

BEFORE THE LAND USE COMMISSION

LAND USE COMMISSION
STATE OF HAWAII

OF THE STATE OF HAWAII

2019 JUN 19 A 10:42

In the Matter of the Petition of)	DOCKET NO. A17-804
)	
HAWAIIAN MEMORIAL LIFE PLAN, LTD.)	HAWAIIAN MEMORIAL LIFE
)	PLAN, LTD.
To Amend The Conservation Land Use)	
District Boundary Into The Urban Land Use)	
District For Approximately 53.449 Acres Of)	
Land At Kāne'ōhe, Island of Oahu, State of)	
Hawai'i, Tax Map Key: (1) 4-5-033: por. 001)	
_____)	

**SECOND AMENDMENT TO PETITION FOR LAND USE
DISTRICT BOUNDARY AMENDMENT**

VERIFICATION

EXHIBITS "8", "9" AND "10"

**AFFIDAVIT OF SERVICE OF SECOND AMENDMENT TO PETITION
FOR LAND USE DISTRICT BOUNDARY AMENDMENT**

**AFFIDAVIT OF SENDING SECOND AMENDED NOTIFICATION OF PETITION
FILING**

CERTIFICATE OF SERVICE

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 HAWAIIAN MEMORIAL LIFE
 PLAN, LTD.

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SECOND AMENDMENT TO PETITION FOR LAND USE
DISTRICT BOUNDARY AMENDMENT

TO THE HONORABLE LAND USE COMMISSION OF THE STATE OF HAWAII:

HAWAIIAN MEMORIAL LIFE PLAN, LTD. (“Petitioner” or “HMLP”) by and through its attorneys, MATSUBARA, KOTAKE & TABATA, respectfully submits this Second Amendment to Petition for Land Use District Boundary Amendment to amend the Petition For Land Use District Boundary Amendment filed November 13, 2017 (“Petition”) to include the following facts and exhibits, and to incorporate by reference said facts and exhibit within the Petition:

1. **DRAINAGE AND GRADING.** A Preliminary Engineering Report (PER) was prepared by Sam O. Hirota, Inc. that addressed water, wastewater and drainage infrastructure (SOH, 2018). The PER is attached to the First Amendment to Petition for

Land Use District Boundary Amendment filed May 10, 2019 (“First Amendment to Petition”) as a part of Exhibit “6”.

Existing municipal drainage facilities are available within the residential subdivisions surrounding HMP and within the subdivisions below the Petition Area. These facilities were generally developed as part of existing residential subdivisions. The municipal system generally consists of various storm drains within roadways, inlets, and catch basins that collect runoff from the street.

Existing Drainage System Serving Petition Area

Within the Petition Area, stormwater runoff generally sheet flows downslope in a north-northwesterly direction following natural ephemeral drainageways and lower lying areas based upon the site’s current topography. Stormwater sheet flowing toward the Pikoiloa subdivision is first collected by City-constructed drainage swales located within the backyards of residences. This system of swales was designed to collect and convey stormwater to existing City catch basin structures. Each property owner is responsible for maintaining the portion of the drainage swales within their property.

Approximately six catch basins identified along the Petition Area border the residential properties, with two larger structures situated at the end of Lipalu Street and Ohaha Place. Prior inspection of these swales indicated they were poorly maintained with residents noting flooding has occurred when the swales became overwhelmed.

Runoff collected by the municipal system (catch basins) is eventually channeled into Kāwā Stream, and later discharges into Kāneʻohe Bay.

A preliminary engineering report prepared in 2008 for an earlier project proposal (HHF, 2008) obtained hydrology studies from the City and County that were completed as part of the Drainage Master Plans for the Pikoiloa subdivisions. Approved Drainage Master Plans were required to address all stormwater requirements prior to the development of any subdivision. Based on these documents, it appeared that the collection of the existing stormwater runoff quantities from the Petition Area were addressed as part of the development of Pikoiloa 9, Pikoiloa 10, and Parkway Subdivisions via various collection points in the residential areas.

A hydraulic analysis of the drainage system was conducted in 2008 after further evaluation of the existing storm drain infrastructure based upon construction documents recorded with the City. This downstream system was designed to meet current, undeveloped conditions within the Petition Area for the 10-year, 1-hour storm. This system analysis, based on the existing stormwater runoff quantities referenced from Drainage Master Plans and full system hydraulic flow calculations, showed that the existing drainage system was adequate for the current, undeveloped conditions within the Petition Area. However, it may have little excess capacity to accommodate additional peak runoff (HHF, 2008).

Current Evaluation of Petition Area

The undeveloped Petition Area is densely vegetated with large canopy trees in the western portions of the area. During recent field investigations, it was noted the canopy, primarily from invasive albizia trees, prevented sunlight from filtering through. This is prevalent on the western portion of the site, where minimal ground cover is evident and some erosion is occurring. The eastern portion of the site has a smaller canopy trees, more ground cover, and heavy vines over boulders due to more sun exposure.

There are a total of five sub drainage areas (Areas A to E). Area E is the largest and includes the central and eastern portions of the cemetery expansion along with the Cultural Preserve. This area corresponds to the Lipalu watershed that drains into the catchment basin at the end of Lipalu Street. The other four drainage areas serve the smaller western watershed area that discharge into the catchment basin at the end of Ohaha Place.

The Petition Area also consists of offsite drainage areas in addition to onsite drainage areas. Offsite drainage areas include land mauka of the Petition Area, to an elevation of 670 feet MSL. A standard runoff coefficient of 0.35 is assumed for storm events, representing a conservative value for timber lands of moderate to steep slopes. Flows for the 10- and 100-year storms are estimated to be approximately 110 cubic feet per second (cfs) and 174 cfs, respectively.

Proposed Project

The Project will change ephemeral drainageways and drainage patterns within the cemetery expansion area as a result of grading activities; however, this change would not have an adverse effect on overall drainage conditions. The rate of stormwater runoff and the volume of runoff being discharged from the Petition Area would change with the implementation of the Proposed Action. Overall, grading improvements would have a beneficial impact on existing drainage conditions by reducing the velocity and volume of stormwater runoff and improving the quality of water being discharged.

Project improvements proposed would change existing site conditions from undeveloped forest to a predominantly landscaped grass area. Topographic conditions would change to create a more level site with sloped grades of less than 20%.

Therefore, runoff rates are expected to decrease because the reduction in slope and the development of landscaped groundcover would increase permeability. Reduction of stormwater runoff rates would result in a corresponding reduction of runoff volumes. Landscaped groundcover will enhance stormwater infiltration and create a vegetated buffer strip serving as a low impact development (LID) improvement. Stormwater would continue to travel in a north-northwesterly direction downslope through the Petition Area for eventual discharge into the City's existing drainage facilities.

Approximately 2 acres of impervious surface would be added to the Petition Area from development of new roadways. After project implementation, the remainder of the Petition Area would consist of cemetery lands, undeveloped land within the Cultural Preserve, and mountainous terrain mauka of the Petition Area. Project implementation results in a 2% total increase in impervious area within the 92.3 acre drainage area. The Cultural Preserve would remain unchanged and would have minimal change to stormwater runoff.

Projected Change to Runoff Rates and Volumes

New proposed drainage areas are based upon proposed grading plans. The five main drainage areas have been divided into subareas, appropriately named, to graphically show the changes occurring to the site's drainage pattern. Drainage improvements consisting of detention basins are also shown and discussed in more detail below. Projected stormwater runoff rates associated with the project were calculated for the 10-year and 100-year, 1 hour storm events.

The proposed project would result in the reduction of the runoff flow rate due to:

- 1) a decrease in the slope of the large open portion of the site;
- 2) improved site permeability with proposed turf grass landscaping;
- 3) reduced runoff coefficient on an average of 0.25-0.35;
- 4) reduced runoff velocity; and
- 5) increased time of runoff concentration within the Petition Area.

These factors result in a reduction of the 10-year and 100-year storm water flows by 4.2 cfs and 7.9 cfs, respectively.

The resulting decrease in runoff rate would also produce a decrease in runoff volume. Providing a well landscaped, stable surface for stormwater infiltration would contribute to the reduction in the overall volume of water leaving the site. The proposed project would reduce the volume of stormwater runoff by 18,665 cf and 29,180 cf for the 10-year and 100-year storms, respectively. This amounts to a beneficial 5.5% decrease in runoff volumes.

Proposed Drainage Improvements

The City recently adopted new “Rules Relating to Water Quality” under their Administrative Rules, Title 20, Department of Planning and Permitting (August 2017). These new rules address water quality both during the construction and post-construction periods. Under these rules, the cemetery expansion is defined as a “Priority A” project, which involves land disturbance of one or more acres. Post-construction stormwater requirements include: incorporation of appropriate LID strategies and source control BMPs, including on-site retention of the water quality volume (WQV) or biofiltration BMPs for the remaining portion of the WQV not retained on-site.

The WQV is defined as the design storm runoff depth, times the volumetric runoff coefficient, times the drainage management area, times the percentage of impervious area on site. For this calculation, the design storm runoff depth is one inch for basins and the water quality volume is approximately 12,700 cf for the 33.6-acre of

disturbed area within the Petition Area. Therefore, planned drainage improvements include the use of two LID strategies and source control BMPs in order to meet the new requirements: 1) retention/detention basins, and 2) vegetative buffers.

Proposed roadways would be graded to direct runoff to drain inlets located adjacent to these roads. Runoff from drain inlets would be piped through drain lines conveying stormwater to lower portions of the site where three permanent retention/detention basins are proposed. These and other basins would initially be constructed to handle sediment laden runoff resulting from grading activities during construction. Three of these basins proposed for the lower portion of the site would remain as permanent post-construction LID improvements. The basins would function as a detention system and retain stormwater for water quality purpose.

It is projected that an additional 12,700 cubic feet (cf) of storage and infiltration would be accommodated by proposed grading plans. Stormwater from the cemetery expansion would be detained and allowed to infiltrate within permanent detention basins. These basins could retain a temporary pool of water that is designed to drain between storm events. Outlets would be designed to be no smaller than 4 inches in diameter allowing a basin to drain completely within 48 hours when full, and 24 to 36 hours when half full. An emergency spillway would also be designed to allow the basin to safely overtop when experiencing a larger storm event.

Detention basins would reduce the volume of stormwater discharge from the site by an additional 3% for the 100-year, 1-hour storm event. Therefore, the cumulative total decrease in runoff volumes during a 100-year storm event with improved site conditions (reduced rate, infiltration, etc.) and detention basins, would be about 8.5%. Runoff volumes for the 10-year storm would similarly be reduced by about 8.5% in total. A summary description of the detention basins is provided:

1. Detention Basin A. A smaller detention basin of about 1,500 square feet in size is located on the western end of the Petition Area. This basin is intended to detain stormwater runoff for the area along the edge of the Ocean View Garden site and the western edge of the cemetery expansion.
2. Detention Basin B. This detention basin is about 4,500 square feet in size, and is located in the northwest area of the cemetery expansion. This basin is intended to collect stormwater runoff from this western area where the hillside would be excavated, and would drain into the existing drainage culvert behind residences at Ohaha Place.
3. Detention Basin C. This detention basin is about 5,000 square feet in size, and is located in the central area of the cemetery expansion site near the end of Lipalu Street. This basin is intended to generally collect stormwater runoff from the central portion of the Petition Area. This basin would have a drain connecting to the existing drainage culvert at the end of Lipalu Street.

Project development would also result in a vegetated buffer strip between the cemetery and lower lying areas. A vegetated buffer strip is a grassy slope vegetated with turf grass that is designed to accommodate sheet flow and removes pollutants by vegetative filtration.

Stormwater would eventually drain from all detention basins through outlet structures that direct flow to pipes outletting adjacent to existing catchment structures on Lipalu Street and Ohaha Place. No impacts are expected to these catchment structures because of the projected reduction in runoff volume and flow rates. Additionally, construction of the project is not expected to damage existing Lipalu Street and Ohaha Place catchment structures. No work would occur within these catchment structures. However, if any damage occurs they would be repaired to City standards with acceptance by the City.

In summary, proposed improvements would reduce runoff volume by about 8.5% for the 10 and 100-year, 1 hour storm events relative to existing conditions. Given that existing drainage structures presently appear to lack capacity beyond the 10-year storm event they were designed for, proposed improvements would beneficially impact the structures and reduce potential flooding for downstream residences. Based upon proposed drainage improvements, no further mitigative measures are necessary.

2. DEVELOPMENT TIMETABLE. Petitioner intends to commence design and construction of the backbone infrastructure for development of the entire Petition

Area in a single integrated system as soon as all entitlements have been obtained. Design work for improvements would then commence with construction projected to start in 2020. Site grading and infrastructure construction would likely occur in phases, possibly in successive 5-acre increments, allowing for the ground to settle from fill activities. Full construction completion would be completed within 10 years after LUC approval as all site and infrastructure improvements for the cemetery expansion area should be completed within about 1.5 years (in 2021). Sales of burial plots would begin in 2021.

3. **FLORA.** A botanical survey of the Petition Area was conducted by LeGrande Biological Surveys, Inc. (LeGrande, 2018). The botanical survey is attached to the First Amendment to Petition as a part of Exhibit "6". Field studies were conducted over several days in September 2017. Results from a prior botanical survey occurring in 2006 in the same general area were considered in this new 2018 botanical survey. The survey area included the proposed cemetery expansion area; a buffer extending into the Cultural Preserve; as well as a buffer outside the cemetery expansion boundary in all directions. The objectives of field studies were to: 1) describe existing vegetation; 2) list all species encountered; and 3) identify threatened or endangered plant species.

The Proposed Action would significantly alter the present botanical characteristics of the area proposed for the cemetery's expansion because this site would undergo extensive grading activities (cut/fill). However, proposed

improvements would not impact Federal or State-listed threatened or endangered plant species or species of concern because none were observed within the Petition Area.

After grading activities, the current Lowland Alien Wet Forest character that is dominated by introduced plant species would change to an open landscaped character consisting mainly of grass and landscaping plantings typical of cemetery areas used for burial spaces. Fringe areas surrounding landscaped burial areas would likely become dominated by other existing surrounding vegetation and trees that are mainly introduced plant species. This would result in a similar condition to the buffer area surrounding Ocean View Garden. This would include areas that are left undeveloped (e.g. spring area to the northwest) or serve as vegetative buffers between residences or upslope areas.

The majority of existing plant species (90%) that would be displaced due to grading activities within the cemetery expansion area are alien (84%) or of Polynesian introductions (6%). The introduced fern species commonly known as Laua'e (*P. grossus*) would be impacted by grading activities within the cemetery expansion area, but not within the proposed Cultural Preserve. The endemic fern also known as Laua'e, *M. spectrum*, was not observed within the Petition Area. Although *M. spectrum* is likely the fern known in native Hawaiian legend as Laua'e, both the introduced and the endemic species possess native Hawaiian cultural value. Given the cultural value of *P. grossus*,

specimen of this fern species could be used to landscape the cemetery expansion area to perpetuate its presence in the area.

Native plant populations that include the Ohi'a Lehua and Ka'e'e populations would also be displaced due to grading activities. The first species mentioned is endemic, and seeds or cuttings from extant plants could potentially be collected and grown to use in replanting efforts in and around the cemetery expansion area or within the Cultural Preserve. The Ka'e'e population observed is being smothered by other vine species, and several of the seed pods observed have insect damage and thus did not appear to be viable for replanting. Fill activities planned in this area would impact these vines. As a result, horticulture experts could be consulted to provide the best techniques to propagate the plants either by vegetative cuttings or seed germination.

The vegetative character of the Cultural Preserve would remain similar to existing conditions because no major site disturbing improvements are proposed in this area. The proposed Cultural Preserve is an appropriate location where native and Polynesian introduced plants displaced by cemetery expansion activities could be replanted, particularly in the area surrounding Kawa'ewa'e Heiau. Native plants would also be used in the landscaping of the cemetery expansion area that would help to perpetuate these extant taxa in the immediate area.

The presence of plants, such as 'Ohi'a Lehua, 'Akia, and Laua'e, within the Cultural Preserve or cemetery area would support its use for cultural practices. Seeds

and cuttings from these plants found on site could be collected and grown for these efforts. Laua'e could also be used in landscaping of the cemetery expansion area.

Proposed Mitigative Measures

To mitigate the impacts to existing indigenous and endemic plant species from this project, the following measures are proposed.

1. Seeds or cuttings from extant indigenous and endemic plants would be collected and grown to use in replanting efforts in and around the cemetery expansion area or within the Cultural Preserve.
2. The preservation plan to be developed for the Cultural Preserve would include landscaping guidance related to the preservation of the Petition Area's indigenous and endemic plant species. Landscaping guidance would use information resulting from the botanical survey to establish proper collection and replanting procedures.
3. The spring area in the northwest section of the Petition Area near Ohaha Place would not be developed for cemetery burial plots, and BMPs would be designed for implementation to minimize short-term construction-related effects in this area.
4. **FAUNA**. Rana Biological Consulting conducted an avian and mammalian survey (Rana, 2017) of the Petition Area. The avian and mammalian survey is attached to the First Amendment as a part of Exhibit "6". The primary purpose of the survey was

to determine whether any avian or mammalian species currently proposed for, or listed as threatened or endangered under either federal or State of Hawai'i endangered species statutes were present within the Petition Area. There is no federally delineated Critical Habitat present on or adjacent to the Petition Area.

A total of 227 individual birds of 19 species, representing 15 separate families, were recorded during the survey. All of the avian species detected during point counts are alien to the Hawaiian Islands. An additional three species, the Cattle Egret (*Bulbucus ibis*), Pacific Golden-Plover (*Pluvialis fulva*), and Rock Pigeon (*Columba livia*) were detected as incidental observations within existing HMP facilities while transiting past them to the eastern end of the Petition Area. Of these species, the Pacific Golden Plover is a native, indigenous migratory species.

Avian diversity and densities observed aligned with the location and predominantly alien vegetation present on site. Three introduced species, the Red-vented Bulbul (*Pycnonotus cafer*), Zebra Dove (*Geopelia striata*), and Red-whiskered Bulbul (*Pycnonotus jacosus*) accounted for 51% of the total number of avian species recorded. The Red-vented Bulbul was the most commonly tallied species, accounting for 19% of the species observed.

The findings of the avian survey are consistent with the current habitats present within the survey, which are dominated by alien plant species. This avian survey is also consistent with a prior faunal survey conducted for the property in September 2006

(Bruner, P., 2006). During the 2006 survey, 14 avian species were recorded. The current survey documented the same 14 species, plus an additional five other species. All species except the Pacific Golden-Plover recorded in this survey are alien to the Hawaiian Islands.

Pacific Golden-Plover are a native, indigenous migratory shorebird species. This species nests in the high Arctic during late spring and summer months. They later return to Hawai'i and the Tropical Pacific in the fall and winter months each year. This species usually returns to the Arctic in late April or early May. They are widely distributed in the Hawaiian Islands during winter months.

No owl species were recorded in this survey. There are two resident owl species on O'ahu, which are the introduced Barn Owl (*Tyto alba*) and the indigenous endemic sub-species of the Short-eared Owl, or Pue'oa as it is locally known (*Asio flammeus sandwichesis*). The Pue'oa has darker colored feathers than the Barn Owl and is comparatively smaller (National Wildlife Health Center 2016). While both species are found on all the main Hawaiian islands, Pue'oa have become increasingly scarce on O'ahu. The island's Pue'oa population is listed as an endangered species by the State of Hawai'i, but is not listed under federal statute.

Pue'oa forage in grasslands, agricultural fields and pastures, as well as upland forested areas (Bruner 2006). This owl species occupies a variety of habitat including wet and dry forests and most commonly inhabit open areas such as grassland,

shrubland, and montane parkland (Conry et al. 2015). This species is not habitat restricted on O'ahu, though there is likely less suitable nesting habitat than there once was. The majority of O'ahu's Pue'ō population is found on the leeward side of the island and on the North Shore. Pue'ō face daunting odds given O'ahu's high population density. They are a ground nesting diurnal species, and prefer to nest in tall grass (e.g. pastures and grasslands) (DOFAW, 2013). The sheer numbers and density of mammalian predators on O'ahu makes it very difficult for this species to successfully nest, except within protected areas with a strong mammalian predator control program in place. The faunal study determined that there is no suitable habitat for this species to forage in or nest in within the Petition Area. The Petition Area's alien forest canopy does not have grassland for nesting and they are vulnerable to mammalian predators present. Pue'ō prefer small mammals (e.g. rats) for their diet, and the existing thick canopy forest of the Petition Area and larger property prevents foraging within this area.

Seabird Species

Although seabirds were not detected in the course of the survey, several seabird species potentially overfly the site on occasion. These species include the Wedge-tailed Shearwater or 'Ua'u Kani (*Puffinus pacificus*), the "threatened" Newell's Shearwater (*Puffinus auricularis newelli*), and the "endangered" White Tern (*Gygis alba*).

The O'ahu population of White Tern (*Gygis alba*) is listed as an endangered species by the State of Hawai'i, but it is not listed under federal statute. This ephemeral species was not recorded during this survey, nor was it expected. The current resident population of White Tern on O'ahu is found on the leeward side of the island concentrated in the Waikiki area.

The primary cause of resident seabird mortality is thought to be predation by alien mammalian species at nesting colonies. The second most common cause of mortality for locally nesting seabirds occurs when they collide with man-made structures after they are disoriented by exterior lighting. If these seabirds are not killed outright, the dazed or injured birds are easy targets for predation by feral mammals.

Project implementation initiated under the Proposed Action is not expected to have a significant impact on avifaunal species because the majority of species present are alien. Grading improvements for the cemetery expansion site would change the landscape from a Lowland Alien Wet Forest to an open landscaped character consisting mainly of grass and landscape plantings. This open grassed landscape should have minimal impact on alien avian species. The Pacific Golden-Plover's migratory pattern that involves returning to Hawai'i in the fall and winter months each year, should not be impacted by this project. This species would continue to be widely distributed in the Hawaiian Islands. The Cultural Preserve would not involve any major site development that would significantly alter the existing landscape and vegetation.

The open grassed landscape created by cemetery expansion improvements would not serve as suitable nesting habitat for the Pue'ō as it would not provide the tall grasslands this species prefers. The open grass landscape established with the cemetery expansion may improve the area's character for potential foraging use by this species. However, they instead prefer grasslands, agricultural fields, and pastures. This is not consistent with the characteristics of cemetery lawn. The bulk of the O'ahu population is found on the leeward side of the island and on the North Shore. Therefore, Pue'ō would not inhabit the Petition Area under the Proposed Action. The O'ahu population of White Tern (*Gygis alba*) should not be impacted by the project since this ephemeral species was not recorded during this survey, nor was it expected because they are found on the leeward (Honolulu) side of the island concentrated in the Waikīkī area.

Protected seabirds are threatened of being downed after becoming disoriented by outdoor lights during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds are: 1) possible night-time construction activities; and 2) streetlights or other exterior lighting within the cemetery expansion during the seabird fledging season, which runs from September 15 through December 15th.

However, the project should not impact protected seabirds because: 1) no night-time construction is planned, and 2) no exterior lighting is planned as part of site improvements. The Cultural Preserve would remain similar to present conditions with

select portions of the area revegetated with native plants. No outdoor lighting is planned and cultural activities would occur during daylight hours.

The mammalian portion of this survey was conducted concurrently with the avian survey and was limited to visual and auditory detection coupled with visual observation of scat, tracks, and other animal signs (Rana, 2018). A running tally was kept of all terrestrial vertebrate mammalian species detected within the Petition Area during time spent on site.

Three terrestrial mammalian species were detected on site during the survey. Numerous dogs (*Canis familiaris*) were heard barking from areas outside the survey area. One small Indian mongoose (*Herpestes auropunctatus*) was seen close to the dead end of Lipalu Street and the Petition Area. A small amount of pig (*Sus scrofa*) rooting was found within the lower section of the proposed cemetery expansion area, indicating that feral pigs may be present. Field surveys conducted by others (Dr. Steven Montgomery) have also identified the area by the spring as being disturbed by feral pigs, which is destructive for that habitat used by the endangered damselfly. No mammalian species currently proposed for listing or listed under the federal or State of Hawai'i endangered species statutes was recorded on site.

The findings of the mammalian survey are consistent with the current habitat present on the site and the current land use of the area surveyed. All mammalian species detected are alien species and deleterious to native ecosystems and their

dependent organisms. Although rodents were not identified during this survey, it is likely that one or more of the four established alien Muridaespecies found on O'ahu use resources found within the Petition Area on a seasonal basis. These are the European house mouse (*Mus musculus domesticus*); roof rat (*Rattus rattus*); brown rat (*Rattus norvegicus*); and black rat (*Rattus exulans hawaiiensis*). These human commensal species are drawn to areas of human habitation and activity, and are deleterious to native ecosystems and dependent species.

No endangered Hawaiian hoary bats were detected on site. It is only recently that this species has been recorded on a regular basis on the Island of O'ahu. It is possible that this species may use resources in the Petition Area. The Proposed Action would have no significant or adverse impact on mammalian species, because identified species on site are alien. Grading improvements for the cemetery expansion site would change the landscape from a Lowland Alien Wet Forest to an open landscaped character consisting mainly of grass and some other landscape materials that are not attractive habitats for mammalian species. The property would now be utilized for human activities that would generally discourage their presence.

The Proposed Action would reduce feral pig destructive foraging activities due to habitat loss. Areas outside of the improved cemetery would continue to provide habitat for pigs. Fencing proposed around the seep would prevent feral pigs from entering and conducting destructive activities to the endangered damselfly's habitat.

The project would thus have a positive effect in limiting some of the destructive pig activities within the Petition Area.

5. **INVERTEBRATES.** An invertebrate survey was conducted by Dr. Steven Lee Montgomery (Montgomery, 2017). The invertebrate survey is attached to the First Amendment to Petition as a part of Exhibit "6". Field surveys were conducted from July to December 2017. Results from a prior invertebrate survey conducted in 2008 was considered in analysis for the current survey. The primary purpose of this survey was to determine the presence or absence of endemic or indigenous terrestrial invertebrates, especially species listed under federal or state threatened and endangered species statutes.

Methodology

Field surveys were conducted over a period of several months from July to December 2017 to include dry and wet conditions and to ensure observation and collections occurred during the day and night. The survey focused on finding endemic and indigenous Hawaiian species. Prior to the initiation of fieldwork, a general assessment of site terrain and habitats was conducted through review of maps and prior reports. Surveys occurred during the day and night, with the property traversed to survey all habitat types. Pathways were also followed to search for any springs or native botanical resources and other host plant options for native invertebrates. Survey

methods included visual observation, searches of host plants, usage of sweep nets, and light sampling.

Plant and invertebrate populations are interdependent, with the presence of host plants serving as a means of gauging invertebrate health. The Petition Area has historically been used by humans for agriculture and ranching. Feral pigs are also present and continue to degrade vegetation and understory plants by rooting, resulting in soil disturbance. These factors likely contribute to the limited number of native plants identified on site. The lack of native plants capable of serving as arthropod host sites may explain why few Hawaiian arthropods were identified. A review of archaeological surveys of the area and field surveys conducted indicate that lava tubes potentially supporting cave-adapted native invertebrates are not present within the Petition Area.

The only federally listed endangered species observed was the Blackline Hawaiian Damselfly (*Megalagrion nigrohamatum nigrolineatum*). Remaining native Hawaiian invertebrates (endemic) sighted are widespread in distribution. Invertebrates endemic to Hawai'i identified in this survey are outlined in study, along with a full listing of other introduced species. There were no indigenous species identified during the survey. The survey report also provides additional details for select invertebrates that impact the survival of native invertebrates.

Blackline Hawaiian Damselfly (*Megalagrion nigrohamatum nigrolineatum*)

Native Hawaiian damselflies are a cluster of 25 species that have diversified from a single waif arriving in Hawai'i, and now occupy many aquatic niches and rain forests. The Blackline or Rainbow-eye Damselfly on O'ahu was formally named by R.C.L. Perkins in 1899. This species of native damselfly has been historically noted as a common species from sea level to 2,400 feet in elevation. However by 1996, this species had appeared to be extirpated from the Waianae Mountains. The Blackline Hawaiian Damselfly is present in the Ko'olau Range only as scattered colonies, breeding in pools along upland streams and in seepage fed pools along overflow channels. The native damselflies were observed along a seep located in the northwestern corner of the Petition Area that is fed from a human developed well. This well was likely created during the area's former use as a dairy farm. The boundaries of the damselfly seep habitat are discussed later in this section.

The brown, inch-long damselfly nymphs favor a concealed existence clinging under stones or hiding in algae masses, both in moving and quiet waters, for long intervals. The Hawaiian Damselfly's diet includes bloodworms, which are the larvae of *Chironomus hawaiiensis*, *Forcipomyia howarthi*, *Tanytarsus*, *Culex*, *Limonia* and *Scatella* shore flies, sowbugs (*Philoscia angusticauda*), and oribatid mites. Kalo is one of the few emergent water plants available as a host site in the Petition Area for native damselfly habitat. Some of these kalo specimen were seen with broken, pig chewed petioles.

On sunny days, up to eight males were sighted spaced out along the seep's waters. With thick cloud cover and much decreased sunlight, two to one were present, at mid-day, likely because damselflies had risen into trees to roost. One major threat to this species is predation on naiads (immature damselfly specimen) by alien fish, especially the Western Mosquitofish (*Gambusia affinis*), Sailfin molly (*Poecilia latipinna*), and the Guppy (*Poecilia reticulata*). Feral pigs are another threat because of their destructive rooting activities. The pig's wallowing and rooting for worms are a major alteration and disruption of the breeding and resting places of the damselfly.

Other invertebrate species that can affect the Hawaiian Damselfly or its habitat are summarized below.

1. Red-rimmed Melania (*Melanoides tuberculata*). These freshwater snails were sited within the area used by native damselflies. However, these species do not compete with native damselflies for food resources as they subsist on algae and debris, and are often associated with kalo roots.
2. Culicidae Mosquitoes (*Melanoides tuberculata*). The Southern House Mosquito (*Culex quinquefasciatus*) and Forest Day Mosquito (*Aedes albopictus*) are breeding in small numbers in the small flowing water of the seep and cement-encased spring source feeding it. The Cannibal Mosquito (*Toxorhynchites amboinensis*) also feeds frequently in these water receptacles, and are cannibalistic, feeding as predators on the larvae of other mosquito. Larvae of

the Southern House Mosquito were found only in a few 1- to 2-inch deep pools associated with this seep, and serve as one food source for damselfly young.

3. Hymenoptera (Wasps, Bees, Ants) and Formicidae (Ants). Alien ants are known to prey on other insects and are documented as a factor in the limited presence of native arthropods. Ants are noted as a primary threat factor for the Blackline Hawaiian Damselfly in the 2011 Listing of Endangered Species. Alien ants observed in the Petition Area include the Long-legged ant (*Anoplolepis gracilipes*), Big-headed ant (*Pheidole megacephala*), and the Glaber ant (*Ochetellus glaber*). The Long-legged ant was not observed in the 2017 survey, likely due to the presence of the Big-headed ant. These species maintain separate territories and do not overlap in distribution. The Big-headed ant is considered a threat to emergent damselflies.

Individuals trespassing into the Petition Area may be a threat to damselfly present at the seep. Trespassers traveling near the seep could inadvertently disturb damselfly breeding and resting sites. Trespassers also risk harming Damselflies directly while specimen are resting and molting on dead leaves or small sticks in stream margins or muddy areas. The coloring of the damselfly make them difficult to see, creating risk that specimen could be stepped on by trespassers.

Damselfly Habitat Boundaries and Characteristics

The boundaries of the damselfly habitat area along the seep were determined by Dr. Montgomery based upon his study and several additional site visits. The habitat of damselfly young, or naiads, does not extend from the water's edge, but the foraging and roosting home ranges of adults does. Undisturbed emergent wetland plants (e.g. sedges) can serve as ant-free perches for larvae molting into damselflies in their few hours of flightless vulnerability to predators. However, the present seep area lacks much foliage and ground cover primarily due to the repeated rooting of feral pigs for worms and wallowing in mud.

Therefore, topographic conditions influence the movement patterns of the damselfly in relation to the surrounding area along the course of the seep. The higher elevation areas along the seep influence and establish the general extent of their habitat area. The habitat boundary does not include an incised ephemeral drainageway located east of the seep. This drainage feature is normally dry except for brief flows after heavy rainfall events, and does not serve as a habitat for damselfly young or naiads. After freshets, the drainageway also lacks residual plunge pools where damselfly could ovipost.

Habitat boundaries would be refined during final project design when more accurate topographic survey data would be obtained. For example, the habitat boundary on the west side may not extend as far west based upon actual site

conditions. Based upon this habitat boundary, grading improvements would need to remain outside of this area.

Other Notable Invertebrates Not Found

In addition to the presence of feral pigs, the area has a long history of human use that has been destructive to native plants. These uses have included Hawaiian agriculture, rice and pineapple cultivation, cattle ranching and coffee cultivation. The resulting extremely low level of native plants serving as arthropod hosts leads to the low level of Hawaiian arthropods present within the Petition Area. Nevertheless, consideration of other native federally protected invertebrate species (snails, spiders, and insects) was considered, and a summary is provided below.

1. The archaeological survey of the Petition Area indicated no lava tubes are present that could support cave-adapted native invertebrate species. The invertebrate study similarly did not observe any indication of lava tubes within the Petition Area.
2. No native mollusks were observed during the invertebrate survey.
3. O'ahu does have protected snail species, but existing vegetation, the presence of rats, and predation by the introduced Rosy Wolf snail (*Euglandina rosea*) make this site unsuitable habitat for endangered native Hawaiian endemic snails.

4. No native *Drosophila* (fly) were observed within the Petition Area, and this property is now unsuitable habitat for any of the endemic *Drosophila*, some being listed as endangered or threatened. These native Hawaiian picture wing flies require a native environment with host flora not present within the Petition Area.
5. The endangered Blackburn's sphinx moth (*Manduca blackburni*) was not found during the survey. Historically, the moth is known from drier locations, and critical habitat established for the moth on O'ahu is many miles away. Neither the moth's solanaceous native host plant, ('aiea (*Nothocestrum* sp.)), nor the alien host tree tobacco (*Nicotiana glauca*) were observed on the site or identified by the botanical survey conducted.

Improvements implemented under the Proposed Action would not adversely impact native invertebrate species present, which are widespread in distribution, or federally or state-listed endangered or threatened species.

Usage of native vegetation in site landscaping of the proposed cemetery expansion area and select portions of the proposed Cultural Preserve would increase the presence of native vegetation on site. Overall, these plants would provide additional habitat for native invertebrates. Landscaping improvements using native plants would provide beneficial habitat and refuge for native arthropods along with supporting

cultural values. Such landscaping improvements would be developed as part of the design plans developed for this project.

Grading improvements would not impact or alter the Blackline Hawaiian Damselfly seep habitat located in the northwestern corner of the Petition Area due to avoidance and proposed minimization measures. This damselfly habitat would be avoided, and would not be impacted by grading activities. As discussed in Section 3.6, design measures would be incorporated into grading plans to minimize fill effects on the well and seep serving this damselfly habitat. Damselfly populations and human developments can co-exist. For example, a population of *M. xanthomelas* at a stream course at Tripler Army Hospital has been sustained by managing piped water for 20 years. On Lānaʻi, *M. xanthomelas* was found breeding in a large, ornamental pond behind The Lodge at Kōʻele. Although impacts to the seep habitat from project implementation are not anticipated, measures are proposed to minimize existing impacts occurring from predators and trespassers as well as ensure the seep remains as a functional damselfly habitat. An Incidental Take Permit under Section 10 of the Endangered Species Act would not be required because the cemetery expansion would avoid the damselfly and its habitat, and proposed minimization measures would ensure continued water flow along the seep and would not alter this habitat.

A portion of the damselfly habitat area may potentially extend into the cemetery expansion area based upon preliminary grading plans. As previously discussed, the

final project design would conduct a more accurate topographic survey that may result in the habitat boundaries being refined. The habitat boundary shown utilizes available topographic data shown to identify higher points. It is possible the habitat boundary on the west side may not need to extend as far west based upon actual site conditions since a site visit indicated the top of the western embankment was only about 30 feet away from the seep. The mauka boundary above the well and seep may also not need to extend as far based upon site visits. Refinement of preliminary habitat boundaries based upon more detailed and accurate topographic conditions would occur during project design to ensure cemetery expansion grading plans would avoid encroaching within the damselfly habitat boundary.

Subdrains would also be installed within the cemetery expansion area above the well and seep to maintain the natural discharge of subsurface water under the overlying soils. The groundwater study shows the seep is maintained by the natural discharge of subsurface water moving downslope through poorly permeable residual soils overlying the unweathered Kailua volcanics. Subsurface water feeding the well flows downslope to the well through subsurface soil at depths of 10 feet or more rather than through surface soil or underlying aquifer geology.

The subsurface drainage system would be designed using a herringbone pattern that would increase and improve the amount of subsurface water collected to ensure continued flow to the well and seep. The herringbone system would be comprised of

three subsurface drainage mainlines with smaller subdrains branching out laterally from the mainlines. This drainage system would generally be aligned perpendicular to the retaining walls and installed at depths about 10 to 15 feet deep. The system would be designed to intercept and convey the flow of subsurface water to the well and seep. This design would minimize potential impedance of subsurface water flows due to potential compaction of soils from fill activities planned mauka of the well.

To further ensure continued water flow to the seep, a monitoring gauge or other appropriate device would be installed inside the well to monitor water levels. A permanent irrigation line extending from the proposed cemetery expansion area's irrigation system to the well would also be installed. This irrigation line would serve as a long-term means of ensuring continued water flows to the seep. If the gauge indicates water levels have declined to levels potentially affecting the seep, water from the irrigation line to the well could be provided to stabilize water levels.

The cemetery expansion area would include maintenance activities to manage grass growth, such as lawn mowing and trimming of other vegetation. However, cemeteries are not intensively managed landscapes as compared to golf courses. Fertilizers are not necessary for use at the existing HMP cemetery due to the generally fertile conditions, supportive weather conditions, and lower maintenance needed for turf grass. Pesticides are also not used by maintenance staff for HMP's cemetery. HMP maintenance staff occasionally use the herbicide Roundup (glyphosate) to address spot

areas needing treatment. However, such use is infrequent due to the generally wet weather in Kāneʻohe, and the characteristics of the cemetery lawn that primarily need to be mowed.

Glyphosate concentrations generated from the cemetery maintenance activities would be small, given the low use anticipated, and should not have a significant impact on the seep's water quality and damselfly based upon the water quality study prepared for this EIS. Section 3.8 addresses the potential project effects on water quality from this study. Water quality samples collected and tested from the Cascade Spring and Parkway sites were used to evaluate the current transport of chemicals related to the existing HMP cemetery via shallow perched ground transport (Cascade Spring) and from runoff during storm events (Parkway Site). Such concentrations were presented in the study and showed no detection of glyphosate or 2,4-D herbicides, and low levels of diuron from runoff associated with the Lipalu watershed.

The drainage area associated with the seep only flows during storm events, which accounts for the vast majority of suspended solids and other pollutants being discharged from the Petition Area. Consequently, the seep would not be affected by runoff the majority of the time, and the large quantities of runoff flowing through the drainage area during storm events would discharge into the City's box culvert below. Runoff data collected from a volume of about 17.6 million gallons produced during a

February 5, 2018 storm event was estimated to have less than a tablespoon of glyphosate.

Proposed Avoidance and Minimization Measures

To minimize potential effects on the endangered damselfly, the following measures are proposed:

1. Schedule a regular inspection of the seep to ensure the present low trickle flow of water is continued through development of a monitoring plan during the project design phase. The plan would include BMP measures (i.e. erosion control) and would be implemented during the project's construction phase. Inspection of the seep should be conducted before the start of construction to establish baseline water flow conditions. Monitoring would occur during construction with the seep area inspected on a weekly basis to evaluate water flow in coordination with BMP measures. Once construction concludes, monitoring would continue for an additional six months to ensure continued seep water flow. Inspections would occur weekly for the first three months and every two weeks thereafter if conditions are satisfactory. After the six month period elapses, HMP staff would conduct monthly water flow inspections. If water flow is significantly disrupted, measures would be implemented to supplement short-term water flow (i.e. piping in of new water). Appropriate measures would be determined through consultation

between the contractor and the design team or other specialists to evaluate conditions and resulting measures. This has been successful at another site for a related endangered damselfly (Evenhuis et al. 1995).

2. A well monitoring gauge or other appropriate device would be installed inside the well located upslope from the seep to monitor water levels prior to, during, and after project construction. Once project earthmoving activities conclude, a permanent irrigation line extending from the proposed cemetery expansion area's irrigation system to the well would be installed. This irrigation line would serve as a long-term means of ensuring continued water flows at the seep. If the gauge indicates water levels have declined to levels potentially affecting the seep, water from the irrigation line to the well could be provided to stabilize water levels. During construction, a temporary irrigation line would also be extended to the well to support water levels, if necessary.
3. Monitor as part of seep inspections to ensure non-native fish, such as the Western Mosquitofish, are not present within this habitat area. Individuals conducting seep water flow inspections should be aware of the presence of alien fishes and should notify experienced biologists if fishes are sighted to ensure prompt identification and removal.

4. Review the habitat boundaries currently shown based upon more accurate data collected from a topographic survey during project final design. Revise habitat boundary as appropriate. Construct fencing around the damselfly habitat boundary to protect native damselfly from disturbance by feral pigs. Fencing should consist of hog wire designed with a lower barbed strand to resist digging.
5. Place small sticks upright and away from the edges of waterlogged areas to serve as molting safe zones to avoid predation during molting. These sticks would protect naiads because ants would not cross water barriers.
6. Evaluate the feasibility and practicability of initiating participation in a habitat restoration and conservation program for the damselfly habitat under the Partners for Fish and Wildlife program. However, the feasibility of such a partnership first needs to be evaluated in relation to the proposed Cultural Preserve, to be managed by the Ko'olaupoko Hawaiian Civic Club, because this area is designated as a historic site (Site -8230). Consequently, the management and conservation of this seep habitat area by the civic club may be more appropriate and first needs to be evaluated in the context of the entire project. If practicable, coordinate with the U.S. Fish and Wildlife Service (FWS) to establish a habitat restoration and conservation program for this damselfly's habitat under the Partners for Fish and Wildlife program. An

agency and landowner partnership can be established that can potentially specify joint stewardship and monitoring responsibilities of this habitat area with the FWS. Such a partnership would support the restoration of this endangered species and provide educational opportunities.

7. A subsurface drainage system designed in a herringbone pattern would be implemented in the fill area above the well and seep. This system would ensure waterflow to the well and seep is maintained given the possibility of subsurface water flow impedance from fill deposited upslope of these features. The system would be comprised of three subsurface drainage mainlines with smaller subdrains branching laterally from the mainlines. This drainage system would generally be aligned perpendicular to the retaining walls and installed at depths to intercept and convey the flow of subsurface water to the well and seep.

6. **GROUNDWATER.** This section discusses groundwater resources present with the Petition Area. Tom Nance Water Resource Engineering (TNWRE) conducted a groundwater assessment to evaluate project impacts to groundwater resources (TNWRE, 2018). As part of this analysis, TNWRE investigated a seep located in the northwest corner of the Petition Area, which is immediately downslope from a shallow man made well. The groundwater assessment is attached to the First Amendment to Petition as a part of Exhibit "6".

The existing HMP and Petition Area are located within the former caldera of the Ko'olau Mountain (referred to as the Kailua Caldera). The caldera filling lavas beneath the Petition Area are a part of the Kailua Member of the Ko'olau volcanics. The basalt flows are dense, massive, and relatively impermeable due to almost complete filling of interstices with secondary minerals resulting from hydrothermal alteration. Clinker beds, where they occur, have been cemented into hard and essentially impermeable breccia. Joints of intruded dikes are also filled with secondary minerals. Therefore, development of even a moderate capacity well anywhere in the Kailua volcanics beneath the Petition Area or other HMP property would not be possible. It is significant that the deep weathering of the Kailua volcanics across the Petition Area has resulted in stiff silt and clay residual soils underlain by saprolite to depths exceeding 50 feet (TNWRE, 2018).

Regional Watershed Background

The State of Hawai'i has identified 19 watersheds in the Ko'olaupoko area of O'ahu, which encompasses much of the windward side of the island and includes the Petition Area. Studies of this watershed area include the State Commission on Water Resource Management's (CWRM) *Water Resource Protection Plan* (CWRM 2008), the State DLNR, Division of Aquatic Resources' (DAR) *Atlas of Hawaiian Watersheds and Their Aquatic Resources* (DAR 2008), the City's *Ko'olau Poko Watershed Management Plan*

(KPWMP) (Townscape, 2012), and the *Ko'olaupoko Watershed Restoration Action Strategy* (KBAC 2007).

The Kāne'ōhe watershed, which surrounds the Petition Area, is subdivided into northern, central, and southern regions (KBAC, 2007). The Petition Area is located within the larger watershed's southern region that reaches from He'eia southward, and includes ridgelines between Kāne'ōhe and Kailua. The southern region is characterized as being the most urbanized portion of this watershed and is the portion most impacted by adjacent land use. This region is almost entirely developed with most of its streams channelized. The Petition Area is located within the southern region's Kāwā watershed. The assessment shows the general boundaries for the Kāwā watershed within the larger Kāne'ōhe watershed based upon the KPWMP. The majority of the Petition Area is located in the southeastern portion of the Kāwā watershed (DAR Watershed Code 32011).

The Kāwā watershed is generally bounded by the Oneawa Hills on the east, residences along Kāne'ōhe Bay Drive to the north, portions of Kāne'ōhe town on the west, and residences near Kamehameha Highway on the south. The KPWMP estimates this watershed to be about 2.1 square miles. The watershed has a maximum elevation of 938 feet rising above its lowest elevation at sea level (KBAC 2007). Kāwā Stream is the single stream flowing through this watershed. Other freshwater inputs including runoff, springs, ephemeral drainageways, and intermittent streams that feed water and

sediment into the system. Land within the Kāwā watershed includes both public and privately-owned land.

Regional Groundwater

The State DLNR, Commission on Water Resource Management (CWRM) has established groundwater hydrologic units to provide a consistent basis for groundwater aquifer management. The Petition Area is located within the Ko'olaupoko Aquifer System (30603212) that is situated within the larger Windward Aquifer Sector (306). The Ko'olaupoko Aquifer System extends from the mauka flanks of the Ko'olau Mountains to the shorelines of Kāne'ohe Bay, and is about 11 miles wide.

The system has an estimated sustainable yield of 30 million gallons per day (gpd) (CWRM 2008). This figure is derived from analytical ground water models and represents the amount of water that may be drawn from the aquifer without impairing its capacity to replenish itself. The aquifer's sustainable yield figure does not include water removed from the system by the Waiahole Tunnel. The majority of Ko'olaupoko ground water sources are located in the Ko'olaupoko Aquifer System of which the greatest sources of developable water is high level dike water located along portions of the Ko'olau Mountain Range proximate to the Kāne'ohe and Kahalu'u communities.

Groundwater is stored in subterranean aquifers, which are permeable rock formations saturated with water. Groundwater can be brought to the surface through natural springs or pumping. In Hawai'i, groundwater is the primary source of

municipal water and is also used for agricultural and industrial purposes. The most abundant form of groundwater on O'ahu is the basal aquifer, a lens of fresh to brackish water floating on sea water. Waters flowing freely to the surface from wells tapping into the basal aquifer are referred to as artesian.

Groundwater within the Ko'olaupoko Aquifer System is stored within dike compartments in the upper portion of a saturated aquifer that are not in contact with seawater. Waters within higher level aquifer systems, such as those at higher elevations closer to the Ko'olau Mountain Range are used for drinking and are classified as fresh relative to water salinity. Higher level waters of the aquifer system are considered irreplaceable and vulnerable to contamination.

Groundwater Usage and Water Quality

The CWRM has set the aquifer's sustainable yield at 30 million gallons per day (mgd) and has issued water use permits to 19 wells with a total permitted use of 10.312 mgd. Based upon monthly pumping data, the total use by these wells has closely matched the combined permitted use amount. Of the 19 wells in the aquifer with permitted use permits, nine are pertinent to the project and are nominally located upgradient of the Petition Area. Most notable is that these nine wells tap into high level groundwater standing between 200 and 570 feet above sea level, apparently all drawing from dike confined compartments in the Ko'olau's dike complex. Since the mid-1990s, total pumpage of all nine wells has been less than their combined permitted use.

Groundwater Quality

The quality of groundwater in the Ko'olaupoko Aquifer System is considered high, and meets Federal and State drinking water standards (Townscape, 2012). The BWS and the State Department of Health (DOH) regularly monitor drinking water quality for over 100 types of contaminants with testing performed at the water source. To further safeguard drinking water sources from contamination, BWS, DOH, and the U.S. Environmental Protection Agency (USEPA) have several other monitoring and treatment programs.

The State DOH administers the underground injection control (UIC) program to protect the quality of state underground drinking water sources from pollution by subsurface disposal of fluids under Chapter 11-23, HAR (State, 2000). Under these regulations, UIC maps show exempted aquifers from underground source drinking water situated below (makai) this line. Exempted aquifers are those that: 1) do not currently serve as a source of drinking water; and 2) will not in the future serve as a source of drinking water due to several criteria.

The UIC line generally runs mauka of Kamehameha Highway. Therefore, the Petition Area is located below and well away from this UIC line indicating it is situated above an exempt portion of the Ko'olaupoko Aquifer.

Shallow Well and Seep Within Petition Area

There is an existing shallow well and perennial seep within the northwest corner of the Petition Area, located about 300 feet east of the roadway serving the Ocean View Garden. The well is 11.5 feet deep below the top of its square-shaped concrete rim. The opening of the concrete top is 2.65 by 2.90 feet in dimension. The dug borehole below the concrete is substantially larger than this opening.

As measured a number of times during the field investigation, the water level in the well was consistently above the ground level on the downstream side of the well. The well is not registered with the CWRM, and no information about its installation or past use could be found. Based on an old pipe laying nearby, it may at one time have been a modest source of supply. A small but perennial seep emerges about four feet downslope from the well. Further down the waterway, the flowrate in the waterway continuously increases along the route to its ultimate discharge into the drain inlet at the end of Ohaha Place. Given the additions to the flowrate enroute downslope, it is more accurate to describe the seep as an area of discharge rather than a discharge from a single point (TNWRE, 2018).

Groundwater Testing Above Well

Two types of field investigation were undertaken to assess whether the well and seep are from a shallow perched water source. This investigation consisted of: 1) drilling four boreholes directly upslope of the well and seep; and 2) conducting a

siphon and pump test of the well to determine if subsurface leakage from the well is creating the seep that emerges just four feet downslope.

Results of the Boreholes Drilled

Four boreholes were drilled above the well and seep. Although an obvious perching member was not encountered in the borings, the water level response in all four boreholes was informative. Water was not encountered in the boreholes until each borehole had been drilled down to between 15 to 20 feet below ground.

After reaching that depth, the water level in each borehole rose up very slowly. The geotechnical boring results included in the groundwater study document this slow filling in each of the boreholes. As the tabulation of approximate water levels in the boreholes and the well show, the semi-confined subsurface water residing in the poorly permeable residual soil has a relatively steep downslope gradient.

Results of Siphon and Pump Testing the Well

Testing of the well was undertaken with two basic objectives: 1) to confirm that the semi-confined subsurface water occurrence found at the four boreholes directly upslope also exists at the well; and 2) to confirm that the seep that emerges four feet downslope of the well is a result of subsurface leakage from the well. Both aspects of the subsurface water occurrence were confirmed by the test.

The initial intent was to run the test by siphoning from the well (and discharging downslope to maintain the siphon) rather than by pumping. Siphoning began at about

30 gallons per minute (gpm), but the siphon was lost in less than 10 minutes. An attempt to restart the siphon also failed, this time in less than five (5) minutes. Thereafter, the well was pumped with a small, 1/4 horsepower sump pump, first at 17 gpm and then at about 15 gpm. The results are summarized below:

1. When the water level in the well was drawn about halfway down the concrete well head, the seep that emerges about four feet downslope stopped flowing. Clearly, the seep is maintained by subsurface leakage from the well.
2. Over the period of intermittent siphoning and then pumping, a total of 1,615 gallons was removed from the well. About 950 gallons was estimated to be removed from storage in the well itself, and the remaining 665 gallons flowed from the area into the well. That inflow was at an average of about 4.3 gpm.
3. The recovered water level manually measured showed the water level had risen up inside the concrete well head, but not high enough to have started flow in the downstream seep. Average inflow to the well was approximately 3.1 gpm.
4. The well's water level was checked on the following day. The water level had fully recovered (actually to a level 0.1-foot higher than at the start of the test the day before). The seep below the well was fully restored at that time.

Therefore, the groundwater study shows the seep is maintained by the natural discharge of subsurface water moving downslope through the poorly permeable

residual soils overlying the unweathered Kailua volcanics. In the vicinity of the well and four test boreholes upslope from the well, the subsurface water is actually semi-confined. The subsurface water movement is through underlying soils at depths of 10 feet or more rather than through the surface soils. The upper end of the seep begins about four (4) feet downslope of the well, and water flow in the upper one third to one half of the linear seep is maintained by subsurface leakage from the well. Further downslope, flow in the seep increases continuously to its ultimate discharge into the Ohaha Place drainage system.

The proposed Cultural Preserve should have no impact on groundwater conditions within the Petition Area because no major site improvements would occur that may impact soils or groundwater conditions. The well and seep would not be impacted because the Cultural Preserve is located on the far eastern end of the Petition Area, well away from the seep.

The expansion of the cemetery would include extensive grading activities and site development that would significantly change the existing topography of the site. Grading improvements also include construction of a sequence of three (essentially parallel) retaining walls upslope of the well and perennial seep, and fill heights for the cemetery of about 10 to 30 feet behind these walls. The groundwater study evaluated whether these retaining walls and/or the fill behind them may intercept, impede, or reroute the subsurface water flow that maintains the perennial seep.

Based upon these tests, it was determined that grading improvements should not have a significant impact on the Petition Area's underlying groundwater conditions or the well and seep. The entire Petition Area overlies caldera-filling volcanics that are virtually impermeable. As such, grading improvements and cemetery use of the area do not have the potential to impact ongoing or possible future uses of groundwater drawn from the permeable Koolau volcanics of the Koolaupoko Aquifer System.

Regarding the well and seep, the footings of the retaining walls proposed as part of the project grading plan would be too shallow to intercept the subsurface water moving downslope. The retaining walls and fill behind them would include subsurface drains.

Proposed cemetery expansion improvements are expected to have a minimal impact on the quality and volume of groundwater underlying the aquifer. The project would not significantly impact the regional watershed area or the aquifer sustainable yield of 30 mgd. Some potable water would be used to irrigate the cemetery expansion area, but the wet climate of the windward district reduces the amount of irrigation required. Cemetery operational staff indicate that irrigation is rarely needed. Water used for irrigation would have a negligible effect on the aquifer system's sustainable yield. As previously discussed, existing wells within the aquifer have a total permitted use of 10.312 mgd, and total use closely matched the permitted use volume. Additional

water for irrigation use for the project would have minimal change to this use, which is well below the aquifer's sustainable yield.

These improvements would also have minimal effect on the water quality of the underlying groundwater because the entire Petition Area overlies caldera-filling volcanics that are virtually impermeable. The Petition Area is located below and well away from the UIC line that generally runs mauka of Kamehameha Highway, and is thus situated above an exempt portion of the Ko'olaupoko Aquifer.

Proposed Minimization Measures

The weight of the fill material has the potential to compress existing soils and interrupt or redirect subsurface water migration that is moving downslope. This could reduce the permeability of these already poorly permeable soils, impeding or re-routing the downslope direction of subsurface water flow. To ensure that the quantity and direction of subsurface water flow is maintained to the well and the seep, the following design measures are proposed.

1. A subsurface drainage system designed utilizing a herringbone configuration would be implemented in the cemetery expansion area planned for fill activities above the seep. The system would be comprised of three subsurface drainage mainlines with smaller subdrains branching laterally from them. This drainage system would generally be aligned perpendicular to the

retaining walls and installed at depths to intercept and convey the flow of subsurface water to the well and seep.

2. Their exact locations, alignments, and depths would be determined with the drilling of additional boreholes as part of the project's design phase in developing final grading plans. However, the subsurface drains would likely be between 10 to 15 feet below the existing surface.
3. A well monitoring gauge or other appropriate device would be installed inside the well located upslope from the seep to monitor water levels prior to, during, and after project construction. Once project earthmoving activities conclude, a permanent irrigation line would be extended from the proposed cemetery expansion area irrigation system to the well. This irrigation line would serve as a long-term means of ensuring continued water flows at the seep. If the gauge indicates water levels have declined to levels potentially affecting the seep, water from the irrigation line to the well could be provided to stabilize water levels. During construction, a temporary irrigation line would also be extended to the well to support water levels, if necessary.

7. **SURFACE WATER.** Element Environmental, LLC (E2) conducted a water quality assessment to evaluate project impacts to water resources pertinent to the project (Element Environmental, 2018). The water quality assessment is attached to the First Amendment to Petition as a part of Exhibit "6".

Streams and Drainageways

There are no perennial or intermittent streams within the Petition Area. The most proximate surface water resource to the Petition Area is Kāwā Stream. The Petition Area is generally located within a broad natural drainage basin created by the topography of the surrounding hillside. As a result, stormwater runoff flowing from upland areas sheet flows across the site following natural drainage patterns, and merges in low lying portions of the site during periods of heavy rainfall. Ephemeral drainageways within the Petition Area carry stormwater runoff into the City's drainage system, which eventually feeds into Kāwā Stream.

Kāwā Stream

Kāwā Stream is a perennial stream located outside the Petition Area, and has a total run of approximately 2.8 miles of main and tributary stream courses serving a 1.13 square mile watershed area. The Hawai'i Stream Assessment (HSA) classifies Kāwā Stream (HSA Code 3-2-11) as a continuously flowing stream (OLI, 2002). This stream begins within the Hawai'i State Veterans Cemetery. The upper portion of the stream within the Veterans Cemetery is classified as intermittent under the HSA, flowing only during periods of heavy rain (OLI, 2002).

This intermittent portion of the stream begins at an open concrete box culvert situated near the Veterans Cemetery baseyard. This box culvert collects sheet flow draining downslope from cemetery lawns. This intermittent stream section becomes

perennial further downslope where the stream crosses the access road to Ocean View Garden. This section of the stream and other nearby branches drain forested lands in the vicinity. These tributaries of Kāwā Stream converge and flow downslope toward the Parkway subdivision.

Kāwā Stream continues to travel downslope through residential areas, while other perennial tributaries merge before eventually discharging into the southern portion of Kāneʻohe Bay. The stream receives perched groundwater input and storm runoff that originate from both forested and urbanized areas. A stream bioassessment report for Kāwā Stream determined this stream does not generally provide good habitat for native aquatic organisms, nor does it support substantial populations of native fish or crustaceans (Burr, 2001).

Ephemeral Drainageways

There are two existing ephemeral drainageways within the Petition Area that carry stormwater runoff from upland and surrounding areas into the lower basin. Discharges from these drainageways eventually enter two City catchment basins situated at the Petition Area's boundary with residences at the end of Ohaha Street and Lipalu Street.

Lipalu Drainageway

One ephemeral drainageway generally serving the central and eastern end of the Petition Area, including the Cultural Preserve, discharges runoff into a catchment basin

at the end of Lipalu Street. This drainageway is unimproved within the Petition Area except near the catchment basin where there is a concrete wall, rock wall, and fencing. This drainageway serves a watershed area (referred to as the Lipalu watershed) estimated to be approximately 73-acres in size. Less than half of this watershed includes the Petition Area.

In February 2019, AECOS, Inc. conducted a site inspection to: 1) preliminarily identify the potential extent of this drainageway; 2) assess whether it may qualify as an unnamed tributary to Kāwā Stream; and 3) identify the potential extent of federal jurisdiction under the Clean Water Act (CWA). A copy of their preliminary memo from the site inspection is attached to the First Amendment to Petition as a part of Exhibit "6". The assessment was based in part on a 2015 rule, the "Clean Water Rule," issued by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (USEPA) defining waters of the U.S. (jurisdictional waters). The Clean Water Rule is in effect in the State of Hawai'i, but is currently being contested through the courts. It is noted that the findings from AECOS' field memo are still preliminary since a more formal jurisdictional determination survey has not been conducted.

For description purposes, the drainageway upslope of Lipalu Street is referred to as the "Lipalu Channel." Within this area, Lipalu Channel and three unnamed branches appear to be jurisdictional under the CWA. This channel is routed through the eastern section of the Petition Area generally near the Cultural Preserve. Lipalu Channel is

likely a tributary to Kāwā Stream, which discharges into Kāneʻohe Bay, and would thus be jurisdictional by rule. Lipalu Channel enters the City's storm drain system through a culvert underneath Lipalu Street and then discharges into a channelized tributary of Kāwā Stream. However, a more formal survey would still need to be conducted and submitted to the USACE for their review and official jurisdictional determination.

Lipalu Channel is a non-relatively permanent waterbody (non-RPW), with physical flow sufficient to create discontinuous indicators of an ordinary high water mark (OHWM). The channel has bed and banks, which are not continuous throughout the length of the channel like the OHWM. The average width of each channel is approximately 3 feet wide, and the channels are incised to mostly less than 3 feet, becoming broader and deeper near the Lipalu Street culvert entrance. Sediment sorting, destruction of terrestrial vegetation, and a break in bank slope were the most frequently observed indicators of OHWM.

Lipalu Channel was mostly dry during the survey, but a brief rain shower resulted in flowing water through some segments and isolated pools containing aquatic insects. The nearest NOAA rain gage, "Lulukū" (located mauka of the survey area), recorded approximately 0.09 inches of rain during the survey. No fishes or crustaceans were observed in Lipalu Channel, whose presence would indicate perennial flow.

Drainageway with Seep and Incised Channel

The second ephemeral drainageway at Ohaha Place serves a smaller basin encompassing the western end of the Petition Area. This includes the area where the well and seep are located. Stormwater sheet flows from upland areas into the lower basin area, eventually merging into and entering the catchment basin at the end of the Ohaha Place. An incised channel is also located next to the seep making up this drainageway. The seep and nearby incised channel have physical indicators of flow that are directed into the culvert at the end of Ohaha Place that is part of the City's drainage system serving the Pikoiloa subdivision. A preliminary jurisdictional waters determination report by AECOS on this seep and incised channel is attached to the First Amendment as a part of Exhibit "6".

The seep emerges from the ground just below the abandoned well. Flow from the seep has eroded a shallow and somewhat braided channel ("seep channel") extending down the slope. This seep channel varies between 3 to 16 feet wide, and water depth is less than 4 inches. Banks are low being mostly less than 8 inches high. Water appears to regularly occupy the bed of organic-rich silt appearing as oily sheens indicating groundwater seepage occurs throughout the length of the channel. Boulders present in the area are sometimes on the streambed or the stream banks with some appearing to have been placed to manipulate flow. Little shelving occurs within the channel, indicating volume of flow is limited and relatively constant. Soil is saturated within the channel, but appears to have low moisture outside of the channel.

Upslope of the seep, erosional gullies on the hillslope direct runoff into an incised channel near the seep. Flows in these small gullies are ephemeral likely occurring only after large storm events, and are not of sufficient volume and duration to create physical indicators of flow, such as a stream bed and banks. These findings are consistent with a water quality study.

Physical indicators of flow (bed and banks and OHWM) first appear in the incised channel located approximately 120 feet upslope (mauka) from the confluence with the seep channel. The incised channel did not contain water at the time of the survey, and was dry during other field inspections of the site. The incised channel is between 3 and 10 feet wide, and nearly vertical banks are up to about 5 feet high. Boulders are on the channel bottom and tree roots growing on the stream banks are exposed. The channel bed consists of boulders and recently-deposited silt, and is configured in "steps" to form a series of small waterfalls and plunge pools when the stream is flowing. Terrestrial plants are rooted above the OHWM and roots are exposed on the eroding banks. Wracking is present at and above the OHWM. No aquatic flora or fauna was observed in the incised channel.

Based upon these results, the seep channel and a section of incised channel would likely be considered jurisdictional waters under the USACE. A final jurisdictional determination would be made based upon USACE review of a jurisdictional determination request that includes AECOS' report. The jurisdictional

seep channel is about 223 feet long (down to the culvert entrance) and the jurisdictional segment of the incised channel is about 100 feet long above the confluence with the seep channel.

Surface Water Flow Rates

The volume of groundwater input to Kāwā Stream above the USGS monitoring station across the street from the Bayview Golf Course was estimated to average around 600 gallons per minute (gpm) between December 2017 and February 2018 (Element Environmental LLC, 2018). Synoptic streamflow measurements were made at multiple locations within the watershed after five days with no rainfall on February 12, 2018. In particular, measurements at the Parkway site indicated a flow rate of 25 gpm, reflecting the approximate baseflow volume originating from the basin next to residences located below (makai of) the existing HMP.

A seepage run conducted in the residential basin (Cascade Spring) measured spring flow of 5 gpm at the slope below HMP's existing maintenance facility; 2 gpm from the buried culvert draining HMP's existing cemetery and receiving groundwater input; and about 8 gpm of perched groundwater inflow across the course of the small tributary flowing northeast from the spring and culvert behind the Parkway residential recreational center.

In addition, water samples collected during this and previous studies from various monitoring locations throughout the watershed after several days with no rain

reflected water quality of perched groundwater rather than the water quality of stormwater runoff from rainfall.

Flow Monitoring Data

A flume was installed within the drainageway serving the Lipalu watershed about 200 feet mauka of the improved Lipalu Street catchment basin to allow continuous monitoring of stormwater flow in this ephemeral drainageway. Manual and tipping rain gauges were also installed on the ridgeline to record rainfall that falls along the ridgeline at the Petition Area between December 2017 and February 2018. The volume of stream and runoff flow for Kāwā Stream was obtained from the USGS gaging station located mauka of Kāneʻohe Bay Drive during this timeframe. During the 71-day monitoring period, runoff was measured at the Lipalu flume on nine days.

It should be noted that monitoring for the flume was terminated on February 18, 2018 due to a large storm event that partially destroyed the flume. The flume recorded a water level of over 4.55-feet shortly before it collapsed. A three-foot high level in the flume is associated with a flow rate of 80.4 cfs, or over 36,000 gallons per minute. It is likely that the peak flow volume during this intense storm was on the order of 200 cfs. The flow measured at the USGS gaging station rose from 10 cfs to 1,000 cfs during the initial intense period of rainfall from this storm. The one-hour, 100-year design storm event for the Kāneʻohe area is around 4.5 inches/hour.

The largest storm during the monitoring period was the February 18th major storm. The highest one-hour rainfall total associated with this event was 2.51 inches. The highest 10-minute rainfall intensity measured during this storm was 0.57 inches, which fell at the beginning of this storm event. An average of 40% of the rainfall that fell within the Kāwā watershed during these nine storm events ended up as runoff discharged within Kāwā Stream at the USGS gaging station. Within the smaller Lipalu watershed, an average of 5.4% of rainfall discharged from this section of the Petition Area during these storm events ended up as runoff in the Lipalu flume. During the nine storm events recorded, only approximately 1.2% of the total runoff discharged from the Kāwā Stream watershed originated from the forested Lipalu watershed area monitored by the flume.

Proposed cemetery expansion improvements would change existing drainage patterns within the site, but would not adversely impact surface water resources. The establishment of the Cultural Preserve would have minimal effect on existing drainage patterns because no major site improvements are planned. The area with the well and seep on the western end of the site would not be used for cemetery burial space, therefore, no grading or filling would occur or significantly impact this particular site. The section of the incised channel along the seep that is likely jurisdictional would also be preserved and not impacted or altered by grading activities.

Grading activities required for cemetery expansion would significantly alter the present topographic condition of the site by cutting and filling large areas of the site. These changes would alter current drainage patterns and drainageway routes. The most significant change would occur in the western end of the Petition Area where a hillside would be cut, and in the eastern section where grading activities would change the Lipalu channel.

Planned grading improvements would not change the overall watershed boundaries, allowing runoff to continue flowing to lower areas of site basins. The project would change topographic conditions within portions of these watersheds (e.g. Lipalu watershed). Grading plans are designed to create a more level site with sloped grades of less than 20%, which is an improvement because portions of the site currently have areas with much steeper grades. Therefore, the velocity of runoff would be reduced by less steep grades. The existing City catchment basins at the end of Ohaha Place and Lipalu Street would continue to serve as drainage discharge points from the site.

The installation of turf grass over the majority of the area to be used for cemetery space would slow the velocity of runoff and result in improved stormwater infiltration and decreased sediment transport. Remaining runoff would be detained by future retention/detention basins, allowing sediments and nutrients to settle before eventually discharging into the City's drainage system and Kāwā Stream.

Retention/detention basins capturing and treating runoff generated from the cemetery would be designed for a 100-year frequency, one-hour duration storm event. Based on this design criteria, runoff generated during storm events less than the 100-year storm event (4.5 inches per hour) would be retained on-site in detention/retention basins having a beneficial impact (reduced) on discharge volumes. Design plans would be coordinated with the City for review and approval during the project's design phase. Therefore, no mitigative measures are required. A Department of Army Permit from the USACE would be obtained for grading plans altering the Lipalu channel located on the eastern end of the Petition Area.

8. **WATER QUALITY.** A water quality study was prepared for the project by E2 and is attached to the First Amendment to Petition as a part of Exhibit "6". This study updates a water quality study prepared in 2009 for previously proposed cemetery expansion plans. The primary purpose of this updated study is to evaluate project water quality impacts to Kāwā Stream.

Impaired Waters Background

The Federal Clean Water Act (CWA) of 1972 establishes a regulatory framework to protect the nation's surface water resources. The CWA requires states to conduct a bi-annual surface water quality assessment. Surface water bodies violating State standards must be reported pursuant to §303(d) of the CWA. The resulting list of impaired water bodies is usually referred to as the "303(d) list." The 303(d) list provides information on

the pollutants impairing stream water quality. Additionally, the list identifies priorities for Total Maximum Daily Load (TMDL) development. TMDL is a regulatory term in the CWA and describes the maximum pollutant amount a waterbody can receive, while meeting water quality standards. TMDL is used as a planning tool for restoration and protection activities, with the ultimate goal of attaining or maintaining water quality standards (Townscape, Inc., 2012).

The TMDL development process identifies the causes of pollution and calculates the maximum daily pollutant amount that can enter a waterbody without violating water quality standards. TMDL calculations are performed for both point and non-point source pollutants. Point sources may include industrial discharge or municipal storm water drainages. Non-point source pollutants may include pollutants carried by rainfall or stream flow. The calculated maximum pollutant loads are then divided and assigned among the identified pollution sources.

The State Department of Health assesses several types of water quality parameters including nutrients, turbidity, total suspended solids (TSS), bacteria, heavy metals, pesticides, herbicides and other potentially harmful substances. In Ko'olaupoko streams, excess pollutants are mostly nutrients, turbidity, and TSS (Townscape, Inc., 2012).

State Water Quality Standards

Kāwā Stream is classified by the State DOH as a Class 2 inland water body. Per HAR §11-54-03, the objective of this classification is to protect the use of these waterbodies for recreational purposes; the support and propagation of aquatic life; agricultural and industrial water supplies; shipping; and navigation (State of Hawai'i, 2011). Kāwā Stream is currently listed on the DOH's 2016 303(d) list due to results of a study on stream water quality and the relationship between measured pollutant loads and State water quality standards (Burr, 2002). Initial TMDL were established by that study for nutrients (nitrogen and phosphorous) and sediments. The study concluded excess nitrogen was the most common pollutant in the watershed while excessive phosphorous and sediment loading occurred only during storm events.

The estimated largest source area for nitrogen and sediment loads measured were residential areas and cemetery lands, whereas the dominant source for phosphorous were from forest land and residential areas. The study concluded the pollutants could enhance unwanted algae growth within Kāwā Stream, and impact coral reef resources in receiving waters of Kāne'ōhe Bay. TMDL developed were updated in 2005 and include nutrients (nitrogen and phosphorous) and TSS. Kāne'ōhe Bay is also listed on the 2004 303(d) list for nutrients, nitrates/nitrites, NH₄ (ammonia), turbidity, *chlorophyll a* and enterococci. Kāne'ōhe Bay provides important habitat for freshwater and marine species of importance to subsistence, commercial and cultural uses.

Estimate of Kāwā Stream Loads

The current impact of Total Nitrogen (TN), Total Phosphorous (TP), Nitrate plus Nitrite (N+N) and Total Suspended Solids (TSS) loads discharging from the watershed into Kāwā Stream was estimated using stream flow and water quality data collected at the Kāwā Stream USGS station. Linear regression models estimated the relationship between streamflow rate and nutrient and TSS delivery during a 71-day monitoring period (December 2017 to February 2018).

A total of 304 million gallons of water flowed past the Kāwā Stream USGS station during the monitoring period. An estimated 256.8 tons of TSS, 2.9 tons of TN, and 1.3 tons of TP were entrained in the water passing the gauging station during this period. The vast majority of sediment and nutrient loads during the monitoring period were carried in Kāwā Stream during nine storm events.

While 69% of stream flow occurred during these nine storm events, 98% of TSS and phosphorous loads and 83% of TN load occurred during these events. The USGS has observed that a single storm event may deliver the equivalent of years and even decades of pollutant loads received by coastal waters under extreme weather conditions. This phenomenon has been observed in the Kāwā watershed. The intense rainfall event beginning around noon on February 18, 2018 accounted for about 74% of TSS yield, TP load, and over 52% of TN load measured over the entire monitoring period. Water flow at the Kāwā Stream USGS station rose 100-fold (from 10 to 1,000 cfs)

in a 15-minute period during this storm. The resulting stream flow likely scoured unhardened portions of drainageways and Kāwā Stream leading to changes in the size, shape, and composition of the channel. Therefore, it can be concluded by data collected that the vast majority of sediment and nutrient loads entering Kāne'ōhe Bay from Kāwā Stream does occur during these significant storm events.

Lipalu Watershed Load Contribution

The smaller Lipalu watershed area within the larger Kāwā watershed contributes nutrients and suspended solids to Kāwā Stream from within the Petition Area. The Lipalu flume set up in the existing ephemeral drainageway provides information on storm runoff volumes along with nutrient and TSS loads. The contribution of streamflow, total suspended solids and nutrients generated from the Lipalu watershed, where much of the cemetery's expansion would occur. The flow data and mass estimates of nutrient and suspended sediments for the large storm event on February 18 are not accurate because the flume collapsed, but do show that the volume of runoff from this single storm dwarfed the volume of runoff generated during the previous eight runoff events.

The measured volume of runoff generated from this undeveloped, forested watershed represents approximately 0.71% of the total water flow measured at the USGS gaging station on Kāwā Stream during the same monitoring period. However, the total suspended solid load leaving this area represents about 31.3% of the TSS load

measured at the USGS gaging station due to the extremely high TSS levels measured in the runoff at the flume. This forested watershed also contributed 4.8% and 1.9%, respectively, of the total nitrogen and total phosphorus mass measured at the USGS gaging station.

This data shows that the undeveloped forested portion of the Petition Area experiences a high level of erosion and sediment runoff contributing a significant amount of TSS into Kāwā Stream. A notable amount of nutrients are also discharged from this undeveloped area. Furthermore, large single storm events can contribute massive amounts of TSS and nutrients overwhelming totals resulting from other smaller rainfalls. Such large storms have a significant impact on Kāwā Stream and its water quality.

Water Quality Sampling Results

Water quality sampling was collected from several sources within the Petition Area and surrounding area between December 2017 and February 2018 to characterize Kāwā Stream and other water sources. Analysis to detect the presence of pesticides and formaldehyde within water resources was also conducted. Existing water quality characteristics were determined through analysis of data from the USGS Kāwā Stream gauging station located mauka of Kāne'ōhe Bay Drive, existing water quality studies, and sampling conducted.

Stream water samples were obtained primarily from two sites; 1) the USGS Kāwā Stream station; and 2) a small groundwater fed tributary entering Kāwā Stream behind the Parkway subdivision recreation center. The USGS Kāwā Stream station receives ground and storm water input from the entire watershed mauka of Kāne'ōhe Bay Drive. The Parkway site receives ground and storm water input from existing portions of HMP and the adjacent residential community.

Perched ground water samples were gathered primarily from two sites: 1) a small spring (Cascade Spring) located below the HMP maintenance yard; and 2) the well located in the northwest end of the Petition Area. Samples were also obtained at the Lipalu flume installed in the ephemeral drainageway leading to the catchment basin at the end of Lipalu Street.

Average concentrations of TN, TP, TSS, and N+N from data sources were examined. Analyzed collectively, the sampling data suggests groundwater dominant baseflow within Kāwā Stream can be characterized by relatively low concentrations of TP (0.04-0.11 mg/L) and TSS (4.9-12 mg/L), with intermediate concentrations of TN (0.95-1.7 mg/L) and somewhat elevated concentrations of N+N (0.70-1.29 mg/L).

Samples comprised predominantly of stormwater runoff tend to have somewhat elevated concentrations of TP (0.11-1.04 mg/L), elevated concentrations of TSS (96.5-3,470 mg/L), elevated concentrations of TN (1.45-10.8 mg/L), and comparatively lower concentrations of N+N (0.25-0.40 mg/L).

The relationship between nutrient concentrations (TN, TP, N+N) and total suspended solids (TSS) at the USGS Kāwā Stream site and the Parkway site samples were visualized through scatterplot graphs. There was a positive relationship between TN and TSS concentrations for samples graphed. The pattern shown indicates TN concentrations generally increase as TSS concentrations rise. This pattern suggests groundwater dominant samples, possessing lower TSS concentrations, also have comparatively lower nitrogen concentrations. Elevated nitrogen concentrations result from the presence of stormwater runoff in samples. Also shown was a positive relationship for TP concentrations that generally increase as TSS concentrations rise. This relationship suggests phosphorous may be present in solids transmitted to the stream during runoff events. There was indication of a negative relationship between N+N and TSS as N+N concentrations generally decline as TSS increases. This pattern suggests groundwater, which generally has lower TSS concentrations, is the primary source of nitrates to Kāwā Stream.

Examined collectively, these graphs illustrate that samples from the USGS Kāwā Stream station and the Parkway site follow similar variation trends. This suggests nutrient and TSS contributions to Kāwā Stream from the existing HMP cemetery area are not elevated compared to contributions to this stream from the lower urbanized portions of the watershed. Although HMP lands are only a portion of the larger

watershed, the pattern may indicate existing areas of HMP do not contribute high nutrient concentrations to Kāwā Stream affecting its water quality.

The flume samples provide an understanding of pollutant concentrations in surface runoff water flowing downslope from the Petition Area and surrounding undeveloped forested areas. The TP, TN, and TSS concentrations from this area are significantly higher than samples taken from elsewhere within the watershed, including the Parkway monitoring site that receives runoff from the existing HMP cemetery.

Pesticide and Formaldehyde Analysis

A total of 42 stream and groundwater samples were collected and analyzed by E2 for Glyphosate, Diuron, and 2,4-D using enzyme-linked immunosorbent assay (ELISA) to address impacts from herbicides and pesticides. The USGS also collected a water sample from Kāwā Stream in February 2017 as part of an Interagency Pesticide Monitoring Initiative with the State Department of Agriculture.

The presence of Glyphosate, commonly known as Roundup, was analyzed since it is the most widely used herbicide, accounting for about 25% of the global herbicide market. Given its widespread use, Glyphosate tends to be ubiquitous in the environment and in food supplies. Diuron and 2,4-D were analyzed given the presence of these pesticides in a sample collected from the USGS Kāwā Stream station. Diuron is an herbicide spray used for selective weed control in certain crops and nonselective weed control in non-cropland areas. This herbicide may be applied to soil prior to weed

emergence to control susceptible seedlings. 2,4-D is one of the oldest and most widely available herbicides globally, and can be found in numerous commercial lawn herbicides. Over 1,500 herbicide products contain 2,4-D as an active ingredient.

Background on Pesticides in Surface Waters

Other agencies and organizations have tested surface waters for pesticides since 1999 in streams on O'ahu and Kaua'i. The various studies have detected concentrations of these three pesticides (diuron, 2,4-D, and glyphosate) in Hawai'i's streams. It should be noted that these pesticides are not always detected, and that the detected values present are at trace levels, typically in the low to mid-part per trillion concentration levels.

In order to put the detected pesticide concentrations in Hawaiian streams in perspective, concentration levels of glyphosate have been measured in common beers and wines sold in Germany and the United States. The concentration levels of glyphosate in beers and wines are typically a couple of orders of magnitude higher (part per billion levels) than the levels detected in Hawaiian streams. The German Federal Institute for Risk Assessment also concluded that the highest glyphosate concentrations detected in German beer (30 parts per billion) do not constitute a risk to human health. An adult would need to drink 1,000 liters of beer in a single day for glyphosate levels to pose a health risk.

Pesticides Sampling Results

Glyphosate was the most commonly detected pesticide with concentrations detected in 15 of 42 samples gathered. Diuron was detected in 7 of the 42 samples analyzed, while 2,4-D was only detected in a single sample.

Pesticides were most commonly detected in turbid, runoff dominated samples where TSS concentrations tended to be elevated. This pattern suggests the source of detected pesticides are pesticide contaminated sediments that may be transported to Kāwā Stream during rainfall events. Pesticides may also be located in alluvial deposits adjacent to the stream where these pesticides are already present. Pesticides in these deposits may become resuspended in stream waters through the scouring of deposits during periods of high stream flow.

The detected concentration levels of glyphosate at the Kāwā Stream monitoring site, which receives runoff from the entire watershed, are generally similar at the Parkway monitoring site that receives runoff from the existing cemetery. This suggests that the input of glyphosate into the stream from HMP's cemetery is broadly similar to the input of glyphosate from lower residential communities that provide runoff to the stream. The trace concentrations of Diuron detected may reflect residual pesticide input to the stream from prior agricultural usage of the area, based upon the detection of this pesticide in runoff from the flume sampling the currently undeveloped Lipalu watershed.

Although variation is apparent, stream samples containing over 0.5 parts per billion glyphosate are generally moderately to highly turbid (>50 NTU). This pattern observed aligns with findings of other studies indicating that glyphosate is commonly detected in stream bed sediments, supporting the suggested conclusion that glyphosate may be found in Kāwā Stream from the runoff related resuspension of contaminated sediments.

The total mass/volume of glyphosate entering Kāwā Stream from runoff sampled related to the February 5, 2018 storm event was estimated through analysis of glyphosate concentrations in Kāwā Stream USGS station samples from this event. Glyphosate was detected in concentrations ranging from 120 to 1,098 ng/L. Concentrations measured in these samples were extrapolated across the duration of the storm event. The estimated total mass of glyphosate in the roughly 17.6 million gallons of runoff produced during the storm event is estimated to be 12.9 grams, or 7.6 milliliters (less than a tablespoon), of glyphosate. Therefore, it can be concluded that glyphosate concentrations detected in Kāwā Stream are minimal, especially given its comparatively greater presence in beers and wines.

Formaldehyde Sampling Results

Formaldehyde is a chemical that has been used as part of the modern embalming process for burials to temporarily prevent the decomposition of a body. Therefore, water samples were collected and analyzed to detect the presence of formaldehyde to

address potential concerns with its leaching into perched groundwater from the veteran's and HMP existing cemeteries.

Four samples were collected from a small spring (Cascade Spring) located outside of the HMP property in the hillslope situated below HMP's maintenance yard and at the well located at the northwestern corner of the cemetery expansion site. Formaldehyde was not detected in any of these samples at an analytical detection limit of 5 parts per billion.

Proposed cemetery expansion improvements would change existing site conditions from an undeveloped forested area to a predominantly landscaped grass area that is maintained by HMP staff for burial plots. The site's topographic conditions would change to sloped grades of less than 20%, which is an improvement over existing conditions because portions of the site currently have areas with much steeper grades. The volume and velocity of runoff would be reduced by less steep grades within the site, improving opportunities for water to infiltrate instead of discharging. Proposed turf grass landscaping would also slow the flow of site runoff, improving ground infiltration and reducing runoff volumes.

Retention/detention basins capturing and treating runoff generated from the cemetery would be designed for a 100-year frequency, one-hour duration storm event (4.5 inches per hour). Therefore, runoff from rainfall rates lower than the 100-year, 1

hour event would be retained by detention/retention basins constructed under the Proposed Action.

Proposed retention/detention basins would reduce sediment and nutrient loads by treating the first flush of runoff from high-intensity rainfall events. The exact quantity of sediments and nutrients reduced on an annual basis is dependent on multiple factors including the timing, size (rainfall amount), and intensity of specific rainfall events as well as the infiltration capacity of the detention/retention basins ultimately installed.

As a result, project improvements are expected to have an overall beneficial impact on water quality associated with Kāwā Stream along with the eventual discharge point at Kāneʻohe Bay. Both Kāwā Stream and Kāneʻohe Bay are listed as 303(d) impaired waters. The prior TMDL study for Kāwā Stream determined that excess nitrogen was the most common pollutant in the watershed, while excessive phosphorous and sediment loading occurred during storm events. The water quality study conducted for this project supports this TMDL study findings, and further documents how large storm events contribute a significant amount of TSS into the stream, primarily associated with undeveloped forested areas. This project would improve Kāwā Stream's water quality and TMDL by reducing stormwater discharges, TSS, and nutrients within this watershed area. The detention/retention basins would

reduce TSS and nutrient discharges, and the landscape grass would allow increased rainfall infiltration, especially during smaller rainfall events.

The cemetery expansion area would include maintenance activities to manage grass growth, such as lawn mowing and trimming of other vegetation. However, cemeteries are not intensively managed landscapes as compared to golf courses. Fertilizers are not necessary for use at the existing HMP cemetery due to the generally fertile conditions, supportive weather conditions, and lower maintenance needed for turf grass. Pesticides are also not used by maintenance staff for HMP's cemetery. HMP maintenance staff occasionally use the herbicide Roundup (glyphosate) to address spot areas needing treatment. However, such use is infrequent due to the generally wet weather in Kāne'ohe, and the characteristics of the cemetery lawn. Appropriate measures would be taken to ensure such herbicide use does not result in adverse water quality impacts. These methods would involve usage in compliance with manufacturer directions and avoidance of application during windy and rainy conditions.

Existing pesticide concentrations and discharges from the Petition Area would be reduced under the Proposed Action. Pesticides were most commonly detected in turbid, runoff dominated samples where TSS concentrations tended to be elevated, and project improvements would significantly improve this condition from occurring within the site. With the extensive grading improvement planned at the site, the trace concentrations of pesticides such as Diuron detected that may be potentially located in

alluvial deposits adjacent to drainageways may become buried within fill material or removed as part of excess material from cutting activities. These pesticides may still be present within the Petition Area from its prior historic use for agriculture and ranching activities.

Glyphosate concentrations generated from the project should not have a significant impact on water quality. Detected concentration levels of glyphosate from the larger watershed serving the existing Veterans and HMP cemetery are broadly similar to the input of glyphosate from lower residential communities discharging runoff into the stream. Thus, glyphosate discharges from the cemetery expansion area should be similar, relatively small, and not have an impact on water quality. Runoff data collected from a volume of about 17.6 million gallons produced during a storm event was estimated to have less than a table spoon of glyphosate. Therefore, impacts from glyphosate concentrations that may be detected in Kāwā Stream would continue to be minimal, especially given its comparatively greater presence in beers and wines.

Based upon the sampling results for Formaldehyde, this chemical would continue to not be an issue with the cemetery expansion, and would not impact the stream's water quality.

The Cultural Preserve would have minimal effect on existing runoff volumes and water quality because no major site improvements would occur within the preserve area. Runoff from this site would thus continue to experience some erosion and

discharges that include TSS and nutrients because of the undeveloped forested area similar to that occurring under the No Action Alternative.

Proposed Mitigative Measures

The project would have a beneficial long-term effect on water quality by reducing runoff volumes, velocity and the amount of TSS and nutrients discharged into drainageways and Kāwā Stream. Therefore, no mitigative measures are proposed to address long-term effects.

However, short-term construction related activities could have an impact on water quality associated with the discharge of sediment from grading activities. Design plans will include BMPs for implementation to address mitigating such effects and plans would be coordinated with the City for review and approval during the project's design phase.

In summary, BMPs implemented to minimize impacts to soils would address water quality and effects on Kāwā Stream. Permits including grading, grubbing, stockpiling, and a National Pollution Discharge Elimination System (NPDES) permit would be obtained after agency review, and would discuss applicable BMPs. An Erosion and Sediment Control Plan (ESCP) would also be prepared. BMPs would be incorporated as part of permit approval and development of the ESCP. Actual BMPs implemented would be determined during the project's design phase.

9. **ARCHAEOLOGICAL.** 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 (Honua, 2018). The AIS is attached to the First Amendment to Petition as a part of Exhibit "6". 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 was reviewed by SHPD, revisions incorporated, and a final AIS was submitted to SHPD. SHPD's acceptance letter is attached hereto as Exhibit "8".

Area of Potential Effect

For this project, the area of potential effect (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.
2. Archaeological background information drawn from prior archaeological studies as determined through consultation with SHPD.
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.
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.

Consultation

Consultation with project proponents and interested community members by Honua has been on-going 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 Project.

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.

In accordance with §13-284-8(2), HAR, consultation with the State Office of Hawaiian Affairs (OHA) was conducted. OHA was also consulted in association with this EIS process (EISPN and Draft EIS). In addition, OHA was given the opportunity to review the Draft AIS on March 30, 2019. OHA's compliance specialist commented that

due to the involvement of cultural practitioners of the area who are involved in helping to maintain the property and provide assistance with important project decisions, OHA would defer in providing further comments.

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.

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.

Several myths and legends are associated with Kāneʻohe and the ahupuaʻa surrounding the Petition Area. Kāneʻohe was a population center containing agricultural fields and multiple streams flowing from the Koʻolau range toward a fertile bay. Streams and natural hillside runoff fed loʻi (irrigated taro fields) as well as sweet potato, pandanus, wauke, and bananas. Coastal areas contained coconut groves and multiple fishponds.

The waters of Kāneʻohe 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 Kāneʻohe lived near coastal areas, on the fringes of lowland fields, and within inland valleys. The ahupuaʻa has been noted throughout historical records as the seat of the ruling aliʻi of Koʻolaupoko.

The Petition Area is located within the ʻili (small land division) of Kawaʻewaʻe and Kalokoai. Kawaʻewaʻe is the name of an important heiau located in the Petition Area while Kalokoai translates to “the food pond.” The high chief ʻOlopana was said to have erected Kawaʻewaʻe Heiau in the beginning of the 12th century. The legend of the half man, half pig demigod Kamapuaʻa is associated with Kawaʻewaʻe Heiau and is a central moʻolelo (story or legend) of Kāneʻohe.

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 Kāneʻohe, attesting to the political importance, abundance, and value of its land.

Kāneʻohe would later become a population center of Oʻahu in the 19th century. According to population estimates for the area, over twice as many individuals resided in Kāneʻohe in 1779 compared to the next most populated ahupuaʻa in the Kāneʻohe Bay region, Heʻeia. An estimated 15,000 to 17,000 individuals resided in the bay region with Kāneʻohe and Heʻeia accounting for 55% of the population at this time.

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

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. 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 Hawai'i in the early 1800s with cultivation reaching commercial levels in the early 20th century. In particular, pineapple cultivation is reputed to have destroyed a famous hōlua slide located in the Petition Area near Kawa'ewa'e heiau.

Following World War II, Kāne'ohe became a central location for dairy production on O'ahu as well as a major residential center. Three dairies opened in the Kāne'ohe 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. O'ahu's dairy industry quickly declined due to the high price of land in Honolulu, the urbanization of Kāne'ohe and Kailua, and landowner realization that developing landholdings for housing was more profitable than farming. Over 5,000 single family homes were developed on Kāne'ohe 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.

Previous Archaeological Research

Several archaeological studies have been conducted within and in the vicinity of the Petition Area.

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 he saw 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'ōhe. This heiau was on the ridge facing the Nu'uānu 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.

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.

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.

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 SIHP #50-80-10 numbers -8228 to -8241.

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). 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.

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.

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.

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. From the 1990s to early 2000s, the site was maintained by local community stewards.

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. 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.

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. 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 Kāneʻohe and Heʻeia. Survey efforts found the site to be in fair condition.

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 lauaʻe 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. 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.

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.

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. 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.

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.

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. 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.

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. 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.

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. 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.

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.

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. 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.

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.

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.

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. 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.

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.

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.

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.

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.

Previously Identified Sites

The ten previously identified historic sites 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.

Evaluation of Impacts to Sites

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 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 determination 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.

SHPD has completed their review of the draft AIS (Honua 2018) and concurred with this effect determination and recommendations based upon their comments provided in March 2019. Overall, the comments were relatively minor and did not change the AIS study findings or study methodology. A revised draft AIS was prepared by Honua and was submitted to SHPD in March 2019 which was subsequently finalized and accepted by SHPD.

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.

Preservation

The landowner intends to preserve and protect (conserve) all features within the proposed Cultural Preserve with creation of a Preservation Plan. 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 in accordance with the Preservation Plan developed. Two sites not located within the proposed preserve (SIHP # -4681 and # -8235) would be avoided and thus protected. Honua 3 ('Auwai), SIHP # -8230, is not located within the Cultural Preserve, but that site would be avoided and consequently preserved due to its function as a habitat for the endangered Blackline Hawaiian Damselfly. Sites SIHP # -8231 and # -

8241 were recommended to be included within the Cultural Preserve, and are already included within this preserve.

The Preservation Plan would include a management component that establishes guidelines for managing activities occurring within the Preserve, which continues to allow cultural practitioners to access the site for cultural practices and gathering. This Preservation Plan for the Cultural Preserve would address:

- a. Allowing community members and organizations to engage in regular maintenance of Kawa'ewa'e Heiau and the surrounding cultural landscape and historic sites.
- b. Determining buffer areas from the Heiau and other sites.
- c. Working with the community to develop educational and interpretive programs.
- d. Working with practitioners to protect culturally significant hula and medicinal plants.
- e. Allowing for restoration of the cultural landscape, including but not limited to 'auwai and historic terraces. The 'auwai associated with the well and seep (SIHP # -8230 site) could be included as part of these restoration and management activities.
- f. Addressing new burials within the Preserve following traditional native Hawaiian protocols.

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.

10. **CULTURAL RESOURCES.** A Cultural Impact Assessment (CIA) for the Proposed Action was prepared by Honua Consulting in 2018, and is attached to the First Amendment to Petition as a part of Exhibit "6". 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 Kāne'ōhe ahupua'a, 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 Pa'akai O Ka 'Āina v. Land Use Commission*, 2000 (*Ka Pa'akai*). The conformance of the CIA with this analytical framework is discussed below.

CIA Conformance with Ka Pa'akai 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 Pa‘akai*, the Hawai‘i 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 Pa‘akai* 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 Kāne‘ohe ahupua‘a 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 Kāne'ohe ahupua'a 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.

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:

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. Keolalaulani Dalire. Kumu Hula.
6. Kaui 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.

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 Kāneʻohe region. Specific resources include historic sites; natural resources such as flora, fauna, and natural phenomenon; intangible resources including moʻolelo, ʻōlelo noʻeau, and mele; and cultural practices.

In summary, the general location of the Petition Area is interesting because it is a true wahi pana (storied place). There are many old moʻolelo (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 moʻolelo, it is determined that this area would be considered “ka wao lāʻau” or the place of ʻamaʻu, a fern upland agricultural zone. While ʻamaʻu (*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 lāʻau also generally translates to the realm where ferns grow. ʻAmaʻu would likely grow in the area, and it is a kino lau (body form) of Kamapuaʻa, the demigod and king who played a prominent role in the famed history of the area.

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. Kawaʻewaʻe Heiau is considered the most prominent of these sites. Kawaʻewaʻe 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. 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.

Natural Resources

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.

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.

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.

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.

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 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.

Proposed Project

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'a 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'a 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. 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 Damselfly. 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. An 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).

Therefore, under the Ka Pa'akai analysis conducted as part of the CIA, approval of the Applicant's petition would not adversely impact traditional and customary native Hawaiian rights identified in the Petition Area. The rights of native Hawaiian cultural practitioners are preserved and protected by avoiding development in any areas identified through the interviews or research as areas utilized for traditional or customary practices. Additionally, the Petitioner is taking the additional step of placing lands and resources used for traditional or customary practices into a Cultural Preserve and conservation easement. This would ensure the protection of these resources in perpetuity. The Petitioner has further agreed to continue to work with practitioners to ensure safe, regular access to the lands and resources for cultural practice.

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.

11. **AGRICULTURE.** The Kāne'ohē ahupua'a was a pre-contact population center with inland agricultural fields fed by streams that flowed downslope from the Ko'olau Range. Sweet potato, pandanus, wauke, bananas, and taro were grown in pre-contact Kāne'ohē. Coastal areas of the ahupua'a also contained multiple fishponds (Honua 2018). By the mid-19th century, Land Commission Award records indicate that lands claimed in Kāne'ohē were occupied by taro fields, fishponds, and dryland for crops. Agricultural production would continue to dominate land use within Kāne'ohē through the mid-20th century. Sugarcane, rice, pineapple, cattle, and sheep were cultivated in the Kāne'ohē region during this period. Pineapple and cattle were previously cultivated on Petition Area lands. Kāne'ohē became an important area for dairy production on O'ahu by the mid-20th century. The Souza Brothers Dairy was located near the Petition Area with area lands said to have been grazed by cattle owned by this operation. Presently, no commercial agriculture activity occurs within the Petition Area.

Agriculture Land Use Classifications

Soils of the Kāne'ohē and Alaeloa soil series underlie the Petition Area. The USDA NRCS characterizes general uses of these soils, which include agriculture (SCS

1972). Soils in the Alaeloa series were recorded as being used for pineapple cultivation, pasturage, wildlife habitat, homesites, and water supply functions. Kāneʻohe series soils were recorded as being used for pasturage, homesites, and urban development. Although agricultural use has been documented for these soils, the Hawaiʻi Soil Atlas classifies these soil series as “naturally infertile” (College of Tropical Agriculture and Human Resources). This classification is granted to soils with low nutrient holding capacity that are often deficient in calcium, magnesium, and potassium. However, naturally infertile soils can become productive if amended with the proper nutrients.

Land Study Bureau Classification

The University of Hawaiʻi Land Study Bureau’s (LSB) Detailed Land Classification-Island of Oahu, classifies soil by land type in which classifications are provided for an overall crop productivity rating, with and without irrigation. Overall LSB ratings range from A to E, with A representing the class of highest productivity and E the lowest.

Petition Area lands are rated “D” and “E” indicating area lands are poorly suited for agricultural use.

Agricultural Lands of Importance to the State of Hawaiʻi.

The State Department of Agriculture’s Agricultural Lands of Importance to the State of Hawaiʻi (ALISH), established a classification system for identification of agriculturally important lands to the State of Hawaiʻi. Three classes of lands are

established which are: 1) Prime, 2) Unique, and 3) Other. Lands not included under this system are “unclassified.”

A small corner of the northwest corner of the Petition Area is classified as “Prime Land.” This area bordering existing residences is associated with the small basin where a well and seep are located. However, no improvements are planned for this corner site. These lands are best suited for production of a variety of crops.

A section of the northeast portion of the Petition Area is classified as “Other Lands.” This area includes the eastern end of the cemetery’s expansion, and a large portion of the Cultural Preserve. Areas classified as Other Lands are important to Hawai’i agriculture, but exhibit properties such as seasonal wetness or a limited rooting zone that render the Prime and Unique designation inapplicable. These lands can be farmed satisfactorily through proper management such as application of fertilizer inputs and soil amendments.

The majority of the Petition Area was excluded from the ALISH classification process. These lands include the western and central portions of the Petition Area, and sections of the northern portion at low and high elevations, and the higher elevation lands of the Cultural Preserve. Lands were excluded from the ALISH classification process based on specific criteria for exclusion that were established. For example, lands with slopes in excess of 35% were not considered for classification.

Important Agricultural Lands

In 2005 and 2008, the State Legislature passed two bills that among other things, provided the framework for counties to identify Important Agricultural Lands (IAL) by establishing eight criteria to be used when reviewing land for IAL consideration and outlined the process used to evaluate agricultural land. The City DPP has identified land on O'ahu where the IAL designation is recommended. The Petition Area is not located in the State Agricultural District and is located within the State Conservation District. Therefore, the Petition Area is ineligible for consideration as IAL.

Potential Project Impact

Uses supporting agricultural activities are not proposed as part of this project. Cemetery expansion improvements including grading of the Petition Area and related site improvements would allow expansion of HMP operations. Although portions of the Petition Area were previously used for pineapple cultivation and dairy production, contemporary soil data indicates the majority of area soils have low utility for agricultural production. As a result, project implementation would not result in adverse impacts to agricultural resources.

12. **NOISE**. Censeo AV+Acoustics (Censeo) conducted an environmental noise assessment (Censeo, 2018) of the Petition Area. This study is attached to the First Amendment to Petition as a part of Exhibit "6". The purpose of this noise assessment is to identify potential noise impacts to the surrounding area resulting from the construction and operation of the expanded cemetery area.

Existing Conditions

Ambient noise level measurements were taken by CENSEO in November 2017 to assess the existing acoustic environment near the Petition Area. A total of one long-term noise measurement location and four short-term noise measurement locations were selected.

Long-Term Measurement Results

One long-term measurement was performed on the northern boundary of the Ocean View Garden section of HMP. The measurement was continuous from November 2, 2017 through November 9, 2017. The measured 1-hour equivalent sound level (L_{eq}) and the 90% exceedance level (L_{90}) were determined. The L_{90} noise level is widely accepted as the standard for determining the background noise level. Dominant sound sources documented included park maintenance activities and vehicles.

The range of background noise levels was consistent across the measurement period. The highest measured sound levels during the week were due to trucks or construction vehicles on the cemetery grounds. Dogs, roosters, air traffic (MCBH Kāneʻohe Bay), and traffic from Kamehameha Highway also contributed to ambient noise levels. Overall daily average sound levels were calculated using long-term measurement data obtained.

Short-Term Measurements

Four short-term measurements (S1 to S4) were performed in the area surrounding HMP and the Petition Area. Traffic noise was the dominant noise source at S1. Noise from maintenance vehicles, although intermittent, resulted in the highest sound levels at S2. Ambient noises inside the cemetery typically originated from traffic on Kamehameha Highway or from roosters. Animals in the surrounding neighborhood were the main noise source measured at locations S3 and S4. Therefore, ambient noise levels in the neighborhood are determined primarily by the presence of dogs or roosters in the surrounding area. Proximity to nearby roads and associated vehicular traffic had less of an influence on sound levels because neighborhood vehicular traffic is minimal.

Potential Project Impact and Mitigation

With the project, the main noise effects would be from short-term construction activities as compared to the long-term operation of the cemetery expansion. The primary long-term noise sources during normal daytime operations would be from maintenance vehicles and equipment (e.g., lawn mowers and grass trimmers) operating within the expanded cemetery. Noise from funeral services would have minimal impact because such services would continue to be held at existing facilities near the HMP entrance, and the number of services scheduled on a typical day would continue to occur at the present levels. The only change would be smaller private services held at a burial plot by the family occurring within the expanded cemetery.

Visitation of burial plots by families or friends within the expanded cemetery would occur in addition to vehicles traveling along extended internal HMP roadways to reach these areas. Currently, noise levels from these visitation activities within HMP is relatively low based upon measurements taken, and similar levels would likely occur within the expanded cemetery (e.g. 48 dBA at Ocean View Garden). Cemeteries tend to not be significant noise generating activities.

Maintenance equipment, though likely audible at nearby residences if occurring nearby, are mobile and temporary noise sources, and are not regulated for noise at the federal, state or local levels. Maintenance equipment would only be used during daytime hours, which is consistent with current cemetery operations. Maintenance equipment and vehicles would not be operated continuously over long periods or allowed to idle for extended periods of time that further reduce potential maintenance equipment noise impacts.

Backhoes are used during normal operations to create burial spaces. These activities occur sparingly and only during daytime hours. Typical backhoe operations at 25 feet or further from the property line are expected to be less than the 90 dBA construction noise limit identified under FTA's criteria for residential land use areas. As previously discussed, the State DOH does not quantify allowable construction noise levels.

Cultural practices and restoration activities occurring within the Cultural Preserve are not expected to generate significant noise, and noises generated would likely not occur on a daily basis.

The project would generate a minor increase in vehicular traffic typically as part of visitations due to additional burial plots within the expanded cemetery. A Traffic Impact Analysis Report projected a 2% increase in traffic volumes along Kamehameha Highway due to the project by the year 2040. Traffic noise occurring about 50 feet within HMP from the highway was projected using these traffic volumes. This analysis projects an increase in traffic noise levels of less than one decibel increasing from 58 dBA to 59 dBA, and is considered negligible. Traffic noise within the cemetery as a whole is expected to increase by only one decibel due to the expansion project by 2040.

Short-Term Construction Noise Effects

Short-term construction activities would generate noise volumes that would be audible at nearby residences. The actual sound levels that would be experienced in the vicinity will vary greatly during construction activities, and are a function of the distance from the noise source, sound attenuation (topography, vegetation structures) between the noise source and the noise receptor, the duration of the construction activities, and the number of pieces of equipment used.

The noise levels represent the maximum A-weighted sound pressure levels (L_{max}) measured at a distance of 50 feet from the construction equipment. The actual noise

levels produced during construction activities would be a function of the methods employed during each stage of the process by the contractor. Although the specific equipment and quantity used would be determined by the contractor, the equipment identified represents a reasonable approximation of what would be used.

Construction noise levels at the property line are expected to be below the FTA's noise impact threshold of 80 dBA for residential land uses. Typical noise levels decrease 6 dBA when doubling the distance away. Given the 150-foot buffer area from residents, construction noise levels for equipment shown at the property line would decrease about 10 dBA. Being within a home structure would further shield and reduce construction noise levels. In addition, the majority of grading activities would occur further mauka and consequently well away from adjacent residents further minimizing noise disturbances. In comparison, average noise from a washing machine is about 70 dBA and gas-powered lawnmowers or leaf blowers are about 90 dBA. Nevertheless, it is anticipated that construction noise levels will exceed the existing ambient noise levels at the Petition Area boundary. Intermittent construction noises would likely be clearly audible during site excavation and grading activities.

None of the intruding noise would be high enough to cause hearing loss for nearby residents. The Federal Occupational Safety and Health Administration and many state standards set the Permissible Exposure Limit at 90 dBA of noise exposure over an 8-hour time period, while 85 dBA is commonly used as a guide for other

industrial safety practices. Hearing risk exposure of 85 dBA for eight hours per day, followed by 10 hours of recovery time results in negligible risk to hearing. Louder noise from construction equipment used during the day would not occur continuously at nearby residences at such levels over an eight hour period.

However, people may need to raise their voice or reduce the talker-to-listener distance in order to communicate effectively. The severity of the speech interference will depend on how close the residents are to the site as well as the location of the construction activities occurring. Although this noise disruption would likely occur over the duration of construction activities, the impact of these disruptions are minor and of a short-term duration.

Therefore, construction activities would inevitably result in short-term, but minor to moderate noise impacts. The extent of these impacts would vary depending on the stage of construction, wind direction, specific equipment being used, distance to the receptor, and the duration of each activity. Therefore, the ability to control construction noise levels relates primarily to the duration and time of construction activity in any one day.

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels, a permit must be obtained from the State DOH to allow the operation of vehicles, construction equipment, power tools, etc., which emit such noise levels. This ministerial permit is typical for construction

activities. Prior to issuing the noise permit, DOH may require the contractor to incorporate noise mitigation into the construction plan, or require the contractor to conduct noise monitoring or community meetings to discuss construction noise.

The DOH noise permit does not limit the noise level generated at the construction site, but rather the times at which noisy construction can take place.

Specific permit restrictions for construction activities are:

1. No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels ... before 7:00 AM and after 6:00 PM of the same day, Monday through Friday.
2. No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels... before 9:00 AM and after 6:00 PM on Saturday.
3. No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays.

Construction activities generate not only audible airborne sounds, but can also result in varying degrees of ground vibration depending on the equipment and methods employed. Vibration induced by the specific construction equipment utilized would not usually result in adverse effects on people or structures. Jack hammering is the greatest source of vibration; however, these impact activities would be located a significant distance away from adjacent residences. During site activities, noise from the

earth-moving construction equipment would likely be more noticeable than any perceived vibration. Furthermore, ground vibration from construction activities would be temporary, and thus not have a significant impact.

Mitigative Measures for Construction Noise

To mitigate short-term construction noise effects, the following mitigative measures are proposed.

1. A construction noise permit would be obtained from the State DOH for operation of construction equipment.
2. A majority of the construction noise mitigation is in the form of scheduling to limit the construction hours to the timeframe specified by the State DOH.
3. The contractor would use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, and using properly tuned and balanced machines. Construction crews should refrain from using loud equipment within 50 feet of a residence, if possible. If unavoidable, noise impacts may be reduced by utilizing equipment intermittently or by blocking the line-of-sight from noise sources to noise-sensitive receivers with barriers or other designed noise mitigation measures.
4. Possible source control methods would be considered during the design phase as part of contractor requirements, and such methods can be applied to most construction equipment.

13. **AIR QUALITY.** Ambient concentrations of air pollution are regulated by both National and State ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawai'i AAQS are defined in Chapter 11-59, HAR.

Present Air Quality in Area

Much of manmade particulate emissions originate from area sources, such as the mineral products of industrial and agricultural activities. Manmade sulfur oxides are emitted almost exclusively by point sources, such as power plants and other fuel-burning industries that are not present in the Kāne'ohe region. Nitrogen oxides emissions emanate predominantly from area sources (mostly motor vehicle traffic), although industrial point sources contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources.

Air quality in the State can generally be characterized as relatively clean and low in pollution. Excluding exceedances due to volcanic emissions, the Island of O'ahu was in attainment of all National and State AAQS in 2015 (DOH, 2015). Tradewinds are predominant throughout the year, typically carrying emissions and other air pollutants from inland areas toward the ocean.

The H-3 Freeway is routed south of the Petition Area with heavy vehicular traffic characteristic of major highways. However, the Oneawa hillside separates and shields

the H-3 Freeway from the Petition Area, which minimizes the impact of vehicular CO emissions associated with the H-3. Additionally, dominant northeasterly trade winds likely push vehicular emissions from this roadway away from the Petition Area. Vehicular traffic using HMP's internal roads is minimal and would not have a significant contribution to CO emissions. Traffic patterns on minor streets in the HMP vicinity are also low and would contribute minimally to CO emissions. Therefore, vehicular related CO emissions in the Petition Area are not expected to exceed the State's one hour AAQS for CO (9 ppm), and should be well within the National AAQS.

Potential Project Impact and Mitigation

With the project, the main effects on air quality would be from short-term construction activities as compared to the long-term activities occurring within the cemetery expansion. The only source of potential long-term effects on regional air quality would be CO from localized traffic congestion at the HMP driveway intersections. Activities at burial sites within the expanded cemetery would not generate long-term impacts potentially affecting air quality. Long-term cemetery operations at the Petition Area are not expected to result in excessive congestion that would lead to vehicular CO emissions exceeding State one hour AAQS (9 ppm). CO emissions should be well within the National AAQS (35 ppm).

Short-Term Effects on Air Quality

Short-term impacts on air quality could occur due to construction of cemetery expansion improvements. There are two types of air pollution that could result in short-term air quality impacts: 1) fugitive dust emission from project construction activities and vehicle movement; and 2) exhaust emission from on-site construction equipment. There may also be short-term impacts from vehicular CO emissions related to travel of construction equipment to and from the Petition Area, the temporary increase in local traffic caused by commuting construction workers, and the disruption of normal traffic flow caused by roadway lane closures, if required.

Fugitive dust emissions could result from earth moving activities associated with cemetery expansion improvements. Earth moving activities include grading and grubbing of the Petition Area, construction of related retaining walls, and development of site improvements such as roadways and drains. Site grading and infrastructure improvements would likely occur in phases of 5-acre increments and should be completed within a year. The geotechnical analysis notes existing soils would be moist to wet given the high rainfall environment surrounding the area (Geolabs, Inc., 2018). Therefore, these soils should result in less potential for airborne transmission of dust compared to drier soils.

Construction activities would comply with State's air pollution controls prescribed under State DOH's rules (Chapter 11-59, HAR "Ambient Air Quality Standards" and Chapter 11-60.1, HAR "Air Pollution Control"). These rules prohibit

visible emission of fugitive dust from construction activities at the property line. A dust control plan would be prepared if adverse air quality impacts are anticipated for implementation by the contractor. Dust control measures may involve implementation of a watering program or use of windscreens. Other measures include BMPs at the job site (i.e. tire washing programs), and use of temporary rock pavers for heavily traveled areas with exposed soils.

On-site mobile and stationary construction equipment would also emit air pollutants from engine exhaust. Large construction equipment typically used for earthmoving activities is generally diesel-powered. NO₂ emissions from diesel engines can be comparatively higher than gasoline powered equipment. However, annual AAQS for NO₂ should not be exceeded from short-term construction equipment operation. The short-term (1-hour) standard for NO₂ is derived from a three-year average for this air pollutant. Therefore, it is unlikely that relatively short-term construction emissions would exceed the 1-hour standard. CO emissions from diesel engines are generally low and should be comparatively lower than vehicular related CO emissions on nearby roadways. Exhaust emissions from construction vehicles can be further minimized through the proper operation and maintenance of all equipment.

Movement of heavy construction equipment and worker vehicles traveling to and from the Petition Area could have temporary short-term effects increasing congestion. Activities could obstruct the normal flow of traffic for short periods,

resulting in increases to overall vehicular emissions in the general region. However, traffic in Kāneʻohe generally operates at acceptable levels, and movement of heavy equipment should not result in excessive traffic congestion.

Mitigative Measures for Short-Term Effects

To mitigate short-term construction effects on air quality within the Petition Area from emissions of fugitive dust, the following mitigative measures are proposed.

1. A dust control plan would be prepared during the project's design phase for implementation by the contractor in compliance with State regulations. Dust control measures may involve implementation of BMPs potentially consisting of a watering program, use of windscreens, and use of temporary rock pavers for heavily traveled areas with exposed soils.
2. Construction vehicles would be properly operated and all equipment properly maintained to minimize exhaust emissions.
3. The movement of heavy construction equipment and workers would occur outside peak traffic periods. Design plans would be coordinated with the project contractor to ensure movement of equipment and workers does not occur during commuter peak traffic hours.

14. **VISUAL RESOURCES.** The project's impact on the visual character of the landscape surrounding the Petition Area was assessed by first identifying prominent views oriented toward the Petition Area from public vantage points where

the Petition Area may be visible. Two City planning documents, the *Coastal View Study* (Chu and Jones, 1987) and *Ko'olau Poko Sustainable Communities Plan* (DPP, 2017) were referenced to identify relevant established views and visual resources that should be evaluated in this analysis.

Visual resources discussed in these documents include prominent views and landforms. Prominent views where the Petition Area may be visible were also identified from vantage points in public areas surrounding the Petition Area. These views were selected from a variety of distances and orientations surrounding the Petition Area to assess the project's visual impact from multiple vantage points. Together, the prominent views identified result in a visual analysis that provides a thorough understanding of the visual impact that would result from project implementation. The following discussion details the prominent views included from the documents referenced, identifies prominent views that comprise this study, and describes the visual character of the landscape seen from these views.

Existing Conditions

The visual character of the Kāne'ohe ahupua'a is defined by the region's natural features and land uses. These natural features include the Ko'olau mountain range, vegetated inland hills, and Kāne'ohe Bay. Residential land uses dominate the area immediately north of the Petition Area. This area is generally comprised of single and two-story single-family homes. The area generally south and east of the Petition Area is

natural in character due to the presence of the Oneawa hillside, which is undeveloped and densely vegetated. The area generally west of the Petition Area is largely open space in character due to the presence of landscaped areas of HMP and the nearby Pali Golf Course. The Petition Area encompasses a portion of Oneawa Hills. These areas include the hillside slopes and parts of the summit ridgeline. These areas are undeveloped and natural in character given the presence of a mature Schefflera/Java Plum non-native forest on the hillside slopes and basins.

Coastal View Study

The *Coastal View Study* was developed for the City's Department of Land Utilization (now known as the Department of Planning and Permitting). The study inventoried significant coastal views, coastal land forms, and important open spaces that comprise O'ahu's scenic shoreline resources. The study identifies views from public viewing points and coastal roadways within the City's Special Management Area (SMA).

The study subdivides the island into viewsheds, which are entire surface areas visible to an observer from a viewing point. The viewshed applicable to the Petition Area is the Ko'olaupoko district's Kāne'ohe Bay Viewshed. The Kāne'ohe Bay Viewshed is further divided into two sections which are Kahalu'u and He'eia. The He'eia section is pertinent to the project area, and visual resources associated with this

section were reviewed. However, no coastal views, scenic lookouts, or resources pertinent to the project area were identified.

The H-3 Freeway leading into the MCBH Kaneohe was identified as a roadway providing lateral views across the bay and encompassing the entire viewshed. However, this section of the freeway is makai (northeast) of HMP and the Petition Area. No significant roadway views from H-3 within the viewshed area occur within the vicinity of the Petition Area or existing HMP site. Coastal views identified occur along sections of Kāneʻohe Bay Drive and Kamehameha Highway located north and away from the project area (past Castle High School). Significant stationary views identified within the Kāneʻohe Bay Viewshed were at the Heʻeia State Park and the H-3 scenic lookout. These stationary view locations are not near the Petition Area, nor would views from these sites be affected by the project. The H-3 scenic lookout is located closer to the entrance to the MCBH Kāneʻohe, and is of scenic coastline views of Kāneʻohe Bay.

Koʻolau Poko Sustainable Communities Plan

The *Koʻolau Poko Sustainable Communities Plan*, adopted in August 2017, provides general policy guidance for land use actions by the City. This plan identifies the general orientation and vantage points of prominent views within the Koʻolaupoko district. Based upon review of the sustainable communities plan's Open Space Map, two views were identified that would be applicable to the Petition Area. Both views are from upland locations of the broader Kāneʻohe community and Kāneʻohe Bay viewshed.

The first viewing point emanates from the Pali Lookout, and consists of a panoramic makai-oriented view of the broad Kāneʻohe community. Individuals looking makai from the Pali Lookout are provided with an expansive view of concentrated urbanized areas combined with large open space areas of the Koʻolau Golf Club, City's Pali Golf Course, Oneawa Hill, other undeveloped areas, and Kāneʻohe Bay in the background. HMP's existing landscaped cemetery lawns are visible as well as a small portion of the Hawai'i Veterans Cemetery. Existing portions of the Petition Area including the heavily vegetated western lower flank slopes of Oneawa Hills are not prominent, but are visible from this view.

The second view identified from the community plan consists of continuous makai views from the H-3 Freeway of the broader Kāneʻohe community while traveling in a vehicle. Makai of the Tetsuo Harano Tunnels, views of the Kāneʻohe viewshed are similar to that from the Pali Lookout, particularly for drivers heading towards Kāneʻohe. Expansive views are mainly of Kāneʻohe Bay due to the highway's concrete guardrails blocking portions of the view from a vehicle. Oneawa Hill and the ridgeline extending toward the MCBH Kaneohe are also landforms prominent in the view.

The Petition Area is visible for a very short period (about 10 seconds) for Kāneʻohe bound vehicles right before entering the Hospital Rock Tunnels. Views of the Petition Area then disappear for motorists once the tunnels are reached and beyond that

because of the highway's lower elevation approaching the Kāne'ohe exit ramp and the presence of dense vegetation and tall trees along the highway obscuring views.

Additional Public Views

Other prominent public views of the Petition Area were identified from surrounding public vantage points. These views of the Petition Area were selected to allow for a more thorough assessment of the project's impact on the visual character of the surrounding landscape. The following discussion identifies these views and describes the visual character of the surrounding landscape.

Public Views Along Kamehameha Highway

Kamehameha Highway near HMP provides existing views of the Oneawa hillside and the Petition area. Motorists traveling northbound on Kamehameha Highway (Kāne'ohe bound) toward HMP can see existing portions of HMP as they pass beneath the overpass of the H-3 Interchange. However, as vehicles approach HMP, a high, vegetated berm on the makai side of the highway is present that obscures views of HMP and the Petition Area until one nears the cemetery's main entrance. Vehicles travelling in the southbound direction would similarly have views of HMP and the Petition Area blocked.

The first public view along Kamehameha Highway identified is oriented makai toward the Petition Area at HMP's main entrance across of Halekou Road. Existing HMP facilities and landscaped areas are visible from this view. Portions of the Petition

Area closest to Kamehameha Highway, including the flanks of Oneawa Hills are visible. However, the dense vegetation and tall trees associated with the undeveloped portions of the Hawai'i State Veterans Cemetery property block most views of the Petition Area.

Traveling further north from this main entrance, tall trees and vegetation present along the highway obscure all views of HMP and the Petition Area until vehicles reach the second HMP entrance across of Mahinui Road. The second view identified from Kamehameha Highway is also oriented makai toward HMP's from their northernmost entrance. Similar to the view from HMP's main entrance, landscaped areas of HMP are visible along with the heavily vegetated flanks of Oneawa Hills within the Petition Area. Dense vegetation and tall trees associated with the undeveloped portions of the Hawai'i State Veterans Cemetery similarly property block most views, and some roofs of existing residences are visible.

Views from Pikoiloa Subdivision

Four views of the Petition Area from vantage points located within the Pikoiloa Subdivision were identified. The first three views are located immediately north of the Petition Area. Views are at the intersection of Ohaha Place and Ohaha Street, a stationary spot further east on Ohaha Street, and a stationary spot on Lupo Street. The fourth vantage point is located further north from these views at the intersection of Namoku Street and Mokulele Drive.

As a whole, the densely vegetated hillside with tall trees currently separating nearby residences from the Petition Area are prominent features within these views. Mature trees populating Oneawa Hills are also visible and are the only aspects of the Petition Area visible.

The fourth view located further north from the Petition Area at the intersection of Namoku Street and Mokulele Drive provides views of the vegetated hillside comprising the eastern portion of the Petition Area. Surrounding residential uses are also visible from this vantage point.

Views from Kāneʻohe Bay Drive

Three views oriented toward the Petition Area were identified along Kāneʻohe Bay Drive. This roadway is located about one and a half miles north of the Petition Area. Looking toward the Petition Area from the eastbound lane of this roadway, existing commercial buildings associated with the Windward City Shopping Center block views.

The first potential available view along Kāneʻohe Bay Drive was identified further east by Castle High School. However, facilities associated with the high school, including the school's classroom buildings, street fencing, and tennis courts are the dominant features of this view. Only a small portion of the Petition Area's upper elevations that consists of heavily vegetated portions of Oneawa hillside are visible from this view.

As one travels further east along Kāneʻohe Bay Drive, Castle High School facilities remain as the only features visible obscuring views toward the Petition Area. These educational facilities dominate views along this roadway from the intersection of Kāneʻohe Bay Drive with Pūʻōhala Street. Only a small portion of the upper reaches of Oneawa hillside outside of the Petition Area can be seen. Residential homes and existing trees dominate and block views of the Petition Area approaching south along this roadway.

The third view is from Kāneʻohe Bay Drive's intersection with the Bay View Golf Course entrance. Residential homes and trees continue to dominate this view block views of the Petition Area and Oneawa hillside.

Potential Project Impact and Mitigation

The concepts established in characterizing visual quality from the *Coastal View Study* (Chu and Jones, 1987) were used to assess the visual impacts resulting from this project. Visual qualities associated with scenic resources were evaluated using three factors that were: 1) visual vividness, 2) unity, and 3) intactness. These criteria are briefly described below:

1. Visual Vividness. The memorability of a landscape is derived from contrasting landscape components as they combine to create striking and distinctive visual patterns, taking into account form, line, texture and color.

2. Visual Unity. The degree to which the visual resources of a landscape scene join together to form a coherent, harmonious and visual pattern; a balanced composition between manmade and natural elements.
3. Visual Intactness. The extent to which the landscape is free from visually encroaching features.

Using these criteria, the visual impact of the project was evaluated based upon the degree of change to an existing view or alteration of a scenic resource.

As a whole, the Proposed Action would result in grading activities for cemetery expansion that substantially alter existing landforms and vegetation within the Petition Area. The Cultural Preserve would have minor landscaping improvements that should not significantly alter current conditions or views of this densely vegetated area. Grading would result in extensive cut and fill activities for the cemetery expansion to achieve a more balanced topography having slopes no greater than 20% to allow for pedestrian access among gravesites.

In order to achieve desired finished grades, the lower flank slopes of the Oneawa Hills on the western end of the site would need to be cut. The majority of this western hillside would be excavated reducing it up to 40 feet in height; however, the areas near the top of the hillside would reduce it up to 100 feet in height. This western section is where the most significant changes to existing topographic conditions would occur.

Areas graded would be landscaped with turf grass, altering the view of the existing canopy forest character within the Petition Area.

Although the project would alter the Petition Area's present visual appearance and forest character, this change would not have an adverse effect on existing views and viewing locations identified. The landscaped and open space character of the expanded cemetery would complement the existing HMP and Hawai'i State Veterans Cemetery already present within the backdrop of the larger Oneawa hillside. The alteration of the Petition Area's view is one of many elements comprising the visual quality of the visible landscape. In comparison, other potential urban developments, such as residences or commercial uses, would create a greater visual change and contrast in character.

Within the larger viewshed, the landscaped open space view and character of the expanded cemetery is similar to several other existing surrounding uses such as the Pali Golf Course, Ko'olau Golf Club, HMP, and State veteran cemetery. The Petition Area would not be visible at several public viewing sites along roadways as already discussed. Existing dense vegetation and tall trees, particularly within the State's veteran cemetery's property along the hillside, would screen views of the expanded cemetery particularly from upland areas looking toward Kāne'ohe Bay.

More importantly, elevations within the cemetery expansion would generally be lower or the same elevation as existing surrounding uses making its view difficult to see

from many areas and along roadways. The grading plan for the cemetery expansion would predominantly result in elevations ranging from about 230 to 350 feet AMSL. Only a very small area of the cemetery expansion near the Cultural Preserve would have grading improvements extending up to the 400-foot elevation. In comparison, the Hawai'i State Veteran Cemetery ranges in elevation from 280 to 370 feet AMSL. HMP's existing cemetery ranges in elevation from 270 to 340 feet AMSL.

Visual simulations were created for several views to assist in the evaluation and assessment of visual impact resulting from the Proposed Action. Utilizing the preliminary grading plan developed, a 3D topographic model was created that was then edited to create the proposed roads and layout of the design. After accurately representing the proposed plan in a 3D model, desired views were rendered to photo manipulate them with images taken.

Pali Lookout View Effects

Only a portion of the 28.2 acre cemetery expansion area would be visible from the view of the Kāne'ohe region viewshed from the Pali Lookout because most of the area would be blocked by existing dense vegetation and trees associated with the State cemetery. The 14.5 acre Cultural Preserve area would predominantly remain vegetated by the existing forest, remaining visually similar to existing conditions, and would not be visible from the lookout.

Although the Petition Area would change visually, the overall character of the larger Kāneʻohe region viewshed from this vantage point would not be significantly impacted. The distance of the Petition Area from this lookout view diminishes its effect as compared to the Koʻolau Golf Club and Pali Golf Course in the immediate distance. The landscaped turf of the cemetery expansion would also be generally compatible with views of the existing landscaped open space character of HMP, veteran cemetery, and golf courses.

The visual vividness of the landscape remains largely unchanged as the undeveloped character of Oneawa hillside is still apparent. Although a small portion of Oneawa hillside is altered, the distinct visual character established by surrounding undeveloped and urbanized areas of Kāneʻohe establishing the vividness of this view is maintained. The backdrop of Kāneʻohe Bay is an important component contributing to the viewshed's visual vividness, and the project would not disrupt this view. The visual unity of this view would not be impacted significantly. Although the Petition Area has changed visually, turf grass and native plant landscaping utilized aligns with the overall vegetated character of the surrounding area. Therefore, the unity of natural and urban elements comprising the visual landscape is predominantly maintained. The visual intactness of this view would also be maintained. Although the appearance of the Petition Area has changed, grading and landscaping improvements do not result in development that encroaches upon important features of the visible landscape.

H-3 Freeway View Effects

The project would not significantly impact the visual qualities of the landscape and overall Kāneʻohe region viewshed seen from the short section of the H-3 Freeway. The Petition Area is only visible momentarily as motorists travel toward Kāneʻohe on the freeway as previously discussed. The Petition Area is one of many features comprising the expansive landscape seen from this vantage point, and the change would not be significant and similar to changes from the Pali Lookout view.

The visual vividness of this view would not be significantly impacted as landscaped portions of the Petition Area align with the natural character of Oneawa hillside and do not detract from the visual character of the surrounding region. Therefore, the distinctive visual pattern of urban development and vegetated areas that characterize the visible landscape would not be significantly altered. The visual unity of this view would not be significantly impacted. Although the cemetery expansion area would be graded and landscaped, the landscaped area visible would not conflict with the vegetated character of the surrounding area. In contrast, residential or commercial developments that are larger in scale would have a disruptive effect on the visual unity of the surrounding area. These developments are not proposed in this project. Therefore, project implementation would not significantly impact the visual intactness of this view relative to developments that would visually encroach upon the existing landscape.

Kamehameha Highway View Effects

The project's impact on the view from Kamehameha Highway at the main HMP entrance would not be significant. A small portion of this graded and landscaped area of the expanded cemetery would be visible, resulting in a slight and relatively minor change to the character of this view. Existing dense vegetation and tall trees from the State's veteran cemetery's property screens views of the expanded cemetery. In addition, the lower elevation of the cemetery expansion relative to the existing HMP cemetery is evident in further blocking views.

Although this view would change slightly, landscaped areas visible align with the vegetated character of the surrounding area. Vegetated areas of Oneawa hillside would continue to be visually dominant. Therefore, the distinct visual pattern established by HMP's existing facilities and landscaped and naturally vegetated areas would be maintained, preserving the visual vividness of the landscape. The visual unity of the landscape would not be impacted as grading and landscaping improvements would not significantly alter the naturally vegetated character of Oneawa hillside that dominates the landscape surrounding the Petition Area. Therefore, the visual unity of manmade and natural features in the landscape would not be significantly altered. Project hillside grading improvements would not result in development that would encroach upon the natural and manmade features seen. While the nearest visible hillside would be graded and landscaped, this action would not encroach upon

surrounding features, such as Oneawa hillside, that establish the visual quality of the landscape.

The project's visual impact on the view at HMP's second driveway entrance across of Mahinui Road would be minimal. Project improvements that grade and landscape the westernmost hillside in the Petition Area would result in a minor change to the landscape seen from this view, which is similar to the change at the main entrance. Although the project would result in a slight change to the visible landscape, the impact of the project would not be significant.

The visual vividness of this view would be maintained as the visual pattern of landscaped and developed areas of HMP in the foreground, residences in the middle ground, and naturally vegetated areas of Oneawa hillside in the background remain prominent components of the view. The project does not disrupt the visual unity of the view. Although a landscaped portion of the Petition Area is visible, this portion is small relative to surrounding natural, landscaped, and developed components of this view. These components continue to dominate the view and the visual unity of these components would be maintained. The visual intactness of this view would not be impacted. The portion of the Petition Area that would be visible is comparatively smaller than other natural and developed components of this view and does not encroach upon these components of the visible landscape.

Pikoiloa Subdivision View Effects

The project would not significantly impact views of the landscape seen from vantage points directly downslope of the Petition Area in the Pikoiloa subdivision. Existing views from these locations would essentially be unchanged. The Petition Area would continue to be obscured by mature trees on the vegetated hillside separating nearby residences from the Petition Area. Although a small number of mature trees seen in the background of the view would be removed through cemetery expansion improvements, the majority of trees visible are located on the nearby hillside that would remain. Therefore, the landscape visible from these views would remain largely unchanged after project implementation, preserving the existing vividness, unity, and intactness of the landscape.

A visual simulation was created for the fourth view from this subdivision located at the intersection of Namoku Street and Mokulele Drive. The highly vegetated hillside upslope of residences along Mokulele Drive greatly obscures most of the current views of the Petition Area that would be altered by grading and landscaping improvements. Only a small graded and landscaped portion of the Petition Area can be seen in views from this vantage point.

Although the landscape seen from this view would change slightly, the overall visual impact would not be significant. Landscaped portions of the Petition Area visible are visually compatible with the naturally vegetated areas surrounding the Petition Area. The visual vividness of the landscape would be maintained as the visual pattern

of residences and Namoku Street in the foreground and vegetated areas in the background would not change substantially. The visual unity of this view would not be disrupted as the coherence between manmade developments in the foreground and open space landscaped elements in the background would predominantly be maintained. Although vegetation in the improved portion of the Petition Area visibly differs from surrounding naturally vegetated areas, it does not differ so drastically that it significantly impacts the distinctive visual pattern of the landscape. The visual intactness of the landscape would be maintained. While a landscaped area of the Petition Area would be visible, this area comprises only a small portion of the surrounding landscape and would not encroach upon the natural character of the surrounding area.

Kāneʻohe Bay Drive View Effects

Prominent views identified along Kāneʻohe Bay Drive would not be significantly impacted by the Proposed Action. These prominent views are oriented south toward the Petition Area and located near Castle High School; the intersection of Kāneʻohe Bay Drive and Pūʻōhala Street; and the intersection of the Bay View Golf Course and Kāneʻohe Bay Drive. As previously discussed, the Petition Area is predominantly not visible from this road due to existing residences, vegetation, Castle High School, and commercial uses obscuring views.

The visual character of the visible landscape is largely dominated by educational facilities and private residences. Upper elevations of Oneawa hillside and the Ko'olau mountains are visible in the backdrop of these views. The Petition Area is not visible and obscured by residences and educational facilities seen in the foreground. The landscape visible from these views would remain unchanged after project implementation because the Petition Area is not visible. The visual vividness, unity, and intactness of the landscape seen from these views would be preserved. Therefore, the project would not significantly impact views of the landscape seen from these prominent views.

15. **TRAFFIC**. Austin, Tsutsumi & Associates, Inc. (ATA) conducted a Traffic Impact Analysis Report (TIAR) for the project, and this updated report (January 2019) is attached to the First Amendment to Petition as a part of Exhibit "6". Traffic counts were taken at select study intersections to determine existing traffic operations during the weekday morning (AM) and afternoon (PM) commuter periods, and during the weekend (Saturday) peak period. Future traffic projections with and without the project were generated for the study year 2040, and analysis of traffic conditions was performed.

Study intersections include the following:

1. Kamehameha Highway and Mahinui Road and Hawaiian Memorial Park Driveway 1 (unsignalized);

2. Kamehameha Highway and Halekou Road and Hawaiian Memorial Park Driveway 2 (unsignalized);

Methods for calculating volume to capacity ratios and delays prescribed under the Transportation Research Board's *Highway Capacity Manual 6th Edition* were used. The analysis methodology also used Level of Service (LOS) as a qualitative measure to describe traffic flow conditions at study intersections. LOS values range from free-flow conditions (LOS A) to congested conditions (LOS F).

Analyses for study intersections occurred using the traffic analysis software Synchro, which is able to prepare reports based on HCM methodologies. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. A LOS value is assigned to each approach and intersection movement as a qualitative measure of performance, based on vehicular delay at each intersection. These results, as confirmed or refined by study field observations, constituted the technical analysis informing the basis of resulting recommendations.

Existing Conditions

Major roadways near the Petition Area consists of Kamehameha Highway, Halekou Road, and Mahinui Road. Private, internal roads within Hawaiian Memorial Park are utilized by cemetery visitors and for daily operations and management of the site. HMP's internal roads also provide access to the Hawai'i State Veterans Cemetery

that is land-locked east of HMP. Two of these private roads connect to the Mahinui Road and Halekou Road intersections with the highway.

Existing Roadway System

Kamehameha Highway is part of Route 83 under the jurisdiction of the State Department of Transportation (DOT), Highways Division. This State highway is generally a north-south, four-lane, two-way, divided arterial roadway located in the vicinity of HMP by Halekou Road and Mahinui Road. The posted speed limit within the vicinity of the study intersections is 35 miles per hour (mph).

The portion of Halekou Road in the vicinity of Kamehameha Highway is an east-west, two-way, two-lane, undivided City roadway forming the western leg of a four-way unsignalized intersection with the highway. Halekou Road provides access to a residential community situated west of Kamehameha Highway. The primary entrance into the HMP and the Veterans Cemetery is situated on the eastern leg of the Kamehameha Highway/Halekou Road intersection, and is identified as HMP Driveway No. 2. Halekou Road has a posted speed limit of 25 mph.

The portion of Mahinui Road in the vicinity of Kamehameha Highway is an east-west, two-way, two-lane, undivided City roadway. This road provides access to the residential community situated to the west of HMP, and forms the western leg of a four-way unsignalized intersection. HMP's second entrance is situated on the eastern

leg of this intersection providing access to the cemetery. This entrance to the HMP is identified as HMP Driveway No. 1. Mahinui Road has a posted speed limit of 25 mph.

Private, internal roadways within the HMP property providing access throughout the cemetery and to the Hawai'i State Veterans Cemetery are owned and maintained by HMP. As previously discussed, these internal roads primarily serve as access for visitors to burial plots within various areas of the cemetery. The roadway within the State-owned Veterans Cemetery is owned and maintained by the State DOD. No posted speed limit signs are provided along these internal roadways. HMP has a roadway easement across the State Veterans Cemetery property to allow visitor access to Ocean View Garden.

Existing Traffic Conditions

Manual turning movement traffic counts and field observations were conducted at study intersections on Tuesday, September 26, 2017 and Saturday, September 30, 2017. Based on traffic count data obtained, the weekday AM, PM, and Saturday peak hour of traffic was determined to be from 7:15 AM to 8:15 AM, 4:00 PM to 5:00 PM, and 11:45 AM to 12:45 PM respectively. Traffic count data is discussed in the project traffic study.

It should be noted that the existing counts of vehicles entering and exiting HMP at the two driveways reflect activities beyond just HMP. There are four separate "users" that account for traffic reflected in these counts. Users directly related to HMP

consist of HMP staff working on site and visitors to the cemetery for funerals or to visit burial sites. A second user consists of employees of Hawaiian Memorial Park Mortuary (not part of HMP) that operates on site providing funeral services. Another major user is the Hawai'i State Veterans Cemetery that includes State staff operating there along with visitors to that cemetery. Finally, the fourth user consists of residents participating in recreational activities (walking) within the cemetery (both HMP and Veterans Cemetery).

Intersection Observations: AM and PM Peak Hour

Kamehameha Highway in the HMP vicinity serves as the regional north-south travel corridor for vehicles in Kāne'ohe. During the AM peak hour, southbound traffic heading towards the Pali Highway to travel into downtown and urban Honolulu is heavier than northbound traffic. During the PM peak hour, this condition is reversed whereas northbound traffic is heavier due to commuters returning home from work.

The laneage on the westbound approach (exiting the cemetery) at HMP's two driveways at their intersections with the highway is currently striped as a wide shared left/through/right lane. However, this lane was observed to operate as a shared left/through with a separate right-turn lane due to the available width of the driveway.

Vehicles making left-turns from the minor east-west approaches (HMP driveways and City roads) are able to use the space created by Kamehameha Highway's wide median to turn onto or off of the highway in two stages. During the

AM and PM peak traffic hour, both minor street left-turn movements onto Kamehameha Highway were executed during a gap, which is suspected to occur when the upstream and downstream traffic signal minor movement phase is occurring. Significant queueing was not observed at both study intersections. Excessive delays were observed for minor street movements. The issue appears to relate to driver comfort due to the relative high speeds and available sight distances due to the frequent change in grade along Kamehameha Highway. Drivers making left-turns along Kamehameha Highway into minor streets/HMP driveways appear to experience discomfort due to high speeds and short deceleration lengths.

Based on HMP's memorial service schedule, a total of three memorial services were scheduled during the time of traffic counts, which occurred at 11:00 AM, 1:00 PM, and 2:00 PM. During field observations, trips generated by memorial services were minimal as the services were not observed to be busy. The majority of the vehicles entering HMP were observed to park along both sides of the HMP's internal roadways and very few vehicles were parked at the parking lot across the funeral hall. Generally, trips generated by HMP were minimal and were observed to have light internal circulation with no significant queuing within the property and at study intersections.

Additionally, during the AM peak hour, queueing of about five to seven cars was observed at Mokulele Drive from both minor street directions. Queueing observed was able to clear within a single cycle. No residual queueing was observed. This

intersection is located about 500 feet north (toward Kāneʻohe Town) from HMP's Driveway No. 1 (across Mahinui Road).

It should be noted that U-turn movements are allowed only for southbound traveling vehicles at the highway's intersection with Kahiko Street, situated approximately 975 feet to the south of HMP's main entrance (Driveway No. 2). U-turns are also allowed only for northbound traveling vehicles along the highway at its intersection with Mahinui Road/Driveway No. 1. In addition, connectivity is provided to Mahinui Road and Mokulele Drive via roads within the subdivision area west of Kamehameha Highway.

Intersection Observations: Saturday MD Peak Hour

Generally, traffic within the HMP vicinity was lighter during the Saturday midday peak hour compared to weekday commuter peak hour traffic. Left-turn movements from minor streets were easier to execute as longer gaps were observed along Kamehameha Highway. No significant queuing was observed at the study intersections.

The volume of incoming vehicles to HMP on Saturday was heavier than weekday peak hours due to memorial services and visitation of burial plots by families, but is likely to vary throughout the day. During field observations, a total of three memorial services were held at 10:00 AM, 11:00 AM and 1:00 PM. The majority of vehicles related to trips to memorial services at the funeral hall were observed to park at

the HMP's internal intersection near the building, along both sides of each internal roadways, and at the parking lot across of the funeral hall, which occupied a little over half of the total stalls.

The largest funeral service was at 10:00 AM and was observed to have approximately 30 to 50 persons in the funeral hall. The memorial service lasted approximately two hours. Two burial services were also observed within the cemetery grounds. Vehicles related to trips attending the burial service parked near the burial site and occurred sporadically within a two hour time frame. Internal circulation nearing the funeral service hall and near the burial sites operated smoothly. No significant queuing was observed within the property and at the study intersections.

Public Transportation, Pedestrian and Bicycle Accessibility

O'ahu Transit Services (OTS) operates TheBus, which is comprised of 519 buses servicing populated areas of O'ahu. Costs per ride vary based on rider characteristics such as age. Within the vicinity of HMP, access to TheBus is provided along Kamehameha Highway. Bus routes servicing these stops are routes 55, 65, and 77.

Bus stops are located along the highway near the intersection of Kamehameha Highway and Halekou Road. These stops are located just north of the intersection, with one stop located in each direction. The crosswalk at this intersection is the closest crossing to these bus stops.

Pedestrian infrastructure in the vicinity of study intersections consist of sidewalks. These sidewalks span from Ko'olau View Drive to Kāne'ohe Bay Drive on the west side of Kamehameha Highway and from Kāne'ohe Elementary School to Kāne'ohe Bay Drive on the east side of the highway. In addition to providing a vehicle refuge, the wide median also provides a pedestrian refuge when crossing Kamehameha Highway. Although bus stops were located near the highway's intersection with Halekou Road, few pedestrians were observed crossing the intersection during the peak hours.

Bicycle lanes are not provided on either side of Kamehameha Highway.

Analysis of Existing Traffic Conditions

Analysis of study intersections was conducted for existing conditions based upon traffic data collected.

Kamehameha Highway & Mahinui Road

Currently, all movements at this unsignalized intersection during weekday and weekend peak hours operate at LOS D or better, with the exception of the minor street movements which operate at LOS E during the weekday AM and PM peak traffic hour.

Kamehameha Highway & Halekou Road

All movements at this unsignalized intersection operate at LOS D or better with the exception of minor street movements that operate at LOS E/F during all peak traffic hours.

Potential Project Impact and Mitigation

The year 2040 was used as the study year to project future traffic conditions with the project and without the project. Future conditions without the project were first projected to establish baseline conditions. Traffic projections were formulated by applying a growth rate to existing 2017 traffic count volumes as well as trips generated by identifying potential future developments in the vicinity of the project. Changes with the project could then be assessed relative to baseline conditions to determine project-related impacts.

A traffic signal study for the intersection of Kamehameha Highway with Halekou Road is currently underway by the State Department of Transportation (DOT) due to current operational conditions. The study is still in progress and no outcome is recommended by the State DOT at this time.

Without Project

Projections for this alternative were based upon the O'ahu Regional Travel Demand Model (ORTDM) which forecasts growth for years between 2007 and 2035. The resulting annual growth rate along Kamehameha Highway was determined to be approximately 0.4 percent per year. This growth rate was applied on all movements along Kamehameha Highway to represent regional traffic growth in the vicinity of the Project through Year 2040.

By year 2040, the Kāneʻohe area is expected to remain similar to existing conditions. All study intersections are projected to operate at an LOS similar to existing conditions, except for the eastbound movement at Halekou Road, which is anticipated to worsen and operate overcapacity at LOS F conditions. Existing intersection movements operating at LOS F and/or overcapacity will continue to operate at LOS F and/or overcapacity conditions without a traffic signal. Minor street movements would continue to experience excessive delays and are forecast to operate at LOS E/F conditions during all peak traffic hours due to relatively higher speeds and available sight distances along Kamehameha Highway. Descriptions of service conditions at each intersection are discussed below.

Kamehameha Highway & Mahinui Road/HMP Driveway No. 1

All major street movements during weekday and weekend peak hour are projected to operate at LOS B or better. Minor street movements that are projected to operate at LOS E/F during the AM and PM peak traffic hour, similar to existing conditions.

Kamehameha Highway & Halekou Road/HMP Driveway No. 2

Traffic flow along the highway is projected to operate well at LOS B for left-turn movements without signalization of this intersection. However, traffic movements from Halekou Road and HMP would continue to operate with excessive delays at LOS E and F during peak hours. Eastbound vehicles from Halekou Road would experience

particularly long delays, and this movement is projected to operate over capacity (volume to capacity (V/C) ratio of 1.02). Other movements from HMP's driveway would operate with considerable delays but would not operate over capacity.

Project Impacts

The Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition* is typically used to estimate vehicle trips generated by a project. However, only one (1) study was used to generate trip generation rates for cemetery land uses from this manual. The manual cautions users when applying trip generation data from a small sample size. Therefore, trip generation rates for the Project were derived using existing traffic count data collected.

Based on resulting trip generation rates developed, the cemetery expansion is forecasted to generate approximately 25, 27, and 71 additional trips (entering and exiting) during the weekday morning, afternoon, and Saturday peak hours, respectively.

Projected trips for the cemetery expansion are believed to be conservative (high) because the project only consists of expanding burial plots along with the Cultural Preserve. Much of the traffic entering and exiting HMP, particularly during weekday peak hours, is due to employees coming to work and leaving at the end of the day. These employees include the small number of additional maintenance staff needed (7 personnel) to service the expanded cemetery area. There should be no change to staff

required for Hawaiian Memorial Park Mortuary or the Hawai'i State Veterans Cemetery with the project. Resident use of the cemetery for recreational purposes is also projected to remain the same, as the population in the nearby area is not expected to increase.

Activities associated with the Cultural Preserve would not generate much traffic, and such activities are not expected to occur on a regular daily basis. It is anticipated that activities could generally occur from one to three days a week, primarily on weekends when volunteers and participants are more available. Typically, about 5 to 10 persons would be present conducting activities. Vehicular traffic to the Preserve would also likely occur outside of the weekday morning peak hour. On weekends, participants would likely visit the site in the morning and leave in the afternoon, thus occurring outside of the Saturday, mid-day peak hour. Therefore, vehicular traffic associated with the Cultural Preserve would be minimal, and the more conservative project trips projected should be able to account for this in assessing traffic impacts.

Project generated trips were generally assigned throughout the study area based upon existing travel patterns. With the project, study intersections would operate with LOS similar to the No Action Alternative (without project). Highway turning movements would operate with little delay. However, minor street eastbound and westbound movements would continue to operate at LOS E/F during weekday peak

traffic hours. Descriptions of LOS conditions at each intersection under this scenario are discussed below.

Kamehameha Highway & Mahinui Road/HMP Driveway No. 1

Intersection movements are expected to operate at LOS similar to conditions under the No Action Alternative. Weekday and weekend peak hour major street movements would continue to generally operate at LOS B or better. Minor street and turning movements would continue to operate at LOS E/F or better during weekday and weekend peak hours.

Kamehameha Highway & Halekou Road/HMP Driveway No. 2

Major street and turning conditions along Kamehameha Highway are projected to operate at LOS B with relatively free flow conditions. Excessive delay in traffic movements during peak hours from Halekou Road and HMP are expected. Peak hour traffic movements for these east and westbound movements would generally operate at LOS E and F during peak hours. Eastbound vehicles from Halekou Road would continue to experience particularly long delays with this movement continuing to operate over capacity.

Evaluation of Proposed Project Effects

Overall, the project would have minimal impact to the operation of the intersections analyzed. Traffic flow along with highway currently operates fairly well with little delay, resulting in vehicles generally travelling at high speeds. Left-turns

from the highway similarly operate with few delays. However, excessive delay occurs for minor street movements. Delays are attributable to driver discomfort for approaches onto the highway due to the relatively high speed of highway traffic and available sight distances along the highway.

Based upon further consultation and correspondence with the State DOT, the agency concurs with the TIAR findings in the Draft EIS that the proposed project is not anticipated to have a significant impact on State highways. Therefore, no transportation improvements to the State highway system are required for the proposed HMP project. However, the State DOT did recommend implementing the TIAR recommendation for restriping the HMP approaches to Kamehameha Highway to provide better exiting traffic flow. This measure is already identified as a proposed minimization measure. State DOT also recommended that the Petitioner provide for appropriate traffic control plans in the event activity causes traffic issues at access driveways. This is addressed under minimization measures.

Proposed Minimization Measures

Based on analysis of traffic data, striping of HMP's two westbound approaches at their driveways is recommended. Striping would delineate a shared left/through and separate right-turn lane to reflect current operating laneage. This change is expected to improve existing traffic flow out of HMP making it easier for drivers to distinguish lane movements from project driveways.

In the event that HMP has an infrequent large activity that may cause temporary traffic issues at access driveways (e.g. start and end of an event), an appropriate traffic control plan would be developed by the Petitioner to address this situation (e.g. hiring police officers or State sheriffs to support traffic control).

Short-Term Construction Effects

Activities related to project implementation may result in short-term construction related impacts to roadways. Construction activities should not occur on weekends. Therefore, short-term impacts are only anticipated during weekdays. These activities include site grading, the construction of internal roadways connecting to Ocean View Garden, and construction of other site improvements such as retaining walls and detention basins. Construction-related workers could have temporary short-term effects associated with the movement of large equipment and worker vehicles traveling to and from the Petition Area during the morning and afternoon commuter periods. However, contractors and related workers would typically arrive at and leave the construction site outside of weekday commuter peak hours.

An estimated 30 to 40 persons could be working at the project site daily throughout the project's 1.5 year construction period. The magnitude and type of construction activities occurring would determine the number of workers required on a given day, which influences the number of vehicles arriving for construction activities. Impacts from vehicle arrival are only anticipated at the intersections of Kamehameha

Highway with Mahinui and Halekou Roads. These vehicles are anticipated to arrive at HMP outside the weekday peak commuter traffic hour because workers typically start the job earlier and finish earlier. Therefore, the short-term impact to public roadways from vehicles arriving for construction related activities would be minimal. Staging areas within HMP or the Petition Area would be established for contractors, and sufficient space is available within HMP and the Ocean View Garden area to provide on-site vehicle parking.

During construction activities, traffic impacts would be mitigated by avoiding transport of large cargo and heavy equipment during peak weekday commuter traffic periods. Equipment and materials are planned to be staged on site to avoid multiple vehicle trips. Lane closures are not anticipated during construction. A permit will be obtained if any oversized and overweight equipment/loads need to be transported on State roadways. Other agency requirements and BMPs would be determined during the design phase of improvements implemented.

Effects on Public Transportation, Bicycling, and Pedestrian Infrastructure

Operation of the cemetery's expansion would not impact public transit service or infrastructure in the vicinity of HMP. These services and facilities include public transit service by TheBus and associated bus stops near the intersection of Kamehameha Highway and Halekou Road. The cemetery expansion area is located well inland of roadways where TheBus operates and associated facilities are found. Therefore,

cemetery expansion area operations should not affect services or infrastructure of TheBus. The majority of cemetery visitors would arrive by car but a small portion may commute to HMP via TheBus. Given the relatively small increase in cemetery visitor trips to the Petition Area expected, the small portion of visitors that may travel to the cemetery expansion area via TheBus would not overtax service delivery of routes near HMP.

Cemetery expansion area operations should not impact municipal bike paths or pedestrian crossings proximate to HMP as the expansion area is located a considerable distance from the highway. Most visitors would travel by car, and no project improvements would affect existing bike lanes or pedestrian crossings. Therefore, improvements to this infrastructure resulting from operation of the expanded cemetery area is not be needed.

On-site bicycle parking is not planned for the cemetery expansion or Cultural Preserve. Bicyclists could use existing internal roadways to visit various gravesite areas, and walk to a particular gravesite. Because gravesites are unique to an individual family member or visitor, having centralized bike racks are not necessary or appropriate.

16. WATER SYSTEM. The Petition Area is an undeveloped site that is not currently serviced by on-site potable water infrastructure. The City Board of Water Supply (BWS) provides potable water service to existing sections of HMP, the Hawai'i

State Veterans Cemetery, Ocean View Garden, and surrounding uses via a network of water transmission mains.

The water system serving HMP is provided by the City's potable water system from two connections. The main connection point to this system is located at the entrance to HMP in the vicinity of Mahinui Road and Kamehameha Highway. A 6-inch meter on Kamehameha Highway services HMP, and has a capacity of 1,000 gallons per minute (gpm). Ocean View Garden's irrigation system is serviced via a separate 1-inch lateral coming off a 5/8-inch meter from Kumakua Place.

Water demand generated from HMP consists of operations occurring within existing building and irrigation for cemetery landscape. HMP has about 31,000 sf of floor area for buildings on the property that include administration buildings, baseyard, chapel, and a funeral home. Based upon the City BWS water system standards for planning, these office-related activities would generate about 3,100 gallons per day of water (100 gallons per 1,000 sf of floor area). This existing office water demand should generally remain the same with the project.

The majority of existing water demand is primarily related to irrigation of the cemetery's landscape, with a smaller portion of water used for cemetery water features and visitor needs (i.e. filling individual containers to water flowers placed on burials). An average of 10,000 gallons of water a day is used by HMP for irrigation of their existing 80 acre cemetery. This average daily water use was estimated based on an

average water demand of 125 gallons per acre per day. Irrigation demand was calculated based upon available 2017-18 water use billings for the Ocean View Garden cemetery. Irrigation water use varies depending upon weather conditions, and HMP's irrigation demand has generally been fairly low to moderate due to the wetter climate conditions in Windward O'ahu. In comparison, BWS planning standards allocate average daily demands of 4,000 gallons per acre for agricultural use, schools, and parks, and 2,500 gallons per acre for single-family use.

Potential Project Impact and Mitigation

Consultation with the City BWS for this project indicated their existing water system is adequate to accommodate the proposed expansion of the cemetery (January 17, 2018 EISPN comment letter in Appendix A of the FEIS). BWS's review of the Draft EIS further confirmed the water system being adequate to accommodate the project based upon their October 11, 2018 comment letter (Appendix A). However, the BWS indicated that the feasibility of using non-potable water for irrigating the cemetery expansion should be first investigated in their EISPN comment letter. It was suggested that the Halekou irrigation wells currently being used to irrigate the Veterans Cemetery should be evaluated for potential use. If non-potable water is either unavailable or infeasible, a report documenting this investigation needs to be submitted to the BWS.

The feasibility of developing a non-potable water system using the Halekou wells is discussed below. Based upon BWS's review of the Draft EIS, it was

recommended that water conservation measures be included, such as utilizing drought tolerant plants, xeriscape landscaping, and efficient irrigation systems. These measures would be incorporated into design plans developed where feasible. However, use of a rain catchment system for non-potable water for irrigation is not feasible given the limited acreage available for cemetery expansion and unpredictability with having a reliable and available source (e.g. during summer).

Further, the existing water system is adequate to support the proposed project and provides a reliable water source. The Petitioner would pay the water system facilities charges for resource development, transmission, and daily storage when water is made available. Construction drawings and the project construction schedule would be coordinated with BWS for review during the project design phase to minimize impacts to the City's water system.

Project Effect on Potable Water System

When the project connects to the City's existing potable water system, this additional demand created would not have a significant impact on the City's water system, which is supported by BWS's comment letters on the existing water system's adequacy. Given Kāne'ohe's wet climate, with annual rainfall averaging about 53.8 inches per year, the need for irrigating grounds would be greatly decreased. Irrigation would only be needed during drier periods, such as during summer months, or during periods of low rainfall. It has been estimated that an average of about 3,500 gpd of

water would be needed for irrigation of the expanded cemetery. This estimate is based upon an average use of 125 gallons per acre per day for the Ocean View Garden. With this increased demand, the total average daily water use for irrigation with the project would be 13,500 gpd.

Site improvements propose to connect the cemetery expansion area's irrigation system to the City's existing waterline at the end of Kumakua Place. There is already an existing waterline being used to irrigate the Ocean View Garden site. The existing 5/8-inch meter serving Ocean View Garden would need to be upgraded to a 2-inch water meter to accommodate the additional water flow needed (SOH, 2018). The water source serving Kumakua Place is from a reservoir at the 500-foot elevation, and should have adequate water pressure for the proposed cemetery expansion to service cemetery elevations that reach a maximum of 360 feet AMSL.

There is another waterline in Lipalu Street that was considered for connection. However, this alternative was not feasible because the existing system will not have the required pressure to service cemetery expansion areas. The existing 272-foot windward reservoir service limit is not high enough to support the proposed cemetery elevations. The highest elevation that can adequately receive water from an existing system is 100 feet below the reservoir spillway at elevation (service up to 172-foot elevation).

Preliminary Non-Potable Water Use Evaluation

Based upon a preliminary assessment, it was determined that it would not be feasible to utilize a non-potable water source for the project because: 1) developing a well within the Petition Area or existing HMP cemetery area are not feasible or practicable, and 2) the Halekou well system would not be sufficient to service additional demand from the cemetery expansion area. Further evaluation and a report documenting these results would be prepared during the project's design phase for submittal to the BWS.

The existing shallow well and seep located within the Petition Area east of Ocean View Garden cannot be used for irrigation because there is insufficient water capacity. Based upon the groundwater study conducted, this well is served by perched water from a relatively small area overlying the impermeable Ko'olau volcanics beneath. Furthermore, drawing water from this well would impact the natural discharge of subsurface water moving downslope into the seep located below it, and consequently impact habitat for the endangered Hawaiian damselfly.

Other areas within the Petition Area and HMP property are also not suitable in the development of even a moderate capacity well anywhere due to the Kailua volcanics beneath. This area is located over basalt flows that are dense, massive, and relatively impermeable due to almost the complete filling of interstices with secondary minerals resulting from hydrothermal alteration. Clinker beds, where they occur, have been cemented into hard and essentially impermeable breccia. Joints of intruded dikes

are also filled with secondary minerals. In addition, the deep weathering of the Kailua volcanics across the area has resulted in stiff silt and clay residual soils underlain by saprolite to depths exceeding 50 feet making development of a well impractical (TNWRE, 2018).

The State Department of Defense (DOD) uses non-potable water to irrigate the Veterans Cemetery. There are six non-potable wells (Halekou irrigation wells) located on State property near the H-3 and Kamehameha Highway interchange that are being used. The elevation of the well heads is approximately 240 feet AMSL. The elevation of the Veterans Cemetery ranges from 300 to 340 feet AMSL, which is comparatively higher. The existing irrigation system at the Veterans Cemetery is known to function properly. It is unknown whether all wells are being utilized (HHF, 2008).

Engineering analysis discussed in the PER determined that connection to the State's non-potable Halekou well water system serving the Veterans Cemetery would not be feasible. Irrigation via this system is infeasible given upgrades that would likely be needed to service additional project water demands. System pumps would likely require upgrades in order to overcome additional friction loss from the additional length of pipeline required and higher static head pressures resulting from the cemetery expansion area's comparatively higher elevation relative to the well system. Higher elevation portions of the cemetery expansion area are located at approximately 360 feet AMSL which is considerably higher than the Halekou irrigation system well heads

located at approximately 240 feet AMSL. Without pump upgrades, sufficient water pressure could not be achieved to irrigate higher elevation portions of the cemetery expansion area.

17. **WASTEWATER.** The City Department of Environmental Services (DES) provides municipal wastewater collection and treatment in the Kāneʻohe district via a system of wastewater pump stations and sewer lines. The Petition Area is currently undeveloped and is not served by the City's wastewater system.

Wastewater Collection System

Sewer mains and laterals are located within City streets in the vicinity of HMP and the Petition Area and include an 8-inch municipal transmission line in Lipalu Street. This infrastructure collects wastewater from nearby residential subdivisions. There are no sewer lines within Kamehameha Highway fronting the HMP site. As a result, HMP is not serviced by this municipal system, and wastewater generated by HMP's present facilities are treated by an approved septic system. The Hawai'i State Veterans Cemetery wastewaters are serviced by a sewer lateral extending from Kumakua Place.

Wastewater from residential subdivisions in the Petition Area vicinity are conveyed by area sewer mains to the Kāneʻohe Wastewater Pre-Treatment Facility (WWPTF) for pre-treatment. Transport of wastewater in force mains is aided by area

pump stations. The nearest pump station to HMP and the Petition Area is the Halekou Waste Water Pump Station.

Wastewater from the Kāneʻohe WWPTF is then conveyed via the Kāneʻohe/Kailua Force Main No. 1 to the Kailua Regional Wastewater Treatment Plant (WWTP). This force main begins at the Kāneʻohe Effluent Pump Station located within the fenced site of the Kāneʻohe WWPTF. This force main travels underground along the makai boundary of the Bay View Golf Park and the Kokokahi YMCA, turning mauka to Kāneʻohe Bay Drive. The sewer main continues beneath Kāneʻohe Bay Drive until it reaches the Kailua Regional WWTP.

The Kailua Regional WWTP was originally built in 1965 to serve the town of Kailua and surrounding communities. The wastewater treatment plant now serves the Koʻolaupoko District that encompasses Kahaluʻu, Kāneʻohe, Kailua, and Maunawili (USEPA, 2010). Treated effluent is then discharged into Kailua Bay via the Mokapu outfall that is located over 5,000 feet offshore at an average depth of 110 feet.

The City is currently in the process of constructing a new three-mile-long wastewater treatment tunnel that will connect the Kāneʻohe pretreatment facility with the Kailua Regional WWTP. The tunnel is the largest sewer project in state history, according to the City, and will replace an older force main that has been subject to numerous failures. It is part of Honolulu's ongoing efforts to eliminate sewer overflows and spills.

Potential Project Impact and Mitigation

Adverse impacts to existing municipal wastewater infrastructure are not anticipated as a result of implementation under the Proposed Action. The project does not include improvements, such as restrooms, that would generate increased wastewater impacting the City's system. As a result, improvements to existing municipal wastewater infrastructure would not be required. No mitigation is necessary.

18. **ECONOMIC IMPACTS.** An economic impact analysis and public fiscal assessment was conducted by CBRE and forecasts the economic and fiscal impacts on O'ahu and across the state from the implementation of the project (CBRE, 2018). The CBRE report is attached to the First Amendment to Petition as a part of Exhibit "6". The analysis evaluated: 1) the general and specific effects to the local economy resulting from cemetery expansion improvements, which include capital investment, construction and maintenance employment, worker wages, and other regional monetary and employment effects; and 2) the impact to the "public purse" from the project from new tax/fee revenue received relative to any additional costs that would be assumed by the State and City due to project implementation.

Summary of Economic and Fiscal Effects

The cemetery expansion of HMP would result in significant expenditures that would favorably impact O'ahu's economy on both a direct and indirect basis. The project would increase the level of capital investment and capital flow in the region,

which would in turn contribute to and extend employment opportunities and the tax base. A summary of the effects is provided below.

1. The project would create numerous construction, equipment operator and specialty trade jobs, directly and indirectly, during the planning and construction phase.
2. Existing employment (administrative and service positions) at the HMP would be extended and marginally enhanced for several additional decades, including positions that could otherwise gradually fade away as available plots are sold and utilized.
3. Cemetery expansion would proportionately increase the need for maintenance workers over time from currently 20 up to 27 positions.
4. Short-term construction jobs, wages, and benefits would be generated for both on-site construction workers along with off-site worker servicing the construction effort.
5. Numerous local businesses would see significant profit opportunities arising for contracting companies involved in the project's construction, and for local businesses that would supply a substantial portion of the materials needed in the effort.
6. The general island economy would benefit from the project, as HMP's employees would spend their discretionary income in shops, restaurants, and

service establishments throughout the island, and in purchasing goods and services.

7. Indirectly, these wages, profits, and expenditures from the project moving through the regional economy would have a multiplier effect increasing the amount of capital flowing to the entire community.
8. Much of the direct and indirect spending would be re-directed to other island industries, and would in turn be put back through the region's economic and tax structure.

Economic Effects of Project

Direct Business Profits from Construction

CBRE's economic analysis was based on a 16-year build-out and sell-out/absorption modeling period (2020 through 2035). The full absorption and construction of the project could possibly take a shorter or longer period. However, whether full sales of burial plots take 16 or 20 years, the economic impact during the construction period and stabilized "operation" of the cemetery would be the same following construction completion.

Implementation of cemetery expansion improvements would contribute an estimated \$29.3 million in direct development capital to O'ahu's economy during the project's approximately 1.5 year construction period. Although a significant proportion of materials required to construct the cemetery expansion may need to be imported to

O'ahu, a portion of construction costs spent during development would flow to local businesses as contractor and supplier profits.

Net contractor profit margins are typically assumed to be 8% to 20% of total construction costs. Analysis for this project utilizes a more conservative 10% profit factor. Supplier profits were extrapolated at 4% of total construction costs. Estimated contractor profits to local building companies from implementation of cemetery expansion improvements totals an estimated \$2.9 million across the project construction period. Aggregate supplier profits are estimated at \$1.1 million.

Employment Opportunities Created

Demand for full-time equivalent (FTE) employment positions (on- and off-site, direct and indirect) during construction, operation, and maintenance of the expanded cemetery area was estimated using indicators obtained from the construction of comparable projects and Hawai'i industry averages. These jobs are expected to be opportunities for existing resident construction workers and local supply businesses, and to maintain HMP's existing operational jobs that could potentially decrease as existing burial plot inventory diminishes.

A total of 73 worker years (equivalent to 52 work weeks at 40 hours per week) of employment in the construction trades is projected to be needed for cemetery expansion related site work and infrastructure emplacement.

HMP's existing 38 operating personnel would continue to be employed with an additional seven maintenance personnel added over time to maintain the expanded cemetery area. The resulting total of 45 personnel employed is expected to remain constant after 2035, although there may be some slippage in administrative, sales, and servicing departments. Indirect/off-site employment positions created by the project would service the construction effort and HMP employees and their operations. Employment positions created are estimated at one-third the on-site/direct job count. This totals 233 worker years from 2020 to 2035 and 15 FTE jobs per year during the project stabilization period.

Wage Income Generated

Data from the State Department of Labor and Industry Relations and the current HMP operating payroll were evaluated to estimate personal income (wages) that would flow to O'ahu workers from the project. Total construction wages paid during construction is expected to be about \$5.9 million. Current payroll for HMP's 38-member staff is approximately \$2.7 million annually, and is expected to continue on a going-forward basis and apart from additional wages paid to increased maintenance staff for the expanded cemetery. Total HMP employee wages during the modeling period would be \$43.8 million and is expected to stabilize to \$3.2 million annually thereafter. Anticipated indirect/off-site employee wages would total \$13.1 million during build-out, and are expected to stabilize to \$842,400 annually.

The general island economy is expected to benefit as individuals employed as a result of the project are expected to spend their discretionary income at O'ahu shops, restaurants, and service establishments. Much of this spending would be re-directed by those businesses to other island industries with a significant portion of these secondary profits put back through the region's economic and tax structure. In this manner, wages, profits, and expenditures resulting from project implementation increase the amount of capital flowing to the entire community.

Summary of Direct, Local Economic Impacts

The total base economic impact during the construction and sale/absorption period of burial plots is estimated at about \$141 million. After build-out, the annual stabilized total base economic impact is expected to be \$5.9 million annually.

Some \$7 million in annual revenue, and \$115.9 million during the 16-year modeling period, in HMP operations would occur. This wouldn't be "new" economic activity, but sustenance of current operations. These gross revenues are partially attributable to sales of new burial plots that would otherwise be diminished with the existing HMP becoming fully absorbed and used. HMP revenues and operating budget was then adjusted (decreased) to \$5 million annually projected on a stabilized basis (with revenues continuing to flow in from the maintenance trust fund, funeral services and plot resales) to account for burial plots being sold-out post-2035.

Comparison with State Input/Output Model

CBRE also analyzed the impacts of the project for O'ahu and Statewide using the State of Hawai'i, Department of Business and Economic Development and Tourism (DBEDT) Inter-County Input-Output Economic Model, Type II multipliers (2012 analysis approved in August 2016). These factors quantify the total Direct, Indirect and Induced "effects" of various forms of business and spending activity as it flows through the economy of the islands. In every instance, application of the macro Input-Output multipliers resulted in higher dollar, employment, and tax revenue indicators than in CBRE's subject-focused micro-model, which was designed to reflect Direct and upper-level Indirect impacts only.

A summary of the results from using the State's multipliers among the construction-based outputs is provided, and tables calculating these results are in CBRE's report.

1. The \$19.3 million in "other construction costs" remaining from the total construction budget would generate a total State Economic Output of \$57.4 million during build-out.
2. Direct construction wage earnings of \$5.9 million would yield \$10.3 million in statewide wage earnings.
3. Indirect and induced State taxes would total \$3.6 million during construction.
4. Direct effect jobs created by construction employment would be 2.25 times the number of projected jobs, or a total of 164.8 worker years of employment.

5. Direct effect jobs created by operating employment would be 1.58 times the number of on-site workers, or a total of 263.1 worker years of employment from 2020 through 2035, and 94.8 annually thereafter.

Ancillary Economic Effects

Project implementation and operation would have negligible to minor impacts to the socio-economic characteristics of the surrounding community related to real estate issues. Cemetery expansion is not expected to significantly impact property values or real estate taxes of homes located down slope and adjacent to the Petition Area. Property values throughout Windward O'ahu are largely driven by external, cyclical economic factors in an existing (and expanding) cumulative mass, and would not be driven by the expansion of a cemetery that has existed for decades.

Fiscal Effects with Project

Public fiscal impacts are typically estimated on a per-capita basis given the conservative assumption that each new person added to O'ahu's community is responsible for a similar tax obligation as other island residents. New per-capita costs would not occur from this project because there no new (migrant) residents would result from the cemetery expansion project. Analysis focused on additional fiscal impacts (i.e. incoming tax dollars and outgoing government expenditures) to the City and State arising from the construction of cemetery expansion rather than monies and costs already existing from the existing cemetery and associated operations.

Total New/Sustained Public Gross Revenue

Real Property Tax (RPT) is expected to generate about 50% of total City General Fund revenue in the 2018 fiscal-year budget with secondary taxes and fees comprising the remainder. The City currently receives some \$530 per year in RPT from HMP's 164-acre property that includes the Petition Area. RPT revenue is not expected to change significantly as a result of HMP expansion. The City is expected to receive \$500,000 in one-time fee, permit, and license revenue at project commencement. Otherwise, there would be no enhanced benefits from the project. Other than the minimal RPT revenue that would be obtained, the \$500,000 in fees is the only public revenue expected from the project.

In recent fiscal years, income tax and General Excise Tax (GET) has generated about 87% of State general fund revenues (excluding carry-over funds), with secondary taxes and fees contributing the remainder. The State is expected to receive \$5.0 million in primary income tax receipts from on and off-site construction worker wages, wages of HMP operations personnel, as well as profits from local businesses benefitting from the project during the 16-year modeling period.

Estimated income tax revenue is based on average statewide corporate and personal payment rates of 4.4% and 5.1%, respectively, applied against economic model forecasts. The State is expected to generate annual income tax revenue of \$266,581 after project stabilization in 2035. The State is expected to collect GET revenues totaling \$2.5

million with a stabilized amount of \$83,311 annually thereafter during the 16-year modeling period. Estimated GET revenues were calculated as 4.712 percent of the gross amount of building contracts, construction supplies, work, and resident spending, and from ongoing HMP business activity sustained by the cemetery expansion.

State Income Tax and GET revenues collectively total \$7.5 million for the construction, and \$349,892 in total revenue stabilized annually after build out. Public fiscal analysis anticipates HMP economic activity expressed in primary tax sources would result in secondary tax revenue equivalent to statewide averages. Estimated secondary State receipts were calculated as 1.15 times Income Tax and GET totals. Application of this ratio results in a cumulative total estimated tax collection of \$8.7 million during the initial forecasting period through 2035, and \$402,376 annually on a stabilized basis thereafter.

Net Public Costs and Benefits

The project is not expected to generate new per capita or actual costs beyond nominal amounts already incurred by the State or City. The cemetery expansion area is expected to merely sustain existing operational parameters. Expansion of public services, infrastructure, and facilities would not be needed. This results in all added public revenue generated by the project being “marginal profits”.

Net public benefits (revenues less costs) flowing to the City from the proposed project total an estimated \$500,000 in upfront licensing, permitting, and other fees. No

other benefits or costs to the City during the modeling period or on a standardized basis thereafter are expected. The State will receive net benefits (“profits”) of \$8.7 million from 2020 through 2035 and an annual benefit of \$402,376 on a standardized basis thereafter.

19. NEED FOR RECLASSIFICATION. HMP serves as the final resting place for over 41,000 persons, and accommodates an average of between 700 to 800 interments¹ a year from families throughout Hawai‘i. HMP accommodates about 25% of all burials occurring in the state. Over the decades, as the need for additional burial space has increased, HMP has met the demand by increasing the land area available for burials within its owned property. Since 1958, as sections of the cemetery have filled, HMP has grown from six acres to their present size of about 80 acres. The most recent expansion occurred in 1999 on a 7.9-acre site within the larger Parcel 1, and is identified as the Ocean View Garden site.

However, HMP only has a limited number of burial sites remaining (3,600 plots), and there is a significant need for additional cemetery space to accommodate the State’s aging population. Even with other cemeteries on O‘ahu being available, projections indicate a shortage of 39,525 to 60,295 burial plots can be expected. Without proper planning for the future, Hawai‘i residents are expected to face a shortage of cemetery space. The 30,000 additional burial plots proposed in HMP’s project are needed to

¹ This includes traditional burials and disposition of cremated remains.

address the anticipated burial space shortage. HMP would thus have a total of 33,600 burial plots (existing plus additional expansion). Therefore, an objective of this project is to provide additional cemetery space to accommodate Hawai'i's residents for several decades, and provide options on disposition and memorialization for families in the future.

Market Study Summary

A market study was conducted by CBRE, Inc. ("CBRE") (CBRE, 2018) to evaluate the need and demand for future cemetery space. The study is attached to the First Amendment to Petition as a part of Exhibit "6". The project was analyzed from a real estate market perspective, and identified and quantified the probable market considering competitive, regional, prevailing and forecast trends. This study evaluated: 1) whether there would be sufficient demand in the O'ahu burial/interment "market" to successfully absorb the additional cemetery space in a timely manner; and 2) whether the project would be an appropriate use of the site relative to market needs, desirability, land planning objectives, and the general area environment.

In summary, the CBRE market study determined that there is demand for an additional 145,025 to 165,795 burial spaces (or referred to as burial plots) needed on O'ahu through 2040. This is due to O'ahu's growing resident population, an aging population with about 18% now being over age 65, and an increasing mortality rate given the increasing and aging population.

Other than HMP, there are only currently six major cemeteries on O'ahu offering burial spaces to the general public, and some have none to only limited numbers of burial plots available. Cumulatively, these facilities only have about 16,500 burial spaces remaining in inventory (plots, niches and crypts) in existing phases. Future expansion or potentially new cemeteries would add a maximum of 89,000 burial spaces by 2040, resulting in about 105,000 spaces potentially being available. Therefore, additional spaces are needed, and the expansion of HMP could be completely absorbed before 2040.

CBRE estimated that HMP's expansion could readily capture a market share of 30% to 33% of the total burials space demand. This is due to HMP's absorption history, the desirability of potential plots created with expansion in this project area, and the characteristics of the competitive supply. HMP's expansion area is an appropriate location for cemetery use being part of a long-successful facility established 60-years ago providing needed burial opportunities for families. The expansion area also offers exceptional panoramic views, an open space and rain forest buffer, excellent exposure and direct access, favorable climate supporting the lush landscape, and good proximity to urban Honolulu and other areas of the island via several accessible highways.

Support Cultural Practices and Long-Term Stewardship of Property

Another objective of this project is to support native Hawaiian cultural practices and to ensure effective stewardship of the Petitioner's property for the future. The

Petition Area and larger property (Parcel 1) includes important historic sites, such as Kawa'ewa'e Heiau, and is used for cultural practices, such as collecting plants. These sites need appropriate restoration and maintenance. The establishment of a Cultural Preserve that includes a preservation plan for the area would support these objectives.

Ensuring that future urban development of the larger property does not occur is also an important objective for the Petitioner. Proper stewardship of the larger property would be supported by the Petitioner's partnership with the Hawaiian Islands Land Trust with the creation of a conservation easement for 156.5 acres of the 164.4 acre parcel.

Assessment of Future Demand for Burial Space

There is a growing demand for more burial spaces on O'ahu through the year 2040 due to the island's growing population, an increasing aging population, and subsequent increasing mortality rate that are discussed in greater detail.

Growing Resident Population

The resident population of O'ahu (City and County of Honolulu) has grown a total of about 90% over the past five decades from 500,409 persons in 1960 to 955,775 persons in 2010. This reflected a compounded annual growth rate varying between 1.0% to 2.4% (DBEDT, 2017). The estimated number of persons in 2017 is 995,583 (CBRE, 2018). In the future, O'ahu's population is projected to continue increasing annually between 0.3% to 0.5% to about 1,086,700 persons by the year 2040 (DBEDT, 2017). CBRE

forecasts a minimum and maximum range in the year 2040 of 1,086,700 persons and 1,142,430 persons, respectively.

Aging Resident Population

Hawai'i's resident population reflects an aging demographic characteristic with increasing numbers of persons over the age of 55. This is a trend which reflects the baby boomer generation moving into and through their 50s and 60s.

The total of Hawai'i residents that are 55+ years of age is projected to increase from 19.8% of the population in 1990 to 33.8% by the year 2040. The numbers for population cohorts ages 70+ are even more dramatic. As a percentage of the overall population, the age 70+ cohort group will grow from 7.2% of the population in 1990 to a projected 18.9% by 2040. This translates to a significant increase in terms of overall numbers, from 79,421 persons in 1990 to a projected 323,560 persons by 2040.

Increasing Death Rate

National death statistics show that the overall death rate has steadily, albeit marginally, declined over the past two decades in the United States (U.S.). However, the total nationwide population has increased at a much faster rate, resulting in an increasing death count each year. The number of deaths nationally has risen at a compounded annual growth rate of 0.9% since 1997.

With the average age of Americans nearing stabilization at over 37 years, and the average life expectancy at over 78 years, there is a greater proportion of Americans

reaching into the upper- age demographic (above 65 years). As a result, the number of future deaths nationally and subsequent demand for industry services will continue to grow into the foreseeable future (CBRE, 2018).

O'ahu and Statewide Historic Deaths

The historic number of deaths occurring on O'ahu has been steadily increasing over the years corresponding to the growing population and increasing demographic aging of residents.

During the 20-year period from 1997 to 2017, the resident population has increased at a growth rate of 0.6% annually, reaching 995,583 persons in 2017. The number of resident deaths has grown at an annual rate of 2.3% per year to reach an annual total approaching 8,000 persons in 2017. The number of deaths as a percentage of the resident population has also steadily increased from 0.69% in 2007 to 0.80% in 2017. Therefore, the island's death rate as a percentage of the growing population is steadily increasing along with the annual number of deaths.

Future Projected Deaths

CBRE used historic rates to forecast future population, death rates and total deaths on O'ahu through 2040 under two scenarios. Scenario One is a minimum forecast and assumes the State's 2040 population forecast and death rates are consistent with those of the past 20 years. Scenario Two is a maximum forecast reflecting population growth trends since 1997, and a modestly higher death rate in-line with

anticipated demographic changes due to the increasing proportionate of aging Hawai'i residents.

The Scenario One model forecasts there would be a cumulative total of about 225,710 deaths among O'ahu residents from 2018 and 2040. The Scenario Two model quantifies the projected deaths at about 245,130 persons during this same period, and reflects an 8.6% increase over Scenario One. More analytical details are provided in CBRE's report in Appendix B. As shown on this table, there is projected to be between about 11,700 and 12,860 annual deaths on O'ahu by 2040. This would be over twice as many deaths that occurred in the year 2000, and over 46% greater than that occurring in 2017.

Projected Disposition of Deaths

There are five standard statistical classifications of "methods of disposition" for a body following death:

1. Burial – The action or practice of interring a body in a grave.
2. Cremation – The disposal of a body by burning it to ashes (cremains).
Cremains can be placed in a burial plot.
3. Removal – Indicates that the body was shipped out of the State of Hawai'i.
4. Medical Science – The body is donated for medical research purposes.
5. All Others – Includes entombment and alternative disposition methods.

Burial requires a casket, as typically does an entombment, while cremation remains are stored in urns. Interment is the act of memorializing a person following death, and placing their remains in a permanent “resting place.” Interment can be via:

- Burial Plots. This can contain one or more caskets and/or several urns.
- Niches. These are above-ground spaces for urns within a “columbarium” or other specially-built structure.
- Crypts. These are specially-built structures that are generally above ground in Hawai’i with spaces for bodies/caskets.

The total number of potential individuals that can be interred in a cemetery or memorial park can vary in accordance with the wishes of the family, and the size, scope and rules of the facility. The number of caskets and/or urns permitted in a plot differs between cemeteries, as does the number and size of columbarium or niche structures. Generally, most cemeteries on O’ahu, including the existing HMP, create about 1,000 to 1,100 burial spaces per developed acre.

Historic Method for Burial Disposition

Nationally, there is an evolving trend in the primary method of burial disposition from in-ground burials to cremations. The cost of traditional in-ground burials are increasing, and the proportion of the population that are Catholic or fundamental Protestant is decreasing causing a trend away from in-ground burials. The percentage of persons of Asian-ancestry or of Buddhist/Shinto/Hinduism is increasing

cause a rise in the number of cremations in the U.S., particularly within the past decade. Nationally, burials have decreased from 53.3% in 2010 to 45.2% in 2015, and cremation has increased from 40.4% to 47.9%, respectively. This trend is expected to continue over the coming decade (CBRE, 2018).

The State of Hawai'i has a higher rate of cremation due to large numbers of Asian-descendant population and the scarcity/price of land. The preferences for post-death care for Hawai'i residents has similarly seen changes over the last 35 years. While the percentage of burials used to be almost equal to cremation as a choice of disposition in 1980, cremation has since risen to the preferred choice at about 72% in 2015. In 1980, 45% of those interred in Hawai'i were buried; whereas in 2015 that percentage has decreased to about 22%. Therefore, burials and cremation presently account for about 94% of all methods of disposition. Even with a decreasing percentage of burials, the overall number of burials has been stable due to the increase in overall number of deaths.

Projected Demand for Interments

Using the projected number of deaths to occur from present to the year 2040, the estimate of those being interred either by cremation or burial was determined. However, other factors have been accounted for in these projections that include: 1) veterans being buried within veteran cemeteries; 2) existing burial plots already pre-purchased; 3) O'ahu residents being buried on the neighbor islands; and 4) non-O'ahu

residents being buried on O'ahu. These factors are summarized below, and the resulting net projected interment demand is calculated.

Other Factors Considered

Veterans Buried Within Veteran Cemeteries. Military veterans represent just over 8% of O'ahu's population. This amount has been decreasing at 0.05% compounded annually over the past two decades. These individuals have alternative cemetery spaces available to them in federal and/or state memorial parks, such as the Hawai'i State Veterans Cemetery adjacent to HMP. A 2001 national survey of veterans concluded that approximately 18% of veterans desiring interment would be buried in military/veteran facilities (CBRE, 2018).

Using projected population figures for O'ahu, the number of annual veterans deaths were determined. This is projected to be about 690 veteran deaths annually in 2018 that increases to about 935 persons annually by 2040. The 18% national factor for veterans desiring to be buried in military/veteran facilities was then applied. This results in about 126 (year 2018) increasing to 170 (year 2040) veterans annually, a cumulative total of about 3,380 veterans between 2018 and 2040, being interred within veteran cemeteries on O'ahu.

Pre-Purchased Burial Spaces. Every major cemetery on O'ahu has sold plots, niches, and crypt spaces to families or individuals who are still living, and won't be "absorbed" until the owner is interred. CBRE's survey of the major cemeteries on O'ahu indicates

there are about 50,000 burial spaces in this “on-hold” category, and about 25,000 of these spaces are within the existing HMP cemetery. It was conservatively forecast that all these burial plots would be used during the year 2018 to 2040 projection time-frame at the rate of 2,200 persons per year through 2035, and 2,080 annually over the last five-year period (2036 to 2040).

O’ahu Residents Buried on the Neighbor Islands. An increasing number of O’ahu families are electing to bury their relatives in Neighbor Island cemeteries due the higher average costs on O’ahu. Based on CBRE’s discussions with funeral and cemetery directors in Hilo and on Maui, and review of available media publications, it was estimated that about 250 persons per year from 2018 through 2025 would take this alternative. This is projected to increase to 400 persons per year through the year 2035, and up to 500 persons per year through 2040.

Non-O’ahu Persons Buried on O’ahu. Acknowledged to be a generally rare occurrence, an allocation of 15 burials of this type per year would contribute to O’ahu’s net demand.

Projected Number of Disposition by Cremation

Using the projected number of deaths to occur from present to the year 2040, the estimate of those being interred by cremation was determined. Not all cremations result in interment creating demand for additional burial spaces. On a national level,

according to the Cremation Association, about 35% of persons considering cremation have their ashes scattered. About 8% have their urn kept in a family home.

Hawai'i residents have a longer and more extensive experience with cremation, and are more respectful of interment than the national population due to this state's large and strong Asian-based heritage. Discussion with O'ahu mortuaries indicates that at most 25% of cremated decedents have their ashes scattered (some opined as few as 15% to 20%), and well less than 10% have their urns kept within family homes. The majority of cremations are thus interred in burial plots, niches, or crypts.

CBRE developed minimum (Scenario One) and maximum (Scenario Two) burial space demand scenarios projecting cremation on O'ahu given Hawai'i's large Asian population and cultural components, and input from existing mortuaries. In Scenario One, only 18% of O'ahu cremations are estimated to result in a scattering of ashes and about 4.6% are disposed otherwise. Scenario Two assumes only 12% of O'ahu cremations results in the ashes being scattered and 3% being disposed otherwise.

Under Scenario One, it was estimated that a cumulative total of 139,276 persons would need to be interred (burial plot) by cremations on O'ahu between 2018 and 2040. Under Scenario Two, the cumulative total number of interred cremations during this same time period is forecast to be 158,409 persons. Annual interred cremations would increase from between 4,450 to 4,990 in 2018 to about 7,940 to 9,200 by 2040.

Projected Number of Disposition by Burial

The number of in-ground (casket) burials projected from 2018 through 2040 is a residual estimate calculated by deducting the number of cremations projected in each scenario from the respective total burial estimates. Under Scenario One, the ratio of deaths that are interred increases at a rate of 0.01% compounded annually, resulting in a cumulative total of 75,402 burials on O'ahu between 2018 and 2040. In Scenario Two, the ratio of deaths that are interred increases at a rate of 0.015% compounded annually, resulting in a total of 76,924 burials during this same period. Annual burials would increase from between 2,670 to 3,150 persons in 2018 up to about 3,300 to 4,100 persons by 2040.

Projected Net Demand for Interment

A model forecasting the net demand for additional burial spaces on O'ahu from the year 2018 through 2040 was developed using the variables and assumptions previously discussed. The first interval is 3 years (2018-2020), and the remaining intervals are divided into 5 years each (2021-2025, 2026-2030, 2031-2035 and 2036-2040).

Totals for projected interred cremations and burials by intervals are estimated. This total is then deducted for unused burial spaces already purchased, veterans interred in veteran cemeteries, and for residents interred on other islands. Finally, an allowance is added for non-O'ahu persons wanting to be interred on O'ahu. The resulting "net" demand for burial spaces is then shown for interval periods.

Based upon the forecast, the projected range for additional burial space on O'ahu by 2040 would total between 145,030 and 165,800 spaces. The mid-point demand for burial spaces would be about 155,400 spaces by 2040. The demand for burial spaces would increase by about 14% to 17% during each 5-year incremental period from 2020. Using the mid-point estimate, this would increase from about 28,400 burial spaces during the 2020 timeframe increment up to 42,650 burial spaces during the 2035 timeframe. This shows that there will be a significant demand for burial space on O'ahu over the next 20+ years to accommodate the increasing and aging resident population.

Evaluation of Existing and Future Inventory

This section discusses the existing and future inventory of burial spaces available on O'ahu to accommodate to projected demand to the year 2040. A discussion of HMP's remaining inventory of available spaces is provided along with consideration of spaces available at other O'ahu cemeteries (non-veteran cemeteries).

Background on Cemetery Industry

The cemetery industry provides products and services to bereaved family members of the deceased, which includes:

- Sales of burial spaces, such as in-ground plots, niches in columbariums and memorials, and crypts in mausoleums.
- Sales of funerary-related merchandise such as coffins, urns, grave markers, and ornamental goods.

- Provision of mortuary services such as embalming, cremation, body preparation and transportation, and memorial/funeral services.

Inventory of HMP Available Plots Being Exhausted

As of April 2018, HMP has sold over 94% percent of available burial plots, and anticipates it will exhaust its available supply of burial plots in the near-term. Of the approximately 79,000 individual plots within HMP, less than about 6% (about 4,500 plots) remain available for the public. HMP has been selling about 700 burial plots a year. Consequently, HMP's inventory of plots is significantly constrained and could be exhausted in about 5 years, if not sooner.

Inventory of Other Cemeteries Available

There are six other major cemeteries on O'ahu that are still offering burial plots. Appendix B has more information on these cemeteries. Most of these cemeteries provide burial plots, and mausoleum and columbarium for families wanting above ground places, along with cemetery and mortuary services for families. A summary of these cemeteries is provided below.

1. Diamond Head Memorial Park. Established in 1936, this cemetery is located on 25 acres in the Diamond Head community at 529 18th Avenue. This cemetery is estimated to have a total of about 30,500 existing burials (including niches and crypts). It is estimated that this cemetery has about 300 burial plots and 1,000 niches of inventory available.

2. Nu‘uanu Memorial Park. Incorporated in 1949, but with a longer history tied to the Royal Mausoleum, this cemetery is located on 3.5 acres in the Nu‘uanu community at 223 Nu‘uanu Avenue. This cemetery is estimated to have a total of about 7,800 existing burials. It is also estimated this cemetery has no burial plots available, but does have 200 crypts and 500 niches of inventory available. Thus, Nu‘uanu Memorial Park is effectively “sold out” with only a limited number of crypts and niches remaining.
3. O‘ahu Cemetery. Founded in 1844, O‘ahu Cemetery is Hawai‘i’s oldest public cemetery. This cemetery is located on 15.5 acres in the Nu‘uanu community at 2162 Nu‘uanu Avenue. It is estimated to have a total of about 25,000 existing burials. It is also estimated that this cemetery has 100 burial plots, and 600 niches of inventory available. O‘ahu Cemetery is also effectively “sold out” with only a limited number of burial plots and niches remaining in inventory.
4. Valley of the Temples Memorial Park. Founded in 1963, this cemetery is the largest on O‘ahu within 244 acres of property located in the Temple Valley community at 47-200 Kahekili Highway. This memorial park also attracts thousands of visitors a year with its Zen garden, wild peacocks, meditation pavilion, Byodo-In Temple, and Shinji-iki reflection pond. This cemetery is estimated to have a total of about 88,000 existing burials, making it

comparable to HMP. It is estimated to have about 7,500 burial plots and 2,200 niches of inventory available.

5. Mililani Memorial Park. Opened in 1965, Mililani Memorial Park is located on 143 acres in the Waipio community at 94-560 Kamehameha Highway. This memorial park acquired the Mililani Downtown Chapel in 1976 and expanded their facilities in 1995 to now provide two additional chapels (Mauka and Makai Chapels) at the Waipio site. This cemetery is estimated to have a total of about 70,000 existing burials, and about 3,800 burial plots available.
6. Lā'ie Cemeteries. Established in 1922, this cemetery predominantly serves the Lā'ie community and is located on 5 acres at 55-710 Wahinepee Street. The site predominantly consists of burial sites, and without facilities supporting cemetery and mortuary services. This cemetery is estimated to have a total of about 4,200 existing burials, and has about 300 burial plots available.

Based upon CBRE's interviews with cemetery personnel and research of available records, it is estimated there are currently about a total of 16,500 burial plots remaining from the six major O'ahu cemeteries previously described. This total does not include the estimated 3,600 burial plots remaining within HMP's inventory. Collectively all of these cemeteries have a total remaining inventory of 20,100 burial plots.

New Cemeteries Planned

Future expansions of existing cemeteries or new cemeteries was researched by CRBE to evaluate future projected burial space. Overall, there is a significant barrier to entry in the O'ahu cemetery sector due to the scarcity of available sites, high land costs, infrastructure expenses, and community issues. There hasn't been a new public cemetery opened on the island in over 50 years, despite evident rising demand and dwindling supply.

Plans for a new cemetery on a 69-acre parcel in Kamilo Nui Valley in Hawai'i Kai were approved by the City Council in 2001. However, development of this site was never initiated, and ownership of the property has changed hands on multiple occasions (in 2003 and 2006). Plans for the new cemetery proposed a total of approximately 45,000 to 60,000 plots, and a first phase was proposed to contain 12,000 burial plots.

In 2010, present ownership entities involved with this development entered bankruptcy. Later that year, the project was restructured and was periodically announced to begin moving forward; though no additional details or project schedules have proven realistic. In May 2015, it was reported that the present landowner is Hawai'i Kai Memorial Park LLC, and they were trying to obtain a cemetery license from the State (Fujimori, 2015). The property also has site issues because the ground is a layer of rock with little topsoil, therefore, an estimated 50,000 cubic yards of material needs to

be imported to develop a landscaped cemetery (Gomes, 2012). Currently, this cemetery project is still believed to be hindered by bankruptcy issues, no State cemetery license has been issued, and the site is instead being used for stockpiling materials that has generated opposition from the surrounding community.

Additional Inventory Projected

CBRE estimated the total number of remaining existing and additional proposed burial space that may be available for O'ahu by the year 2040. A few existing cemeteries have plans to add more burial spaces based upon research. An allocation was also added for the new Hawai'i Kai Memorial Park LLC, (Hawai'i Kai Cemetery) even though existing issues make its feasibility questionable.

Overall, about 105,500 new burial space could be provided within the 2040 study timeframe (without existing HMP space). Including remaining available burial spaces at HMP adds about another 3,600 burial spaces to the existing inventory resulting in a current island total of about 20,100 spaces. In 2040, this would total 109,100 burial spaces, including existing HMP.

No new expansions are planned by Diamond Head Memorial Park, Lā'ie Cemetery, Nu'uuanu Memorial Park, and O'ahu Cemetery, and these sites do not have additional property to develop. Therefore, only Valley of the Temples Memorial Park and Mililani Memorial Park are proposing development to provide additional burial space to accommodate future needs. Without the Hawai'i Kai Cemetery, the future total

of available plots would decrease to 85,100 plots by 2040. With a future projected demand of between 145,030 and 165,800 burial spaces needed, the likely inventory of between 85,100 to 109,100 spaces would be significantly short of adequately meeting this demand.

Appropriateness of Petition Area and Absorption Estimates

The previous section quantified that there is significant future market demand for more burial space based upon demographics and evaluation of existing and proposed inventory. This section discusses the appropriateness of the proposed HMP expansion area from a market perspective to meet this future projected demand. CRBE's evaluation of this aspect documents the HMP expansion project's competitiveness and resulting probable market shares.

The conceptual plan for the proposed project is consistent with modern cemetery planning objectives. This includes considerations for views, maximizing use of easily walkable terrain, creating individual/exclusive burial areas, and addressing feng shui issues that is an important consideration in Hawai'i. Features of the Petition Area considered most relevant relative to achieving full market acceptance are identified:

1. Exceptional panoramic views stretching for miles along the Ko'olau Pali, encompassing the hills of Mōkapu Peninsula and Kaneohe Bay.
2. HMP provides feelings of serenity for family members enhanced by a surrounding buffer of dense vegetation and open spaces, and insulation from

future intruding land uses. At one time, it was acclaimed as the most beautiful memorial park in the United States.

3. The site would have a gently flowing terrain creating discrete memorial gardens within the larger HMP cemetery.
4. The Petition Area, as an expansion of HMP, provides excellent exposure and direct access from Kamehameha Highway and the H-3 Freeway. In addition, the Likelike Highway and Pali Highway located about 1.5 miles to the north and south, respectively, provide convenient additional vehicle access and route options for residents.
5. HMP has good proximity to Kāneʻohe and Kailua, which are the two largest towns in the windward district, and the cemetery site is only 10 miles away from Downtown Honolulu. HMP is also the closest cemetery to urban Honolulu with significant numbers of burial spaces available.
6. The favorable windward climate with a higher island rainfall helps keep HMP cemetery lawns along with surrounding areas green and lush (CBRE, 2018).

There are other qualitative factors that contribute to the HMP's attractiveness and marketability to O'ahu families.

1. There are many family members from all parts of the island buried at HMP. Only the Valley of the Temples Memorial Park has more existing burials than

HMP. Just as there is a societal tendency for families and friends to settle in the same neighborhood or community, many families desire to have burial space in the same area of the cemetery as their parents and other relatives to be close to them from a relational perspective. This is called “Heritage,” and is an important part of the end of life experience and choice. This places long-term demands on memorial parks to fulfill these important desires. Space management for the cemetery requires that vacant burial plots be scattered throughout the park to allow families to locate close to other family members as a final resting place.

2. The Hawai'i State Veterans Cemetery is relatively new and located inland of HMP, and shares the same main vehicular entrance from Kamehameha Highway. As a result, existing veterans and many future veterans would eventually be buried at this cemetery. There would be a tendency for family members to want to be located at HMP to be closer to family as part of the Heritage factor.
3. There is also a practical consideration and benefit to being located close to family members, so that family and relatives can easily visit a single cemetery site to pay respects instead of having to travel to different locations (e.g. HMP to Mililani Memorial Park).

4. Another form of “Heritage” is the very important desire for religious and ethnic groups in the greater community to have special affinity gardens tailored to their customs, rituals, and symbolism. HMP plans for and accommodates such gardens and the inevitable expansion required over time to accommodate these groups and their members. HMP supports these religious and ethnic factors throughout the cemetery, which would be accommodated and complemented with the proposed expansion. HMP is non-denominational, welcoming all religions and cultures. It includes a floral urn garden with Buddhist figures, accommodates Asian shrines, etc. Other features supporting the site’s desirability include a memorial of “The Fraternal Order of Eagles,” a memorial for the Honolulu Police Department and Honolulu Fire Department. HMP includes a number of iconic Hawaiian musicians, and most recently added a memorial monument dedicated to Hawai’i’s Gold Star Families.

Projected HMP Expansion Absorption Rate

Given the various factors contributing to HMP’s attractiveness and marketability, the proposed expansion would be highly supportive of meeting the projected market demand for additional burial space over the next 20+ years, and should be successfully absorbed during the 2040 study period. The probable absorption

velocity for the additional burial spaces created by the proposed HMP expansion project was estimated by CBRE using three methodologies:

1. Gross Demand/Supply Comparison. This technique assumes that if there is insufficient existing and planned supply to meet projected market gross demand levels during the projection period, there is rational support for the subject project.
2. The Residual Method. Under this method, all the competitive inventory existing and proposed for development on O'ahu during the 2018-2040 projection period is placed on a time-line depicting their combined anticipated rates of absorption or assuming a reasonable market share. To the extent this supply of burial spaces falls short of the forecast demand for space on O'ahu, an undersupply situation is present generating a "residual" demand for the inventory created by the HMP expansion. This method is considered the most conservative because it allows the maximal competitive product to achieve their full absorption potential before any residual demand flows to absorb the subject.
3. The Market Shares Method. This approach accounts for the probable competitiveness of the project's inventory regardless of the total level of product being otherwise offered on the market. It is an estimate of how much of the total forecast net demand for additional burial spaces on O'ahu the

project could expect to capture on an annual basis considering its history, location, product type, probable pricing, perceived competitiveness, and other characteristics.

Gross Demand Results. On an islandwide basis, the Gross Demand method indicates there is strong support for the HMP expansion project. The net demand for non-military burial spaces on O'ahu through 2040 is forecast to be between 145,000 to 164,800 total burial plots. The remaining unsold existing and proposed inventory (not including HMP) total about 105,500 burial spaces or only 64% to 73% of the needed inventory. If the Hawai'i Kai Cemetery does not materialize given its history of issues, these percentages would decrease considerably to only 49% to 56% of projected demand being met. Therefore, this Gross Demand method shows the proposed HMP expansion project would be highly supportive of sufficient market demand existing over the next 20+ years, and new burials should be successfully absorbed during a reasonable exposure period.

Residual Demand Results. Using the Residual Demand method, there would still be a substantial unmet demand needed for burial space through 2040. If it is reasonably assumed that existing unused burial space and additional proposed burial space at existing cemeteries are developed by 2040, there would be 105,500 new spaces provided for O'ahu families. This total would be 110,000 plots if the unused burial space existing at HMP is also added. However, there will remain substantial unmet residual demand

throughout the 2040 study period given the projected 145,000 to 164,800 total burial plots needed.

Even if the assumed supply made available at other cemeteries achieves full absorption within reasonable periods, there will be excess residual demand available for the 33,600 total remaining HMP burial spaces (estimated 3,600 in existing acreage and 30,000 for expansion project). The shortage in supply increases considerably under the mid-point scenario from 1,169 in years 2018 to 2020 up to almost 20,000 burial spaces during the 2036 to 2040 period.

CBRE's analysis shows HMP burial spaces would be expected to successfully capture left-over, unmet demand under both 95% and 100% capture rate projection scenarios. Using the residual analysis, the remaining and new burial space (from expansion project) inventory at HMP would be fully absorbed (sold-out to final users) within 15 to 19 years, with a mid-point of 17 years.

Given HMP's desirable location, the unique qualities of its cemetery site and support facilities, its historic market standing, and anticipated pricing envisioned for new inventory resulting from the HMP's expansion, it will achieve a solid market standing and prove competitive in the O'ahu burial plot market. HMP would be able to garner a reasonable share of total island net demand regardless of the numbers of competing plots offered.

Market Shares Results. Using the Market Shares method, CBRE estimates that the HMP cemetery with proposed expansion could readily achieve an average “capture rate” (market shares) rate of 30% to 33% of O’ahu’s total net burial space demand during the projection period. This capture rate was determined to be a reasonable and appropriate fraction of the total demand given HMP’s historic market penetration, and because there will only be two or three other cemeteries offering competing (though probably less desirable) burial spaces and location.

Using this method, a total absorption period for the proposed expansion burial spaces would be between 15 and 18 years (minimum and maximum demand forecast), with a mid-point at 16.8 years. This equates to an average market capture rate of 29.8% with an average annual absorption of 1,975 plots.

Conclusion. The correlation of the analysis resulting from the three absorption quantification techniques indicates that HMP’s total 33,600 burial spaces associated with 30,000 new spaces created with this expansion project, plus 3,600 existing inventory remaining, should achieve full absorption within approximately 17-years of the expansion area’s opening for sale and interment in 2021.

Need for Cultural Practices and Stewardship

Need for Cultural Practices

There is a need to support traditional native Hawaiian cultural practices within the Petition Area and larger Parcel 1 property. Kawa’ewa’e Heiau is a significant

historic site listed in the National Register of Historic Places. Members of the Ko'olaupoko Hawaiian Civic Club have served as caretakers of this heiau and the surrounding area to the extent possible. Kawa'ewa'e Heiau currently requires extensive clearing given the widespread growth of invasive flora, along with other landscape restoration and maintenance. Improving access to and within this area is needed to support these efforts, which requires clearing trees, etc. Other historic sites in the vicinity would also be included as part of cultural landscape restoration efforts.

Other cultural practices also occur in the vicinity, such as collecting plants for hula-related activities and other plants with traditional medicinal value. Cultural organizations have expressed a desire to conduct traditional native Hawaiian burials in the heiau vicinity as part of cultural practices. The adoption of the "clean burial" law by the Hawai'i legislature in 2015 (Act 171) recognized and allows for the preparation of a deceased person for burial in a manner consistent with traditional native Hawaiian cultural customs and such burials are intended within the Cultural Preserve.

Consequently there is a need to establish a Cultural Preserve where such cultural practices and activities can occur. The Preserve would need to include a preservation plan to guide and regulate cultural activities, access, management responsibilities, and coordination responsibilities with the landowner (Petitioner). The project proposes to establish a 14.5 acre site for the Cultural Preserve.

The boundary amendment is required for the Cultural Preserve because activities that would occur in the Preserve are not allowed within the State Conservation District. HMP is unique compared to other cemeteries due to the presence of Kawa'ewa'e Heiau and the cultural significance of this site, which complements and supports the opportunity to have native Hawaiian burials following traditional practices. New burials would need to be recorded and coordinated with the Petitioner as part of applicable state burial and cemetery regulations. Establishing a Cultural Preserve would further define boundaries where activities could occur supporting management efforts. The preservation plan included as part of the Cultural Preserve would support this need and ensure the long-term restoration, maintenance, and stewardship of the area.

Need for Long-Term Stewardship

There is a need to establish long-term stewardship responsibilities for the 156-acre property (does not include HMP's 7.9-acre existing Ocean View Garden site). Areas of the property outside of the Petition Area would remain undeveloped, but some management and stewardship of this area is necessary for the future. Efforts are needed to prevent unauthorized use of the remaining areas because the area could be accessed from surrounding properties.

A conservation easement is proposed for the remaining 156.5 acres of this property to address long-term management and stewardship of the area. A

conservation easement is a legal agreement between a landowner and a third party that permanently limits uses of the land. The conservation easement would ensure no future urban development of the remaining 103 acres outside of the Petition Area would occur and that development of the Petition area would be limited to cemetery use and the Cultural Preserve. The conservation easement would establish a partnership between the Petitioner and the Hawaiian Islands Land Trust, and allow for that organization to oversee the long-term management of remaining undeveloped areas. This conservation easement would also oversee the Cultural Preserve and ensure the long-term stewardship of this area as well.

Project Objectives

Without proper planning for the future, Hawai'i residents could easily face a shortage of cemetery space in the near future based upon the results of the market study. At the base of the Ko'olau Mountains, HMP provides a convenient location for Windward, Honolulu and Leeward communities for both initial interment and subsequent visitations to a burial site by family and relatives. With O'ahu's increasing and aging population and growing yearly deaths projected, there is a need for more burial space and proper planning to ensure a crisis does not occur in the future.

The long history of HMP serving families since 1958 reflects the importance and tradition of this cemetery. The "Heritage" factor associated with HMP, which is an important part of the end of life experience and family choice, also supports the

importance of HMP allowing families to have burial space in the same area of the cemetery as their parents and other relatives. The adjacent Hawai'i State Veterans Cemetery would have many future veterans buried there as well, and further supports the desire for family members wanting to be located nearby at HMP as part of the Heritage factor.

Management of cemeteries requires a large number of available inventory, especially ground burial spaces, in order to adequately service the community, specifically allowing a choice for the future generations of the families that currently own and/or are interred at HMP. Since HMP must be able to satisfy all of these different demands, it is necessary to have vacant inventory available scattered throughout the cemetery, even as new inventory is developed. Consequently, future planning must occur well in advance of the depletion of existing inventory to ensure the needs of families can be met.

Therefore, an important objective of the proposed project is to increase the number of available burial plots to ensure the long-term needs of families can be adequately fulfilled and addressed given the increasing number of annual deaths and limited number of cemetery spaces islandwide. It is also important to provide additional burial space close to HMP due to the "Heritage" factor, associated with proximity to families who have burials within HMP and the nearby Hawai'i State Veterans Cemetery. The expansion of HMP would address this objective by providing

additional burial plots and options on disposition and memorialization for families for the future. The cemetery expansion area is also desirable for several other reasons (e.g. climate, location, views) as previously discussed.

The second important objective of this project is to support native Hawaiian cultural practices and the desire for native Hawaiian burials following traditional practices and protocols now permitted under a 2015 change in state law (clean burial). Kawa'ewa'e Heiau is a significant historic site that requires restoration, improved access, and maintenance to support cultural practices and activities.

Establishment of the Cultural Preserve supports these objectives. A preservation plan for the Cultural Preserve will provide guidance regarding cultural activities, access, management responsibilities, and coordination with the landowner (Petitioner) will further support these objectives and allow for proper stewardship of the area. Including the Cultural Preserve as part of the Petition Area allows for burials following traditional native Hawaiian cultural customs and practices.

The third project objective is to establish long-term stewardship responsibilities for the 164.4-acre property, less HMP's 7.9-acre existing Ocean View Garden cemetery site. As previously discussed, areas outside of the Petition Area would remain undeveloped, but would require management and stewardship oversight, guarantees of no additional development, and prevention of unauthorized or unpermitted activities. Establishing the conservation easement would create a partnership between the

Petitioner and the Hawaiian Islands Land Trust, and allow the organization to support the long-term management of remaining undeveloped areas.

20. **HAWAII STATE PLAN AND FUNCTIONAL PLANS.** The Hawai'i State Plan (Chapter 226, HRS) sets forth the goals, objectives, polices, and priority guidelines for growth, development, and allocation of limited resources throughout the State. It contains diverse policies and objectives on topics of state interest including but not limited to, the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, and sustainability. The State Plan is divided into three parts: Part I (Overall Theme, Goals, Objectives and Policies); Part II (Planning, Coordination and Implementation); and Part III (Priority Guidelines).

Part I, II, and III of the State Plan were reviewed to assess the project's consistency with statutes discussed in this plan. The policies of Parts I, II and III were evaluated in relation to the Project to determine whether the Project was consistent, inconsistent or inapplicable to each policy. The Project was not found to be inconsistent with any policy of the Hawaii State Plan.

The Statewide planning system requires the development of State Functional Plans which are approved by the Governor of Hawai'i. The State Functional Plans guide the implementation of State and County actions in the areas of agriculture, conservation lands, education, energy, health, higher education, historic preservation, housing,

recreation, tourism, water resources development, transportation, employment, and human services. The proposed project is consistent with the following objectives, policies and implementing actions of the respective State Functional Plans.

Conservation Lands Functional Plan

Preparation of the Conservation Lands Functional Plan was coordinated by the State of Hawai'i Department of Land and Natural Resources in 1991.

Issue Area II: Management

Objective IIB: Protection of Fragile or Rare Natural Resources.

Policy IIB(1): Develop protection and preservation of habitats of rare and endangered wildlife and native ecosystems in Hawai'i.

Discussion: A seep in the western portion of the Petition Area provides habitat for the endangered Blackline Hawaiian Damselfly. The presence of the damselfly and the utility of the seep as habitat for these specimen was considered in the design of cemetery expansion improvements. Related studies, including hydrological analysis of Petition Area groundwater resources, determined the proposed project would not impact this habitat. Mitigation measures are proposed to preserve and protect this habitat. A drainage system designed in a herringbone pattern would be installed in the fill area above the seep as part of project improvements to ensure continued conveyance of subsurface water to the seep. This system would be comprised of three subsurface drainage mainlines with smaller lateral subdrains. Fencing would be constructed

around the seep to ensure feral pigs and humans do not adversely impact this damselfly habitat. Regular monitoring of the seep would also occur to ensure water remains present and non-native predators are not found.

Historic Preservation Functional Plan

Preparation of the Historic Preservation Functional Plan was coordinated by the State of Hawai'i Department of Land and Natural Resources in 1991.

Issue Area I: Preservation of Historic Sites

Objective A: Identification of Historic Properties

Policy A.1: Expand Statewide Historic Sites Inventory Program.

Objective B: Protection of Historic Properties

Policy B.2: Establish and make available a variety of mechanisms to better protect historic properties.

Objective C: Management and Treatment of Historic Properties

Policy C.3: Explore innovative means to better manage historic properties.

Discussion: The project AIS documented previously unidentified historic sites within the Petition Area. The historic significance of these sites was assessed under State historic significance criteria with recommendations provided regarding site listing eligibility for the State register of historic places. Eligibility will be determined by SHPD review of eligibility recommendations. In this manner, the project aligns with the functional plan policy objective to expand the State's historic sites inventory program.

The project proposes multiple recommendations to protect historic properties identified. The primary mechanism to protect these historic properties is the establishment of the Cultural Preserve. This area will allow in situ preservation of significant historic sites identified, such as Kawa'ewa'e Heiau. Maintenance of these sites would be guided by a preservation plan. This plan would discuss best treatment strategies to protect these historic properties. The preservation plan would also discuss guidance on the management, operation, and maintenance of the Preserve. An important aspect of these operations is cultural restoration activities for the landscape surrounding historic properties. Restoration work would involve replacement of non-native and invasive vegetation with native plants. Enhancement of the cultural character of the surrounding landscape would also enhance historic properties present as all features collectively contribute to the cultural character of the landscape. The collective benefit gained from restoration of the cultural landscape could be considered an innovative method of managing extant historic properties.

Recreation Functional Plan

Preparation of the Recreation Functional Plan was coordinated by the State of Hawai'i Department of Land and Natural Resources in 1991.

Issue Area II: Mauka, Urban, and Other Recreational Opportunities

Objective II-A: Plan, develop, and promote recreational activities and facilities in mauka and other areas to provide a wide range of alternatives.

Policy II-A(1): Plan and develop facilities and areas that feature the natural and historic/cultural resources of Hawaii. Develop interpretative programs for these areas.

Discussion: Establishment of the Cultural Preserve would provide land area where native Hawaiian natural and historic resources in the Petition Area can be preserved. These natural resources include culturally significant plants, such as the Laua'e fern. Establishment of culturally significant plants would ensure their continued presence after project improvements are implemented. Significant historic sites would also be featured in the Preserve. Establishment of the Preserve would ensure these historic sites are protected. Interpretive programs would be developed for this area through coordination between the stewarding organization and the community. Landscape restoration work would restore the cultural character of the landscape, also enhancing its value for passive interpretation by the stewarding organization and individuals authorized to enter the Preserve.

21. COASTAL ZONE MANAGEMENT PLAN. Hawai'i's Coastal Zone Management (CZM) program was enacted in 1977 (Chapter 205A, Hawai'i Revised Statutes), following the passage of the federal CZMA of 1972. Section 307 of the CZMA requires that development projects affecting any coastal use or resource be undertaken in a manner consistent to the maximum extent practicable with the State's CZM objectives and policies. Although the Petition Area is not located on the coast, in Hawai'i, the entire state has been designated as the CZM area.

All objectives and policies of the State CZM were reviewed to assess their relevance to the proposed project. Some objectives and policies are more pertinent to agency actions or responsibilities (i.e. §205A-2(b)(7) Managing Development), or address areas unrelated to the project (i.e. §205A-2(b)(6) Coastal Hazards). Therefore, the project's consistency with objectives and associated policies was assessed for only those objectives determined to be applicable to the proposed project. The following objectives of the State CZM were determined to be inapplicable to the project.

- Recreational resources
- Economic uses
- Managing development
- Public participation
- Marine resources

Consistency with CZM Objectives

Historic Resources

Objective: Protect, preserve, and where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

- (A) Identify and analyze significant archaeological resources;
- (B) Maximize information retention through preservation of remains and artifacts or salvage operations;

- (C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Discussion: The location of significant historic sites was considered in the project's design. These historic sites were analyzed in the project AIS. The proposed Cultural Preserve is intended to protect, preserve, and restore historic sites identified within the Petition Area. Preserve boundaries were designed so they encompass the most significant historic sites, such as Kawa'ewa'e Heiau. Preservation of these significant historic sites will maximize site information retention potential. The Preserve will be guided by a preservation plan to steward and maintain resources in the Preserve area. The Cultural Preserve and associated preservation efforts would facilitate restoration of historic sites and the surrounding landscape. In this manner, the project supports the protection and restoration goals of this objective.

Scenic and Open Space Resources

Objective: Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

- (B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

- (D) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: Project impacts on views oriented toward the shoreline where the Petition Area is visible were assessed. Although the visual character of the Petition Area would change due to cemetery expansion improvements, the Petition Area is one of many components contributing to the overall character of these views. Therefore, changes to the Petition Area's visual character would not significantly impact the quality of overall shoreline oriented views. Project cemetery expansion and Cultural Preserve improvements are not dependent on being located in coastal areas. Cemetery expansion improvements were designed with consideration of the Petition Area's unique resources to ensure impacts to these resources were avoided. In this manner, the Petition Area was designed in alignment with the surrounding environment.

Coastal Ecosystems

Objective: Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

- (E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The proposed project incorporates water quality management practices sensitive to associated freshwater and marine ecosystems. These ecosystems are located downslope and a considerable distance from the Petition Area and would not be impacted by the proposed project. The project impact on the water quality of associated water resources was assessed as part of a Total Maximum Daily Load (TMDL) analysis of the affected watershed. These water resources eventually flow into coastal water bodies and ecosystems. This assessment documented that sediment reaching Kāwā stream would decrease after construction of cemetery improvements. Project design incorporated mitigative measures to avoid significant water quality impacts. These measures include retention/detention basins that serve as on-site stormwater management infrastructure. The basins function as nonpoint source water pollution control measures. Implementation of these measures and other drainage improvements would prevent the project from disrupting or impacting associated coastal ecosystems.

Coastal Hazards

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion and subsidence.

- (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
- (D) Prevent coastal flooding from inland projects.

Discussion: Petition Area flood hazard designations were evaluated in the project's environmental review. As discussed in the Chapter 3 flood hazard analysis, the project impact to flood hazard of the site and residential areas downslope is expected to be minimal. Engineering analysis conducted for the project determined the project would reduce the volume of stormwater runoff draining offsite. This determination indicates flooding risk for coastal areas downslope from the project would decrease with project implementation.

Beach Protection

Objective: Protect beaches for public use and recreation.

- (A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

Discussion: The Petition Area is located approximately one mile from the coastline of Kāneʻohe Bay, although there are no public beaches close to this bay. As a result project improvements would not interfere with natural shoreline processes. Proposed drainage improvements such as retention/detention basins will mitigate water quality impacts on adjacent water resources that could result from project implementation. These water resources would eventually flow into Kāneʻohe Bay.

22. **GENERAL PLAN.** The *General Plan* of the City and County of Honolulu (DGP, 1992, amended October 3, 2002) is a comprehensive statement of objectives and

policies which sets forth the long-range social, economic, environmental, and design objectives for O'ahu. The *General Plan* serves as a guide for government, private enterprise, communities, and individual citizens around 11 areas of concern.

The 1992 O'ahu General Plan is currently undergoing an update. The O'ahu 2035: General Plan Focused Update looked at the critical issues of growth, development, and quality of life, including regional population, economic health, affordable housing, and sustainability during the planning process. A final version of the plan was completed by the end of 2017, and reviewed by the City's Planning Commission. The *Proposed Revised General Plan* was subsequently transmitted from the Planning Commission to the City Council on April 20, 2018. The City Council is now processing the *Proposed Revised General Plan* under Resolution 18-093, and public hearings will eventually be scheduled on this plan. Until the new plan is adopted, the 1992 *General Plan* remains the guiding document, and pertinent objectives and policies from this document are addressed in relation to the project.

Natural Environment

Objective A To protect and preserve the natural environment.

Policy 2 Seek the restoration of environmentally damaged areas and natural resources.

Policy 4 Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation.

Policy 6 Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.

Policy 7 Protect the natural environment from damaging levels of air, water and noise pollution

Policy 8 Protect plants, birds, and other animals that are unique to the State of Hawai'i and the Island of O'ahu.

Discussion: Landscape restoration activities within the Cultural Preserve would restore the Preserve area landscape, which is currently dominated by non-native and invasive vegetation. Activities would replace existing vegetation with native species. The features of the Petition Area natural environment were considered in the project's design. This resulted in the incorporation of mitigative measures that protect and preserve these resources. Existing Petition Area slope and topographic characteristics were considered in the design of proposed grading improvements. Grading will be compatible with existing Petition Area topographic conditions. The Petition Area is not located within a floodplain. Stormwater runoff during large storms currently results in erosion of Petition Area soils. These soils and other stormwater contaminants adversely impact water resources adjacent to and downslope from the Petition Area. Proposed

retention/detention basins and other drainage improvements will mitigate impacts from stormwater induced erosion, aiding the preservation of the Petition Area's natural setting and associated water resources. Although grading would alter distinctive landforms of the Petition Area, impacts to visual resources are not anticipated. These distinctive landforms are one of many components creating the visual character of the region around the Petition Area. Therefore, landform alteration would not adversely impact Petition Area or regional visual resources. Grading improvements would displace vegetation in the cemetery expansion area. Although the majority of displaced species are alien, a comparatively smaller percentage are Polynesian introductions possessing native Hawaiian cultural value. These Polynesian introduced species would be used to landscape the Cultural Preserve, ensuring their continued presence in the Petition Area. Air and noise impacts would primarily occur during the construction of cemetery expansion improvements. Mitigative measures are proposed to alleviate these impacts and include preparation of a dust control plan if adverse air quality impacts are anticipated. A noise permit would be obtained if construction noise exceeds or is expected to exceed State permissible noise standards. The project avian and mammalian survey determined rare or endangered avian and mammalian species are not present in the Petition Area. In particular, the Petition Area would continue to be an unsuitable Pue'ō habitat following project implementation. Pue'ō would continue to not inhabit the Petition Area. The Petition Area would remain an unsuitable Pue'ō habitat because

the open grassed landscape created by cemetery expansion improvements would not provide the tall grassland habitat this species prefers.

Objective B To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policy 1 Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.

Policy 2 Protect O'ahu's scenic views, especially those seen from highly developed and heavily traveled areas.

Discussion: The proposed project was designed to avoid significant impacts to O'ahu's natural resources. Surface water, groundwater, and oceanic resources throughout the Kāne'ohe watershed would not be impacted by proposed improvements. Improvements within the cemetery expansion area include construction of retention/detention basins, which will retain site stormwater runoff, allowing pollutants time to settle before stormwater is conveyed in drainage facilities to the ocean. These improvements will mitigate significant water quality impacts to water resources throughout the Kāne'ohe watershed. The project would replace the Petition Area's mature forest with turf grass landscaping. This forest is predominantly comprised of alien vegetation and a small number of native species. Native plants would be used in the landscaping of the Cultural Preserve, ensuring native plant species remain present

in the Petition Area. O'ahu's scenic views would not be impacted. Although the visual character of the Petition Area would change, the area is a singular component of the landscape visible in the region. Therefore, the landscape would not be impacted by the project and the character of scenic views would remain unaltered.

Physical Development Urban Design

Objective A . To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.

Policy 2 . Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.

Policy 5 . Locate community facilities on sites that will be convenient to the people they are intended to serve.

Discussion: The proposed project will develop additional cemetery space near the existing HMP cemetery. Burial space at HMP is being depleted, limiting burial options for individuals that want to be interred near deceased family members already interred at HMP. Colocation of new cemetery space near an existing cemetery will allow individuals expanded interment options. Colocation would also benefit remembrance and visitation activities, as deceased relatives would be interred in the same cemetery facility. Consultation with the City BWS indicated existing municipal water facilities

can accommodate the project. Improvements generating additional wastewater demand are not included in the proposed project. The project would not significantly impact existing municipal drainage facilities servicing Petition Area stormwater runoff. These facilities presently appear to lack capacity beyond the 10-year storm event they were designed for. Project drainage improvements would reduce Petition Area runoff volumes for the 10 and 100-year, 1 hour storm events relative to existing conditions. The TIAR conducted for the project concluded the project would have minimal impact to the operation of the transportation facilities analyzed.

Culture and Recreation

Objective B To protect Oahu's cultural, historic, architectural, and archaeological resources.

Policy 1 Encourage the restoration and preservation of early Hawaiian structures, artifacts, and landmarks.

Policy 2 Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.

Policy 4 Promote the interpretive and educational use of cultural, historic, architectural, and archaeological sites, buildings, and artifacts.

Discussion: The proposed Cultural Preserve would encourage the restoration and preservation of native Hawaiian historic sites within the Petition Area. The preservation

plan being prepared would identify appropriate treatment strategies for native Hawaiian historic sites within the Preserve, ensuring their long-term maintenance and security. Educational activities led by the organization managing the Preserve would be accessible to organization affiliates and authorized members of the public. These activities would promote education regarding cultural activities and archaeological sites within the Preserve.

23. **KO'OLAU POKO SUSTAINABLE COMMUNITIES PLAN.** The City's Development Plan (DP) & Sustainable Communities Plan (SCP) program provides a regional level framework to implement the City's *General Plan* objectives. The Petition Area is located within the *Ko'olau Poko Sustainable Communities Plan* (SCP) area, one of eight geographic regions of O'ahu that are part of the DP/SCP program. The Ko'olaupoko district encompasses the windward coastal and valley areas generally extending from Makapu'u Point to Kailua, Kāne'ohe, and northbound up to Ka'ō'io Point in Kualoa. An updated *Ko'olau Poko SCP* was adopted by the Honolulu City Council in August 2017 as Ordinance No. 17-42, Revised Ordinances of Honolulu (ROH).

Under Section 6-1509 of the City Charter, development plans (including SCPs) consist of "conceptual schemes" for implementing and accomplishing the development objectives and policies of the City's *General Plan*. Further, these plans are to describe the desired urban character and the significant natural, scenic and cultural resources for

several parts of the city to a degree which is sufficient to serve as a “policy guide” for more detailed zoning maps and regulations.

Consistent with the City Charter, Ordinance 17-42 adopting the *Ko’olau Poko SCP* states (Section 1) that the plan presents a “vision” for future development consisting of “policies, guidelines, and conceptual schemes that will serve as a policy guide” for public and private sector investment decisions. Section 24-6.2 (Applicability and Intent) further explains that the provisions of the *Ko’olau Poko SCP* are not regulatory. SCPs are established with the explicit intent of “providing a coherent vision to guide” all new public and private sector development, and are not deemed to be regulatory.

Ko’olau Poko SCP Community Growth Boundary

The existing HMP site and Veterans Cemetery are designated as “Preservation Areas” by the *Ko’olau Poko SCP’s* Land Use Map, and are within the “Community Growth Boundary.” The Community Growth Boundary (CGB) is intended to define and contain the extent of developed or “built” areas of the SCP area’s urban fringe and rural communities. Its purpose is to provide an adequate supply of land to support the region’s established suburban and rural communities while protecting lands outside the boundary for agricultural and open space preservation values.

This CGB was revised as part of the 2017 update of the SCP, to include the proposed HMP cemetery expansion. As discussed in Appendix A of the City’s SCP,

these maps are general and conceptual, and are not intended to be used to determine specific land use boundaries. The maps are considered illustrations of policies.

The CGB relative to the proposed project is also discussed in Appendix A of the SCP. The boundary description states that it encompasses,

“most of Hawaiian Memorial Park, the proposed expansion of the Hawaiian Memorial Park, the proposed Kawa’ewa’e Heiau cultural preserve, and the Hawai’i State Veterans Cemetery before heading northeast to Kokokahi. The extension of the CGB in this area is solely limited to 28.2 acres for the expansion of the active cemetery area, and 14.5 acres for the proposed Kawa’ewa’e Heiau cultural preserve, and should not be construed to be suitable for any other urban-type development on the old 156-acre Pikoiloa Tract.”

Therefore, the Petition Area for the proposed cemetery expansion of HMP is included within the SCP’s CGB, and is consistent with this plan by reflecting the extent of this future developed area.

Land Use and Open Space Designations

Land Use Designations

The proposed HMP cemetery expansion project area identified within the CGB is designated as “Preservation Areas” by the SCP’s land use map. Although designated for future cemetery expansion, this site does not yet have the “Golf Courses and Cemeteries” land use designation as the existing HMP and Veterans Cemetery areas. Obtaining a State land use district boundary amendment is still required before actual

cemetery expansion can occur, after which the next update of the SCP would appropriately reflect the Golf Courses and Cemeteries designation for the Petition Area.

The Preservation Area land use designation is established to protect undeveloped lands which form an important part of the region's open space fabric, but that are not valued primarily for agricultural uses. Such lands include important wildlife habitat, archaeological or historic sites, significant landforms or landscapes over which significant views are available, and development-related hazard areas.

In general, existing cemeteries within the *Ko'olau Poko SCP* are designated as "Preservation Area." This includes existing cemeteries that are both within and outside of the currently designated CGB. For example, the existing Valley of the Temples Cemetery located near Āhuimanu is designated as Preservation Area, but not located within the CGB. However, this use is designated Urban District at the State level, and is zoned P-2, General Preservation District by the City. Therefore, the cemetery expansion project would similarly be consistent with the Preservation Area land use designation. As previously discussed, the expansion of the CGB to include the HMP expansion also supports its justification and consistency with the land use designation.

A listing of Preservation Area characteristics described under the SCP relevant to the project is provided along with a discussion of the project's applicability or consistency.

- Are necessary for protection of watersheds, water resources and water supplies.

Discussion: This Petition Area is not located within an area necessary for protection of the watershed and water resources as discussed in Chapter 3. The Petition Area is located within the former Kailua Caldera. The filling lavas beneath this caldera are dense, massive, and relatively impermeable due to almost complete filling of interstices with secondary minerals resulting from hydrothermal alteration. The Petition Area is also located below and well away from the State DOH's UIC line indicating it is situated above an exempt portion of the Ko'olaupoko Aquifer. Project improvements would also improve the watershed and water quality below by reducing the volume of runoff and reducing the amount of silt and erosion currently occurring.

- Are necessary for the conservation, preservation and enhancement of sites with scenic, historic, archaeological or ecological significance.

Discussion: As discussed in Chapter 4, the project would have a beneficial effect on historic sites, cultural resources, and cultural practices through establishment of the Cultural Preserve.

- Are necessary for providing and preserving park lands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife, for forestry, and other activities related to these uses.

Discussion: Various sections in the Final EIS discuss the project's beneficial effect on the natural ecosystem by improving water quality, and reducing storm water runoff volumes and erosion. In addition, habitat for the endangered damselfly would be preserved. The feasibility of establishing a partnership with the U.S. FWS to establish a habitat restoration and conservation program for the damselfly habitat would be evaluated. The feasibility of this partnership must be evaluated relative to the proposed Cultural Preserve as the habitat area is designated a historic site (Site -8230). The Cultural Preserve would be managed by the Ko'olaupoko Hawaiian Civic Club. Therefore, habitat management and conservation by the civic club may be more appropriate and must first be evaluated in the context of the entire project. If program establishment is deemed practicable, a partnership between the agency and landowner can be established, potentially specifying joint stewardship and monitoring responsibilities of the habitat area.

- Are generally characterized by topography, soils, climate or other related environmental factors that may not be normally adaptable or presently needed for urban community or agriculture use.

Discussion: The Petition Area was previously used for large scale agricultural production. Thus, this area does include topography, soils, and other factors that have been and can be adapted for agricultural use or potentially urban use. The proposed expansion of the cemetery and Cultural Preserve consist of far less intensive use of the area from what could occur on the property. Furthermore, the proposed Conservation Easement for the Petitioner's property would ensure future agricultural or urban use does not occur, which is a beneficial effect supportive of Preservation Area designation.

- Have general slopes of 20 percent or more that provide for open space amenities and/or scenic values.

Discussion: The Petition Area has slopes of 20% or greater, but does not provide for open space amenities. The majority of the area is characterized as being a Lowland Alien Wet Forest dominated by introduced plant species. The area has been disturbed historically and alteration of native plant habitat has been in place for some time with very few native plant elements remaining. The cemetery expansion would change the current view and characteristics of this forest to an open grassed landscape. The project would also create open space as a heritage (cemetery) and cultural amenity that the public can utilize. As stated under the SCP's relationship of their Open Space

map, cemeteries provide their visual contributions to open space by virtue of their size and landscape character.

- Are susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring corrective attention, and lands necessary to the protection of the health, safety and welfare of the public by reason of soil instability or the land's susceptibility to landslides and/or inundation by tsunami and flooding;

Discussion: As discussed in other sections, the Petition Area currently experiences soil erosion from the thick forested canopy that restricts sunlight and growth of ground cover. The area is not within a flood hazard area, but does contribute to storm water runoff for lower lying areas during large storms. The project would improve this condition by changing site conditions to a grassed landscape allowing for improved infiltration and detention of storm water. Therefore, the project would have a beneficial effect by reducing the volume of runoff, thereby reducing the amount of silt and erosion that now leaves the property.

The SCP states that the Preservation Area is intended to include the following types of areas.

- Areas within the State Conservation District and other areas within the preservation district, but not located within the Community Growth Boundary or Agricultural Areas.

Discussion: As discussed previously, the Petition Area is located within the community growth boundary. Existing cemeteries within the *Ko'olau Poko SCP* are designated as Preservation Area, and the expansion of the CGB to include this also supports its justification and consistency with the land use designation.

- Golf courses and cemeteries not located within the Community Growth Boundary and/or Agricultural Areas.

Discussion: The SCP includes existing cemeteries that are both within and outside (e.g. Valley of the Temples) of the currently designated CGB. The cemetery expansion project is located within the CGB, and would similarly be consistent with this Preservation Area land use designation.

Open Space Use Designations

The SCP's Open Space Map is intended to illustrate the region's major open space patterns and resources as discussed in Chapter 3 of the SCP. Under this Open Space Map, the Petition Area within the CGB is also designated as "Preservation Areas." The area for the cemetery expansion is also categorized as a "Prominent Land

Feature,” which encompasses the entire Oneawa hillside including the existing quarry operations on the eastern half of the hillside.

Conformance with SCP Policies

This section discusses the project’s conformance and consistency with the pertinent policies and guidelines of the 2017 *Ko’olau Poko SCP*.

Section 3.1 Open Space Preservation

Section 3.1.3.3 Wetlands, Wildlife Preserves and Nature Parks

- Prepare and implement a plan to establish a Ko’olau Greenbelt.

Discussion: The Ko’olau Greenbelt encompasses the transitional area between the Ko’olau Mountain Range and area valleys and coastal plains. The intent of this designation is to preserve this natural, recreational, and scenic resource; maintain significant view corridors; to prevent inappropriate development or use that may cause hazards or other undesirable environmental consequences downstream; and to provide opportunities for environmental and cultural research and education. The Petition Area is not located in the area designated as the Ko’olau Greenbelt. The Petition Area is located outside the Ko’olau Greenbelt on the northern facing slopes of Oneawa hillside. As a result, the proposed project is not subject to requirements associated with this designation. Although the project is not subject to regulations that would be contained in the proposed

Ko'olau Greenbelt plan, the project does align with the designation intent discussed in the Ko'olau Poko SCP. Mitigation measures incorporated in the design of the proposed project such as retention/detention basins will ensure the project does not impact downstream natural resources or result in additional hazard such as increased flood risk. The project will not impact recreational facilities in the surrounding area or authorized public recreational use of the site that would occur. The project visual analysis discussed in Chapter 4 indicates that the project will not impact visual resources associated with the Petition Area. The proposed Cultural Preserve will provide authorized members of the public with expanded opportunities for education on Preserve cultural resources.

Section 3.1.3.4 Cemeteries, Natural Gulches, Streams and Drainageways

Guidelines:

- Maintain the open space character of the cemeteries through very low lot coverage ratios.

Discussion: The proposed project would be consistent with this policy because it will maintain the open space character of the Petition Area. The expanded cemetery would have a very low lot coverage ratio. The expanded cemetery does not include buildings or other structures (e.g. restrooms) that would increase lot coverage. The proposed project includes only internal roadways and burial plots

with grave markers that would cover small areas. The Cultural Preserve would similarly not include any buildings or structures affecting lot coverage ratios. Therefore, the density of cemetery expansion would be minimal and maintain an open space character consistent with cemeteries.

- Limit above-grade structures to grave markers of modest size; and necessary administrative and maintenance support buildings that are minimally visible from public rights-of-way, entries and vista points.

Discussion: The expanded cemetery would consist of normal grave markers. Administrative and maintenance support structures are not proposed in the Petition Area as part of this project. Thus, the project would be consistent with this policy.

- Where direct, indirect, or cumulative impacts of any proposed cemetery expansion will affect rare, threatened, or endangered species; or where direct, indirect, or cumulative impacts of any proposed cemetery expansion on sensitive areas are identified in any environmental setting; measures to mitigate, reduce, or rectify any adverse impacts shall be formulated.

Discussion: The presence of rare, threatened, or endangered species within the Petition Area was evaluated in the FEIS. In particular, a seep in the western portion of the Petition Area functions as a habitat for the endangered Blackline

Hawaiian Damselfly. This area along the seep would be preserved and is not included in grading plans. Additional design and minimization measures have been proposed to ensure continued flow of subsurface water to this seep (e.g. subsurface drains) and to prevent current damage occurring from feral pigs as discussed in the FEIS. As a result, the project would not negatively impact the seep or the damselfly habitat. The direct, indirect, and cumulative impacts from cemetery expansion are addressed in the FEIS, and show there would not be significant effects on listed species.

- Any proposed expansion by Hawaiian Memorial Park must include a 150-foot buffer from residential homes, a 2,000-foot buffer from the Pohai Nani senior living community, and a phased approach to sales and marketing to ensure that the land adjacent to the residential homes on Lipalu Street is the last portion of land used for cemetery interment, in order to minimize potential impacts to neighboring residents.

Discussion: The buffer areas identified under this policy are guidelines and conceptual schemes that serve as a policy guide for public and private sector investment decisions under the *Ko'olau Poko SCP*. It should be clarified that this policy is not regulatory, and instead provides a coherent vision to guide developments. Therefore, the proposed buffers are consistent with this policy. An approximately 150-foot buffer is provided separating residences from the

cemetery expansion. The mean distance from the center of the Pohai Nani residential tower to the edge of the proposed cemetery expansion area is about 1,900 feet, and is thus consistent with the 2,000-foot buffer guideline.

Buffer distances in the SCP were based upon general conceptual plans and information submitted to the City Council during the SCP update process. The purpose for revising initial cemetery expansion concept plans throughout that review process was to address "visual concerns" expressed by Pohai Nani residents even though private views are not protected by any State or City statutes. DPP has consistently supported this position over the years. As an example, an adjacent homeowner could construct a new dwelling that would block a neighbors prior views, without interference by government.

Further, the 2,000-foot buffer language in the SCP was included by the Council Planning and Transportation committee based upon conceptual plans provided to the committee that stated the distance was approximate. Throughout that process, correspondence and testimony from DPP supported the project, even with the cemetery expansion up to the Pohai Nani property line, with elimination of the housing component, and then with revised concept plans showing an approximate buffer distance. The extensive vegetation and trees that would remain within the buffer area, under the conservation easement, further provides a visual buffer from the cemetery expansion consistent with the intent

for this policy. The project plans in the Final EIS reflect a configuration necessary to create a cemetery expansion providing for the 28.2 acres that is provided for under the SCP's cemetery guidelines. Therefore, based upon these factors, current project plans are consistent with the policy associated with the buffer guideline.

Burials within the Cultural Preserve are not subject to the visual buffer distance from Pohai Nani because these actions would be conducted as part of traditional native Hawaiian cultural practices following traditional protocols. Deceased individuals buried within the Cultural Preserve would not be subject to HMP requirements necessitating caskets in concrete containers. Traditional native Hawaiian protocols for burials would follow the "clean burial" process that involves partial cremation approved under State law enacted in 2015. Furthermore, such burials would not be visible from Pohai Nani due to the extensive trees and vegetation within the Cultural Preserve blocking any views of such burials.

Development of the cemetery expansion area would also be consistent with the policy identifying a phased approach for the sale and marketing of burial plots to ensure effects on Lipalu Street residences are minimized.

- Hawaiian Memorial Park shall record with the State of Hawaii Bureau of Conveyances or the State of Hawaii Land Court, or both, as appropriate, a

conservation easement on the entirety of the 156-acre undeveloped portion of its Pikoiloa Tract property (TMK No. 4-5-033: 001) that would limit any other future development on the property, except for the 28.2-acre portion of the property that encompasses the proposed Hawaiian Memorial Park expansion site, 10.75 acres of internal roadways and open space, and the 14.5-acre portion of the property that encompasses the proposed Kawa'ewa'e Heiau cultural preserve.

- **Discussion:** The conservation easement would be recorded with the State by the Petitioner for the undeveloped portion of TMK No. 4-5-033: 001 that encompasses the Petition Area. This planned recordation would be consistent with this policy. The details of this private conservation easement agreement would be developed between the Petitioner and Hawaiian Islands Land Trust upon reclassification approval of this project.

Section 3.3 *Historic and Cultural Resources Guidelines:*

- *Preserve significant historic features from earlier periods.*
- *Implement in situ preservation and appropriate protection measures for sites that have high preservation value because of their good condition or unique features.*
- *Determine the appropriate treatment for a historic site by the particular qualities of the site and its relationship to its physical surroundings. Carefully plan and design adjacent uses to avoid conflicts or abrupt contrasts that detract from or destroy the physical*

integrity and historic or cultural value of the site since the context of a historic site is usually a significant part of its value.

- *Establish the degree of public access and interpretation that would best promote the preservation of the historic, cultural and educational value of the site, recognizing that economic use is sometimes the only feasible way to preserve a site. Public access to a historic site can take many forms, from direct physical contact and use to limited visual contact. In some cases, however, it may be highly advisable to restrict access to protect the physical integrity or cultural value of the site.*

Discussion: The proposed project includes development of a Cultural Preserve that will preserve significant native Hawaiian historic features. These include Kawa'ewa'e Heiau, which is associated with important mo'olelo of the Ko'olaupoko region. Kawa'ewa'e Heiau and other features within the Preserve would be preserved in situ with appropriate treatment for sites determined by a preservation plan. In situ preservation of the sites retains their contextual relationship with the surrounding cultural landscape that contributes to their value as historic features. The boundaries of the Cultural Preserve were designed to encompass significant historic sites to avoid adverse impacts from development of the adjacent cemetery expansion. In this manner, uses within the Petition Area are designed to avoid conflicts with historic sites. The public cannot access the Cultural Preserve. Only individuals authorized by the Preserve

stewarding organization can access the area. Access restriction will protect the physical integrity and cultural value of sites within the Preserve.

Section 3.3.2 *Native Hawaiian Cultural and Archaeological Sites, Guidelines*

- *Determine the appropriate preservation methods on a site-by-site basis in consultation with the State Historic Preservation Officer.*
- *Determine appropriate delineation of site boundaries and setback restrictions for adjacent uses based on whether a site is listed and/or eligible for listing on the State and/or National Register of Historic Places and on a site-by-site basis in consultation with the State Historic Preservation Office.*
- *Determine the appropriateness of public access on a site-by-site basis in consultation with the State Historic Preservation Officer and the owner of the land on which the site is located.*

Discussion: Preservation measures for Petition Area native Hawaiian cultural and archaeological sites were determined by the project AIS and CIA. The boundaries of the proposed Preserve were determined with consideration of site significance and context. The AIS that includes discussion of preservation measures and use boundaries is intended for review and acceptance by SHPD. In this manner, preservation methods and use boundaries will be established by consultation with the State Historic Preservation Division. The public is not

allowed access to the Cultural Preserve. Only authorized individuals would be allowed access to these sites, encouraging the preservation of these significant sites.

The KSCP is a policy plan and the proposed Project, when taken in its entirety, is consistent with the KSCP. The testimony of the Acting Director of the Department of Planning and Permitting Kathy Sokugawa on April 23, 2019 is attached hereto and incorporated herein as Exhibit "9".

24. ZONING. The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the General Plan and Development (Sustainable Communities) plans. Permitted land uses and activities are prescribed under Chapter 21 Land Use Ordinance (LUO) of the City's Revised Ordinances of Honolulu, as amended (City and County of Honolulu 1990). The provisions are also referred to as the "zoning ordinance".

The Petition Area is within the City's P-1, Restricted Preservation District. According to the LUO, the purpose of the City's preservation district is to preserve and manage open space and recreation lands and lands of scenic and other natural resource value. The P-1 Restricted Preservation District corresponds to the State's Conservation District as intended under the City's LUO, Section 21-3.40(b). P-1 lands are under the jurisdiction of the State BLNR. Permitted land uses are regulated under Title 13,

Chapter 5, HAR, and are not subject to City zoning regulations. Cemetery uses are not allowable within the Conservation District.

The nearby Ocean View Garden site is within the P-2, General Preservation District. P-2 lands are intended for uses characterized by open space (parks, golf courses, cemeteries) within the State Urban District. Cemetery expansion under the Proposed Action would be permitted within the P-2 district under the City's LUO. A district boundary amendment is proposed for the Petition Area to reclassify the area from the Conservation to Urban District. Upon reclassification to the Urban District, allowable uses, structures, and development standards would be governed by P-2, General Preservation District regulations. As a result, the cemetery expansion project would be a permitted use within the Petition Area.

Permitted Uses

Permitted uses and structures within the P-2 zone are identified in the LUO's Table 21-3, Master Use Table. According to this table, "cemeteries and columbaria" are permitted within the P-2 zoning district. Cemeteries and columbaria are defined in the LUO as *"interment facilities engaged in subdividing property into cemetery lots and offering burial plots or air space for sale. Included are cemetery lots, mausoleums and columbaria. The following are permitted as accessory uses: crematory operations, cemetery real estate operations, mortuary services, floral and monument sales, and detached one-family dwellings to be occupied only by caretakers of the cemetery."*

Uses associated with the proposed project meet the LUO definition of cemeteries and columbaria. These uses include burial spaces and small, private structures such as monuments and garden walls associated with burial spaces. These small structures are also present in other areas of HMP. The project will also establish a Cultural Preserve. The Cultural Preserve will function as a location where native Hawaiian cultural practitioners can inter deceased individuals in a traditional manner. Cultural practitioners choosing to inter deceased individuals in a traditional manner must document burials with the State DOH, record the burials with HMP, and receive HMP's approval. Allowance of traditional burials and the offering of burial space within the Cultural Preserve would define the Preserve as a cemetery under the LUO. The Cultural Preserve would also be allowable within the P-2 district under this use.

25 SPECIAL MANAGEMENT AREA. The Hawai'i Coastal Zone Management Program embodied in Chapter 205A, HRS contains the general objectives and policies upon which all counties within the State have structured specific legislation creating Special Management Areas (SMA). The SMA permit is part of a regulatory system that is the cornerstone of the Hawaii CZM program. The City and County of Honolulu's SMA permitting system is a management tool to assure that uses, activities, or operations on land within the SMA comply with the CZM objectives, policies, and guidelines. The Petition Area is not located within Honolulu's SMA.

26. Hawaiian Customary and Traditional Rights.

Ka Pa`akai Analysis:

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 Pa`akai*, the Hawai'i 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 Pa`akai 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.

Therefore, under the Ka Pa‘akai analysis conducted as part of the CIA, approval of the Applicant’s petition would not adversely impact traditional and customary native Hawaiian rights identified in the Petition Area. The rights of native Hawaiian cultural practitioners are preserved and protected by avoiding development in any areas identified through the interviews or research as areas utilized for traditional or customary practices. Additionally, the Petitioner is taking the additional step of placing lands and resources used for traditional or customary practices into a Cultural Preserve and conservation easement. This would ensure the protection of these resources in perpetuity. The Petitioner has further agreed to continue to work with practitioners to ensure safe, regular access to the lands and resources for cultural practice.

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.

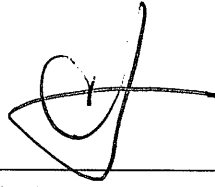
27. **Written Comments.** The Draft EIS was published in OEQC’s September 8, 2018 issue of *The Environmental Notice*. The legal deadline for written comments received or postmarked during the Draft EIS 45-day comment period was October 23, 2018.

A copy of the Draft EIS (on CD) was distributed for review to several government agencies, community organizations, and consulted party individuals. Hard copies of the Draft EIS were made available for public review at the Hawai’i State Library (Hawai’i Documents Center), Kāne’ohe Regional Library, and other state and City libraries. The Draft EIS was also available for viewing and/or download on OEQC’s website and publication of *The Environmental Notice*.

Written comments were received from government agencies and individuals and are attached to the First Amendment to Petition as a part of Exhibit “6”.

In addition several comment letters were received after the comment period deadline. Those late comments and the responses thereto are attached hereto and incorporated herein by reference as Exhibit “10”.

DATED: Honolulu, Hawai'i, June 19, 2019.



Of Counsel:

MATSUBARA, KOTAKE & TABATA
A Law Corporation

BENJAMIN M. MATSUBARA
CURTIS T. TABATA
Attorneys for Petitioner
HAWAIIAN MEMORIAL LIFE
PLAN, LTD.

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of) DOCKET NO. A17-804
)
HAWAIIAN MEMORIAL LIFE PLAN, LTD.) VERIFICATION
)
To Amend The Conservation Land Use)
District Boundary Into The Urban Land Use)
District For Approximately 53.449 Acres Of)
Land At Kāneʻohe, Island of Oʻahu, State of)
Hawaiʻi, Tax Map Key: (1) 4-5-033: por. 001)
_____)

VERIFICATION

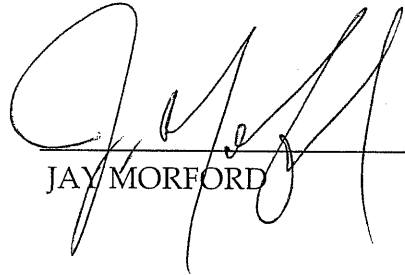
STATE OF HAWAII)
) ss.:
CITY AND COUNTY OF HONOLULU)

Jay Morford, being first duly sworn, on oath, deposes and says that:

1. I am the President of HAWAIIAN MEMORIAL LIFE PLAN, LTD. ("Petitioner"), and in this capacity I am familiar with matters relating to the land which is the subject of Docket No. A17-804 and knowledgeable to testify on behalf of the Petitioner.
2. I have personal knowledge of the matters set forth in the foregoing Second Amendment to Petition in Docket No. A17-804 and am qualified and competent to make this verification.
3. I make this verification pursuant to HAR § 15-15-39, Land Use Commission Rules.

4. I have read the foregoing document and the contents therefore are true and correct to the best of my knowledge and belief.

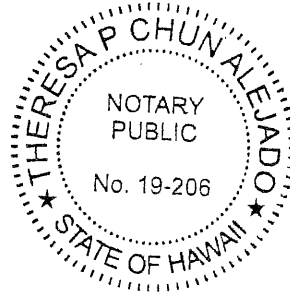
Dated: Honolulu, Hawai'i, JUN 12 2019.



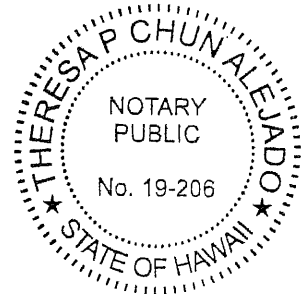
JAY MORFORD

Subscribed and sworn to me
this 12th day of June 2019

Theresa P. Chun Alejado
Name Theresa P Chun Alejado
Notary Public, State of Hawai'i
My commission expires: 05/12/2023

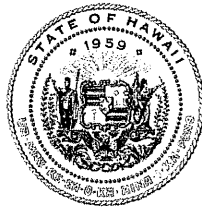
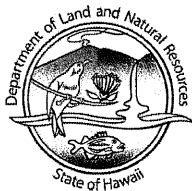


NOTARY CERTIFICATE (Hawai'i Administrative Rules § 5-11-8)	
Document Identification or Description: Verification	
Doc. Date: <u>Undated</u>	No. of Pages: <u>2</u>
Jurisdiction: <u>1st</u> Circuit	
(in which notarial act is performed)	
<u>Theresa P. Chun Alejado</u>	<u>JUN 12 2019</u>
Signature of Notary	Date of Certificate
<u>Theresa P Chun Alejado</u>	<u>Exp. 05/12/2023</u>
Printed Name of Notary	



(Official Stamp or Seal)

DAVID Y. IGE
GOVERNOR OF
HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES
ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE
COMMISSION LAND
STATE PARKS

April 8, 2019

Daniel E. Orodener
Executive Officer
Land Use Commission
Department of Business, Economic Development & Tourism
State of Hawaii
235 S. Beretania Street, # 406
Honolulu, HI 96813

IN REPLY REFER TO:
Log No. 2018.02114
2019.00690
Doc. No. 1904SL01
Archaeology

Dear Mr. Matsubara:

**SUBJECT: Chapter 6E-42 Historic Preservation Review –
LUC Docket No. A17-804/Hawaiian Memorial Life Plan, Ltd.
Hawaiian Memorial Park Cemetery Expansion Project
Archaeological Inventory Survey for Hawaiian Memorial Park
Kāne‘ohe Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu
TMK: (1) 4-5-003:001**

This letter provides the State Historic Preservation Division's (SHPD's) review of the revised archaeological inventory survey (AIS) report titled, *Archaeological Inventory Survey Report for Hawaiian Memorial Park, Kāne‘ohe Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu, TMK: (1) 4-5-003:001 (Thurman et al., March 2019)*. The SHPD received the original draft AIS report with the LUC application on September 9, 2018 (Log No. 2018.02114). SHPD previously received a EIS preparation notice on January 7, 2018 (Log No. 2018.0044) and a draft EIS on September 7, 2018 (Log No. 2018.02103). Following an email request on March 29, 2019 for revisions to the AIS report (Susan Lebo [SHPD] to Trisha Kehaulani Watson [Honua Consulting]), SHPD received the revised AIS (Log No. 2019.00690) via email on April 1, 2019 (Rosanna Thurman to Susan Lebo).

The property is privately owned by Hawaiian Memorial Life Plan, Ltd. The project area is approximately 53.45 acres. The proposed project is to expand the existing Hawaiian Memorial Park Cemetery, involving specific construction activities within two distinct portions of the project area, a 14.5-acre proposed Cultural Preserve (CP) in the northeast portion of the project area and expansion of the cemetery in the remaining 38.95-acre portion of the project area. Proposed project improvements within the CP include clearing of vegetation, creation of walking trails, and installation of interpretive signage. Project construction outside the CP includes mass earth moving to level the existing hillside, creation of an access driveway, installation of a drainage system, and landscaping. There is also discussion of adding a Hawaiian burial interment area. Ground disturbance within the proposed CP would extend to 0.9 meters deep (3 ft.) for removal of existing trees and vegetation, approximately 0.6 meters deep (2 ft.) for pounding-in signage posts, and shallow grading to create walking trails. Ground disturbance outside of the CP will include mass earth moving, ranging from 6 to 30 meters deep (20-100 ft.) at higher elevations of the hillside to level the area. To the extent necessary, the excavated soil will be redistributed within the project area. Drainage installation will utilize low areas of the project area.

The AIS was conducted on behalf of Hawaiian Memorial Life Plan, Ltd. It involved a 100% coverage pedestrian survey of the project area and excavation of two test pits (TU 1 and TU 2) and an exploratory excavation within a single historic property, Site 50-80-10-8241, a historic charcoal kiln. The AIS fieldwork included re-locating and

EXHIBIT "8"

further documenting 10 previously recorded sites and documenting 14 newly-identified sites. The previously identified sites include 8 within the CP: Kawa'ewa'e Heiau [Site 50-80-10-354], a historic charcoal kiln [Site 50-80-10-4683], traditional habitation complex [Site 50-80-10-4684], a traditional ceremonial stone enclosure [Site 50-80-10-6930], a traditional ceremonial area [Site 50-80-10-6931], a historic stone storage feature [Site 50-80-10-6932], a historic charcoal kiln [Site 50-80-10-6933], and a traditional agricultural complex [Site 50-80-10-7079]. Two previously identified sites were further documented outside the CP: a historic water retention terrace [Site 50-80-10-4680] and a traditional habitation complex [Site 50-80-10-4681]. The newly-identified sites outside the CP include historic dairy roads [Site 50-80-14-8228], a historic road segment [Site 50-80-10-8229], a historic 'auwai [Site 50-80-14-8230], an 'auwai with associated terraces [Site 50-80-10-8232], agricultural terrace remnants [Sites 50-80-10-8233, -8234, and -8237], a historic water retention terrace [Site 50-80-10-8236], possible habitation sites [Sites 50-80-10-8235 and -8238], and an earthen pit [Site 50-80-10-8239]. Within the CP, the AIS recorded additional features of Kawa'ewa'e Heiau [Site -354]; expanded Site -7079 to include several terrace remnants and a stone mound; and recorded Site 50-80-10-8240, a terraced drainage 'auwai. Two newly-identified sites occur on the southern border of the proposed CP, including a terraced 'auwai [Site 50-80-10-8231] and a historic charcoal kiln [Site 50-80-10-8241]. Both will be included within the boundaries of the proposed CP.

The AIS results support a project effect determination of "Effect, with agreed upon mitigation commitments" pursuant to HAR 13-284-7(2). The agreed upon mitigation commitments are: data recovery, preservation, and archaeological monitoring. No further work is recommended for six sites [Sites -4680, -8228, -8232, -8236, -8237] and for Feature A at Site -8233. They have been adequately documented. No further work is recommended for Site -8241, which will be included within the CP. Data recovery excavations are recommended for Site -8233 Feature B [modified outcrop], at Sites -8234, -8235, -8238, and -8239, and data recovery or preservation is recommended for Site -7079 [agricultural complex]. Preservation within the CP is recommended for Sites -354, -4683, -4684, -6930, -6931, -6932, -6933, -8231, -8240, and -8241. Preservation outside the CP includes Sites -4681, -8230, and -8235.

The revisions adequately address the issues and concerns identified in our previous correspondence. This AIS report satisfies the requirements of HAR §13-276-5. **It is accepted.** Please send one hard copy of the document, clearly marked FINAL, along with a text-searchable PDF version, to the Kapolei SHPD office, attention SHPD Library.

Pursuant to HAR §13-284-3, Steps (1) through (4) of the historic preservation review process are complete. The SHPD concurs that the survey identification efforts were adequate, agrees with the significance assessments, agrees with the project effect determination, and accepts the agreed upon mitigation in the form of data recovery for four sites, as well as Feature B at Site -8233; data recovery or preservation of Site -7079; preservation of 10 sites within the CP and 3 sites outside the CP; and archaeological monitoring during project work.

As stipulated in HAR §13-284-7, when SHPD comments that a project will result in "effect with agreed upon mitigation commitments," then detailed mitigation plans shall be developed for SHPD review and acceptance, prior to project work commencing. **SHPD looks forward to** receiving a data recovery plan (DRP) meeting the requirements of HAR §13-278-3, a preservation plan (PP) meeting the requirements of HAR §13-277, and an archaeological monitoring plan (AMP) meeting the requirements of HAR §13-279-4.

SHPD will notify the LUC when the DRP, PP, and AMP have been reviewed accepted and the permit issuance process may proceed.

Please contact Dr. Susan A. Lebo, Archaeology Branch Chief, at Susan.A.Lebo@hawaii.gov or at (808) 692-8019 for any concerns regarding archaeological resources or this letter.

Aloha,
Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Trisha Kehaulani Watson, Honua Consulting, watson@honuaconsulting.com
Rosanna Thurman, Honua Consulting and OASES, rosannathurman@gmail.com

LAND USE COMMISSION

STATE OF HAWAI'I

Hearing held on April 23, 2019

Commencing at 9:30 a.m.

Kaneohe Bay View Golf Course

Bayview Banquet Hall

45-285 Kaneohe Bay Drive, Kaneohe, HI 96744

AGENDA

I. Call to Order

II. Adoption of Minutes

III. Tentative Meeting Schedule

IV. ACTION

A17-804 HAWAIIAN MEMORIAL LIFE PLAN, LTD
(O'ahu)

* To Consider the Acceptance of the Final
Environmental Impact Statement for the
Petition to Amend the Conservation Land Use
District Boundary into the Urban Land Use
District for Approximately 53.449 acres of
land at Kane'ohe, Island of O'ahu, State of
Hawai'i TMK: (1)4-5-033:por.001

V. Adjournment

BEFORE: Jean Marie McManus, CSR #156

1 minutes.

2 Do you swear or affirm that the testimony
3 you're about to give is the truth?

4 THE WITNESS: I do.

5 CHAIRPERSON SCHEUER: Thank you.

6 Make sure the orange button is lit, and if
7 you look at me, I'm almost kissing the microphone.

8 Please state your name and address for the
9 record and proceed.

10 THE WITNESS: Is that my home address or
11 business address?

12 CHAIRPERSON SCHEUER: Business.

13 THE WITNESS: Kathy Sakugawa, Acting
14 Director for City Department of Planning and
15 Permitting. My work place is at 650 South King
16 Street, Honolulu, Hawai'i.

17 KATHY SOKUGAWA

18 Was called as a witness by and on behalf of the
19 Public, was sworn to tell the truth, was examined and
20 testified as follows:

21 DIRECT EXAMINATION

22 THE WITNESS: Thank you very much for this
23 opportunity. I'm sorry I can't stay for the whole
24 hearing. The council is dealing with a little matter
25 called short-term rentals even as we speak, so I need

1 to tear myself away from this to attend that hearing.

2 Thank you very much again for this
3 opportunity. I want to clarify our position. We
4 have no objections to the Land Use Commission
5 accepting the Final EIS. We believe our comments
6 have been adequately addressed or can be addressed
7 downstream in the Land Use Commission's deliberative
8 process.

9 I do want to clarify that there is a slight
10 uniqueness to the Ko'olaupoko Sustainable Community
11 Plan in that it spent a fair amount of detail on the
12 expansion of Hawaiian Memorial Park.

13 You may or may not know, but based on the
14 attendance today, that has been a very controversial
15 issue for us at the city, as well as it may be
16 perhaps for you on the boundary amendment.

17 We do believe that this is a good project
18 in the process of trying to make balanced decisions
19 on the Ko'olaupoko Sustainable Community Plan with
20 regard to the cemetery. I think a little bit more
21 detail than was needed for a policy plan, like the
22 Sustainable Community's Plan, has been included in
23 it.

24 Nevertheless, we believe it's still a
25 policy plan and should be treated as such. It is not

1 a zoning regulation. But we are, of course, looking
2 at you for guidance as we proceed with the boundary
3 amendment to formulate the city's position.

4 At this time we believe that essentially it
5 is, taken in its entirety, the project is consistent
6 with the Ko'olaupoko Sustainable Plan and can proceed
7 to boundary amendment.

8 CHAIRPERSON SCHEUER: Thank you very much.

9 Everybody, following the testimony, the
10 Petitioner and the Commissioners will have
11 opportunity to ask any questions of the witness.

12 Petitioner?

13 MR. MATSUBARA: Thank you, Mr. Chair.

14 CROSS-EXAMINATION

15 BY MR. MATSUBARA:

16 Q Good morning.

17 A Good morning.

18 Q Is the position that you're taking that the
19 Ko'olaupoko Sustainable Community is a broad policy
20 plan, and is not regulatory in nature?

21 A Yes, that is stipulated in our city
22 charter.

23 Q So that position is consistent with the
24 ordinance and the city charter?

25 A Correct. If you are referencing the

1 ordinance that adopted the Ko'olaupoko Sustainable
2 Plan, yes.

3 Q The ordinance indicates that it serves as a
4 policy guide.

5 A Yes.

6 Q And under Section 24-6.2(c) provides that
7 provisions of article and Ko'olaupoko Sustainable
8 Community Plans are not regulatory; is that correct?

9 A Yes.

10 Q Thank you very much.

11 CHAIRPERSON SCHEUER: Commissioners, are
12 there any questions for Director Kathy Sokugawa?

13 Thank you very much -- Commissioner Okuda.

14 COMMISSIONER OKUDA: Thank you.

15 Director, even though the county has
16 adopted the Sustainability Plan, the Land Use
17 Commission is still free to make the determination
18 here today, in other words, whether to accept this
19 EIS or not accept it, correct?

20 THE WITNESS: Correct.

21 COMMISSIONER OKUDA: So in other words, the
22 fact that the county has adopted the Sustainability
23 Plan doesn't mean that the Land Use Commission has to
24 adopt the EIS statement; is that correct?

25 THE WITNESS: Correct.

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAIKOOLAWI ISLAND RESERVE COMMISSION
LAND
STATE PARKS

October 31, 2018

Mr. Ronald Sato
Helber, Hastert, and Fee Planners
733 Bishop Street, Suite 2590
Honolulu, Hawai'i 96813
Transmitted via email to: rsata@hhf.com

Dear Mr. Sato,

We have reviewed the draft Environmental Impact Statement (DEIS) for the Hawaiian Memorial Park Expansion. The Division of Forestry and Wildlife (DOFAW) offers the following comments on the DEIS.

Protected Species

Black-line Damselfly Habitat Requirements

The black-line damselfly (*Megalagrion nigrohamatum nigrolineatum*) has been documented as currently present at a seep located within the project area. This species is one of 23 damselfly species endemic to Hawaii. It is a single-island endemic, found only on the island of O'ahu. The species inhabits stream corridors, as well as springs and seeps near streams. Populations of black-line damselfly previously occurred in both the Waianae and Ko'olau mountains, and while they remain in low abundance in Ko'olau streams, the species is now considered extirpated from the Waianae Mountains. Habitat loss and habitat alteration, and the introduction of non-native species (introduced fish and amphibian predators) have resulted in dramatic declines in populations of Hawaiian damselflies across their historic ranges.

Springs and seeps represent integral habitat for declining damselfly species. Aquatic invasive predators typically travel in surface waters to disperse across the landscape, therefore streams are ideal corridors in which these predators become established and expand their ranges. In contrast, seeps and springs have only intermittent or no connectivity to other bodies of water. As a result, these habitats often remain refuges for threatened species which would otherwise be subject to high mortality from introduced predators. An example of a damselfly which has been extirpated from nearly its entire native range on O'ahu by aquatic invasive predators is the orange-black damselfly (*M. xanthomelas*). That species is now found in just a single 100-meter stretch of artificial habitat that is maintained and the population persists because the habitat has no surface-

EXHIBIT "10"

water connection to any stream. At the proposed Hawaiian Memorial Park expansion, the seep (also referred to as a spring) in question that is within the Hawaii Memorial Park property also has no direct surface-water connection and is likely to serve a similar role for *M. nigrohamatum nigrolineatum* and therefore could be crucial for conservation of this species on Oahu.

The DEIS does recognize the importance of the seep habitat and discusses management actions under the proposed action for the area. There is a commitment to fence the area to keep out pigs, monitor water flow and the presence of non-native fish predators, and work with the US Fish and Wildlife Service to establish a habitat restoration and conservation program (p. 3-56). There is no proposal in the DEIS proposed action to establish a managed preserve for the seep area. This needs further explanation and evaluation. We note that Figure 2.7 indicates at least part of the seep area is designated as an area to be revegetated.

Hydrology Assessment for Impacts to the Black-line Damselfly

Appendix H of the DEIS is a subcontractor Report *Assessment of the Potential Impact on Groundwater of the Proposed Expansion of the Hawaiian Memorial Park*. This report describes the groundwater seep habitat that supports the damselfly as emanating in part from approximately four feet downslope from a dug well. This source is further described as follows: "The groundwater seep is maintained by the natural discharge of groundwater moving downslope through the poorly permeable residual soils overlying the unweathered Kailua volcanics at depth" (p. 21).

The general description of the proposed action which is described in the subcontractor report is that the project would involve "installation of retaining walls and fill of tens of feet in depth in the area upslope from the well and seep" (p. 13). The report states "Loading by the fill behind the retaining walls does have the potential to compress the soils below through which the groundwater is moving downslope." (p. 22). The proposed solution to alleviate this potential compression and ensure that the quantity and direction of groundwater flow is maintained is to construct "at least two and possibly three deeper subsurface drains" (p. 22).

DOFAW does not agree that the proposed solution is sufficient to maintain the essential flow characteristics that support the endangered blackline damselfly habitat and there is unlikely to be any solution under the existing plan and site layout with the proposed extensive cut and fill and retaining walls that can provide the degree of certainty necessary that there would be no impacts to the damselfly habitat. A description of the full length of the seep flow is described as follows in the subcontractor plan: "Based on results of the well test, flow in the upper one third to one half of the linear seep is maintained by subsurface leakage from the well" then "Further downslope, flow in the seep increases continuously to its ultimate discharge into the Ohaha Place drainage system" (pp. 21-22). This description indicates that subsurface groundwater in other areas of the site, other than from the groundwater in the area of the dug well, may be important to maintain the habitat in the lower one-half of the seep area. This indication of complexity is supported in the discussion of soils in the DEIS which notes the complex terrain and surface hydrology in the area of the seep: "The spring area contains multiple swale alignments and localized standing water" (p. 3-11 of the DEIS main text). The overall complexity and uncertainty of groundwater discharge along the entire length of the seep flow that is supporting

the endangered damselfly is a significant consideration.

Although the DEIS does specify monitoring of the seep flow after the alterations are made (p. 3-56), there is minimal data available to judge what seasonal level of flow would be a concern and no contingencies proposed if a flow abnormality is observed. The DEIS also states that "Herbicide, and to a lesser extent pesticide, usage may occur as a result of landscaping maintenance activities associated with cemetery expansion area" (p. 3-87). Specific measures would be needed to prevent runoff with these substances from reaching the seep area. Fertilizer runoff may also alter vegetation growth and affect water quality in the seep. An additional area of concern is that there is apparently no permit for the existing dug well that is now the source of the upper portion of the seep and if so this structure is not legal at the present time.

Based on the above analysis DOFAW recommends that the project proposed action be redesigned to avoid the need for large amounts of fill and retaining walls that are hydrologically upgradient of the seep. If this avoidance is not possible, the project proponent should apply to DLNR for a Habitat Conservation Plan and associated Incidental Take License for impacts to the damselfly. Additionally, we suggest implementation of further measures to ensure pesticides or herbicides do not reach the seep area through surface runoff. We also recommend that the landowner work with the DLNR Commission on Water Resource Management and DOFAW to decide how to address the unpermitted dug well going forward to ensure that habitat for the damselfly is maintained.

Hawaiian Hoary Bat

The proposed avoidance measure for this species to avoid disturbance of trees greater than 15 feet in height during the bat breeding and pupping season of June 1 to September 15 is adequate as written.

Seabirds

DOFAW agrees that seabirds are not expected to be impacted based on the project proposed action: "The project should not impact protected seabirds because: 1) no night-time construction is planned, and 2) no exterior lighting is planned as part of site improvements" (p. ES-6).

Vegetation and Landscaping

If the proposed action for the project is approved, DOFAW has the following recommendations regarding vegetation:

- Avoid importing to Oahu soil or other plant material from off-island. You may consider the Hawaii Interagency Biosecurity Plan at <http://dlnr.hawaii.gov/hisc/plans/hibp/> in planning, design, and construction so that the project is in-line with the plan.
- Use native plant species for landscaping that are appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Invasive plant species should be avoided. DOFAW recommends consulting the Hawai'i weed risk assessment website to determine the potential invasiveness of plants proposed for use in the project (<http://www.botany.hawaii.edu/faculty/daehler/wra>)

We appreciate the opportunity to provide comments on the proposed action. Please contact James Cogswell, Wildlife Program Manager, at 808-587-4187 or James.M.Cogswell@hawaii.gov if you have any questions.

Sincerely,


David G. Smith
Administrator

cc: Chairperson, Board of Land and Natural Resources
DLNR Land Division



April 19, 2019

Mr. David G. Smith, Administrator
Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawai'i
1151 Punchbowl Street, Room 325
Honolulu, Hawai'i 96813

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāne'ohe, O'ahu, Hawai'i

Dear Mr. Smith:

Thank you for the letter providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that the letter was dated October 31, 2018, and the envelope was postmarked November 1, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS, consistent with State environmental review regulations, Title 11, Chapter 200, Hawai'i Administrative Rules. However, responses to your comments (italicized) are provided below. You may obtain a copy of the Final EIS that is already available on the State Land Use Commission's website, and will be available at the State Office of Environmental Quality Control when published in their April 23rd issue of *The Environmental Notice*.

Black-line Damselfly Habitat Requirements

1. *The black-line damselfly (*Megalagrion nigrohamatum nigrolineatum*) has been documented as currently present at a seep located within the project area. This species is one of 23 damselfly species endemic to Hawaii. It is a single-island endemic, found only on the island of O'ahu. The species inhabits stream corridors, as well as springs and seeps near streams. Populations of black-line damselfly previously occurred in both the Waianae and Ko'olau mountains, and while they remain in low abundance in Ko'olau streams, the species is now considered extirpated from the Waianae Mountains. Habitat loss and habitat alteration, and the introduction of non-native species (introduced fish and amphibian predators) have resulted in dramatic declines in populations of Hawaiian damselflies across their historic ranges.*

Response: We acknowledge the background information on the Blackline Hawaiian Damselfly. Section 3.5 of the Final EIS includes expansive discussion of this species based upon an invertebrate study conducted by Dr. Steven Montgomery.

2. *Springs and seeps represent integral habitat for declining damselfly species. Aquatic invasive predators typically travel in surface waters to disperse across the landscape, therefore streams are ideal corridors in which these predators become established and expand their ranges. In contrast, seeps and springs have only intermittent or no connectivity to other bodies of water. As a*

result, these habitats often remain refuges for threatened species which would otherwise be subject to high mortality from introduced predators. An example of a damselfly which has been extirpated from nearly its entire native range on O'ahu by aquatic invasive predators is the orange-black damselfly (*M xanthomelas*). That species is now found in just a single 100-meter stretch of artificial habitat that is maintained and the population persists because the habitat has no surface water connection to any stream. At the proposed Hawaiian Memorial Park expansion, the seep (also referred to as a spring) in question that is within the Hawaii Memorial Park property also has no direct surface-water connection and is likely to serve a similar role for *M nigrohamatum nigrolineatum* and therefore could be crucial for conservation of this species on Oahu.

Response: The Final EIS includes significant discussion and description of the seep and its physical characteristics which support the endangered damselfly. Such information is included in Sections 3.6 (Groundwater), 3.7 (Surface Waters), and Section 3.5 (Invertebrate Resources). The seep has physical indicators of surface flow that is connected to and directed into the drainage culvert at the end of Ohaha Place. This culvert discharges into Kāwa Stream as part of the City drainage system serving the Pikoiloa subdivision. It should be clarified that the section of the well, seep, and drainage culvert encompasses about 200 linear feet as shown on Figure 3.10 of the Draft EIS, and not 330 feet (100 meters).

3. *The DEIS does recognize the importance of the seep habitat and discusses management actions under the proposed action for the area. There is a commitment to fence the area to keep out pigs, monitor water flow and the presence of non-native fish predators, and work with the US Fish and Wildlife Service to establish a habitat restoration and conservation program (p. 3-56). There is no proposal in the DEIS proposed action to establish a managed preserve for the seep area. This needs further explanation and evaluation. We note that Figure 2.7 indicates at least part of the seep area is designated as an area to be revegetated.*

Response: The importance of the seep and maintaining that habitat is discussed in the Final EIS, and includes several design measures to avoid and minimize effects, such as installing a fence and subsurface drainage system above the seep. The Petitioner will evaluate the feasibility and practicability of initiating participation in a habitat restoration and conservation program for the damselfly habitat under the Partners for Fish and Wildlife program. However, the feasibility of such a partnership first needs to be evaluated in relation to the proposed Cultural Preserve, to be managed by the Ko'olaupoko Hawaiian Civic Club, because the seep area is designated as a historic site (Site -8230). Consequently, the management and conservation of this seep habitat area by the civic club may be more appropriate and first needs to be evaluated in the context of the entire project. That is why there is no need for a "managed preserve" proposed for the seep area at this time. If the seep is managed by the civic club, it would be included as part of a Preservation Plan developed for historic sites associated with the Cultural Preserve.

Hydrology Assessment for Impacts to the Black-line Damselfly

1. *Appendix H of the DEIS is a subcontractor Report Assessment of the Potential Impact on Groundwater of the Proposed Expansion of the Hawaiian Memorial Park. This report describes the groundwater seep habitat that supports the damselfly as emanating in part from approximately four feet downslope from a dug well. This source is further described as follows: "The groundwater seep is maintained by the natural discharge of groundwater moving downslope through the poorly permeable residual soils overlying the unweathered Kailua volcanics at depth" (p. 21).*

The general description of the proposed action which is described in the subcontractor report is that the project would involve "installation of retaining walls and fill of tens of feet in depth in the area upslope from the well and seep" (p. 13). The report states "Loading by the fill behind the retaining walls does have the potential to compress the soils below through which the groundwater is moving downslope." (p. 22). The proposed solution to alleviate this potential compression and ensure that the quantity and direction of groundwater flow is maintained is to construct "at least two and possibly three deeper subsurface drains" (p. 22).

DOFAW does not agree that the proposed solution is sufficient to maintain the essential flow characteristics that support the endangered blackline damselfly habitat and there is unlikely to be any solution under the existing plan and site layout with the proposed extensive cut and fill and retaining walls that can provide the degree of certainty necessary that there would be no impacts to the damselfly habitat.

Response: We acknowledge your opinion of the potential effects of the project on the seep, which is not supported by facts or hydrological and geotechnical engineering technical expertise. We disagree that there is unlikely to be "any solution" to minimize effects based upon proposed grading plans. The Draft EIS documented fieldwork and studies conducted by subject experts that addressed the feasibility and practicability of measures proposed. The Final EIS includes additional information addressing this issue, and identifies measures to ensure the long-term continuation of water flow to the seep based upon recommendations by these experts.

A subsurface drainage system designed in a herringbone pattern would be installed in the fill area above the well and seep. This system would capture more subsurface water to ensure water flow to the well and seep is maintained given the possibility of subsurface water flow impedence from fill deposited upslope from these features. The system would be comprised of three subsurface drainage mainlines with smaller subdrains branching laterally from the mainlines. In addition, a well monitoring gauge or other appropriate device would be installed inside the well located upslope from the seep to monitor water levels prior to, during, and after project construction. Once project earthmoving activities conclude, a permanent irrigation line extending from the proposed cemetery expansion area's irrigation system to the well would be installed. This irrigation line would serve as a long-term means of ensuring continued water flows at the seep if the natural flow significantly decreases, which is not expected to occur. If the gauge indicates water levels have declined to levels potentially affecting the seep, water from the irrigation line to the well could be provided to stabilize water levels. During construction, a temporary irrigation line would also be extended to the well to support water levels, if necessary.

2. *A description of the full length of the seep flow is described as follows in the subcontractor plan: "Based on results of the well test, flow in the upper one third to one half of the linear seep is maintained by subsurface leakage from the well" then "Further downslope, flow in the seep increases continuously to its ultimate discharge into the Ohaha Place drainage system" (pp. 21-22). This description indicates that subsurface groundwater in other areas of the site, other than from the groundwater in the area of the dug well, may be important to maintain the habitat in the lower one-half of the seep area. This indication of complexity is supported in the discussion of soils in the DEIS which notes the complex terrain and surface hydrology in the area of the seep: "The spring area contains multiple swale alignments and localized standing water" (p. 3-11 of the DEIS main text). The overall complexity and uncertainty of groundwater discharge*

along the entire length of the seep flow that is supporting the endangered damselfly is a significant consideration.

Response: The understanding of the hydrology associated with subsurface water flow in the area of the seep is not uncertain, and has been identified based upon testing of the area and studies conducted by our subconsultant team of experts. Figure 3.10 in the Final EIS has been revised to show areas where subsurface water feeds the well and seep area. Based upon this hydrology, the herringbone patterned subsurface drainage system proposed would allow capturing subsurface water to ensure water flow to the well and seep is maintained. Section 3.6 of the Final EIS includes considerable discussion explaining the hydrology of this area, which included boreholes to determine soil composition and pump testing of the well.

4. *Although the DEIS does specify monitoring of the seep flow after the alterations are made (p. 3-56), there is minimal data available to judge what seasonal level of flow would be a concern and no contingencies proposed if a flow abnormality is observed.*

Response: Section 3.6 includes adequate data from the testing and field work to document the water flow associated with the seep and average inflow to the well. The current small water flow associated with the seep is understood. A well monitoring gauge or other appropriate device would be installed inside the well located upslope from the seep to monitor water levels prior to, during, and after project construction. A permanent irrigation line extending from the proposed cemetery expansion area's irrigation system to the well would also be installed serving as a long-term means of ensuring continued water flows at the seep. If the gauge indicates water levels have declined to levels potentially affecting the seep, water from the irrigation line to the well could be provided to stabilize water levels.

5. *The DEIS also states that "Herbicide, and to a lesser extent pesticide, usage may occur as a result of landscaping maintenance activities associated with cemetery expansion area" (p. 3-87). Specific measures would be needed to prevent runoff with these substances from reaching the seep area. Fertilizer runoff may also alter vegetation growth and affect water quality in the seep.*

Response: Section 3.8 of the Final EIS includes additional information addressing concerns with herbicide use with landscape maintenance based upon additional information obtained from the Petitioner. The cemetery expansion area would include maintenance activities to manage grass growth, such as lawn mowing and trimming of other vegetation. However, cemeteries are not intensively managed landscapes, as compared to golf courses. Fertilizers are not necessary for use at the existing HMP cemetery due to the generally fertile conditions, supportive weather conditions, and lower maintenance needed for turf grass. Landscape maintenance is intended to keep the grass low and not increase growth with fertilizer use, such as at golf courses. Pesticides are also not used by HMP maintenance staff. HMP maintenance staff occasionally use the herbicide Roundup (glyphosate) to address spot areas needing treatment. However, such use is infrequent due to the generally wet weather in Kāne'ohe, and the characteristics of the cemetery lawn.

The drainage area associated with the seep only flows during storm events, which account for the vast majority of suspended solids and other pollutants being discharged. Consequently, the seep would not be affected by runoff the majority of the time, and the large quantities of runoff flowing through drainage area during storm events would discharge into the City's box culvert

below. Section 3.8 addresses the potential project effects on water quality using the results from a water quality study for the Final EIS (Element Environmental, Appendix I). Drainage improvements would reduce the volume and intensity of storm water runoff resulting in an improvement on water quality. Section 5.3 discusses these improvements in more detail.

6. *An additional area of concern is that there is apparently no permit for the existing dug well that is now the source of the upper portion of the seep and if so this structure is not legal at the present time.*

Response: The well was likely constructed in the 1950's as part of dairy or agricultural activities based upon the archaeological inventory survey conducted. Thus, this well was established before State Commission of Water Resources Management rules were established. The Petitioner would register this shallow well with the Commission upon approval of the project by the LUC.

5. *Based on the above analysis DOFAW recommends that the project proposed action be redesigned to avoid the need for large amounts of fill and retaining walls that are hydrologically upgradient of the seep.*

Response: The suggested alternative to redesign the project to avoid large amounts of fill and retaining walls is not reasonable or justified based upon the studies and analysis documented in the Final EIS. The DEIS demonstrated that the cemetery expansion would not have a detrimental impact to the damselfly and seep habitat. The testing and studies conducted have resulted in a thorough understanding of the shallow perched water source feeding the well and seep. The revised Figure 3.10 in the Final EIS shows the small confined basin area that contributes to subsurface flows to the well and seep area. The concern with impacting water flow is limited to potential compaction of soils due to filling planned within a portion of this basin area above the seep. Design measures providing subsurface drainage lines would address this concern by ensuring continued water flow to the well and seep. The permanent irrigation line connecting to the well provides an additional measure to ensure water flow on a long-term basis. Therefore, this seep would not be significantly impacted by the grading plan, and there is no practicable reason or justification why such a large section of the cemetery expansion should be redesigned. In addition, the landscaped grass of the cemetery would improve detention of runoff and increase infiltration improving this watershed area.

6. *If this avoidance is not possible, the project proponent should apply to DLNR for a Habitat Conservation Plan and associated Incidental Take License for impacts to the damselfly.*

Response: A Habitat Conservation Plan as part of an Incidental Take Permit application under Section 10 of the Endangered Species Act would not be required because the cemetery expansion would avoid the damselfly and its habitat, and proposed minimization measures would ensure continued water flow along the seep and would not alter this habitat.

7. *Additionally, we suggest implementation of further measures to ensure pesticides or herbicides do not reach the seep area through surface runoff. We also recommend that the landowner work with the DLNR Commission on Water Resource Management and DOFAW to decide how to address the unpermitted dug well going forward to ensure that habitat for the damselfly is maintained.*

Response: The Petitioner has indicated that pesticides are not used by maintenance staff for cemetery maintenance. Further measures are not needed to address concerns with herbicides as explained under Response No. 5. The project includes several drainage improvements that would improve water quality, and minimal use of herbicide would not significantly impact the seep based upon the results documented in pertinent sections of the Final EIS. As already discussed, all the Petitioner would need to do regarding the shallow well is to register it with the Commission upon approval of the project by the LUC.

Hawaiian Hoary Bat

The proposed avoidance measure for this species to avoid disturbance of trees greater than 15 feet in height during the bat breeding and pupping season of June 1 to September 15 is adequate as written.

Response: This avoidance measure would be implemented by the Petitioner.

Seabirds

DOFAW agrees that seabirds are not expected to be impacted based on the project proposed action: "The project should not impact protected seabirds because: 1) no night-time construction is planned, and 2) no exterior lighting is planned as part of site improvements" (p. ES-6).

Response: We concur with your comments that seabirds would not be significantly impacted by this project.

Vegetation and Landscaping

If the proposed action for the project is approved, DOFAW has the following recommendations regarding vegetation:

- *Avoid importing to Oahu soil or other plant material from off-island. You may consider the Hawaii Interagency Biosecurity Plan at <http://dlnr.hawaii.gov/hisc/plans/hibp/> in planning, design, and construction so that the project is in-line with the plan.*
- *Use native plant species for landscaping that are appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Invasive plant species should be avoided. DOFAW recommends consulting the Hawai'i weed risk assessment website to determine the potential invasiveness of plants proposed for use in the project (<http://www.botany.hawaii.edu/faculty/daehler/wra>).*

Response: The reference regarding the biosecurity plan would be reviewed during the project design phase to determine if information may be applicable and beneficial to design plans. Native plants are already proposed for landscaping, and invasive plant species would be avoided. The website reference would be reviewed during the project's design phase to determine if information may be applicable and beneficial to landscape design plans.

Mr. David G. Smith, Administrator
State DLNR, DOFAW

Page 7

Thank you for providing us with your comments on the DEIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Ezer". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

DIVISION OF AQUATIC RESOURCES
DEPT. OF LAND & NATURAL RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813



Ronald A. Sato, AICP, Senior Associate
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

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Date: 10/23/18

DAR # 5783

MEMORANDUM

TO: Brian J. Neilson
Acting DAR Administrator

FROM: Glenn Higashi *GRH*, Aquatic Biologist

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project; Draft Environmental Impact Statement (DEIS)

Request Submitted by: HHF Planners

Location of Project: TMK: (1) 4-5-033: por. 001 (privately owned); Kane'ohe, O'ahu, Hawai'i

Brief Description of Project:

Hawaiian Memorial Life Plan, Ltd. owns Hawaiian Memorial Park (HMP), which operates as a cemetery providing the community with burial plots along with a variety of interment options. HMP is a full service cemetery that has been at its present location since 1958. HMP is the final resting place for over 41,000 people, representing families across Hawai'i. As sections of the cemetery have filled, HMP has grown from an initial size of six acres to its existing size of approximately 80 acres situated on three tax map parcels. One of the parcels is separated by the Hawai'i State Veterans Cemetery. (continued on the next page)

Comments:

No Comments Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: *Brian J. Neilson* Date: 10/26/18
Brian J. Neilson
Acting DAR Administrator

Brief Description of Project

The Hawaiian Memorial Park Cemetery Expansion Project involves proposed improvements (Proposed Action) within the approximately 53.45-acre Petition Area would consist of two main components: 1) expansion of the HMP cemetery; and 2) creation of a 14.5-acre cultural preserve immediately to the northeast of the cemetery expansion area. Remaining undeveloped areas of Parcel 1 outside of the Petition Area would continue to remain undeveloped.

The Petition Area for the expansion of the cemetery is situated makai (seaward) of the existing HMP area and the Hawai'i State Veterans Cemetery. The Petition Area is about 53.45 acres in size, and is a portion of a larger 164.4-acre parcel identified as Tax Map Key (1) 4-5-033: 001 (Parcel 1). Parcel 1 is owned by Hawaiian Memorial Life Plan Ltd. (Petitioner) and about 7.9 acres of Parcel 1 consists of the existing Ocean View Garden cemetery, which is part of HMP. Of the 53.45-acre Petition Area, only 28.2 acres would be for cemetery use. The remaining 25.25 acres of the site would consist of internal roadways, open space, and land for the establishment of a cultural preserve. The entire HMP property is comprised of three separate parcels.

There are no perennial or intermittent streams within the Petition Area. The most proximate water resource to the Petition Area is Kawa Stream and its location is .01 miles due east.

HMP is a privately-owned cemetery located in the Kane'ohe district on the Windward side of the island of O'ahu. The cemetery is approximately 7 miles northeast of downtown Honolulu, and located mid-way between the towns of Kailua to the east and Kane'ohe to the west. The Petition Area is situated within the ahupua'a (traditional land division) of Kane'ohe. Kane'ohe is a large ahupua'a of approximately 11,000 acres, extending from the Windward crest of the Ko'olau Mountain Range to include most of the Mokapu Peninsula, and is bordered by the ahupua'a of He'eia to the west and Kailua to the east.

The Ko'olau Mountain Range is located west of the HMP site, and Kane'ohe Bay is situated approximately 1.5 miles to the north.

DAR# 5783

Comments

Previous comments (DAR#5663) remain applicable. The proposed project is not expected to have adverse impacts on the aquatic environment.

DAVID Y. IGE
GOVERNOR OF
HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAIHOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

Date: Jan. 19, 2018
DAR # 5663

MEMORANDUM

TO: Bruce S. Anderson, PhD
DAR Administrator

FROM: Glenn Higashi GRH, Aquatic Biologist

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) on the Hawaiian Memorial Park Expansion Project

Request Submitted by: HHF Planners on behalf of Hawaiian Memorial Life Plan, Ltd.

Location of Project: (1) 44-5-033; por. 001 (private property), Kaneohe District, Oahu, Hawaii

Brief Description of Project:

Hawaiian Memorial Life Plan, Ltd. owns Hawaiian Memorial Park (HMP), which operates as a cemetery providing the community with burial plots along with a variety of interment options. HMP is a full service cemetery that has been at its present location since 1958. HMP is the final resting place for over 41,000 people, representing families across Hawai'i. As sections of the cemetery have filled, HMP has grown from an initial size of six acres to its existing size of approximately 80 acres situated on three tax map parcels. One of the parcels is separated by the Hawai'i State Veterans Cemetery. (continued on the next page)

Comments:

No Comments Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: Bruce S. Anderson Date: 1/22/18
Bruce S. Anderson, PhD
DAR Administrator

DAR# 5663

Brief Description of Project

The Hawaiian Memorial Park Expansion Project involves proposed improvements (Proposed Action) within the approximately 53.45-acre Petition Area would consist of two main components: 1) expansion of the HMP cemetery; and 2) creation of a 14.5-acre cultural preserve immediately to the northeast of the cemetery expansion area. Remaining undeveloped areas of Parcel 1 outside of the Petition Area would continue to remain undeveloped.

The Petition Area for the expansion of the cemetery is situated makai (seaward) of the existing HMP area and the Hawai'i State Veterans Cemetery. The Petition Area is about 53.45 acres in size, and is a portion of a larger 164.4-acre parcel identified as Tax Map Key (1) 4-5-033: 001 (Parcel 1). Parcel 1 is owned by Hawaiian Memorial Life Plan Ltd. (Petitioner) and about 7.9 acres of Parcel 1 consists of the existing Ocean View Garden cemetery, which is part of HMP. Of the 53.45-acre Petition Area, only 28.2 acres would be for cemetery use. The remaining 25.25 acres of the site would consist of internal roadways, open space, and land for the establishment of a cultural preserve. The entire HMP property is comprised of three separate parcels.

HMP is a privately-owned cemetery located in the Kāne'ōhe district on the Windward side of the island of O'ahu. The cemetery is approximately 7 miles northeast of downtown Honolulu, and located mid-way between the towns of Kailua to the east and Kāne'ōhe to the west. The Petition Area is situated within the ahupua'a (traditional land division) of Kāne'ōhe. Kāne'ōhe is a large ahupua'a of approximately 11,000 acres, extending from the Windward crest of the Ko'olau Mountain Range to include most of the Mōkapu Peninsula, and is bordered by the ahupua'a of He'eia to the west and Kailua to the east.

The Ko'olau Mountain Range is located west of the HMP site, and Kāne'ōhe Bay is situated approximately 1.5 miles to the north. Figure 1.1 is a location map showing the Petition Area in relation to the larger Windward district.

DAR# 5663

Comments

The proposed project is not expected to have adverse impacts on the aquatic environment.

HHF PLANNERS
places for people

RECEIVED

AUG 27 2018

Division of Aquatic Resources
DAR 5778

August 22, 2018



Mr. Bruce S. Anderson, DAR Administrator
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawai'i
1151 Punchbowl Street, Room 330
Honolulu, Hawai'i 96813

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Environmental Impact Statement Preparation Notice (EISPN)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāne'ohe District, O'ahu, Hawai'i

Dear Mr. Anderson:

Thank you for the January 19, 2018 letter providing comments on the Environmental Impact Statement Preparation Notice (EISPN) for the subject project.

The general project description discussed is consistent with the EISPN and the soon to be published Draft Environmental Impact Statement (DEIS).

We acknowledge your assessment that the proposed project is not expected to have adverse impacts on the aquatic environment.

Thank you for providing us with your comments on the EISPN and participating in this process. If you have any questions, please contact me at 457-3172 or rsato@hhf.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'R A Sato'.

Ronald A. Sato, AICP
Sr. Associate

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.



RECEIVED

DEC 26 2017

Division of Aquatic Resources

DAR 5663

December 19, 2017

Dear Participant:

Enclosed is an Environmental Impact Statement Preparation Notice (EISPN) providing public notice that a Draft Environmental Impact Statement (Draft EIS) is being prepared for the subject project. The EIS will be prepared in accordance with State of Hawai'i EIS law (Chapter 343, Hawaii Revised Statutes) and EIS rules (Title 11, Chapter 200, Hawai'i Administrative Rules). This EISPN is intended to solicit public input regarding the scope of the forthcoming Draft EIS.

TITLE OF PROJECT: Hawaiian Memorial Park Cemetery Expansion Project
LOCATION: Kāne'ohe District, O'ahu, Hawai'i
TAX MAP KEY NO.: (1) 4-5-033: por. 001 (Private Property)
APPLICANT: Hawaiian Memorial Life Plan, Ltd.
ADDRESS: 1330 Maunakea Street
Honolulu, Hawaii 96813
CONTACT: Mr. Jay Morford, President
PHONE: (808) 522-5233

YOUR COMMENTS MUST BE RECEIVED OR POSTMARKED BY MONDAY, JANUARY 22, 2018. COMMENTS SHOULD BE SENT TO THE FOLLOWING:

CONSULTANT: HHF Planners
ADDRESS: 733 Bishop Street, Suite 2590
Honolulu, Hawai'i 96813
CONTACT: Ronald A. Sato, AICP, Senior Associate
Email: rsato@hhf.com
PHONE: (808) 457-3172

WITH A COPY SENT TO:

APPROVING AGENCY: State of Hawai'i
Land Use Commission
Department of Business, Economic Development & Tourism
ADDRESS: P.O. Box 2359
Honolulu, Hawaii 96804
CONTACT: Mr. Scott Derrickson
Email: scott.a.derrickson@hawaii.gov
PHONE: (808) 587-3921

Thank you for your participation in the EIS process. We look forward to receiving your comments.



April 19, 2019

Mr. Brian J. Neilson, Administrator
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawai'i
1151 Punchbowl Street, Room 330
Honolulu, Hawai'i 96813

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāne'ohe District, O'ahu, Hawai'i

Dear Mr. Neilson:

Thank you for the letter providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that the letter was dated October 23, 2018, but the envelope was postmarked October 26, 2018, and received by our office on October 29, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS under the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (*italicized*) are being provided and are included below.

DAR Comments

Previous comments (DAR#5663) remain applicable. The proposed project is not expected to have adverse impacts on the aquatic environment.

1. *DAR#5663 comment: The proposed project is not expected to have adverse impacts on the aquatic environment.*

Response: We acknowledge your assessment that the proposed project is not expected to have adverse impacts on the aquatic environment. We acknowledge your determination that comments previously submitted by the Division of Aquatic Resources (DAR) for the project's environmental impact statement preparation notice (EISPN) remain applicable. EISPN comments document a similar assessment by DAR that the project is not expected to adversely impact the aquatic environment.

Thank you for providing us with your comments on the Draft EIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,

A handwritten signature in black ink that reads "Scott Ezer".

Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097
RETURN SERVICE REQUESTED

HONOLULU
HI 968
25 OCT '18
PM 2 1

Mr. Ronald A. Sato
AICP, Senior Associate
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

96813-401640



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DAVID Y. IGE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

JADE T. BUTAY
DIRECTOR


Deputy Directors
ROY CATALANI
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
DIR 1029
STP 8.2544

October 23, 2018

TO: THE HONORABLE LUIS P. SALAVERIA, DIRECTOR
DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT
AND TOURISM

ATTN: SCOTT DERRICKSON
LAND USE COMMISSION

FROM: JADE T. BUTAY
DIRECTOR OF TRANSPORTATION 

SUBJECT: HAWAIIAN MEMORIAL PARK (HMP) CEMETERY EXPANSION PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT
KANEOHE, OAHU, HAWAII
TMK: (1) 4-5-033:001 (POR.)

The applicant, Hawaiian Memorial Life Plan, Ltd., which owns and manages HMP, proposes an expansion to ensure that a sufficient supply of burial plots can be maintained. The applicant proposes reclassification of a 53.45 acres portion of Parcel 001 (164.4 acres) from Conservation District to Urban District. The reclassified area will consist of 28.2 acres for cemetery use, 14.5 acres for cultural preserve and the remainder for open space and internal roadways. The Department of Transportation (DOT) offer the following comments:

Highways Division

Kamehameha Highway in the project vicinity is a four-lane facility and HMP has two stop-controlled driveways across from Mahinui Road and from Halekou Road. The Traffic Impact Analysis Report (TIAR) noted that DOT was evaluating the Halekou Road intersection for possible signalization but, no decision had been made. The TIAR included two alternatives: one with a traffic signal, and one without a traffic signal.

1. Based on the TIAR, the proposed expansion is not anticipated to have a significant impact to our State highways; therefore, HMP has no transportation improvements to the State Highway System. HMP should implement the TIAR recommendation for restriping the HMP approaches to Kamehameha Highway to provide for better exiting traffic flow.
2. HMP should provide for appropriate traffic control plans in the event some activity within HMP and/or areas contained within its boundaries may cause traffic issues at access driveways.

The Honorable Luis P. Salaveria
October 23, 2018
Page 2

DIR 1029
STP 8.2544

3. If there should be unexpected traffic issues not provided for in the TIAR that can be attributed to HMP, the traffic issues should be mitigated to the satisfaction of the DOT.

If there are any questions, please contact Mr. Blayne Nikaido of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7979 or by email at blayne.h.nikaido@hawaii.gov.

c: Ronald A. Sato, HHF Planners



April 19, 2019

Ms. Jade T. Butay, Director
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, Hawai'i 96813

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāne'ohe, O'ahu, Hawai'i

Dear Mr. Butay:

Thank you for the letter providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that the letter was dated October 23, 2018, but the envelope was postmarked October 25, 2018, and received by our office on October 29, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS under the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (italicized) are being provided and are included below.

1. *Based on the TIAR, the proposed expansion is not anticipated to have a significant impact to our State highways; therefore, HMP has no transportation improvements to the State Highway System. HMP should implement the TIAR recommendation for restriping the HMP approaches to Kamehameha Highway to provide for better exiting traffic flow.*

Response: Thank you for reviewing the TIAR associated with the project, and acknowledging the study results stating that the project is not anticipated to have a significant impact on the State highway system. As a result, Hawaiian Memorial Park (HMP) has no improvements required for the highway system. The two westbound approaches of HMP's driveways at their intersections with Kamehameha Highway will be restriped by the Petitioner to provide for better traffic flow for vehicles exiting HMP as recommended by the TIAR.

2. *HMP should provide for appropriate traffic control plans in the event some activity within HMP and /or areas contained within its boundaries may cause traffic issues at access driveways.*

Response: After project implementation, appropriate short-term traffic control measures (e.g. hiring police officers to support traffic control) will be implemented in the event certain activities or events at HMP are believed to potentially result in traffic issues at cemetery access driveways.

Ms. Jade T. Butay, Director
State DOT

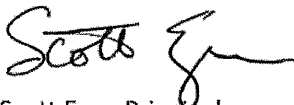
Page 2

3. *If there should be unexpected traffic issues not provided for in the TIAR that can be attributed to HMP, the traffic issues should be mitigated to the satisfaction of the DOT.*

Response: The Petitioner will consult with DOT as appropriate to determine necessary measures if there are unexpected traffic issues attributable to the HMP project not provided for in the TIAR.

Thank you for providing us with your comments on the DEIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,

A handwritten signature in black ink that reads "Scott Ezer". The signature is written in a cursive, flowing style.

Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

Ronald Sato

From: Yamasaki, Renee <ryamasaki@honolulu.gov>
Sent: Thursday, November 01, 2018 4:39 PM
To: Ronald Sato
Subject: DEIS for Hawaiian Memorial Park Cemetery Expansion Project (TP9/18-743544)
Attachments: DOC (134).PDF

Follow Up Flag: Follow up
Flag Status: Completed

Hi Mr. Sato,

My apologies for sending you our comments late. See attached copy. The original is being mailed to you today.

Thank you,

Renee R. Yamasaki
Regional Planning Branch, Planner
Dept. of Transportation Services | City & County of Honolulu
(808) 768-8383 | ryamasaki@honolulu.gov
www.honolulu.gov/dts

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This message has been scanned for viruses and dangerous content by [MailScanner](#), and is believed to be clean.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

850 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR



WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP9/18-743544R

October 23, 2018

Mr. Ronald A. Sato, AICP
Senior Associate
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Sato:

SUBJECT: Draft Environmental Impact Statement (DEIS) for Hawaiian Memorial Park Cemetery Expansion Project, Kaneohe, Oahu, Hawaii

This is in response to your notice dated September 8, 2018, requesting our review and comments on the subject project. We have the following comments:

1. Traffic Impact Analysis Report (TIAR):
 - a. Section 2.4.2.1 (page 7), first line, the word "approaches" is spelled incorrectly.
 - b. Table 4.2 (page 17), the weekday am total and the Saturday midday total does not add up correctly.
 - c. Figure 4.1 (page 19), the trip data on this page does not match the trip data on Table 4.2.
 - d. Figures 4.2 and 4.3 (pages 20 and 21), the traffic volumes do not correlate with the forecast base year traffic volumes plus trips generated by the project.

Mr. Ronald A. Sato, AICP
October 23, 2018
Page 2

2. Section 5.6 Transportation Facilities (page 5-18 to 5-39), the above corrections in the TIAR should also be corrected in the DEIS.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

A handwritten signature in black ink, appearing to read 'W Frysztacki', with a stylized flourish at the end.

Wes Frysztacki
Director

April 19, 2019



Mr. Wes Frysztacki, Director
Department of Transportation Services
City and County of Honolulu
650 S. King Street, 3rd Floor
Honolulu, Hawai'i 96813

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāneʻohe District, Oʻahu, Hawai'i

Dear Mr. Frysztacki:

Thank you for the letter providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that the letter was dated October 23, 2018, but the envelope was postmarked November 2, 2018. We also received an email from your office with an electronic pdf copy of the letter on November 1, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS under the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (italicized) are being provided and are included below.

- 1a. *Traffic Impact Analysis Report (TIAR): Section 2.4.2.1 (page 7), first line, the word "approaches" is spelled incorrectly.*
Response: The misspelled word in TIAR Section 2.4.2.1 has been corrected per your comment.
- 1b. *Traffic Impact Analysis Report (TIAR): Table 4.2 (page 17), the weekday am total and the Saturday midday total does not add up correctly.*
Response: Values for the weekday AM total and Saturday midday totals reflected in TIAR Table 4.2 have been corrected in a revised TIAR included in the Final EIS per your comment.
- 1c. *Traffic Impact Analysis Report (TIAR): Figure 4.1 (page 19), the trip data on this page does not match the trip data on Table 4.2.*
Response: Trip data shown in TIAR Figure 4.1 was revised to align with TIAR Table 4.2. Project-generated through traffic that should have been carried through from adjacent intersections is also shown in the revised TIAR Figure 4.1.
- 1d. *Traffic Impact Analysis Report (TIAR): Figures 4.2 and 4.3 (pages 20 and 21), the traffic volumes do not correlate with the forecast base year traffic volumes plus trips generated by the project.*
Response: Traffic volumes shown in TIAR Figures 4.2 and 4.3 were revised to match the anticipated number of vehicle trips generated by the project that are shown in the revised TIAR

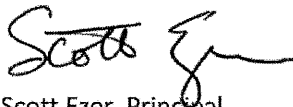
Table 4.2 included in the Final EIS. As a result, traffic volumes in these figures reflect forecasted base year traffic volumes plus trips generated by the project. The TIAR analysis was also revised to incorporate the exact number of vehicle trips that the project is expected to generate which are shown in Table 4.2 of the revised TIAR. Revisions to the analysis did not result in significant changes to LOS conditions at either of the study intersections.

2. *Traffic Impact Analysis Report (TIAR): Section 5.6 Transportation Facilities (page 5-18 to 5-39), the above corrections in the TIAR should also be corrected in the DEIS.*

Response: The Final EIS includes these revisions to align with related revisions to the revised TIAR.

Thank you for providing us with your comments on the DEIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,



Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

From: [James Makuakane](#)
To: [DBEDT LUC](#)
Cc: rsato@hhf.com
Subject: Regards to Hawaiian Memorial Project
Date: Thursday, October 25, 2018 5:28:04 PM

The Project is needed by the community for the future and is well managed and maintained.

Thank you.

James K. Makuakane
long time resident of Kaneohe 51 years



April 19, 2019

Mr. James K. Makuakane
jmakuakane@gmail.com

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāneʻohe District, Oʻahu, Hawaiʻi

Dear Mr. Makuakane:

Thank you for the email providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that your email was received on October 25, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your email will not be included in the Final EIS consistent with the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (italicized) are provided below. You may also obtain a copy of the Final EIS that is already available on the State Land Use Commission's website, and will be available at the State Office of Environmental Quality Control when published in their April 23rd issue of *The Environmental Notice*.

The Project is needed by the community for the future and is well managed and maintained.

Response: We acknowledge your comment that the project is needed by the community for the future, and that Hawaiian Memorial Park is well managed and maintained.

Thank you for providing us with your comments on the Draft EIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,

A handwritten signature in black ink that reads "Scott Ezer". The signature is fluid and cursive, with the first name "Scott" being larger and more prominent than the last name "Ezer".

Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

October 20, 2018

LAND USE COMMISSION
STATE OF HAWAII

HFF Planners
133 Bishop Street, Suite # 2590
Honolulu, HI 96817
Attention: Mr. Ronald Sato, Senior Planner

2018 OCT 24 A 9:02

State of Hawaii
Land Use Commission
Department of Business, Economic Development and Tourism
PO Box 2359
Honolulu, HI 96804
Attention: Mr. Scott Derrickson

I believe that different religions and individuals are entitled to choose how to memorialize their loved ones. However, land in Hawaii is precious and finite which makes it imperative to provide alternatives to burial interment. **What religions seek a criteria for interment and do not accept cremation or other options as an alternative?**

Is the traditional use of concrete vaults and caskets still the best way to memorialize our deceased?

As families struggle to make ends meet, what alternatives do you provide to offset overpriced burial options?

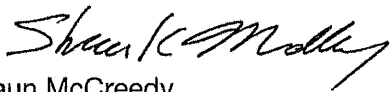
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Hawaiian Memorial Park should also consider utilizing their current plots more efficiently. Traditional cemeteries are not sustainable. Once the bodies are laid to rest, the land becomes inoperable for any other purpose. The environmental impact of traditional burials is startling and my generation is concerned about the land we will inherit. **Ironically, as populations continue to increase in the future, and land on Oahu is no longer available, where will HMP bury the dead?**

Sloane, D. (2018), *Is the Cemetery Dead?*, The University of Chicago Press, chronicles how Americans are adapting and reinventing old traditions, burial sites and memorials. People are controlling their grief by bringing relatives home to die, mourning them online, scattering their ashes or memorializing them with shrines, murals and ghost bikes. Different generations are breaking free of convention, to better embrace the people they want to remember. **How can HMP be more responsive to this new American attitude towards death?**

Natural, green forests are not only vital to our health and well being, but to the watersheds, streams, animals and insects that inhabit it. I strive to preserve conservation lands, forests, streams and receiving coastal ocean waters for my generation and generations to come. **As a result, I am against the Hawaiian Memorial Park Expansion.**

Thank you for your time and consideration,



Shaun McCreedy
45-423 Ohaha Street
Kaneohe, HI. 96744



April 19, 2019

Mr. Shaun McCreedy
45-423 Ohaha Street
Kāneʻohe, Hawaiʻi 96744

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāneʻohe, Oʻahu, Hawaiʻi

Dear Mr. McCreedy:

Thank you for the letter providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We did not receive your letter that you dated October 20, 2018 via email or hardcopy. The State Land Use Commission later provided us with a copy of your letter that shows it was received October 24, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS consistent with the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (italicized) are provided below. You may also obtain a copy of the Final EIS that is already available on the State Land Use Commission's website, and will be available at the State Office of Environmental Quality Control when published in their April 23rd issue of *The Environmental Notice*.

1. *I believe that different religions and individuals are entitled to choose how to memorialize their loved ones. However, land in Hawaii is precious and finite which makes it imperative to provide alternatives to burial interment. What religions seek a criteria for interment and do not accept cremation or other options as an alternative?*

Response: We concur that families should be entitled to choose how they would like to inter and memorialize loved ones. The project provides additional burial space that would provide these options. Section 2.1 of the Draft EIS discusses the need for the project, trends in disposition, and how the project would adequately meet this important community need. As indicated in the project market study, anticipated demand for in-ground casketed burials will continue to increase although cremation is expected to remain the dominant method of burial disposition. The choice of how to be interred is a personal family decision, and various factors can influence that decision, including religion and culture. However, religious beliefs related to this matter are not the subject of this project. The project simply provides burial options for families who decide to inter their members at Hawaiian Memorial Park.

2. *Is the traditional use of concrete vaults and caskets still the best way to memorialize our deceased?*

Response: How a family decides to memorialize their relatives is a personal family decision. Whether they decide to use caskets or cremation is their choice, The project is only intended to provide burial space to accommodate such needs.

3. *As families struggle to make ends meet, what alternatives do you provide to offset overpriced burial options?*

Response: The Petitioner does not view their pricing for interment options as being “overpriced” as they are priced relative to market conditions with other cemeteries. It is a family decision whether to inter a family member at Hawaiian Memorial Park or another cemetery. Therefore, alternatives to offset the costs for burial options are not required or necessary.

4. *Hawaiian Memorial Park should also consider utilizing their current plots more efficiently. Traditional cemeteries are not sustainable. Once the bodies are laid to rest, the land becomes inoperable for any other purpose. The environmental impact of traditional burials is startling and my generation is concerned about the land we will inherit. Ironically, as populations continue to increase in the future, and land on Oahu is no longer available, where will HMP bury the dead?*

Response: The Petitioner does utilize current plots efficiently, but is running out of space as discussed in Section 2.1 of the Draft EIS. That section discusses the purpose and need for the project in detail. We disagree with your comment that traditional cemeteries are not sustainable. Hawaiian Memorial Park is an example of a sustainable operation. Cemeteries provide for the long-term memorialization of family members. Burial plots within cemeteries are not intended to be used for other purposes, such as commercial or residential use. We disagree with your comment that the “environmental impact of traditional burials is startling” and you provide no basis or justification for such a statement. The Draft EIS documents the environmental impacts of the cemetery expansion. Impacts are minimized and mitigated through design and other measures. The Petitioner proposes to accommodate burial needs for families within the Petition Area, an important future need. How other cemeteries or landowners accommodate future burials outside of the Petition Area is subject to their decisions and actions.

5. *Sloane, D. (2018), Is the Cemetery Dead?, The University of Chicago Press, chronicles how Americans are adapting and reinventing old traditions, burial sites and memorials. People are controlling their grief by bringing relatives home to die, mourning them online, scattering their ashes or memorializing them with shrines, murals and ghost bikes. Different generations are breaking free of convention, to better embrace the people they want to remember. How can HMP be more responsive to this new American attitude towards death?*

Response: As discussed in a previous response, how a family decides how to memorialize their relatives is a personal decision. If they wish to inter and memorialize family members using an alternative method, that is their decision and the Petitioner is not required to accommodate those alternative methods. However, families that choose to memorialize and inter members within Hawaiian Memorial Park using available disposition would be available to be served by this project.

Mr. Shaun McCreedy

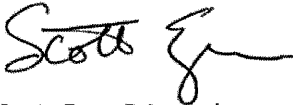
Page 3

6. *Natural, green forests are not only vital to our health and well being, but to the watersheds, streams, animals and insects that inhabit it. I strive to preserve conservation lands, forests, streams and receiving coastal ocean waters for my generation and generations to come. As a result, I am against the Hawaiian Memorial Park Expansion.*

Response: As discussed in pertinent sections of the Draft EIS, the project would not adversely impact the environment, such as botanical resources, fauna, invertebrates, water quality, streams, etc. We acknowledge your opposition to the project.

Thank you for providing us with your comments on the DEIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Ezer". The signature is fluid and cursive, with the first name "Scott" being more legible than the last name "Ezer".

Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

Support for Hawaiian Memorial Park

To: Land Use Commission

Subject: Support for Hawaiian Memorial Park Expansion

Date: October 23, 2018

I am in support of Hawaiian Memorial Park's expansion plan. Cemeteries are important to the community because it provides a place where family members can go to visit and remember their loved ones. Hawaiian Memorial Park is a good company and I have family members buried there. Having a place to honor and remember loved ones is important to my family. Please support the Hawaiian Memorial Park Project.

Mahalo,

Lehua Stevens
Kapolei, HI

HHF PLANNERS
places for people

April 19, 2019



Ms. Lehua Stevens
Via Email: lehualani077@yahoo.com

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāneʻohe District, Oʻahu, Hawaiʻi

Dear Ms. Stevens:

Thank you for the email providing a letter with comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that your email was received on October 24, 2018. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS consistent with the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (italicized) are provided below. You may also obtain a copy of the Final EIS that is already available on the State Land Use Commission's website, and will be available at the State Office of Environmental Quality Control when published in their April 23rd issue of *The Environmental Notice*.

I am in support of Hawaiian Memorial Park's expansion plan. Cemeteries are important to the community because it provides a place where family members can go to visit and remember their loved ones. Hawaiian Memorial Park is a good company and I have family members buried there. Having a place to honor and remember loved ones is important to my family. Please support the Hawaiian Memorial Park Project.

Response: We acknowledge your support for the proposed project. We agree that cemeteries are an important community resource by providing a space for visitation and remembrance for deceased relatives. We acknowledge you sharing your personal connection to Hawaiian Memorial Park and support of the cemetery.

Thank you for providing us with your comments on the DEIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

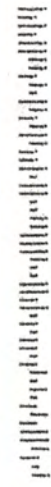
Sincerely,

A handwritten signature in black ink that reads "Scott Ezer". The signature is fluid and cursive, with the first name "Scott" being more prominent.

Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

From: O'ahu Gr
PO Box 2



HONOLULU P8DC 968
WED 24 OCT 2018

To: HHF Planners
Attn: Ron Sato
733 Bishop St., Suite 2590
Honolulu, Hawaii 96813





SIERRA CLUB OF HAWAI'I O'AHU GROUP

October 23, 2018

HHF Planners
Attn: Ron Sato
733 Bishop St., Suite 2590
Honolulu, Hawaii 96813

State of Hawaii
Land use Commission
Department of Business, Economic Development & Tourism
Attn: Scott Derrickson
PO Box 2359
Honolulu, Hawaii 96804

RE: Response to Draft Environmental Impact Statement for
Hawaiian Memorial Park Cemetery Expansion Project
Kaneohe District, Oahu, Hawaii, Tax Map Key: (1) 4-5-033: por. 001

Dear Land Use Commissioners and Administrators:

The O'ahu Group of the Sierra Club of Hawai'i is concerned that the proposed cemetery expansion at Hawaiian Memorial Park will adversely affect the survival of a population of endangered Blackline Hawaiian Damselflies that live in a mini-wetland on conservation land on the slopes of Oneawa Hills.



Figure 1: Blackline Hawaiian Damselfly -- Most common male morph recently discovered in Kāne'ohe

CONSERVATION STATUS

The Blackline Hawaiian Damselfly – *Megalagrion nigrohamatum nigrolineatum* -- was first described by RCL Perkins in 1899. It used to be widespread on O'ahu from sea level to the mountain tops, but their numbers crashed since the 1960's due to loss of habitat and invasive species. The damselflies were placed on the federal list of endangered species by Dan Polhemus in 2012. Today they are only found on O'ahu – at high elevations around 2,000 feet -- except for this newly found low elevation population in Kāne'ohe discovered by Liam Gray in 2016. See Exhibit A for an account of the discovery of the endangered damselflies and more close-up photos of the damselflies in Kāne'ohe.

PINAO IN HAWAIIAN CULTURE

Pinao is the Hawaiian word for dragonflies and damselflies. Pinao are specifically mentioned in the Kumulipo, the Hawaiian creation chant, on line 290 of the chant.

*Puka kana keiki he Pinao, lele
Out came its child a dragonfly, and flew*

Pinao was the name of the heiau where the Naha Stone – a huge heavy stone -- was located. It was prophesized that whoever overturned the Naha Stone would conquer all the islands. High ranking chiefs watched a young Kamehameha over turn the Naha Stone in 1775. There was a pillar at the entrance to the Pinao Heiau that was called the Pinao Stone. Both the Naha Stone and the Pinao Stone were moved to the Hilo Public Library in 1916 where they reside today.

Pinao is the name of a bay at Kalae – South Point – on Hawaii Island where a fishing village once stood. Both the bay and fishing village were named Pinao.

Pinapinao ānuenuē -- is in the Pukui/Elbert Hawaiian Dictionary -- © 2003 edition. Pinapinao ānuenuē is rainbow-eye damselfly (*Megalagrion nigrohamatum nigrolineatum*). Lit., rainbow damselfly.

DAMSELFIES IN POAMOHO STREAM

Since the damselfly population in Kāne'ohe is small – I never saw more than 8 individuals at a time, I ventured high into the Ko'olau Mountains see a more robust population of Blackline Hawaiian Damselflies at about 2,000 feet elevation. My goal was to get a better idea of the range colors and patterns the damselfly can assume.

I was pleased to find an actively breeding colony at Poamoho Stream. I was amazed to see that the thoraxes of Blackline Hawaiian Damselflies can assume a wide range of colors: red, orange, yellow, green, blue, and purple. Their eyes are colored independently from the body and can be bi-colored or tri-colored. The name pinapinao ānuenuē – rainbow eye damselfly – is a most appropriate name for these beautifully colored damselflies.



Figure 2: The most common male morph mates with a less common blue female morph at Poamoho Stream



Figure 3: The male has blue eyes in this pair and the female is green at Poamoho Stream



Figure 4: The male has tri-colored rainbow-eye while the female is purple at Poamoho Stream



Figure 5: The male's thorax is deep crimson while female' thorax is a yellow-orange at Poamoho Stream

DAMSELFLY HABITAT

The endangered Blackline Hawaiian Damselflies survive on the slopes of Oneawa Hills in Kāneʻohe because ground water seeps to the surface and creates a miniature wetland about 150 feet long by 15 feet wide. The damselflies lay their eggs in the water which hatch into nymphs and molt several times before becoming adults and completing their life cycle. Without this miniature wetland the population of damselflies would cease to exist.

The hydrological analysis indicates that the well at the head of the seep does not get its water from a deep underground aquifer. Instead the seep gets its water from the movement of shallow ground water that converge at the spot beneath the well from several directions.

WETLANDS DESIGNATION

According to the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA), *"Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

The 1987 Corps of Engineers Wetlands Delineation Manual and Regional Supplements defines criteria for determining whether an area is a wetland. Wetland hydrology, hydric soil, and hydrophytic vegetation indicators are used to determine whether an area is a wetland. Has the U.S. Army Corps of Engineers evaluated the damselfly habitat to determine whether the miniature wetland is a wetland as defined by the Corps and EPA?

GRADING

The proposed expansion involves grading the slopes of the Oneawa Hills on the western end of the site. Much of the western hillside would be excavated up to 40 feet in height and areas near the top of the hillside would be reduced up to 100 feet in height. The earth will be moved to fill low spots and to establish a consistent grade. A large volume of earth (57,287 cubic yards of soil and rocks) will be taken from high areas and moved into low areas and compacted to create the desired grade.

Since the seep is fed by the movement of shallow ground water, grading Oneawa Hills is likely to affect ground water supplies to the seep. Removing steep slopes and compacting the soil to build up low areas will undoubtedly affect the movement of shallow ground water when the slopes are redefined.

DEFORESTATION

The proposed expansion involves cutting down thousands of the trees on Oneawa Hills in the Kāwā Watershed. A significant part of the hillside will no longer be forested. Removal of trees will reduce the moisture transpired by the trees into the atmosphere which promotes cloud formation and rainfall.

Olelo Noeʻau
Traditional Hawaiian Proverb

Hahai no ka ua i ka ulu laʻau
The rain follows the forest

Hawaiians knew that forested slopes were crucial to attracting clouds and rain and memorialized that knowledge in a proverb.

Over the past 50 years rainfall on Oahu shows a declining trend. Deforestation of the trees on Oneawa Hills is likely to exacerbate this trend. It can be reasonably anticipated that reduced rainfall and decreased ground water supplies to the seep is a likely scenario when trees are cut down from the site.

RUN-OFF

The proposed expansion involves cutting down trees on the hillside and the planting lawn grass over about an 18-month period. A large volume of earth (57,287 cubic yards of soil and rocks) will be relocated in the process. Heavy rain during this period could send tons of mud and rocks flowing downslope to cover and destroy the damselfly habitat.

The mud and rocks would do further damage as they flowed into the Kāwā Stream and into Kāneʻohe Bay. Many coral reefs in Kaneohe Bay were killed in the 1950-60s when mud and silt from construction sites flowed into the bay and smothered the coral.

Even after the slope is established and grass grows on the lawn, muddy run-off would continue to threaten the site especially with extreme rain events happening at greater frequency and intensity. The 49 inches of rain of torrential rain on Kauai over a 24-hour period in April 2018 wasn't even a hurricane – just a big rain storm. Muddy run-off threatens to inundate, destroy or degrade the damselfly habitat. The retention ponds should be increased in size to accommodate more severe rainstorm.

RETAINING WALLS, RUN-OFF, and CANOPY

Figure 2.3 Preliminary Grading Cut and Fill Plan shows the location of three proposed retaining walls. The lowest of the three walls "Proposed Wall A" appears to be just 10-20 feet away from the miniature wetland.

The walls are crucial to holding back soil relocated from grading the hill side. With "Proposed Wall A" being just 10-20 feet away there is zero margin of error to avert disaster should the system fail under extreme rainfall conditions and/or when plans go awry. With freak rain events becoming increasingly prevalent, it is reasonably foreseeable that a larger buffer is needed to preserve the miniature wetland.

The damselfly habitat is dark – many trees -- schefflera, strawberry guava, java plum and other introduced trees -- provide shade over the seep which keeps light levels low, prevents evaporation, and keeps humidity levels high. Under the existing plan "Proposed Wall A" is just 10-20 feet away with no tree canopy over that part of the habitat. There needs to be a canopy of trees for at least 100 feet (but preferably more) to maintain the low-light and high-humidity conditions at the miniature wetland.

GROUND WATER CONTAMINATION

The proposed expansion calls for conservation land in the Kāwā Watershed to be zoned urban so the land can be used as a cemetery. Cemeteries adversely affect ground water.

Modern human burials introduce formaldehyde and other toxic elements and chemicals into the environment. Mercury in dental fillings, pacemakers, esophageal tubes, and other medical products, can leach into groundwater as they decay. Unlike formaldehyde which breaks down more readily, mercury is stable and persists in the environment for long periods of time.

Toxic chemicals from coffins are also released into the groundwater including varnishes, sealers and preservatives and metal handles and ornaments used on wooden coffins. Many paints still contain lead, mercury, cadmium, and chromium. Arsenic is sometimes used as a pigment, a wood preservative and anti-fouling agent. Barium is sometimes used as a pigment and corrosion inhibitor.

All of these toxic chemicals, including pesticides, fertilizers, and weed killers used to maintain the lawn and shrubbery, soak into the earth and contaminate the ground water. Some of these compounds are toxic and known carcinogens to humans and wildlife.

Since shallow ground water emerges at the miniature wetland, it is foreseeable that toxic chemicals from the burial of humans will appear in the damselfly habitat. Additionally, there are 19 permits for wells in the area with a total permitted use of 10.312 mgd some of which are possibly used for drinking water by the community. The accumulation of tens of thousands of bodies and caskets has the potential to contaminate ground water resources for those who tap the Ko'olaupoko aquifer.

ADDITIONAL MEASURES TO MITIGATE ADVERSE AFFECTS

The Sierra Club commends Hawaiian Memorial Park for adjusting the original expansion plan to accommodate the damselfly habitat. The footprint of the expansion has been moved back to avoid grading the miniature wetland. However, the Sierra Club sees additional measures that could be implemented to enhance the ability of the damselflies to survive.

The damselflies chances for survival will be greatly improved if the landowner could install a long hose to artificially supply the habitat with clean water should something happen to disrupt the water flow or if the ground water became contaminated. A long hose is relatively inexpensive and can be deployed in under half a day to provide water. This would provide additional security to the habitat that water will always flow in the miniature wetland.

We do not completely understand or appreciate all the factors that resulted in the survival of this remnant population of endangered damselflies at this spot. In order to give the best chances for survival the goal should be to alter the habitat as little as possible. A canopy of trees shades the wetland, reduces evaporation, and keeps humidity levels high. Their chances for survival will be enhanced if the landowner left the canopy of trees intact over the wetland and for at least another 100 feet beyond the habitat before the trees are cut down.

A habitat management plan should be developed to address all the items and tasks that must be in place or performed to ensure the critical habitat for the damselflies remains intact over the long haul.

There is increasing consciousness about green burials -- ways of caring for the dead that lessen the environmental impact, reduce impact on water quality, and reduce carbon emissions. Green burials involve the use of non-toxic and biodegradable materials, for caskets, shrouds, and urns, and the use of fungi to breakdown toxic chemicals in the human body before releasing them into the environment. It would be ideal if green burials could be offered to reduce adverse impacts to water quality. Green burials are still in its infancy and the Sierra Club would like to see Hawaiian Memorial Park become a pioneer and leader in promoting green burials to the public.

CLOSING

The Sierra Club places high priority on the survival of this population of Blackline Hawaiian Damselflies into the future. Pinapinao ānuenu -- rainbow-eye damselflies -- are beautiful insects that come in a spectacular array of colors and patterns. These damselflies are unique to the natural and cultural history of the Hawaiian Islands and are found only on O'ahu. These damselflies are biological treasures that deserve to be preserved for future generations. Please consider these special creatures as you decide this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Nathan Yuen". The signature is written in a cursive, flowing style.

Nathan Yuen
Conservation Chair
Sierra Club of Hawaii

EXHIBIT A

Discovery of
Blackline Hawaiian Damselflies
in Kaneohe

January 22, 2018

Nathan Yuen
91-233 Hanapouli Cir #29T
Ewa Beach, Hawaii 96706
Email: 808nateyuen@gmail.com

HHF Planners
733 Bishop Street #2590
Honolulu, HI 96813

Ronald A. Sato, AICP, Senior Associate
email: rsato@hhf.com
457-3172

With a copy to:

Mr. Scott Derrickson
State of Hawaii
Land Use Commission
Department of Business, Economic Development and Tourism
PO Box 2359
Honolulu, HI 96804

Project: Docket Number: A17-804
Hawaiian Memorial Park Cemetery Project
Kane'ohe District, O'ahu, Hawaii
(1) 4-5-033: por.001 (Private Property)

Dear Sir or Madam:

I am responding to the Environmental Impact Statement Preparation Notice by Hawaiian Memorial Park.

I work as an accountant for an engineering consulting firm during the week but on the weekends I become an amateur naturalist, hiker, and photographer. For the past 20 years I have been venturing to remote parts of our islands to photograph the native plants and animals of the Hawaiian Islands many of which are rare or endangered. I have a blog – HawaiianForest.Com – which documents some of the rarest species on the planet.

I served as a commissioner for the State of Hawaii's Natural Area Reserves System (NARS) Commission administered by the Department of Land and Natural Resources from 2013 to 2017. I currently serve as Conservation Chair for the Sierra Club of Hawaii Executive Committee. I am also a member of the Hawaiian Entomological Society.

In this matter, I am acting on my personal behalf as a private citizen. I was involved in the initial discovery and confirmation of the population of Blackline Hawaiian Damselflies — *Megalagrion nigrohamatum nigrolineatum* – on conservation land owned by Hawaiian Memorial Park.

My friend Patrick Shea was a candidate for State House of Representatives District 49 in the 2016 election. In June 2016, Patrick met Liam Gray while canvassing the homes on Ohaha Street. Liam told Patrick that he discovered a previously unknown population of endangered Blackline Hawaiian Damselflies in the backyard of Ernest and Bettye Harris on Ohaha Place who live adjacent to the land owned by Hawaiian Memorial Park. Patrick asked whether I could confirm the find and made arrangements for Liam to take us to the site.

On June 26, 2016, Liam Gray took me and several windward residents – Patrick Shea, Grant Yoshimori, Caitlyn Yoshimori, Rich McCreedy, and Julie McCreedy – to see the endangered damselflies. I was surprised to see these damselflies in Kāneʻohe. I had previously only seen this species of damselflies in native forests and streams above 2,000 feet elevation in the Koʻolau Mountain. I did not expect to see them at this low elevation in Kāneʻohe under alien trees – schefflera, albezia, strawberry guava, and other non-native vegetation.

The Pukui/ Elbert Hawaiian dictionary has an intriguing entry for this damselfly — pinapinao ānuenuē — the rainbow-eye damselfly.



This is the most common morph for males — it has big round eyes that are red, green, and yellow, a orange-yellow-black thorax, and a segmented abdomen with a red tip.

I have taken many photos of these damselflies at the low elevation site in Kāneʻohe. There are multiple morphs (color patterns) for both male and female damselflies. One of the morphs has a

three colored-eye. The name pinapinao ānuenuē — the rainbow-eye damselfly – is appropriate for this colorful insect.

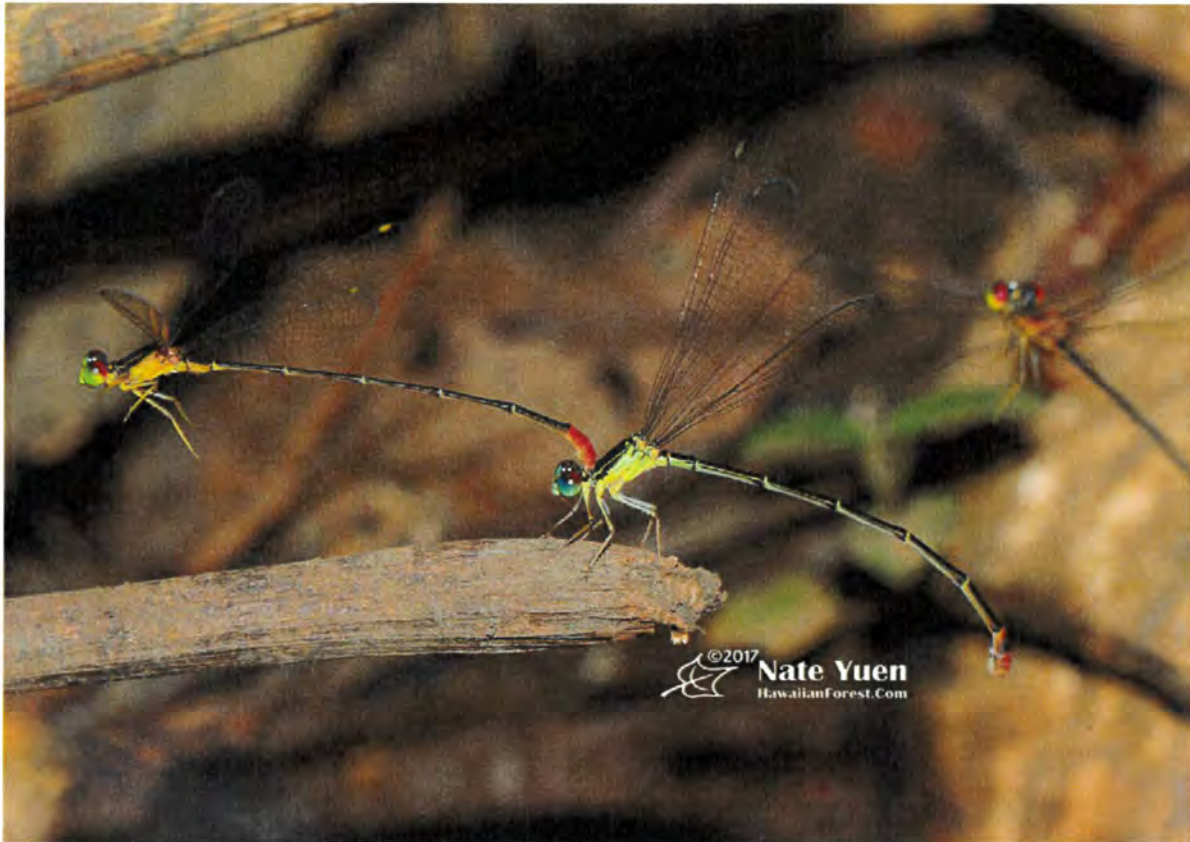


This is the most common female morph – the eyes are red on top and blue on the bottom.

I contacted Hawaiian damselfly expert Dan Polhemus at the US Fish & Wildlife Service and brought him to the site. He did the research to get this and several other damselfly species listed as endangered species. Dan Polhemus confirmed that this was a previously unknown population of Blackline Hawaiian Damselflies — *Megalagrion nigrohamatum nigrolineatum*. Dan was also surprised to see these damselflies at this low elevation. He said that this species is endemic only to O‘ahu and once inhabited the streams and wetlands throughout the island at all elevations. But they are rare today with less than 1,000 estimated to remain.

Blackline Hawaiian Damselflies are on the federal list of endangered species. Loss of habitat and predation by invasive species are the biggest reasons for their decline. Today they are found at high elevations in the Ko‘olau Mountains except for this population in Kāne‘ohe. For some reason this population managed to survive at low elevation.

This population of damselflies exists because of a seep – a small fresh water spring – that trickles down a shallow ravine and creates a miniature wetland where they breed. This habitat is crucial to the survival of this remnant population of low-elevation rainbow-eye damselflies. If the habitat is destroyed or otherwise adversely affected, this population of damselflies will likely cease to exist.



A rival male darts in to interrupt a pair of mating rainbow-eye damselflies.

The proposed cemetery expansion is likely to adversely affect this population of damselflies. It is my understanding that Hawaiian Memorial Park is required to develop a habitat conservation plan to protect these endangered insects. The plan would need to address several issues important to the continuation of this unique population of damselflies.

Of greatest concern is that the proposed cemetery expansion could disrupt the ground water hydrology of the area and cause the seep to stop flowing. The damselfly population cannot survive without water flowing in their habitat.

Another big concern is run-off from the construction or operation of the expanded cemetery could destroy the habitat or introduce fertilizers/pesticides that harm the damselflies. Also studies have shown that the decomposition of human bodies could introduce arsenic and other toxins into the ground water adversely affecting water quality in the seep.

It is also important to establish a sufficient buffer between the expanded cemetery and the damselfly habitat so they continue to exist and breed at the seep without disruption and interference by humans.



After the female is fertilized the pair fly to water where she curls her abdomen and lays eggs in the seep.

The discovery of this previously unknown population of low elevation Blackline Hawaiian Damselflies in Kāneʻohe is a remarkable and significant find. Rainbow damselflies are an endangered species found only on Oʻahu and are unique to the natural history and heritage of Kāneʻohe. The low elevation habitat for these damselflies needs to be protected to ensure their survival into the future.

Thank you for this opportunity to protect these damselflies. I would appreciate being places on your distribution list so I can participate in this proceeding though the various stages of the process.

Sincerely,

Nathan Yuen

EXHIBIT B

Sources

EXHIBIT B SOURCES

Kumulipo A Hawaiian Creation Chant

Edited and translated by Martha Warren Beckwith (University of Chicago Press, 1951)

Interlinearization by David Stampe

<http://www.kauainenehpc.com/uploads/8/1/8/0/81802884/kumulipo-text.pdf>

The Story of the Naha Stone

HokuLoa Blog, Posted on December 13, 2015

<https://nupepa-hawaii.com/2015/12/13/on-the-moving-of-the-na-ha-stone-to-hilo-library-100-years-ago-and-its-history-5-of-6-1915/#more-20162>

Naha Stone is Moved

<http://ulukau.org/elib/collect/elibrary/index/assoc/D0.dir/doc112.pdf>

Pinao Bay and Fishing Village at Kalae, South Point, Hawaii Island

South Point Resources Management

https://dhhl.hawaii.gov/wp-content/uploads/2015/07/South-Point-Pre-Final-Plan_092916_w-cover-app_low-res.pdf

Rainfall Changes in Hawai During the Last Century

Henry F. Diaz¹, Pao-Shin Chu, and Jon K. Eischeid¹

Climate Diagnostics Center, NOAA, Boulder, CO

Department of Meteorology, University of Hawaii at Manoa, Honolulu, HI

<https://ams.confex.com/ams/pdfpapers/84210.pdf>

Changes in Precipitation Extremes in the Hawaiian Islands in a Warming Climate

Pao-Shin Chu, Ying Ruan Chen, and Thoas A. Schroeder

Department of Meteorology, School of Ocean and Earth Science and Technology, University of Hawaii at Manoa, Honolulu, Hawai

<http://www.soest.hawaii.edu/MET/Hsco/Paper/2010JCLI3484.pdf>

Is a Green Burial Right for You?

By Chris Raymond, VeryWellHealth

<https://www.verywellhealth.com/what-is-a-green-burial-1131911>

What is Green Burial?

Green Burial Council

<https://greenburialcouncil.org/home/what-is-green-burial/>



April 19, 2019

Mr. Nathan Yuen, Conservation Chair
O'ahu Group
Sierra Club of Hawai'i
P.O. Box 2577
Honolulu, Hawai'i 96803

SUBJECT: Hawaiian Memorial Park Cemetery Expansion Project
Draft Environmental Impact Statement (DEIS)
TMK: (1) 4-5-033: por. 001 (Private Property)
Kāne'ohe, O'ahu, Hawai'i

Dear Mr. Yuen:

Thank you for the letter providing comments on the Draft Environmental Impact Statement (Draft EIS) for the subject project. We note that the letter was dated October 23, 2018, but the envelope mailed was postmarked October 24, 2018. We also received your email sent on October 24, 2018 that included an electronic copy of your letter. Unfortunately, the 45-day Draft EIS comment period concluded on October 23, 2018. As a result, your letter will not be included in the Final EIS consistent with the State's environmental review regulations, Title 11, Chapter 200, HAR. However, responses to your comments (italicized) are provided below. You may also obtain a copy of the Final EIS that is already available on the State Land Use Commission's website, and will be available at the State Office of Environmental Quality Control when published in their April 23rd issue of *The Environmental Notice*.

Conservation Status

1. *The O'ahu Group of the Sierra Club of Hawai'i is concerned that the proposed cemetery expansion at Hawaiian Memorial Park will adversely affect the survival of a population of endangered Blackline Hawaiian Damselflies that live in a mini-wetland on conservation land on the slopes of Oneawa Hills.*

Response: The Petitioner is also sensitive to and has taken steps to avoid and minimize project effects on the seep that is has the endangered Blackline Hawaiian Damselfly. The studies and analysis conducted and documented in the Draft and Final EIS reflect such actions, and demonstrate that the project would not have a significant impact on this species. It should be clarified that the seep is not a wetland as considered and analyzed under the U.S. Department of Army's wetland criteria.

2. *The Blackline Hawaiian Damselfly – *Megalagrion nigrohamatum nigrolineatum* -- was first described by RCL Perkins in 1899. It used to be widespread on O'ahu from sea level to the mountain tops, but their numbers crashed since the 1960's due to loss of habitat and invasive species. The damselflies were placed on the federal list of endangered species by Dan Polhemus in 2012. Today they are only found on O'ahu – at high elevations around 2,000 feet -- except for this*

newly found low elevation population in Kāne'ōhe discovered by Liam Gray in 2016. See Exhibit A for an account of the discovery of the endangered damselflies and more close-up photos of the damselflies in Kāne'ōhe.

Response: We acknowledge your comments providing background information of the endangered damselfly. Section 3.5 of the Final EIS discusses this species in considerable detail. It should be noted that the HMP property is privately-owned, and trespassing is not permitted. Your reference to Exhibit A attached to your letter is a copy of your January 22, 2108 comment letter on the EIS Preparation Notice for this project. Our August 22, 2018 response letter to that Exhibit A comment letter noted your discussion documenting that nearby residents trespassed onto the Petitioner's property. That response letter further stated that it appears those residents took you onto the Petitioner's property, without prior landowner authorization and notification, to view these damselflies.

Pinao In Hawaiian Culture

*Pinao is the Hawaiian word for dragonflies and damselflies. Pinao are specifically mentioned in the Kumulipo, the Hawaiian creation chant, on line 290 of the chant. Pinao was the name of the heiau where the Naha Stone – a huge heavy stone -- was located. It was prophesized that whoever overturned the Naha Stone would conquer all the islands. High ranking chiefs watched a young Kamehameha over turn the Naha Stone in 1775. There was a pillar at the entrance to the Pinao Heiau that was called the Pinao Stone. Both the Naha Stone and the Pinao Stone were moved to the Hilo Public Library in 1916 where they reside today. Pinao is the name of a bay at Kalae – South Point – on Hawaii Island where a fishing village once stood. Both the bay and fishing village were named Pinao. Pinapinao ānuenuē -- is in the Pukui/Elbert Hawaiian Dictionary -- © 2003 edition. Pinapinao ānuenuē is rainbow-eye damselfly (*Megalagrion nigrohamatum nigrolineatum*). Lit., rainbow damselfly.*

Response: We acknowledge your comments providing background information of the endangered damselfly in relation to Hawaiian culture.

Damselflies in Poamoho Stream

Since the damselfly population in Kāne'ōhe is small – I never saw more than 8 individuals at a time, I ventured high into the Ko'olau Mountains see a more robust population of Blackline Hawaiian Damselflies at about 2,000 feet elevation. My goal was to get a better idea of the range colors and patterns the damselfly can assume. I was pleased to find an actively breeding colony at Poamoho Stream. I was amazed to see that the thoraxes of Blackline Hawaiian Damselflies can assume a wide range of colors: red, orange, yellow, green, blue, and purple. Their eyes are colored independently from the body and can be bi-colored or tri-colored. The name pinapinao ānuenuē – rainbow eye damselfly – is a most appropriate name for these beautifully colored damselflies.

Response: We acknowledge your comments providing background information of the endangered damselfly in relation to Poamoho Stream located on the north shore of O'ahu.

Damselfly Habitat

1. *The endangered Blackline Hawaiian Damselflies survive on the slopes of Oneawa Hills in Kāne'ohe because ground water seeps to the surface and creates a miniature wetland about 150 feet long by 15 feet wide. The damselflies lay their eggs in the water which hatch into nymphs and molt several times before becoming adults and completing their life cycle. Without this miniature wetland the population of damselflies would cease to exist.*

Response: The seep does not meet the criteria for a wetland based upon an assessment using the U.S. Department of Army, Corps of Engineers (COE) wetland delineation manual. The Final EIS includes information describing the characteristics of the seep in Sections 3.5 (Invertebrate Resources) and 3.7 (Surface Waters). It should be clarified that this seep channel varies between 3 and 16 feet wide, and is not consistently 15 feet wide. These sections also document that water flow from this seep supports the damselflies.

2. *The hydrological analysis indicates that the well at the head of the seep does not get its water from a deep underground aquifer. Instead the seep gets its water from the movement of shallow ground water that converge at the spot beneath the well from several directions.*

Response: Section 3.6 of the Draft EIS included information describing the characteristics of the subsurface water flow feeding the well and seep, and the Final EIS includes more information.

Wetlands Designation

According to the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA), "Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The 1987 Corps of Engineers Wetlands Delineation Manual and Regional Supplements defines criteria for determining whether an area is a wetland. Wetland hydrology, hydric soil, and hydrophytic vegetation indicators are used to determine whether an area is a wetland. Has the U.S. Army Corps of Engineers evaluated the damselfly habitat to determine whether the miniature wetland is a wetland as defined by the Corps and EPA?

Response: The seep does not meet the criteria for a wetland based upon an assessment by AECOS, Inc. using the COE's wetland delineation manual. The Final EIS includes a copy of AECOS's report in Appendix O. Coordination with the COE has been initiated in the process of obtaining a more formal jurisdictional determination as part of the project's design phase. No filling is proposed within this seep, therefore, a U.S. Department of Army permit would not be triggered.

Grading

The proposed expansion involves grading the slopes of the Oneawa Hills on the western end of the site. Much of the western hillside would be excavated up to 40 feet in height and areas near the top of the hillside would be reduced up to 100 feet in height. The earth will be moved to fill low spots and to establish a consistent grade. A large volume of earth (57,287 cubic yards of soil and rocks) will be taken from high areas and moved into low areas and compacted to create the desired grade. Since the seep is

fed by the movement of shallow ground water, grading Oneawa Hills is likely to affect ground water supplies to the seep. Removing steep slopes and compacting the soil to build up low areas will undoubtedly affect the movement of shallow ground water when the slopes are redefined.

Response: The Draft EIS documents the potential effect of compaction of soils above the well and seep from grading activities, and includes measures to avoid the seep and minimize impacting the seep and water flow. The Draft EIS documented fieldwork and studies conducted by subject experts that addressed the feasibility and practicability of measures proposed. The Final EIS includes additional information addressing this issue, and identifies measures to ensure the long-term continuation of water flow to the seep based upon recommendations by these experts.

A subsurface drainage system designed in a herringbone pattern would be installed in the fill area above the well and seep. This system would capture more subsurface water to ensure water flow to the well and seep is maintained given the possibility of subsurface water flow impedence from the weight of fill deposited upslope from these features. The system would be comprised of three subsurface drainage mainlines with smaller subdrains branching laterally from the mainlines. In addition, a monitoring gauge or other appropriate device would be installed inside the well located upslope from the seep to monitor water levels prior to, during, and after project construction. Once project earthmoving activities conclude, a permanent irrigation line extending from the proposed cemetery expansion irrigation system to the well would be installed. This irrigation line would serve as a long-term means of ensuring continued water flows at the seep if the natural flow significantly decreases, which is not expected to occur. If the gauge indicates water levels have declined to levels potentially affecting the seep, water from the irrigation line to the well would be provided to stabilize water levels. During construction, a temporary irrigation line would also be extended to the well to support water levels, if necessary.

Deforestation

The proposed expansion involves cutting down thousands of the trees on Oneawa Hills in the Kāwā Watershed. A significant part of the hillside will no longer be forested. Removal of trees will reduce the moisture transpired by the trees into the atmosphere which promotes cloud formation and rainfall. Hawaiians knew that forested slopes were crucial to attracting clouds and rain and memorialized that knowledge in a proverb. Over the past 50 years rainfall on Oahu shows a declining trend. Deforestation of the trees on Oneawa Hills is likely to exacerbate this trend. It can be reasonably anticipated that reduced rainfall and decreased ground water supplies to the seep is a likely scenario when trees are cut down from the site.

Response: Section 3.3 (Botanical Resources) of the Draft EIS addresses the botanical resources associated with the Petition Area based upon a survey conducted. That study determined the majority of the Petition Area is characterized as being a Lowland Alien Wet Forest dominated by introduced plant species. The area has been disturbed historically, being previously used for pineapple cultivation and dairy farming activities. Alteration of native plant habitat has been in place for some time with few native plant species remaining. The project would significantly alter the present botanical characteristics of the area proposed for the cemetery's expansion because this site would undergo extensive grading activities as discussed in Section 3.3.2. Project effects associated with climate change were also addressed in Section 3.2.5 of the Draft EIS. Increased risk of adverse impacts from climate change is not expected under the Proposed Action. Changing

the botanical characteristic of the Petition Area is unlikely to cause a noticeable change in the area's rainfall, which may be more appropriately attributable to larger global climate change issues. Such minor changes to this area would have no noticeable effect on cooling the atmosphere or encouraging more rain. Grading improvements would reduce storm water runoff volumes, velocity, erosion, and increase stormwater infiltration, detention, and therefore improve water resources and water quality within the surrounding area. Such effects and benefits are discussed in pertinent sections of Chapter 3 (e.g. 3.8 Water Quality) and Section 5.3 (Drainage Facilities).

Runoff

1. *The proposed expansion involves cutting down trees on the hillside and the planting lawn grass over about an 18-month period. A large volume of earth (57,287 cubic yards of soil and rocks) will be relocated in the process. Heavy rain during this period could send tons of mud and rocks flowing downslope to cover and destroy the damselfly habitat. The mud and rocks would do further damage as they flowed into the Kāwā Stream and into Kāne'ōhe Bay. Many coral reefs in Kaneohe Bay were killed in the 1950-60s when mud and silt from construction sites flowed into the bay and smothered the coral.*

Response: Section 2.2.2 of the DEIS discusses the project's preliminary design and identifies several measures and best management practices (BMPs) that would be implemented to minimize impacts from short-term construction activities. This includes measures before construction commences, during construction activities, and during adverse weather conditions. Sediment basins would be used during construction to collect and detain runoff, allowing suspended soil to settle, and further minimize impacts from storm water runoff. Design measures and BMPs developed during the project design phase would be reviewed by jurisdictional agencies for approval, further ensuring appropriate measures are implemented.

The area surrounding the seep defines a drainage basin. A City drainage culvert located at the end of the Petition Area serves the larger drainage system. During periods of heavy rainfall, this drainage basin is flushed with storm water runoff, debris, and considerable sediment as discussed in Section 3.8 of the Draft EIS. However, such events repeatedly occurring over several years have not destroyed the damselfly habitat. Grading improvements would actually reduce storm water runoff volumes, velocity, erosion, and debris discharged within this area and the larger Petition Area, representing an improvement over current conditions. In the 1950s and 1960s, there were far less regulatory requirements for construction projects than under today's regulatory environment. Advanced techniques have considerably improved the type of materials and designs implemented as part of BMPs to address storm water runoff.

2. *Even after the slope is established and grass grows on the lawn, muddy run-off would continue to threaten the site especially with extreme rain events happening at greater frequency and intensity. The 49 inches of rain of torrential rain on Kauai over a 24-hour period in April 2018 wasn't even a hurricane –just a big rain storm. Muddy run-off threatens to inundate, destroy or degrade the damselfly habitat. The retention ponds should be increased in size to accommodate more severe rainstorm.*

Response: As already discussed in prior responses, proposed grading improvements would reduce storm water runoff volumes, velocity, erosion, and debris discharged within this area and the larger Petition Area, representing an improvement over current conditions. Sediment basins would be used during construction to collect and detain runoff, allowing suspended soil to settle, and further minimize impacts from storm water runoff. During periods of heavy rainfall, this basin area is flushed with storm water runoff, debris, and considerable sediment as discussed in Section 3.8 of the Draft EIS that have not destroyed the damselfly habitat. The detention basins are being designed for a 100-year storm that is beyond what would be required under City regulations. Therefore, these basins are appropriately designed and do not need to be increased in size.

Retaining Walls, Runoff, and Canopy

Figure 2.3 Preliminary Grading Cut and Fill Plan shows the location of three proposed retaining walls. The lowest of the three walls "Proposed Wall A" appears to be just 10-20 feet away from the miniature wetland. The walls are crucial to holding back soil relocated from grading the hill side. With "Proposed Wall A" being just 10-20 feet away there is zero margin of error to avert disaster should the system fail under extreme rainfall conditions and/or when plans go awry. With freak rain events becoming increasingly prevalent, it is reasonably foreseeable that a larger buffer is needed to preserve the miniature wetland.

Response: On Figure 2.3, the area you refer to being shown close to Wall A is not the location of the well and where the seep begins, but of an area around the seep that has about a 30+-foot buffer. Thus, the wall would likely be over 50 feet away from the seep when actually designed. As already noted, this seep is not a wetland. The retaining walls and grading plans would be properly designed, and are not expected to fail due to heavy rain events. Furthermore, these structures would be properly inspected and maintained because HMP has existing maintenance staff working around the property. Consequently, a larger buffer area from the well and seep is not necessary nor warranted based upon the technical studies and analysis documented in the Draft and Final EIS documents.

- 2. The damselfly habitat is dark – many trees -- schefflera, strawberry guava, java plum and other introduced trees -- provide shade over the seep which keeps light levels low, prevents evaporation, and keeps humidity levels high. Under the existing plan "Proposed Wall A" is just 10-20 feet away with no tree canopy over that part of the habitat. There needs to be a canopy of trees for at least 100 feet (but preferably more) to maintain the low-light and high-humidity conditions at the miniature wetland.*

Response: The area around the seep would be preserved and maintained as discussed in Section 3.5 of the Draft EIS, retaining the shade and cover provided by existing vegetation. There is also a larger buffer area between residences along the Petition Area and the cemetery expansion area that allows for such conditions to be retained. Section 3.5 includes extensive discussion of the damselfly based upon a study conducted by Dr. Steven Montgomery who is an expert in his field. There is no requirement for low-light and high-humidity conditions to support the damselfly. Threats to this species consist of predation by alien fish, toads, other insects, and destruction of their seep habitat by feral pigs rooting activities. Thus, there is no requirement, need, or justification for your suggestion of having at least 100 feet of canopy trees from the seep.

Ground Water Contamination

The proposed expansion calls for conservation land in the Kāwā Watershed to be zoned urban so the land can be used as a cemetery. Cemeteries adversely affect ground water. Modern human burials introduce formaldehyde and other toxic elements and chemicals into the environment. Mercury in dental fillings, pacemakers, esophageal tubes, and other medical products, can leach into groundwater as they decay. Unlike formaldehyde which breaks down more readily, mercury is stable and persists in the environment for long periods of time.

Toxic chemicals from coffins are also released into the groundwater including varnishes, sealers and preservatives and metal handles and ornaments used on wooden coffins. Many paints still contain lead, mercury, cadmium, and chromium. Arsenic is sometimes used as a pigment, a wood preservative and anti-fouling agent. Barium is sometimes used as a pigment and corrosion inhibitor. All of these toxic chemicals, including pesticides, fertilizers, and weed killers used to maintain the lawn and shrubbery, soak into the earth and contaminate the ground water. Some of these compounds are toxic and known carcinogens to humans and wildlife.

Since shallow ground water emerges at the miniature wetland, it is foreseeable that toxic chemicals from the burial of humans will appear in the damselfly habitat. Additionally, there are 19 permits for wells in the area with a total permitted use of 10.312 mgd some of which are possibly used for drinking water by the community. The accumulation of tens of thousands of bodies and caskets has the potential to contaminate ground water resources for those who tap the Ko'olaupoko aquifer.

Response: Section 3.8 (Water Quality) of the Draft EIS discussed the results of a water quality study conducted for the project that included sampling and testing of several areas for various contaminants. Those results showed no issues in groundwater quality from human burials, including formaldehyde, and the project would not negatively impact water quality. Section 3.6 (Groundwater Resources) addressed the existing groundwater conditions within the Petition Area and surrounding vicinity. The entire Petition Area overlies caldera-filling volcanics that are virtually impermeable. As such, grading improvements and cemetery use of the area do not have the potential to impact ongoing or possible future uses of groundwater drawn from the permeable Ko'olau volcanics of the Ko'olaupoko Aquifer System.

Section 2.2 also discussed the burial process occurring and how casketed remains are placed in a concrete outer burial container that address your concerns with human burials. Furthermore, Section 2.1 discussed that the trend toward cremation in Hawai'i and how future burials are projected to predominantly consist of cremations as opposed to human casketed burials. This would significantly further reduce potential concerns with human casketed burials.

Additional Measures to Mitigate Adverse Affects

1. *The Sierra Club commends Hawaiian Memorial Park for adjusting the original expansion plan to accommodate the damselfly habitat. The footprint of the expansion has been moved back to avoid grading the miniature wetland. However, the Sierra Club sees additional measures that could be implemented to enhance the ability of the damselflies to survive. The damselflies chances for survival will be greatly improved if the landowner could install a long hose to artificially supply the habitat with clean water should something happen to disrupt the water flow or if the ground water became contaminated. A long hose is relatively inexpensive and can be deployed in under*

half a day to provide water. This would provide additional security to the habitat that water will always flow in the miniature wetland.

Response: We acknowledge your comments regarding the Petitioner's efforts to redesign the project's previous plans. Several measures have been incorporated into proposed plans to preserve and protect the seep, which provides habitat for the damselfly. This includes installing a permanent irrigation line to serve as a long-term means of ensuring continued water flows at the seep if the natural flow significantly decreases, which is not expected to occur. The water gauge installed within the well would monitor water levels. These measures support your suggestion.

- We do not completely understand or appreciate all the factors that resulted in the survival of this remnant population of endangered damselflies at this spot. In order to give the best chances for survival the goal should be to alter the habitat as little as possible. A canopy of trees shades the wetland, reduces evaporation, and keeps humidity levels high. Their chances for survival will be enhanced if the landowner left the canopy of trees intact over the wetland and for at least another 100 feet beyond the habitat before the trees are cut down.*

Response: Based upon our prior responses, the damselfly habitat would not be altered and impacted. Several design measures have been proposed to ensure water continues to flow to the seep. Other design and minimization measures discussed in the Draft EIS address efforts to preserve and protect this habitat, which includes avoiding this area that would retain the existing vegetation canopy. However, there is no basis or justification for a 100-foot vegetation buffer of trees.

- A habitat management plan should be developed to address all the items and tasks that must be in place or performed to ensure the critical habitat for the damselflies remains intact over the long haul.*

Response: A Preservation Plan would be developed for historic sites that includes this seep area, which can include measures supporting its management. Otherwise, the proposed project includes several measures to avoid the seep and minimize project effects on it. This Preservation Plan would be evaluated in relation to the Cultural Preserve being established and managed by the Ko'olaupoko Hawaiian Civic Club in the context of the entire project. Because this area is designated as a historic site, the area's management and conservation may more appropriately fall under the management and preservation by the civic club.

- There is increasing consciousness about green burials -- ways of caring for the dead that lessen the environmental impact, reduce impact on water quality, and reduce carbon emissions. Green burials involve the use of non-toxic and biodegradable materials, for caskets, shrouds, and urns, and the use of fungi to breakdown toxic chemicals in the human body before releasing them into the environment. It would be ideal if green burials could be offered to reduce adverse impacts to water quality. Green burials are still in its infancy and the Sierra Club would like to see Hawaiian Memorial Park become a pioneer and leader in promoting green burials to the public.*

Response: Thank you for your suggestion of considering "green burials." Green burials encompass a variety of burial practices and necessitate the use of non-toxic or biodegradable materials for burial items (i.e. caskets and shrouds). Proponents believe green burials are better for the environment as they require fewer burial items (i.e. caskets) and can be more affordable as embalming and expensive burial items are not required. However, green burials would still

require additional burial plots. Furthermore, green burials would violate State Department of Health (DOH) regulations (HAR Title 11, Chapter 22) governing cemetery operations. These regulations are intended to prevent unhygienic conditions or dangers to public health from cemetery operations. Corpse decomposition may release pathogens into the surrounding soil and may contaminate the environment leading to violation of these regulations. Thus, this alternative burial practice is not appropriate, violates State regulations, and would be more environmentally damaging.

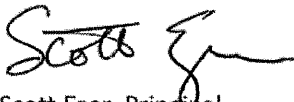
Closing

The Sierra Club places high priority on the survival of this population of Blackline Hawaiian Damselflies into the future. Pinapinao ānuenue -- rainbow-eye damselflies -- are beautiful insects that come in a spectacular array of colors and patterns. These damselflies are unique to the natural and cultural history of the Hawaiian Islands and are found only on O'ahu. These damselflies are biological treasures that deserve to be preserved for future generations. Please consider these special creatures as you decide this matter.

Response: Based upon the information discussed in both the Draft and Final EIS, the Petitioner has expended considerable effort to ensure the protection and survival of the damselfly and its habitat.

Thank you for providing us with your comments on the DEIS and participating in this process. If you have any questions, please contact me at 457-3158 or sezer@hhf.com.

Sincerely,



Scott Ezer, Principal

cc: Mr. Jay Morford, Hawaiian Memorial Life Plan, Ltd.

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of) DOCKET NO. A17-804
)
HAWAIIAN MEMORIAL LIFE PLAN, LTD.) AFFIDAVIT OF SERVICE OF
) SECOND AMENDMENT TO
To Amend The Conservation Land Use) PETITION FOR LAND USE
District Boundary Into The Urban Land Use) DISTRICT BOUNDARY
District For Approximately 53.449 Acres Of) AMENDMENT
Land At Kāneʻohe, Island of Oʻahu, State of)
Hawaiʻi, Tax Map Key: (1) 4-5-033: por. 001)
_____)

**AFFIDAVIT OF SERVICE OF SECOND AMENDMENT TO PETITION
FOR LAND USE DISTRICT BOUNDARY AMENDMENT**

STATE OF HAWAII)
) ss.:
CITY AND COUNTY OF HONOLULU)

CURTIS T. TABATA, being first duly sworn on oath, deposes and says:

A. Affiant is the attorney for Petitioner HAWAIIAN MEMORIAL LIFE PLAN, LTD. and agent of the Petitioner for a State of Hawaiʻi Land Use District Boundary Amendment from Conservation District to Urban District, identified as Docket No. A17-804, for land situated at Kāneʻohe, Island of Oʻahu, Hawaiʻi, identified as Tax Map Key No. (1) 4-5-033: por. 001.

B. In compliance with § 15-15-48(a) of the Hawaiʻi Administrative Rules ("HAR"), Affiant did on June 19, 2019 deposit in the United States Mail, postage prepaid, by certified mail or hand delivered, a copy of the Second Amendment to Petition for District Boundary Amendment, to the following:

DAWN TAKEUCHI-APUNA, ESQ.
Deputy Attorney General
Department of the Attorney General
425 Queen Street
Honolulu, Hawai'i 96813

HAND-DELIVERY

MARY ALICE EVANS, DIRECTOR
Office of Planning, State of Hawai'i
235 South Beretania Street
Room 600, Leiopapa A Kamehameha Bldg.
Honolulu, Hawai'i 96813

HAND-DELIVERY

KATHY K. SOKUGAWA, DIRECTOR
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

HAND DELIVERY

PLANNING COMMISSION
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

HAND DELIVERY

PAUL S. AOKI, ESQ.
Acting Corporation Counsel
City and County of Honolulu
Department of Corporation Counsel
530 South King Street, Room 110
Honolulu, Hawai'i 96813

HAND DELIVERY

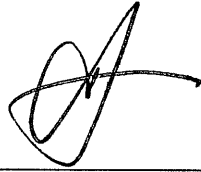
HUI O PIKOILOA, an unincorporated
Association, LIANNE CHING, ERNEST
HARRIS, BETTYE HARRIS, RICHARD
MCCREEDY, JULIANE MCCREEDY,
JESSE REAVIS, and GRANT YOSHIMORI
c/o 45-464 Lipalu Street
Kaneohe, Hawai'i 96744

U.S. MAIL
CERTIFIED MAIL
RETURN RECEIPT
REQUESTED

C. This Affidavit is provided in compliance with § 15-15-50(c)(5), (C), HAR.

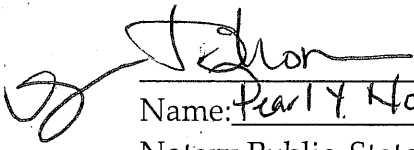
That further Affiant sayeth naught.

Dated: Honolulu, Hawai'i, June 19, 2019.



CURTIS T. TABATA

Subscribed and sworn to me
this 19th day of June 2019



Name: Pearl Y. Nomura
Notary Public, State of Hawai'i
My Commission expires: 4/1/23

NOTARY CERTIFICATE (Hawaii Administrative Rules § 5-11-8)

Document Identification or Description: Affidavit of Service of Second Amendment to
Petition for Land Use District Boundary Amendment

Doc. Date: June 19, 2019 No. of Pages: 3

Jurisdiction: First Circuit

(in which notarial act is performed)



6-19-19

Signature of Notary

Date of Certificate

Pearl Y. Nomura



Printed Name of Notary

(Official Stamp or Seal)

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of) DOCKET NO. A17-804
)
HAWAIIAN MEMORIAL LIFE PLAN, LTD.) AFFIDAVIT OF SENDING OF
) SECOND AMENDED
To Amend The Conservation Land Use) NOTIFICATION OF PETITION
District Boundary Into The Urban Land Use) FILING
District For Approximately 53.449 Acres Of)
Land At Kāneʻohe, Island of Oʻahu, State of)
Hawaiʻi, Tax Map Key: (1) 4-5-033: por. 001)
_____)

**AFFIDAVIT OF SENDING OF SECOND
AMENDED NOTIFICATION OF PETITION FILING**

STATE OF HAWAII)
) ss.:
CITY AND COUNTY OF HONOLULU)

CURTIS T. TABATA, being first duly sworn on oath, deposes and says:

A. Affiant is the attorney for Petitioner HAWAIIAN MEMORIAL LIFE PLAN, LTD. and agent of the Petitioner for a State of Hawaiʻi Land Use District Boundary Amendment from Conservation District to Urban District, identified as Docket No. A17-804, for land situated at Kāneʻohe, Island of Oʻahu, State of Hawaiʻi, identified as Tax Map Key No. (1) 4-5-033: por. 001.

B. In compliance with § 15-15-50(d) of the Hawaiʻi Administrative Rules ("HAR"), Affiant did on June 19, 2019 deposit in the United States Mail, postage prepaid, by regular mail, a copy of the Second Amended Notification of Petition Filing,

attached hereto as Exhibit "1", to the persons identified in the required mailing and e-mail list, attached hereto as Exhibit "2."

C. This Affidavit is provided in compliance with § 15-15-50(d), HAR.

That further Affiant sayeth naught.

Dated: Honolulu, Hawai'i, June 19, 2019.



CURTIS T. TABATA

Subscribed and sworn to me

this 19th day of June 2019

Name: Pearl Y. Nomura

Notary Public, State of Hawai'i

My Commission expires: 4/1/23

NOTARY CERTIFICATE (Hawaii Administrative Rules § 5-11-8)

Document Identification or Description: Affidavit of Sending of Second Amended Notification of Petition Filing

Doc. Date: June 19 2019 No. of Pages: 2

Jurisdiction: First Circuit

(in which notarial act is performed)

[Signature]
Signature of Notary

6-19-23
Date of Certificate

Pearl Y. Nomura

Printed Name of Notary

[Signature]
(Official Stamp or Seal)

June 19, 2019

SECOND AMENDED NOTIFICATION OF PETITION FILING

This is to advise you that a Second Amendment to Petition for Land Use District Boundary Amendment with the following general information has been submitted to the State of Hawai'i Land Use Commission:

Docket No: A17-804
Petitioner/Address: HAWAIIAN MEMORIAL LIFE PLAN, LTD.
c/o Mr. Jay Morford
1330 Maunakea Street
Honolulu, HI 96813

Landowners and HAWAIIAN MEMORIAL LIFE PLAN, LTD.

Tax Map Key Number: (1) 4-5-033; por. 001

Location: Kaneohe, Island of Oahu, Hawai'i

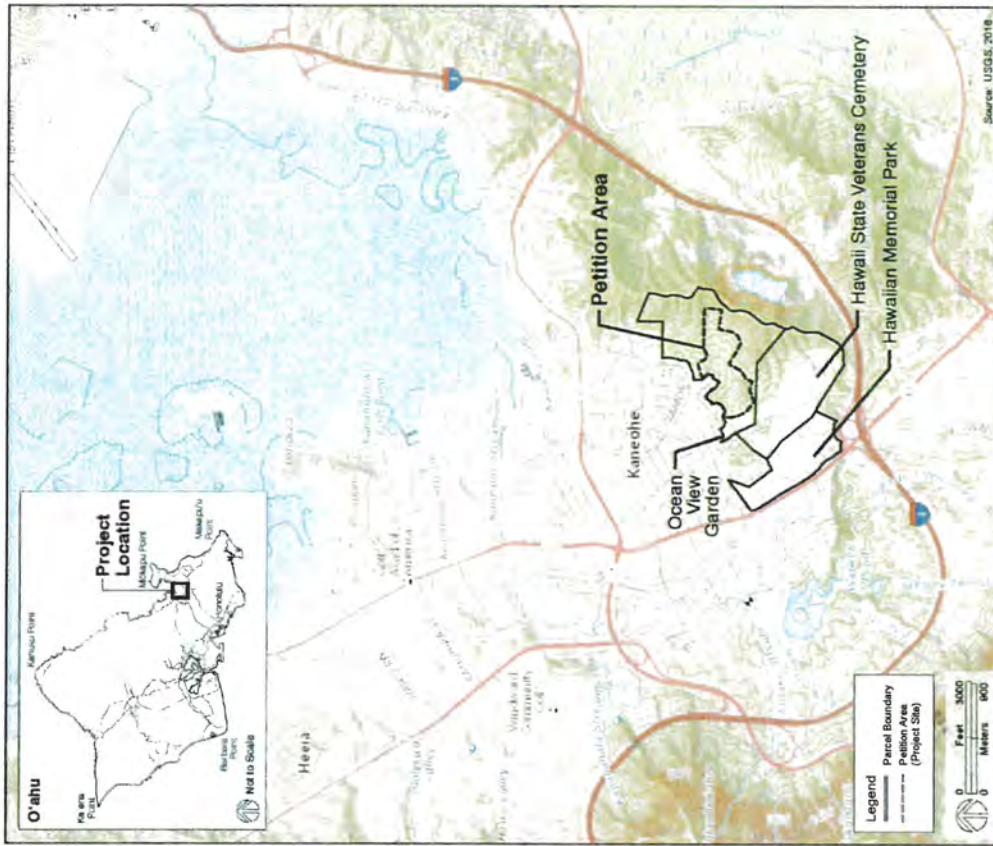
Requested Reclassification: Conservation to Urban

Acreage: Approximately 53.449 acres

Proposed Use: The development of cemetery expansion, cultural preserve, roadways and open space

You may review detailed information regarding the petition at the Land Use Commission ("Commission") office or the City and County of Honolulu, Department of Planning & Permitting located at 650 South King Street, Honolulu, Hawai'i 96813. The Commission's office is located at 235 S. Beretania Street, Room 406, Honolulu, Hawai'i. Office hours are from 7:45 a.m. to 4:30 p.m., Mondays through Fridays.

A hearing on this petition will be scheduled at a future date. If you are interested in participating in the hearing as a public witness, please write or call the Commission office at P.O. Box 2359, Honolulu, Hawai'i 96804-2359; telephone (808) 587-3822. If you intend to participate in the hearing as an intervenor, pursuant to § 15-15-52, Hawai'i Administrative Rules, you should file a Notice of Intent to Intervene with the Commission within 30 days of the date of this notice. Please contact the Commission office for further information.



Project Location Map
Hawaiian Memorial Park Cemetery Expansion Project
Kaneohe, Oahu, Hawai'i

Email List for Statewide Distribution
As of 05/14/19

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dawn.t.apuna@hawaii.gov; jngi@hawaii.rr.com; vshigekuni@pbrhawaii.com;
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hphw@hawaiiintel.net; gpknopp@gkenvllc.com; bruce@townscapeinc.com; laluzmaui@gmail.com;
mching@abhi.com; Robyn_Loudermilk@notes.k12.hi.us; blau@ksglaw.com;
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faith.caplan@hartcrowser.com; mpoffice@earthjustice.org; NancyC@daylum.com;
jane.e.f.tam@hawaii.gov; cyjohnas@ksbe.edu; peteryoung@hookuleana.com; souki@hawaii.edu;
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BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of) DOCKET NO. A17-804
)
HAWAIIAN MEMORIAL LIFE PLAN, LTD.) CERTIFICATE OF SERVICE
)
To Amend The Conservation Land Use)
District Boundary Into The Urban Land Use)
District For Approximately 53.449 Acres Of)
Land At Kāneʻohe, Island of Oʻahu, State of)
Hawaiʻi, Tax Map Key: (1) 4-5-033: por. 001)
_____)

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