

CHAPTER 4: HUMAN ENVIRONMENT



This chapter discusses the environmental consequences on subjects associated with the human environment resulting from implementation of the project. Discussion of probable impacts addressing the No Action Alternative provides a baseline of future conditions with the human environment from which impacts associated with the Proposed Action can be evaluated. Several technical studies were completed by project team subconsultants to address various subjects discussed in this chapter. These studies are included as part of the DEIS in the Appendix.

4.1 HISTORIC AND ARCHAEOLOGICAL RESOURCES

This section examines existing historic and archaeological resources identified within the Petition Area, and probable project impacts. If applicable, necessary mitigative measures are also identified. The *Archaeological Inventory Survey for Hawaiian Memorial Park* was prepared by Honua Consulting (Honua) in 2018, and is included in Appendix J (Honua, 2018). The archaeological inventory survey (AIS) was prepared in accordance with State Historic Preservation Division (SHPD) rules governing standards for archaeological reports (HAR 13-13-276). The draft AIS has been submitted to SHPD for review and acceptance.

Area of Potential Effect

An essential element of any AIS is to establish the area of potential effect (APE) for the Proposed Action. For this project, the APE was considered to be the entire 53.45-acre Petition Area. Prior archaeological studies have occurred within the Petition Area and have documented numerous historic properties within the Petition Area. Proposed improvements within the Cultural Preserve include clearing of vegetation, minor site improvements for new burials following traditional native Hawaiian protocols, creation of walking trails, and potential installation of interpretive signage. Construction of the cemetery expansion includes mass grading, creation of internal roadways, installation of a drainage system, other site improvements, and landscaping.

Scope of Work

Archaeological fieldwork for the current study included a 100% surface pedestrian survey, GPS recordation of archaeological sites and features, site documentation, and photography of all historic properties documented. The scope of work was designed to satisfy State requirements for archaeological inventory surveys and includes the following information in compliance with survey criteria:

1. Historic background information, including present and historic findings on land use and site patterns. This information was drawn from sources such as existing literature, land commission awards (LCA), and oral history. Documents and material reviewed were summarized with applicable LCA mapped when possible.
2. Archaeological background information drawn from prior archaeological studies as determined through consultation with SHPD. Summaries of prior archaeological studies include the extent of survey coverage; synthesis and analysis of information on the Petition Area and the chronology of related lands; function and land use patterns; and predictions to the type of sites anticipated to be encountered in the field survey.
3. Discussion of methods used in the archaeological field survey as well as sampling design. Design of study field survey methods evaluated the presence of possible subsurface sites and includes discussion of factors limiting the survey effort, survey techniques, and the extent of historic property recordation.
4. Discussion on archaeological field survey and laboratory findings with properties found individually described. Details on site information are also included such as stratigraphy, integrity, usage, age, and significance.
5. A summary of findings including the total number of archaeological sites found, maps showing property locations, and a table summarizing applicable site details.
6. Discussion of the stakeholder consultation process. Details include information on the individuals and organizations consulted as well as the methods utilized. Whether or not additional archaeological sites were identified through the consultation process is also discussed.

4.1.1 Background Research Results

4.1.1.1 Consultation Conducted

Consultation with project proponents and interested community members by Honua has been ongoing since 2016. Discussions are also in-progress with groups regarding plans for the Cultural Preserve. Several lineal and cultural descendants, recognized cultural experts, and other knowledgeable individuals have also been interviewed as part of a Cultural Impact Assessment (CIA) for this EIS (Appendix J).

During an April, 2017 meeting with the Ko‘olaupoko Hawaiian Civic Club, cultural descendants mentioned an area where two cultural sites were known to exist in the Petition Area that were not documented during the previous AIS investigation. The sites included: 1) a circular arrangement of basalt boulders at the southwest base of the hillside below Kawa‘ewa‘e Heiau, near the end of Lipalu Street; and 2) a grouping of large basalt boulders thought to have been a Hale o Papa. The descendants requested these cultural sites be preserved.

A site visit was conducted in response, and a potential circular concentration of natural boulders at the southwest base of the hillside below Kawa‘ewa‘e Heiau, near the end of Lipalu Street, was located, documented, and mapped. The only site encountered during the survey that is similar to a Hale o Papa was a traditional habitation complex (SIHP # -4681) that was described in a previous CIA for the project (Hammatt, 2008). This potential Hale o Papa was mapped and designated as a feature of SIHP # -4681.

On September 27, 2017 an on-site meeting was conducted with project team members led by LaGrande Biological Surveys, Inc. It was discussed that a native damselfly was present within a historic ‘auwai located in the northwest corner of the Petition Area. The biologist showed several existing dirt trails throughout the area. A potential archaeological site (identified as Honua 8) located in the southeast portion of the area was also inspected, which was situated within an area containing multiple large mango trees.

4.1.1.2 History of the Kāne‘ohe Region

The history of the Kāne‘ohe region has been documented in a number of studies. These studies detail the legendary history and oral traditions, legendary rulers and personalities, early historic accounts, land ownership and utilization changes during and following the Māhele, and changes in land use from traditional to modern times. A summary is provided below, and additional information can be found in the AIS.

Pre-Contact Period

Several myths and legends are associated with Kāne‘ohe and the ahupua‘a surrounding the Petition Area. These myths and legends provide the origin of the name of this ahupua‘a. One account attributes the name of the ahupua‘a to a story about a woman that compared her husband’s cruelty to the cutting edge of a bamboo knife, as Kāne‘ohe can be translated to mean “bamboo husband” or “bamboo man.” Kāne‘ohe was a population center containing agricultural fields and multiple streams flowing from the Ko‘olau range toward a fertile bay. Streams and natural hillside runoff fed lo‘i (irrigated taro fields) as well as sweet potato, pandanus, wauke, and bananas. Coastal areas contained coconut groves and multiple fishponds.

The waters of Kāne‘ohe Bay are ideal for the construction of fishponds with native Hawaiians constructing up to 30 known fishponds. Over half of these fishponds would be filled after World War II with few original ponds remaining. The inhabitants of Kāne‘ohe lived near coastal areas, on the fringes of lowland fields, and within inland valleys. The ahupua‘a has been noted throughout historical records as the seat of the ruling ali‘i of Ko‘olaupoko.

The Petition Area is located within the ‘ili (small land division) of Kawa‘ewa‘e and Kalokoai. Kawa‘ewa‘e is the name of an important heiau located in the Petition Area while Kalokoai translates to “the food pond.” The high chief ‘Olopana was said to have erected Kawa‘ewa‘e Heiau in the beginning of the 12th century. The legend of the half man, half pig demigod

Kamapua‘a is associated with Kawa‘ewa‘e Heiau and is a central mo‘olelo (story or legend) of Kāne‘ohe.

A hōlua slide was also reported to be adjacent to this heiau. The hōlua slide was later destroyed during an attempt to cultivate pineapples in the area. A number of other heiau are associated with Kāne‘ohe, attesting to the political importance, abundance, and value of its land.

Early to Mid 1800s

Kāne‘ohe would later become a population center of O‘ahu in the 19th century. According to population estimates for the area, over twice as many individuals resided in Kāne‘ohe in 1779 compared to the next most populated ahupua‘a in the Kāne‘ohe Bay region, He‘eia. An estimated 15,000 to 17,000 individuals resided in the bay region with Kāne‘ohe and He‘eia accounting for 55% of the population at this time. Population estimates between 1835 and 1836 indicate the population of nine ahupua‘a from Kualoa to Kāne‘ohe had dropped by only approximately 48 people, compared to 1831 to 1832, while Kualoa and Kāne‘ohe had increased in population. An 1876 map of Kāne‘ohe shows the land covered in cane fields, swamp lands, streams, coastal fishponds, and scattered cattle pens.

In 1795, Kamehameha I divided O‘ahu among his warrior chiefs and counsellors. He retained the ahupua‘a of Kāne‘ohe as Crown Land for his own personal property. Upon his death, much of Kāne‘ohe remained under his sons Liholiho (Kamehameha II) and Kauikeaouli (Kamehameha III).

The Great Māhele occurred in 1848 and marked a dramatic shift in Hawai‘i’s traditional system of land use. Kamehameha III, through the guidance of foreign advisors, divided lands previously held and administered by chiefs and their konohiki (advisors). These divisions apportioned the land as follows: 23.8% (984,000 acres) to the king (Crown Lands), 39.2% (1,619,000 acres) divided among 245 chiefs (konohiki lands), and 37% (1,523,000 acres) designated as government lands. These government lands were awarded to commoners that worked the land as active tenants.

The Māhele was followed by the Kuleana Act of 1850 that allowed commoners to petition for title to land they cultivated and resided on. The Kuleana Act established a system of fee simple land ownership with tenants required to document claims to gain permanent title. Once title was granted, these kuleana lands were independent of the ahupua‘a they were situated in. The lands could then be sold to parties with no ties to the area. Few commoners were awarded kuleana land by the Board of Land Commissioners prior to the Kuleana Act.

Land awards issued were called Land Commission Awards (LCA). Commoners fared the worst from the Māhele, as approximately 8,000 individuals received about 2.5 acres each, which is less than one percent of the total lands. Land use in Kāne‘ohe during the 19th century is known through LCA records.

A significant quantity of Crown Lands were sold and mortgaged during Kamehameha III and IV's reign to settle foreign debt. In 1865, Crown Land was declared inalienable, eliminating the power of the monarchs to sell or transfer these lands. This dramatically changed the character of the lands and the power of the monarchs. The legislature also declared that Crown Lands would be inalienable, passing to the heirs and successors of the Hawaiian Crown in perpetuity while prohibiting any lease of the lands for a period longer than 30 years.

Following the Kuleana Act, 242 land claims were made within the Kāneʻohe ahupuaʻa, with just over half of claims awarded by the Land Commission. Queen Hakaleleponi Kalama, 11 konohiki, and three non-konohiki were eventually awarded the majority of Kāneʻohe lands. Lands claimed in Kāneʻohe were predominantly occupied by taro cultivation, fishponds, and dryland agriculture. LCAs were not issued within the Kawaʻewaʻe ʻili. However, two LCA were granted within Kalokoai (LCA 2444 and 2806). Table 4.1 lists details of these LCA.

<p>Table 4.1 LCA Awards - Kalokoai Ahupuaʻa</p>				
LCA #	ʻIli	Claimant	Land Use	Awarded
2444	Kalokoai	Keawekukahi	2 loʻi; 1 house lot; 3 fish ponds	3 ʻāpana; 1.808 acres
2806	Kalokoai	Kahilikoolani	2 loʻi	1 ʻāpana; 0.839 acres
Source: Honua, 2018				

Mid 1800s to Present

Historic land use between the mid-19th and the mid-20th centuries in Kāneʻohe can be characterized by the cash crops that dominated the landscape. Prior agricultural practices in the Kāneʻohe area were responsible for the degradation of significant sites located within the Petition Area.

Sugarcane was introduced to Hawaiʻi through European contact, with cultivation peaking in the 1860s. During this period, Parker Sugar Co. and the Kāneʻohe Sugar Plantation were two dominant sugar plantations in Kāneʻohe. The Kāneʻohe Sugar Plantation was the more successful of the operations, due to the mill the plantation constructed, its labor force, and its equipment. This plantation remained operational until 1885. As a whole, sugarcane cultivation was unsuccessful in Kāneʻohe due to the uneven topography of area lands leading to problems with the systematic watering of sugarcane, which was the general practice.

Rice cultivation was also practiced in the Kāneʻohe Bay region. Crop cultivation can be attributed in part to the increase in Asian workers immigrating to the islands in the 1800s as labor for island agricultural operations. In Kāneʻohe, tracts of land once used for taro cultivation were modified to make way for rice cultivation. Rice acreage in 1892 in the Kāneʻohe bay region were as follows: Waikane, 200 acres; Kahaluʻu and Kaʻalaea, 300 acres; Heʻeia and Kāneʻohe,

200 acres. The shift to rice cultivation was not as successful as farmers and businesses had hoped, with the industry declining steadily over a 10-year period due to environmental, economic, and political factors.

Livestock as part of ranching operations had been cultivated in the Kāneʻohe Bay region since pre-contact times and included domesticated pigs, dogs, and jungle fowl. European contact introduced a number of new livestock species into the area including cattle and sheep. These species began to change the landscape of Kāneʻohe as early as the mid-1800s, altering the presence of vegetation in the area.

Kāneʻohe Ranch was a significant ranching operation in the region. At its peak, the ranch included 2,000 head of cattle and 12,000 acres of land from the ocean in Kailua to the Pali. The construction of features for the Kāneʻohe Ranch Company were detrimental to important native Hawaiian religious sites. Puʻumakani Heiau was noted to be located near the southern portion of the Petition Area on a ridge facing the Pali. This heiau was dismantled with its stones used for the construction of a cattle corral. Kawaʻewaʻe Heiau, located in the current Petition Area, was degraded when the structure was used for a cattle pen, obliterating any trace of features within the heiau.

Pineapple was introduced to Hawaiʻi in the early 1800s with cultivation reaching commercial levels in the early 20th century. Kāneʻohe's rich soils and ideal climate contributed to pineapple cultivation becoming the leading agricultural industry in the area from 1910 to 1925. Cultivation reached 2,500 acres at its peak and stretched from Kāneʻohe to Kahaluʻu. This industry was responsible for the degradation of many significant native Hawaiian sites. In particular, pineapple cultivation is reputed to have destroyed a famous hōlua slide located in the Petition Area near Kawaʻewaʻe heiau.

Following World War II, Kāneʻohe became a central location for dairy production on Oʻahu as well as a major residential center. In the 1950's, dairy operations of Oʻahu were forced to relocate to Kāneʻohe and Kailua. Three dairies opened in the Kāneʻohe area with the Souza Brothers Dairy located closest to the Petition Area. In particular, the Petition Area was said to have been used as grazing land by this dairy. The old dairy is now the site of the Kaluapuhi Neighborhood Park, also referred to as Souza Dairy Park.

Oʻahu's dairy industry quickly declined due to the high price of land in Honolulu, the urbanization of Kāneʻohe and Kailua, and landowner realization that developing landholdings for housing was more profitable than farming. The construction of Wilson Tunnel and expansion of the Pali Highway occurring concurrently with the development of Kailua and Kāneʻohe's dairy industry made Windward Oʻahu accessible to Honolulu. This contributed to a development boom in this area. Farming and ranching also became unprofitable with Kāneʻohe Ranch converting operations to the management and leasing of their landholdings. Over 5,000 single family homes were developed on Kāneʻohe Ranch's vast landholdings, with many leasehold properties eventually sold to their lessees.

Hawaiian Memorial Park opened in 1961 with a land area of six acres. It gradually expanded to its current size of 80 acres. The Pikoiloa Subdivision lots, located northwest of the Petition Area, were created through subdivision approvals executed in 1964. Pikoiloa Tract Units 9 and 10 total 280 lots.

4.1.1.3 Previous Archaeological Research

Several archaeological studies have been conducted within and in the vicinity of the Petition Area. Figures 4.1 and 4.2 show the locations of these studies and documented sites in the area. Table 4.2 provides additional detail on these studies.

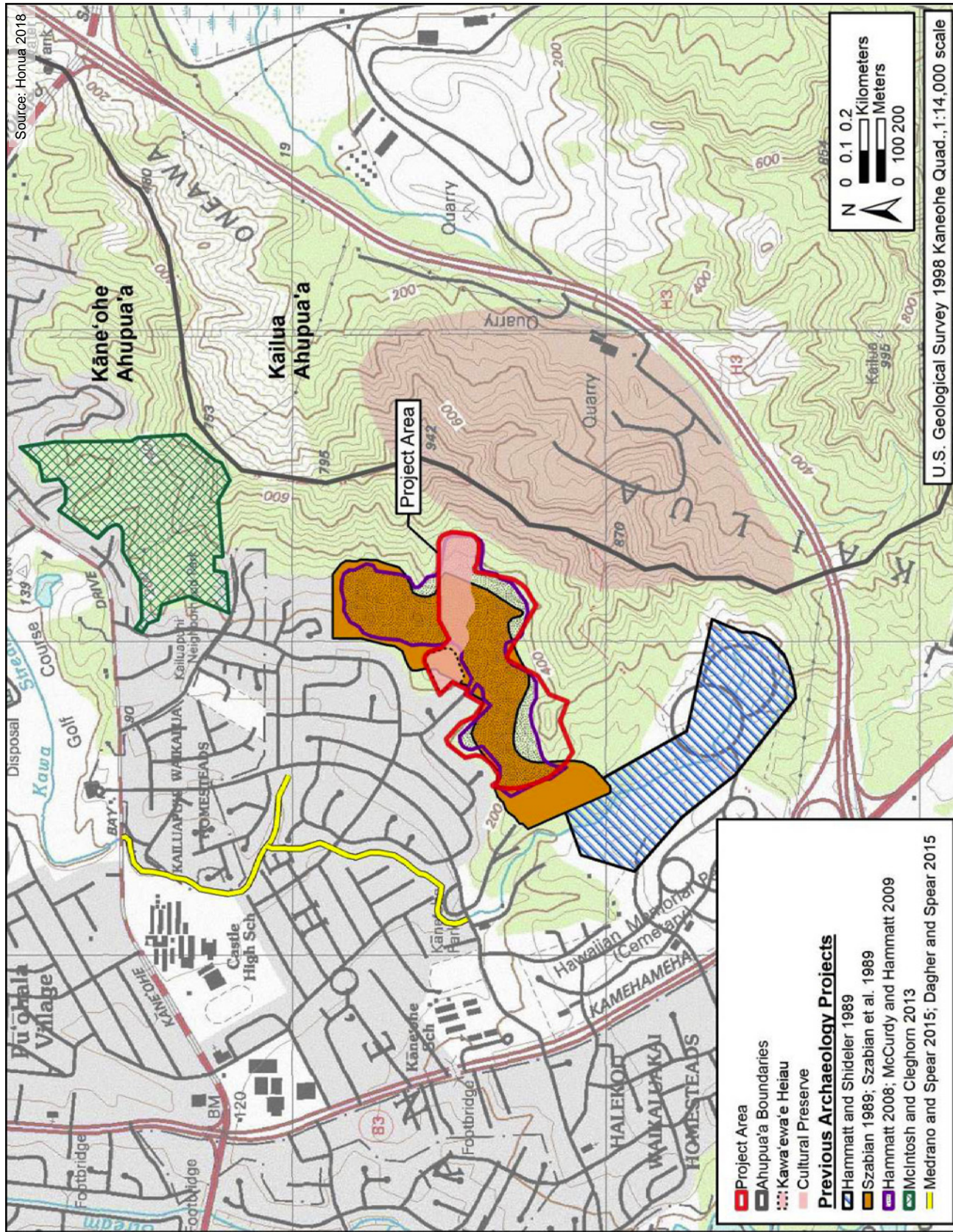
Previous Archaeological Studies in Petition Area Vicinity

McAllister 1933

The earliest archaeological survey of O‘ahu was conducted by J.G. McAllister in 1933. McAllister recorded several sites within and in the vicinity of the Petition Area. Sites in the vicinity include multiple fishponds (Site 349-351), a spring (Site 353), heiau (Site 352, 354, 356), and a hōlua slide (Site 355). McAllister located Kawa‘ewa‘e Heiau (Site 354), the hōlua slide (Site 355), and Pu‘umakani Heiau (Site 356) close to or within the Petition Area. Kawa‘ewa‘e Heiau (Site 354) is discussed in detail later in this section. Sites 355 and 356 were recorded as follows:

1. **Site 355.** Small round hill, whose name is not remembered, near the mountain side of Kawa‘ewa‘e Heiau. Said by John Bell to have been the location of a hōlua. This heiau was destroyed when an attempt was made to plant pineapples in this section. Without doubt, this is the site of the slide described by Bates in 1853. “Before reaching the mission station at Kaneohe, the road leads through a narrow but fertile ravine, tenanted by a few natives. In leaving the ravine, a low round hill, to the right of the path, is rather conspicuous from a long, narrow depression or channel on its side. It was an indication that one of the favorite games of the old Hawaiians had been played there. This game was called the holua, and was one of their favorite games...” This same site was seen by Briggs in 1881: “Dewight pointed out to me a long narrow depression on some of the hills to be seen from our path, where old Hawaiians used to play one of their favorite games of chance”.
2. **Site 356.** Pu‘umakani Heiau, Kalapuhi, Waikalua, Kāne‘ohe. This heiau was on the ridge facing the Nu‘uanu Pali, but the stones were removed and used for building a cattle corral farther down the slope. The heiau is said to have been built by Olopana.

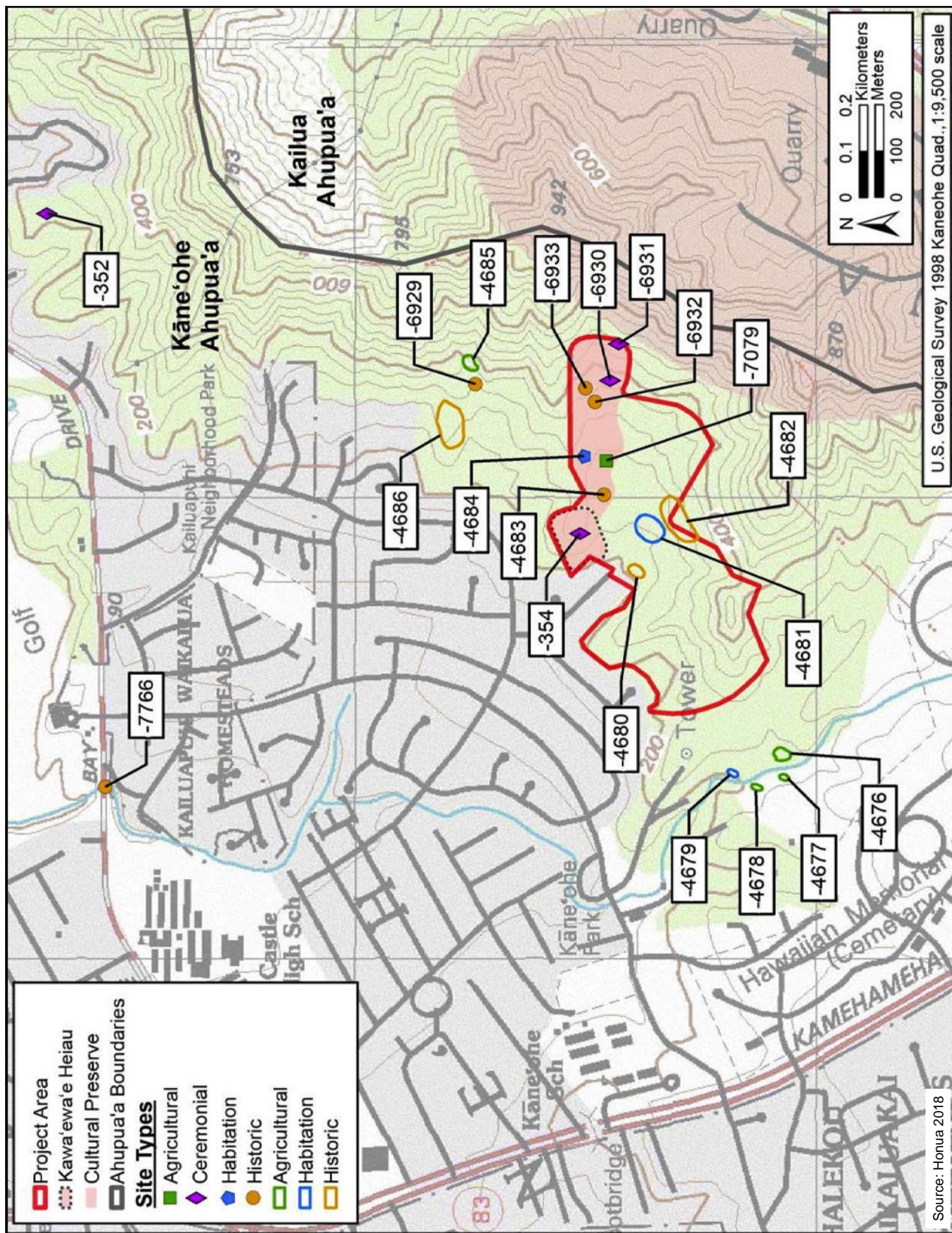
The hōlua slide (Site 355) and Pu‘umakani Heiau (Site 356) have not been relocated.



Previous Archaeological Studies Within Petition Area Vicinity

Hawaiian Memorial Park Cemetery Expansion Project Draft Environmental Impact Statement
Kāne'ohe, O'ahu, Hawai'i

Figure 4.1



<p>Table 4.2 Previous Archaeological Studies Within and in the Vicinity of the Petition Area</p>			
Reference	Type of Study	Location	Documented Sites/ Results
Hammatt and Shideler 1989	Archaeological Survey	Hawai'i State Veterans Cemetery, TMK [1] 4-5-023: 002 (approx. 0.8 km south of PA)	No sites recorded
Szabian et al. 1989, Szabian 1989	Archaeological Reconnaissance Survey and Post-Field Summary Report	Pikoiloa Cemetery (current Hawaiian Memorial Park Cemetery), TMK [1] 4-5-032:001-002 (includes current PA)	One previously recorded site, Kawa'ewa'e Heiau (SIHP # 50-80-10-354), and 11 new sites: SIHP # -4676 (traditional habitation complex), -4677 (historic wall remnant, earthen mound), -4678 (historic wall remnant, earthen mound), -4679 (historic wall remnant), -4680 (historic terrace), -4681 (traditional habitation complex), -4682 (natural terracing), -4683 (historic pit feature), -4684 (traditional habitation complex), -4685 (historic wall remnants, terracing), and -4686 (historic stone alignments)
Hammatt 2008	Cultural Impact Assessment	Hawaiian Memorial Park, TMK [1] 4-5-033:001 (includes current PA)	Described concerns for preservation of Kawa'ewa'e Heiau (SIHP # -354), understanding of surrounding sites as a cultural complex associated with Kawa'ewa'e Heiau, and on-going cultural practices associated with gathering of plants for <i>hula</i> and <i>lei</i>
McCurdy and Hammatt 2009	Archaeological Inventory Survey	Hawaiian Memorial Park, TMK [1] 4-5-033:001 (includes current PA)	Seven previously recorded sites, Kawa'ewa'e Heiau (SIHP # -354), -4680 (historic terrace), -4681 (traditional habitation complex), -4682 (terracing determined to be natural), -4683 (historic pit feature [charcoal kiln]), -4684 (traditional habitation complex) and -4686 (historic stone alignments); and 6 new sites, SIHP # -6929 (2 concentrations of lithic debitage), -6930 (traditional ceremonial stone enclosure), -6931 (traditional ceremonial stone alignments), -6932 (historic stone storage feature), -6933 (historic pit feature [charcoal kiln] with associated stone terrace), and -7079 (traditional grinding stone)
McIntosh and Cleghorn 2013	Archaeological Inventory Survey	Kāne'ohe Ahupua'a, TMK [1] 4-5-032:001 (0.7 km north of PA)	One previously recorded site, SIHP # 50-80-10-352 (Ahukini Heiau)
Medrano and Spear 2015, Dagher and Spear 2015	Archaeological Inventory Survey, and Cultural Impact Assessment	Kāwā Stream and Ditch, TMK [1] 4-5 various (0.6 km NW of PA)	One newly identified site, SIHP #50-80-10-7766 (Kāwa Stream Bridge)
Source: Honua, 2018			

Hammatt and Shideler 1989

In 1989, Cultural Surveys Hawai'i (CSH) conducted an archaeological survey of a 90-acre parcel for the proposed Hawai'i State Veterans Cemetery, located approximately 0.5 miles south of the Petition Area. The field survey did not encounter any archaeological features. The report recommended that archaeological monitoring would not be necessary for proposed construction of the Veterans Cemetery.

McIntosh and Cleghorn 2013

In 2013, Pacific Legacy, Inc. conducted an AIS of a 56-acre parcel, located approximately 0.4 miles north of the Petition Area. One previously documented site, Ahukini Heiau (SIHP # 50-80-10-352) was relocated. The heiau appeared to have been impacted by previous construction activities. No additional sites were recorded.

Medrano and Spear 2015

In 2015, Scientific Consultant Services, Inc. conducted an AIS and Cultural Impact Assessment for the Kāwā Stream and Ditch Improvements Project. The project was located along Kāwā Stream, approximately 0.3 miles northwest of the Petition Area. The archaeological inventory survey documented one new site, Kāwā Stream Bridge (SIHP #50-80-10-7766). The Cultural Impact Assessment found that the Kāwā Stream and Ditch Improvements Project would not hinder any cultural practices or have an adverse effect on the cultural significance of the area.

Previous Archaeological Studies within the Petition Area

Szabian et al. 1989, Szabian 1989

In June 1989, the applied research group of Bishop Museum conducted a 59.8-acre reconnaissance survey of the proposed Pikoiloa Cemetery. The project area overlapped a portion of the Petition Area, and extends approximately another 0.2 miles north and 0.4 miles to the southwest. Their project area was 92-acres and extended to Kāwā Stream. One previously recorded site, Kawa'ewa'e Heiau (SIHP # 50-80-10-354), was encountered as well as 11 new sites, containing 25 associated features. A post-field summary of the reconnaissance effort was composed with recommendations for the newly recorded sites. The newly recorded sites were interpreted as being likely associated with Kawa'ewa'e Heiau and religious ritual, habitation and agricultural use of the land. Szabian (1989) recommended future fieldwork within the project area that would include intensive clearing and mapping with subsurface testing.

Hammatt 2008, McCurdy and Hammatt 2009

In 2008, a CIA for the Hawaiian Memorial Park Expansion project (formerly referred to as Pikoiloa Cemetery) was conducted by CSH. The CIA described two primary cultural concerns: 1) the preservation of previously recorded Kawa'ewa'e Heiau (SIHP # 50-80-10-354); and 2) on-going cultural practices associated with gathering of plants for hula and lei. It was noted that Kawa'ewa'e Heiau should be recognized as not one isolated site, but a complex of associated sites throughout the surrounding area. Consultation and site visits with community members suggested the potential for burials in or around Kawa'ewa'e Heiau, the potential of a Hale o Papa

(women's heiau) at SIHP # -4681. CIA recommendations included the preservation and maintenance of Kawa'ewa'e Heiau in addition to awareness of cultural gathering practices within the previous Petition Area.

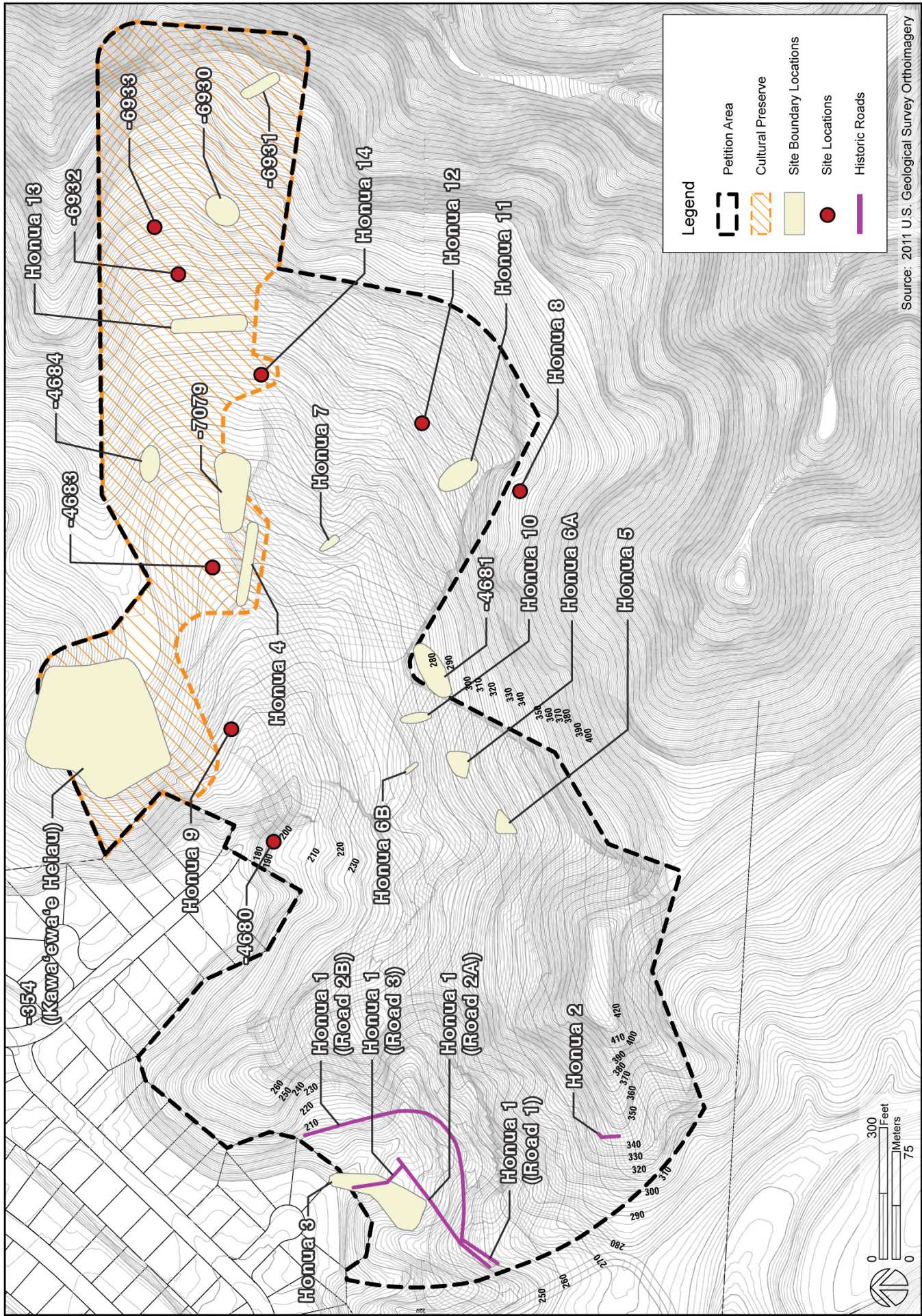
In 2009, CSH conducted an AIS for the Hawaiian Memorial Park Expansion project. The AIS included a complete surface survey, documentation of encountered archaeological sites, and subsurface testing of select features to determine if subsurface deposits existed. During fieldwork a total of 12 sites were identified, with six sites previously recorded by Szabian et al. (1989) and six newly recorded. Of the six previously recorded sites, five were relocated within the Petition Area. Five of the newly recorded sites were found within the current Petition Area. One newly recorded site was found north of the current Petition Area (SIHP # -6929 [2 concentrations of lithic debitage]). Subsurface testing produced very limited findings. Project results indicated traditional Hawaiian and historic utilization of the Petition Area. The study recommended a Cultural Preserve be established to protect a large portion of the documented sites within the Petition Area boundary.

During the McCurdy and Hammatt (2009) AIS, two sites previously recorded by Szabian et al. (1989) were relocated to be well north of what project maps had indicated. SIHP # -4683 and -4684 were shown on the Szabian et al. (1989) map to be located near the center of the Petition Area, however, McCurdy and Hammatt (2009) more accurately relocated the sites to be within the Cultural Preserve in the northeast portion of the Petition Area.

4.1.2 Results of Fieldwork

Archaeological fieldwork for the current AIS conducted by Honua documented encountered surface sites and features. A total of 24 numbered sites were documented and are shown in Figure 4.3. Table 4.3 summarizes these sites and their location with respect to the Petition Area.

As shown on Figure 4.3, there are actually 28 sites identified because Honua 1 consists of four roadway segments (Roads 1, 2A, 2B and 3), and Honua 6 is comprised of two separate sites (6A and 6B). Ten of the sites documented were previously identified, and the remaining 18 sites documented during this investigation (Honua 1 to 14) are newly identified. Newly discovered sites are identified by the "Honua" site name. SHPD site numbers assigned to these new Honua sites are also included in the table and are SIHP #50-80-10 numbers -8228 to -8241.



Sites Documented in Project Archaeological Inventory Survey (Honua 2018)

Figure 4.3

Hawaiian Memorial Park Cemetery Expansion Project Draft Environmental Impact Statement
Kāne'ohe, O'ahu, Hawai'i

Table 4.3
Historic Sites Identified and Location

No.	SIHP #50-80-10	Site Type	No. of Features	Feature Types	Location
1.	-354	Kawa'ewa'e Heiau	8 Heiau Features (1-8), 1 Exterior Feature (A)	1: entrance; 2: east end of south wall; 3: east wall; 4: interior of heiau, 4A: newly documented terrace; 5: central portion of south wall; 6: western portion of heiau on steep slope 6A: stone-lined pit within southeast interior corner; 7: north wall; 8: semi-circular earthen terrace, 8A-8D: newly documented earthen pits; Feature A: enclosure	Within Cultural Preserve
2.	-4680	Terrace	2 Features (A-B)	A: large terrace; B: small terrace	Outside Cemetery Expansion Area
3.	-4681	Habitation Complex	8 Features (A-H)	A: c-shape; B1: hearth, B2-B3: terraces; C1-C2: terraces; D: terrace; E: c-shape; F1-F3: terraces (potential Hale o Papa); G1-G3: terraces; H1-H2: terraces	Outside of Petition Area
4.	-4683	Pit Feature and Terracing	2 Features (A-B)	A: earthen pit; B: terraces	Within Cultural Preserve
5.	-4684	Habitation Complex	7 Features (A-G)	A: enclosure; B: terrace; C: terrace; D: c-shape; E: possible hearth; F: c-shape; G: c-shape	Within Cultural Preserve
6.	-6930	Stone Enclosure	1 Feature	Enclosure	Within Cultural Preserve
7.	-6931	Stone Alignments	4 Features (A-D)	A-C: terraces; Feature D: potential ceremonial area	Within Cultural Preserve
8.	-6932	Storage Feature	1 Feature	Stone Storage Feature	Within Cultural Preserve
9.	-6933	Pit Feature and Stone Wall	2 Features (A-B)	A: earthen pit; B: terrace	Within Cultural Preserve
10.	-7079	Agricultural Complex	6 Features (A-F)	A: grinding stone; B-C: terrace remnants; D: mound; E-F: terrace remnants	Within Cultural Preserve (Partially)
11.	Honua 1 -8228	Historic Dairy Roads (Roads 1 - 3)	3 Features (1-3)	Road 1-3: dirt roadways	Cemetery Expansion Area
12.	Honua 2 -8229	Historic Road	1 Feature	Dirt roadway	Cemetery Expansion Area
13.	Honua 3 -8230	'Auwai	3 Features (A-C)	A1: concrete capped spring; A2: terrace; A3: soil terrace; A4: metal pipe; A5: water hole; A6: historic road crossing; B: small terrace; C: large terrace 'auwai determined to be a native damselfly habitat	Outside Cemetery Expansion Area
14.	Honua 4 -8231	Terraced 'Auwai	7 Features (A-G)	A-C: terraces; D-F: mounds; G: terrace remnant	Within Cultural Preserve
15.	Honua 5 -8232	Terrace Remnants	5 Features (A-E)	A1-A2: mounds; B-E: terrace remnants	Cemetery Expansion Area

Table 4.3 (continued) Historic Sites Identified and Location					
No.	SIHP #50-80-10	Site Type	No. of Features	Feature Types	Location
16.	Honua 6 -8233	6A - Terrace Remnants 6B - Modified Outcrop	5 Features (A-E) 1 Feature	A-E: terraces; Feature C3: mound Modified outcrop	Cemetery Expansion Area
17.	Honua 7 -8234	Terrace	2 Features (A-B)	A: terrace; B1-B2: likely natural terraces	Cemetery Expansion Area
18.	Honua 8 -8235	Habitation Site	1 Feature	Rectangular stone alignment	Outside of Petition Area
19.	Honua 9 -8236	Terrace	1 Feature	Water retention terrace	Cemetery Expansion Area
20.	Honua 10 -8237	Terrace Remnants	2 Features (A-B)	A1-A4: terrace remnants, B1-B2: terrace remnants	Cemetery Expansion Area
21.	Honua 11 -8238	Possible Habitation Site	6 Features (A-F)	A-F: terraces	Cemetery Expansion Area
22.	Honua 12 -8239	Earthen Pit	1 Feature	Earthen pit	Cemetery Expansion Area
23.	Honua 13 -8240	Terraces	3 Features (A-C)	A-C: terraces	Within Cultural Preserve
24.	Honua 14 -8241	Walled Pit	3 Features (A-C)	A-C: stacked-stone walls	Within Cultural Preserve
Source: Honua, 2018					

Of these 28 total sites, 26 are located within the Petition Area. Two sites identified as Sites -4681 and Honua 8 are located outside of the Petition Area. A total of 11 sites are situated within, or partially within, the proposed Cultural Preserve. Of the 10 previously identified sites, eight of them are located within the Cultural Preserve (SIHP # -354, -4683, -4684, -6930, -6931, -6932, -6933, and -7079). As indicated in Figure 4.3, some features associated with SIHP # -7079 (agricultural complex) are located outside the proposed Cultural Preserve area. The newly identified Honua 4 (terraced 'auwai), Honua 13 (terraces), and Honua 14 (walled pit) sites are located within the Cultural Preserve.

All previously identified sites from prior studies were relocated under Honua's AIS work, with plan maps and descriptions amended to account for current conditions and observations. Three of the previously documented sites were expanded in size to include additional features (Kawa'ewa'e Heiau [-354], -4681, and -7079).

The majority of documented sites are likely associated with the traditional Hawaiian, pre- and early post-contact eras, while eight of the sites are considered historic (older than 50 years). Documented historic sites include dairy roads (Honua 1 comprised of Roads 1 to 3), an 'auwai system (Honua 3), water retention terraces (SIHP # -4680 and Honua 6A/6B), and earthen pits identified as charcoal kilns (-4683, -6933 and Honua 14). Brief descriptions of sites documented are provided below and are subdivided by areas: 1) outside the Petition Area; 2) within the Cultural Preserve; 3) outside the Cultural Preserve and not affected by the cemetery expansion; and 4) affected by the cemetery expansion. Some sites within the remaining area would be

located outside of actual grading improvements for the cemetery expansion. Expanded descriptions of these sites can be found in the project AIS included in Appendix J.

4.1.2.1 Properties Outside the Petition Area

A description of the two sites identified that are located outside of the Petition Area is provided, and would subsequently not be affected by the project.

SIHP # 50-80-10-4681 - Traditional Habitation Complex. This historic property is located upslope of the central section of the cemetery expansion area, and outside of the Petition Area. The site was determined to be a pre-Contact habitation site consisting of eight features, including several C-shaped structures, a terrace wall, terrace systems, circular rock feature, and guardian stones. This site is in good to fair condition. Exhibit 4.1 shows the natural hillside terrace and guardian stones associated with this property. Informants from McCurdy and Hammatt's



(2009) study suggested this site may be interpreted as a Hale o Papa. The current study further documented this site and the presence of two possible large basalt boulders, referred to as guardian stones. Feature F documented at this site is likely a significant area associated with reported ceremonial activity associated with it serving as the potential Hale o Papa.

Honua 8, Habitation Site. This site is situated upslope and in the vicinity of the Petition Area. The site includes a potential traditional hale foundation, and is in fair condition. The foundation, consisting of a single course rectangular stone alignment is situated at the top of a level portion of a steeply sloping hillside.

4.1.2.2 Properties Within the Cultural Preserve

A description of the 11 total sites identified that are located within the Cultural Preserve is provided.

1. SIHP # 50-80-10-354 - Kawa'ewa'e Heiau. The Kawa'ewa'e Heiau is a historic site in good condition that was placed on the State and National Register of Historic Places in 1972. This historic property is located in the makai portion of the Cultural Preserve generally bordering the residences by Lipalu Street. Kawa'ewa'e was a luakini type heiau, commissioned by Olopana and associated with human and animal sacrifice. Exhibit 4.2 shows a model replica of the heiau created by a long-time caretaker. From the 1990s to early 2000s, the site was maintained by local community stewards.



Exhibit 4.2 Model Replica of Kawa'ewa'e Heiau

The heiau is on top of a small knoll and consists of one large enclosure 120 by 253 feet (30,360 sf) in dimension, with a small terrace on the north side which follows the contours of the land. The structure was used as a cattle pen for many years by previous ranching operations, resulting in obliteration of many traces of the heiau. Remaining heiau features include a walled enclosure and a small terrace (Exhibit 4.3). The terrace follows the contours of the land. Survey efforts found the heiau to be generally in good condition and largely covered in low lying vegetation and vines. Several additional features were identified in this study, such as terraces along with rocklined and earthen pits.



Exhibit 4.3 North Wall of Kawa'ewa'e Heiau

2. SIHP # 50-80-10-4683 - Historic Charcoal Kiln. This historic property is located in the southern portion of the Cultural Preserve. The site is believed to be a historic charcoal production area based on features identified, including a rectangular pit (Exhibit 4.4). Charcoal production was a widespread industry in Windward O‘ahu during the later part of the 19th and early part of the 20th century. Remnant charcoal kilns have been extensively documented in a number of archaeological investigations conducted in Kāne‘ohe and He‘eia. Survey efforts found the site to be in fair condition.



Exhibit 4.4 Pit Feature (SIHP # -4683)

3. SIHP # 50-80-10-4684 - Traditional Habitation Complex. This historic property is generally located within the center area of the Cultural Preserve. The site consists of a habitation site comprised of several C-shaped structures, a terrace wall, a circular rock feature, and several house terraces. This site was determined to be in good condition. However, to the east, west and south of the complex, is a badly disturbed area. The site is situated on a west-facing slope with vegetation consisting of a dense canopy of large trees and an understory of lau‘a fern. Current survey efforts identified an additional feature at this site consisting of a stone alignment.

Two test units (1 x 1 m) were excavated at this site. Test Unit 1 excavation was located in the eastern corner of the enclosure. A total of four artifacts were recovered consisting of three basalt flakes and a small piece of brown bottle glass. Test Unit 2 excavation was placed within Feature F, along the southeastern wall. No artifacts were recovered from this excavation.

4. SIHP # 50-80-10-6930 - Traditional Ceremonial Stone Enclosure. This historic property is located in the eastern end of the Cultural Preserve at a higher elevation (mauka end). The site is comprised of a rectangular shaped enclosure with an irregular notch on its eastern end, giving it an L shaped appearance. This site was determined to be in good condition (Exhibit 4.5). McCurdy and Hammatt (2009) believed the structure was used for ceremonial rather than habitation purposes, based on site features. Current study efforts found the site covered by dense vegetation.



Exhibit 4.5 Photo of -6930 Enclosure

Although trees and erosion have caused some collapse, the integrity of the structure is considered good. West of the notch, inside of the structure there are remnants of a possible paved surface. Several stone tools were observed in the general site vicinity. Based upon the site's dimensions, features, and the effort expended on the construction seems excessive for a habitation and is more consistent with that of a ceremonial structure.

A single exploratory (12 by 12 inch) test unit was excavated inside the enclosure against the southern wall to determine its vertical boundary and to obtain a soil profile. A total of three strata were observed, and the wall of the enclosure continues at least one course below the ground surface. No artifacts or cultural features were observed during this excavation.

5. SIHP # 50-80-10-6931 - Traditional Ceremonial Area. This historic property is located near the upper (mauka) boundary of the Cultural Preserve. The site was determined by McCurdy and Hammatt (2009) to be a possible pre-contact ceremonial area located on a natural knoll between two intermittent drainages. This site is in poor condition and consists of four features including stone alignments, a collapsed terrace/alignment, and a cleared leveled area atop a landform. The site was recommended for avoidance and protection due to its location outside of the project area defined in 2009. Honua found SIHP # -6931 to be very similar to the site previously described by McCurdy and Hammatt. Modern disturbances include two small pits dug on the southern edge of the hillside along with several black plastic pots scattered on the ground nearby indicating the pits were likely for growing illegal plants.

6. SIHP # 50-80-10-6932 - Historic Stone Storage Feature. This historic property is located in the eastern and mauka half of the Cultural Preserve, and consists of a possible storage area beneath a boulder near an intermittent drainage. A single historic beer bottle was located inside this storage area. This site was determined to be in good condition (Exhibit 4.6).



7. SIHP # 50-80-10-6933 - Historic Charcoal Kiln. This historic property is located in eastern half of the Cultural Preserve slightly mauka of Site -6932. The property consists of a large circular pit with burned walls. A faced, 2 to 3 course stone wall is located on the northeast side of this site. McCurdy and Hammatt (2009) note that the feature appears to be a historic charcoal kiln in fair condition. Current survey efforts found a historic bottle at the site.

8. SIHP # 50-80-10-7079 - Traditional Agricultural Complex. This somewhat rectangular-shaped historic property is generally located in the southern end of the Cultural Preserve along the northern boundary of the cemetery expansion area. Although the majority of the area designated SIHP # -7079 is located within the Cultural Preserve, some features associated with the property would be located outside Preserve boundaries. Honua study efforts found this historic property, initially consisting of just a grinding stone, to be an agricultural complex larger in extent than previously documented by McCurdy and Hammatt (2009). A total of 11 features were identified, including the large basalt grinding stone documented in the 2009 study. Additional features include terrace remnants, stone alignments, and a stone mound. The condition of this site is poor.

9. Honua 4 - Traditional Terraced ‘Auwai (-8231). This site is located within the southern portion of the Cultural Preserve, generally along the northern boundary of the cemetery expansion area. This site is a traditional agricultural terrace complex that has large agricultural terraces as well as terraces and mounds for water diversion (Exhibit 4.7). These features are constructed within and adjacent to a small ‘auwai. Construction techniques suggest the site is a traditional agricultural site. The ‘auwai is a secondary tributary that eventually flows to a large drainage ditch that empties into a concrete drainage basin at the end of Lipalu Street. This site was determined to be in fair to good condition.



Exhibit 4.7 Honua 4 Agricultural System (Feature A)

10. Honua 13 - Traditional Terraced ‘Auwai (-8240). This site is located in the southern portion of the Cultural Preserve and consists of a traditional terraced ‘auwai system that overall was determined to be in fair condition. The site is comprised of three terraces in good to fair condition. The terraces are built across and adjacent to a small ‘auwai receiving intermittent water flow from natural hillside runoff. Large ‘ekaha (*Asplenium nidus*) were observed growing in this feature.



Exhibit 4.8 Honua 14 and Associated Stacked Stone Wall Features

11. Honua 14 – Historic Guava Charcoal Kiln (8241). This site is located in the southern portion of the Cultural Preserve and was observed to be in good condition. The site’s function and associated time period was initially unknown with the site characterized as a walled pit feature constructed of earth and dry-stacked basalt stones. Exhibit 4.8 is a view of the site looking south.

Associated stacked stonewall features are visible in the foreground and background of the photograph. In order to determine the site type, function, and time period, two test units and a small exploratory trench were excavated adjacent to the site's southern interior stone wall. Excavation efforts revealed the interior stone wall observable on the ground surface extends approximately 70 cm deeper and was constructed of small to large basalt cobbles and boulders. Concentrations of dense soot on the lower portions of the stone wall and adjacent to intentional voids and holes in the wall construction indicate the site was a historic charcoal kiln with constructed vents and a chimney to release smoke. Charcoal identified from the floor of the kiln indicated the site was used to make guava charcoal.

4.1.2.3 Properties Not Affected by Cemetery Expansion (Outside Cultural Preserve)

There are 12 remaining sites identified within the Petition Area that are located outside of the Cultural Preserve. Two of these sites (Site -4680 and Honua 3) would not be affected by grading plans and other major site improvements planned as part of the cemetery's expansion.

1. SIHP # 50-80-10-4680 - Historic Water Retention Terrace. This historic property is located near the northwest boundary of the Petition Area at a lower elevation and mauka of Lipalu Street. This site is situated beyond the limit of proposed grading plans for the cemetery expansion. The site is described as a historic water retention terrace in fair condition that consists of two features. The first feature consists of a rock formation forming a crude terraced structure stacked five levels high (Exhibit 4.9). The site extends across a steep soil-lined drainage ditch, indicating the site was for water control or retention. The second feature is a small terrace remnant made of basalt boulders and cobbles within the base of the drainage ditch. Honua's survey efforts relocated the first site feature 121 feet north of McCurdy and Hammatt's (2009) plotted location. The ditch continues to the northeast where it becomes very steep and empties into a larger primary drainage ditch that eventually flows northwest to a large concrete and basalt boulder drainage basin located at the end of Lipalu Street.



Exhibit 4.9 Site -4680 Water Retention Terrace Features

2. Honua 3 - Historic 'Auwai (-8230). This site is located at a lower elevation on a sloping hillside in the northwest corner of the Petition Area downslope of historic dirt dairy roads (Honua 1). This site is mauka of residences at the end of Ohaha Place. The site consists of a historic 'auwai and a shallow well. It is likely this site was utilized in the 1950's by the Souza

Brothers Dairy as a source of water for grazing cows, along with former agricultural activities. This site is situated beyond the limit of proposed grading for the cemetery expansion.

The ‘auwai contains several areas of modification and was determined to be in fair to good condition. It extends approximately 180 feet north/south by 65 feet east/west. A photo providing a general overview of this ‘auwai is shown in Exhibit 4.10. The site is comprised of three main features comprised of the modified ‘auwai, a small terrace, and a large terrace. The shallow well feature consists of a concrete capped spring with a broken square concrete lid. Spring waters of this feature feed the ‘auwai system that extends downslope. This system supports taro saplings, ti plants, and also provides habitat for the endangered Blackline Hawaiian Damselfly.

Downslope from the concrete cap is a small terrace formed of basalt cobbles that retains the spring water. Ti trees and a taro variety grow in the area. Another wet and level soil terrace is on the west side of the ‘auwai that also supports a variety of taro. The ‘auwai continues downslope about 3.3 feet wide and the waters are tapped by an old, corroded metal pipe. It branches southward creating a small, very wet ditch leading to a pool of water that was likely a historic water source for grazing dairy cattle. The ‘auwai continues downslope where it appears to cross over an old dairy road (Honua 1, Road 3). At this location, the ground is very wet and there is a concentration of basalt cobbles on the downslope side, likely to provide support for the historic roadway.



Exhibit 4.10 Photo Showing General Overview of Historic ‘Auwai (Honua 3)

A flat area extends past piles of rubbish, suggesting the old roadway may have continued at one time prior to residential development of the adjacent parcel. Near the base of the hillside, the ‘auwai widens under modern brush piles, likely dumped by nearby residential homeowners. The ‘auwai and a separate soil-lined drainage ditch converge and empty into the City’s concrete drainage basin.

Two additional terrace features are located at the southern end of this site atop a hillside just off a dirt pathway. An amber glass beer bottle was documented upslope of one of the terrace features.

4.1.2.4 Properties Affected by Cemetery Expansion

A description is provided of the remaining nine sites identified that would be affected by the cemetery expansion plans. A portion of Site -7079 would be affected by the cemetery expansion, and was previously discussed under sites within the Cultural Preserve.

1. Honua 1 - Historic Dairy Roads (-8228). This site consists of a total of four road features that are identified as Roads 1, 2A, 2B, and 3. These roadways are located in the western corner of the Petition Area generally mauka of Ohaha Place, and are in poor condition. The sites include several historic dairy roads extending through this area that are relatively level, but damaged by natural tree growth and soil erosion. Roads 1 and 2 were found extending from the western Petition Area boundary, and generally run parallel to each other. Road 1 extends for only about 100 feet and varies from 4.5 to 7 feet wide.

Road 2 is divided into Roads 2A and 2B that are generally cut into a hillside, exposing basalt bedrock and red silty clay soil. Road 2 splits, with one side traveling northeast (Road 2A) to meet with Road 3, and the other side (Road 2B) runs eastward to intersect with Road 1. Exhibit 4.11 shows a view of Road 2A. These roads are about 8 to 9 feet wide, Road 2A is in poor condition, and Road 2B is in poor to fair condition.

Road 3 is in poor condition, and extends from Road 2 to a historic ‘auwai, documented as Honua 3. Road 3 runs along the east side of Honua 3, and then crosses over a section of this ‘auwai after which it becomes unobservable. Exhibit 4.11 also shows a photo of this road.



2. Honua 2 - Historic Road (-8229). This site consists of a short segment of an old dirt road that is in poor condition. The road segment is about 10 feet wide and runs in a north-south direction for about 33 feet. The ends of this roadway have been removed, likely bulldozed, leaving only this short segment remaining. Honua 2 may correspond with an old road shown on an 1876 Lyons and Alexander map along with a 1902 Wall map.

3. Honua 5 - Traditional Terrace Remnants (-8232). This site is generally located in the central portion of the cemetery's expansion area upslope at a higher elevation near the mauka boundary of the Petition Area. This site consists of the remnants of a traditional terrace that is in poor condition. It is comprised of five features, consisting of a series of basalt cobble-lined terraces situated on a moderate to steeply sloped hillside. The terraces are watered by natural hillside runoff and an adjacent 'auwai. The condition of these features has been affected by natural water erosion and rockfall.

4. Honua 6 - Traditional Terrace Remnants (6A) and Modified Outcrop (6B) (-8233). This site is also located in the central portion of the cemetery's expansion area upslope at a higher elevation near the mauka boundary of the Petition Area, slightly east of Honua 5. This site is comprised of two feature areas identified as Features 6A and 6B that are in poor to fair condition. The terraces have been heavily disturbed by natural erosion and rockfall. Feature 6A includes a series of five traditional terrace remnants located on a moderately sloping hillside. These terraces are watered by natural drainage. Feature 6B includes a modified basalt outcrop with a leveled surface that is about 100 feet downslope (makai) of Feature 6A. This feature could have been used as a temporary habitation. Exhibit 4.12 shows the modified basalt outcrop.



5. Honua 7 - Traditional Terrace (-8234). This site is situated in the eastern end of the cemetery expansion area toward the boundary of the Cultural Preserve. Site features include a low stone terrace and two features that are likely natural terraces located near the convergence of two drainage ditches. This site was determined to be in fair condition, and Exhibit 4.12 includes a photo of this site.

6. Honua 9 - Historic Water Retention (-8236). This site is located in the eastern end of the cemetery expansion at a lower elevation closer to the Kawa'ewa'e Heiau. This site is in good condition, and is shown in Exhibit 4.13. Site features include a basalt boulder and cobble concentration located on the steep slope of a west-tending drainage ditch. The construction style is roughly stacked and appears to be historic-era. This site may be used for water retention, given its location within a large ditch.



Exhibit 4.13 Historic Water Retention Feature, Honua 9

7. Honua 10 - Traditional Terrace Remnants (-8237). This site is located in the central portion of the cemetery's expansion area upslope at a higher elevation near the mauka boundary of the Petition Area, slightly east of Honua 6A and 6B. This site includes remnants of a traditional terrace. These features are located on a moderately sloping, north-tending hillside and are watered by a natural streambed created by intermittent rain water. The site is in poor condition due to natural erosion and thick vegetation growth.

8. Honua 11 - Habitation and Agricultural Terraces (-8238). This site is located in the eastern end of the cemetery expansion area at a higher elevation near the Petition Area boundary. The site served as agricultural terraces with possible habitation, and was determined to be in poor to fair condition. A terraced north-tending hillside and level area atop the hillside are features associated with this site. The shape of the site indicates the top portion may have served as a habitation site with six associated agricultural terraces below. An ephemeral drainageway is located just east of the site. An old remnant 'auwai that runs north/south may also be present adjacent to the west side of the site. It was noted that the site had been recently cleared by an unknown individual on two separate site visits for the study survey.

9. Honua 12 - Earthen Pit (-8239). This site is located in the eastern end of the cemetery expansion area at a higher elevation near the Petition Area boundary and Honua 11. It is comprised of an earthen pit located at the top of a steep hillside that is in good condition. The interior southern pit wall has a flat, large basalt boulder and black, hardened soil. The darkened, cemented soil indicates fires were burned within the site. Similarities were apparent with the other two charcoal kilns documented within the proposed Cultural Preserve and this site. However, the site location at the top of a foothill suggests usage as a signal fire, should the sites be pre-contact in origin.

4.1.2.5 Results of Laboratory Analysis

Artifacts collected during this investigation include a historic glass bottle (Acc. #1) found during the survey of Honua 3 and materials recovered during excavation of Honua 14. Materials recovered include a piece of volcanic glass (Acc. #2), cow bones, and kukui nut shells. Several modern to historic bottles were documented in the field but were not collected.

Glass Bottles

One milk bottle, designated Acc. #1, was collected from the Honua 3 site. The base of the bottle was embossed with an Owens-Illinois maker's mark. The Owens-Illinois Glass Company was known to emboss the manufacturer plant code and the date code. Based upon the marking, the milk bottle was either made in 1937 or 1947 at a plant in Los Angeles, California.

Several early- through late-20th century glass bottles were observed during the surface survey and were documented in the field. These bottles include a bottle observed on the surface of Honua 3, Feature B with a "triple triangle" maker's mark, indicative of the American National Can Company, dating from 1987-1995. Two other isolated bottles were also found in the western portion of the Petition Area. One isolated bottle was observed in the central Petition Area that was a turn mold with a slight push up base. Turn molds were common from 1880 to the 1920s. Another bottle was found near Site -6933 (historic charcoal kiln). The bottle is machine-made, likely dating from between 1908-1930.

Lithic Analysis

One piece of volcanic glass, designated Acc. #2, was recovered during excavation of Honua 14. The artifact contained outer cortex on one side and did not exhibit obvious flake scars or worked edges. Energy Dispersive X-Ray Fluorescence analysis was used to identify the chemical composition of this material. Determining the chemical composition of a lithic material allows comparison with known source locations throughout the Hawaiian archipelago and the wider Pacific region to identify where the material likely originated. Analysis determined the recovered volcanic fragment is similar to dyke material found within the Ko'olau Mountain Range, particularly on Mokolī'i Island in the Kualoa Ahupua'a of the Ko'olaupoko district.

Faunal Analysis

Approximately 90 pieces of cow bone were collected from Honua 14. Skeletal elements collected included an axis vertebrae, scapula, rib bones, an articulated tibia, calcaneus, and foot bones. The animal appeared to have been scavenged, as the bones were found largely in one concentration with a few fragments found in other portions of the test excavation. No cut marks were observed on the cow bones.

Charcoal Identification

Three charcoal samples were collected from Honua 14 and sent to the International Archaeological Research Institute, Inc. (IARII) in Honolulu for plant species identification. One sample was unable to be identified, while the remaining samples were determined to contain guava. The production of guava charcoal was a common industry in Windward O‘ahu throughout the late 19th century and again in the 20th century.

4.1.3 Potential Project Impact and Mitigation

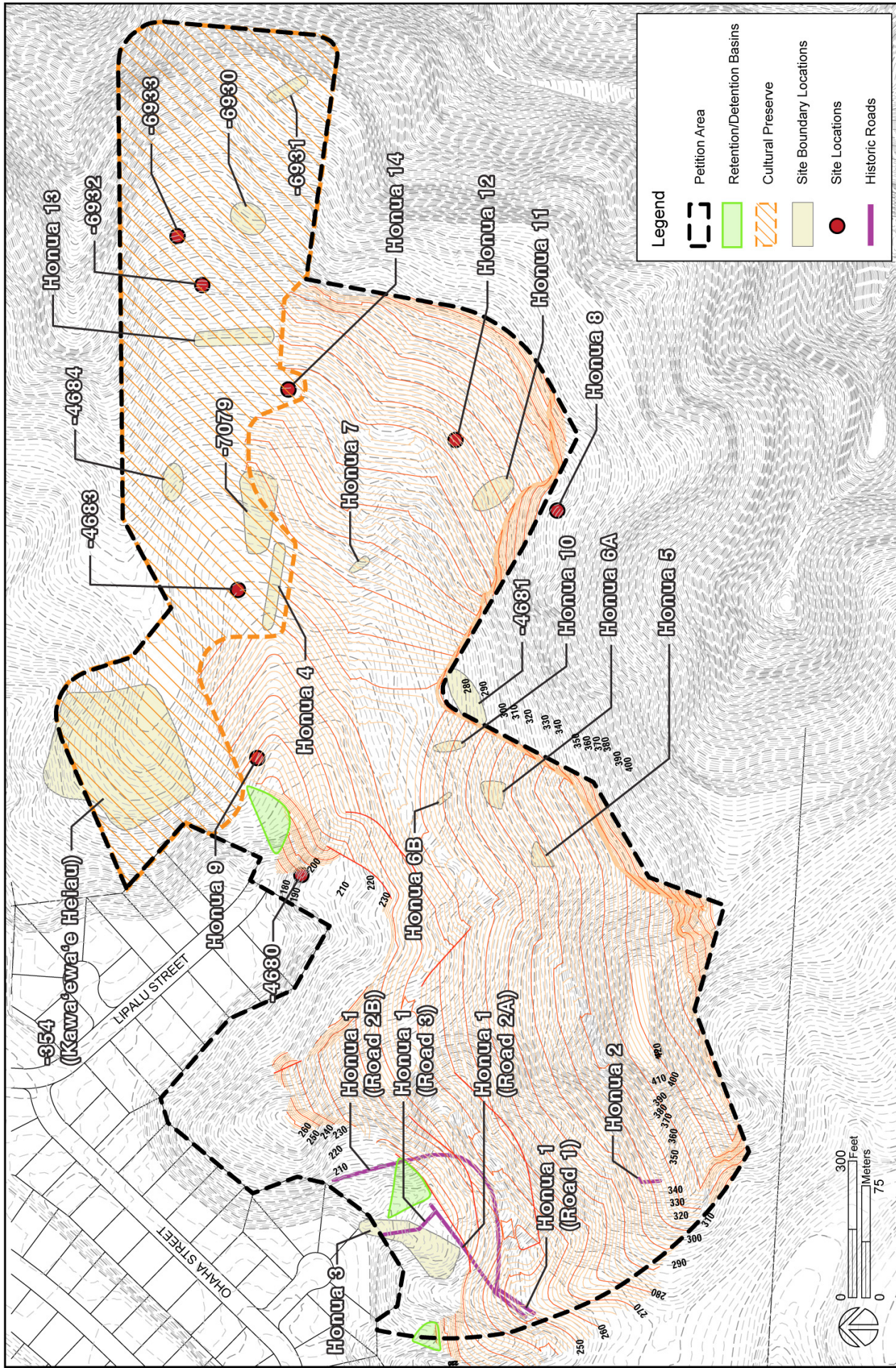
Under State regulations (§13-13-276, HAR), there are two possible effect determinations for projects under historic preservation review: 1) “no historic properties affected” and 2) “effect, with proposed mitigation commitments.” Assessment of historic properties was conducted in compliance with these regulations. The project proposes specific construction activities planned within the 53.45 acre Petition Area that may directly or indirectly cause alteration of historic properties identified. As a result, the APE is assigned to the same area as the Petition Area.

4.1.3.1 Significance Assessments

The historic properties identified were evaluated for significance according to the following five broad criteria used by the Hawai‘i State Register of Historic Places (§13-284-6, HAR). The first four criteria identified are also consistent with National Register of Historic Places criteria. These criteria are identified below.

1. Criterion A. Historic property reflects major trends or events in the history of the state or nation.
2. Criterion B. Historic property is associated with the lives of persons significant in our past.
3. Criterion C. Historic property is an excellent example of a site type, period, method of construction, or work of a master.
4. Criterion D. Historic property has yielded or may be likely to yield information important in prehistory or history.
5. Criterion E. Historic property has cultural significance to an ethnic group, including, but not limited to, religious structures, burials, traditional cultural properties, cultural practices, and/or beliefs important to the groups history and cultural identity.

Site historic significance eligibility under State and Federal Register criteria is summarized in Table 4.4. Figure 4.4 identifies all 28 site “locations” in relation to the proposed cemetery expansion plans and Cultural Preserve since a few of the historic sites have multiple feature locations. A discussion of why historic significance is recommended for properties under these criteria is below. The 14 new sites identified with the Honua site name have been evaluated for their function and significance eligibility.



Source: 2011 U.S. Geological Survey Orthoimagery

Existing Historic Sites Affected by Project

Figure 4.4

Hawaiian Memorial Park Cemetery Expansion Project Draft Environmental Impact Statement
Kāne'ohe, O'ahu, Hawai'i

Table 4.4 Eligibility and Recommendations of Documented Sites					
SIHP #50-80-10	Site Type	Possible Functions	Age	State & National Register Eligibility	Recommendations
-354	Heiau	Ceremonial	Pre-Contact	Criterion A through E	Preservation in Cultural Preserve
-4680	Terrace	Water Retention	Historic	Criterion D	No Further Work
-4681	Habitation Complex	Habitation/ Agriculture/ Ceremonial	Pre-Contact	Criterion D and E	Avoid and Protect
-4683	Pit Feature and Terracing	Charcoal Kiln/ Agriculture	Historic	Criterion D	Preservation in Cultural Preserve
-4684	Habitation Complex	Habitation	Pre-Contact	Criterion D	Preservation in Cultural Preserve
-6930	Stone Enclosure	Ceremonial	Pre-Contact	Criterion D and E	Preservation in Cultural Preserve
-6931	Stone Alignments	Ceremonial	Pre-Contact	Criterion D and E	Preservation in Cultural Preserve
-6932	Storage Feature	Storage	Historic	Criterion D	Preservation in Cultural Preserve
-6933	Pit Feature and Stone Wall	Charcoal Kiln	Historic	Criterion D	Preservation in Cultural Preserve
-7079	Agricultural Complex	Agriculture	Pre-Contact	Criterion D	Preservation in Cultural Preserve or Data Recovery
Honua 1-2 (-8228) & (-8229)	Dirt Roadways	Dairy	Historic	Criterion D	No Further Work
Honua 3 (-8230)	'Auwai	Water Collection and Retention	Historic	Criterion D	Avoid and Protect
Honua 4 (-8231)	Terraced 'Auwai	Agriculture	Pre-Contact	Criterion D	Preservation in Cultural Preserve
Honua 5 (-8232)	Terrace Remnants	Agriculture	Pre-Contact	Criterion D	No Further Work
Honua 6 (-8233)	Terrace Remnants (6A) & Modified Outcrop (6B)	6A: Agriculture; 6B: Possible Temporary Habitation	Pre-Contact	Criterion D	6A: No Further Work; 6B: Data Recovery
Honua 7 (-8234)	Terrace	Agriculture	Pre-Contact	Criterion D	Data Recovery
Honua 8 (-8235)	Habitation Site	Temporary Habitation	Possibly early Post-Contact	Criterion D	Data Recovery; Avoid and Protect
Honua 9 (-8236)	Terrace	Water Retention	Historic	Criterion D	No Further Work
Honua 10 (-8237)	Terrace Remnants	Agriculture	Pre-Contact	Criterion D	No Further Work

Table 4.4 (continued) Eligibility and Recommendations of Documented Sites					
SIHP #50-80-10	Site Type	Possible Functions	Age	State & National Register Eligibility	Recommendations
Honua 11 (-8238)	Possible Habitation Site	Habitation and Agriculture	Possibly early Post-Contact	Criterion D	Data Recovery
Honua 12 (-8239)	Earthen Pit	Charcoal Kiln or Fire Pit	Unknown	Criterion D	Data Recovery
Honua 13 (-8240)	Terraces	Agriculture/ Horticulture	Pre-Contact	Criterion D	Preservation in Cultural Preserve
Honua 14 (-8241)	Walled Pit	Unknown	Unknown	Criterion C and D	No Further Work, Preservation in Cultural Preserve
Source: Honua 2018					

Previously Identified Sites

The ten previously identified historic sites shown on Table 4.4 were considered historically significant under State and Federal Register criterion. Of these sites, Kawa'ewa'e Heiau (SIHP # -354) has been placed on the State and National Registers of Historic Places, and qualifies as historically significant under all State and National criteria. The remaining nine previously identified sites are considered significant under Criterion D because their associated features may yield information important on historic utilization of the area. Three of the remaining sites are also significant under Criterion E because they have cultural significance related to religious structures, traditional cultural properties and practices, and beliefs important to the history and cultural identity of Hawaiians.

Of these 10 sites, eight have been recommended to be preserved within the Cultural Preserve. Site -4681 is a habitation complex located mauka up the hillside that is situated outside the Petition Area. Because it is outside the Petition Area, it was recommended to continue avoidance and protect the site. Site -4680 is a terrace in fair condition previously used for water retention located near the end of Lipalu Street, and no further work was recommended.

New Sites Identified

The 14 newly identified sites by Honua were all considered historically significant under Criterion D. These sites were thus considered historically significant because their features may yield important information on historic utilization of the area. Honua 14 was also considered historically significant under Criterion C as the property exemplifies a site type, period, method of construction, or work of a master. Three of the sites were recommended for preservation and inclusion within the Cultural Preserve, and consist of Honua 4 (terraced 'auwai), Honua 13 (agricultural terraces), and Honua 14 (walled pit). These sites are already proposed to be located within the Cultural Preserve. Another site identified as Honua 3 ('auwai) is located in the western corner of the Petition Area and includes the shallow well and seep. This site was

recommended to be avoided and protected, and is not included as part of cemetery expansion improvements.

The Honua 8 site consists of a habitation site that is located up the hillside and is outside of the Petition Area. This site was recommended for data recovery and avoidance. Four other sites were recommended for data recovery and consist of: 1) Honua 6B (Modified Outcrop); 2) Honua 7 (agricultural terrace); 3) Honua 11 (habitation and agriculture); and 4) Honua 12 (earthen pit). The remaining sites, including Honua 6A (terrace remnants), required no further work.

4.1.3.2 Evaluation of Impacts to Sites

No Action Alternative

No adverse impacts to historic properties previously identified or new sites identified are anticipated under the No Action Alternative. The Petition Area where previously and newly documented sites are located would remain undeveloped and subject to effects from natural conditions. As a result, continued erosion would occur within this area from significant rainfall or storms, and would continue to impact existing sites. Several of the sites identified were documented being in poor condition due to natural erosion along with thick vegetation growth. Although, perhaps not adverse because it would occur over time, these sites would nevertheless continue to be negatively impacted by these conditions.

This alternative would prevent cultural landscape restoration activities and cultural practices, including new Hawaiian burials, desired from occurring. Preservation plan strategies to manage and maintain sites within a proposed Cultural Preserve by the Ko‘olaupoko Hawaiian Civic Club would be prevented. This alternative would negatively impact opportunities to implement desired long-term maintenance and security of historic sites, including restoration of Kawa‘ewa‘e Heiau. Existing activities occurring near these historic resources would remain unmanaged and generally difficult to property maintain.

Proposed Action

The project would have an overall positive and beneficial impact on previously identified and newly identified sites within the Petition Area. Several of the historic sites that would be impacted by grading plans for the cemetery expansion were determined to require no further work due to their historic function and poor remnant condition, indicating a lack of excavation potential for finding significant data. Other sites impacted by grading plans were recommended for data recovery, after which the sites can be demolished.

Grading plans would not impact three existing sites that were recommended for avoidance and protection. Sites -4681 and Honua 8 are located up the hillside and outside of the Petition Area, and would thus be avoided by the project allowing for their protection. Honua 3 would not be included as part of cemetery expansion grading plans allowing for this site to be avoided

consistent with the recommendations. Existing site -4680 (terrace) requires no further work, but this site would also be avoided by not being included for disturbance under the grading plans.

A total of 11 sites recorded were recommended to be included in the Cultural Preserve, and project plans do include having these sites situated within this Preserve. As a result, the cemetery's expansion would not impact these historic sites. These sites within the Cultural Preserve would benefit from the project's implementation. Cultural landscape restoration, restoration of historic sites, and cultural practices would all have a beneficial effect on these sites. The preservation plan developed for this preserve by the Ko'olaupoko Hawaiian Civic Club would ensure the needed long-term management and maintenance of sites that is a positive effect.

Based upon Honua's mapping, the extent of Kawa'ewa'e Heiau is larger than indicated by earlier surveys, as shown on Figure 4.4. As a result, a portion of the northern end of the heiau is currently located outside of the Cultural Preserve and Petition Area. Restoration of portions of the heiau and surrounding cultural landscape located outside the Cultural Preserve would still occur by the stewarding organization and associated individuals. However, landscape restoration and other activities may require issuance of a Site Plan Approval from the State DLNR. For example, landscape restoration activities occurring in excess of one acre are only allowable in the State Conservation District, General Subzone that surrounds the Cultural Preserve through the issuance of this approval. If needed, such approvals would be obtained separately from this Petition Area.

The project effect recommendation is "effect, with agreed upon mitigation measures." The project has potential to impact historic properties identified in the APE as previously discussed. Short-term construction activities along with long-term operation of the cemetery expansion would impact several sites. Restoration improvements proposed within the Cultural Preserve would also effect historic sites, although in a beneficial manner. Therefore, the following recommended mitigation measures are proposed to mitigate the project's potential effect on these significant historic properties.

Proposed Mitigation Measures

Proposed mitigation measures would reduce the project's potential impact on significant historic properties. Mitigation measures include: 1) data recovery; 2) preservation; and 3) implementing an archaeological monitoring program, and are discussed below.

Data Recovery

The current AIS investigation included a 100% pedestrian survey with excavation only at one site, Honua 14. In order to better understand and characterize certain documented sites within the Petition Area, a data recovery program is recommended. The program would begin with completion of a Data Recovery Plan that would outline the proposed testing strategy and

research objectives. The plan would be reviewed and accepted by SHPD prior to controlled excavation of select sites.

Data recovery is recommended for Honua 6B (possible temporary habitation), Honua 7 (terraces), Honua 8 (habitation site), Honua 11 (habitation site), and Honua 12 (earthen pit). If all or portions of SIHP # -7079 are impacted by the proposed project, it is recommended that Data Recovery be conducted on one or more of the features, particularly Feature D (mound), and that Feature A (grinding stone) either be preserved in place or relocated to an appropriate location in the Cultural Preserve. Data recovery efforts would attempt to establish function, usage, and the age of these sites. Findings from this investigation will aid determination of any further mitigation measures that may be needed for selected sites. Table 4.5 provides the rationale that supports implementation of Data Recovery as impact mitigation for these sites.

Table 4.5 Sites Recommended for Data Recovery		
Site	Type	Rationale
Honua 6B	Modified Outcrop	Feature creates a flat area on edge of hillside; excavation could answer if site was used for temporary habitation and associated time-period
Honua 7	Low Terrace	Terrace in Fair Condition located on level area by stream; could provide data on what plants were grown and associated time period
Honua 8	Habitation Site	Excavation would provide data on activities and use of the site as well as associated time period
Honua 11	Habitation Site	Excavation would provide data on activities and use of the site as well as associated time period
Honua 12	Earthen Pit	Excavation would provide data on function, use, and associated time period
SIHP # - 7079	Agricultural Complex	The function of Feature D (mound) is unknown; excavation would provide data on function and potential time period
Source: Honua 2018		

Preservation

The landowner intends to preserve and protect (conserve) all features within the proposed Cultural Preserve. However, if deemed necessary, the proposed project may impact some or all features of SIHP # -7079 (Agricultural Complex in poor to remnant condition). In the event SIHP # -7079 is impacted by cemetery expansion improvements, Feature A (grinding stone) should either be preserved in place or relocated to an appropriate location within the Cultural Preserve. Two sites not located within the proposed preserve (SIHP # -4681 and Honua 8) would be avoided and thus protected. Honua 3 ('Auwai) is not located within the Cultural Preserve, but that site would be avoided due to its function as a habitat for the endangered Blackline Hawaiian Damselfly.

Archaeological Monitoring

An archaeological monitoring program is recommended given the project's potential to adversely impact significant cultural features within the Petition Area. This monitoring program would be designed in coordination with SHPD. The monitoring plan would be written and approved by SHPD prior to project implementation, in accordance with HAR §13-279.

4.2 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) for the Proposed Action was prepared by Honua Consulting in 2018, and is included in Appendix K. This report assesses the potential impact to cultural beliefs, practices, and resources that might be associated with the Proposed Action. The CIA broadly covers the Kāneʻohe ahupuaʻa, focusing on areas near or adjacent to the Petition Area. The methodology used to assess the Proposed Action's impact to Petition Area cultural resources follows the analytical framework established in *Ka Paʻakai O Ka ʻĀina v. Land Use Commission*, 2000 (*Ka Paʻakai*). The conformance of the CIA with this analytical framework is discussed below.

CIA Conformance with Ka Paʻakai Analytical Framework

The State and its agencies have an affirmative obligation to preserve and protect the reasonable exercise of customarily and traditionally exercised rights of native Hawaiians to the extent feasible. State law further recognizes that cultural landscapes provide living and valuable cultural resources where Native Hawaiians have and continue to exercise traditional and customary practices, including but not limited to hunting, fishing, gathering, and religious practices. In *Ka Paʻakai*, the Hawaiʻi Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. The analytical framework guiding Ka Paʻakai analyses involves:

1. The identification of valued cultural, historical, or natural resources in the Petition Area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the Petition Area;
2. The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the Proposed Action; and
3. The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

Appropriate information concerning the Kāneʻohe ahupuaʻa was collected through archival research and interviews, focusing on areas near or adjacent to the Petition Area. Research and interviews allowed identification of cultural, historical, and natural resources in the Petition Area and the extent traditional native Hawaiian rights are exercised. The extent the Proposed Action

would affect these resources and native Hawaiian rights was assessed. Results of this assessment allowed identification of feasible actions needed to reasonably protect these resources and rights.

Archival Research

CIA archival research drew from significant primary and secondary sources such as documents, oral traditions (chants, songs, and/or hula), as well as Hawaiian language sources (books, manuscripts, and newspaper articles). Research focused on identification of recorded cultural and archaeological resources present in the landscape. Resources included but were not limited to native Hawaiian and non-native Hawaiian place names, landscape features, archaeological features, culturally significant areas, and significant biocultural resources. Information gathered focused CIA interview efforts on specific features and elements within the Petition Area.

Interviews and Consultations

Interviews occurred with lineal and cultural descendants, and recognized cultural experts with ties to the Kāneʻohe ahupuaʻa and to the Petition Area. In particular, the interview process focused on identifying and speaking with cultural practitioners, specifically Kumu Hula, who accessed or have knowledge about area resources. These individuals were identified through community member recommendation and expertise along with the body of individuals consulted during a CIA for an earlier project that included this Petition Area (CSH 2008).

Existing Oral Records

In 2008, a CIA was prepared by Cultural Surveys Hawaii (CSH) as part of a Final EIS that covered an earlier proposal for cemetery expansion (HHF 2008). That proposal included a 66-acre project area, of which approximately 56.6 acres of the current Petition Area was included. Information on oral histories previously gathered by CSH are summarized in Honua's CIA (Appendix K).

New Interviews

Efforts were taken to interview individuals that were unable to be consulted for the prior 2008 CIA, with a focus on Native Hawaiian cultural masters. The primary focus was to identify and interview cultural practitioners, specifically Kumu Hula, who accessed or have knowledge regarding the area's resources.

Eleven individuals were interviewed for this current CIA. Of these individuals, one individual interviewed for the 2008 CIA was re-interviewed for this study. Two individuals unable to be interviewed for the 2008 CIA were interviewed for this study. An advertisement was also placed in the State Office of Hawaiian Affairs (OHA) *Ka Wai Ola* February 2018 newspaper requesting information about possible resources in the Petition Area.

The following is a list of individuals interviewed for the CIA. Summaries of their interviews are included in the CIA found in Appendix K:

1. Alice Hewett. President, Ko‘olaupoko Hawaiian Civic Club.
2. Leialoha “Rocky” Kaluhiwa. Practitioner / Member Ko‘olaupoko Hawaiian Civic Club.
3. Mahealani Cypher. Practitioner / Member Ko‘olaupoko Hawaiian Civic Club.
4. Mae Kamamalu Klein. Kumu Hula.
5. Keolaulani Dalire. Kumu Hula.
6. Kauai Dalire. Kumu Hula.
7. Howell “Chinky” Mahoe Jr. Kumu Hula.
8. Richard Pedrina. Kumu Hula.
9. Anthony Kawenaulaokala Mann. Kumu Hula.
10. Kawaikapuokalani Hewett. Lehua Hula.
11. Dr. Lianne Chang. Cultural Practitioner.

4.2.1 Existing Biocultural Resources

To employ the Hawaiian landscape perspective and emphasize the symbiosis of natural and cultural resources, the term “biocultural” is used in the CIA to refer to natural and cultural resources, with additional sub-classifications by attributes. Three broad terms are used to place traditional cultural areas/properties, naturally occurring non-modified features, archaeological features, and other areas of cultural significance within a specific spatial-temporal framework.

Hawaiian epistemology categorizes ecological regions that are referred to as wao (realms). Focus is placed on the following wao most important to this assessment as they relate to the Petition Area and the surrounding Kāne‘ohe region. Specific resources include historic sites; natural resources such as flora, fauna, and natural phenomenon; intangible resources including mo‘olelo, ‘ōlelo no‘eau, and mele; and cultural practices.

1. Wao kānaka: The region, usually from coast to inland plain (exclusive of inland forests), characterized by permanent human occupation, active resource management, and resource modification. This is observable through the presence of archaeological features indicating permanent occupation, including large concentrations of house lot complexes, religious complexes, and fishponds.
2. Wao kele: The inland forest region, including rain-belt forests, characterized by large-scale subsistence systems, active resource management, and resource modification. This is observable through the presence of agriculture-related archaeological features, fewer heiau than the wao kānaka region, and smaller concentrations of house lots.
3. Wao akua: The distant realm inhabited by the gods and demigods, this area was kapu for commoners to enter. Wao akua can include the mountains, mountain tops, and ridges of entire islands and/or regions.

In summary, the general location of the Petition Area is interesting because it is a true wahi pana (storied place). There are many old mo'olelo (stories, legends) written about this region, and some about the features and sites within the Petition Area. In particular, there are stories about the individuals who once lived in the region.

From analysis of the existing resources, oral histories, and mo'olelo, it is determined that this area would be considered “ka wao lā'au” or the place of 'ama'u, a fern upland agricultural zone. While 'ama'u (*Sadleria*) is not currently found in the Petition Area, it may have been at one time. It is possible the introduction of invasive flora and fauna, in addition to ungulates, led to the loss of the species in the area. Ka wao lā'au also generally translates to the realm where ferns grow. 'Ama'u would likely grow in the area, and it is a kino lau (body form) of Kamapua'a, the demigod and king who played a prominent role in the famed history of the area.

4.2.1.1 Cultural History of Kāne'ohe

Kāne'ohe is full of a rich and interesting cultural history, and several mo'olelo and legends are associated with this ahupua'a.

Mo'olelo

Important mo'olelo associated with the Petition Area include those associated with the demigod Kamapua'a. King David Kalākaua describes Kamapua'a as a demigod that is half pig and half man, and is deeply connected to the Windward O'ahu area. He was described as the “traditional monster of Oahu” and “a monster of prodigious bulk and malicious and predatory propensities.” Kamapua'a is the son of Hina and 'Olopana, who was a chief of the island of O'ahu.

'Olopana exiled Kamapua'a from the district, however, Kamapua'a was joined by a large party of miscreants who aided him in exacting revenge against 'Olopana. 'Olopana repeatedly failed to dispose of Kamapua'a and his followers, but Kamapua'a was eventually captured and delivered to 'Olopana. The captured demigod was taken to Kawa'ewa'e heiau, which was erected by 'Olopana and is located in the Petition Area. 'Olopana aimed to sacrifice Kamapua'a at this heiau. Kamapua'a was able to avoid sacrifice and slays 'Olopana with assistance from Hina and Lonoaohi, high-priest of the heiau. The legend of Kamapua'a concludes with the demigod escaping, and setting sail to the windward islands in a fleet obtained from the people of Ewa. The legend regarding Kamapua'a and 'Olopana directly links the demigod to Kawa'ewa'e heiau, and its description as a location of sacrifices designates it as a luakini heiau.

Ruling Chiefs

The genealogy of the ruling chiefs of O'ahu can be traced back to Nana'ulu, the son of Ki'i and Hinako'ulu. The chiefs of Maui and Hawai'i generally trace their genealogy back to 'Ulu, the brother of Nana'ulu, and both the Nana'ulu and 'Ulu genealogies stem from Wakea and Papa.

The lineage of the ruling chiefs of O‘ahu can be followed from Wakea to Kumuhana and Kahahana. The ruling of O‘ahu under separate ali‘i came to an end during the reign of Kumuhana and then Kahahana. In 1795, Kamehameha I sailed with his fleet to O‘ahu and conquered the island during the decisive Battle of Nu‘uanu.

Discussion of the area’s history from the pre-contact period to present was discussed in Section 4.1, and further details are provided in both the AIS in Appendix K and CIA in Appendix L.

4.2.1.2 Historic Sites

Many historic sites identified in the Petition Area have been destroyed or degraded by prior agricultural activities, development initiatives, or invasive plant growth. Kawa‘ewa‘e Heiau is considered the most prominent of these sites. Kawa‘ewa‘e can be translated as referring to a “kind of stone or coral, as used in polishing canoes, or in rubbing off pig bristles.” The site was a luakini heiau, which were heiau dedicated to human sacrifice and prayers by ruling chiefs. The heiau was noted in prior archaeological studies of the Petition Area to be in a degraded condition with few features recognizable.

A hōlua slide was reported to be located adjacent to Kawa‘ewa‘e Heiau. Hōlua was a traditional native Hawaiian game where individuals rode sleds downhill in manmade trenches lined with grass. Covering these trenches with grass allowed the sleds to travel quickly down the slide. Death was the consequence for riders unsuccessful in reaching the bottom of the slide. Prior 19th century archaeological studies were able to locate the site of this slide. However, later archaeological research noted the slide was destroyed by attempts to cultivate pineapple in the Petition Area.

4.2.1.3 Natural Resources

Flora

The vegetation within the Petition Area is a diverse mixture of endemic, indigenous, Polynesian introduced, and invasive plant species. Of the 95 plant species identified, 13 were culturally significant to native Hawaiians and played a role in their daily lives. Mr. Richard Pedrina mentioned the overgrowth of invasive plants in the Petition Area makes it difficult for culturally significant vegetation to flourish as they once did.

Endemic species identified in the Petition Area include Koa (*acacia koa*) trees and ‘Akia (*Wikstroemia oahuensis* var. *oahuensis*) trees and shrubs. Koa was used by native Hawaiians primarily for its wood and bark. This wood was notably used to construct canoes, surfboards, and kāhili poles. Koa was also used for its medicinal properties. ‘Akia bark and roots were used to create a poison for native Hawaiian fishing practices. Berries of this plant were also strung like beads to create lei ‘akia ha‘a ha‘a.

Indigenous plant species found within the Petition Area include the Hala tree (*Pandanus tectorius*), Pala‘a (*Sphenomeris chinensis*), Moa (*Psilotum nudum*), ‘Uhaloa (*Waltheria indica*), and Kā‘e‘e (*Mucuna gigantea*). Hala was extremely important to native Hawaiians with all parts of the plant utilized. For example, leaves were used as thatching for homes while Hala flowers functioned medicinally as a mild laxative. Pala‘a is one of the most abundant native ferns in Hawai‘i and is associated with mo‘olelo of Hi‘iaka, sister of the volcano goddess Pele. Due to an association with Hi‘iaka, native Hawaiians regarded Pala‘a as an emblem to dispel feminine ailments. Pala‘a is also sacred to the hula goddess Laka, with the fern used to decorate hālau hula altars.

Moa fern was occasionally used by native Hawaiians for lei and children’s games. Most Moa specimen are now found in gardens and can be widely distributed due to its propagation through spores. ‘Uhaloa shrub was occasionally used by native Hawaiians as medicine. This shrub remains abundant throughout Hawai‘i and continues to be used for its medicinal value. Kā‘e‘e vine was used primarily for lei making and was occasionally ingested as a purgative.

The five Polynesian-introduced species identified in the Petition Area are extremely important to Hawaiian culture and include Ti (*Cordyline fruticosa*), Niu (*Cocos nucifera*), Mai‘a (*Musa sp.*), Kukui (*Aleurites moluccana*), Hau (*Hibiscus tiliaceus*), and Laua‘e (*Phymatosorus grossus*). These plants were instrumental in many aspects of native Hawaiian life, are widely distributed throughout Hawai‘i, and are not threatened or in danger of extinction. Ti continues to be used primarily for its leaves. However all parts of this plant have been essential to native Hawaiian culture and daily life. For example, Ti leaves were commonly used as lei by hula dancers and were essential in decorating altar of Laka in hālau hula. Ti continues to be regarded as a sacred symbol and an emblem of protection against evil spirits.

Niu was associated with the god Kū. The fronds of Niu trees were used in a variety of ways including lei and recreation. The most important part of this plant was its gourd with all gourd parts used in daily activities. For example, the gourd husk was commonly used as cordage while the gourd itself could be used to craft instruments for hula such as rattles and drums. Native Hawaiians primarily mixed the inner meat of the gourd with Laua‘e fern sap and applied the substance as a perfume for kapa fabric.

Mai‘a was associated with the god Kanaloa and was used as offerings at luakini and māpele (agricultural) heiau. This plant was primarily used for its leaves and fruit. Mai‘a leaves had a variety of uses including lei making, cooking, and burial customs. Hula dancers also wore skirts made from strips of Mai‘a fibers. Mai‘a fruit was not an essential food for ancient native Hawaiians but was easily accessible.

Kukui can be found throughout Hawai‘i and spread so rapidly after introduction that it can be classified as a weed. This plant had a variety of uses ranging from apparel to sports and recreation. For example, processed Kukui nuts was used to dye kapa while roasted kernels of the

nut were inserted into fishing spears and ignited to create a light that attracted fish during night fishing.

Similar to Kukui, Hau is so abundant across Hawai‘i that it has reached invasive status. Native Hawaiian’s used Hau primarily as cordage, with the outer bark removed leaving smooth ribbons that could be braided or twisted. Retention of the bark created stronger cordage. This cordage was used for a variety of uses including apparel, baskets, and children’s toys. The wood, flowers, and bark were also used.

Laua‘e is located throughout the Petition Area. This plant is used in the process of perfuming kapa and is commonly included in lei. Many believe the fern species sighted, *Phymatosorus grossus*, is the species referred to in mo‘olelo. However, all evidence about *P. grossus* suggests the species was introduced in the early 20th century. The name “laua‘e” was originally granted to *Microsorium spectrum*, which is an endemic species similar in size and scent to *P. grossus*. *M. Spectrum* is likely the species mo‘olelo refer to. Laua‘e is regarded as culturally significant to native Hawaiians, despite confusion about the origin of the species.

Fauna

The majority of avifaunal and feral species located within the Petition Area are not culturally significant. The only native species discovered in the Petition Area is the Pacific Golden-Plover (*Pluvialis fulva*), known as the Kōlea. This indigenous shorebird winters on the main Hawaiian Islands from August through April, then migrates to Siberia and western Alaska to breed from April through early August. In the winter, Kōlea reside in a variety of habitat including grassy areas on both urban and undeveloped land. This shorebird plays an important role in many native Hawaiian myths and were believed to be messengers of the gods and divine chiefs. In particular, the Kana mo‘olelo discusses how the Kōlea and ‘Ulili (*Tringa incana*) are sent by the Moloka‘i chief Kapepe‘ekauila to reconnoiter before battle.

Other Environmental Features

Native Hawaiian’s held specific beliefs about Hawai‘i’s natural phenomenon. Beliefs specific to the Kāne‘ohe ahupua‘a’s natural phenomenon concern area rain and winds. These beliefs exist as mo‘olelo.

Mo‘olelo, ‘ōlelo no‘eau (traditional sayings), mele, oli (chants), etc., associated with the particular rain name provide insight into the importance and cultural significance that the different types of rains have to the Native Hawaiian people. Native Hawaiian cultural belief holds that rain can be distinguished into different types based on its intensity, duration, and other characteristics. Specific rainfall types that occur within the Kāne‘ohe ahupua‘a include ‘Āpuakea, Kāhikohala, Kua‘o‘e, Mololani, Nihipali, Pō‘ailau‘awa, and Pōpōkapa rains.

According to native Hawaiian legend the wind god, La‘amaomao, used his gourd to control the winds. His descendants could also control the winds by chanting their specific names, which recalled particular winds from La‘amaomao’s gourd. Each wind name is associated with an ahupua‘a or place. The name of the wind associated with Kāne‘ohe is Ulumano, which translates literally to “blowing hard”. The Ulumano wind is characterized as a strong wind blowing from a given direction in each locality, such as a strong southeast wind at Kāne‘ohe.

Intangible Cultural Resources

‘Ōlelo no‘eau are another source of cultural information about the area, and literally means “wise saying.” They encompass a wide variety of literary techniques and multiple layers of meaning common in the Hawaiian language. These wise sayings can provide an understanding of the everyday thoughts, customs, and lives of the individuals that created them. Three ‘ōlelo no‘eau are relate to Kāne‘ohe and the place names within this ahupua‘a.

1. Hopu hewa i ka ‘āhui hala o Kekele.
[One] grasps the pandanus cluster of Kekele by mistake.
Said of one who meets with disappointment. A play of hala (to miss or to be gone). The hala cluster is often used figuratively to refer to the scrotum. Kekele is a grove at the base of Nu‘uanu Pali.
2. Kini Kailua, mano Kāne‘ohe.
Forty thousand in Kailua, four thousand in Kāne‘ohe.
A great number. Said by a woman named Kawaiho‘olana whose grandson was ruthlessly murdered by someone from either Kailua or Kāne‘ohe. She declared that this many would perish by sorcery to avenge him. Another version credits Keohokauouli, a kahuna in the time of Kamehameha, for this saying. He suggested sorcery as a means of destroying the conqueror’s O‘ahu enemies.
3. Na hala o Kekele.
The hala grove of Kekele.
This grove, famous for the variety and fragrance of its hala, was found at the foot of Nu‘uanu Pali. Some people declare that although the hala trees have been cut down for many years, they can still smell the fragrance in the breeze as they pass at night.

Three mele associated with Kāne‘ohe were identified. One mele was written by Louise Hart Hopkins in 1939 to honor her home, Halekou, nestled in the beautiful Ko‘olaus. Another mele was written in the 1930’s to commemorate the installation of electricity in Kāne‘ohe. This mele also told of a delightful love affair on the windward side of O‘ahu. The third mele detailed two lovers who play among the waterfalls in the Ko‘olau mountain range of O‘ahu’s windward coast.

4.2.1.4 Cultural Practices

Prior to contact and modernization, a range of cultural practices took place in the general Petition Area. These practices would have been predominantly related to traditional agriculture and aquaculture, and were obstructed beginning in the 19th century by western modernization.

The presence of Kawa'ewa'e Heiau, a luakini heiau, signifies cultural practices involving sacrifice and religion occurred in the Petition Area in the pre-contact era. Mo'olelo concerning this heiau discuss these sacrificial practices. Members of the Ko'olaupoko Hawaiian Civic Club have served as the caretakers of the heiau and the surrounding area to the extent possible. Civic Club members have expressed concerns about accessibility to the heiau for kūpuna. Kawa'ewa'e heiau currently requires extensive clearing given the widespread growth of invasive flora. Community members would be interested in assisting with heiau maintenance if the site was cleared of invasive trees and brush.

Various cultural practitioners interviewed for the 2008 CIA and current CIA noted the Petition Area is a valued source of hula related plants including Laua'e and Pala'a fern as well as plants with traditional medicinal value. Dr. Lianne Chang noted that Laua'e found in the Petition Area are especially valued because of the high quality of their color and scent. Dr. Chang and a number of other cultural practitioners mentioned accessing the Petition Area to gather culturally significant plants from Lipalu Street.

4.2.2 Potential Project Impact and Mitigation

No Action Alternative

The No Action Alternative should not result in adverse impacts to native Hawaiian cultural resources or practices in the Petition Area. The Petition Area would remain undeveloped under this alternative. As a result, culturally significant flora such as Laua'e and Pala'a fern would continue to be found in areas where they are currently present. However, interviewees noted the overgrowth of invasive vegetation in the Petition Area negatively impacts its suitability as a habitat for these plants. Therefore, invasive vegetation could significantly impact the availability of Laua'e and Pala'a fern.

The Kōlea is the only culturally significant faunal resource found in the Petition Area. Kōlea present in the Petition Area would not be impacted under this alternative as the area would continue to provide potential habitat for this species.

No adverse impacts to historic properties previously identified or new sites identified are anticipated under this alternative. The Petition Area where historic sites are located would remain undeveloped and subject to effects from natural conditions. Access to Kawa'ewa'e heiau would continue to be difficult for kūpuna or become worse with overgrowth. Continued erosion would occur from significant rainfall or storms, impacting existing sites as discussed in Section 4.1. Several of the sites identified were documented in poor condition due to natural erosion along with thick vegetation growth. Therefore, these sites would continue to be negatively impacted by these conditions.

Intangible cultural resources including mo‘olelo, ‘ōlelo no‘eau, and mele would not be impacted under the No Action Alternative. Of these intangible resources, only mo‘olelo related to Kawa‘ewa‘e Heiau are specifically associated with the Petition Area. Although the heiau would not be impacted, the historic site and surrounding area would continue to be overgrown with invasive vegetation.

Proposed Action

Overall, culturally significant resources and practices within the Petition Area would be enhanced by the Proposed Action due to the establishment of the Cultural Preserve supporting cultural practices, cultural landscape restoration, and maintenance and management of resources and historic sites. The Cultural Preserve would be managed under a preservation plan developed jointly by the Ko‘olaupoko Hawaiian Civic Club and the Petitioner that would provide for the long-term maintenance and preservation of resources, which is a beneficial effect.

Grading plans for the cemetery’s expansion would impact flora such as Laua‘e and Pala‘ā because of the extensive cut and fill improvements, and this concern was expressed by practitioners. However, the Cultural Preserve also has similar flora and would provide significant opportunities to improve Laua‘e and Pala‘ā habitat, by providing an area where such resources can be grown and managed in a more accessible and effective manner by the Ko‘olaupoko Hawaiian Civic Club and associated practitioners. As discussed under the No Action Alternative, leaving conditions as they are now may result in a greater threat to the existing flora due to unrestricted growth of invasive vegetation, erosion, along with threats posed from unauthorized recreational activities and trespassers. Landscaping plans created as part of the project design can also provide opportunities to allow seeds or cuttings from extant endemic plants to be collected and grown or replanted within the Cultural Preserve as part of cultural landscape restoration efforts.

Interviews with practitioners identified no traditional and customary practices associated with fauna in the Petition Area that would potentially be impacted by the project. As previously discussed and in Chapter 3, fauna present are alien species and deleterious to native ecosystems and their dependent species (e.g. feral pigs, rats). The Kōlea would continue to be the only culturally significant avian species occurring within the Petition Area. Grassed landscaped areas within the cemetery expansion area would provide a more suitable foraging habitat for Kōlea, resulting in a beneficial effect on this species. Existing forested areas of the Petition Area do not provide suitable habitat and expose Kōlea to predators (e.g. mongoose).

Numerous native Hawaiians expressed concerns about Kawa‘ewa‘e Heiau and surrounding historic sites and features present. Based upon information provided by the updated AIS, the project would have an overall positive and beneficial impact on previously identified and newly identified sites within the Petition Area and through establishment of the Cultural Preserve. Several of the historic sites that would be impacted by grading plans for the cemetery expansion

were determined to require no further work due to their historic function and poor remnant condition. Other sites impacted by grading plans were recommended for data recovery, after which the sites can be demolished. Other sites would be avoided and thus preserved.

A total of 10 sites would be within the Cultural Preserve, including the important Kawa'ewa'e Heiau. These sites within the Cultural Preserve would benefit from project implementation. Cultural landscape restoration, restoration of historic sites, and cultural practices would have a beneficial effect on these sites. The preservation plan developed for this preserve would ensure the proper long-term management and maintenance of sites.

The intangible cultural resources in the project area consist of historic mo'olelo ('Olopana and Kamapua'a) associated with the heiau and cultural practices. There are no impacts to these intangible cultural resources as the heiau will be conserved and better managed through the Cultural Preserve.

The other intangible cultural resources related to traditional and customary practices are associated with hula. The area designated for protection as a Cultural Preserve has been utilized by Kumu Hula for generations. Laua'e groves, Pala'a, Ti, Kūkui, Palapalai, and other hula plants grow in the area. Kumu Hula access the area, care for the area and its resources, use these resources to make lei, dye, medicine, and for other practices. They also teach these practices to their students. The area is important for perpetuating customary practices. Establishment of the Cultural Preserve allows for the restoration, management, and continued cultural practices to occur under the preservation plan to be developed. This would result in a beneficial effect on traditional and customary practices.

Some of the interviewees and groups consulted shared concerns regarding trespassers in the area. As a result, the Petitioner is considering erecting a fence around the perimeter of the Petition Area to keep out squatters, unauthorized paintball activities, and other trespassers that could harm cultural resources in the area.

Erecting a fence could both positively and negatively impact the valued resources in the project area. The positive impacts would be that it would keep trespassers out. Fences could also help to keep destructive and predatory feral mammals out of sensitive areas, like the seep area that serves as habitat for the endangered Damsselfly. The negative impacts would be that it could also deter cultural practitioners from easily accessing resources they have utilized for many years and generations.

Cultural practitioners would have access to the Cultural Preserve via the main entrance to HMP and an access path planned from the expanded cemetery's internal roads. This access would potentially provide a more convenient and accessible path to the Cultural Preserve and heiau. The exact location of the access would be determined as part of final grading plans developed for the cemetery expansion. However, a preliminary route is shown on grading plan figures in Chapter 2. Another option is to allow continued access from the end of Lipalu Street. However,

access to the heiau would not be improved because that area would remain and serve as a buffer from the cemetery. Thus, this access may potentially be a more difficult (slope) and inconvenient (unimproved) route for practitioners to use in the long-term. In addition, access would need to be gated at this location to restrict unauthorized access, and there may be concerns with uncontrolled distribution of access (e.g. duplicate keys).

Proposed Mitigative Measures

The following recommended mitigative measures are based on information gathered during the preparation of the CIA. Implementation of these measures can mitigate adverse impacts from the project on native Hawaiian cultural beliefs, practices, and resources.

1. Establish the proposed Cultural Preserve and support development of a preservation and management plan that includes participation by cultural advisory groups, the Ko'olaupoko Hawaiian Civic Club, and the Petitioner to foster appropriate cultural management of the preserve.
2. Follow recommendations for all historic sites presented in the AIS prepared for this project.
3. Continue to allow cultural practitioners to access the Cultural Preserve under the management guidelines established by the future preservation plan.
 - a. Create safe access for kūpuna and practitioners to the heiau while limiting access from trespassers who could potentially degrade and harm the site and resources.
 - b. A managed (gated and restricted) access can continue from Lipalu Street. However, a proposed new pathway through the expanded cemetery can be evaluated by the Ko'olaupoko Hawaiian Civic Club with the Petitioner to determine if it would be a better and more convenient alternative.
4. The preservation and management plan should address the following:
 - a. Allow community members and organizations to engage in regular maintenance of Kawa'ewa'e Heiau and the surrounding cultural landscape and historic sites.
 - b. Work with the community to develop educational and interpretive programs.
 - c. Work with practitioners to protect culturally significant hula and medicinal plants.
5. Allow for restoration of the cultural landscape including but not limited to 'auwai and historic terraces. The 'auwai associated with the well and seep (Honua 3 site) could be included in restoration and management activities.

4.3 SOCIAL AND ECONOMIC FACTORS

4.3.1 Social Factors

Kāneʻohe Overview

The Kāneʻohe community is located on the windward side of the island of Oʻahu, about 8 miles northeast of urban Honolulu. According to the 2016 American Community Survey, Kāneʻohe had a total resident population of 35,065 persons. This suburban community extends north to south from the Haiku Road area near Windward Mall to the H-3 Freeway. The community is generally bounded by the foothills of the Koʻolau Mountains at its mauka extent down to the shoreline that rings Kāneʻohe Bay on its makai boundaries.

This community is comprised predominantly of 29 residential subdivisions. The subdivisions are made up primarily of single-family homes and a smaller number of townhomes and multi-family developments. The Pikoiloa Subdivision is located most proximate to the Petition Area and is located immediately west. This roughly 240-acre subdivision is comprised of single-family homes. Properties in the subdivision along Ohaha Street, Ohaha Place, and Lipalu Street share a common boundary with the Petition Area.

James B. Castle High School is located on the eastern boundary of the subdivision along with the Windward City Shopping Center. Recreational amenities within this subdivision include Kaluapuhi Neighborhood Park.

Kāneʻohe Town is the business and commercial center for this community. This area generally consists of street blocks along Kamehameha Highway between Keaahala Road and Haiku Road and street blocks along Kahuhipa Street. Many of Kāneʻohe Town's retail establishments are located at Windward Mall, Kāneʻohe Bay Shopping Center, and Windward City Shopping Center. There are also several smaller retail centers with multiple tenants generally located along Kamehameha Highway. Other commercial and retail establishments are found within low-rise commercial buildings located along Kamehameha Highway and Kahuhipa Street. A number of light industrial uses are also located in Kaneʻohe Town, with many situated within the Kahuhipa Street area. These industrial uses include auto dealerships, hardware supply stores, and warehouses.

4.3.1.1 Kāneʻohe Demographic Profile

Demographic information from the 2000 and 2010 U.S. Decennial Census, the 2016 American Community Survey (ACS), and the City DPP were examined to understand past, present, and future demographic characteristics of the Petition Area. ACS data examined also includes information on income and employment.

In the State of Hawai‘i, the U.S. Census Bureau does not report data for “incorporated places” (commonly called “cities”) as it does in most of the U.S. Instead, the Census Bureau, through an agreement with the State of Hawai‘i, recognizes “census designated places” (CDP). There are 151 CDP in Hawai‘i that include the Kāne‘ohe CDP. HMP and the Petition Area are located in this CDP, which also includes census tracts 103, 105, 106, and 107. Discussion of the demographic characteristics of “Kāne‘ohe” is represented by data for this CDP.

The Kāne‘ohe CDP includes households and individuals living in close proximity to the Petition Area, and thus represent the population that would likely be affected by project-related impacts. Table 4.6 provides a summary comparing census data from 2000 to 2016 for the Kāne‘ohe CDP to show changes that have occurred over this timeframe. Table 4.7 provides a summary comparing 2016 census data for the Kāne‘ohe CDP with similar data for Honolulu (O‘ahu) County. Demographic trends are discussed in the following sections.

Population Trends

The earliest census of Ko‘olaupoko moku, which includes Kāne‘ohe, occurred in 1831 (Devaney et al, 1982). Kāne‘ohe’s population was 1,159 individuals at this time, comprising the dominant portion of Ko‘olaupoko’s 3,019 residents. The population of Ko‘olaupoko would decline in the latter half of the nineteenth century, largely due to widespread sickness in the area that reduced Ko‘olaupoko’s population to its lowest point at 2,028 individuals in 1872. The area’s population would increase slightly by the twentieth century due to individuals moving to Ko‘olaupoko to work in area agriculture and mariculture operations. Ko‘olaupoko’s population would increase steadily from this period to the present.

The Ko‘olaupoko area experienced significant population growth in the years following World War II. The most dramatic population growth occurred in the decade from 1940-1950 when the area population more than doubled, and in the years from 1950-1960 when the population nearly tripled. Ko‘olaupoko’s population increased notably by 30,000 individuals from 1960–1970, although the associated growth rate of 53% was comparatively smaller than prior decades. Population growth during these decades highlighted the rapid urbanization of Ko‘olaupoko communities such as Kāne‘ohe during the mid to latter half of the twentieth century. By 1970, Kāne‘ohe’s population would number 29,903 individuals who constituted 32% of Ko‘olaupoko’s total population.

Recent population growth in Kāne‘ohe has been comparatively slower than prior decades, growing an average of 5.73% per decade from 1970 to 2000. By 2000, Kāne‘ohe’s population numbered 34,970 individuals. Since 2000, Census data indicates the resident population has been stable fluctuating a little from 2000 to 2016 as shown on Table 4.6. The lack of significant growth in the population during this period may be attributed to a slight decrease in the number of Kāne‘ohe housing units. A decrease in housing units within the community would decrease opportunities for resident movement into Kāne‘ohe, limiting population growth.

Table 4.6
Comparison of Kāneʻohe Community Demographic Data (2000 and 2016)

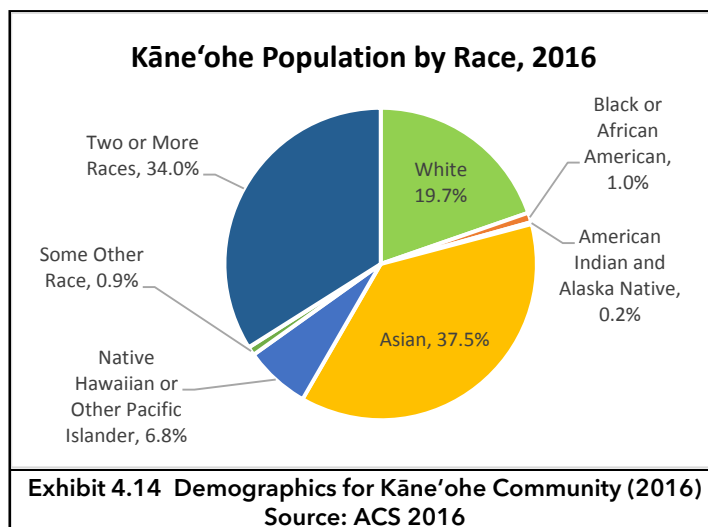
Description of Demographic Data	Kāneʻohe CDP 2000		Kāneʻohe CDP 2016	
	Number	Percent	Number	Percent
POPULATION	34,970		35,065	
AGE				
Under 5 Years	2,015	5.8	1,866	5.3
5 to 19 Years	7,383	21.1	5,354	15.3
20 to 64 Years	20,417	58.4	21,063	60.1
65 Years and Older	5,155	14.7	6,782	19.3
Median Age	38		42.1	
RACE				
White	7,166	20.5	6,905	19.7
Black or African American	285	0.8	337	1.0
American Indian and Alaska Native	69	0.2	65	0.2
Asian	13,456	38.5	13,165	37.5
Native Hawaiian or Other Pacific Islander	3,999	11.4	2,385	6.8
Some Other Race	237	0.7	299	0.9
Two or More Races	9,758	27.9	11,909	34.0
HOUSEHOLDS	10,976		10,775	
Family Households	8,680	79.1	8,393	77.9
Non-Family Households	2,296	20.9	2,382	22.1
Households with Individuals Under 18 Years	4,443	40.5	3,428	31.8
Average Owner Household Size	3.19		3.36	
Average Renter Household Size	3.03		2.81	
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	11,472		11,218	
Occupied Housing Units	10,976	95.7	10,775	96.1
Occupied Housing Units	10,976		10,775	
Owner-Occupied Housing Units	7,473	68.1	7,446	69.1
Renter-Occupied Housing Units	3,503	31.9	3,329	30.9
EMPLOYMENT STATUS				
Population 16 Years and Older	27,510		28,981	
In Labor Force	17,890	65.0	18,951	65.4
Not in Labor Force	9,620	35.0	10,030	34.6
INCOME				
Total Households	10,984		10,775	
Less than \$10,000	463	4.2	217	2.0
\$10,000 to \$49,999	3,368	30.7	2,215	20.6
\$50,000 to \$99,999	4,497	40.9	3,495	32.4
\$100,000 or More	2,656	24.2	4,848	45.0
Median Household Income	\$66,006		\$92,257	
Source: U.S. Census Bureau, Census 2000 and ACS 2016				

Table 4.7
Comparison of Kāneʻohe with Oʻahu Community Demographic Data (2016)

Description of Demographic Data	Kāneʻohe CDP 2016		Honolulu County 2016	
	Number	Percent	Number	Percent
POPULATION	35,065		986,999	
AGE				
Under 5 Years	1,866	5.3	64,745	6.6
5 To 19 Years	5,354	15.3	171,203	17.3
20 To 64 Years	21,063	60.1	594,551	60.2
65 Years And Older	6,782	19.3	156,500	15.9
Median Age	42.1		37.4	
RACE				
White	6,905	19.7	208,830	21.2
Black or African American	337	1.0	23,334	2.4
American Indian and Alaska Native	65	0.2	1,464	0.1
Asian	13,165	37.5	423,405	42.9
Native Hawaiian or Other Pacific Islander	2,385	6.8	92,920	9.4
Some Other Race	299	0.9	8,448	0.9
Two or More Races	11,909	34.0	228,598	23.2
HOUSEHOLDS	10,775		309,548	
Family Households	8,393	77.9	218,344	70.5
Non-Family Households	2,382	22.1	91,204	29.5
Households With Individuals Under 18 Years	3,428	31.8	104,822	33.9
Average Owner Household Size	3.36		3.24	
Average Renter Household Size	2.81		2.86	
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	11,218		342,982	
Occupied Housing Units	10,775	96.1	309,548	90.3
Occupied Housing Units	10,775		309,548	
Owner-Occupied Housing Units	7,446	69.1	170,220	55.0
Renter-Occupied Housing Units	3,329	30.9	139,328	45.0
EMPLOYMENT STATUS				
Population 16 Years And Older	28,981		796,215	
In Labor Force	18,951	65.4	526,530	66.1
Not In Labor Force	10,030	34.6	269,685	33.9
INCOME				
Total Households	10,775		309,548	
Less than \$10,000	217	2.0	15,338	5.0
\$10,000 to \$49,999	2,215	20.6	79,735	25.8
\$50,000 to \$99,999	3,495	32.4	99,504	32.1
\$100,000 or More	4,848	45.0	114,971	37.1
Median Household Income	\$92,257		\$77,161	
Source: U.S. Census Bureau, ACS 2016				

Demographic Composition

Currently, residents of Asian ancestry comprise the largest proportion of Kāneʻohe residents (37.5%) as shown in Exhibit 4.14. Individuals with ancestry from two or more races (34%) and Caucasians (Whites) (19.7%) comprise the other dominant categories of Kāneʻohe residents by race. In particular, the proportion of individuals reporting ancestry from two or more races has increased since 2000. The proportion of Native Hawaiian or other Pacific Islanders individuals has decreased from 11.4% to 6.8% during this time period.

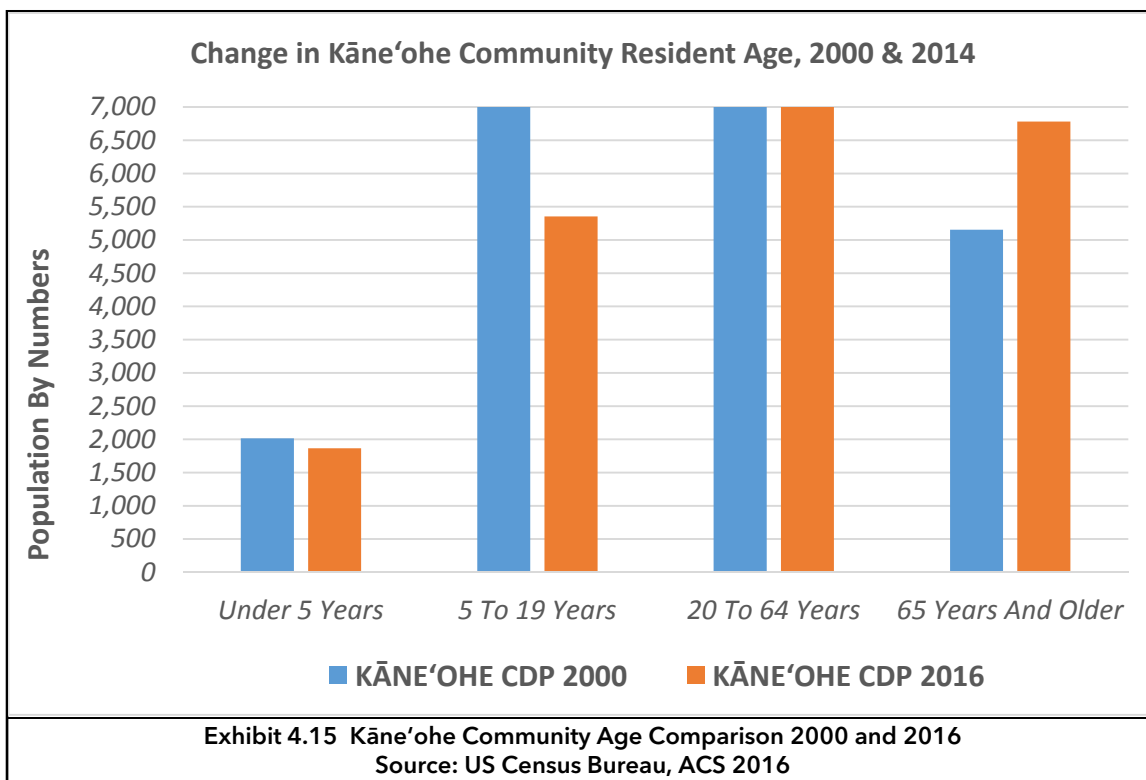


The racial distribution of Oʻahu is similar to Kāneʻohe's. Like Kāneʻohe, Asians comprise the largest percentage of Oʻahu's population (42.9%), followed by individuals of two or more races (23.2%) and Caucasians (21.2%). The population racial distribution differs in that individuals with ancestry from two or more races comprise a larger proportion of Kāneʻohe's population (34%) compared to Oʻahu as a whole (23.2%). Additionally, Native Hawaiians or other Pacific Islanders comprise a larger proportion of Oahu's population at 9.4% compared to 6.8% within Kāneʻohe.

Demographic data suggests Kāneʻohe's resident population has aged in the period between 2000 and 2016. As shown on Table 4.6, the median age in 2000 was 38, increasing to 42.1 in 2016. The resident population aged 65 and older has also steadily increased from 14.7% to just over 19% in 2016, while the proportion of individuals between the ages of 5 and 19 years has decreased from 21.1% to 15.3%. Exhibit 4.15 graphically compares census data between 2000 and 2016 by age groups. The increase in the proportion of individuals 65 years and older is notable, increasing from 14.7% of the population in 2000 to 19.3% in 2016. Evaluated collectively, this data suggests Kāneʻohe's community is "maturing."

This trend may be attributable to minimal growth in new residential developments, that would allow new and younger families to move into Kāneʻohe. This can be attributed to minimal area available to accommodate new development, especially larger housing projects. Unless there is an increase in allowable residential development densities, this community is essentially fully developed from the Kāneʻohe Bay shoreline mauka to the H-3 Freeway. Other mauka areas below the Koʻolau Mountain Range are Conservation District designated lands. Without growth in Kāneʻohe's housing stock, new families and individuals relocating to the community would have to acquire existing residences. These existing residences are higher in cost, making it more difficult for younger families to purchase. The aging of Kāneʻohe's population combined with

low population growth suggests trends observed would continue, with the community's population transitioning to an older population, with no overall growth.



While the overall distribution of Kāneʻohe's population by age is similar to Oʻahu, demographic data suggests Kāneʻohe's population as a whole is comparatively older. For example, the median age of Kāneʻohe residents in 2016 was 42.1 while the median age of Honolulu residents was 37.4. In 2016, Oʻahu had a greater proportion of individuals less than 5 years of age (6.6%) and 5 to 19 years of age (17.3%) compared to Kāneʻohe, indicating that Kāneʻohe's population was comparatively older. The proportion of individuals 65 years and older in Kāneʻohe was 19.3% in 2016, which is relatively higher than the proportion of individuals in the same age grouping for Oʻahu (15.9%).

Housing Characteristics

From 2000 to 2016, the total number of housing units in Kāneʻohe decreased by 254 units, indicating that housing units have exited the community housing market. The proportion of occupied units has increased slightly during this period. In 2016, Kāneʻohe had a total of 11,218 housing units. The majority of these units are occupied (96.1%) with 68% of units owned rather than rented by their occupants. The dominant proportion of Kāneʻohe housing units were constructed between 1960 and 1969 (29.3%). In contrast, only 1.3% of Kāneʻohe units were constructed within the last decade. When evaluated as a whole, this data suggests that

development in Kāneʻohe has not kept pace to replace the number of units that have exited the market. Housing occupancy has remained steady during this period.

In 2016, Kāneʻohe's housing occupancy rate of 96.1 percent was comparatively higher than Oʻahu's occupancy rate of 90.3. A greater proportion of Oʻahu housing units were held by renters while Kāneʻohe's housing units were primarily owned by their occupants. Comparisons between Kāneʻohe and Oʻahu occupancy statistics support trends observed in prior decades that Kāneʻohe's housing stock has not grown, and the majority of units are owner-occupied. The comparatively greater proportion of owner occupants in Kāneʻohe may be associated with the community's greater proportion of higher income earners.

The average size for owner households has changed little from 2000 to 2016 at about 3.36 individuals while the average size of renter households has decreased from 3.03 to 2.81 individuals. During this time period, the proportion of households with individuals under 18 years of age (31.8%) has decreased notably by 8.7%. In contrast, Honolulu County has a slightly greater proportion of households with children under age 18 (33.9%). This data may support prior conclusions that Kāneʻohe's population is stable and aging, since the number of households with dependent children has decreased as children of families have grown older. This may reflect the number of family households in the community decreasing while average household size remains constant.

Employment and Household Income

The number of employment aged residents in the Kāneʻohe area in the labor force remained constant at around 65% in 2000 and 2016. Around 97% of employment aged residents were in the civilian labor force in both years, with the remainder employed by the armed forces. These participation rates are comparable to Honolulu County as a whole, which had a comparable employment rate of 66%. Between 2000 and 2016, the proportion of the Kāneʻohe residents in the work force increased by just over 1% while the unemployment rate decreased by a similar percentage. This data suggests that Kāneʻohe has stable rates of employment.

The median income reported for Kāneʻohe households increased from \$66,006 to \$92,257 from 2000 to 2014, a 39% increase. The median income of Honolulu residents only increased by 28% during this period. The proportion of households in Kāneʻohe earning below \$49,999 annually decreased from 34.9% to 22.6% from 2000 to 2016, and households reporting income within higher earning categories increased notably during this period. For example, the percentage of households earning in excess of \$100,000 annually increased from 24.2% to 45%. This data indicates that Kāneʻohe households and Oʻahu households as a whole are earning more annually relative to 2000 earning data. However, analysis of individual annual income categories indicates that the proportion of higher income earning households increased during this time while the proportion of households earning comparatively less annually decreased. This data suggests that Kāneʻohe has become more affluent during the period examined.

4.3.1.2 Future Changes to Kāneʻohe’s Demographic Profile

Future changes to Kāneʻohe demographics would generally reflect projected changes to community resident population and housing characteristics. The City DPP develops socio-economic projections for City development plan areas based upon the State Department of Business, Economic Development and Tourism’s (DBEDT) long-range socio-economic projections. DPP currently projects socio-economic conditions to the year 2035 and further develops projections for subareas of each development plan area. The Koʻolaupoko development plan area has five subareas: 1) Kahaluʻu; 2) Kāneʻohe; 3) Kailua; 4) Waimanalo; and 5) Mōkapu (Kāneʻohe Marine Corps Hawaiʻi).

Based upon DPP’s projections, Kāneʻohe’s resident population is projected to only increase moderately by about 5.6% from 2016 to 2035 (19 year period). As indicated in Exhibit 4.16, this projected growth rate is comparatively lower than population growth anticipated for the Koolaupoko Development Plan area as a whole and significantly lower than projections for high growth areas like Kapolei. Kaneʻohe’s comparatively

low rate of population growth reflects a community that is anticipated to be relatively stable, aligning with patterns observed in demographic data.

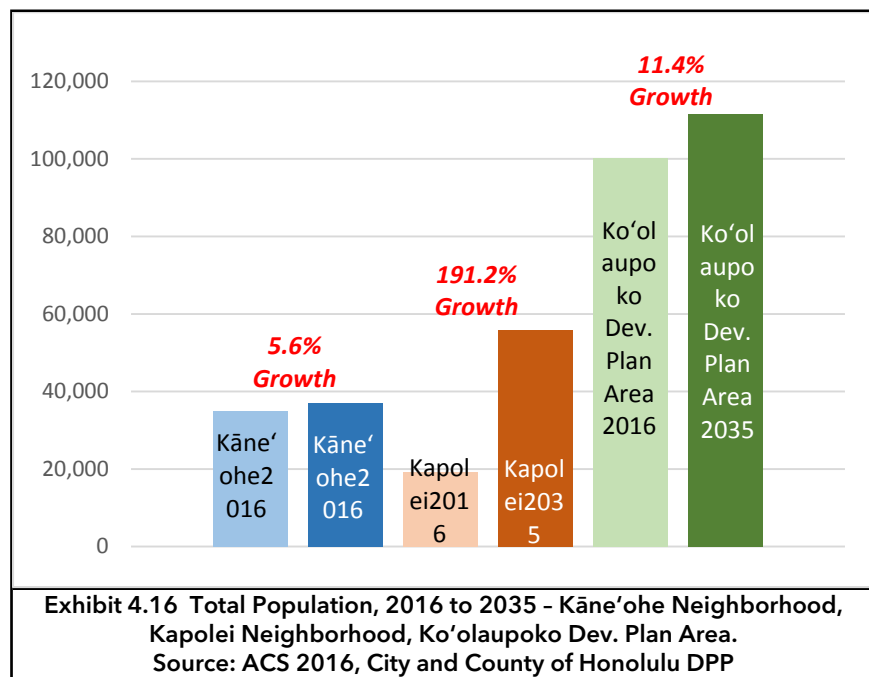
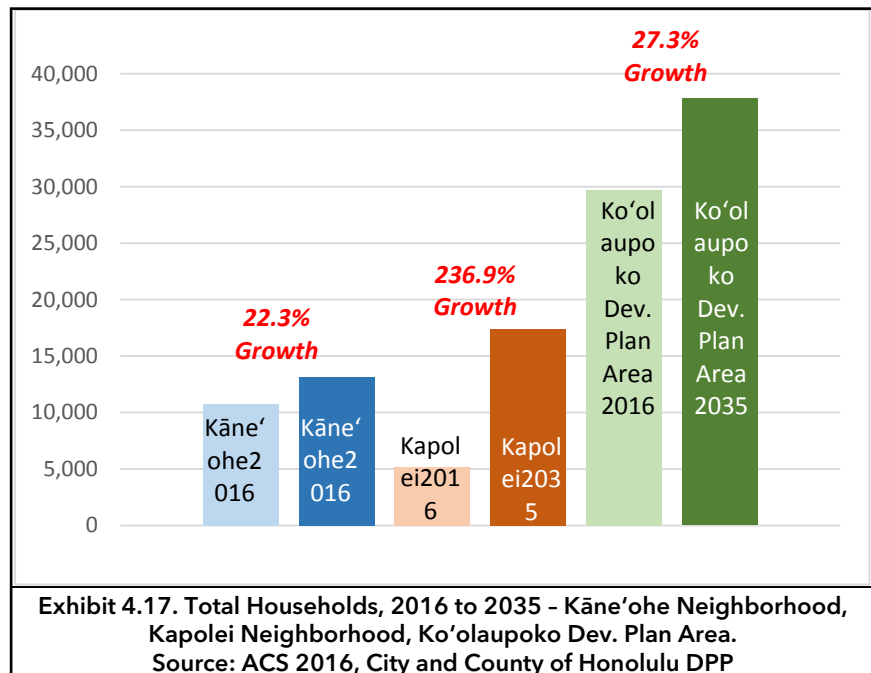


Exhibit 4.17 compares changes in the total number of households from 2016 to 2035 for Kāneʻohe and the areas previously analyzed. In Kāneʻohe the total number of households would increase in tandem with the neighborhood's population by 22.3%, a growth rate slightly lower than growth seen for the Koʻolaupoko area as a whole. The growth in the number of households is comparably lower than the projected increase in households for Kapolei. Similar growth patterns are observed for the projected increase in the number of housing units in these areas. The number of housing units in Kāneʻohe is projected to increase by 22.1% which is four percentage points lower than the anticipated growth rate for Koʻolaupoko as a whole. Similar to previous patterns observed, the growth rate in housing units for Kāneʻohe is significantly smaller than the 260.9% growth rate anticipated for Kapolei.



Projected growth in Kāneʻohe's population, housing units, and households are relatively lower than projections observed for high growth communities like Kapolei. Growth patterns for Kāneʻohe neighborhood characteristics are slightly lower to those of the larger Koʻolaupoko area. Existing census data for Kāneʻohe suggests neighborhood growth is currently stable. Demographic projections suggests Kāneʻohe will continue to grow at a stable rate that is comparably lower than the growth of the surrounding community and Oʻahu's high growth neighborhoods.

Projected growth in Kāneʻohe's population, housing units, and households are relatively lower than projections observed for high growth communities like Kapolei. Growth patterns for Kāneʻohe neighborhood characteristics are slightly lower to those of the larger Koʻolaupoko area. Existing census data for Kāneʻohe suggests neighborhood growth is currently stable. Demographic projections suggests Kāneʻohe will continue to grow at a stable rate that is comparably lower than the growth of the surrounding community and Oʻahu's high growth neighborhoods.

4.3.1.3 Heritage Sensitivity Concerns

As discussed previously, over 41,000 individuals are presently interred at HMP. Less than 6% of HMP's burial plots remain unsold and could be exhausted in about 5 years. Anticipated near-term depletion of available burial plots at HMP pose significant concerns in how HMP and cemeteries statewide would accommodate future demand for burial space. In particular, near-term depletion of HMP burial space constrains the capacity of families that own and/or are interred at HMP to plan for the interment of relatives in the same location as other deceased family members.

While other cemeteries exist on Oʻahu, the interment of deceased family members across multiple cemeteries presents heritage sensitivity issues related to visitation and remembrance activities. While cremation has become the dominant method of post-death care for Hawai'i