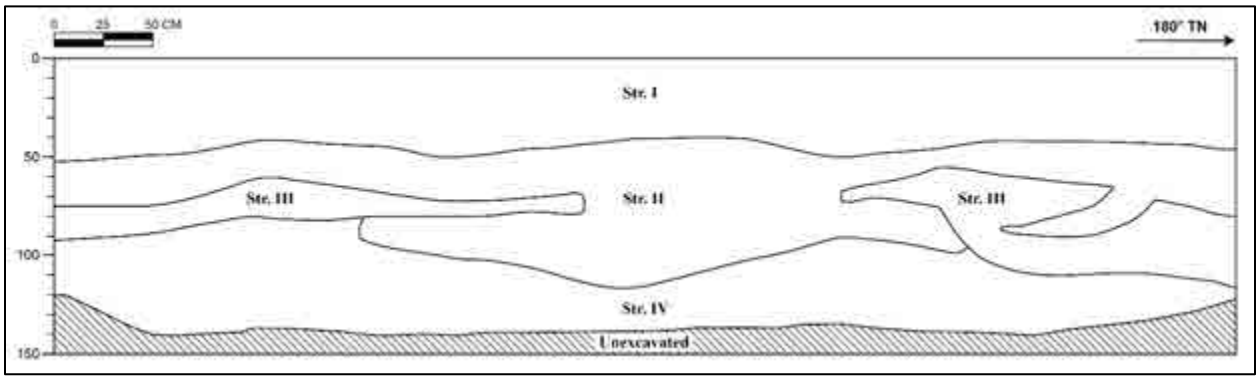

Figure 49. TE-11, stratigraphy of the east wall

Table 11. TE-11 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–52	Ap horizon; 7.5YR 2.5/2, very dark brown; very gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, smooth lower boundary; contained black plastic irrigation drip tape pieces (not collected)
II	40–116	Natural; 10YR 3/4, dark yellowish brown; gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, irregular lower boundary
III	55–116	Natural; 10YR 3/2, very dark grayish brown; extremely cobbly sandy loam; weak, medium granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; clear, discontinuous lower boundary; stream deposit
IV	80–140	Natural; 7.5YR 4/3, brown; gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed

1.1.12 Test Excavation 12 (TE-12)

TE-12 was in the central portion of the northern tip of the study area (Figure 50). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.45 mbs. The stratigraphy of TE-12 consisted of a very dark brown, very gravelly sandy clay loam Ap horizon (Stratum I) overlying dark yellowish brown, natural very gravelly silty clay loam (Stratum II); a dark grayish brown, natural extremely cobbly sandy loam stream deposit (Stratum III); dark brown, natural silty clay loam (Stratum IV); and brown, natural very gravelly silt loam (Stratum V) (Figure 51 through Figure 53 and Table 12). No cultural materials were encountered.

Figure 50. TE-12, overview of the general location, view to southeast

Figure 51. TE-12, overview of the east wall, view to southeast

Figure 52. TE-12, overview of the east wall, view to northeast

Figure 53. TE-12, close-up of the east wall, view to east

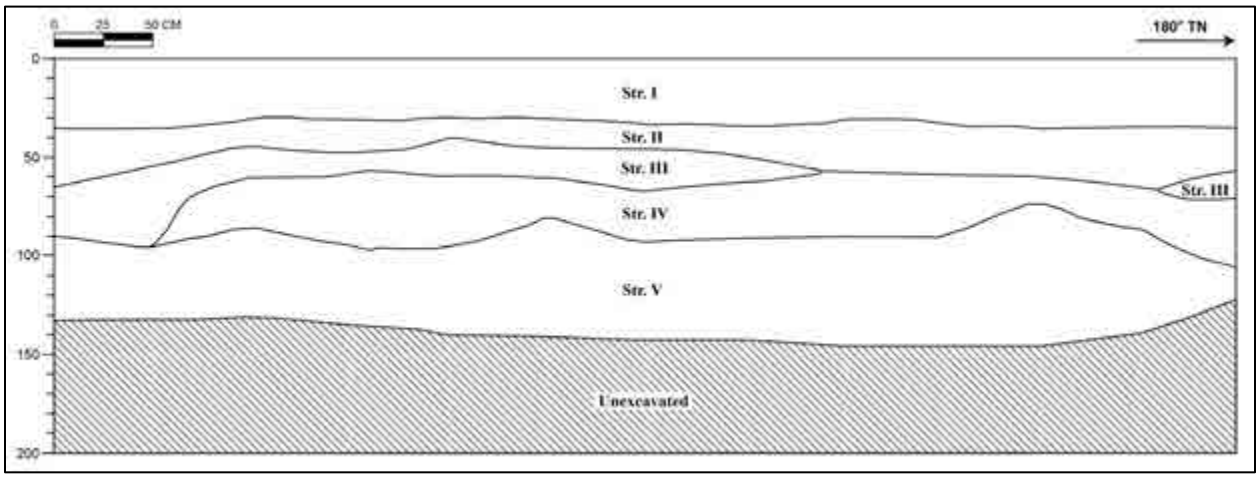

Figure 54. TE-12, stratigraphy of the east wall

Table 12. TE-12 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–35	Ap horizon; 7.5YR 2.5/2, very dark brown; very gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, smooth lower boundary
II	30–67	Natural; 10YR 3/4, dark yellowish brown; very gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine roots common; clear, smooth lower boundary
III	40–95	Natural; 10YR 4/2, dark grayish brown; extremely cobbly sandy loam; weak, fine granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; clear, discontinuous lower boundary; stream deposit
IV	58–105	Natural; 10YR 3/3, dark brown; silty clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, smooth lower boundary
V	80–145	Natural; 10YR 4/3, brown; very gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed

1.1.13 Test Excavation 13 (TE-13)

TE-13 was near the eastern border of the northern tip of the study area (Figure 55). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.36 mbs. The stratigraphy of TE-13 consisted of a very dark brown, very gravelly sandy clay loam Ap horizon (Stratum I) overlying dark brown, natural very gravelly silty clay loam (Stratum II) and brown, natural very gravelly silt loam (Stratum III) (Figure 56 through Figure 58 and Table 13). Stratum I contained a concentration of burnt sugarcane and charcoal near the surface. Stream deposit concentrations were present at the upper and lower boundaries of Stratum II. No cultural materials were encountered.

Figure 55. TE-13, overview of the general location, view to southeast

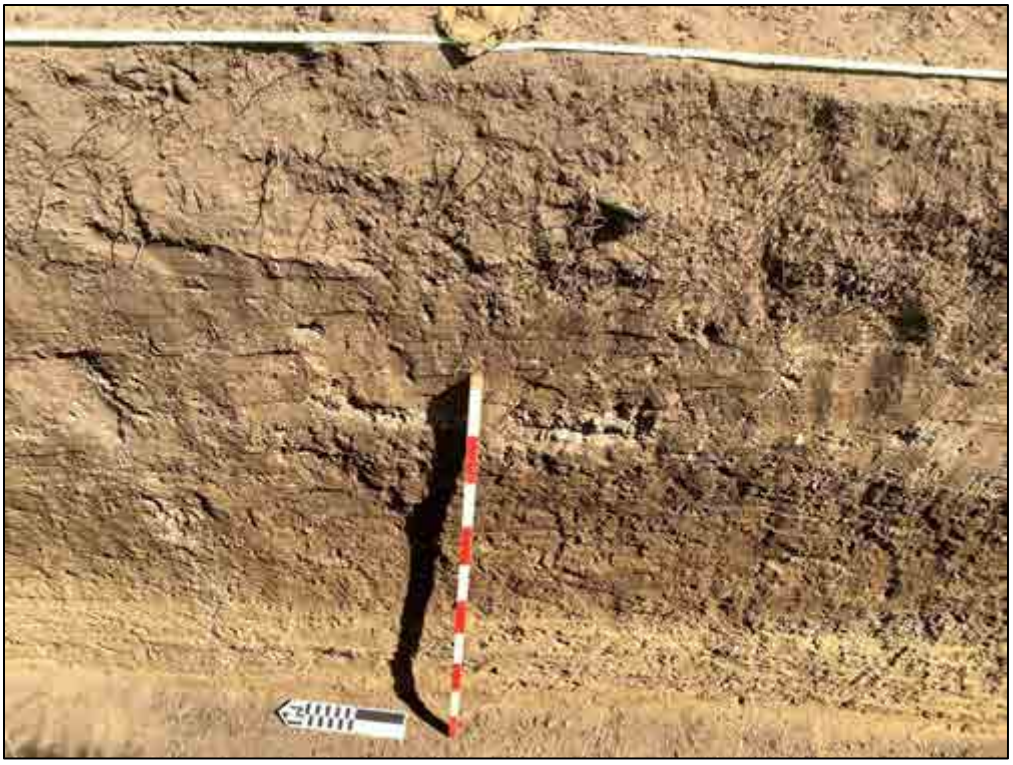

Figure 56. TE-13, close-up of the east wall, view to east

Figure 57. TE-13, overview of the east wall, view to northeast

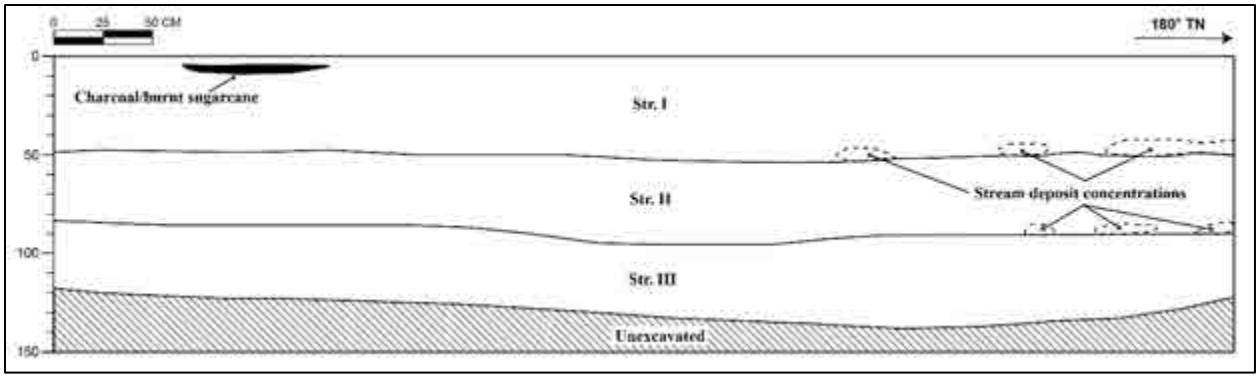

Figure 58. TE-13, stratigraphy of the east wall

Table 13. TE-13 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–52	Ap horizon; 7.5YR 2.5/2, very dark brown; very gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, smooth lower boundary; contained a concentration of charcoal/burnt sugarcane and fine concentrations of 7.5YR 5/1, gray, sandy loam stream deposits
II	48–95	Natural; 10YR 3/3, dark brown; very gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, smooth lower boundary; contained coarse concentrations of 7.5YR 4/2, brown, sandy loam stream deposits
III	83–136	Natural; 7.5YR 4/3, brown; very gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; lower boundary not observed

1.1.14 Test Excavation 14 (TE-14)

TE-14 was in the southwestern portion of the northern tip of the study area (Figure 59). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.62 mbs. The stratigraphy of TE-14 consisted of a very dark brown, gravelly sandy clay loam developing A horizon (Stratum I) and a dark brown; very gravelly silty clay loam Ap horizon (Stratum II) overlying dark reddish brown, natural very gravelly silty clay loam (Stratum III) and yellowish brown, natural very gravelly silt loam (Stratum IV) (Figure 60 through Figure 62 and Table 14). Stream deposit inclusions were common within Strata II through IV. No cultural materials were encountered.

Figure 59. TE-14, overview of the general location, view to southeast

Figure 60. TE-14, close-up of the east wall, view to east

Figure 61. TE-14, overview of the east wall, view to southeast

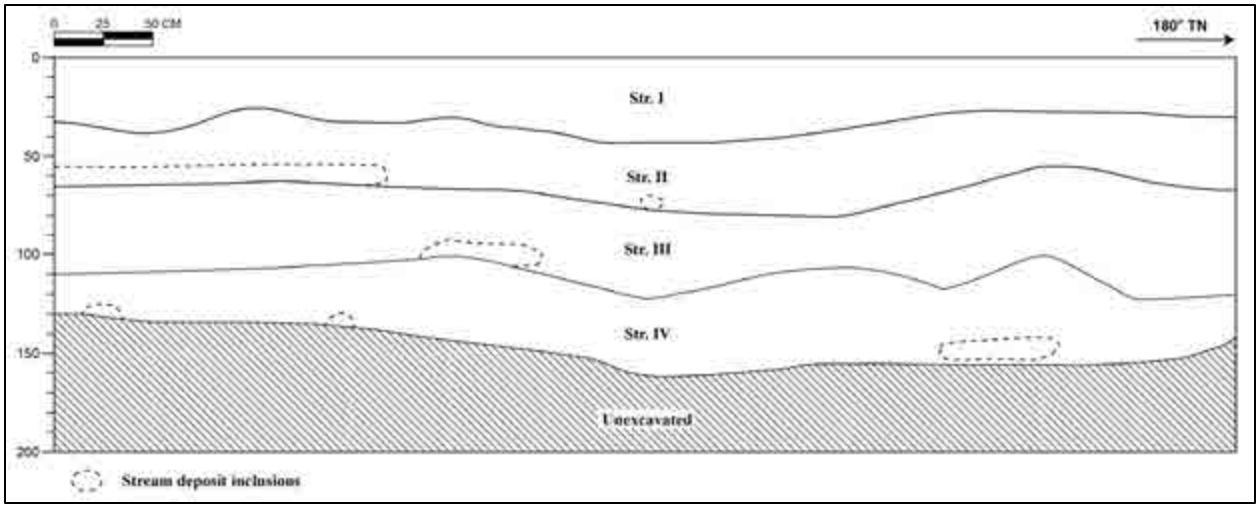

Figure 62. TE-14, stratigraphy of the east wall

Table 14. TE-14 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–43	Developing A horizon; 7.5YR 2.5/3, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, smooth lower boundary
II	25–80	Ap horizon; 7.5YR 3/2, dark brown; very gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, wavy lower boundary; contained common inclusions of 7.5YR 5/1, gray, sandy loam stream deposits
III	55–123	Natural; 5YR 3/3, dark reddish brown; very gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, wavy lower boundary; contained common inclusions of 7.5YR 5/1, gray, sandy loam stream deposits
IV	100–162	Natural; 10YR 5/4, yellowish brown; very gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed contained common inclusions of 7.5YR 5/1, gray, sandy loam stream deposits

1.1.15 Test Excavation 15 (TE-15)

TE-15 was in the northwestern portion of the study area (Figure 63). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.45 mbs. The stratigraphy of TE-15 consisted of a very dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying light reddish gray, natural extremely gravelly sand from a possible high-energy alluvial deposit (Stratum II); dark brown, natural gravelly silty clay loam (Stratum III); dark reddish brown, natural gravelly silty clay (Stratum IV); and dark yellowish brown, natural gravelly silt loam (Stratum V) (Figure 64 through Figure 66 and Table 15). No cultural materials were encountered.

Figure 63. TE-15, overview of the general location, view to southeast

Figure 64. TE-15, overview of excavation, view to southeast

Figure 65. TE-15, close-up of the east wall, view to east

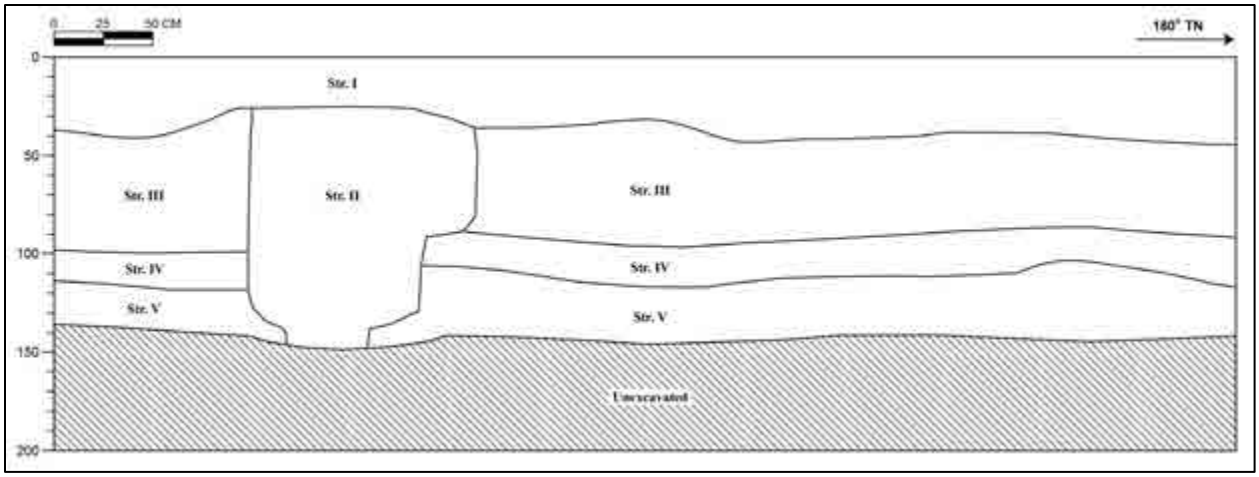

Figure 66. TE-15, stratigraphy of the east wall

Table 15. TE-15 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–43	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; diffuse, wavy lower boundary
II	24–147	Natural; 2.5YR 7/1, light reddish gray; extremely gravelly sand (basalt gravel and grains); structureless (single grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; few fine to medium roots; abrupt, lower boundary not observed; contained mottles of 10YR 4/1, dark gray, fine to coarse sand of terrigenous origin
III	30–100	Natural; 7.5YR 3/3, dark brown; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; diffuse, broken lower boundary
IV	88–118	Natural; 5YR 3/3, dark reddish brown; gravelly silty clay; moderate, fine blocky structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, broken lower boundary
V	105–145	Natural; 10YR 4/4, dark yellowish brown; gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed

1.1.16 Test Excavation 16 (TE-16)

TE-16 was in the northwestern portion of the study area (Figure 67). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.35 mbs. The stratigraphy of TE-16 consisted of three strata: a very dark brown, very gravelly sandy clay loam Ap horizon mottled with stream deposits of dark gray sand (Stratum I) overlying dark reddish brown, natural gravelly silty clay loam (Stratum II) and brown, natural gravelly silt loam (Stratum III) (Figure 68 through Figure 71 and Table 16). Several inclusions of gravelly sand stream deposits were present at the interface of Strata I and II. No cultural materials were encountered.

Figure 67. TE-16, overview of the general location, view to southeast

Figure 68. TE-16, overview of the east wall, view to southeast

Figure 69. TE-16, close-up of the east wall, view to east

Figure 70. TE-16, oblique view of the east wall showing the stream deposit inclusions, view to southeast

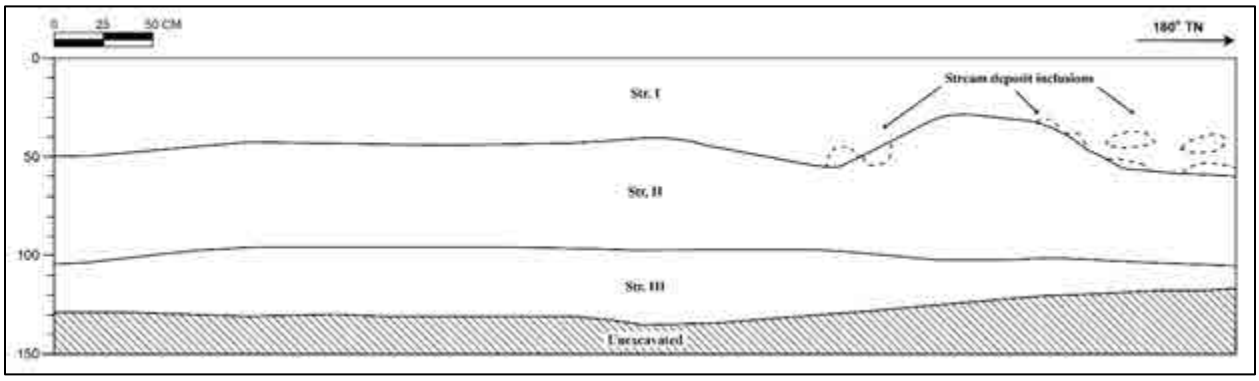

Figure 71. TE-16, stratigraphy of the east wall

Table 16. TE-16 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–60	Ap horizon; 7.5YR 2.5/2, very dark brown; very gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, wavy lower boundary; contained inclusions of 2.5YR 4/1, dark gray, gravelly sand stream deposits
II	30–105	Natural; 5YR 3/3, dark reddish brown; gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine roots common; clear, smooth lower boundary
III	95–135	Natural; 7.5YR 4/3, brown; gravelly silty clay; weak, fine platy structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed

1.1.17 Test Excavation 17 (TE-17)

TE-17 was in the southeastern portion of the northern tip of the study area. The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.80 mbs (Figure 72). The stratigraphy of TE-17 consisted of a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying dark brown, natural very gravelly silty clay loam (Stratum II); brown, natural gravelly silt loam (Stratum III); gray, natural extremely cobbly sandy loam (Stratum IV); and brown, natural gravelly silt loam (Stratum V) (Figure 73 through Figure 75 and Table 17). The agricultural plow zone (Stratum I) contained pieces of black plastic irrigation drip tape that were not collected. No other cultural materials were observed.

Figure 72. TE-17, overview of excavation area, view to north

Figure 73. TE-17, oblique view of the east wall, view to northeast

Figure 74. TE-17, close-up of the east wall, view to east

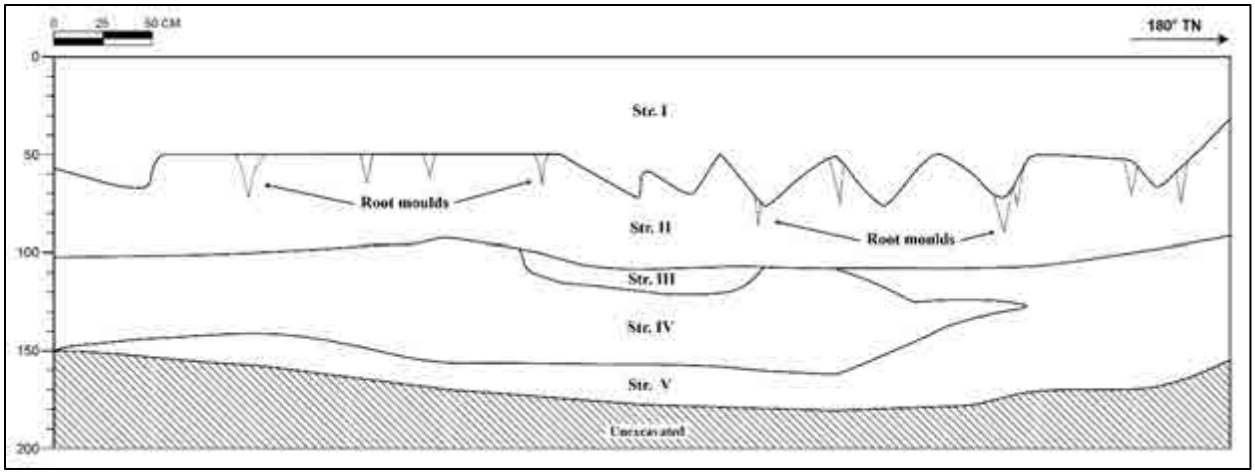

Figure 75. TE-17, stratigraphy of the east wall

Table 17. TE-17 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–78	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; diffuse, irregular lower boundary containing root moulds; contained black plastic irrigation drip tape pieces (not collected)
II	31–108	Natural; 7.5YR 3/4, dark brown; very gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, smooth lower boundary
III	99–121	Natural; 7.5YR 5/4, brown; gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; abrupt, broken lower boundary
IV	92–164	Natural; 2.5YR 5/1, gray; extremely cobbly sandy loam; structureless (single grain); moist, loose consistence; no cementation; plastic; terrigenous origin; few, fine roots; clear, smooth lower boundary; stream deposited material
V	91–180	Natural; 7.5YR 5/4, brown; gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; lower boundary not observed

1.1.18 Test Excavation 18 (TE-18)

TE-18 was in the southwestern portion of the northern tip of the study area (Figure 76). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.38 mbs. The stratigraphy of TE-18 consisted of four strata: a very dark brown, cobbly sandy clay loam Ap horizon (Stratum I) overlying dark reddish brown, previously disturbed natural silty clay loam (Stratum II); yellowish brown, natural cobbly sand mottled with very dark gray sandy loam (Stratum III); and dark brown, natural very gravelly silt loam (Stratum IV) (Figure 77 through Figure 79 and Table 18). No cultural materials were encountered.

Figure 76. TE-18, overview of the general location, view to southeast

Figure 77. TE-18, oblique view of the east wall, view to northeast

Figure 78. TE-18, close-up of the east wall, view to east

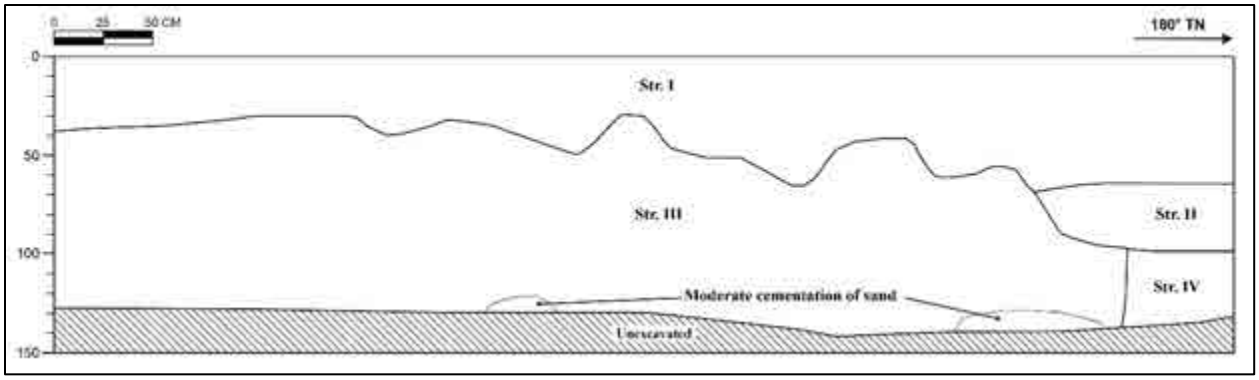

Figure 79. TE-18, stratigraphy of the east wall

Table 18. TE-18 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–70	Ap horizon; 7.5YR 2.5/2, very dark brown; cobbly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, wavy lower boundary; agricultural plow zone
II	66–100	Previously disturbed natural; 5YR 3/2, dark reddish brown; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; fine roots common; clear, smooth lower boundary; upper boundary previously disturbed by the plow zone
III	30–143	Natural; 10YR 5/6, yellowish brown; cobbly sand; fine, structureless; moist, loose consistence; weak to moderate cementation; non-plastic; marine origin; few fine roots; lower boundary not observed; aeolian sand; contained common mottles of 7.5YR 3/1, very dark gray, sandy loam
IV	95–138	Natural; 7.5YR 3/2, dark brown; very gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; mixed origin; lower boundary not observed

1.1.19 Test Excavation 19 (TE-19)

TE-19 was in the southwestern portion of the northern tip of the study area (Figure 80). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.48 mbs. The stratigraphy of TE-20 consisted of four strata: a very dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying dark brown, natural gravelly silty clay loam (Stratum II); dark gray, natural extremely gravelly sand (Stratum III); and dark gray, natural gravelly silt loam mottled with brown, silt loam (Stratum IV) (Figure 81 through Figure 83 and Table 19). No cultural materials were encountered.

Figure 80. TE-19, overview of the general location, view to southeast

Figure 81. TE-19, oblique view of the east wall, view to north

Figure 82. TE-19, close-up of the east wall, view to east

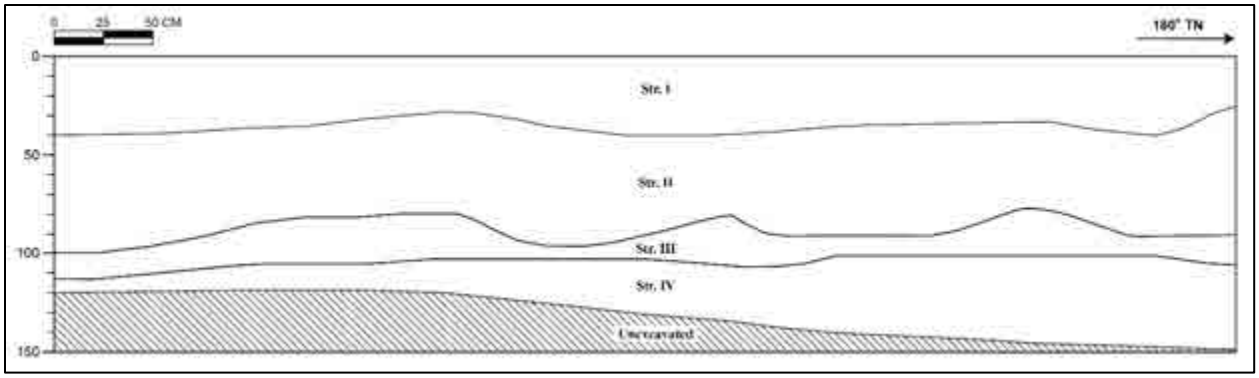

Figure 83. TE-19, stratigraphy of the east wall

Table 19. TE-19 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–40	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; diffuse, smooth lower boundary; agricultural plow zone
II	25–95	Natural; 7.5YR 3/4, dark brown; gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, wavy lower boundary; natural deposition by water and erosion
III	80–113	Natural; 7.5YR 4/1, dark gray; extremely gravelly sand, coarse grain; structureless; moist, loose consistence; no cementation, non-plastic; terrigenous origin; few fine roots; clear, wavy lower boundary; alluvial deposit
IV	100–148	Natural; 7.5YR 4/1, dark gray; gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; few fine roots; contains mottles of 7.5YR 4/3, brown, fine silt loam

1.1.20 Test Excavation 20 (TE-20)

TE-20 was in the southwestern portion of the northern tip of the study area (Figure 84). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.30 mbs. The stratigraphy of TE-20 consisted of four strata: a very dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying dark reddish brown, natural cobbly silty clay (Stratum II); dark gray, natural extremely cobbly sand (Stratum III); and brown, natural very cobbly silty clay (Stratum IV) (Figure 85 through Figure 88 and Table 20). Strata II and IV contained inclusions of cobbly and gravelly basalt stream deposits. No cultural materials were encountered.

Figure 84. TE-20, overview of the general location, view to southeast

Figure 85. TE-20, oblique view of the east wall, view to southeast

Figure 86. TE-20, close-up of the east wall, view to east

Figure 87. TE-20, oblique view of the east wall showing stream deposit inclusions, view to southeast

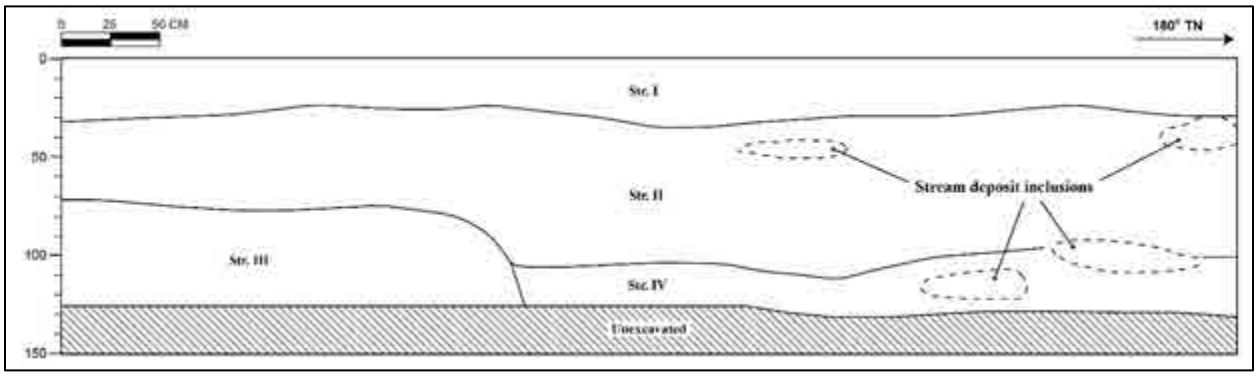

Figure 88. TE-20, stratigraphy of the east wall

Table 20. TE-20 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–33	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, smooth lower boundary
II	22–106	Natural; 5YR 3/3, dark reddish brown; cobbly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, irregular lower boundary; contained inclusions of 5YR 4/1, dark gray, basalt cobble and gravel sand stream deposits
III	70–125	Natural; 5YR 4/1, dark gray; extremely cobbly, sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; lower boundary not observed
IV	94–130	Natural; 10YR 5/3, brown; very cobbly silty clay; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; contained inclusions of 5YR 4/1, dark gray, basalt cobble and gravel sand stream deposits

1.1.21 Test Excavation 21 (TE-21)

TE-21 was in the northwestern portion of the study area (Figure 89). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.20 mbs. The stratigraphy of TE-21 consisted a very dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying dark brown, natural gravelly silty clay loam (Stratum II); dark reddish brown, natural silt loam (Stratum III); and dark yellowish brown, natural very gravelly silty clay (Stratum IV) (Figure 90 through Figure 93and Table 21). Strata II and IV contained inclusions of cobbly and gravelly basalt stream (alluvial) deposits. No cultural materials were encountered.

Figure 89. TE-21, overview of the general location, view to southeast

Figure 90. TE-21, oblique view of the west wall, view to southwest

Figure 91. TE- 21, close-up of the west wall, view to west

Figure 92. TE-21, oblique view of the west wall showing two gravelly stream deposit inclusions, view to northwest

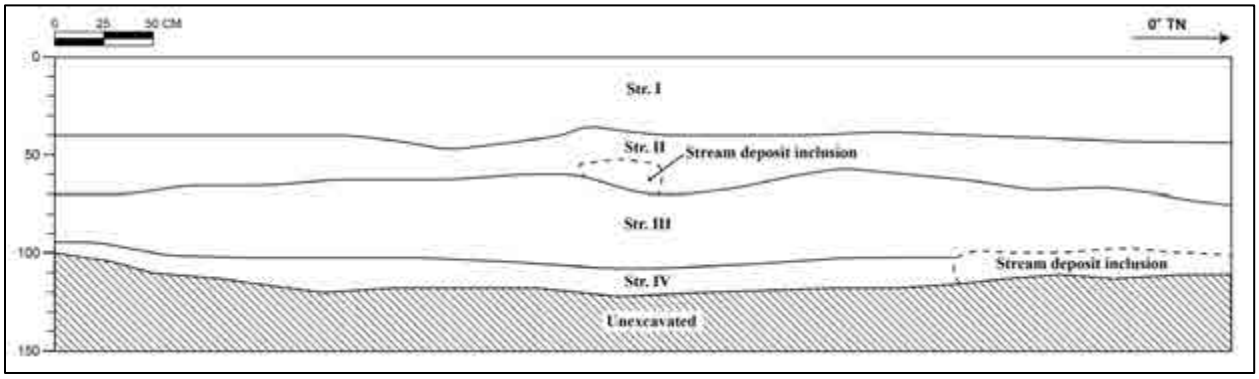

Figure 93. TE-21, stratigraphy of the west wall

Table 21. TE-21 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–47	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, wavy lower boundary
II	35–75	Natural; 7.5YR 3/3, dark brown; gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, wavy lower boundary; contains a fine inclusion of 2.5Y 5/1, gray, extremely gravelly and cobbly basalt sand stream deposit
III	57–108	Natural; 5YR 3/3/, dark reddish brown; silt loam; weak, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; clear, smooth lower boundary
IV	95–120	Natural; 10YR 3/4, dark yellowish brown; very gravelly silty clay; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; contains a coarse inclusion of 2.5YR 5/1, reddish gray, extremely gravelly and cobbly basalt sand stream deposit

1.1.22 Test Excavation 22 (TE-22)

TE-22 was in the northern portion of the study area. The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.47 mbs (Figure 94). The stratigraphy of TE-22 consisted of a very dark brown, gravelly sandy clay loam Ap horizon (Stratum I) overlying yellowish brown, natural very gravelly sand (Stratum II); dark reddish brown, natural gravelly silty clay loam (Stratum III); very dark grayish brown, natural gravelly silty clay loam (Stratum IV); and dark reddish brown, natural gravelly sandy clay loam (Stratum V) (Figure 94 through Figure 97 and Table 22). Stratum IV contained inclusions of silty clay loam stream deposits. No cultural materials were encountered.

Figure 94. TE-22, overview of the excavation area, view to northwest

Figure 95. TE-22, oblique view of the west wall, view to north

Figure 96. TE-22, close-up of the west wall, view to west

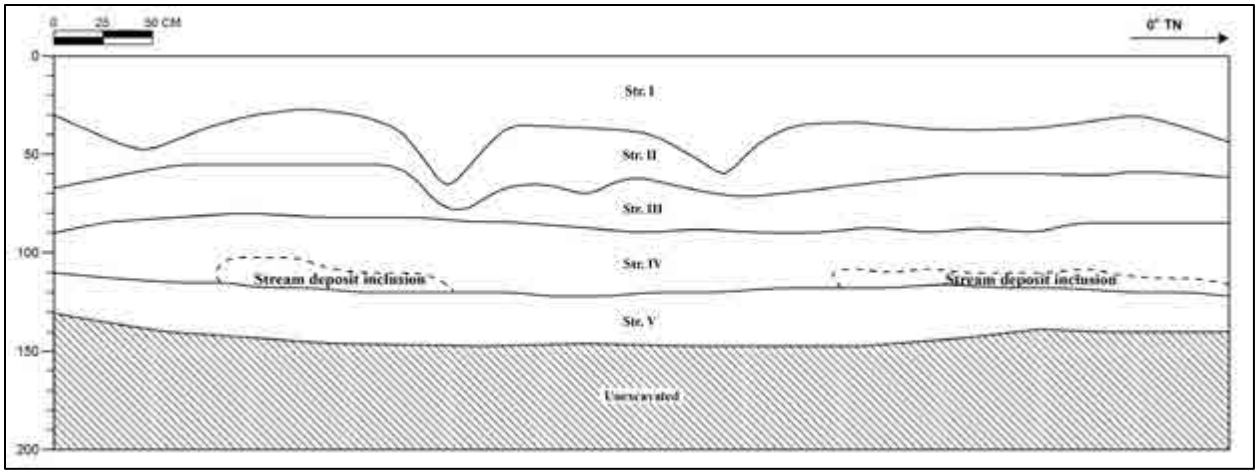

Figure 97. TE-22, stratigraphy of the west wall

Table 22. TE-22 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–68	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine to medium roots; clear, irregular lower boundary
II	30–80	Fill; 10YR 5/4, yellowish brown; very gravelly sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; marine origin; fine roots common; clear, irregular lower boundary
III	57–90	Natural; 5YR 2.5/2, dark reddish brown; gravelly silty clay loam; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, smooth lower boundary
IV	80–123	Natural; 10YR 3/2, very dark grayish brown; very cobbly silty clay; moderate, fine platy structure; moist, firm consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, smooth lower boundary; contains coarse inclusions of 7.5YR 3/4, dark brown silty clay loam stream deposits
V	113–147	Natural; 5YR 3/3, dark reddish brown; gravelly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; no roots; lower boundary not observed

1.1.23 Test Excavation 23 (TE-23)

TE-23 was near the northern boundary of the study area (Figure 98). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.80 mbs. The stratigraphy of TE-23 consisted of a very dark brown, sandy clay loam Ap horizon (Stratum I) overlying very pale brown, natural sand (Stratum II) and dark yellowish brown, natural sand (Stratum III) (Figure 99 through Figure 101 and Table 23). Stratum I contained several inclusions of very pale brown sand. No cultural materials were encountered.

Figure 98. TE-23, overview of trench location, view to northeast

Figure 99. TE-23, oblique view of the west wall, view to northwest

Figure 100. TE-23, close-up of the west wall

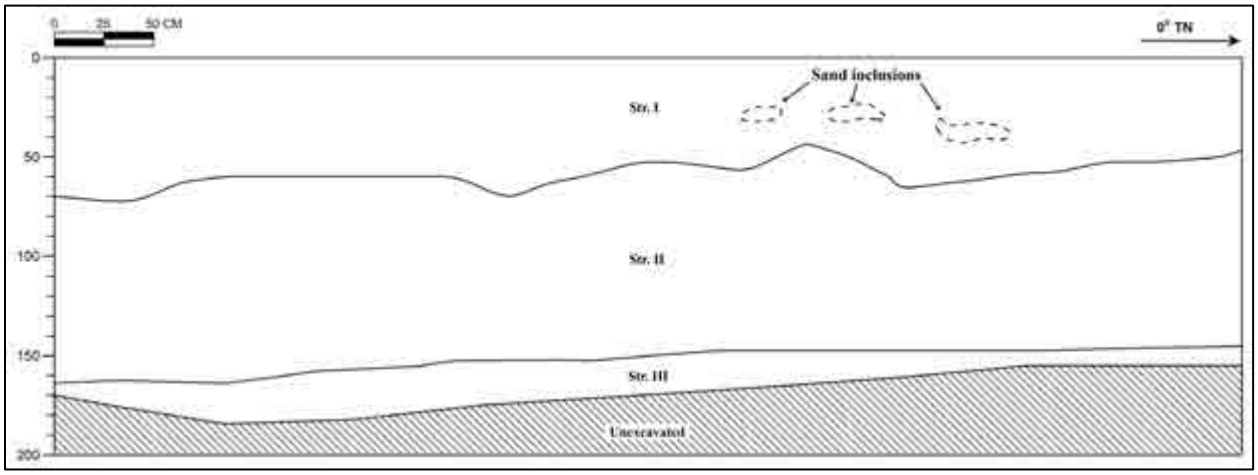

Figure 101. TE-23, stratigraphy of the west wall

Table 23. TE-23 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–70	Ap horizon; 7.5YR 2.5/2, very dark brown; sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine roots; clear, wavy lower boundary; contained inclusions of 10YR 7/4, very pale brown sand
II	40–163	Fill; 10YR 7/4, very pale brown; gravelly sand; structureless (single grain), moist, loose consistence; no cementation; non-plastic; mixed origin; no roots; clear, smooth, lower boundary
III	144–180	Natural; 10YR 4/4, dark yellowish brown; sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; mixed origin; no roots; lower boundary not observed

1.1.24 Test Excavation 24 (TE-24)

TE-24 was near the northern boundary of the study area. The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.50 mbs (Figure 102). The stratigraphy of TE-24 consisted of three strata: a very dark brown, gravelly sand Ap horizon (Stratum I) overlying dark brown, natural gravelly silty clay loam (Stratum II) and light gray, natural very gravelly silt loam (Stratum III) (Figure 103 through Figure 106 and Table 24). Stratum III contained an inclusion of a dark gray sand stream deposit. The agricultural plow zone (Stratum I) contained pieces of black plastic irrigation drip tape that were not collected. No other cultural materials were observed.

Figure 102. TE-24, overview of the general location, view to north

Figure 103. TE-24, overview of excavation area, view to south

Figure 104. TE-24, oblique view of the west wall, view to northwest

Figure 105. TE-24, close-up of the west wall, view to west

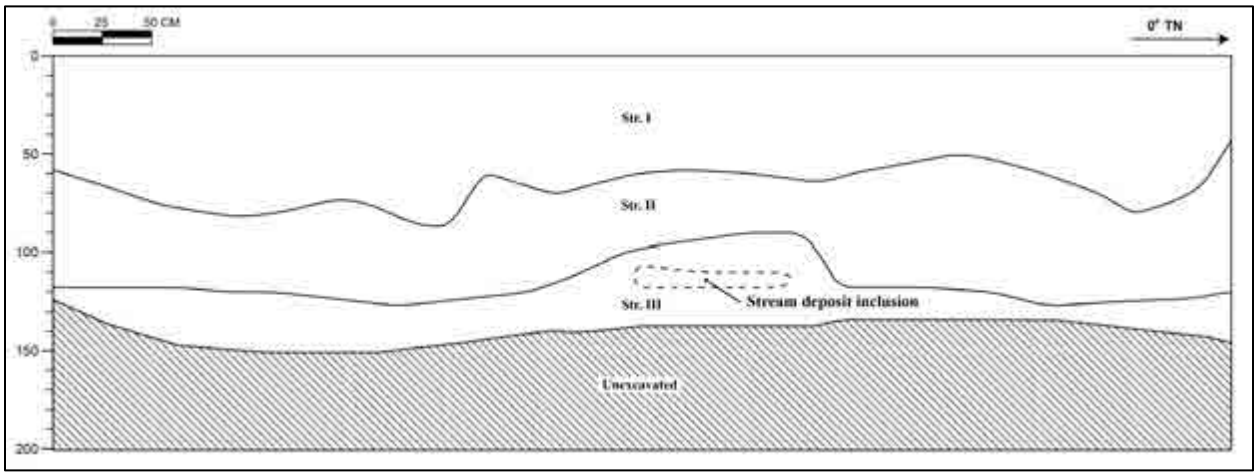

Figure 106. TE-24, stratigraphy of the west wall

Table 24. TE-24 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–80	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; mixed origin; many fine to medium roots; diffuse, wavy lower boundary; contained mottles of 7.5YR 3/3, dark brown, silty clay loam and black plastic irrigation drip tape pieces (not collected)
II	43–130	Natural; 10YR 3/3, dark brown; gravelly silty clay loam; moderate, fine granular structure; moist, firm consistence; no cementation; plastic; terrigenous origin; fine to medium roots common; clear, irregular lower boundary
III	87–150	Natural; 7.5YR 7/1, light gray; very gravelly silt loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed; contained an inclusion of 10YR 4/1, dark gray, sand streambed deposit

1.1.25 Test Excavation 25 (TE-25)

TE-25 was located near the northeastern corner of the study area (Figure 107). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.63 mbs. The stratigraphy of TE-25 consisted of three strata: a dark brown, sandy loam Ap horizon (Stratum I) overlying dark yellowish brown, natural silty clay loam (Stratum II); natural volcanic cinder sand (Stratum III); and yellowish brown, natural cobbly silt loam (Stratum III) (Figure 108 through Figure 110 and Table 25). No cultural materials were observed.

Figure 107. TE-25, overview of the general location, view to northwest

Figure 108. TE-25, oblique view of the west wall, view to northwest

Figure 109. TE-25, close-up of the west wall, view to southwest

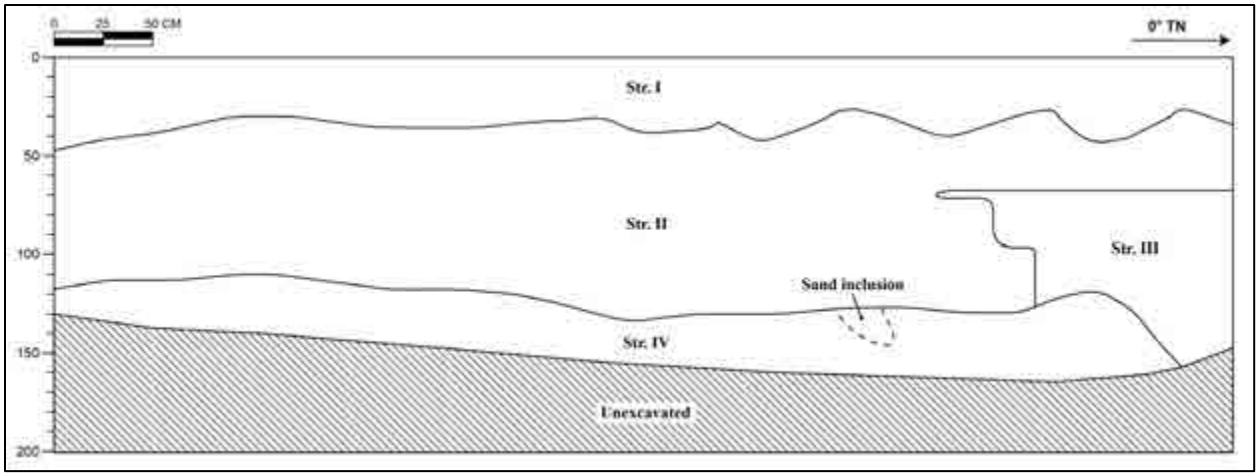

Figure 110. TE-25, stratigraphy of the west wall

Table 25. TE-25 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–45	Ap horizon; 10YR 3/3, dark brown; sandy loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; many fine roots; clear, wavy lower boundary; plow zone
II	25–130	Natural; 10YR 4/4, dark yellowish brown; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; clear, irregular lower boundary
III	65–155	Natural; 10YR 3/2, very dark grayish brown; sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; clear, discontinuous lower boundary; volcanic cinder
IV	110–163	Natural; 10YR 5/4, yellowish brown; cobbly silt loam; weak, fine granular structure; moist, loose consistence; slightly plastic; terrigenous origin; lower boundary not observed; contains extremely cobbly, alluvial sand deposit

1.1.26 Test Excavation 26 (TE-26)

TE-26 was near the northeastern corner of the study area (Figure 111). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.50 mbs. The stratigraphy of TE-26 consisted of a very dark brown, cobbly sandy loam Ap horizon (Stratum I) overlying brown, natural gravelly sand (Stratum II) and brown natural sand (Stratum III) (Figure 112 through Figure 114 and Table 26). The agricultural plow zone (Stratum I) contained pieces of black plastic irrigation drip tape that were not collected. No other cultural materials were observed.

Figure 111. TE-26, overview of the general location, view to northeast

Figure 112. TE-26, oblique view of the west wall, view to southwest

Figure 113. TE-26, close-up of the west wall, view to west

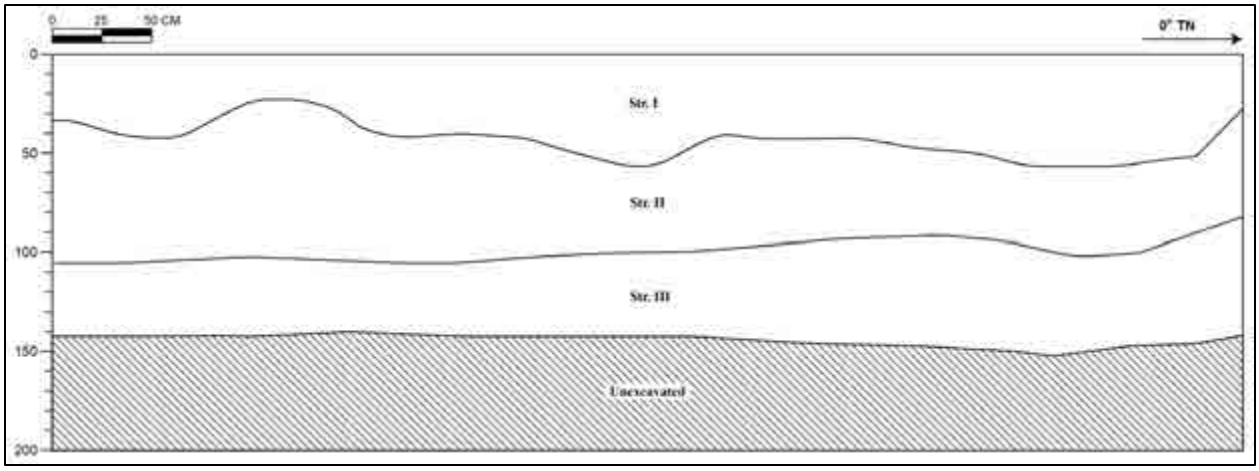

Figure 114. TE-26, stratigraphy of the west wall

Table 26. TE-26 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–56	Ap horizon; 7.5YR 2.5/2, very dark brown; cobbly sandy loam; weak, fine granular structure; moist, friable consistence; no cementation; slightly plastic; mixed origin; many fine to medium roots; clear, wavy lower boundary; contained black plastic irrigation drip tape pieces (not collected)
II	20–104	Natural; 10YR 5/3, brown; gravelly sand; structureless (single grain), moist, loose consistence; no cementation; non-plastic; marine origin; fine roots common; clear, smooth lower boundary; contained fine to coarse mottles of 10YR 3/4, dark yellowish brown, sandy loam
III	80–150	Natural; 7.5YR 4/2, brown; sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; mixed origin; few fine roots; lower boundary not observed

1.1.27 Test Excavation 27 (TE-27)

TE-27 was in the northeastern corner of the study area (Figure 115). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.65 mbs. The stratigraphy of TE-27 consisted of a very dark brown, cobbly sandy clay loam Ap horizon (Stratum I) overlying dark yellowish brown, natural sand (Stratum II); reddish brown, natural gravelly sand (Stratum III); and reddish brown, natural gravelly sand (Stratum IV) (Figure 116 through Figure 118 and Table 27). The agricultural plow zone (Stratum I) contained pieces of black plastic irrigation drip tape that were not collected. No other cultural materials were observed.

Figure 115. TE-27, overview of the general location, view to northwest

Figure 116. TE-27, oblique view of the west wall, view to northwest

Figure 117. TE-27, close-up of the west wall, view to west

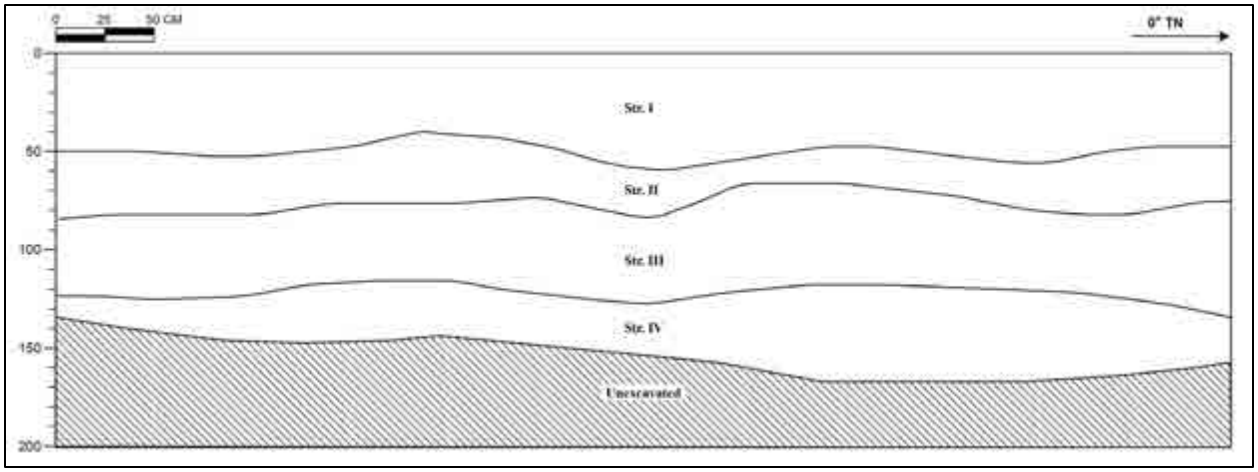

Figure 118. TE-27, stratigraphy of the west wall

Table 27. TE-27 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–57	Ap horizon; 7.5YR 2.5/2, very dark brown; cobbly sandy clay loam; moderate, fine granular structure; moist, friable consistence; no cementation; plastic; mixed origin; many fine to medium roots; clear, wavy lower boundary; black plastic irrigation drip tape pieces (not collected)
II	42–83	Natural; 10YR 4/4, dark yellowish brown; sand; structureless (single grain), moist, loose consistence; no cementation; non-plastic; marine origin; fine to medium roots common; clear, wavy lower boundary
III	67–125	Natural; 2.5YR 4/3, reddish brown; gravelly sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; marine origin; no roots; clear, wavy lower boundary
IV	115–165	Natural; 2.5YR 5/3, reddish brown; gravelly sand; structureless (single grain); moist, loose consistence; weak cementation; non-plastic; marine origin; lower boundary not observed

1.1.28 Test Excavation 28 (TE-28)

TE-28 was in the northwestern corner of the study area (Figure 119). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.45 mbs. The stratigraphy of TE-28 consisted of a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying dark yellowish brown, natural silt loam with mottles of very dark brown sandy loam (Stratum II); reddish yellow, natural sand with mottles of dark yellowish brown silt loam (Stratum III); dark brown, natural silt loam (Stratum IV); and brown, natural extremely gravelly sandy loam mottled with dark yellowish brown, silt loam (Stratum V) (Figure 120 through Figure 122 and Table 28). An approximate 43-by-43-cm triangular fragment of concrete was observed in Stratum I and not collected.

Figure 119. TE-28, overview of the general location, view to southwest

Figure 120. TE-28, oblique view of the east wall, view to northeast

Figure 121. TE-28, close-up of the east wall, view to east

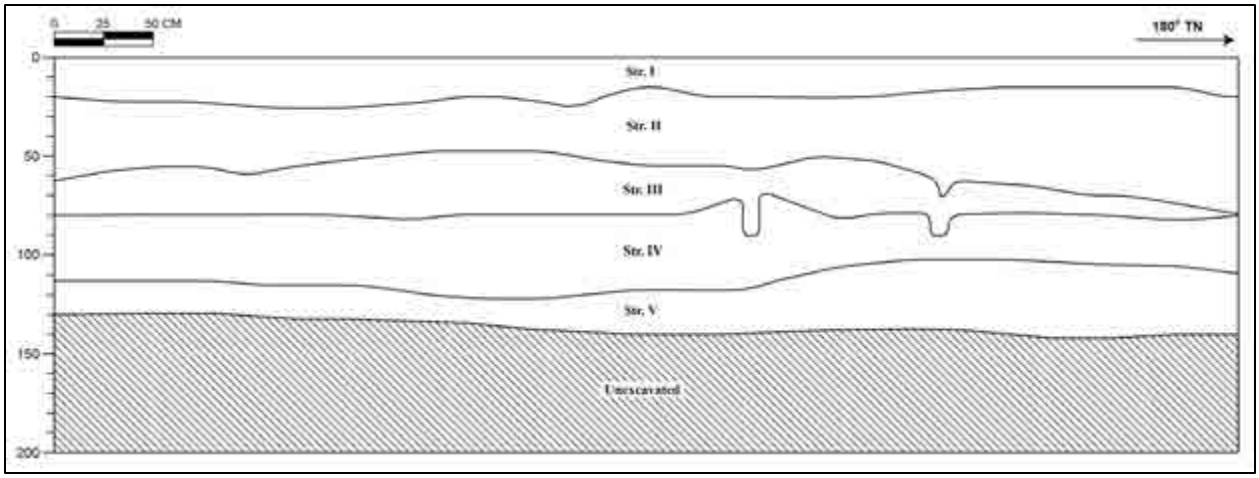

Figure 122. TE-28, stratigraphy of the east wall

Table 28. TE-28 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–27	Ap horizon; 7.5YR 2.5/3, very dark brown; gravelly sandy loam; moderate, fine granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; many fine roots; clear, wavy lower boundary; contained a fragment of concrete (not collected)
II	15–80	Fill; 10YR 3/6, dark yellowish brown; silt loam; moderate, fine granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; few fine roots; abrupt, wavy lower boundary; few cobbles present; contained fine to coarse mottles of 7.5YR 2.5/3, very dark brown; sandy loam
III	48–92	Natural; 7.5YR 6/6, reddish yellow; sand; structureless (single grain); moist, loose consistence; weak cementation; non-plastic; marine origin; abrupt, irregular lower boundary; contained fine to coarse mottles of 10YR 3/6, dark yellowish brown, silt loam
IV	68–124	Natural; 10YR 3/3, dark brown; silt loam; weak, fine granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; gradual, smooth lower boundary; few cobbles present
V	105–145	Natural; 7.5YR 4/3, brown; extremely gravelly sandy loam; fine, weak granular structure; moist, loose consistence; no cementation; non-plastic; marine origin; lower boundary not observed; few cobbles present; contained fine to coarse mottles of 10YR 3/6, dark yellowish brown, silt loam

1.1.29 Test Excavation 29 (TE-29)

TE-29 was near the northwestern corner of the study area (Figure 123). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.50 mbs. The stratigraphy of TE-29 consisted of three strata: a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying dark yellowish brown, natural gravelly silty clay loam mottled with dark grayish brown sand (Stratum II) and dark yellowish brown, natural gravelly silt loam (Stratum III) (Figure 124 through Figure 126 and Table 29). No cultural materials were observed.

Figure 123. TE-29, overview of the general location, view to northeast

Figure 124. TE-29, oblique view of the east wall, view to northeast

Figure 125. TE-29, close-up of the east wall, view to east

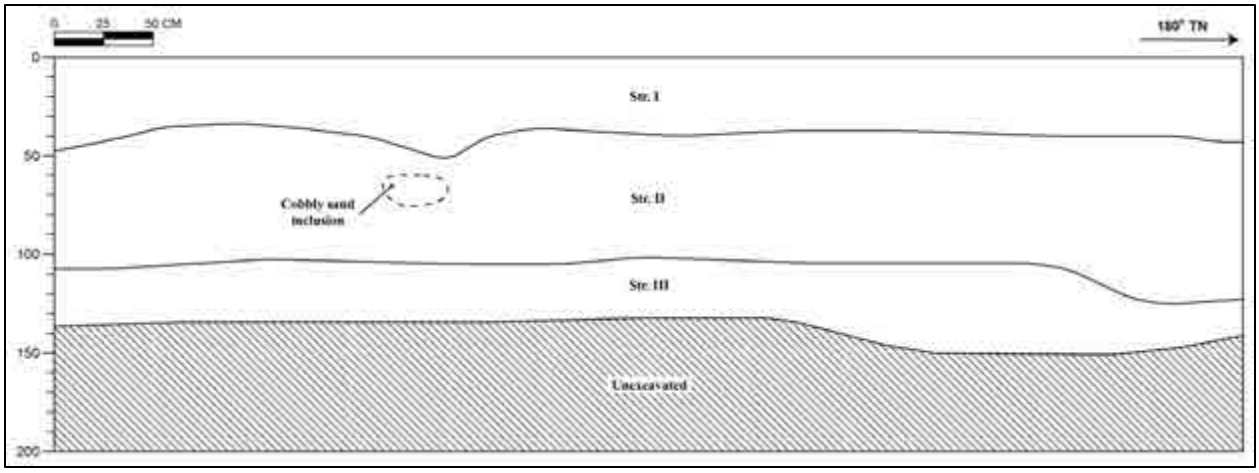

Figure 126. TE-29, stratigraphy of the east wall

Table 29. TE-29 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–54	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy loam; moderate, fine granular structure; moist, friable consistence; no cementation; non-plastic; mixed origin; many fine roots; clear, wavy lower boundary; contained fine to coarse mottles of 10YR 4/2, dark grayish brown, cobbly sand
II	34–122	Natural; 10YR 3/4, dark yellowish brown; gravelly silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few fine roots; clear, smooth lower boundary; contained an inclusion of 10YR 4/2, dark grayish brown, cobbly sand
III	104–150	Natural; 10YR 4/4, dark yellowish brown; gravelly silt loam; weak, very fine granular structure; moist, loose consistence; no cementation; non-plastic; terrigenous origin; lower boundary not observed

1.1.30 Test Excavation 30 (TE-30)

TE-30 was in the northwestern quadrant of the study area (Figure 127). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.30 mbs. The stratigraphy of TE-30 consisted of backfilled sandy loam material from the installation of pipes (Stratum I), and a dark brown, gravelly sandy loam Ap horizon (Stratum II) overlying brown, natural sand (Stratum II); brown, natural sandy clay loam mottled with brown sand (Stratum III); and dark yellowish brown, natural silt loam (Stratum IV) (Figure 128 through Figure 130 and Table 32). Stratum I contained three abandoned PVC pipes. No other cultural materials were observed.

Figure 127. TE-30, overview of the general location, view to west

Figure 128. TE-30, oblique view of the east wall, view to northeast

Figure 129. TE-30, close-up of the east wall, view to east

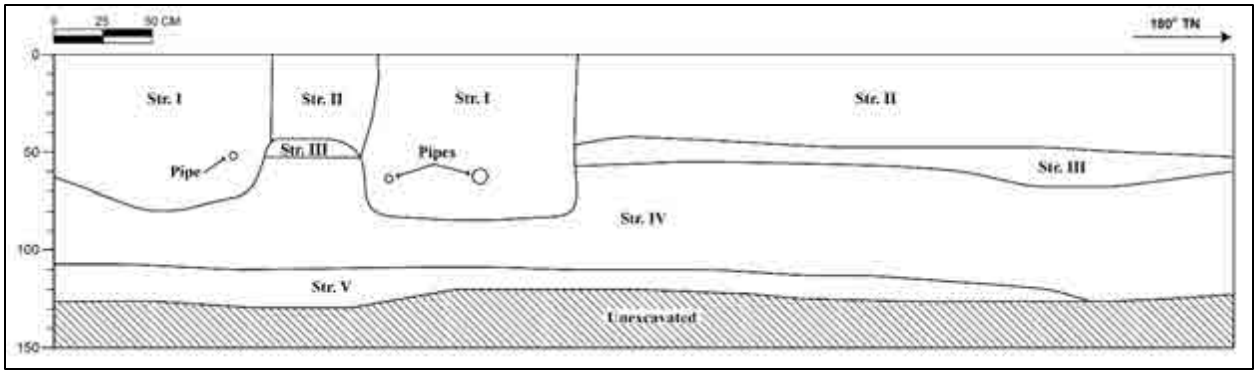

Figure 130. TE-30, stratigraphy of the east wall

Table 30. TE-30 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–85	Fill; 7.5YR 3/2, dark brown; gravelly sandy loam; moderate, fine granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; fine to medium roots common; clear, discontinuous lower boundary; backfilled material from installation of pipes
II	0–52	Ap horizon; 7.5YR 3/2, dark brown; gravelly sandy loam; moderate, fine blocky structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; many fine to medium roots; gradual, broken lower boundary
III	43–66	Natural; 7.5YR 5/3, brown; sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; few fine roots; diffuse, broken lower boundary
IV	53–125	Natural; 7.5YR 5/3, brown; sandy clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; plastic; terrigenous origin; gradual, smooth lower boundary; contains fine to coarse mottles of 7.5YR 5/3, brown sand
V	108–130	Natural; 10YR 3/4, dark yellowish brown; silt loam; moderate, fine granular structure; moist, loose consistence; no cementation; plastic; terrigenous origin; lower boundary not observed

1.1.31 Test Excavation 31 (TE-31)

TE-31 was in the northwestern quadrant of the study area (Figure 131). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.70 mbs. The stratigraphy of TE-31 consisted of a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying dark yellowish brown, natural very gravelly silty clay loam (Stratum II); a dark reddish gray, natural extremely gravelly sand stream deposit (Stratum III); and brown, natural gravelly silt loam (Stratum IV) (Figure 132 through Figure 135 and Table 31). Stratum II contained an inclusion of yellowish red silty clay loam. No cultural materials were observed.

Figure 131. TE-31, overview of the general location, view to south

Figure 132. TE-31, oblique view of the east wall, view to southeast

Figure 133. TE-31, close-up of the east wall, view to east

Figure 134. TE-31, close-up of Stratum III, extremely gravelly sand stream deposit, view to east

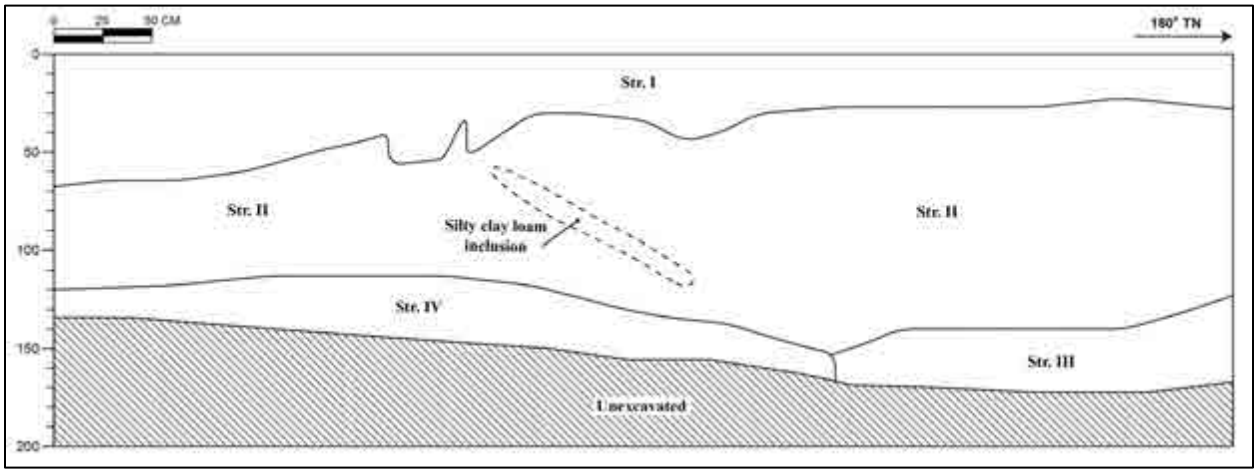

Figure 135. TE-31, stratigraphy of the east wall

Table 31. TE-31 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–68	Ap horizon; 7.5YR 2.5/2, very dark brown; gravelly sandy loam; moderate, fine blocky structure; moist, friable consistence; no cementation; non-plastic; mixed origin; many fine to medium roots; gradual, irregular lower boundary; contained fine mottles of 10YR 3/3, dark brown very gravelly sandy loam
II	25–154	Natural; 10YR 3/4, dark yellowish brown; silty clay loam; weak, fine granular structure; moist, very friable consistence; no cementation; plastic; terrigenous origin; few fine roots; diffuse, smooth lower boundary
III	114–165	Natural; 2.5YR 4/1, dark reddish gray; extremely gravelly and cobbly sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; mixed origin; no roots; lower boundary not observed; contained basalt cobbles and pebbles stream deposit
IV	120–170	Natural; 7.5YR 4/4, brown; gravelly silt loam; moderate, fine granular structure; moist, very friable consistence; no cementation; plastic; terrigenous origin; lower boundary not observed

1.1.32 Test Excavation 32 (TE-32)

TE-32 was in the central-northern portion of the study area (Figure 136). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.56 mbs. The stratigraphy of TE-32 consisted of a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying a dark reddish gray, natural cobbly sand stream deposit (Stratum II) at the southern end; and dark yellowish brown, natural gravelly silt loam (Stratum III); brown, natural gravelly silt loam (Stratum IV); and yellowish brown, natural gravelly silt loam (Stratum V) in the northern half (Figure 137 through Figure 140 and Table 32). Stratum V contained a lens of a dark reddish gray gravelly sand stream deposit at the interface with Stratum IV. The lens was comparable to the stream deposit of Stratum II. No cultural materials were observed.

Figure 136. TE-32, overview of the general location, view to southeast

Figure 137. TE-32, oblique view of the east wall, view to southeast

Figure 138. TE-32, close-up of the east wall, view to east

Figure 139. TE-32, overview from the southern end of the trench showing the cobbly sand stream deposit

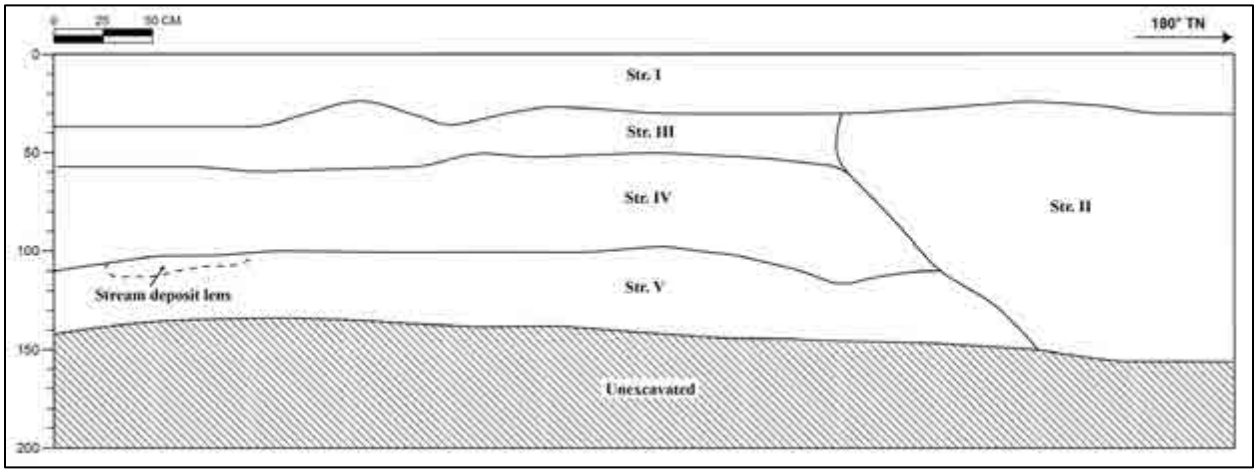

Figure 140. TE-32, stratigraphy of the east wall

Table 32. TE-32 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–40	Ap horizon; 10YR 2/2, very dark brown; gravelly sandy loam; moderate, fine granular structure; moist, loose consistence; no cementation; non-plastic; mixed origin; many fine roots; clear, wavy lower boundary
II	26–156	Natural; 2.5YR 3/1, dark reddish gray; extremely cobbly sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; lower boundary not observed; stream deposit containing basalt cobbles and pebbles
III	24–60	Natural; 10YR 3/4, dark yellowish brown; gravelly silt loam; weak, very fine platy structure; moist, very friable consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; clear, smooth lower boundary
IV	52–116	Natural; 10YR 4/3, brown; gravelly silt loam; weak, fine platy structure; moist, very friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; clear, smooth lower boundary
V	100–151	Natural; 10YR 5/4, yellowish brown; silt loam; weak, very fine platy structure; moist, very friable consistence; no cementation; slightly plastic; terrigenous origin; no roots; lower boundary not observed

1.1.33 Test Excavation 33 (TE-33)

TE-33 was in the central-northern portion of the study area (Figure 141). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.57 mbs. The stratigraphy of TE-33 consisted of a very dark brown, gravelly sandy loam Ap horizon (Stratum I) overlying dark yellowish brown, natural silty clay loam (Stratum II); dark brown, natural gravelly silty clay loam (Stratum III); a gray, natural extremely gravelly sand stream deposit (Stratum IV); and dark yellowish brown, natural gravelly silt loam (Stratum V) (Figure 142 through Figure 144 and Table 33). No cultural materials were observed.

Figure 141. TE-33, overview of the general location, view to northwest

Figure 142. TE-33, oblique view of the west wall, view to northwest

Figure 143. TE-33, close-up of the west wall, view to west

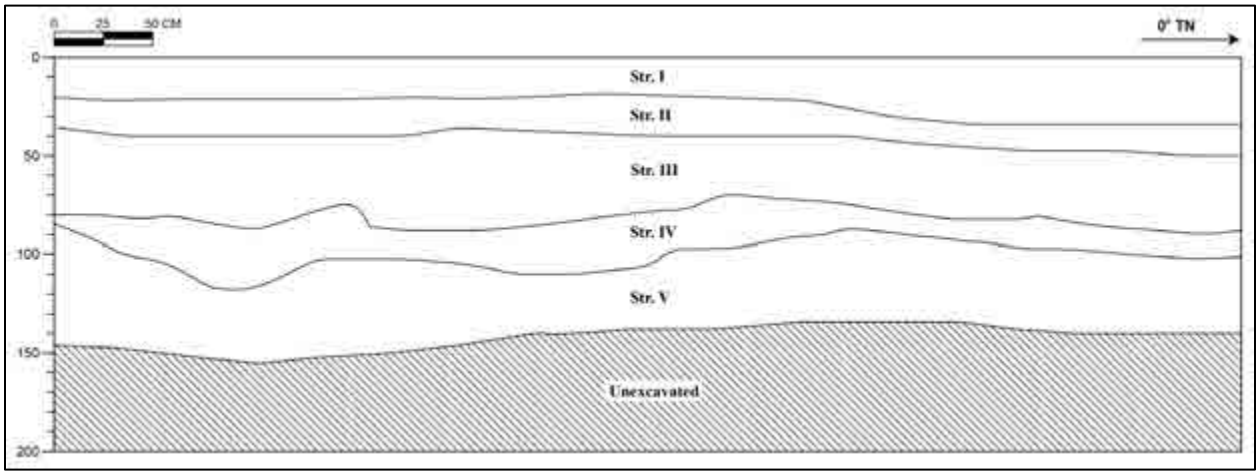

Figure 144. TE-33, stratigraphy of the west wall

Table 33. TE-33 stratigraphic description

Stratum	Depth (cmbs)	Description
I	0–35	Ap horizon; 7.5YR 2.5/3, very dark brown; gravelly sandy loam; moderate, fine granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; many fine roots; clear, smooth lower boundary
II	20–48	Natural; 10YR 3/6, dark yellowish brown; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; abrupt, smooth lower boundary
III	38–90	Natural; 7.5YR 3/3, dark brown; silty clay loam; moderate, fine platy structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; few fine roots; clear, wavy lower boundary
IV	70–119	Natural; 5YR 5/1, gray; extremely gravelly sand; structureless (single grain); moist, loose consistence; no cementation; non-plastic; marine origin; abrupt, smooth lower boundary; stream deposit
V	86–157	Natural; 10YR 4/4, dark yellowish brown; gravelly silt loam; weak, very fine granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; lower boundary not observed

1.1.34 Test Excavation 34 (TE-34)

TE-34 was in the northeastern quadrant of the study area (Figure 145). The excavation was 6.00 m long by 0.80 m wide with a maximum depth of 1.58 mbs. The stratigraphy of TE-34 consisted a dark yellowish brown, silt loam Ap horizon (Stratum I) overlying dark yellowish brown, natural loamy sand mottled with very dark brown silty clay loam (Stratum II); very dark brown, natural silty clay loam (Stratum III); brown silt loam, natural mottled with dark grayish brown sandy loam (Stratum IV); and brown, natural silt loam (Stratum V) (Figure 146 through Figure 147 and Table 34). No cultural materials were observed.

Figure 145. TE-34, overview of the general location, view to northeast

Figure 146. TE-34, oblique view of the east wall, view to northeast

Figure 147. TE-34, close-up of the east wall, view to east