

Final—Archaeological Monitoring for the Construction of Hale Makana o Nānākuli, Nānākuli Ahupua‘a, Wai‘anae District, Island of O‘ahu, Hawai‘i

TMK: (1) 8-9-002:001 (por.)



Prepared For:

Nanakuli Kauhale Development, LP
1188 Bishop Street, Suite 907
Honolulu, Hawaii 96813

April 2016

Keala Pono 

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Prepared By:

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MANAGEMENT SUMMARY

Archaeological monitoring was conducted for the construction of Hale Makana o Nānākuli, a housing development in Nānākuli Ahupua‘a, Wai‘anae District on the island of O‘ahu. The project area consisted of 1.9 acres on TMK (1) 8-9-002:001. Ground disturbance that was monitored included trenching, grading, and backfilling. Among the items recovered were 20th century bottles, ceramic fragments, and marbles, as well as ‘*opihi*’ shells thought to be of recent origin. No cultural deposits or traditional cultural material were encountered during monitoring.

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INTRODUCTION

At the request of Nanakuli Kauhale Development, Keala Pono Archaeological Consulting conducted archaeological monitoring for construction of Hale Makana o Nānākuli, a housing development on a portion of TMK: (1) 8-9-002:001 in Nānākuli Ahupua‘a, Wai‘anae District on the island of O‘ahu. The primary focus of the monitoring was on the identification and appropriate treatment of historic properties that might be affected by construction.

Archaeological monitoring was performed under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended. Field procedures were conducted in accordance with an Archaeological Monitoring Plan (Chaffee and Dega 2009) approved by the Hawai‘i State Historic Preservation Division (SHPD). This report is drafted to meet the requirements and standards of both federal and state historic preservation law. These include Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, Chapter 6e of the Hawai‘i Revised Statutes, and SHPD’s draft *Rules Governing Standards for Archaeological Monitoring Studies and Reports* (§13–279).

The report begins with a description of the project area and an historical overview of land use and archaeology in the area. The next section presents methods used in the fieldwork, followed by the results of the archaeological monitoring. Project results are summarized and recommendations are made in the final section. Hawaiian words and technical terms are defined in a glossary at the end of the document.

Project Location and the Undertaking

TMK: (1) 8-9-002:001 (por.) is located within the *ahupua‘a* of Nānākuli on the leeward side of O‘ahu (Figures 1 and 2). The parcel is on the *mauka* side of Farrington Highway, which serves as the western property boundary. A canal borders the parcel on the north, Mano Avenue is on the east, and residential lots are on the south. The project area includes 1.9 acres (.7 ha) of the property, which is owned by the Department of Hawaiian Homelands. It is located approximately .3 miles (450 m) from the coast at an elevation of roughly 20 feet (6.1 m) above mean sea level.

The undertaking consists of construction of a 48-unit affordable housing complex that also includes multi-purpose learning, community health, and commercial retail centers. The facility will provide safe, long-term rental housing for Nānākuli’s low income populace, targeting Hawaiian families who earn 40% or below the adjusted median income. The complex will consist of 16 one-bedroom units (592 sf.), 8 two-bedroom units (843 sf.), 24 three-bedroom units (1,123–1,164 sf.), perimeter fencing, a private access gate, a community resource center, a playground, parking lots, and a laundry room. Federal funding received/anticipated for the undertaking includes rental subsidies and a U.S. Department of Agriculture (USDA) loan.

Physical Environment

Nānākuli Valley is cut into the Wai‘anae Mountain Range, a heavily eroded shield volcano. Erosion has removed most of the western slope and exposed the internal structure of the volcano. The caldera of the Wai‘anae volcano was located just west of Kolekole Pass, and extended from the northern side of Mākaha Valley to the head of Nānākuli Valley (Macdonald et al. 1983).

Nānākuli Valley is 1.2 miles (1.9 km) wide at its mouth and extends 3.1 miles (5 km) inland, and is part of the Wai‘anae District on the leeward side of O‘ahu (Cordy 2002:77). It is situated between the *ahupua‘a* of Lualualei on the northwest and Honouliuli on the southeast and encompasses a

total area of 1,602 acres (648 ha) (Juvik and Juvik 1998:306). Cordy defines the *ahupua'a* boundaries further:

The south border of Nānākuli is at Nānākuli Point on the shore. Back across the coastal trail (today's highway), the south ridge of the valley begins and rises to Pu'u Manawahua. The ridge then meets the main ridgeline of the Wai'anae mountains, which forms the back of the valley with Mauna Kapu and the light grey cliffs of Palikea at 3,098 feet. The north ridge then heads back toward the sea, forming the north side of the valley. The ridge dips in the back then rises to the high peak called Pu'u Heleakalā. (Cordy 2002:79)

Similar to the other Wai'anae valleys, there is a lower valley and an upper valley, which gradually increases in elevation. The valley's many tributaries are located in the upper portion, all emerging from the 'Ewa side, and merge in the lower valley. They are intermittent streams that appear to not have run full-time in the past, due to the lack of remains of irrigated fields (Cordy 2002:79).

Situated on the dry coastal plain, the project area receives low rainfall of only 20–30 inches (51–76 cm) per year, and the wind generally comes from the east, over the Ko'olau and Wai'anae mountain ranges (Juvik and Juvik 1998:50). Vegetation in the project area consists of *kiawe* and various grasses. Substrates are almost entirely coral outcrop, shown as CR in Figure 3. Sinkholes are a common feature on coral substrates, formed as water percolates downward and erodes the coral. A small section of soil occurs on the eastern corner of the property, consisting of Mamala stony silty clay loam, 0–12% slopes, or MnC (Foote et al. 1972).

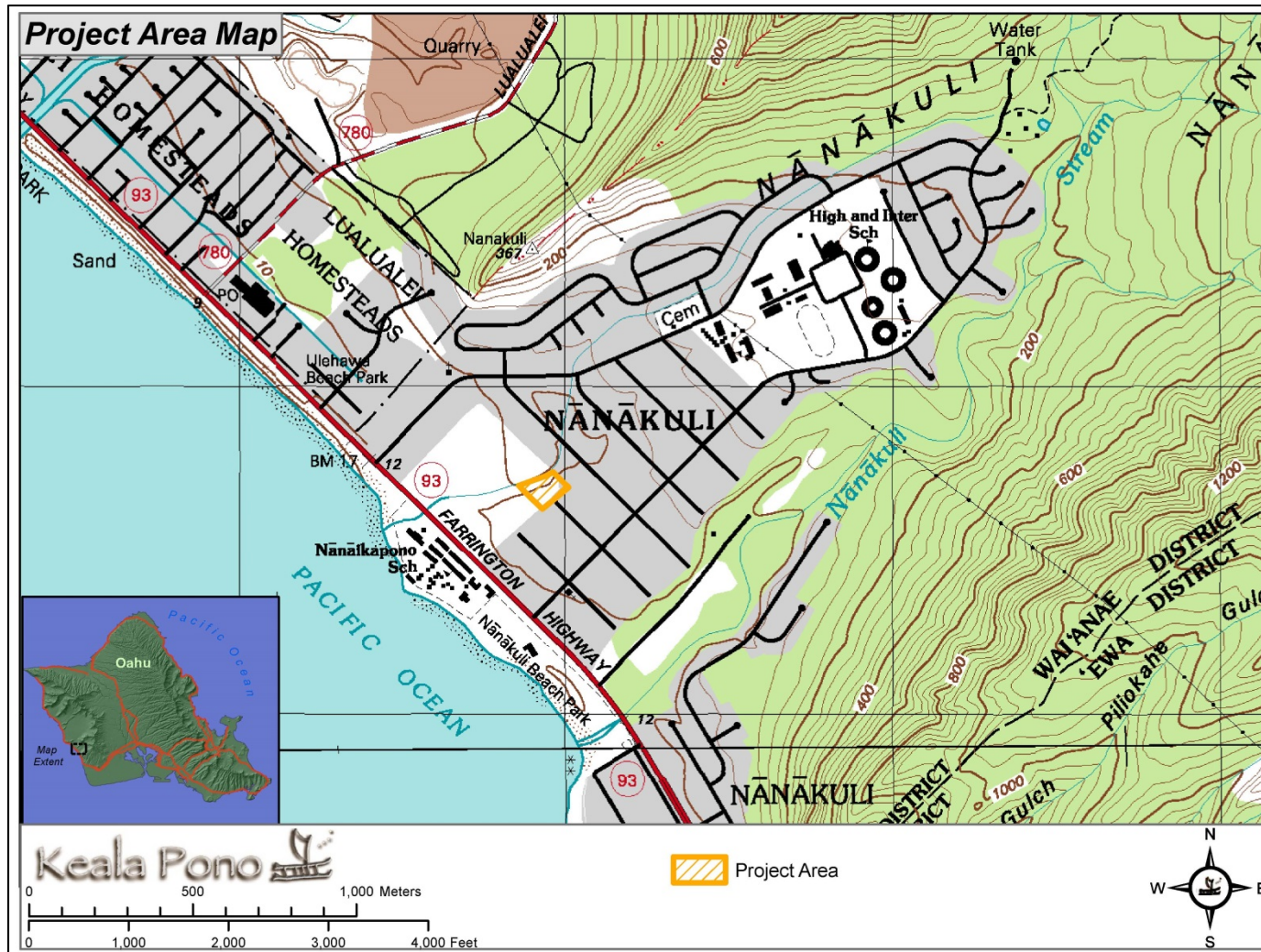
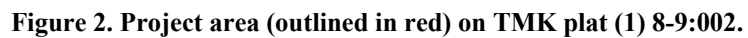


Figure 1. Project location on a 7.5 minute USGS Waianae quadrangle map.



BACKGROUND

This section of the report presents traditional and historic background information for Nānākuli, including place names, Hawaiian proverbs and *mo'olelo*, land use, Māhele land tenure data, and a summary of previous archaeological research.

Inoa 'Āina Nānākuli: Place Names

Nānākuli literally means “look at knee” or “look deaf” (Pukui et al. 1974). There are several stories that attempt to explain the origin of the name.

One *mo'olelo* relates that Nānākuli is named in honor of the tattooed knee of Ka'ōpulupulu, a priest whose chief, Kahāhana, turned a deaf (*kuli*) ear to his advice (Pukui et al. 1974):

Kahahana dug up bones from their burial places “to make arrows for rat-shooting and hooks for fishing. The bones of chiefs were bartered for skirts for chiefesses and handles for *kāhili*. Ka'ōpulupulu pleaded with him in vain to stop this disrespectful deed, but Kahahana turned a deaf ear to Ka'ōpulupulu's pleas. As a sign of protest, Ka'ōpulupulu, his followers, relatives and members of his household tattooed their knees to signify Kahahana's unwillingness to listen to advice. (Kamakau 1992:133)

Sterling and Summers (1978) share another story based on the “look deaf” translation, as told to noted historian and author Mary Kawena Pukui in 1945 by Simeona Nawa'a:

Simeona Nawa'a came in to the Museum and sat down to talk to me. In the course of the conversation he told me these things:

Nanakuli – It was Kanui, a native woman of Wai'anae who told him why this place was so named. In the olden days, this place was sparsely inhabited because of the scarcity of water. The fishing was good but planting very poor. When it rained, some sweet potatoes would be put into the ground, but the crops were always poor and miserable.

There were a few brackish pools from which they obtained their drinking water and it is only when they went to the upland of Waianae that they were able to get fresh water. They carried the water home in large calabashes hung on mamaka or carrying sticks and used their water very carefully after they got it home. They spent most of their time fishing and most of the fish they caught were dried as gifts for friends and relatives in the upland. Sometimes they carried dried and fresh fish to these people in the upland and in exchange received poi and other vegetable foods. And as often as not, it was the people of the upland who came with their products and when home with fish.

Because of the great scarcity of water and vegetable food, they were ashamed to greet passing strangers. They remained out of sight as much as possible. Sometimes they met people before they were able to hide, so they just looked at the strangers with expressionless faces and acted as though they were stone deaf and did not hear the greeting. This was so that the strangers would not ask for water which they did not have in that locality.

The strangers would go on to other places and mention the peculiar, deaf people who just stared and they would be told that the people were not deaf but ashamed of their inability to be hospitable. So the place they lived was called Nana, or look, and kuli, deaf—that is, Deaf mutes who just look. (Mary Pukui, as told to her by Simeona Nawa'a, March 6, 1945, HEN, p 270). (Nawa'a 1956:2740 in Sterling and Summers 1978:61–62)

Another interpretation comes from an early 20th century resident of Nānākuli, Wm. Z. H. Olepau in 1933 as follows:

There were two women who went up the hill of “PuuHakila” or PuuHela to dry their Kapas. While the kapas were being dried they left and went down the hill to the pool for some water. They heard dogs barking so they stood, looking around for the barking was deafening. (Sterling and Summers 1978:62)

Olepau then explains why Nānākuli may have been named for the knee:

- (1) Women used to go to the top of a hill to dry their kapa, and when they got there, they looked at their knees – nana kuli.
- (2) Royalists of the valley used to sit with their knees up and watch their knees – nana kuli.

W.Z. Olepau, resident of Nanakuli, Mar. 20, 1933. (Sterling and Summers 1978:62)

Another explanation for the “looking at the knees” translation is related to an incident in the travels of the famous O‘ahu chief Kualī‘i. His attendants wished to relieve the king of his fatigue by pressing his knees (Thrum 1922:87).

While many stories attempt to interpret the meaning behind the place name Nānākuli, there are still others that refute that Nānākuli is the correct spelling, and thus the wrong meaning, for the *ahupua‘a*. Fred Cachola and Lehua Kapaku are two Nānākuli residents who share their beliefs with regard to the spelling of the name. In an interview, Cachola explains how he heard about the meaning when he was a school principal at Nānāikapono Elementary, from longtime resident Mrs. Eli:

So she said that the first principal of that school was Reverend Awai and that he knew that the tradition of that area, Nānākuli, had a Hawaiian hidden meaning which she told me was “Nānā-i-ka-ule.” I was kind of smiling. And she said, “Yeah, because that’s how in the old days this place was known for promiscuity. It got this name from ancient times. And it might have something to do with the mountain range.” Look at your map. Look at your map. The one that you were showing me. Because you can see the *ule* over there. See? There it is. See the testicles over here, and the penis sticking out there. So it could be [in] reference to that... And, that’s one interpretation of the name. And, it’s very Hawaiian. To me, it’s a very Hawaiian thing, very Hawaiian. (McGuire and Hammatt 2000:9)

In another interview, Lehua Kapaku, a resident of Nānākuli since 1960, shared a different story:

The Māui legend names off the various places this side of O‘ahu. Māui had so many brothers and he had two sisters. One was Lualualei and [the other was] his baby sister whom he treasured. The baby sister’s name was Nānāku‘ulei [which means] *look to my pretty lei*. To have the name “Lualualei” which is *sacred wreath*, and, then having a baby sister [whose name means] *looking deaf*, I just didn’t agree. I wasn’t satisfied with that. So, I accepted the Māui legend part where his baby sister was Nānāku‘ulei... This is the only place in the whole State to have a derogatory name, *look deaf*. You look at any other place, they have nice names... Only Nānākuli. So, it may have been a misprint... (McGuire and Hammatt 2000:13)

A major landmark in Nānākuli is Pu‘u Heleakalā, a hill located on the northwestern side of the valley. Not to be confused with the famous “Haleakalā” on Maui, Heleakalā translates to “snare by the sun,” for the *pu‘u* blocks the rays of the sun as it sets (Pukui et al. 1974:44). Pukui offers further insight into the name:

Heleakala Hill

A barren hill in Nanakuli, Waianae. Sometimes called Haleakala which Mrs. Pukui believes is probably wrong.

Hele – snare
a – belonging to
kala – sun

Heleakala meaning, where the sun is snared. This hill faces right into the setting sun and reference is made as to this place being ‘where the sun’s rays are broken.’ (Pukui 1953 in Sterling and Summers 1978:62)

The *pu‘u* is also described in the following historic account, originally printed in the Hawaiian language newspaper *Nupepa Kuokoa*:

....It wasn’t long when we arrived at Nānākuli and then to a place which bears a peculiar name, said to be the one on which the rays of the sun was broken. This is a barren hill as though plants hated all of its sides. I saw the cave in which Hina made tapa cloths on the slope of a hill facing a stream whose mouth was at a place with a peculiar name. (Kuokoa 1899 in Sterling and Summers 1978:62)

Other peaks include Pu‘u Manawahua, Mauna Kapu, and Palikea toward the back of the valley. Pu‘u Manawahua is 2,401 feet (732 m) high, and the name means “great grief hill” or “nausea hill” (Pukui et al. 1974:202). Mauna Kapu separates the Nānākuli and Honouliuli Forest Reserves and can be translated as “sacred mountain” (Pukui et al. 1974:148). Palikea rises 3,098 feet (944 m) high on the Lualualei side of Nānākuli. The name translates to “white cliff” (Pukui et al. 1974:177).

Nānākuli Beach Park is a recent name given by the City and County of Honolulu to the stretch of coastline including Pili o Kahe, Zablan Beach, and Kalaniana‘ole Beach. On the south end of the park is Pili o Kahe, which translates to “clinging to Kahe” (Pukui et al. 1974:185). Next to Pili o Kahe is Zablan Beach, named for a family who is connected with the area (Clark 1977:84). On the north end of the park is Kalaniana‘ole Beach, named after Prince Jonah Kūhiō Kalaniana‘ole, who created the Hawaiian Homes Commission Act of 1920. The beach was given the name in 1940 at the request of the Nānākuli homestead community.

Nānākuli ‘*Ōlelo No‘eau* and *Mo‘olelo*

‘*Ōlelo no‘eau* and *mo‘olelo* offer insight into what life may have been like in Nānākuli in ancient Hawai‘i. They also share topics of interest of the time that were meant to be passed down from one generation to the next.

‘*Ōlelo No‘eau*

Whereas no ‘*ōlelo no‘eau* were found specifically for Nānākuli, the following sayings relating to the greater Wai‘anae District paint a picture of the region in times past. They describe a mountain goddess, a coconut grove, and also politics and power of the land.

He lokomaika‘i ka manu o Kaiona.

Kind is the bird of Kaiona.

Said of one who helps a lost person find his way home. The goddess Kaiona, who lived the Wai‘anae Mountains of O‘ahu, was said to have pet birds who could guide anyone lost in the forest back to his companion.

(Pukui 1983:85)

Ka wahine hele lā o Kaiona, alualu wai li‘ulā o ke kaha pua ‘ōhai.

The woman, Kaiona, who travels in the sunshine pursuing the mirage of the place where the ‘ōhai blossoms grow.

Kaiona was a goddess of Ka‘ala and the Wai‘anae Mountains. She was a kind person who helped anyone who lost his way in the mountains by sending a bird, a *‘iwa*, to guide the lost one out of the forest. In modern times Princess Bernice Pauahi was compared to Kaiona in songs.
(Pukui 1983:177)

E nui ke aho, e ku‘u keiki, a moe i ke kai, no ke kai la ho‘i ka ‘āina.
Take a deep breath, my son, and lay yourself in the sea, for then the land shall belong to the sea.
Uttered by the priest Ka‘opulupulu at Wai‘anae. Weary with the cruelty and injustice of Kahāhana, chief of O‘ahu, Ka‘opulupulu walked with his son to Wai‘anae, where he told his son to throw himself into the sea. The boy obeyed, and there died. Ka‘opulupulu was later slain and taken to Waikīkī where he was laid on the sacrificial altar at Helumoa.
(Pukui 1983:44)

Ka malu niu o Pōkā‘ī.
The coco-palm shade of Pōkā‘ī.
Refers to Wai‘anae, on O‘ahu. At Pōkā‘ī was the largest and best-known coconut grove on O‘ahu, famed in chants and songs.
(Pukui 1983:160)

Kapakahi ka lā ma Wai‘anae.
Lopsided is the sun at Wai‘anae.
Used to refer to anything lopsided, crooked, or not right. First uttered by Hi‘iaka in a rebuke to Lohi‘au and Wahine‘ōma‘o for talking when she had warned them not to.
(Pukui 1983:164)

Malolo kai e! Malolo kai!
Tide is not high! Tide is not high!
Said of a threatening disaster. Robbers once lived at a place in Wai‘anae now known as Malolo-kai. Their spies watched for travelers to kill and rob. When there were only a few that could be easily overcome, the spies cried, “Low tide!” which meant disaster for the travelers. But if there were too many to attack, the cry was “High tide!”
(Pukui 1983:232)

Ola Wai‘anae i ka makani Kaiaulu.
Wai‘anae is made comfortable by the Kaiaulu breeze.
Chanted by Hi‘iaka at Ka‘ena, O‘ahu, after her return from Kaua‘i.
(Pukui 1983:272)

Mo‘olelo

From the following *mo‘olelo* about fishing, we can learn what the social and political life may have been like in pre-contact in Nānākuli.

In the time when Kahekili, ruler of Maui ruled Oahu, after the battle with Kahahana, his own nephew, there lived a man at Nanakuli, Waianae, island of Oahu. He was a man that never thought of nor kept any of the gods of old Hawaii. He was ungodly lazy, poor and simply lived on the charity of his host.

One night, he had a dream. A small stone image spoke to him saying, “Say! Say! Wake up you and come and get me. I am dying of cold where I am. Come and get me. There I am, placed by the small heap of rocks placed on the ridge.” The man awoke with a start and found that it was a dream. He thought nothing of this thing, this worthless idea of a stone speaking and fell off to sleep again. After he had fallen asleep again, the stone image bestirred him. He awoke and went where the stone had instructed him. When he got there, he found the stone, carried it home, washed it clean and kept it.

The next night, the stone told that there are visitors at the shore, a school of fish and that he should fetch nets and a canoe. The man looked around and said that he couldn't get any fish because he lacked a canoe and nets. Therefore, he went to speak to the konohiki of the land, "I have been told that there are visitors to the shore. It will be well to get the nets and canoes ready to go to sea."

The konohiki of the land made ready with nets and canoes and set out to sea. On this trip, there were so much fish caught that a stench rose up on the shore. People went from Ewa, Waianae and Waialua to get some fish but the supply was inexhaustible. The fish kept coming to the same place for several days. When the fish came the keeper of the stone god took one fish and gave it to him because he was told to do so in a dream. Whenever fish was caught, one should be given to him. The keeper did so.

He became a great favorite of the konohiki's and received property, fish nets, canoe and land, such wealth as he have never seen before. The konohiki continued caring for him and they shared their wealth together for a long time.

One day some keepers of gods discovered the man had a stone and so some of them, from Ewa, came and carried it away. The spirit of that stone image went to his keeper to tell him where he had been taken, the land and the house in which it was placed. Then its keeper went and found it in the very place that the stone image described...

(signed) D. Kalakaua

(Kalakaua Ms.:241 in Sterling and Summers 1978:63)

The legendary hero Maui, a significant figure in Hawaiian *mo'olelo*, is associated with several places in Nānākuli, including a rock, a shelter, and a spring:

Site 148. Large rock said to be named Maui, about 1.1 mile from Nanakuli station toward Puu o Hulu.

Northeast of the road on the property of E.P. Fogarty is a rock said to be named after the Hawaiian hero, Maui who is said to have landed here when he first came to the Hawaiian islands from the south. This stone at the time was surrounded by water, and it was here that Maui reposed and sunned himself. In the bluff just northeast of the rock is a shelter in which he lived, and in the vicinity was a spring where he obtained water. The large rock is now split in half and adorned with many small, oddly-shaped rocks. It is said to be bad fortune to build one's house across a line drawn directly from the rock to the shore. J.J. Mathews is said to have collected detailed information in regard to this site. (McAllister 1933:110).

Power and Warfare in Wai'anae

For centuries, O'ahu chiefs competed against one another for power on O'ahu and the other islands. In the 1400s, the Māweke-Kumuhonua line unified O'ahu's rule, Līhu'e (also known as Wai'anae Uka) was the royal center, and oral histories portray this time as peaceful and prosperous. Of the Māweke line, La'akona, who lived in 'Ewa and controlled Wai'anae, reigned until Haka, an evil ruler, assumed power between 1520 and 1540. He was later captured and slain somewhere between the valleys of Mākaha and Wai'anae (Cordy 2002:26).

In the 1600s and 1700s, population grew on O'ahu and the island was ruled under Kala'imanuia (1600–1620), Kākuihewa (1640–1660), Kualī'i (1720–1740), and Peleīōholani (1740–1779). Power declined and was built back up several times among these rulers, but by 1778 the Kingdom included Moloka'i, O'ahu, and portions of Kaua'i (Cordy 2002:32).

In 1783 Maui invaded O'ahu after Maui's ruler Kahekili tricked O'ahu's chief Kahāhana into killing his high priest. This was a significant turn of events, as the high priest, Ka'ōpulupulu, controlled the Waimea-Pūpūkea area on O'ahu's North Shore, including the large *heiau* Pu'u o Mahuka in Pūpūkea and Kunaiwa in Wai'anae

(Cordy 2002:37). The O‘ahu army was defeated and Kahāhana was caught and killed in 1785. In response, Kahāhana’s supporters revolted, but with many losses in ‘Ewa, they pulled back to the valleys of Wai‘anae where many more were killed. The Maui Kingdom ruled O‘ahu for ten years under Kahekili and his son Kalanikūpule until they were defeated by Kamehameha’s Hawaii Kingdom army in 1795.

Land Use and Subsistence

The Wai‘anae coast was one of three dry areas on the island of O‘ahu (Handy et al. 1972). Due to low rainfall and intermittent streams, there were not many options for agriculture. Sweet potato, or *‘uala* (*Ipomoea batatas*), was the staple crop, planted throughout the dry slopes of the Wai‘anae region (Handy 1940:156). Throughout the district, a pattern of small coastal villages with farms in the upper valleys was likely the norm (e.g., Cordy 2002). The seas fronting the district were known as prime fishing grounds, thus fishing and sweet potato cultivation were the main subsistence activities:

Undoubtedly there were also small settlements subsisting mainly on sweet potato, in the valleys where constant streams were lacking (Nanakuli and Makua). Along this coast the fishing is excellent. In famine times, then, there was reef fishing, and the Wai‘anae Mountains had wild banana, *ti*, fern, and other roots that were edible...(Handy et al. 1972:275–276)

Handy (1940) describes a broken platform, pavings, and a house site in Nānākuli, indicating traditional habitation along the stream. Handy also talked with a rancher, however, who stated that “there are no terrace remains anywhere in Nanakuli valley, nor any available water for irrigation, except at the very head of the valley’s head, far up the mountains” (Handy 1940:83). The rancher also mentioned that at the top of the valley, there are abandoned terraces, platforms, and orange trees that mark habitation sites.

We know much of Wai‘anae’s cultural history through John Papa ‘Ī‘ī’s series of articles in the Hawaiian newspaper *Ka Nupepa Ku‘oko‘a*. ‘Ī‘ī was born in 1800 and died in 1870, and his writing was translated by Mary Kawena Pukui in 1959 in a book titled *Fragments of Hawaiian History*. Below are entries that detail his experiences while visiting relatives in Nānākuli:

Ii’s aunt on his father’s side, Kaneiakama, came from Waianae with her husband Paakonia. They visited the family’s houses to rest a while before continuing on to Honolulu to their landlord. These people, who were bracelet-makers and residents of that land of the foamy sea, were well known. They were of chiefly stock and were privileged to place their bundles with those of the chiefs. Their landlord, Pahoa, was in charge of Ka‘ahumanu’s extensive lands, granted her by her husband, Kamehameha; and there were very few *ahupua‘a* in which she did not have a portion, for she was a great favorite of the king. Ka‘ahumanu was fond of Kaneiakama and admired her skill in composing chants. Because of this, perhaps, the land at Waianae was given to Kaneiakama and her husband. (Ii 1993:26)

There were three such journeys, one by way of Pohakea, one through Kolekole, and one by a route below Puu o Kapolei. On the first two trips they went to Pahoauka, where his aunt and uncle lived. (Ii 1993:27)

Ii was eight or nine years old when he was again seized by a desire to go to visit his aunt Kaneiakama, and he was given permission to do so. He had heard that his aunt was at Nanakuli, so he and his attendant departed by way of Puu o Kapolei to Waimanalo and on to Nanakuli. There he found his aunt and her husband who were in charge of the fishing.” (Ii 1993:29)

During his visit Ii observed how the children of Nanakuli produced a long quavering sound while chanting. This was performed while the children sat on the branches of the breadfruit trees. They sat apart from each other on branches from the base to the top, chanting. When the boy listened carefully to the long, drawn out sound, he could distinguish the words that they were chanting. He asked his

aunt to let him join the children, and he quickly saw how the quavery sound was produced. He noted that one of the boys held up two fingers on his right hand and tapped his throat in order to make the quaver. Ii learned the chant at once. This is the chant that they were using:

Kau koli‘i ka la i luna o Maunaloa,
E ke ao e lele koa,
Halulu i ka mauna
Kikaha ke kuahiwi o Kona he la‘i,
Ku papu Hilo i ka ua.
Paliloa Hamakua,
‘Ope‘ope Kohala i ka makani,
Huki Kauiki pa i ka lani, etc. [sic]
The sun sends a streak of light on Maunaloa,
The clouds go scurrying by,
There is a rumble on the mountain top
That echoes from the mountain of Kona, the calm.
Hilo stands directly in the rain. Hamakua’s cliffs are tall,
Kohala is buffeted by the wind,
Kauiki reaches and touches the sky, etc.

This was memorized by all and was chanted in perfect unison, and the boy noticed how pleasing it was. Thus did Ii enjoy himself with the children of Nanakuli, and he continued to spend his spare time with them. (Ii 1993:29)

Heiau

‘Ilihune Heiau was a noted religious structure in Nānākuli. Nothing of it remains today, however, as many *heiau* were used as cattle pens, and rocks were moved during the time of ranching. The scant information known for the *heiau* is as follows:

Ahupuaa: Nanakuli

“poor, destitute”

Comments: Site 147. Approximate site of Ilihune heiau, Nanakuli, of which nothing remains. Thrum notes: A small walled heiau of pookanaka class; used about 1860 by Frank Manini as a cattle pen, for which natives prophesied his poverty and death.” (McAllister 1933:110)

On the night of Po Kane there are some who hear a voice of a child calling e------. This voice trails off and ends up at a place called a heiau by some – a cattle pen by others. (Mrs. Annie Soong, Nov. 1954 in Sterling and Summers 1978:62)

Archaeological research has found a small shrine in the upper valley, but it is hard to determine if there were others due to the disturbance of the ruins (Cordy 2002:84). Another *heiau* overlooking Nānākuli includes one from Honouliuli Ahupua‘a:

Puu Kuua Heiau

pu‘u ku‘ua. PEM: relinquished hill. Honouliuli Ahupua‘a

“Site 137. Puu Kuua heiau, Palikea, Honouliuli. The heiau was located on the ridge overlooking Nanakuli, as well as Honouliuli, at the approximate height of 1800 feet. [This is far from Palikea as currently identified.] Most of the stones of the heiau were used for a cattle pen... That portion of the *heiau* which has not been cleared for pineapples has been planted in ironwoods.” Coordinates at 1800 ft. elevation. (McAllister 1933:108)

Nānākuli in the Historic Period

In the late 1700s to early 1800s, foreigners and locals provided written accounts of visits and descriptions of what life was like during this period. One of the earliest accounts of the area is from 1798 when George Vancouver sailed along the Wai‘anae coast and described what he saw:

From these shores we were visited by some of the natives, in the most wretched canoes I had ever yet seen amongst the South-Sea islanders; they corresponded however with the appearance of the country, which from the commencement of the high land to the wet land of Opooroah, was composed of one barren rocky waste, nearly destitute of verdure, cultivation, or inhabitants, with little variation all the way to the west point of the island. Not far from the s.w. point is a small grove of shabby cocoanut trees, and along those shores are a few straggling fishermen’s huts. Nearly in the middle of the side of the island is the only village we had seen westward from Opooroah. In its neighborhood the bases of the mountains retire further from the sea-shore, and a narrow valley, presenting a fertile cultivated aspect, seemed to separate the wind distance through, the hills. The shore here forms a small sandy bay. On its southern side, between the two rocky precipices, in a grove of cocoanut trees is situated the village... The few inhabitants who visited us from the village, earnestly intreated our anchoring, and told us, that if we would stay until morning, their chief would be on board with a number of hogs, and a great quantity of vegetables. (Vancouver 1967:217)

In the early 1800s, John Papa ‘Ī‘Ī visited his aunt in Nānākuli, describing in little detail that ‘ulu trees were present and fishing was taking place. There were also reports in 1818 by Hunnewell and 1828 by Chamberlain that there were a number of villages in the area (Cordy 2002:80).

In the early 1800s, many chiefs in Wai‘anae had their people go to the mountains to gather sandalwood, an item in high demand for trade with foreigners (Cordy 2002:41). This new effort changed the traditional way of life, and may have contributed to population decline during this time. By the mid to late 1800s, much of the land was leased for ranching purposes.

In the *1880 Hawaiian Kingdom Statistical and Commercial Directory and Tourist’s Guide*, a writer describes his visit to Nānākuli, observing that much of the land was being used for grazing:

Leaving Waianae, a ride of about two miles brought me to the Lualualei Valley, another romantic place opening to the sea and surrounded in every other direction by high mountains. This valle is occupied as a grazing farm by Messrs. Dowsett & Galbraith, who lease some sixteen thousand acres from the Crown. Its dimensions do not differ materially from those of the Waianae Valley, except that it is broader—say, two miles in width by a length of six or seven miles. The hills which inclose [sic] it, however, are not so precipitous as thos at Waianae, and have, therefore, more grazing land on their lower slopes, a circumstance which adds greatly to the value of the property as a stock farm. Although only occupied for grazing purposes at present, there is nothing in the nature of the soil to prevent the cultivation of the sugar cane, Indian corn, etc. Arrangements for irrigation, however, will be a necessary preliminary to cultivation.

From the Lualualei Valley to the Nanakuli Valley I had a rather dreary ride of three miles. The intervening country towards the sea is barren, with a little pasturage at the base of the mountains. The track, however, is in very good order, much better than I expected to find it, looking to the mountainous and rocky character of the country through which it passes. At Nanakuli and Hoaeae, close adjoining, the Messrs. Robinson have cattle ranches. The pasture here cannot be compared with that in the valleys I had just left behind, but inland among the mountain ranges it is much better. This, indeed, is a characteristic of the ranges throughout the island.

During my journey along the western coast of this island, where the road is generally so much more fatiguing to the traveler than that of the windward side, I have often pulled up to give both horse and rider a spell, whilst I entered into a chat with some group of natives whom I have fallen in with, or

those whose hamlets I have been passing at the time. More than once, too, I have passed the night at their houses. I have always found them very sociable and thoroughly hospitable....(Bowser 1881:493-494)

Handy's *The Hawaiian Planter*, published in 1940, gives further description of Nānākuli in the late 1800s, including an account from a rancher who had been living and working there for 50 years:

On the south side of the stream, about a quarter of a mile inland from the main coastal road, there is a broken platform (Paepae) built of small rocks with apparently a small paved area below, close to the stream bed. Extending inland along the south bank of the stream bed for about 75 yards there is a rough stone facing from 1 to 2 feet high in general level along the top. This might be judged to be a terrace area were it not that the ground behind the stone facing is not level; however, that might be due to washing out when the stream was in flood. According to Ernest Rankin, a rancher in this and other valleys for years past and now living on a homestead on the ridge north and above this site, the stonework just described was not terracing for taro patches but was built by a man named Whitney 40 years ago when he located a house and cattle shelter at that point. Behind the terrace there are six large old monkeypod trees, indicating earlier habitation. On the north side of the stream at this point, there is a fairly recent habitation site, with several large trees, also papayas and traces of sugar cane plantings. Nearby are a tiny stone paving and the remains of an old Hawaiian house.

According to Rankin there are no terrace remains anywhere in Nanakuli valley, nor any available water for irrigation, except at the very head of the valley's head, far up in the mountains. High in the small gulches at the valley's head there are some abandoned terraces, stone platforms, and orange trees marking the sites of ancient Hawaiian habitations. But as long ago as 1890 when Rankin first frequented the valley as a cowboy, there was not one Hawaiian living there. (Handy 1940:83)

Māhele Land Tenure and Historic Land Use

From 1848 through 1855, the Māhele divided and privatized the land across the islands, and the entire Waiʻanae District, aside from Mākaha, was designated as Crown Land. At this time the area was sparsely populated by Hawaiians. For example, only five Māhele land claims were made for all of Nānākuli (LCA 830, 833, 846, 7455, and 8153), and none were awarded (Table 1). The Nānākuli claims mention a *muliwai* and pond in addition to house lots and agricultural plots in *kula* lands and *wauke* plantations in the uplands. It is not clear exactly where the LCAs were located, although Berdy et al. (2002:10) surmise that they were situated in the upper valley where permanent habitation sites have been found. Only a small population of roughly 50 individuals lived in coastal Nānākuli during the mid-1800s (Cordy 1997). By 1881 there were just four Nānākuli residents listed in the Hawaiian Island Directory (Cordy 1997).

Table 1. Māhele Data for Nānākuli

LCA	Claimant	ʻIli	Awarded	Description
830	Mahiki		No	3 ʻāpana, 1 house lot, cairns, streams
833	Kahaanui	Kaape	No	4 ʻāpana, 1 house lot, cairns, streams
846	Awa		No	5 ʻāpana, 1 house lot, streams
7455	Kuluahi	Hapai	No	1 ʻāpana, 1 kula, 1 house lot, wauke, muliwei, pond
8153	Haulula	Kuamokahi	No	1 ʻāpana, 1 kula, 1 house lot, wauke, ʻuala

The Waianae Sugar Plantation was founded in 1878 by H.A. Widemann, and the leeward community grew substantially. During the 1890s the Oʻahu Railway and Land Co. (O.R.&L.) railroad was constructed to bring crops and animals from the Leeward Coast to Pearl Harbor. This railway would eventually run through all of

the Wai‘anae District and around Ka‘ena Point to Kahuku. Vestiges of the old rail line can still be seen along Farrington Highway.

After the overthrow of the monarchy in 1893, the Crown Lands were combined with the Government Lands. In 1898, when Hawai‘i became a U.S. Territory, all lands combined were ceded to the United States. It was not until the passage of the 1920 Hawaiian Homes Commission Act that the ceded lands (roughly 188,000 acres) were set aside to benefit Native Hawaiians (Juvik and Juvik 1998:228). Following this, Native Hawaiian homesteading in Nānākuli ensued, with 241 lots for applicants to choose from. The establishment of the Nānākuli Hawaiian homestead community is described below:

Among the areas designated as Hawaiian homesteads was a hot, stickery portion of Nānākuli. By 1929 this land had been divided into house lots and plans were underway to bring in homesteaders. From the beginning, there was criticism of the project. Frederick Ohrt, manager of the Water Board in Honolulu, said there wasn’t enough water in Nānākuli to supply the homesteaders. (McGrath et al. 1973:111)

In the early 1900s, a series of parcels were sold in nearby Lualualei, classified as pastoral lands because of the dearth of water. Roughly 40 families settled on the smaller lots, while families such as the Von Holts, McCandlesses, and Dowsetts laid claim to the large parcels there.

In March 1917, 31.36 acres within Nānākuli were set aside as a U.S. military reservation which was designated as Camp Andrews in 1941. A 1949 article in *Paradise of the Pacific* explains how Camp Andrews, an overnight rest and recreation center, was the answer to relaxation for “fighting men” of the time and had cabins and picnic benches (Allen 1999).

The answer to this problem was construction of a camp accessivble to railroad and highway transportaion. Camp Andrews resulted—a peaceful haven where there is no routine, no reveille, and where a thousand men and fifty officers can rest after returning from the bloody shambles of the Southwest Pacific.

Camp Andrews... is located at Nanakuli on the south-western shore of Oahu, twenty-six miles from “Pearl.” It had been established early in 1941 by the Hawaiian Detachment but in December of that year it was turned over to Commander Hickey. Dances and USO shows help provide fun for the men during their “away from it all” two days at Camp Andrews. (*Paradise of the Pacific* 1949)

Sugarcane production and military activity dominated the first half of the 20th Century on the Leeward Coast. World War II was devastating for the Waianae Sugar Plantation as high paying defense jobs created a labor shortage. All sugarcane production in the Wai‘anae District was eliminated during the 1940s due to labor shortages, water shortages, military procurement of land, and other more productive agricultural regions taking over. The O.R.&L. railway was officially abandoned in 1946.

During World War II, concrete bunkers, pill-boxes and gun emplacements were built along the Leeward Coast. Many of these concrete features are still present today. At times as many as 20,000 troops were training in the Wai‘anae District. McGrath et al. write, “American troops caused more destruction on the Waianae coast than the Japanese” (1973:135–136).

Historic Maps

The earliest map found for Nānākuli is an 1854 Government Survey map (Figure 4). Few details are depicted, but the coastline and mountains can be seen, and two points on the mountains are labeled. “HALEMANU” is on the northwest, and “GREEN HILL” is on the southeast. The expanse to the east of Green Hill is labeled as “J. MEEK’S LAND.” The coastal road is shown, and an old house is illustrated along the shore.



Figure 4. Portion of an 1854 Hawaiian Government Survey map (Webster 1854).

A 1912 Hawaii Territory survey map shows the Nānākuli region in more detail (Figure 5). Several places are named, such as Heleakalā and Manawahua Peaks. Two points half way up the valley are labeled “end of fence,” indicating that a fenceline once stood there. Nānākuli Cemetery is shown adjacent to Haleakalā Avenue, and a “Tank, Pump, and Tunnel Site” are illustrated to the east. An electric transmission line crosses the valley, and the military reservation is shown near the coast. Also along the shoreline are the Government Road, O.R.&L railroad track, a park, and an area of standing water.

A 1925 Hawaii Territory survey map depicts the 1,101-acre Nānākuli Forest Reserve and surrounding area (Figure 6). Places labeled on the mountains surrounding Nānākuli include Heleakalā Peak, Palikea, Pōhākea, Maunakapu, and Manawahua. The coastal road and shoreline are illustrated, but no other details are shown in Nānākuli.

By 1930, Nānākuli is illustrated as a large community with many residences (Figure 7). A Hawaiian Homelands map shows the Nānākuli subdivision much as it appears today. A feature that appears to be a rock wall runs across the military reservation both north and west of the current project area. Nānākuli Beach Park is depicted with a flooded area near the current highway. Just *makai* of the highway was an “Old Road” and the O.R.&L. railway.

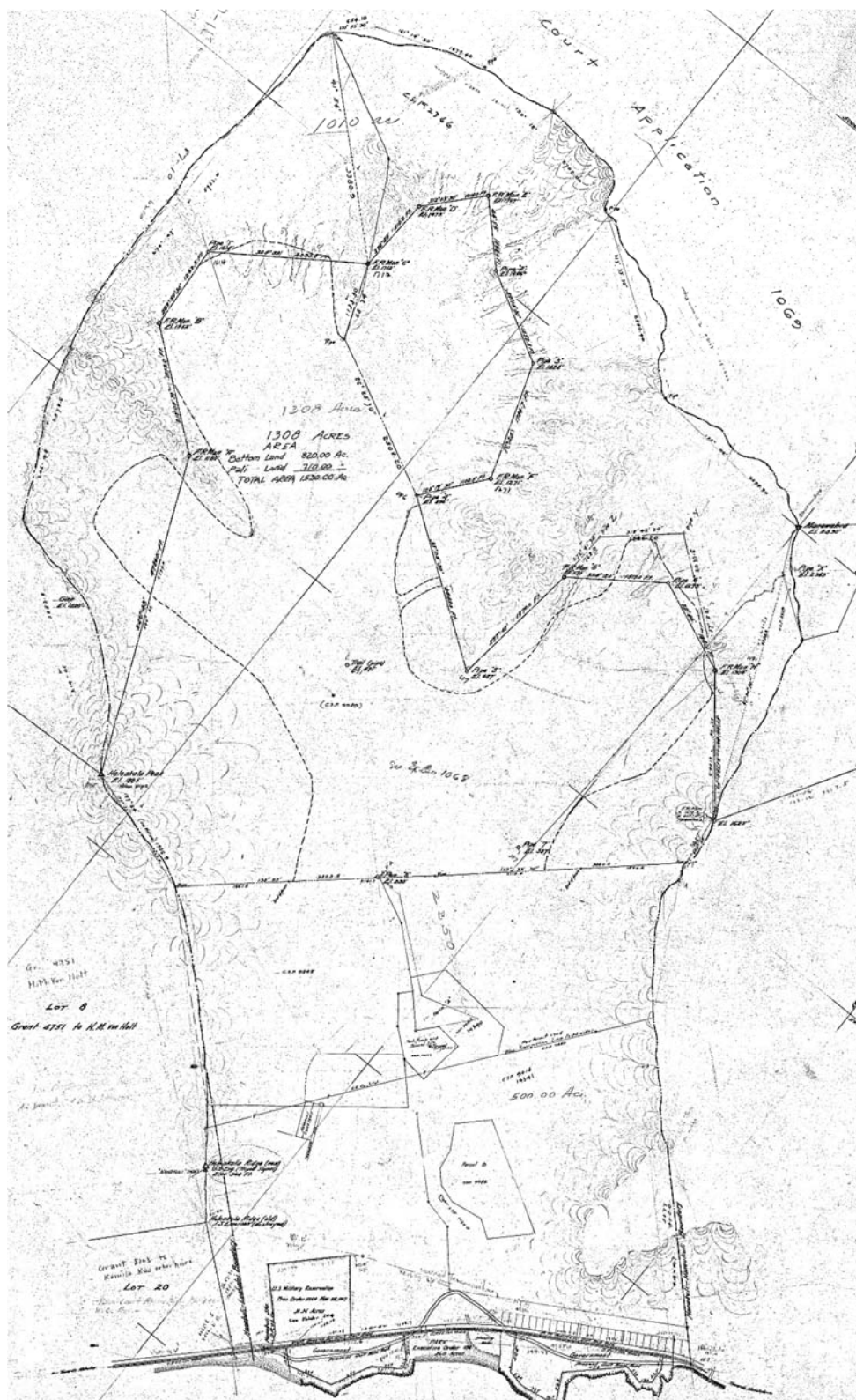
A 1953 USGS map also depicts a modern Nānākuli community (Figure 8). Additions include water tanks at the coast and farther inland, as well as a pipeline and quarry *mauka* of the subdivision. A jeep trail extends the length of the valley into the forest reserve, and the Palikea Trail runs along the ridge.

Previous Archaeology

Many archaeological projects have been carried out in Nānākuli (Table 2). The following paragraphs summarize the most relevant studies which lie in the vicinity of the project area. Their locations are illustrated in Figure 9.

The first archaeological work in Nānākuli was done by J.G. McAllister from 1929 to 1930, as part of an island-wide archaeological survey on O‘ahu. He identified one site, ‘Ilihune Heiau, Site 147, near the mouth of the valley, of which he noted that nothing remained (see *Heiau* section).

In 1999 an archaeological assessment was conducted for the former Camp Andrews site, adjacent to the current project area on the northwest (Hammatt et al. 1999). The only remains found were a concrete bunker and two coral columns at the camp entrance, however an archaeological inventory survey was recommended. This began in 2000 with identification and subsurface testing of additional sinkhole features (McDermott and Hammatt 2000). Although 17 sinkholes were recorded, only the two largest were excavated. They contained historic trash, traditional Hawaiian artifacts and midden, paleontological remains, and a human burial. A traditional practices assessment was also conducted. Little information was found for the pre-contact period, and ranching and military recreation were among the historic-era land uses for the parcel. Additional archaeological inventory survey work was completed in 2001 where traditional artifacts and midden, extinct avifauna, and small amounts of human bone were recovered from the sinkholes (McDermott et al. 2001). Also documented were additional features of Camp Andrews, including road remnants, trash piles, and concrete foundations. Two State Inventory of Historic Places (SIHP) site numbers were designated: 50-80-07-5946 for the historic remnants of Camp Andrews, and 50-80-07-5947 for the sinkhole features. Archaeological monitoring was later conducted for the Nānākuli IV Elementary School (Yorck and Hammatt 2003) and the Boys & Girls Club of Hawai‘i Youth Education Town (Moore et al. 2009), both located in the area that was surveyed. The only findings consisted of a few traditional artifacts (basalt flakes and a coral abrader) and midden, all found on the surface (Moore et al. 2009).





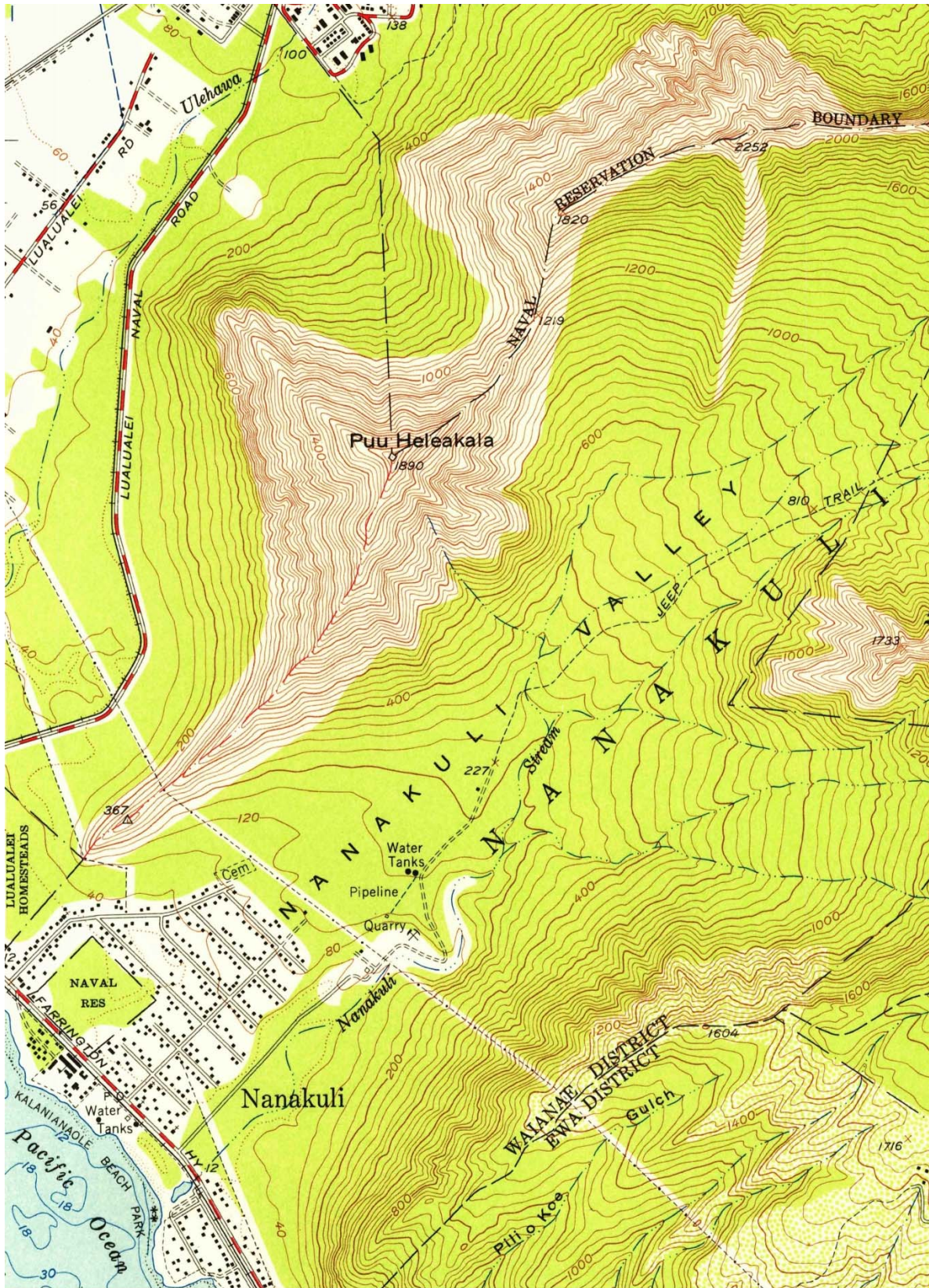


Figure 8. Portion of a 1953 USGS Schofield Barracks Quadrangle map (USGS 1953).

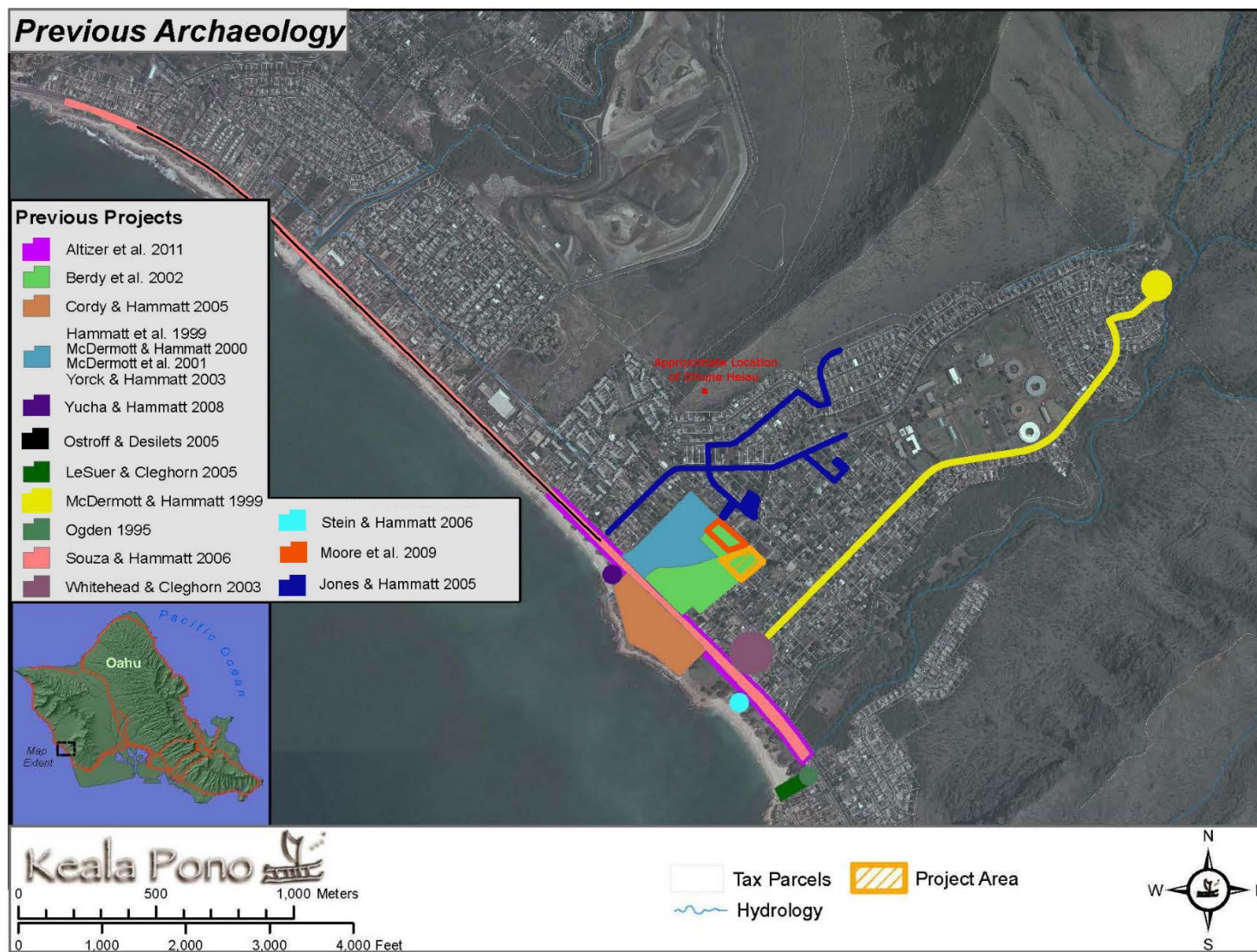


Figure 9. Previous archaeological studies in the vicinity of the project area.

Table 2. Previous Archaeology in Nānākuli

Author and Year	Location	TMK	Type of Study	Findings
McAllister 1933	Islandwide	Multiple	Survey	‘Ilihune Heiau, now destroyed.
Nakamura & Pantaleo 1994	Nānākuli & Lualualei Ahupua ‘a	Multiple	Reconnaissance Survey	Extensive surface disturbance noted.
Ogden Environmental and Energy Services Company 1995	MILCON-313, Naval Undersea Warfare Engineering Station (NUWES) Facility, Lualualei and Nānākuli	8-9-006:088	Subsurface Testing	No cultural properties were identified.
Cordy 1997	Nānākuli Ahupua‘a	8-9	Inventory Survey	Recorded agricultural sites, scattered habitation sites, and possible religious structures in upper Nānākuli Valley. Few sites were located in the lower valley, although the beach region was not included.
McDermott & Hammatt 1999	Proposed Nanakuli 242 Reservoir Site, and Nānākuli Ave.	8-9-008:003	Inventory Survey	No significant historic properties were identified.
Hammatt et al. 1999	Portion of former location of Camp Andrews	8-9-002:065	Assessment	Identified remains of Camp Andrews and numerous sinkholes which may provide additional information on traditional land use, flora and fauna.
McDermott and Hammatt 2000	Proposed Nanakuli IV Elementary Site (former location of Camp Andrews)	8-9-002:065, 023, por. 1	Inventory Survey with Subsurface Testing	Recorded sinkholes containing historic trash, traditional Hawaiian artifacts and midden, paleontological remains, and a human burial.
McGuire & Hammatt 2000	Proposed Nanakuli IV Elementary Site (former location of Camp Andrews)	8-9-002:065, 023, por. 1	Traditional Practices Assessment	Little documentation found for traditional cultural practices; historic land use includes ranching and military recreation. Describes the traditional practice of placing burials within sinkholes found on the subject property.
McDermott et al. 2001	Proposed Nanakuli IV Elementary Site (former location of Camp Andrews)	8-9-002:065, 023, por. 1	Inventory Survey with Subsurface Testing	Identified Site 50-80-07-5946, the remains of Camp Andrews and Site 50-80-07-5947, sinkholes with cultural deposits.
Berdy et al. 2002	Proposed Nanakuli Kokua Ohana Center (current subject property)	8-9-002:001	Inventory Survey with Subsurface Testing	Identified the two previously recorded sites above (5946 and 5947) and extended the boundaries of Site 5946.
Yorck & Hammatt 2003	Proposed Nanakuli IV Elementary Site (former location of Camp Andrews)	8-9-002:065	Monitoring	No cultural properties were identified.

Table 2. (cont.)

Author and Year	Location	TMK	Type of Study	Findings
Whitehead & Cleghorn 2003	Nanakuli Water System Improvements, Nānākuli Ave.	8-9-005	Monitoring	No archaeological features or sites were reported, although a possible cultural layer consisting of charcoal flecking and single piece of marine shell was recorded.
Cordy & Hammatt 2005	Ka Waihona O Ka Na‘auau Public Charter School	8-9-001:004	Monitoring	No cultural properties were identified.
Jones & Hammatt 2005	Dept. of Hawaiian Homelands Subdivision	Multiple	Monitoring	No cultural properties were identified.
LeSuer & Cleghorn 2005	Nānākuli Beach Park	8-9-006:001	Monitoring	No cultural properties were identified.
Ostroff & Desilets 2005	Farrington Highway	Multiple	Monitoring	Recorded five charcoal deposits, one of which may have been associated with Site 50-80-07-6671 in Lualualei.
Souza & Hammatt 2006	Farrington Highway	8-9-005:007, 8-7-006:013	Monitoring	No cultural properties were identified.
Stein & Hammatt 2006	Nānākuli Beach Park	8-9-001:002	Monitoring	No cultural properties were identified.
Yucha & Hammatt 2008	Nānākuli Beach Park	8-9-001:002	Monitoring	No cultural properties were identified.
Moore et al. 2009	Boys & Girls Club of Hawaii, Nanakuli Youth Education Town (YET)	8-9-002:067	Monitoring Report	Two surface scatters encountered, consisting of basalt flakes, a coral abrader, and midden.
Altizer et al. 2011	Farrington Highway	Multiple	Archaeological Field Inspection and Literature Review	Identified three cultural resources: a section of OR&L Railroad; an historic section of Farrington Highway; and previously recorded subsurface charcoal deposits.

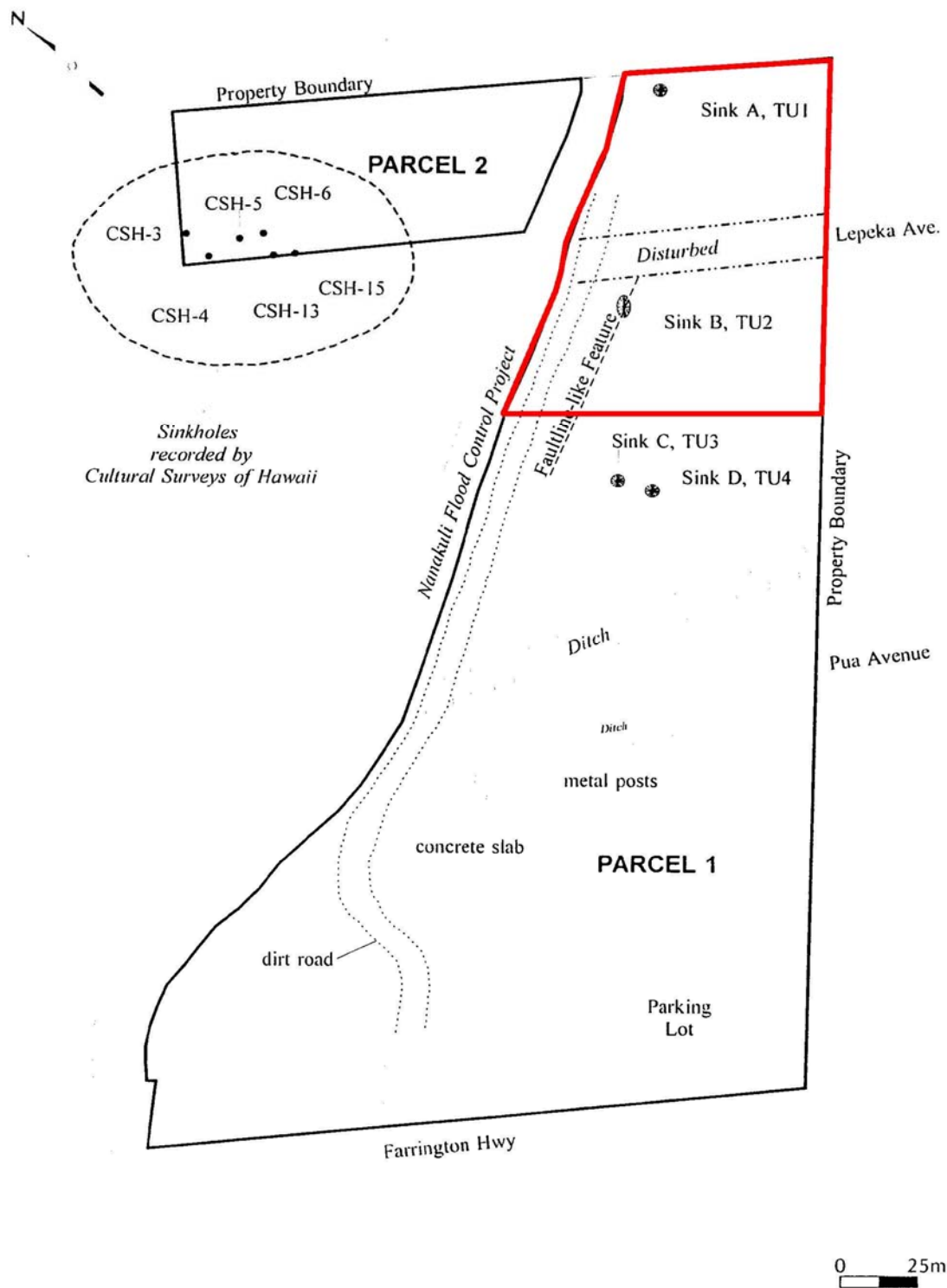


Figure 10. Findings of previous archaeological inventory survey on the subject property (adopted from Berdy et al. 2002:6). Approximate boundaries of the current project area are outlined in red.

An archaeological inventory survey of the subject property identified portions of the two sites mentioned above (SIHP 50-80-07-5046 and -5947) (Berdy 2002) although neither site occurs within the current project area, which includes only 1.9 acres of the parcel. The boundaries were extended for Site 5046, the remains of Camp Andrews. They now include a concrete pad and fence line in the *makai* portion of TMK: (1) 8-9-002:001. Although several sinkholes were identified on the parcel, only Sink A and B were located within the current area of study (Figure 10). Sink A contained cultural material although it is unclear exactly what was found. Berdy et al. report only the following:

Only one of the sinks, Sink A, contained significant historic materials and palaeontological materials but not in sufficient quantities, nor were the materials significant enough to alter the existing boundary of the site [Site 5947]. (Berdy et al. 2002:21)

Sink B was later determined to only be a shallow depression and not a true sink. Archaeological monitoring was recommended (reported herein), and a monitoring plan was written (Chaffee and Dega 2009).

Three archaeological monitoring projects were conducted along Farrington Highway, *makai* of the subject property. In 2005, five charcoal deposits were found during monitoring, but none were given SIHP site numbers (Ostroff and Desilets 2005). The closest deposit to the current project area was near Ulehawa Beach Park in Lualualei. A year later, archaeological monitoring conducted for fiber optic installation along much of the same route produced no cultural material or deposits (Souza and Hammatt 2006). A literature review and field inspection were completed for a portion of the same highway corridor (Altizer et al. 2011). Three cultural resources were identified, including a portion of the old O.R.&L. railroad track (SIHP 50-80-12-9714); an historic section of Farrington Highway (SIHP 50-80-7-6824); and the subsurface deposits previously recorded by Ostroff and Desilets (2005).

Other work in the vicinity of the project area did not produce any significant finds (see Table 2 and Figure 10). These include an archaeological survey and assessment (McDermott and Hammatt 1999), monitoring (Whitehead and Cleghorn 2003, Cordy and Hammatt 2005, LeSuer and Cleghorn 2005), and subsurface testing (Ogden 1995).

Summary of Environmental and Cultural Background

Nānākuli is an *ahupua'a* of the Wai'anae *moku* on the western coast of O'ahu. It is made up of an upper and lower valley with tributaries originating from the mountain tops that descend and meet to form Nānākuli Stream. The valley receives low amounts of rainfall, therefore traditional agriculture consisted of sweet potato and other dryland crops, and fishing was a main form of subsistence.

Pre-contact Wai'anae appears to have been a well-populated *moku* and a ruling center for O'ahu in the early to mid-1500s (Cordy 2002). There were three gods that lived on top of Mount Ka'ala in the Wai'anae mountains, and '*ōlelo no'eau* describe the goddess Kaiona who helped people who were lost in the mountains. Fishing and the coconut grove of Pōkā'i also appear often in *mo'olelo*.

The best descriptions of Nānākuli, however, come from John Papa 'Ī'i, who published a series of articles in *Ka Nupepa Ku'oko'a* in the 1800s about his travels there. He paints a picture of a community who spent much of their time fishing. While Nānākuli was not as populated as the other *ahupua'a* in Wai'anae, it was a permanent residence for a small community until the mid to late 1800s.

In the early 1800s, during the height of the sandalwood trade, the traditional way of life changed, and population declined. There were no LCA awards given in Nānākuli. The land in Nānākuli,

owned by the king, was leased out to ranchers. Much of the ranching has disturbed historic sites and, in at least one case, used historic site walls as cattle pens.

The later historic period saw continued growth of Nānākuli. The Waianae Sugar Plantation was founded in 1878, and the O.R.&L. railroad passed through Nānākuli along the coast. In 1917, a portion of land was set aside for a U.S. military reservation which was turned into Camp Andrews in 1941. After the passage of the 1920 Hawaiian Homes Commission Act, the Nānākuli Hawaiian Homestead subdivision was established, though the dearth of water continued to be a problem in the region.

Settlement Patterns and Anticipated Finds

Settlement patterns in Nānākuli were likely similar to the rest of the Wai‘anae District (e.g., Cordy 2002). Initial settlement probably began with small groups of people living near the coast to take advantage of the abundant marine resources. The population then spread farther inland behind the coastal dunes and along the coastal trail which is roughly the route of today’s Farrington Highway. Finally, the back valley areas were settled as people began to utilize more agriculturally productive zones. Archaeological evidence has shown that the upper valley currently hosts many house sites and dryland agricultural terraces. Early descriptions of Nānākuli depict a barren land with few houses and an area that lacks water and agricultural resources. However, the land may have appeared desolate from the coast because many of the people lived in the upper valley, and this was not visible from the shore.

Based on the project area’s ranching history, previous archaeological work within the same area, and the proximity of Camp Andrews, anticipated finds include sinkholes and historic military or ranching remnants. An archaeological inventory survey within the project area identified one sinkhole that contained small quantities of historic material and paleontological remains. Sinkholes nearby have housed human burials, traditional Hawaiian artifacts, and midden as well, and it is possible that these might be found during excavation. Surface remains of Camp Andrews also occur nearby, and it is likely that historic artifacts associated with the camp are located on the property. These may take the form of bottles, ceramics, and other such items typically found at historic-era sites in Hawai‘i.

METHODS

Archaeological monitoring was conducted between May 20, 2013, and November 1, 2013, by Jeffrey Lapinad or Robin Kapoi-Keli'i, BA. The archaeological monitor was on site full time for all ground disturbing activity during this period, for 81 full days and 7 half days of monitoring. Windy McElroy, PhD, served as Principal Investigator, conducting one site visit during the monitoring and overseeing all aspects of the project.

Archaeological monitoring was guided by a SHPD-approved monitoring plan (Chaffee and Dega 2009) although Keala Pono Archaeological Consulting was not called to begin monitoring until May 20, 2013, approximately four months after construction began. Approximately 20% of the construction work had been completed by this time, without an archaeological monitor. The surface at Buildings 3 and 4 was lowered and material was pushed to the Building 1 and 2 area (see Figure 13 for the location of the newly constructed buildings). As Sinkhole A was located in the north corner of the property (see Figure 10), it is believed that it was removed during this initial period of un-monitored excavation.

On the first day of work, archaeological monitor, Jeffrey Lapinad, attended a meeting with the contractor, and Principal Investigator, Windy McElroy, participated by phone. Strategies were discussed for gathering data for the excavations that had been completed beforehand. This included reviewing photos of previous excavations and digging test trenches in previously excavated areas to determine the nature of stratigraphy there. Lapinad and McElroy were provided a series of photographs depicting the ground disturbance that had already taken place and found nothing of concern, as it appeared that only solid coral and fill had been excavated (Figure 11). The previously recorded sinkholes were not visible in any of the photos.

On May 20, 2013, before the start of the first work day, the archaeological monitor met with the construction team to discuss the monitoring plan to ensure that they understood the purpose of the monitoring and that the monitor has the authority to halt construction activity. Ground disturbing work included trenching, grading, and backfilling. This was accomplished with backhoes, excavators, mini excavators, trenching machines, loaders, and bobcats (Figure 12).

Representative profiles were drawn and photographed. Sediments were described using Munsell Soil Color Charts and a sediment texture flow chart (Thien 1979). The scale in all field photographs is marked in 10 cm increments. The north arrow on all maps points to magnetic north. Throughout this report rock sizes follow the conventions outlined in *Field Book for Describing and Sampling Soils*: Gravel <7 cm; Cobble 7–25 cm; Stone 25–60 cm; Boulder >60 cm (Schoeneberger et al. 2002:2-35). Collected materials are temporarily being curated at the Keala Pono office in Kāne'ohe until they can be returned to the land owner.

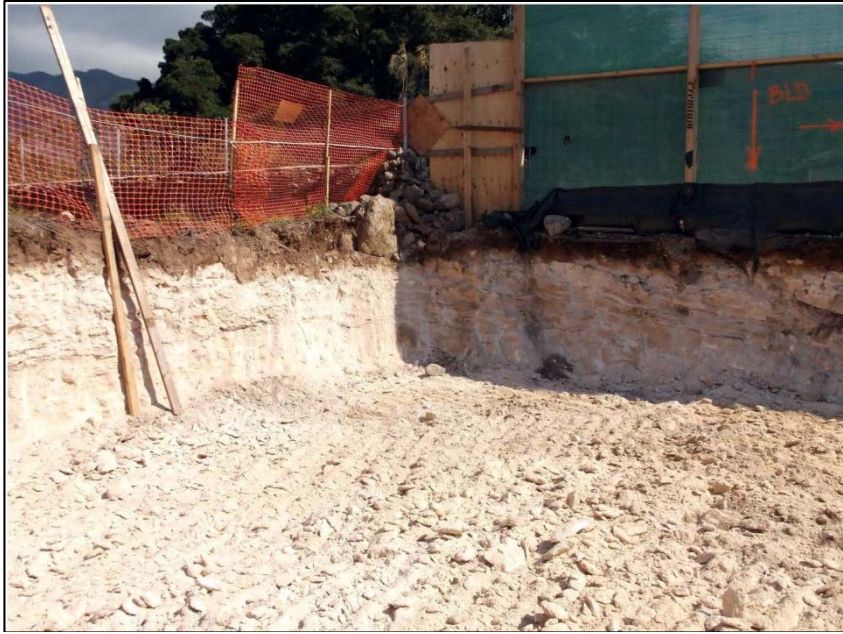


Figure 11. Example of a photo provided to Keala Pono showing areas excavated before archaeological monitoring began. This is the north corner of the parcel.



Figure 12. Example of equipment used on the construction site. Two backhoes are shown.

RESULTS

Archaeological monitoring was conducted between May 20, 2013, and November 1, 2013. A total of four profiles were drawn in various locations within the 1.9-acre project area; together, they characterize the stratigraphy over the parcel (Figure 13). Stratigraphy generally consisted of solid coral in the east half of the property and various layers of fill throughout the west half of the parcel (Table 3). Glass bottles, marbles, a metal nail, and 'opihi shells were recovered from the excavations or from the surface.

Stratigraphy

Profile 1 was taken on the west end of the property. The trench was excavated to 122 cmbs (cm below surface), and stratigraphy consisted of three layers of fill with abundant coral cobbles and gravel (Figure 14).

Profile 2 was drawn on the southeast side of the parcel, near Lepeka Avenue. The trench was excavated to 36 cmbs, and four layers were encountered, consisting of the modern road, road base, and two layers of fill (Figure 15). The fill was rich in coral and basalt gravel and contained asphalt fragments and modern debris.

Profile 3 was taken on the east end of the parcel where excavations reached 147 cmbs. The substrate consisted of a solid layer of coral containing a narrow horizontal fissure filled with sandy loam (Figure 16).

Profile 4 was drawn on the north side of the property. The trench was excavated to 92 cmbs, and stratigraphy consisted of six layers of fill (Figure 17). Coral cobbles and gravel were abundant in the upper fill layers.

Cultural Material

The artifact assemblage consists of five ceramic fragments, three marbles, nine whole bottles, one bottle base fragment, a nail, and four 'opihi shells, all found on the *makai* (southwest) side of the parcel. Table 4 provides data for each artifact, and Figure 18 shows their horizontal provenience on the property. The items are discussed below.

Five ceramic fragments were found on the surface in the vicinity of Buildings 1 and 2 (see Figure 13 for the location of the buildings). These buildings were newly constructed during the project and are not associated with the ceramics. Of the five ceramic pieces, three are plain white and two have a blue on white design (Figure 19). They date to the late-19th to early-20th centuries.

Three marbles were recovered in various areas on the parcel. The first (Figure 20, left) was found near Lepeka Avenue at 50 cmbs. It is clear with a blue cat's eye. The second (Figure 20, center), a small white marble, was collected from the surface of the center parking lot. The third (Figure 20, right) is a clear marble that was found on the surface between Buildings 1 and 2. The three marbles are all machine made and manufactured after 1926, as they have no cut-off marks. Machine made marbles were produced with hundreds of varieties and may be dated fairly precisely, but that is beyond the scope of the present study.

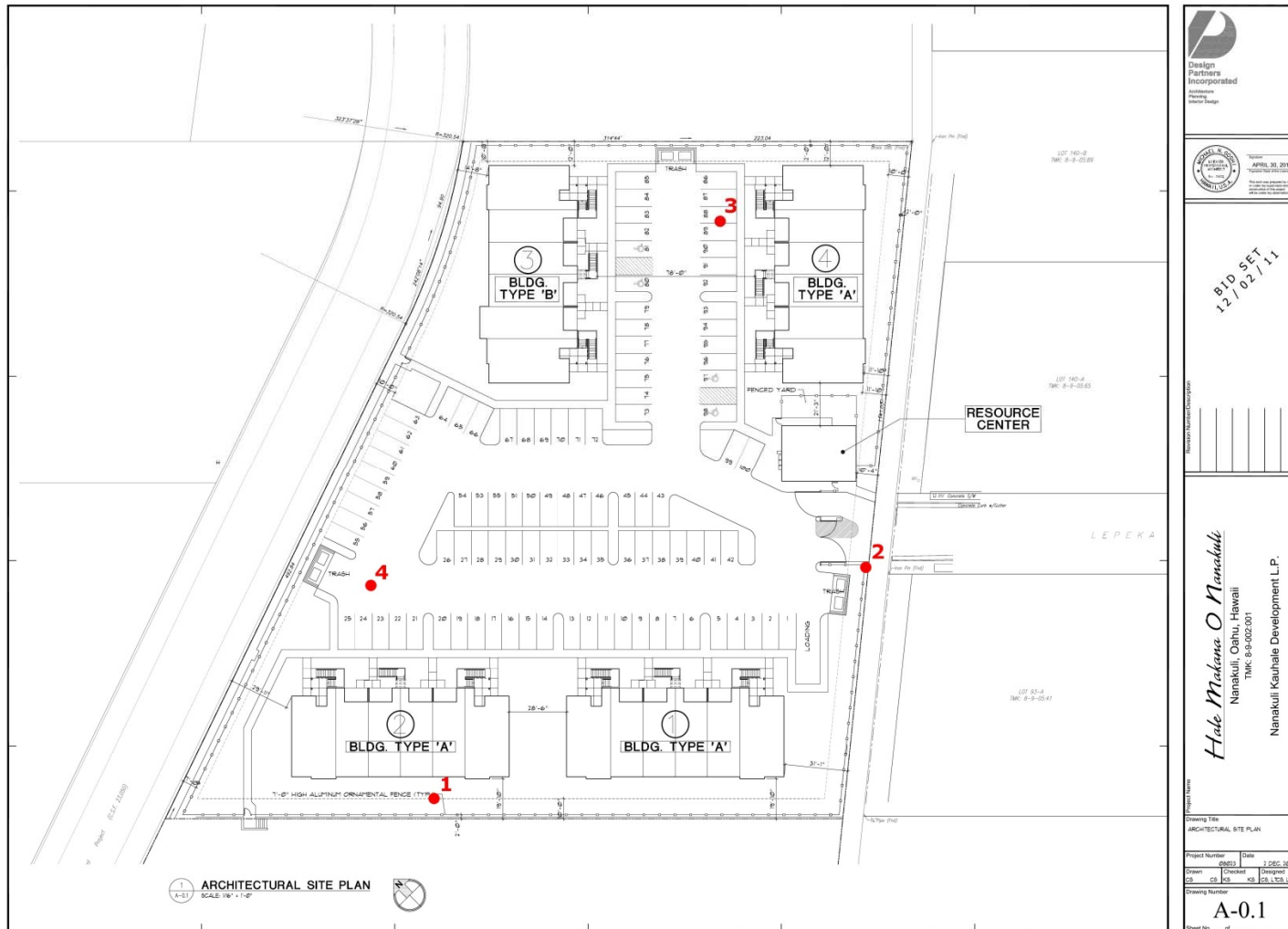


Figure 13. Location of Profiles 1–4 within TMK: (1) 8-9-002:001 (in red). The building designations are shown as circled numbers.

Table 3. Sediment Descriptions

Location	Layer	Depth (cmbs)	Color	Description	Interpretation
1	I	0-70	10YR 6/3	Sandy loam; 40% coral cobbles and gravel; smooth, very abrupt boundary.	Fill
	II	70-83	10YR 3/3	Sandy loam; 30% coral cobbles and gravel; smooth, very abrupt boundary.	Fill
	III	83-122+	7.5YR 3/2	Sandy loam; 40% coral cobbles and gravel; base of excavation.	Fill
2	I	0-7	N/A	Asphalt; smooth, very abrupt boundary.	Road
	II	7-12	10YR 5/3	Sandy loam; 80% coral and basalt gravel; smooth, very abrupt boundary.	Road Base
	III	12-23	10YR 5/1	Sandy loam; 65% coral and basalt gravel and asphalt fragments; smooth, very abrupt boundary.	Fill
	IV	23-36+	10YR 6/3	Sandy loam; 40% coral and basalt gravel; modern debris; base of excavation.	Fill
3	I	0-91	10YR 8/1	Solid coral; smooth, very abrupt boundary.	Coral Shelf
	II	91-107	10YR 5/4	Sandy loam; 10% coral gravel; smooth, very abrupt boundary.	Natural Accumulation of Sediment within Fissure of Coral Shelf
	III	107-147+	10YR 8/3	Solid coral; base of excavation.	Coral Shelf
4	I	0-47	10YR 4/3	Sandy clay loam; 30% coral cobbles and gravel; smooth, very abrupt boundary.	Fill
	II	47-54	10YR 6/3	Sandy loam; 30% coral cobbles and gravel; smooth, very abrupt boundary.	Fill
	III	54-67	10YR 5/6	Sandy loam; 30% coral cobbles and gravel; smooth, very abrupt boundary.	Fill
	IV	67-77	10YR 7/3	Sandy loam; 40% coral cobbles and gravel; smooth, very abrupt boundary.	Fill
	V	77-87	10YR 4/6	Sandy clay loam; 20% coral cobbles and gravel; smooth, abrupt boundary.	Fill
	VI	87-92+	10YR 7/4	Sandy loam; 2% coral cobbles and gravel; base of excavation.	Fill

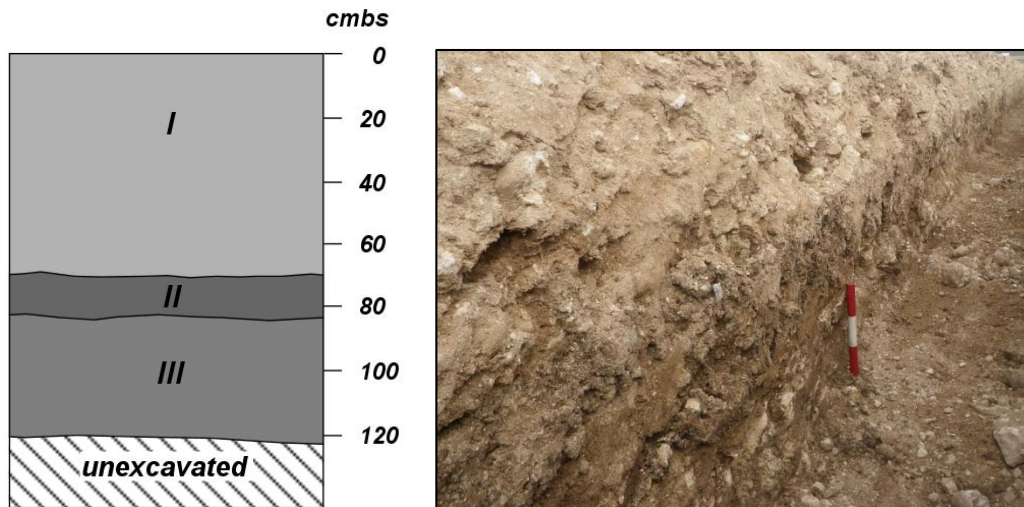


Figure 14. Profile 1, south face profile drawing and photo.

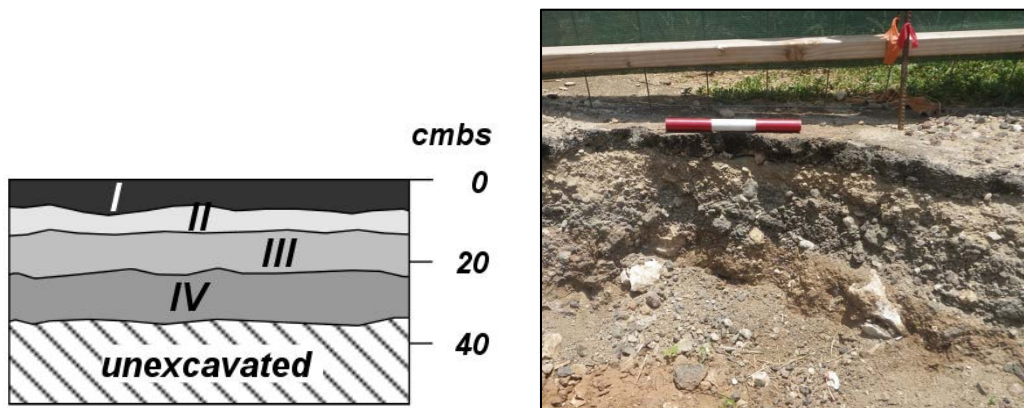


Figure 15. Profile 2, southeast face profile drawing and photo.

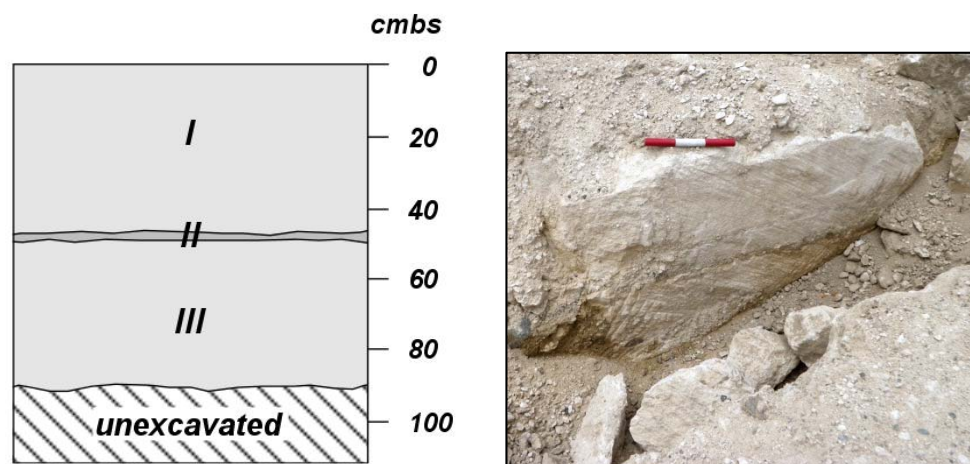


Figure 16. Profile 3, northeast face profile drawing and photo.

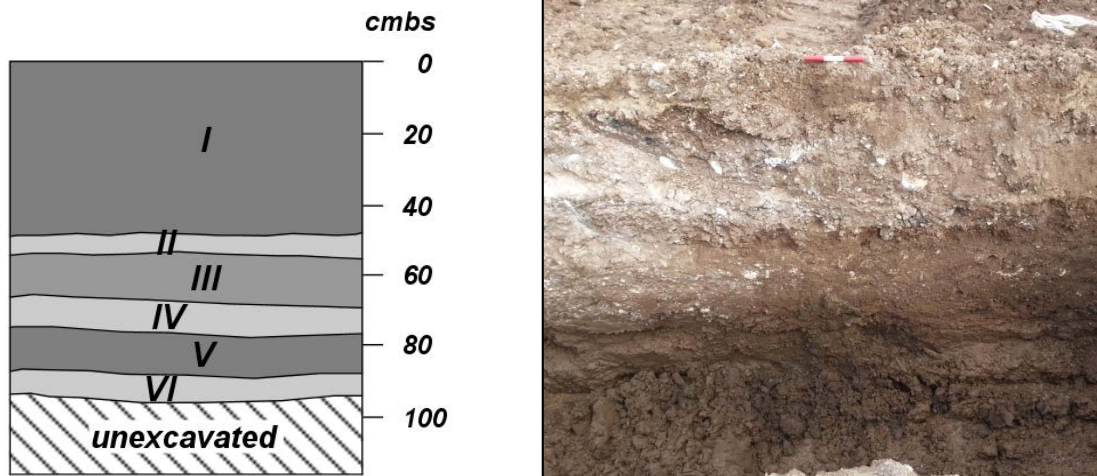


Figure 17. Profile 4, east face profile drawing and photo.

The ten bottles were all found near Lepeka Avenue from 40–50 cmbs. Of the ten bottles, most date to the 1960s (see Table 4). Coca-Cola bottles are the most common, with five of these recovered. The other half of the bottle assemblage includes four other soda bottles and one medicine bottle. The bottles are described in detail below.

Bottle 7a (Figure 21, left) is a hobble skirt Coca-Cola bottle of the applied color label (ACL) variety with all of the original paint missing. Embossing on the skirt reads “67-23,” indicating a manufacture date of 1967 and mold code 23 (cf. Lockhart 2010). Also embossed are “REG U.S. PAT OFF,” and “CONTENTS 6 ½ FL. OZS.”

Bottle 7b (Figure 21, second from left) is a hobble skirt Coca-Cola bottle with “return for deposit,” “Trade-mark ®,” and “6 ½ FL.OZ.” labels. “74 6” is embossed on the skirt, indicating a manufacture date of 1974. In addition, “LOGAN UTAH,” “TRADE MARK BOTTLE,” and “LA” are embossed on the base. Also on the base is an embossed “I” within an “O,” the designation for the Owens-Illinois Glass Co. after 1959 (SHA 2013).

Bottle 7c (Figure 21, third from left) is a hobble skirt Coca-Cola bottle with a capacity of 6 ½ fluid ounces and exhibiting a combination of embossing and painted labeling. The painted label shows the words “Coca-Cola” in white cursive script twice on the body of the bottle. The embossing is identical to that of Bottle 7a, except that the numbers read “67-10,” indicating a manufacture date of 1967 and a different mold code from Bottle 7a (cf. Lockhart 2010).

Bottle 7d (Figure 21, third from right) is a hobble skirt Coca-Cola bottle that appears to be the 10 fluid ounce variety of ACL bottle that has lost its painted label. Embossed on the skirt is “69-06,” indicating a manufacture date of 1969.

Bottle 7e (Figure 21, second from right) bears the label “Bottled By OK BEVERAGE CO., LTD. Honolulu, Hawaii” on one side and “OK Beverages NET CONTENTS 10 FLUID OUNCES” on the other. The OK logo is on both sides of the neck. “NET CONT. 10 OZ.,” “Y806-G,” “20,” “65” and “2E” are embossed on the base, probably indicating manufacture in 1965. It also exhibits an embossed “I” within an “O” on the base, the designation for the Owens-Illinois Glass Co. after 1959 (SHA 2013). This bottle was clearly in use sometime after Hawai‘i became a state in 1959 since prior to statehood, bottles carried the designation “T.H.” for “Territory of Hawaii.”

Table 4. Data for Cultural Material Found During Monitoring

Bag	Artifact	Provenience	Measurements (cm)	Details	Possible Age/Use
1a	Ceramic Fragment	Building 1, Surface	4.3 Long x 3.5 Wide	White	Undetermined
1b	Ceramic Fragment	Building 1, Surface	1.7 Long x .8 Wide	Blue on White	Undetermined
2	Ceramic Fragment	Building 2, Surface	1.8 Long x 1.2 Wide	White	Undetermined
3a	Ceramic Fragment	Building 1, Surface	.9 Long x .8 Wide	Blue on White	Undetermined
3b	Ceramic Fragment	Building 1, Surface	1.9 Long x 1.7 Wide	White	Undetermined
4	Marble	Lepeka Ave., 50 cmbs	1.5 Diameter	Clear with Blue Cat's Eye	Post-1926; Game Piece
5	Marble	Center Parking Lot, Surface	1.3 Diameter	White	Post-1926; Game Piece
6	Marble	Between Buildings 1 and 2, Surface	1.5 Diameter	Clear	Post-1926; Game Piece
7a	Bottle: Coca Cola	Lepeka Ave., 40 cmbs	19.7 Tall x 5.6 Wide at Base	Green	1967; Soda
7b	Bottle: Coca Cola	Lepeka Ave., 40 cmbs	19.5 Tall x 5.5 Wide at Base	Green	1974; Soda
7c	Bottle: Coca Cola	Lepeka Ave., 40 cmbs	9.5 Tall x 5.5 Wide at Base	Green	1967; Soda
7d	Bottle: Coca Cola	Lepeka Ave., 40 cmbs	24.5 Tall x 6.3 Wide at Base	Green	1969; Soda
7e	Bottle: OK	Lepeka Ave., 40 cmbs	23.5 Tall x 5.4 Wide at Base	Clear	1965; Soda
7f	Bottle Fragment: Kist	Lepeka Ave., 40 cmbs	11.3 Tall x 5.5 Wide at Base	Clear	1967; Soda
7g	Nail	Lepeka Ave., 40 cmbs	9.5 Long x 1.1 at Head	Rusty, Rectangular Head	Undetermined
8	Bottle: Bayer Aspirin	Lepeka Ave., 50 cmbs	6.4 Tall, 2.9 Wide at Base	Clear	1935–1950; Medicine
9	'Opihi Shells	Lepeka Ave., 10 cmbs	7.6, 6.6, 6.6, and 6.2 Long	4 Shells, Unworked	Possibly Modern; Food
10a	Bottle: TaB	Lepeka Ave., 50 cmbs	24.5 Tall x 5.5 wide at Base	Clear	Post-1963; Soda
10b	Bottle: Coca Cola	Lepeka Ave., 50 cmbs	24.4 Tall x 6.3 Wide at Base	Green	1962; Soda
10c	Bottle: Canada Dry	Lepeka Ave., 50 cmbs	20.2 Tall x 5.5 Wide at Base	Clear	1960; Soda

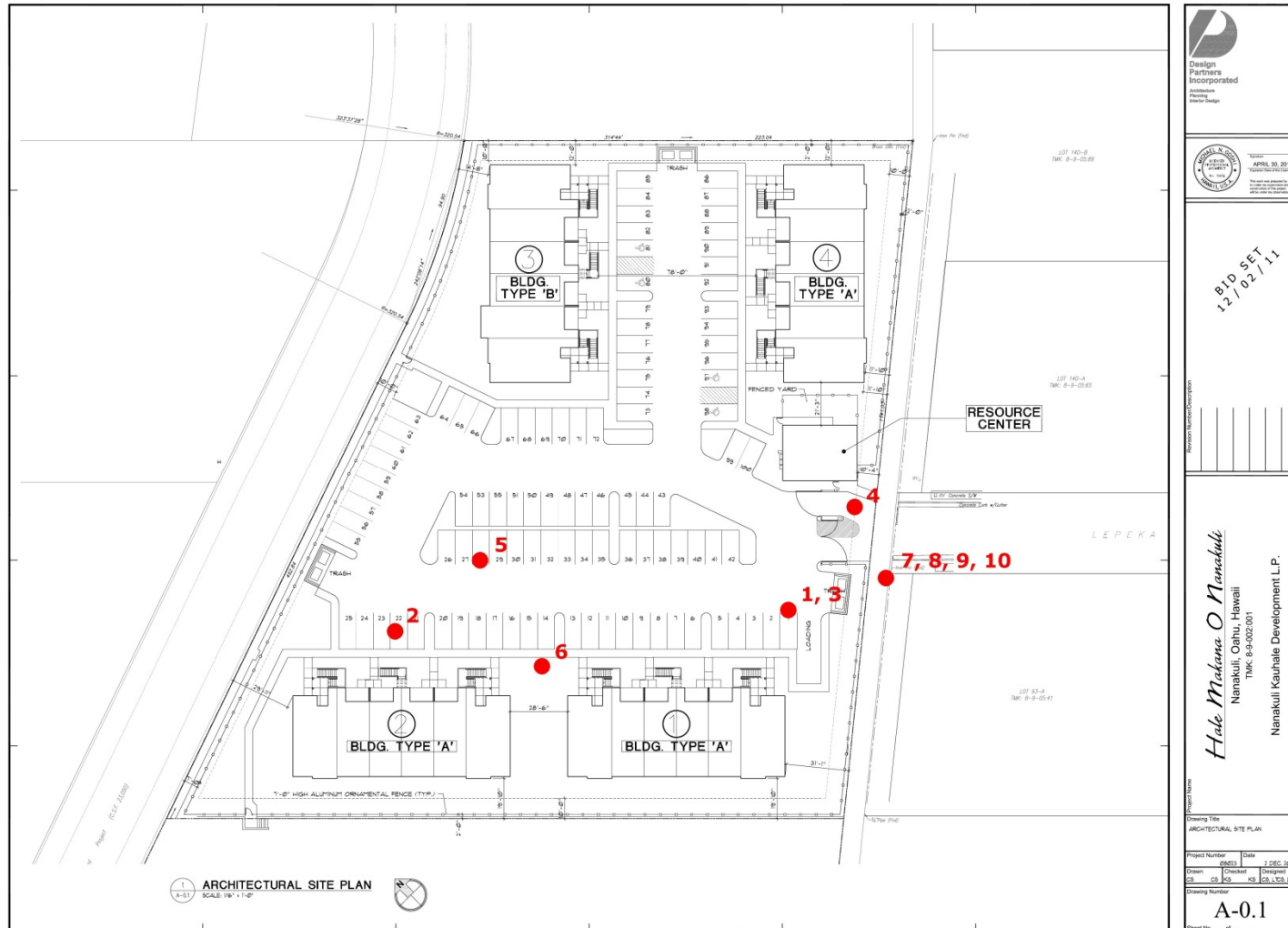


Figure 18. Location of artifacts found during monitoring. Red numbers indicate the artifact bag numbers, as shown in Table 4.



Figure 19. Ceramic fragments, left to right: Bag 1a, 1b, 2, 3a, 3b.

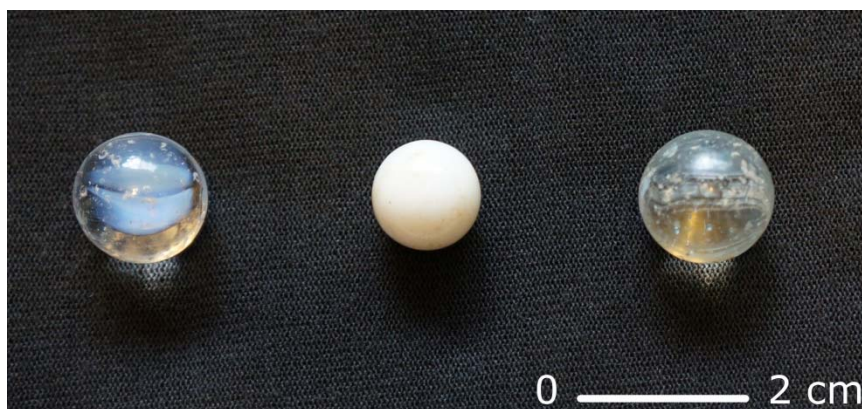


Figure 20. Marbles, left to right: Bag 4, 5, 6.

Bottle 7f (Figure 21, right) is a fragmentary base from an ACL Kist Beverages bottle. “18312-C,” “23,” and “67” are embossed on the base, possibly indicating a date of 1967. Also on the base is an embossed “I” within an “O,” the designation for the Owens-Illinois Glass Co. after 1959 (SHA 2013). The Kist beverage is described by Ted (2013):

Citrus Products Company was founded in 1919 in Chicago, Illinois. Two of their products, Kist and Chocolate Solder, are familiar brands of The Citrus Company.

Like most soft drink companies, they experimented with different flavors to try and find their niche in the market. Kist was bottled in a wide range of flavors like orange, ginger ale, lemon and grape, and became very popular. They also offered a complete range of bottle sizes including seven ounce, ten ounce and twelve ounce, and also two family sizes.

By 1958 Kist was being bottled by franchised bottlers in every state. (Ted 2013)

Bottle 8 (Figure 22) is a Bayer aspirin bottle that was likely produced sometime between 1935 and 1950 as evidenced by photographs on the Bayer website (Bayer 2013). The 1935 photograph from the website depicts a clear ovoid bottle with embossed words on both shoulders, while the 1950 bottle was amber and round.

Bottle 10a (Figure 23, left) is a TaB ACL soda bottle with embossing. The yellow label reads “TaB TRADE-MARK ® 10 FL. OZ.” “A PRODUCT OF THE COCA-COLA COMPANY,” and there is a star decoration in yellow on the skirt. It exhibits an embossed “I” within an “O” on the base, the designation for the Owens-Illinois Glass Co. after 1959 (SHA 2013), although the bottle dates to after 1963:

In 1963, The Fanta Beverage Company was a separate but wholly owned subsidiary of The Coca-Cola Company. The Fanta Beverage Company handled the marketing for Fanta and Sprite, and TaB was added to its list of products. McCann-Marschalk developed the brand's initial marketing campaign and focused on the dual theme of full flavor and low calorie. The initial ads touted a product “Brimming with flavor” and with “One calorie in a 6-oz serving.”

The test in Springfield was a success, so plans were made to roll out the product nationwide in May 1963, right on schedule. By 1964, TaB was available in more than 90 percent of the country, and by the middle of the decade, TaB was the No. 1 diet drink on the market -- a position it maintained until Diet Coke was introduced in 1982. (Ryan 2013)

Bottle 10b (Figure 23, center) is an ACL Coca-Cola bottle used sometime after 1962 when embossing was eliminated from Coca-Cola bottles. White lettering reads “Coke TRADE-MARK®,” “Coca Cola” twice in script on either side, and “CONTENTS.” Embossed on the skirt are the numbers “62-10,” indicating manufacture in 1962.

Bottle 10c (Figure 23, right) is an ACL bottle with remnants of a red on white label reading “WORLD FAMOUS” and “CANADA DRY BEVERAGES” on the skirt. Embossed on the base are “Duraglas” in script, “2902-G”, “20”, “I” in an “O”, “60”, and “AV.” This likely indicates manufacture in 1960 by the Owens-Illinois Glass Co., which changed their symbol to the “I” within an “O” in 1959 (SHA 2013). “20” may refer to the plant number for Oakland, California.

A rusty nail (Figure 24) was recovered from 40 cmbs near Lepeka Avenue. The nail is rectangular in cross-section and has a rectangular head. The rusty condition of the nail precludes further identification. However the nail likely dates to the twentieth century as it was found with bottles that were manufactured during this time.

Four large *‘opihi* shells (Figure 25) were found near Lepeka Avenue, just below the surface. The shells are unworked and were almost certainly used for food. Their stratigraphically superior position in relation to the historic bottles indicates that they were not deposited in the pre-contact era. *‘opihi* is a prized food item that continues to be popular today, and the shells are probably the remains of a relatively recent meal.



Figure 21. Bottles, left to right: Bag 7a, 7b, 7c, 7d, 7e, 7f.



Figure 22. Bayer aspirin bottle, Bag 8.



Figure 23. Glass bottles, left to right: Bag 10a, 10b, 10c.



Figure 24. Metal nail, Bag 7g.



Figure 25. 'opihi shells, Bag 9.

Summary of Results

In sum, stratigraphy at TMK: (1) 8-9-002:001 (por.) consisted of solid coral in the east half of the property with layers of fill on the west half of the parcel. Cultural material was found only on the west half of the property, within the fill and on the surface. This consisted of modern 'opihi shells, as well as historic items, such as ceramics, marbles, bottles, and a nail. Many of the bottles bore diagnostic characteristics or labels, and most dated to the 1960s. One bottle, a Bayer aspirin container, may date to an earlier time, possibly manufactured from 1935–1950. As all of the bottles, the nail, and one of the marbles (Bag 4) were found within the same fill deposit, it can be surmised that these items were all deposited in the 20th century. The ceramics and other marbles were found on the surface and likely post-date the other materials. With the exception of the Bayer Aspirin bottle, none of the materials are likely to be associated with the nearby Camp Andrews, which was in use prior to and during World War II (pre-1945).

CONCLUSION AND RECOMMENDATIONS

Approximately five months of archaeological monitoring was conducted for the construction of Hale Makana o Nānākuli, a low-income rental complex at TMK: (1) 8-9-002:001 (por.) in Nānākuli Ahupua‘a, Wai‘anae District, on O‘ahu. Work took place on 1.9 acres on the east side of the parcel and included trenching, grading, and backfilling. Archaeological monitoring was conducted for all ground disturbance after May 20, 2013, as Keala Pono Archaeological Consulting was contacted approximately four months after the undertaking began. Because of this oversight, photographs of previous excavations were reviewed, and it appeared that only solid coral and fill had been excavated. This is in agreement with observations from the five months of monitoring, in which only solid coral and fill were encountered.

No cultural deposits were identified during monitoring, and the coral bedrock was located on the east side of the parcel and fill on the west. Several historic artifacts were collected, including five ceramic fragments, three marbles, nine whole bottles, one bottle base fragment, a nail, and four ‘opihi shells, all recovered from the west side of the parcel. They were found either on the surface or within layers of fill. Many of the bottles bore diagnostic characteristics or labels, and most dated to the 1960s, except for a Bayer aspirin bottle, which may have been manufactured between 1935 and 1950.

Previous archaeological studies in the immediate vicinity of the project area have identified both historic and traditional sites, including sinkholes containing artifacts and human burials, and the remnants of World War II-era Camp Andrews. Because of these findings, it is recommended that archaeological monitoring is conducted for any future work on or nearby TMK: (1) 8-9-002:001.

GLOSSARY

<i>ahupua‘a</i>	Traditional Hawaiian land division usually extending from the uplands to the sea.
<i>‘āina</i>	Land.
<i>‘āpana</i>	Piece, slice, section, part, land segment, lot, district.
boulder	Rock 60 cm and greater.
cobble	Rock fragment ranging from 7 cm to less than 25 cm.
gravel	Rock fragment less than 7 cm.
<i>heiau</i>	Place of worship and ritual in traditional Hawai‘i.
<i>‘ili</i>	Land division, next in importance to <i>ahupua‘a</i> and usually a subdivision of an <i>ahupua‘a</i> .
<i>inoa</i>	Name, title, or namesake.
<i>kiawe</i>	The algaroba tree, <i>Prosopis</i> sp., a legume from tropical America, first planted in 1828 in Hawai‘i.
<i>kula</i>	Plain, field, open country, pasture, land with no water rights.
<i>kuleana</i>	Right, title, property, portion, responsibility, jurisdiction, authority, interest, claim, ownership.
Māhele	The 1848 division of land.
<i>makai</i>	Toward the sea.
<i>mauka</i>	Inland, upland, toward the mountain.
<i>mele</i>	Song, chant, or poem.
midden	A heap or stratum of refuse normally found on the site of an ancient settlement. In Hawai‘i, the term generally refers to food remains, whether or not they appear as a heap or stratum.
<i>moku</i>	District, island.
<i>mo‘olelo</i>	A story, myth, history, tradition, legend, or record.
<i>muliwai</i>	River mouth, estuary, or pool near the mouth of a stream, enlarged by ocean water left there at high tide.
<i>‘ōlelo no‘eau</i>	Proverb, wise saying, traditional saying.
<i>oli</i>	Chant.

<i>‘opihi</i>	Limpets, four types of which are endemic to Hawai‘i: <i>Cellana exarata</i> (<i>‘opihi makaiauli</i>), <i>C. sandwicensis</i> (<i>‘opihi alinalina</i>), <i>C. talcosa</i> (<i>‘opihi ko‘ele</i>), and <i>C. melanostoma</i> (no Hawaiian name). <i>‘Opihi</i> are a prized food in Hawai‘i and considered a rare treat today.
pre-contact	Prior to A.D. 1778 and the first written records of the Hawaiian Islands made by Captain James Cook and his crew.
<i>pu‘u</i>	Hill, mound, peak.
stone	Rock fragment ranging from 25 cm to less than 60 cm.
<i>‘uala</i>	The sweet potato, or <i>Ipomoea batatas</i> , a Polynesian introduction.
<i>‘ulu</i>	The Polynesian-introduced tree <i>Artocarpus altilis</i> , or breadfruit.
<i>wauke</i>	The paper mulberry, or <i>Broussonetia papyrifera</i> , which was made into tapa cloth in traditional Hawai‘i.

REFERENCES

- Allen, G.
1999 *Hawaii's War Years 1941–1945*. University of Hawaii Press, Honolulu.
- Altizer, K., M. McDermott, and H.H. Hammatt
2011 *Archaeological Field Inspection and Literature Review for the Farrington Highway Intersection Improvements at Nānākuli Avenue and Haleakalā Avenue, Nānākuli and Lualualei Ahupuaʻa, Waiʻanae District, Oʻahu Island, Multiple TMKs*. Cultural Surveys Hawaii, Kailua, Hawaiʻi.
- Bayer
2012 *Historical Photos*. <http://stage.wonderdrug.com/historical_photos.html> Accessed 12/15/13.
- Berdy, C., M. Elmore, and J. Kennedy
2002 *An Archaeological Inventory Survey with Subsurface Testing Report for the Property Located at TMK: 8-9-002:001 in Nanakuli Ahupuaʻa, Waiʻanae District, Island of Oʻahu*. Archaeological Consultants of the Pacific, Inc., Haleʻiwa, Hawaiʻi.
- Bowser, G.
1881 *Hawaiian kingdom statistical and commercial directory and tourists' guide 1880/1881*. Honolulu.
- Chaffee, D.B. and M.F. Dega
2009 *An Archaeological Monitoring Plan for the Hale Makana O Nanakuli Project in Nanakuli Ahupuaʻa, Waiʻanae District, Island of Oʻahu, Hawaiʻi [TMK: (1) 8-9-02:01]*. Scientific Consultant Services, Inc., Honolulu.
- Clark, J.
1977 *Beaches of Oʻahu*. University of Hawaiʻi Press, Honolulu.
- Cordy, D.L. and H.H. Hammatt
2005 *Archaeological Monitoring Report for the Installation of Fiber Optic Cable at Ka Waihona O Ka Naʻauau Public Charter School, Nānākui Ahupuaʻa, Waiʻanae, Oʻahu TMK: 1-8-9-001:004*. Cultural Surveys Hawaii, Kailua, Hawaiʻi.
- Cordy, R.
1997 *Learning about Nanakuli's Past: the 1988–1991 Archaeological Survey of Nanakuli*. State Historic Preservation Division, Department of Land and Natural Resources. Manuscript on file at the Kapolei, Oʻahu Office of the State Historic Preservation Division.

2002 *An Ancient History of Waiʻanae*. Mutual Publishing, Honolulu.
- Evans, T.J.K.
1930 "Nanakuli Residence Lots First Series." Hawaiian Homes Commission, March–July, 1930. Scale 1 inch = 100 feet.
- Foote, D., E. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. United States Department of Agriculture, Soil Conservation Service. Published in

- cooperation with the University of Hawaii Agricultural Experiment Station, Washington, D.C.
- Hammatt, H.H., M. McDermott, and R. Chiogioji
1999 *Archaeological Assessment of an Approximately 15-Acre Parcel, Ahupua'a of Nanakuli, Wai'anae District, Island of O'ahu*. Cultural Surveys Hawaii, Inc. Kailua, Hawai'i.
- Hammatt, H.H., M. McDermott, and D.W. Shideler
2001 *Archaeological Monitoring Plan for the Nanakuli IV Elementary School Project Site 50-80-07-5947, Nanakuli Ahupua'a, Wai'anae District, Island of O'ahu* (TMK 8-9-02:65). Cultural Surveys Hawaii, Kailua, Hawai'i.
- Handy, E.S.C.
1940 *The Hawaiian Planter, Volume 1*. Bishop Museum Bulletin No. 161, Bishop Museum, Honolulu.
- Handy, E.S., E.G. Handy, and M.K. Pukui
1972 *Native Planters in Old Hawaii; Their Life, Lore, and Environment*. Bernice P. Bishop Museum Bulletin 23, Bishop Museum Press, Honolulu.
- I'i, J.P.
1993 *Fragments of Hawaiian History*. Bishop Museum Press, Honolulu.
- Jones, C.K. and H.H. Hammatt
2005 *Archaeological Monitoring Report for the Fiber Optic Cable Installation of the DHHL Subdivision in Nānākuli Ahupua'a, Wai'anae District, Island of O'ahu* TMK [1] 8-9; 8-9-02-23, 36, 38; 8-9-03:63; 8-9-04:78, por. 79; 8-9-07:01. Cultural Surveys Hawaii, Kailua, Hawai'i.
- Juvik, S. and J. Juvik (editors)
1998 *Atlas of Hawai'i* (Third ed.). University of Hawai'i Press, Honolulu.
- Kamakau, S.M.
1992 *Ruling Chiefs of Hawai'i*. The Kamehameha Schools Press, Honolulu.
- Le Suer, C.C. and P. Cleghorn
2005 *Archaeological Monitoring for Nānākuli Beach Park (Zablan Beach Park) Parking Lot Improvements Project, Nānākuli, O'ahu Island, Hawai'i* (TMK 8-9-06:01). Pacific Legacy, Inc., Kailua, Hawai'i.
- Lockhart, B.
2010 *Bottles on the Border: The History and Bottles of the Soft Drink Industry in El Paso, Texas, 1881-2000*. Chapter 8c Bottles of the Magnolia Coca-Cola Bottling Co. [Revised Edition – Originally Published Online in 2000]
<<http://www.sha.org/bottle/pdf/files/EPChap8c.pdf>> Accessed 12/26/13.
- Macdonald, G.A., A.T. Abbott, and F.L. Peterson
1983 *Volcanoes in the Sea: The Geology of Hawaii*. University of Hawaii Press, Honolulu.
- McAllister, J.G.
1933 *Archaeology of O'ahu*. Bishop Museum, Bulletin 104, Honolulu.

- McDermott, M., R. Chiogioji, and K. McGuire
 2001 *Archaeological Inventory Survey of the Proposed 15-Acre Nanakuli IV Elementary School Site (A portion of the Former Camp Andrews), Nanakuli Ahupua'a, Wai'anae District, Island of O'ahu (TMK: 8-0-02:65)*. Cultural Surveys Hawaii, Kailua, Hawai'i.
- McDermott, M. and H.H. Hammatt
 1999 *Archaeological Inventory Survey of the Proposed Nanakuli 242 Reservoir Site, with Archaeological Assessment of the Proposed 20" Transmission Main Along Nanakuli Avenue, Nanakuli, Wai'anae District, Island of O'ahu (TMK 8-9-8:03)*. Cultural Surveys Hawaii, Kailua, Hawai'i.
- 2000 *End-of-Fieldwork Results for the location of Sink Features (for Land Surveyor Recording) and Excavation of Two Large Sink Features BA Subset of the Work for the Archaeological Inventory Survey for the Proposed Nanakuli IV Elementary School, Nanakuli, Wai'anae, O'ahu (TMK 8-9-02: por. 01)*. Cultural Surveys Hawaii, Kailua, Hawai'i.
- McGrath, E.J. Jr., K.M. Brewer and R. Krause
 1973 *Historic Wai'anae, a Place of Kings*. Island Heritage Limited, Norfolk Island, Australia.
- McGuire, K. and H.H. Hammatt
 2000 *A Traditional Practices Assessment for the Proposed Nanakuli IV Elementary School Site, Nanakuli, Wai'anae District, Island of O'ahu (TMK 8-9-02: 65, 23, por. 1)*. Cultural Surveys Hawaii, Kailua, Hawai'i.
- Moore, J.R., E. Yoshifuku, and J. Kennedy
 2009 *An Archaeological Monitoring Report for a Property Located at TMK: (1) 8-9-02:067 in Nanakuli Ahupua'a, Wai'anae District, Island of O'ahu*. Archaeological Consultants of the Pacific, Hale'iwa, Hawai'i.
- Nakamura, B. and J. Pantaleo
 1994 *Aspects of the History of Lualualei and Nanakuli, Wai'anae, O'ahu*. Aki Sinoto Consulting, Honolulu.
- Newton, H.E.
 1912 "Nanakuli Waianae, Oahu." Hawaii Territory Survey, February 1912. Scale 1 inch = 500 feet.
- Ogden Environmental and Energy Services Co., Inc.
 1995 *Archaeological Subsurface Testing in Conjunction with Milcon P-313, Range Operations Center Naval Undersea Warfare Engineering Station Detachment, Lualualei at Nanakuli, O'ahu Island, Hawai'i, Pre-Final Report*. Honolulu.
- Ostroff, B. and M. Desilets
 2005 *Archaeological Monitoring Results for the Installation of a Waterline along Farrington Highway between Hakimo Road and Haleakala Avenue Intersections, Nanakuli and Lualualei Ahupua'a, District of Wai'anae, O'ahu Island, Hawai'i*. Garcia and Associates, Kailua, Hawai'i.
- Paradise of the Pacific*
 1943 "Providing Fun for Fighting Men." December 1943:62–63.

- Pukui, M.K.
1983 *‘Ōlelo No ‘eau; Hawaiian Proverbs and Poetical Sayings*. Bernice P. Bishop Museum Special Publication No. 71. Bishop Museum Press, Honolulu.
- Pukui, M.K., S.H. Elbert and E.T. Mookini
1974 *Place Names of Hawai‘i*. University of Hawaii, Honolulu.
- Ryan, T.
2013 *A Sweet Celebration: TaB Commemorates Golden Anniversary on Valentine’s Day*. Feb 7, 2013. <<http://www.coca-colacompany.com>> Accessed 12/15/13.
- Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson (editors)
2002 *Field Book for Describing and Sampling Soils, Version 2.0*. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.
- Society for Historical Archaeology (SHA)
2013 *Machine-made bottles portion of the Dating Key*. October 17, 2013.
<<http://www.sha.org/bottle/machinemadedating.htm>> Accessed 12/26/13.
- Souza, T. and H.H. Hammatt
2006 *Archaeological Monitoring Report For the Fiber Optic Duct Line Phase 1 from Nānākuli Avenue to Hakimo Road in Nānākuli Ahupua‘a, Wai‘anae District, O‘ahu TMK [1] 8-9-005:007, 8-7-006:013*. Cultural Surveys Hawaii, Kailua, Hawai‘i.
- Stein, E. and H.H. Hammatt
2006 *Archaeological Monitoring Report for the Nānākuli Beach Park Sewer Connection for the Recreation Center Project, Nānākuli Ahupua‘a, Wai‘anae District, O‘ahu Island [TMK: (1) 8-9-001:002]*. Cultural Surveys Hawaii, Kailua, Hawai‘i.
- Sterling, E.P. and C.C. Summers
1978 *Sites of O‘ahu*. Dept. of Anthropology, B.P. Bishop Museum, Honolulu.
- Ted, T.
2013 *This Week’s Softdrink – Kist*. November 19, 2013.
<<http://retrorambling.wordpress.com/2013/11/19/this-weeks-softdrink-kist/>>
Accessed 12/15/13.
- Thien, S.
1979 A Flow Diagram for Teaching Texture-By-Feel Analysis. *Journal of Agronomic Education* 8:54–55.
- Thrum, T.G.
1922 *Hawaiian Annual*. Honolulu.
- United States Geological Survey (USGS)
1953 “Schofield Barracks, Hawaii.” Contour interval 40 feet. Scale 1:24,000.
- Vancouver, G.
1967 *A Voyage of Discovery to the North Pacific Ocean and Round the World*. Amsterdam, N. Israel: Da Capo Press, New York.

Wall, W.E.

1925 "Honouliuli Forest Reserve." Hawaii Territory Survey, September 1925. Scale 1 inch = 2,000 feet.

Webster, W.

1854 "Nanakuli, Waianae, Oahu (Crown Land)." Hawaiian Government Survey Register No. 113. Honolulu 27th May, 1854. Scale 1:12,000.

Whitehead, B. and P.L. Cleghorn

2003 *Archaeological Monitoring of Nānākuli Water System Improvements, Nānākuli Avenue, Nānākuli, Island of O'ahu (TMK: 8-9-005)*. Pacific Legacy, Inc., Kailua, Hawai'i.

Yorck, J. and H.H. Hammatt

2003 *Archaeological Monitoring Report for the Nānākuli IV Elementary School Project, Nānākuli Ahupua'a, Wai'anae District, Island of O'ahu [TMK (1) 8-9-02: 65]*. Cultural Surveys Hawaii, Kailua, Hawai'i.

Yucha, T. and H.H. Hammatt

2007 *Archaeological Monitoring Report for the Nānākuli Beach Park (Cove Location) Sewer Connection, Nānākuli Ahupua'a, Wai'anae District, O'ahu Island [TMK (1) 8-9-006: 001]*. Cultural Surveys Hawaii, Kailua, Hawai'i.