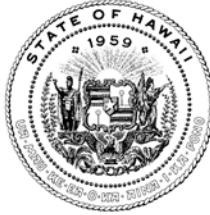


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DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
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September 14, 2015

Chris Monahan, PhD, Principal
TCP Hawai'i LLC
333 Aloa Street, #303
Kailua, HI 96734

Log No. 2015.01827
Doc. No. 1509SL01
Archaeology

Dear Dr. Monahan:

SUBJECT: **Chapter 6E-42 Historic Preservation Review
Archaeological Preservation Plan for State Site No. 50-80-09-2273,
Features 14 (portion), 19, 22, and 23 (portion), Kamehameha Schools' Land
Waiawa Ahupua'a, 'Ewa District, Island of O'ahu
TMK: (1) 9-4-004:024 portion**

Thank you for the opportunity to review the draft report titled *Archaeological Preservation Plan State Site No. 50-80-09-2273 Features 14 (Portion), 19, 22 & 23 (Portion) Kamehameha Schools' Land in Waiawa Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i TMK (1) 9-6-004:024 (portion)* (Monahan, May 2015). We received this submittal on May 12, 2015; we apologize for the delay and thank you for your patience. SHPD requested an archaeological inventory survey be conducted due to the potential for proposed project plans to affect historic properties (June 12, 2014; Log No. 2014.02357, Doc. No. 1405GC14). The landowner, Kamehameha Schools (KS), proposes to develop a 50 megawatt solar facility on a portion of the property. The archaeological inventory survey (Monahan, September 2014) was reviewed and accepted by SHPD on April 24, 2015 (Log No. 2014.04229, Doc. No. 1504GC15).

The archaeological inventory survey (AIS) provided surface coverage of the entire 1,395-acre project area which included two existing access roads and two proposed utility tie-ins. Subsurface testing consisted of a single hand-excavated unit placed to examine whether a small, dry-stacked terrace in Gulch C (Site 50-80-09-2273, Feature 21) was pre-Contact or plantation-era in age and association. Large-scale non-historic properties identified within the project area include recent earthen roads with low berms formed when the roads were graded or scraped; evidence of recent modification by civil engineers to control flooding of the landscape near two of the old reservoirs, Gulch C (Reservoir 3 on historic maps) and Gulch B (Reservoir 1-A on historic maps), and a long, heavily-built earthen berm in the northwest portion of the property, north of Gulch A, in an area of former workers' camp.

The accepted AIS report (Monahan 2015) indicated that three previous archaeological surveys have included portions of the current project area (Barrera 1987, Goodman and Nees 1991, and Thurman et al. 2012). Portions of a data recovery project also extended into the project area (Sinoto and Pantaleo 1994, 1995). Five historic properties (Sites 50-80-09-2262, 2270, 2271, 2272, and 2273) have been documented within or extending into the current project area. Of these, three were further documented during the AIS (Sites 2270, 2271, and 2273); not further documented were Site 2262 (a small lithic scatter) and Site 2272 (WWII and later military concrete buildings and stock pile areas); Site 2262 was fully collected during the Goodman and Nees (1991) survey, and no evidence was found of possible Site 2272 features within the three areas previously identified in Figure 7 as having been used for military storage. Monahan (2015) indicates that no historic properties were newly identified. Site 2270 is a network of roads and railroad right-of-ways consisting of 28 features, Site 2271 is the remains of workers' camps and other

facilities represented by two extant features, and Site 2273 is an irrigation system consisting of 25 features. The most significant features of Site 2271—the Japanese cemetery (Feature 3) and the cannery (Feature 1)—were subject to data recovery work by Sinoto and Pantaleo (1994, 1995).

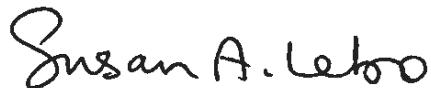
Pursuant to Hawaii Administrative Rule (HAR) §13-284-6, Monahan (2015) assessed Site 2270 as significant under Criterion d for its informational value regarding geospatial location, extent, and character of the plantation roads and temporary railroad in Waiawa built around or just after the turn of the 19th/20th century. Site 2273 was assessed as significant under Criterion c for its distinctive construction method and Criterion d for its information value. Like Site 2270, Site 2273 provides important data on geospatial location, extent, and character of the plantation irrigation infrastructure in Waiawa Uka built by the Oahu Sugar Company and its association with the nearby Waiāhole Ditch System (upslope and *mauka* of the current project area). Site 2271 Feature 1 (structural remnants) was assessed as significant under Criterion d for its information content relative to plantation working conditions in the early to middle 20th century, while Site 2271 Feature 2 (camp debris) was assessed as not significant. Per HAR §13-284-7, the project effect determination was “effect, with proposed mitigation commitments.” Of the three historic properties, no further work was recommended for Site 2270 and Site 2271 which were assessed as having yielded their informational and research value. The proposed mitigation was “*preservation of certain features of Site 2273*.” SHPD concurred with the site significance assessments and the mitigation commitments, and the development of an archaeological monitoring plan meeting the requirements of HAR §13-277.

The archaeological preservation plan (PP) indicates that preservation includes: (1) a representative section (100 ft [30 m]) of Feature 14, the cut basalt and mortar irrigation ditch draining into Gulch B and directly associated with the Feature 19 dam; (2) the entirety of Feature 19, a large dam-like retention structure in the west end of Gulch B; (3) the entirety of Feature 22, a large water-distribution and water-retention basin on the plateau east of Gulch A, and one of the most formal structures in the project area; and (4) a representative section (75 ft [25 m]) of Feature 23, the cut basalt and mortar irrigation ditch leading into the Feature 22 basin. Preservation will be in the form of “avoidance and protection” and will involve a 10-ft (3 m) buffer around all features or portions of preserved features, except one side of Feature 22 (east side). The buffers will be marked by permanent fencing. No vegetation clearance is anticipated/planned within the buffers. In addition, no signage or access is planned. Periodic monitoring of the preserves will be conducted by the landowner or their representatives.

The preservation plan meets the requirements of HAR 13-277. It is accepted by SHPD. Please send one hardcopy of the document, clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the Kapolei SHPD office, attention SHPD Library.

Please contact me at (808) 692-8019 or at Susan.A.Lebo@hawaii.gov if you have any questions or concerns regarding this letter.

Aloha,



Susan A. Lebo, PhD
Archaeology Branch Chief



Waiawa Phase 2 Solar + Storage Project **Biological Resources Survey Report**

Prepared for:

Waiawa Phase 2 Solar, LLC

Revised August 2021



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- Appendix B.** List of Plant Species Observed During Surveys of the Waiawa Phase 2 Solar + Storage Study Area
- Appendix C.** Pueo Survey Datasheets

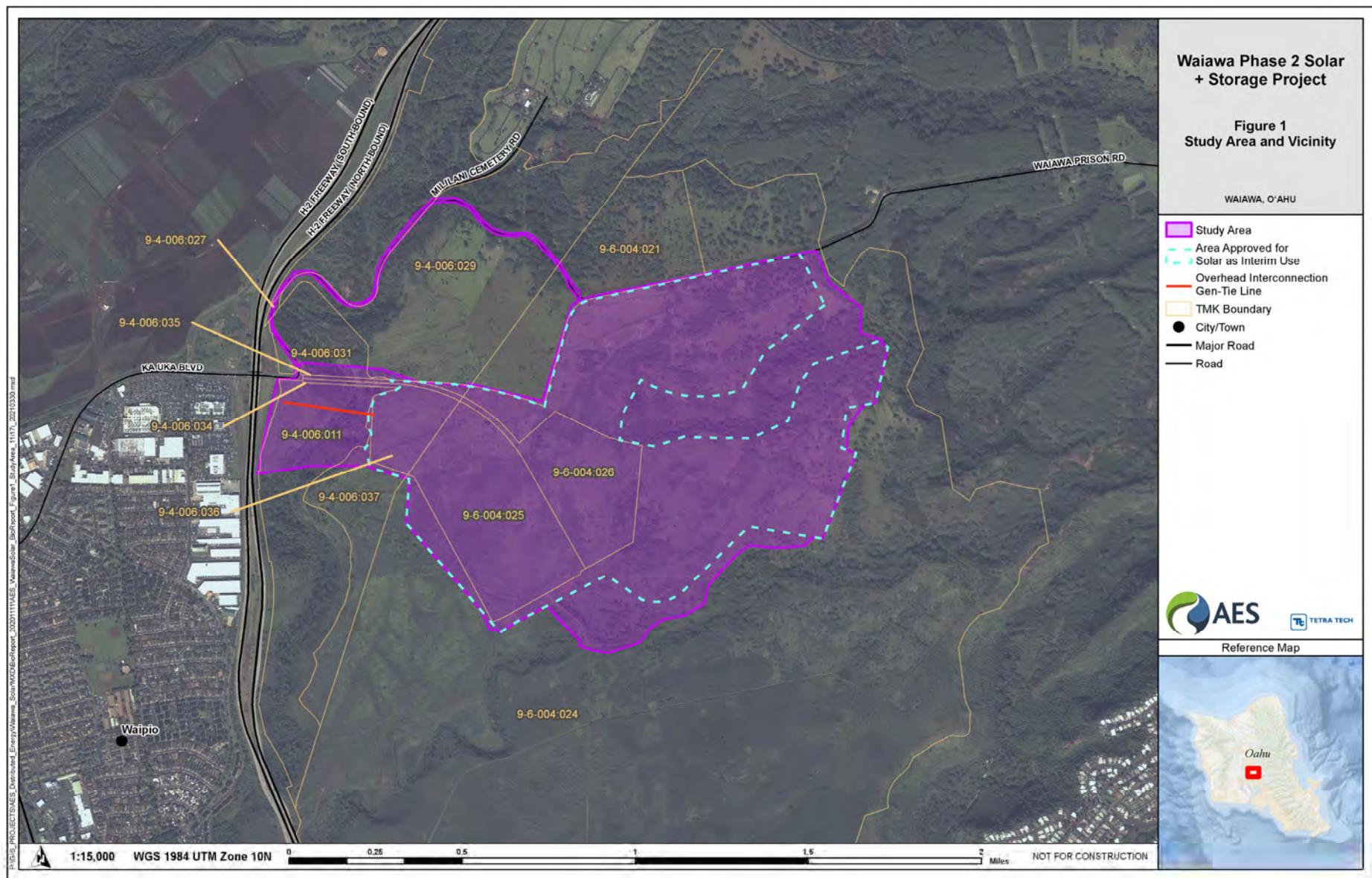
1.0 Introduction

Waiawa Phase 2 Solar, LLC (AES) is proposing the Waiawa Phase 2 Solar + Storage Project (Project) in the ‘Ewa district on the island of O‘ahu. The proposed Project involves construction and operation of a ground-mounted solar photovoltaic and distributed battery energy storage system on approximately 387 acres of land owned by Kamehameha Schools. A general biological survey was conducted for the Project by Tetra Tech, Inc. (Tetra Tech) and LeGrande Biological Surveys, Inc. The survey was conducted within a larger 497-acre area (referred to as the “Study Area”) to provide information that may improve flexibility during the Project planning and development process. The general location and extent of the Study Area is shown in Figure 1.

The purpose of the biological survey was to characterize the existing plant and animal habitat and determine whether species that are federally or state listed as threatened or endangered (pursuant to the federal Endangered Species Act or Hawai‘i Revised Statutes [HRS] § 195D), or are otherwise considered rare, have the potential to occur within the Study Area and could be negatively impacted by the Project. In addition, the survey included a preliminary evaluation of potential streams, wetlands, and other features that may be considered Waters of the U.S. and therefore subject to jurisdiction under the Clean Water Act; however, it did not constitute a formal delineation. This report summarizes the survey results.

1.1 Project Description

The Project involves construction and operation of an approximately 30-megawatt (MW) alternating current/60 MW direct current ground-mounted solar photovoltaic system coupled with a 240 MW-hour battery energy storage system, a substation and switchyard, and related interconnection and ancillary facilities. A series of solar photovoltaic panels would be mounted on a racking system arranged in evenly-spaced rows throughout the Project area. The energy storage system would consist of containerized lithium-ion battery units distributed throughout the solar arrays. This equipment would connect via underground electrical wiring with a Project substation. The substation would be located near the existing Hawaiian Electric Company, Inc. (Hawaiian Electric) Waiau-Mililani and Wahiawa-Waimano 46-kilovolt (kV) sub-transmission lines and would include equipment to allow interconnection with the electrical grid; two 46kV overhead lines would deliver power from the Project substation to the existing Waiau-Mililani and Wahiawa-Waimano 46 kV sub-transmission line(s). The Project would be accessed via an existing gated entry off Waiawa Prison Road and would utilize a network of existing on-site access roads. Within the Project area, a series of new gravel access roads would be installed to accommodate construction vehicles and to allow ongoing access for operations and maintenance. Temporary construction staging and laydown would occur within the Project area. The power generated by the Project would be sold to Hawaiian Electric under a new power purchase agreement. At the end of the Project’s useful life, the Project equipment would be decommissioned and the land would be returned to substantially the same condition as existed prior to Project development.

Figure 1. Study Area and Vicinity

2.0 Description of Study Area

The Study Area encompasses approximately 497 acres of land located east of the H-2 Freeway and Ka Uka Boulevard interchange, including areas within tax map key (TMK) 9-6-004:024 (por.), 025, 026 and 9-4-006:011 (por.), 034, 035, 036, 037 (por.), as shown on Figure 1. It is located within the northwest portion of Kamehameha Schools' Waiawa property, which totals approximately 1,395 acres and is surrounded by Waiawa Correctional Facility and Mililani Memorial Park & Mortuary to the north, by Waiawa Stream to the south, and by Pānakauahi Gulch to the west. The area to the east consists of conservation land associated with the Ko'olau Mountains. Nearby communities include Pacific Palisades and Pearl City to the south (beyond Waiawa Stream), and Waipi'o and Mililani to the west and north (beyond the H-2 Freeway). The Study Area comprises vacant, undeveloped land. No structures or other equipment are known to occur, although remnant agricultural infrastructure (e.g., old irrigation piping) is present.

Kamehameha Schools' Waiawa property was historically used to cultivate sugarcane (*Saccharum officinarum*) and pineapple (*Ananas comosus*), but agricultural operations ceased in 1983. Subsequently, the property was the subject of a state land use district boundary amendment in the 1980s, in which the land was reclassified from the state agricultural district to the urban district (with similar rezoning by the City & County of Honolulu in the 1990s) to allow for development of a master plan community (LUC 1988). The district boundary amendment was subsequently modified with approval granted for utility-scale solar as a permitted interim use on the property (LUC 2014); the approved area to be used for the Project is indicated in Figure 1. A separate utility-scale solar project is being developed within another approved area on Kamehameha Schools' Waiawa property, southeast of the Study Area.

There are two existing entrances to the Waiawa property, entering from the north and south sides. The entrance to the northern portion of the property is via a driveway off Mililani Cemetery Road and Waiawa Prison Road, which are accessed from Ka Uka Boulevard and the H-2 Freeway (see Figure 1). The entrance to the southern portion of the property is via a driveway from Waihona Street, mauka of Kamehameha Highway.

2.1 Climate

The climate in the Study Area is characterized as mesic. According to the Online Rainfall Atlas of Hawai'i (Giambelluca et al. 2013), the area receives a mean annual rainfall of approximately 36 inches (914 millimeters). Rainfall is typically highest from November through January and lowest from April through August (Giambelluca et al. 2013). The closest functioning National Weather Service (NWS) rainfall gauge to the Study Area (Waiawa Correctional Facility, which is roughly 0.7 miles northeast of the Study Area) recorded 167 percent of average rainfall in August 2020, 45 percent of average rainfall in September 2020, and 189 percent of average rainfall in October 2020 when the surveys were conducted (NWS 2020). The year-to-date total for this gauge through the end of October 2020 was approximately 195 percent of average. The NWS rainfall data suggest conditions were wetter than normal when the biological survey was conducted.

2.2 Topography and Soils

The topography of the Study Area generally slopes in a southerly direction, with elevations ranging from approximately 705 feet above mean sea level (amsl) along the northeastern boundary to approximately 360 feet amsl along the southern edge of the Study Area. The Study Area contains uneven terrain, due in part to several drainage features located in the eastern portion of the property. In addition, Pānakauahi Gulch, which is tributary to Waiawa Stream, occurs along the western edge of the Study Area.

The Natural Resources Conservation Service (NRCS) identifies four main soil types within the Study Area (NRCS 2020). As shown on Figure 2, the majority of the site comprises Manana silty clay, Wahiawa silty clay, Lahaina silty clay, and Helemano silty clay. Small portions of the Study Area are classified as fill land and water. The area classified as water had no standing water in it at the time of the surveys.

2.3 Hydrology

The Study Area is within the Waiawa watershed which encompasses roughly 26.7 square miles (Parham et al. 2008; CWRM 2008). Stream, wetlands, ditches, and other features identified by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data (NWI 2019), the National Hydrography Dataset (NHD 2020), and the State of Hawai‘i Division of Aquatic Resources (DAR) dataset (DAR 2008) are shown in Figure 3.

These datasets identify Pānakauahi Gulch, a tributary to Waiawa Stream, along the western edge of the Study Area. This feature is characterized as perennial by DAR, intermittent by NHD, and as PFO3C (palustrine, forested, broad-leaved evergreen, seasonally flooded) by NWI. It runs parallel to the H-2 Freeway and joins with the main branch of Waiawa Stream near the H-1/H-2 freeway interchange, approximately 2 miles south of the Study Area, before discharging to the Middle Loch of Pearl Harbor.

Other features shown by the NHD, NWI, and DAR datasets within the Study Area are understood to be man-made features. These include linear features that traverse both the northern and eastern portions of the Study Area; these are identified as ditches by NHD and DAR, and as R5UBFx (riverine, unknown perennial, unconsolidated bottom, semipermanently flooded, excavated) by NWI. These features appear to connect with other similar offsite ditches via siphons, as indicated by DAR and USGS topographic mapping. A waterbody at the juncture of these ditches, in the northeastern portion of the Study Area, is identified by NWI as R5UBH (riverine, unknown perennial, unconsolidated bottom, permanently flooded) and as an impoundment by DAR. Similarly, an approximately 7-acre wetland area shown near the southern boundary of the Study Area is identified by NWI as PSSAh (palustrine, scrub-shrub, temporarily flooded, dike/impounded) and as an impoundment by DAR. Based on the nature of these features and the land use history, and consistent with the conclusions of previous archaeological investigations, it is understood that these features were constructed as part of an extensive irrigation network that supported sugar cane and pineapple cultivation in this region. Field observations indicate that the irrigation network has not been actively maintained, with certain features no longer intact.

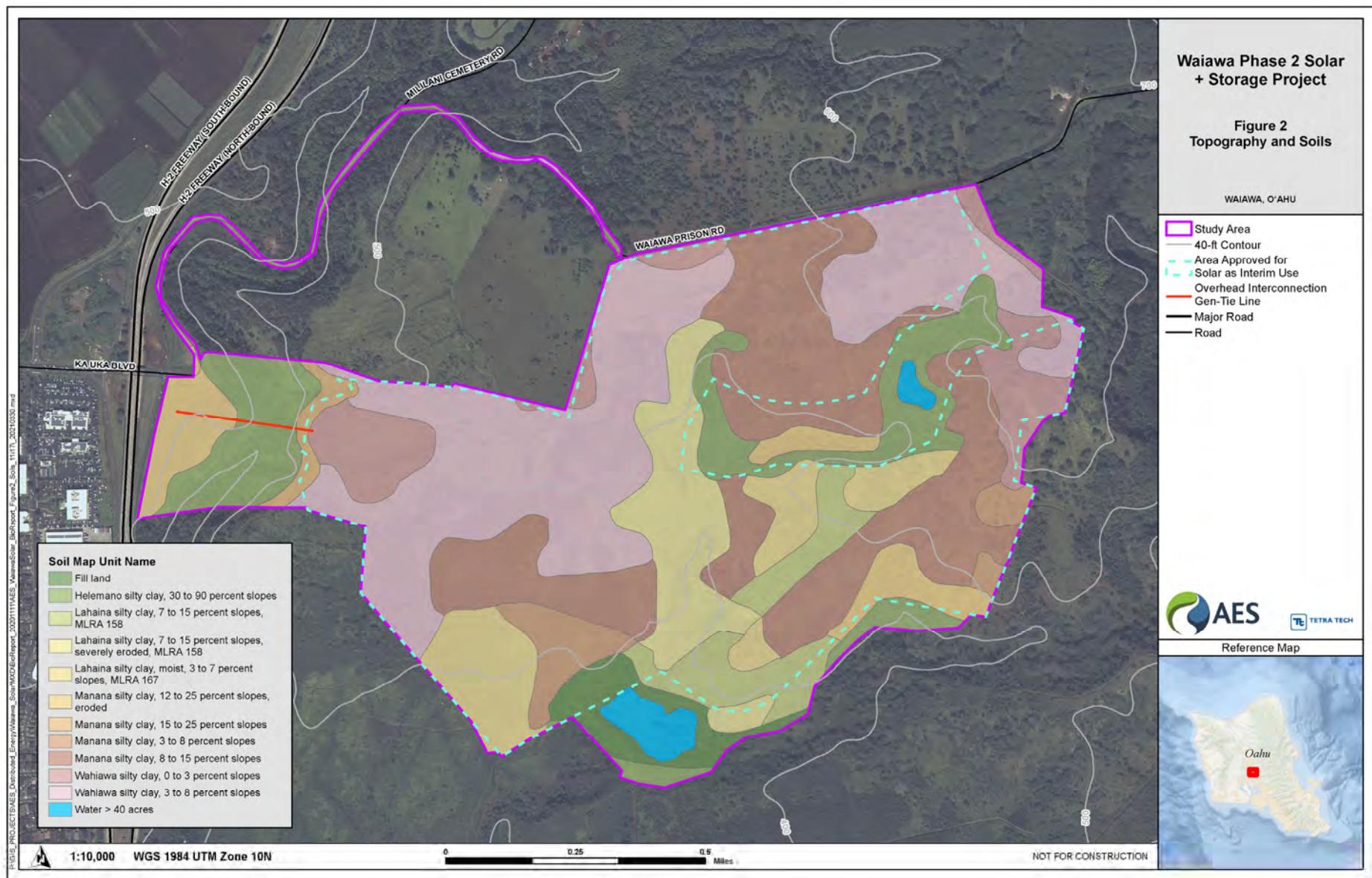
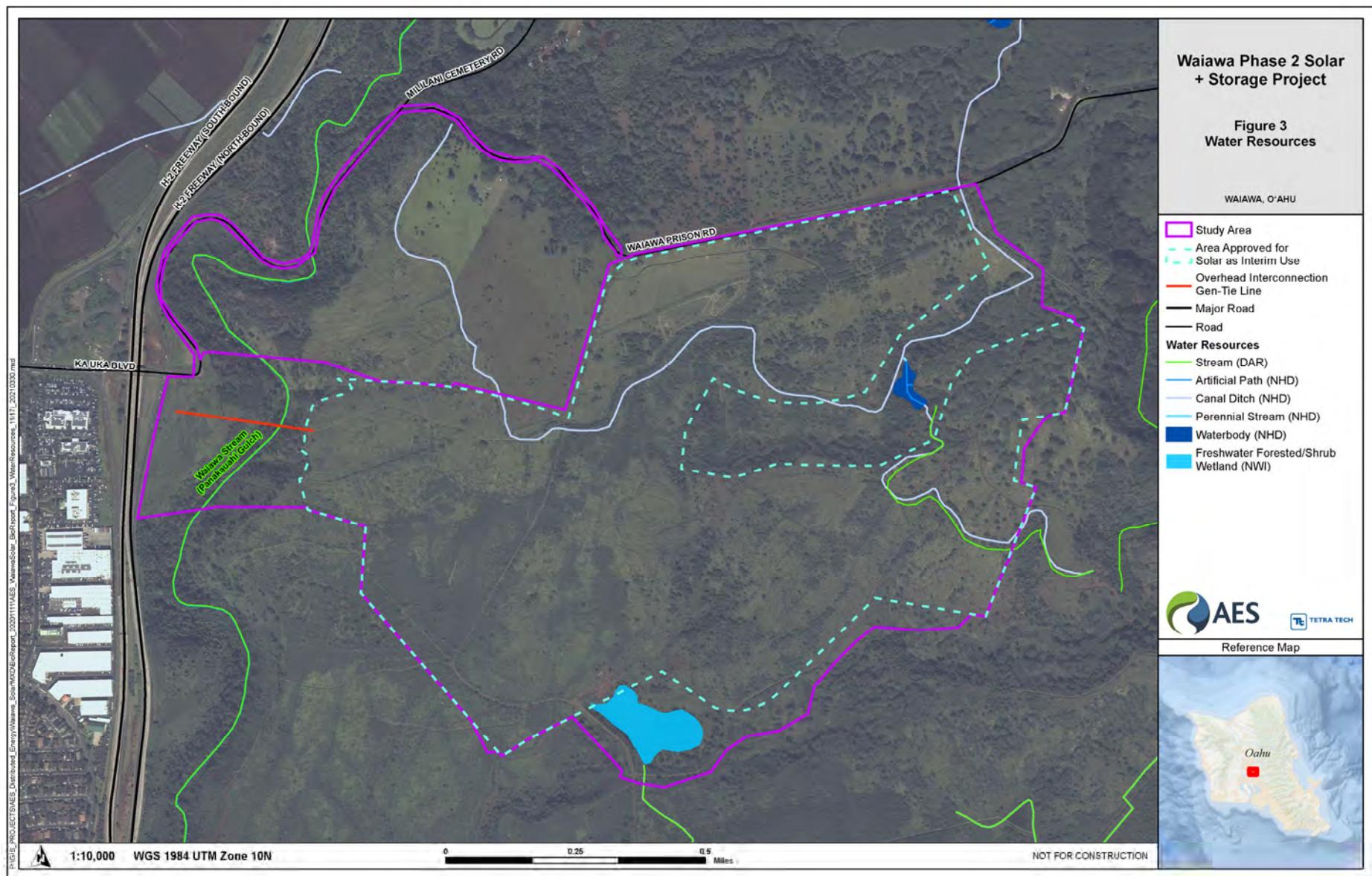
Figure 2. Topography and Soils in the Study Area

Figure 3. Water Resources Identified by NWI, NHD, DAR in the Vicinity of the Study Area



3.0 Methods

Prior to the field survey, publicly available literature and data relevant to the biological resources in and near the Study Area were reviewed. Evaluated resources included previous survey reports, environmental assessments and environmental impact statements, public datasets (including NWI, NHD and DAR), scientific journals and reports, as well as available, unpublished data that are relevant to the natural history and ecology of the area. In addition, available geospatial data, aerial photographs, and topographic maps of the Study Area were reviewed to identify previous occurrences of federally or state listed species, otherwise rare species, or habitats that could harbor these species. A field survey of the Study Area was subsequently conducted on October 5–7 and 10–11, 2020; the survey work was conducted from approximately 7:30 am until 3:30 pm each day in ideal survey conditions with weather that is typical for the area (light winds, clear to partly cloudy skies, and warm temperatures). In addition, three evening surveys were conducted specifically for pueo or Hawaiian short-eared owl (*Asio flammeus sandwichensis*) on November 2, 2020, January 14, and February 10, 2021. Details of the field survey methodologies are provided below.

3.1 Plants

All plant species and dominant vegetation types encountered were identified and recorded as part of a pedestrian search of the Study Area. During the survey, biologists examined areas more likely to support native plants (e.g., rocky outcrops and gulches) more intensively. Plant identifications were made in the field; plants that could not be positively identified were photo-documented for comparison with the recent taxonomic literature.

Plants recorded during this survey are indicative of the season and environmental conditions at the time of the survey. The presence and location of plants can be influenced by seasonal and temporal changes; therefore, it is possible additional species may occur within the Study Area but were not present during this survey.

The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999, 2012), Wagner and Herbst (2003), and Imada (2012) for native and naturalized flowering plants, and Staples and Herbst (2005) for ornamental plants. Common/Hawaiian names are provided first, followed by scientific names in parentheses. If no common or Hawaiian name is known, only the scientific name is provided.

3.2 Wildlife

Wildlife surveys consisted of observations and identification of birds, mammals, and large invertebrate species encountered while searching the Study Area. Observations of invertebrates encountered were recorded incidentally to wildlife surveys. Invertebrates were identified through visual observations and were not collected in the field. Tetra Tech recorded all wildlife seen or heard while walking and driving within the Study Area coupled with visual observation of scat, tracks, and other animal sign. Habitats or

plants that could support listed species were also identified, if present (such as water features as potential habitat for listed Hawaiian waterbirds).

Specific surveys for the endangered Hawaiian hoary bat or ‘ōpe’ape’ā (*Lasius cinereus semotus*) with acoustic bat detectors or nighttime observation were not conducted. Rather, as the USFWS and State of Hawai‘i Division of Forestry and Wildlife (DOFAW) recognize all woody vegetation greater than 15 feet tall as potential bat roosting habitat (DOFAW 2015, USFWS 2019), Tetra Tech noted the presence or absence of any such vegetation within the Study Area.

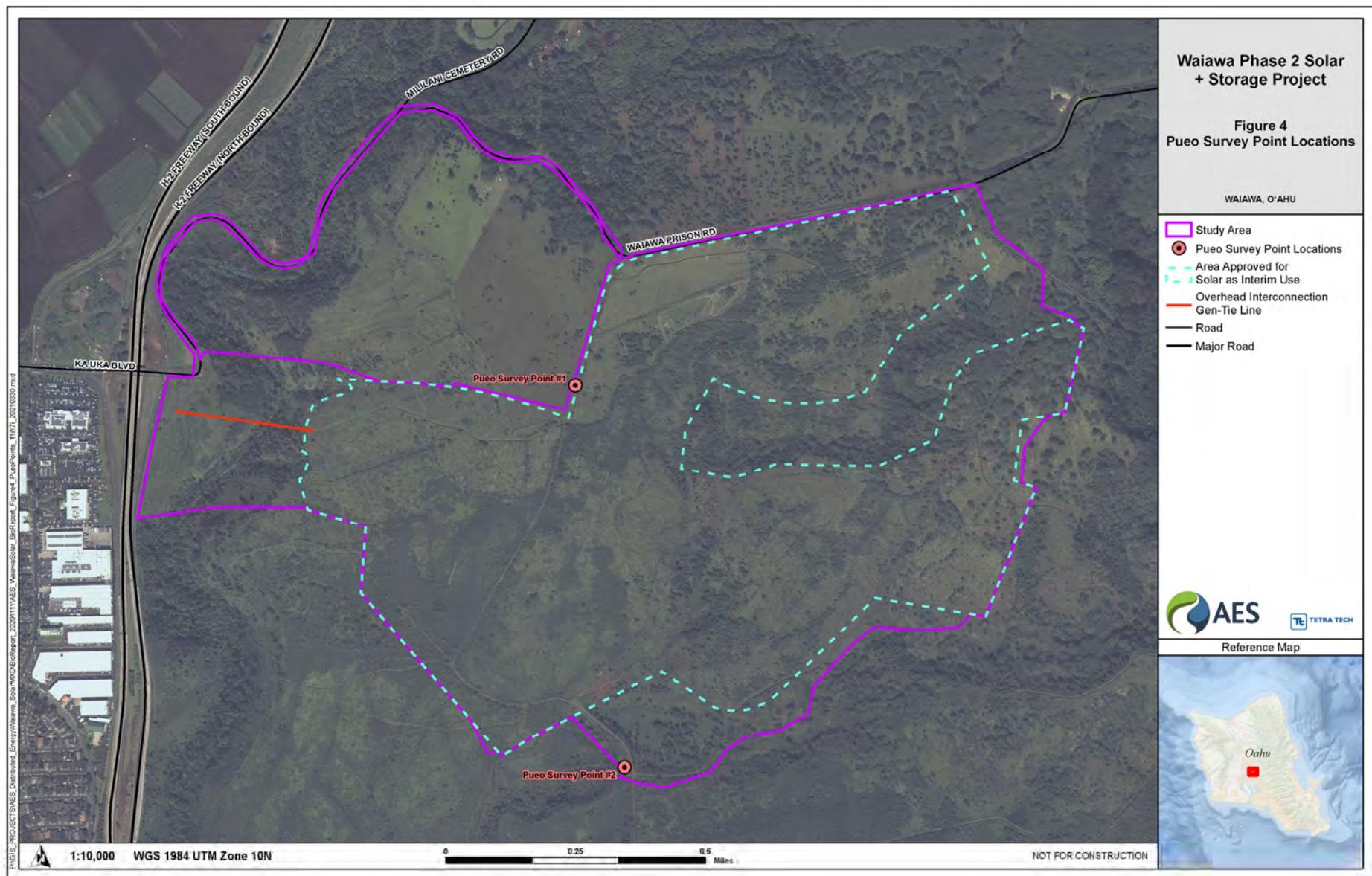
Surveys specifically to detect the pueo or Hawaiian short-eared owl were conducted on three dates: November 2, 2020, January 14, and February 10, 2021. This species is listed as endangered by the State of Hawai‘i on the island of O‘ahu; it is not a federally listed species. The survey methods followed the Pueo Project Survey Protocol (Price and Cotin 2018) but were adjusted to stay within the boundaries of the Study Area. Because most pueo detections have occurred in the evenings (M. Price/ UH Mānoa, pers. comm., September 2019; Cotín et al. 2018), the pueo surveys were conducted in the evenings, with surveys beginning 60 – 75 minutes before sunset and finishing at civil twilight. Two survey locations were established in areas with the best vantage of suitable pueo habitat within the Study Area (Figure 4; Photos 7 and 8 in Appendix A), and a biologist was present at each survey point for the duration of each of the three surveys. The ground and sky within the viewshed of each survey point were scanned with binoculars and the naked eye for the duration of the survey period. The following general information was collected during each pueo survey: date, observer, GPS coordinates, start time, and end time. Environmental information was also recorded, including cloud cover, wind speed, temperature, precipitation, extent of surveyed area (maximum length of viewshed surveyed in cardinal directions), and habitat classification. For any pueo observations, the following information would be collected: detection start time, detection end time, detection type, owl behavior classification, owl vocalization description, distance from observer, direction from observer, habitat where owl observed, and courtship behavior description. All pueo surveys were conducted in good weather with light winds, few clouds, and no precipitation.

Scientific nomenclature for birds follows Birds of the World (Billerman et al. 2020). Scientific names for mammals follow Tomich (1986). Scientific nomenclature follows Nishida (2002) for arthropods (insects and spiders).

3.3 Potential Waters of the U.S.

On June 22, 2020, the Navigable Waters Protection Rule (NWPR) became effective across the United States (U.S. Army Corps of Engineers [USACE] and Environmental Protection Agency [EPA] 2020). The NWPR specifies four categories of Waters of the U.S. subject to regulation under the Clean Water Act: territorial seas and traditional navigable waters; perennial and intermittent tributaries that contribute surface water flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters.

Prior to the survey, data from the NWI, NHD, and DAR datasets were reviewed to identify streams, wetlands, ditches, and other surface water features within the Study Area. During the field survey, these features were visited to initially evaluate whether they may be considered potential Waters of the U.S.

Figure 4. Pueo Survey Locations

based on the NWPR; streams and ditches were scanned for surface water and the presence of an ordinary high water mark (OHWM), and potential wetlands were scanned for surface water, obligate or facultative wetland plants, and surface hydrology indicators. This survey did not constitute a formal delineation or determination of Waters of the U.S., but was intended to evaluate whether a formal delineation and determination is warranted and to inform that effort. A jurisdictional waters survey was subsequently conducted by AECOS, Inc. in November 2020 (AECOS 2021) and submitted to the USACE in May 2021. The results of the survey by AECOS, Inc. and the USACE's determination is summarized in Section 5.3.

4.0 Results and Discussion

In general, the Study Area has been heavily modified by previous agricultural activities, which has resulted in degraded habitat dominated by non-native plant and wildlife species. Suitable habitat for native species is limited; all of the native species that were observed are common across O'ahu and other Hawaiian Islands. The land within the Study Area was historically used by the Oahu Sugar Company for sugarcane cultivation, but has been fallow since approximately 1982. Remnants of the agricultural plantation infrastructure, including various stone and concrete ditches are present within the Study Area. Based on aerial imagery, this area appears to have been cleared of vegetation numerous times over the last several decades, most recently in early 2016. Discussions with workers on the neighboring Castle & Cooke ranchland confirm that large sections of land were previously cleared down to bare dirt. These previous land use disturbances within the Study Area, in addition to the introduction and spread of invasive plants and animals, have reduced the abundance of native species and habitats suitable for native species. Representative photographs of the Study Area are presented in Appendix A.

No federally or state listed species were observed within or in the immediate vicinity of the Study Area during the survey. Although not observed, several federally or state listed wildlife species may occasionally occur in or traverse the Study Area. These listed species are discussed in further detail below.

4.1 Plants

No federally or state listed threatened, endangered, proposed listed, or candidate plant species were observed in the Study Area during the survey. A total of 77 plant species were documented within the Study Area, four of which are native to the Hawaiian Islands (Table 1). None of the observed native plants are considered rare anywhere in the Hawaiian Islands (Wagner et al. 1999). The remaining 73 plant species observed within the Study Area are non-native to the Hawaiian Islands. A list of plants observed during the survey is presented in Appendix B.

Table 1. Native Plant Species Observed in the Study Area

Common/Hawaiian Name	Scientific Name	Status
pōpolo	<i>Solanum americanum</i>	I?
hau	<i>Hibiscus tiliaceus</i>	I?

'ala'ala wainui	<i>Peperomia blanda</i> var. <i>floribunda</i>	I
'uhaloa	<i>Waltheria indica</i>	I

Status: I = Indigenous (native to the Hawaiian Islands and elsewhere)

I? = Questionably indigenous (most likely native to the Hawaiian Islands and elsewhere)

Three main vegetation types occur in the Study Area, all of which are dominated by non-native species: Koa Haole Scrub, Non-Native Grassland, and Mixed Non-Native Forest. Each vegetation type within the Study Area is relatively equal in abundance. The Koa Haole Scrub and Non-Native Grasslands are generally found in the fallow agricultural fields and the Mixed Non-Native Forest is confined to the slopes and bottoms of the gulches and along the access route.

Koa Haole Scrub: This vegetation type is characterized by open to dense stands of non-native koa haole (*Leucaena leucocephala*) trees, ranging from 4 to 10 feet in height (see Photo 1; Appendix A). Guinea grass (*Urochloa maxima*) is the most abundant plant in the understory. Other species infrequently scattered in the understory include the native 'uhaloa (*Waltheria indica*), Jamaican vervain (*Stachytarpheta jamaicensis*), and *Sida ciliaris*. In some areas, the koa haole trees are festooned with glycine vine (*Neonotonia wightii*).

Non-Native Grassland: The non-native grassland vegetation type dominates areas that are relatively flat or gently sloping within the Study Area (see Photo 2; Appendix A). Guinea grass is almost monotypic within these areas with only a few other grass species observed, including natal redtop (*Melinis repens*), swollen fingergrass (*Chloris barbata*), and lovegrass (*Eragrostis amabilis*). The grasslands form a matrix with the koa haole scrub in some locations where they interface. Other species observed in the grasslands include Christmas berry (*Schinus terebinthifolius*), aloe vera (*Aloe vera*), slender amaranth (*Amaranthus viridis*), and bitter melon (*Momordica charantia*).

Mixed Non-Native Forest: Mixed Non-Native Forest occurs mainly within the gulches and drainages within the Study Area and is characterized by a mix of non-native trees and shrubs (see Photo 3; Appendix A). In the eastern half of the Study Area, the canopy ranges from 10 to 20 feet in height with a mix of scattered tree species such as satin leaf (*Chrysophyllum oliviforme*), Christmas berry, chinaberry (*Melia azederach*), and Java plum (*Syzygium cumini*). Less abundant species include kukui (*Aleurites moluccana*), Chinese banyan (*Ficus microcarpa*), *Macaranga tanarius*, guava (*Psidium guajava*), padang cassia (*Cinnamomum burmanii*), silk oak (*Grevillea robusta*), and Fukien-tea (*Carmona retusa*). Abundant and common understory species include koa haole, Chinese violet (*Asystasia gangetica*), and Guinea grass. 'Opiuma (*Pithecellobium dulce*) trees are uncommonly scattered in this vegetation type, especially along the upper slopes of the gulches. In the northeastern corner of the Study Area, a large albizia (*Falcarias moluccana*) forest creates a monotypic stand up to 50 feet in height with an understory of Guinea grass (see Photo 4; Appendix A).

Along the western edge of the Study Area, Pānakauahi Gulch is relatively deep with steep sides dominated by non-native tree species including ironwood (*Casuarina equisetifolia*), paperbark (*Melaleuca quinquenervia*), Formosan koa (*Acacia confusa*), satin leaf, Java plum, and African tulip (*Spathodea campanulata*) (see Photo 5; Appendix A). At the bottom of the gulch along the stream bed, trees such as kukui, earpod (*Enterolobium cyclocarpum*), and guava were observed. Understory plants

included wedelia (*Sphagneticola trilobata*), sourbush (*Pluchea carolinensis*), and a few populations of the native 'ala'ālawainui (*Peperomia blanda* var. *floribunda*) on some of the rocky cliff faces along the stream bank.

The northern access route to the site, which originates at the H-2 Freeway offramp and includes Mililani Memorial Park Road and Waiawa Prison Road, is also predominantly vegetated with mix of non-native species (see Photo 6; Appendix A). Besides one thicket of hau (*Hibiscus tiliaceus*), no other native species were observed along the access route. Dominant tree species include ironwood, silk oak, monkeypod (*Samanea saman*), Formosan koa, Christmas berry, earpod tree, African tulip, and octopus tree (*Schefflera actinophylla*). Grass species and weedy ornamentals observed include Guinea grass, lovegrass, swollen fingergrass, yellow oleander (*Thevetia peruviana*), and pink hibiscus (*Hibiscus* sp.).

4.1.1 Listed Species and Critical Habitat

As stated above, no federally or state listed threatened, endangered, proposed listed, or candidate plant species were observed in the Study Area. No portion of the Study Area has been designated as critical habitat. The nearest designated plant critical habitat is O'ahu Lowland Wet Unit 09, which occurs approximately 2.5 miles northeast of the Study Area (Figure 5). This unit of critical habitat is currently occupied by 20 listed plant species and is considered by USFWS to be unoccupied critical habitat for 24 additional listed plant species (USFWS 2012).

4.2 Wildlife

4.2.1 Birds

Twenty-one bird species were recorded within the Study Area and immediate vicinity (Table 2). Red-vented bulbul (*Pycnonotus cafer*), warbling white-eye (*Zosterops japonicus*), and zebra dove (*Geopelia striata*) were the most common bird species recorded during the survey. Most of the bird species detected are non-native to the Hawaiian Islands and are commonly found in rural or agricultural areas. The Pacific golden-plover or kōlea (*Pluvialis fulva*), an overwintering migrant shorebird, was the only native bird species observed in the Study Area. The Pacific golden-plover is protected by the Migratory Bird Treaty Act (MBTA), along with several non-native birds listed in Table 2.

Table 2. Birds Detected in the Study Area and Immediate Vicinity

Common Name	Scientific Name	Status	MBTA
Cattle egret	<i>Bubulcus ibis</i>	NN	X
Chestnut munia	<i>Lonchura atricapilla</i>	NN	
Common myna	<i>Acridotheres tristis</i>	NN	
Common waxbill	<i>Estrilda astrild</i>	NN	
Gray francolin	<i>Francolinus pondicerianus</i>	NN	
House finch	<i>Haemorhous mexicanus</i>	NN	X
Japanese bush warbler	<i>Horornis diphone</i>	NN	
Northern cardinal	<i>Cardinalis cardinalis</i>	NN	X

Pacific golden-plover	<i>Pluvialis fulva</i>	M	X
Red-billed leiothrix	<i>Leiothrix lutea</i>	NN	
Red-crested cardinal	<i>Paroaria coronata</i>	NN	
Red-crowned parrot	<i>Amazona viridigenalis</i>	NN	
Red junglefowl	<i>Gallus gallus</i>	NN	
Red-vented bulbul	<i>Pycnonotus cafer</i>	NN	
Red-whiskered bulbul	<i>Pycnonotus jocosus</i>	NN	
Rose-ringed parakeet	<i>Psittacula krameri</i>	NN	
Scaly-breasted munia	<i>Lonchura punctulata</i>	NN	
Spotted dove	<i>Streptopelia chinensis</i>	NN	
Warbling white-eye	<i>Zosterops japonicus</i>	NN	
White-rumped shama	<i>Copsychus malabaricus</i>	NN	
Zebra dove	<i>Geopelia striata</i>	NN	

Status: M = Migrant, NN = non-native established species, MBTA = Migratory Bird Treaty Act

4.2.2 Mammals

Several non-native terrestrial mammalian species were detected during the survey. Cats (*Felis catus*), small Indian mongoose (*Herpestes javanicus*), dogs (*Canis lupus familiaris*), pigs (*Sus scrofa*) and a single black rat (*Rattus rattus*) were all observed within the Study Area. Although not observed, other introduced mammals, such as house mouse (*Mus musculus*), and other rat species (*Rattus spp.*), are likely to occur within the Study Area.

4.2.3 Invertebrates

Invertebrates incidentally observed during the wildlife surveys are listed in Table 3. Of these, only the globe skimmer (*Pantala flavescens*) is native to the Hawaiian Islands. This dragonfly is common in Hawai'i.

Table 3. Invertebrates Recorded in the Study Area During the Survey

Common Name	Scientific Name	Status
Dog dung fly	<i>Musca sorbens</i>	NN
Globe skimmer	<i>Pantala flavescens</i>	I
Gray bird grasshopper	<i>Schistocerca nitens</i>	NN
Gulf fritillary	<i>Agraulis vanillae</i>	NN
Katydid	<i>Tettigoniidae sp.</i>	NN
Mosquito	<i>Culicidae sp.</i>	NN
Orange giant sulphur	<i>Phoebeis agarithe</i>	NN
Oriental flower beetle	<i>Proteatia orientalis</i>	NN
Western honeybee	<i>Apis mellifera</i>	NN
Yellow garden spider	<i>Argiope aurantia</i>	NN

Status: I = Indigenous, NN = non-native established species.

4.2.4 Listed Species and Critical Habitat

No federally or state listed threatened, endangered, proposed listed, or candidate wildlife species were observed in the Study Area. However, several listed species have the potential to occur within or traverse over the Study Area. These species are discussed below.

No portion of the Study Area has been designated as critical habitat. The nearest designated critical habitat is O'ahu 'elepaio (*Chasiempis ibidis*) Unit 3, which occurs approximately 1.8 miles northeast of the Study Area (Figure 5). This unit of critical habitat is currently occupied by O'ahu 'elepaio, but the population in the central Ko'olau region is sparsely distributed and the number of birds is smaller than in more dense populations found elsewhere on O'ahu (USFWS 2006). No O'ahu 'elepaio populations are known to occur within or immediately adjacent to the Study Area.

4.2.4.1 Hawaiian Hoary Bat

The Hawaiian hoary bat or 'ōpe'ape'a is the only extant native land mammal present in the Hawaiian archipelago. It is federally and state listed as endangered due to apparent population declines and a lack of knowledge concerning its distribution, abundance, and habitat needs (USFWS 1998). Recent studies have found that this species is more abundant across the Hawaiian Islands than previously believed (USGS 2019). It is widely distributed across the Hawaiian Islands, with breeding populations known to occur on O'ahu, Maui, Moloka'i, Kaua'i and Hawai'i Island (Gorresen et al. 2013, Bonaccorso et al. 2015).

Hawaiian hoary bats are tree-roosting bats and roost in native and non-native vegetation, including 'ōhi'a (*Metrosideros polymorpha*), hala (*Pandanus tectorius*), coconut palms (*Cocos nucifera*), kukui (*Aleurites moluccana*), kiawe (*Prosopis pallida*), avocado (*Persea americana*), mango (*Mangifera indica*), shower trees (*Cassia javanica*), pūkiawe (*Leptecophylla tameiameiae*), ironwood (*Casuarina equisetifolia*), macadamia (*Macadamia* spp.), and fern clumps (USFWS 1998, Mitchell et al. 2005, Gorresen et al. 2013). Hawaiian hoary bats are primarily solitary roosters; however, mothers and pups roost together with young left alone in roost trees during maternal foraging (USFWS 1998). Foraging occurs in open and semi-cluttered landscapes in a wide range of habitats and vegetation types, including open pastures, forest gaps and edges, and above forest canopies (Bonaccorso et al. 2015). Hawaiian hoary bats feed at night on a variety of night-flying insects, primarily aerial beetles and moths (Todd 2012).

As part of an island-wide occupancy and distribution study, WEST Consultants, Inc. (WEST) operates bat detectors across O'ahu (June 2017–present); the nearest detectors to the Study area are listed in Table 4. The closest detector, Site-109 (Central Oahu Park), is approximately 1.1 miles to the southwest. This bat detector has operated for approximately 65 percent of detector nights (550 active nights/851 total nights) and has a mean detection rate of 0.0164 detections per detector night. The detection rate at this detector (as well as other nearby detectors) is relatively low in comparison to other detector sites on O'ahu (WEST 2020).

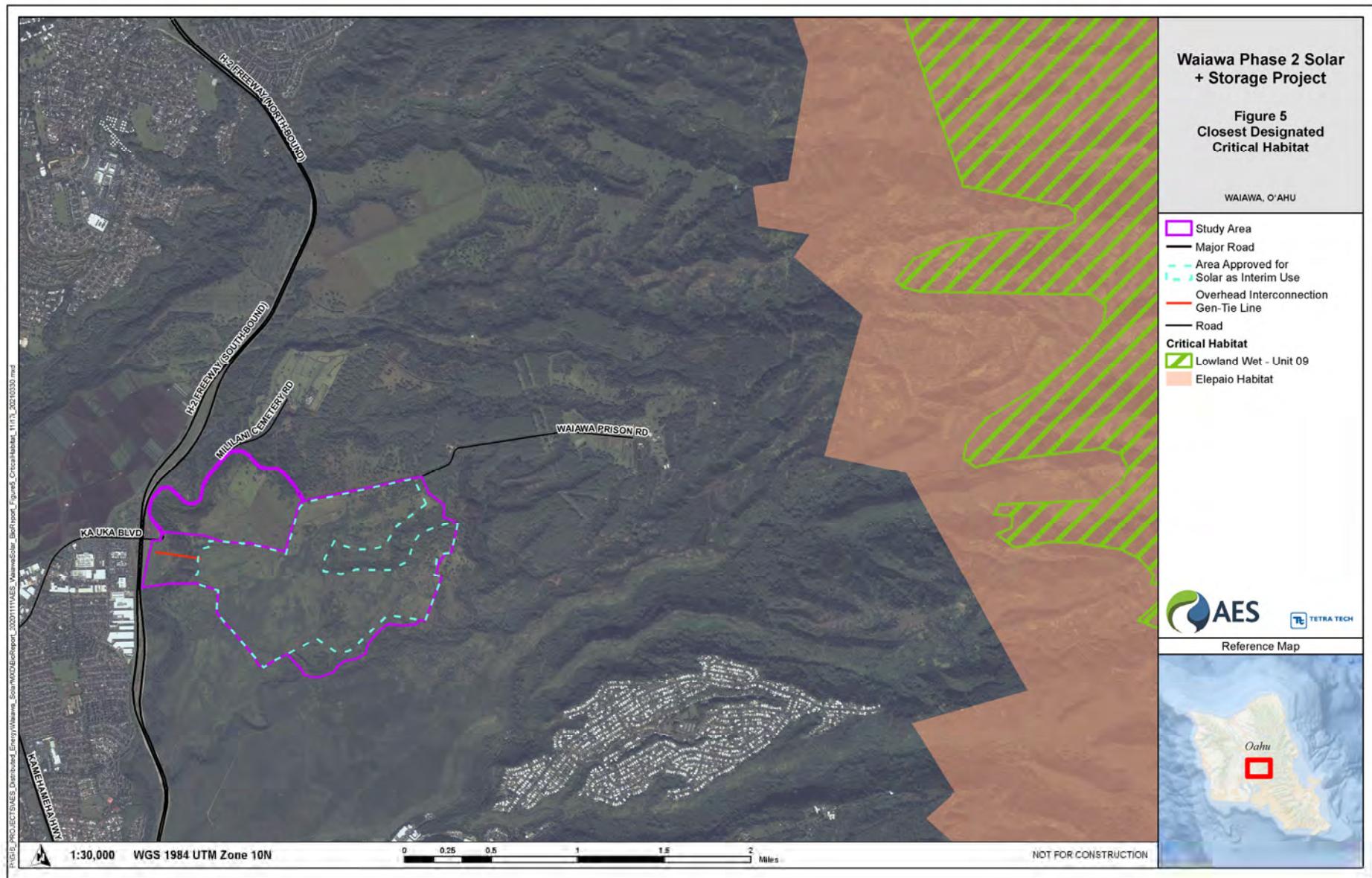
Figure 5. Closest Designated Critical Habitat

Table 4. Hawaiian Hoary Bat Activity Rates at Nearby Bat Detectors

Site ID	Distance and Bearing from Study Area	Site Name	Detections	Nights with Detections	Detector Nights	Mean Detections Per Detector Night	Proportion of Detector Nights with Detections
Site-109	1.8 km (1.1 mi) SW	Central Oahu Park	9	9	550	0.0164	0.0164
Site-043	4.0 km (2.5 mi) E	Manana Trail 1	2	2	800	0.0025	0.0025
Site-031	5.0 km (3.1 mi) SW	Plantation Village	4	4	737	0.0054	0.0054

Although not observed during the biological survey, the Hawaiian hoary bat may transit, forage, or roost in the Study Area. Many of the trees within the Study Area (e.g., paperbark, ironwood, Chinese banyan) are over 15 feet tall and have the potential to function as bat roost trees, as well as provide edge habitat that bats could use for foraging. These trees primarily occur within the Mixed Non-Native Forest along Pānakauahi Gulch, as well as sporadically in the other drainages within and adjacent to the Study Area.

4.2.4.2 Pueo

The pueo or Hawaiian short-eared owl is a bird of prey listed as endangered by the State of Hawai‘i on the island of O‘ahu, but is not a federally listed species. It is a culturally significant endemic subspecies of the widespread short-eared owl (*Asio flammeus*) and is believed to have colonized the Hawaiian Islands after the arrival of Polynesians (Price and Cotín 2018). Threats to the pueo include loss and degradation of habitat, predation by introduced mammals, and disease; other concerns relate to pesticides and other contaminants, food shortages, nest predation, and human interaction such as vehicle strikes (Pueo Project 2019).

Pueo are found on all of the main Hawaiian Islands, at elevations ranging from sea level to 8,000 feet. On O‘ahu they occupy a variety of habitats, including agricultural lands, grasslands, wetlands, shrublands, and native forests. It is suggested their habitat use may be influenced by food availability (Price and Cotín 2018). Pueo are active during the day, with increased activity levels at dawn and dusk, and are commonly seen hovering or soaring over open areas. There is little known about the breeding biology of this species, but their nests have been found throughout the year. Nests placed on the ground are made of scrapes lined with grasses and feather down (Price and Cotín 2018, Mitchell et al. 2005).

No pueo were observed in the Study Area during the general biological surveys or during the pueo specific surveys conducted on November 2, 2020, January 14, and February 10, 2021 (Appendix C). The nearest known pueo observation relative to the Study Area is approximately 1.5 miles east in non-native forest habitat (Price and Cotín 2018). Based on consultation with DOFAW biologists and Pueo Project researchers regarding the survey results and previous pueo detections in the vicinity, Tetra Tech concluded that pueo are not likely to regularly use the Study Area as they were not detected during any of the pueo-specific surveys (A. Siddiqui/DOFAW, pers. comm., October 2019; C. Wilhite/Pueo Project,

pers. comm., March 2021). Furthermore, based on current knowledge of the species biology, the tall stands of Guinea grass that occur throughout a majority the Study Area are not expected to be good nesting or foraging habitat (Price and Cotín 2018).

4.2.4.3 Seabirds

Federally and state listed seabird species that occur in Hawai‘i include the Hawaiian petrel or ‘ua‘u (*Pterodroma sandwichensis*) and Newell’s shearwater or a‘o (*Puffinus newelli*), which are collectively referred to as seabirds. Hawaiian petrel is federally and state listed as endangered, and Newell’s shearwater is federally and state listed as threatened.

Hawaiian petrels are known to breed on Kaua‘i, Maui, Hawai‘i, Lāna‘i, and possibly Moloka‘i and Kaho‘olawe (Pyle and Pyle 2017, Mitchell et al. 2005). Although previously thought to be extirpated from O‘ahu, this species was recently detected on the windward slopes of Mt. Ka‘ala (Young et al. 2019) and appear to be regularly prospecting for nesting sites and potentially breeding on O‘ahu (Pacific Rim Conservation 2019). Hawaiian petrels spend most of their life at sea and return to land to breed (March to December). During the non-breeding season, they are found far offshore, primarily in equatorial waters of the eastern tropical Pacific. They nest in colonies, returning to the same nest site each year. Colonies are typically located in high elevation, xeric habitats or wet, dense forests. Nesting occurs in burrows, crevices, or cracks in lava tubes (Mitchell et al. 2005).

Newell’s shearwaters breed primarily on Kaua‘i, but small populations breed on Maui and Hawai‘i (Ainley et al. 2020). The species also possibly breeds on Moloka‘i and was recently detected in two locations on O‘ahu—one on the leeward slopes of Mount Ka‘ala in the Wai‘anae Mountains and another at Poamoho in the Ko‘olau Mountains (KESRP 2019, Young et al. 2019). Evidence suggests Newell’s shearwaters are regularly prospecting for nesting sites and potentially breeding on O‘ahu (Pacific Rim Conservation 2019). Similar to the Hawaiian petrel, this species remains at sea during the non-breeding season. Breeding colonies are typically located on steep mountain slopes and cliffs, with nesting in burrows, generally beneath ferns and tree roots. During the breeding season (April–November), adults forage at sea during the day and return to the colony to tend chicks and eggs at night (KESRP 2019, Ainley et al. 2020).

Hawaiian seabirds have not been documented in the Study Area and suitable nesting habitat does not occur in the area. However, suitable nesting habitat may exist in upper elevations of the Wai‘anae Mountains and northern Ko‘olau Mountains, suggesting the potential for these birds to fly over the area at night while transiting between colonial nest sites and the ocean. These seabirds may be attracted and disoriented by construction lights at night. Disorientation and fallout as a result of light attraction could occur for individuals attracted to nighttime construction lighting and unshielded nighttime facility lighting. Juvenile birds are particularly vulnerable to light attraction, and grounded birds are vulnerable to mammalian predators or vehicle strikes (Rodríguez et al. 2017).

4.2.4.4 Hawaiian Waterbirds

Listed waterbird species that occur on O'ahu include ae'o or Hawaiian stilt (*Himantopus mexicanus knudseni*), 'alea kea or Hawaiian coot (*Fulica alai*), and 'alae 'ula or Hawaiian common gallinule (*Gallinula galeata sandvicensis*). Listed Hawaiian waterbirds are found primarily in and around fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found in upland fields, and where ephemeral or persistent standing water may occur (Kawasaki et al. 2019). No listed waterbirds or suitable habitat were observed in the Study Area. As discussed in the following section, no standing water was documented within any portion of the Study area, including the mapped water features shown in Figure 3.

At some solar facilities in the continental U.S., water-dependent birds (such as grebes, loons, rails, coots, shorebirds, and waterfowl) have been documented as colliding with photovoltaic arrays (Kosciuch et al. 2020). It has been hypothesized that some waterbirds may perceive the panel arrays to be bodies of water and collide with the panels while attempting a water landing (Kagan et al. 2014, WEST 2014, Walston et al. 2016); this hypothesis has been termed the “lake effect”. However, no studies have found a causal link for the source of waterbird mortalities observed in the continental U.S. More research is needed to investigate whether water-dependent birds are attracted to solar panel arrays, and if proximity to water sources or other factors relate to avian mortality at the facilities (Walston et al. 2016, Kosciuch et al. 2020).

Listed waterbird species that occur in Hawai'i have not been documented to collide with photovoltaic arrays. Hawai'i currently has over 1,000 MW of installed solar (HECO 2020, KIUC 2021) and utility-scale solar has existed in Hawai'i since 2008; yet there are no public records indicating endangered birds are colliding with solar panel arrays in Hawai'i. Waterbird activity and abundance varies regionally and may result in variation in avian mortality risk across different landscapes. There have been no reports to date of the “lake effect” from operating solar facilities in Hawai'i or information to indicate listed birds are colliding with solar panel arrays in Hawai'i.

4.3 Potential Waters of the U.S.

Pānakauahi Gulch, a tributary to Waiawa Stream, is the only potential perennial stream identified within the Study Area during the biological survey; it falls mostly outside the western boundary of the Study Area. Based on the preliminary design, the Project would require the overhead electrical lines that would connect with Hawaiian Electric's electrical grid to span Pānakauahi Gulch. During the biological survey, the rocky water-worn stream was dry and is presumed to only flow during heavy rain events (see Photos 9 and 10; Appendix A). However, given the connection to Waiawa Stream and the navigable waters of Pearl Harbor, this feature could be considered a jurisdictional Waters of the U.S. under the NWPR.

A variety of smaller gulches and drainages were observed in the Study Area, including features traversing the northern and eastern portions of the Study Area, all of which appear to have been utilized for transporting water for agricultural purposes. Sections of these features are lined with concrete

and/or stone (see Photo 11; Appendix A). The NWPR does not consider ditches to be jurisdictional unless the ditch “relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland” and “as long as the ditch is perennial or intermittent and contributes surface water flow to a traditional navigable water or territorial sea in a typical year” (USACE and EPA 2020).

No standing water or other surface hydrology indicators were observed in either of the two areas identified as NWI wetland polygons within the Study Area, nor did either of these areas support obligate or facultative wetland species (see Photo 12; Appendix A). These areas are believed to be former impoundments that were previously used as part of the agricultural irrigation system. While the initial surface observations during the biological survey do not suggest these areas are currently jurisdictional wetlands, these observations do not constitute a formal field determination or delineation.

A jurisdictional waters survey was subsequently conducted by AECOS, Inc. in November 2020 (AECOS 2021) and submitted to the USACE in May 2021. The results of this survey and the USACE’s determination is summarized in Section 5.3.

5.0 Conclusions and Recommendations

As described in Section 4, the majority of the plants and animals observed in the Study Area are introduced species that are non-native to the Hawaiian Islands. No federally or state listed wildlife species were observed during the biological surveys. However, several listed wildlife species have the potential to occur in or transit through the Study Area. Recommended measures to avoid and minimize impacts to federally and state listed species that could occur in or transit through the Study Area, as well as other native species, are outlined below.

5.1 Plants

Overall, the vegetation in the Study Area is disturbed from previous and current land use activities. The majority of the plant species recorded in the Study Area (over 95 percent) are not native to the Hawaiian Islands. No listed plants were seen during the survey, and the vegetation types and species identified are not considered unique. Regardless, the following measures are recommended to avoid and minimize potential impacts of the Project:

- If landscaping is installed as part of the Project, use non-invasive plants and incorporate native plant species to the maximum extent practicable.
- Although non-native weedy species are common in the Study Area, implement invasive species minimization measures to avoid the unintentional introduction or transport of new invasive species to the area. This includes utilizing on-site gravel, rock, and soil (or purchasing from a local supplier) when practicable; utilizing certified, weed-free seed mixes; and washing construction equipment and/or visually inspecting for excessive debris, plant materials, and invasive or harmful non-native species, as appropriate.
- To minimize spread of the fungal pathogen responsible for Rapid ‘Ōhi‘a Death (CTAHR 2020), follow the most recent Rapid ‘Ōhi‘a Death decontamination protocols recommended by USFWS and DOFAW.

5.2 Wildlife

Nearly all the animal species recorded in the Study Area are not native to the Hawaiian Islands. Tetra Tech recommends the following general measures to avoid and minimize potential impacts to listed wildlife species:

- Establish a wildlife education and observation program for all construction and operational personnel. Staff should be trained to identify listed wildlife that may be found on-site (including Hawaiian hoary bat, Hawaiian seabirds, Hawaiian waterbirds, and pueo) and to take appropriate steps if listed wildlife species are found.
- If downed listed species are observed at the Project, notify USFWS and DOFAW.
- Implement speed limits on site to reduce the risk of collision to listed wildlife.

5.2.1 Hawaiian Hoary Bat

The USFWS (2019) provides the following avoidance and minimization measures for the Hawaiian hoary bat:

- Avoid trimming or removing woody vegetation (trees or shrubs) taller than 15 feet between June 1 and September 15, when juvenile bats are not yet capable of flying and may be roosting in the trees, resulting in the potential to be impacted.
- To prevent entanglement, do not use barbed wire for fencing.

Tetra Tech recommends that if some trimming or removing woody vegetation taller than 15 feet is necessary between June 1 and September 15, consult with USFWS and DOFAW to ensure impacts to the Hawaiian hoary bat are avoided.

5.2.2 Pueo

Pueo were not observed in the Study Area during the general biological survey or the three pueo specific surveys. Based on consultation with DOFAW biologists and Pueo Project researchers, Tetra Tech concluded that pueo are not likely to regularly use the Study Area as they were not detected during any of the pueo-specific surveys. However, should this species occur within the Study Area, it could be impacted by construction activities. Tetra Tech recommends the following avoidance and minimization measures for this species:

- Prior to clearing vegetation or ground-disturbing activities with heavy machinery in areas of suitable nesting habitat within the Project area, pre-construction pueo surveys should be conducted by a qualified biologist to improve confidence that pueo are not nesting in the area.
- If a pueo is observed in the Project area at any time (prior to construction, during construction, or during operation), all activities in the immediate vicinity should stop immediately. The location of the bird should be reported to a designated representative, and a qualified biologist should check the area for the presence of a pueo nest.
- If a ground nest or a pueo nesting on the ground is observed at any time (prior to construction, during construction, or during operation), a 100-foot buffer should be established around the nest and marked in the field by a qualified biologist. DOFAW should be contacted immediately. If the nest is confirmed as a pueo nest, no work should occur in the buffer until pueo nesting is complete.

5.2.3 Seabirds

The Study Area does not provide suitable nesting or foraging habitat for the listed Hawaiian seabirds. However, seabirds may fly over the Study Area in transit between the ocean and upland breeding sites during the breeding, nesting and fledging seasons (March 1–December 15) and may be attracted to nighttime lighting. Tetra Tech recommends the following measures to avoid and minimize potential impacts to listed seabirds:

- Restrict construction activity to daylight hours during the seabird peak fallout period (September 15–December 15) and avoid the use of nighttime lighting that could attract seabirds.
- If nighttime construction cannot be avoided, construction lighting should be shielded and directed downward and fit with non-white lights if construction safety is not compromised, to minimize the attractiveness of construction lights to seabirds.
- If nighttime construction is required during the seabird peak fallout period, a biological monitor should be present in the construction area from approximately 0.5-hour before sunset to 0.5-hour after sunrise to watch for the presence of seabirds. If the biological monitor observes a seabird, and the seabird appears affected by the lighting, the monitor should notify the construction manager to reduce or turn off construction lighting until the individual(s) move out of the area.
- For operational onsite lighting, use fixtures that are shielded and directed downward to prevent upward radiation, triggered by a motion detector, and fitted with non-white light bulbs to the extent possible. Lighting should be situated so that light does not shine on and reflect off the solar panels.
- Minimize construction of overhead lines to reduce the collision risk for seabird species.

5.2.4 Listed Waterbirds

The Study Area does not provide suitable nesting or foraging habitat for listed Hawaiian waterbirds. Listed waterbirds may fly through the Study Area in transit to and from other areas or forage in the Study Area in the event of temporary flooding. If these species land within the Study Area, they could be impacted by construction and operation activities. Tetra Tech recommends the following avoidance measures:

- Avoiding creating areas with standing water. Design stormwater retention areas to drain within 48 hours of end of a storm event and keep retention areas free of emergent vegetation, to avoid attracting listed waterbirds.
- If listed waterbirds are found in the Project area during active construction, cease all activities within 100 feet of the bird(s) and do not approach the bird(s). A qualified biologist should conduct Hawaiian waterbird nest surveys where appropriate habitat occurs. Repeat surveys within 3 days of starting work and after any subsequent delay of 3 or more days (during which birds may attempt nesting). If a nest of a listed waterbird is not discovered, work may continue after the listed waterbird leaves the area of its own accord. If a nest of a listed waterbird is discovered, contact USFWS and DOFAW, and establish a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Potentially disruptive activities or habitat alteration should not be conducted within this buffer.

5.3 Potential Waters of the U.S.

The regulatory requirements under the NWPR differ from that under the previous 2015 Clean Water Rule (USACE and EPA 2015) as well as subsequent recodification of pre-2015 regulations (USACE and EPA 2008, USACE and EPA 2019). Notably, the NWPR does not consider ephemeral streams or wetlands isolated from other surface waters as jurisdictional. Furthermore, the NWPR does not consider ditches jurisdictional unless the ditch “relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland” and “as long as the ditch is perennial or intermittent and contributes surface water flow to a traditional navigable water or territorial sea in a typical year” (USACE and EPA 2020). Based on the current regulatory framework and initial observations of features within the Study Area, Tetra Tech recommended a formal delineation and determination of Waters of the U.S. be conducted for the streams, NWI wetland polygons, and ditches identified in the Study Area.

Based on this recommendation, a jurisdictional waters survey was conducted by AECOS, Inc. in November 2020. Consistent with the findings of the biological survey, the jurisdictional waters survey concluded that Pānakauahi Gulch has intermittent flow and therefore is subject to regulation by USACE under the Clean Water Act (AECOS 2021); no other jurisdictional waters occur within the Study Area. Based on the understanding that the overhead electrical lines would span Pānakauahi Gulch, with no fill placed below the ordinary high water mark, the Project would not require authorization from the USACE. These conclusions were confirmed in a USACE letter dated July 20, 2021.

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APPENDIX A

REPRESENTATIVE PHOTOGRAPHS OF THE

WAIAWA PHASE 2 SOLAR + STORAGE STUDY AREA

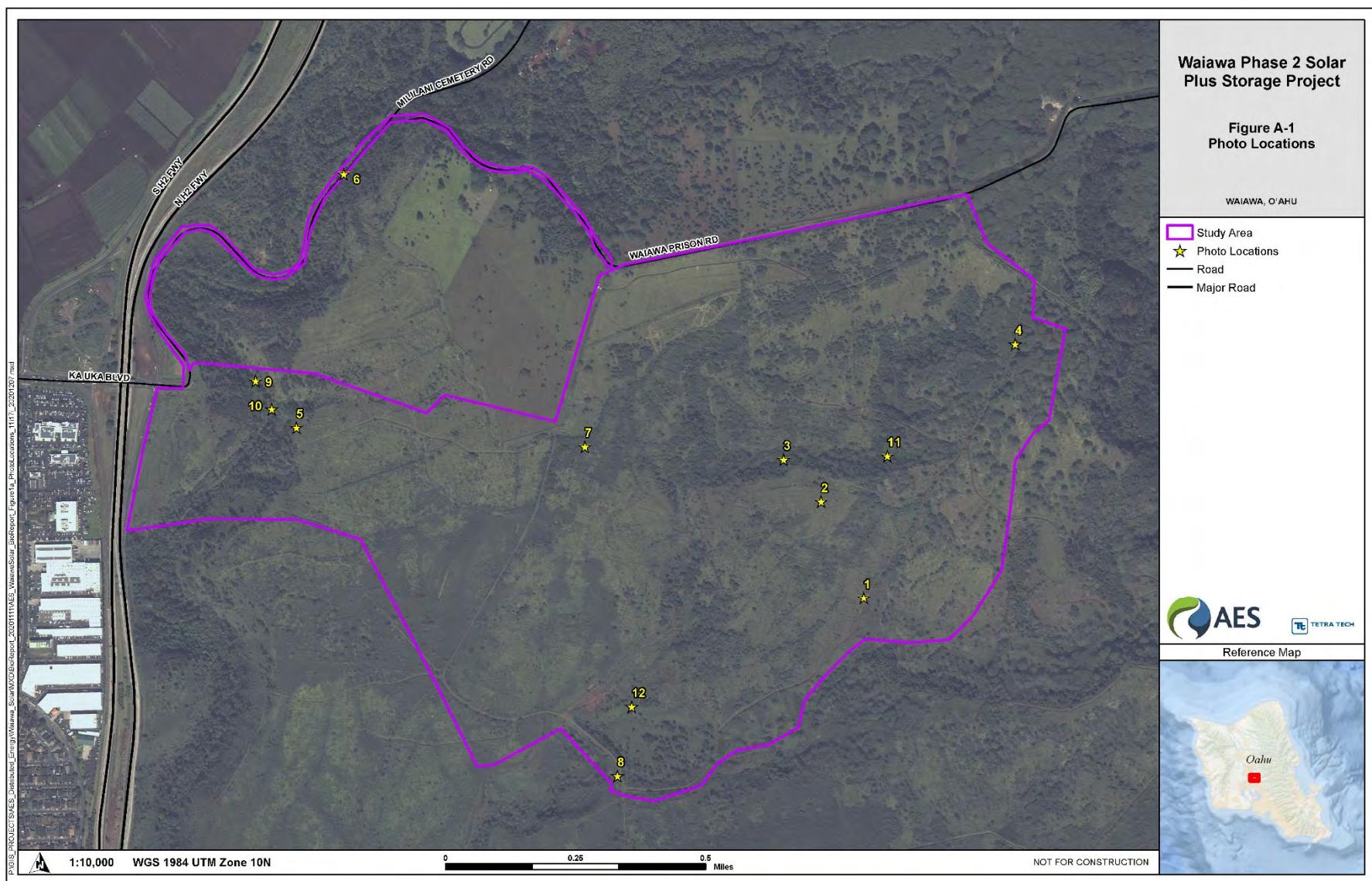




Photo 1. Representative koa haole (*Leucaena leucocephala*) scrub habitat with guinea grass (*Urochloa maxima*) understory (looking west); December 2020.



Photo 2. Representative non-native grassland habitat (looking west); December 2020.



Photo 3. Representative mixed non-native forest habitat found primarily within the gulches in the Study Area; December 2020.



Photo 4. Representative albizia (*Falcataria moluccana*) forest habitat (looking north); December 2020.



Photo 5. Representative habitat within Pānakauahi Gulch (looking west); December 2020.



Photo 6. Mixed non-native forest along the northern access route (Mililani Cemetery Road, looking east); December 2020.



Photo 7. View of habitat within Study Area, looking east from pueo survey point #1; December 2020.



Photo 8. View of habitat within Study Area, looking northwest from pueo survey point #2; December 2020.



Photo 9. Dry streambed within Pānakauahi Gulch (looking downstream to the southeast); December 2020.



Photo 10. Evidence of previous flow within Pānakauahi Gulch; December 2020.



Photo 11. Example of a concrete and stone lined ditch found within the Study Area; December 2020.



Photo 12. NWI-mapped freshwater forested/shrub wetland (looking southwest). No standing water or hydrophytic plant species were observed; December 2020.

APPENDIX B

LIST OF PLANT SPECIES OBSERVED DURING SURVEYS OF THE WAIAWA PHASE 2 SOLAR + STORAGE STUDY AREA

Table B-1 provides a list of plant species observed in the Study Area on October 5, 6, 7 and 10, 2020. The plant names are arranged alphabetically by family and then by species into three groups: Pteridophytes, Monocots, and Dicots. The taxonomy and nomenclature of flowering plants are in accordance with Wagner et al. (1999, 2012), Wagner and Herbst (2003), Imada (2012), and Staples and Herbst (2005). If no common or Hawaiian name is known, only the scientific name is provided.

Status:

- E = endemic = native only to the Hawaiian Islands
- I = indigenous = native to the Hawaiian Islands and elsewhere
- P = Polynesian = introduced by Polynesians
- X = introduced/ non-native = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact (Cook's arrival in the islands in 1778)

Table B-1. List of Plant Species Observed During Surveys for the Waiawa Phase 2 Solar + Storage Project

Scientific Name and Authorship	Hawaiian/Common Name	Status
PTERIDOPHYTES		
Nephrolepidaceae		
<i>Phlebodium aureum</i> (L.) J.Sm.	Iaua'e haole	X
<i>Nephrolepis brownii</i> (Desv.) Hovenkamp&Miyam	Asian sword fern	X
Polypodiaceae		
<i>Phymatosorus grossus</i> (Langsd.&Fisch.) Brownlie	Iaua'e	X
Pteridaceae		
<i>Cheilanthes viridis</i> (Forssk.) Sw.	green cliff brake	X
MONOCOTS		
Aloeaceae		
<i>Aloe vera</i> (L.) Burm.f.	aloe vera	X
Poaceae		
<i>Chloris barbata</i> Sw.	swollen fingergrass	X
<i>Chloris radiata</i> (L.) Sw.	radiate fingergrass	X
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	X
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	X
<i>Eragrostis amabilis</i> (L.) Wight & Arn.	lovegrass	X
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	X
<i>Urochloa maxima</i> (Jacq.) R.D.Webster	Guinea grass	X
DICOTS		
Acanthaceae		
<i>Asystasia gangetica</i> (L.) T.Anderson	Chinese violet	X
Amaranthaceae		
<i>Alternanthera pungens</i> Kunth	khaki weed	X

Scientific Name and Authorship	Hawaiian/Common Name	Status
<i>Amaranthus spinosus</i> L.	spiny amaranth	X
<i>Amaranthus viridus</i> L.	slender amaranth	X
Anacardiaceae		
<i>Mangifera indica</i> L.	mango	X
<i>Schinus terebinthefolius</i> Raddi	Christmas berry	X
Apocynaceae		
<i>Thevetia peruviana</i> (Pers.) K.Schum.	be-still tree, yellow oleander	X
Araliaceae		
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	X
Asteraceae		
<i>Ageratum conyzoides</i> L.	maile honohono	X
<i>Bidens alba</i> L.		X
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	X
<i>Sphagneticola trilobata</i> (L.) Pruski	wedelia	X
Boraginaceae		
<i>Carmona retusa</i> (Vahl) Masamune	Fukien-tea	X
<i>Heliotropium procumbens</i> Mill. var. <i>depressum</i> (Cham.)Fosberg	—	X
Bignoniaceae		
<i>Spathodea campanulata</i> P.Beauv.	African tulip tree	X
Caricaceae		
<i>Carica papaya</i> L.	papaya	X
Casuarinaceae		
<i>Casuarina equisetifolia</i> L.	ironwood	X
Clusiaceae		
<i>Clusia rosea</i> Jacq.	autograph tree	X
Convolvulaceae		
<i>Ipomoea obscura</i> (L.) Ker Gawl.	morning glory	X
Cucurbitaceae		
<i>Momordica charantia</i> L.	balsam pear, bitter melon	X
Euphorbiaceae		
<i>Aleurites moluccana</i> (L.) Willd.	kukui	X
<i>Euphorbia hirta</i> L.	hairy spurge	X
<i>Euphorbia hypericifolia</i> L.	graceful spurge	X
<i>Euphorbia hyssopifolia</i> L.	spurge	X
<i>Macaranga tanarius</i> (L.) Mull.Arg.		X
<i>Ricinus communis</i> L.	castor bean	X

Scientific Name and Authorship	Hawaiian/Common Name	Status
Fabaceae		
<i>Acacia confusa</i> Merr.	Formosan koa	X
<i>Acacia farnesiana</i> (L.) Wild.	klu	X
<i>Canavalia cathartica</i> Thouars	maunaloa	X
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	X
<i>Desmanthus pernambucanus</i> (L.) Thell.	slender mimosa	X
<i>Desmodium incanum</i> DC.	Spanish clover	X
<i>Enterolobium cyclocarpum</i> (N.Jacq.) Grisb.	earpod tree	X
<i>Falcataria moluccana</i> (Micq.) Barneby&Grimes	albizia	X
<i>Indigofera suffruticosa</i> Mill.	indigo	X
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole	X
<i>Mimosa pudica</i> L.	sensitive plant	X
<i>Neonotonia wightii</i> (Wight & Arnott) Lackey	glycine vine	X
<i>Pithecellobium dulce</i> (Roxb.) Benth	'opiuma	X
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	X
Lamiaceae		
<i>Hyptis pectinata</i> (L.) Poit.	comb hyptis	X
Lauraceae		
<i>Cinnamomum burmanii</i> (Nees) Blume	padang cassia	X
<u>Malvaceae</u>		
<i>Hibiscus</i> cultivar	pink hibiscus	X
<i>Hibiscus tiliaceus</i> L.	hau	I?
<i>Sida ciliaris</i> L.	—	X
<i>Sida rhombifolia</i> L.	—	X
Meliaceae		
<i>Melia azederach</i> L.	chinaberry	X
Moraceae		
<i>Ficus microcarpa</i> L.f.	Chinese banyan	X
Myrtaceae		
<i>Melaleuca quinquenervia</i> (Cav.) S.T.Blake	paperbark	X
<i>Psidium guajava</i> L.	guava	X
<i>Syzygium cumini</i> (L.) Skeels	java plum	X
Nyctaginaceae		
<i>Boerhavia coccinea</i> Mill.	—	X
Passifloraceae		
<i>Passiflora edulis</i> Sims	passion fruit, lilikoi	X
<i>Passiflora foetida</i> L.	love in a mist	X

Scientific Name and Authorship	Hawaiian/Common Name	Status
<i>Passiflora suberosa</i> L.	huehue haole	X
Phytolaccaceae		
<i>Rivina humilis</i> L.	coral berry	X
Piperaceae		
<i>Peperomia blanda</i> var. <i>floribunda</i> Kunth	'ala'ala wainui	I
Pittosporaceae		
<i>Pittosporum pentandrum</i> (Blanco) Merr.	--	X
Proteaceae		
<i>Grevillea robusta</i> A.Cunn. ex R.Br.	silk oak	X
Sapotaceae		
<i>Chrysophyllum oliviforme</i> L.	satin leaf	X
Solanaceae		
<i>Solanum americanum</i> Mill.	pōpolo	I?
<i>Solanum seaforthianum</i> Andrews	vining solanum	X
Sterculiaceae		
<i>Waltheria indica</i> L.	'uhaloa	I
Verbenaceae		
<i>Stachytarpheta australis</i> Moldenke	--	X
<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Jamaican vervain	X

APPENDIX C

PUEO SURVEY DATASHEETS



Pueo Project Survey Datasheet 2017



Site : Waiawa GPS point: Site #1 GPS coordinates: (D.ddddd, -D.ddddd) 0605133, 2370128

Date: 11-2-20 Visit # (1, 2 or 3): 1 Survey Start Time: 4:30p Survey Stop Time: 6:25p Observers: Philip Taylor

Temperature: 80°F Cloud cover (Clear, PC, MC, Cloudy): Clear Rain: Ø Wind (0-7): 3

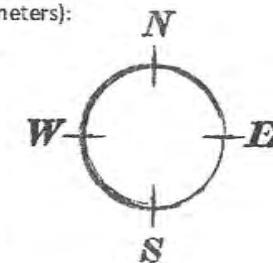
Detection start time	Detection end time	Number	Initial distance	Initial direction	Sounds	Behavior	Habitat

% Habitat w/in 400 m or surveyed area (must be 100%):

Developed	Wetland	Agricultural Crops	Agricultural Dirt	Grasslshort Grazed	Grasslshort Golf	Grasslshort Mowed
Ø	Ø	Ø	Ø	Ø	Ø	Ø
Grassland Fallow	Grasslands Tall >75cm	Shrublands	Non Native Forest	Native Forest	Other	Total
Ø	60	Ø	40	Ø	Ø	100

Surveyed area (max visible meters):

N: 40 S: 200
NE: 300 SW: 50
E: 500 W: 100
SE: 10 NW: 50



Observations: Birds spp: Rose-ringed parakeet, Common myna, Japanese white-eye, Red-crested cardinal, Red-vented bulbul, Red-whiskered bulbul, Japanese bush-warbler, white-rumped shama, chestnut munia, common waxbill, cattle egret, pacific golden-plover,



Pueo Project Survey Datasheet 2017



605511 2369287

Site: Waiau Solar GPS point: #2 GPS coordinates: (D.ddddddd, -D.ddddddd) 21.422827 -157.981921

Date: 11/21/20 Visit # (1, 2 or 3): 1 Survey Start Time: 4:28 Survey Stop Time: 6:18 Observers: J. Dutton

Temperature: 80° Cloud cover (Clear, PC, MC, Cloudy): Clear Rain: None Wind (0-7): 2 from NE

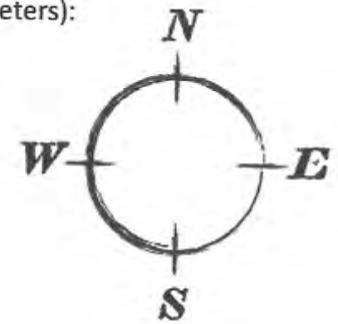
Detection start time	Detection end time	Number	Initial distance	Initial direction	Sounds	Behavior	Habitat
—	—	—	—	—	—	—	—

% Habitat w/in 400 m or surveyed area (must be 100%):

Developed	Wetland	Agricultural Crops	Agricultural Dirt	Grasslshort Grazed	Grasslshort Golf	Grasslshort Mowed
Grassland Fallow	Grasslands Tall >75cm	Shrublands	Non Native Forest	Native Forest	Other	Total
		30%	70%			100%

Surveyed area (max visible meters):

N: 100ft	S: 100ft
NE: 200ft	SW: 100ft
E: 100ft	W: 100ft
SE: 100ft	NW: 100ft



Observations: No detections



Pueo Project Survey Datasheet 2017



24

Site: Waiauna GPS point: #1 GPS coordinates: {D.ddddddd, -D.ddddddd} 605133 2370128
 Date: 1-14-21 Visit # (1, 2 or 3): 2 Survey Start Time: 4:45PM Survey Stop Time: 6:35PM Observers: Phil Taylor
 Temperature: 78°F Cloud cover (Clear, PC, MC, Cloudy): Clear Rain: No Wind (0-7): 1

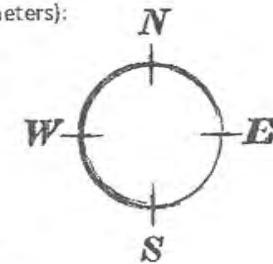
Detection start time	Detection end time	Number	Initial distance	Initial direction	Sounds	Behavior	Habitat

% Habitat w/in 400 m or surveyed area (must be 100%):

Developed	Wetland	Agricultural Crops	Agricultural Dirt	Grasslshort Grazed	Grasslshort Golf	Grasslshort Mowed
/	/	/	/	/	/	/
Grassland Fallow	Grasslands Tall >75cm	Shrublands	Non Native Forest	Native Forest	Other	Total
/	80%	/	20%	/	/	100%

Surveyed area (max visible meters):

N: 100	S: 100
NE: 300	SW: 20
E: 500	W: 50
SE: 20	NW: 20





Pueo Project Survey Datasheet 2017



605511 2369287

Site: Waiaawa Solar GPS point: #2 GPS coordinates: (D.dddddd, -D.dddddd) 21.422827 -157.981921

Date: 1/14/21 Visit # (1, 2 or 3): 2 Survey Start Time: 4:30pm Survey Stop Time: 6:38 Observers: J.Button

Temperature: 80 Cloud cover (Clear, PC, MC, Cloudy): PC Rain: None Wind (0-7): 0-2 from East

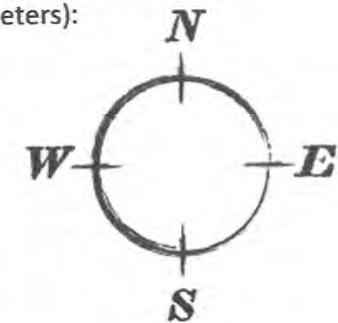
Detection start time	Detection end time	Number	Initial distance	Initial direction	Sounds	Behavior	Habitat
—	—	—	—	—	—	—	—

% Habitat w/in 400 m or surveyed area (must be 100%):

Developed	Wetland	Agricultural Crops	Agricultural Dirt	Grasslshort Grazed	Grasslshort Golf	Grasslshort Mowed
Grassland Fallow	Grasslands Tall >75cm	Shrublands	Non Native Forest	Native Forest	Other	Total
		30%	70%			100%

Surveyed area (max visible meters):

N: 1000+ S: 100
NE: 200 SW: 1000+
E: 100 W: 1000+
SE: 100 NW: 1000+



Observations: No Detections



Pueo Project Survey Datasheet 2017



Site: Waiawa GPS point: H1 GPS coordinates: (D.ddddd, -D.ddddd) 605133 2370128

Date: 2-10-21 Visit # (1, 2 or 3): 3 Survey Start Time: 4:55 PM Survey Stop Time: 6:55 PM Observers: Phil Taylor

Temperature: 72°F Cloud cover (Clear, PC, MC, Cloudy): clear Rain: None Wind (0-7): 2

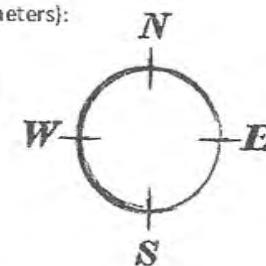
Detection start time	Detection end time	Number	Initial distance	Initial direction	Sounds	Behavior	Habitat

% Habitat w/in 400 m or surveyed area (must be 100%):

Developed	Wetland	Agricultural Crops	Agricultural Dirt	Grasslshort Grazed	Grasslshort Golf	Grasslshort Mowed
/	/	/	/	/	/	/
Grassland Fallow	Grasslands Tall >75cm	Shrublands	Non Native Forest	Native Forest	Other	Total
/	70	/	30	/	/	100

Surveyed area (max visible meters):

N: 100	S: 200
NE: 500	SW: 15
E: 500	W: 10
SE: 100	NW: 15



Observations:

① Kolea on road. 150M north of survey point.



Pueo Project Survey Datasheet 2017



Site: Waiauwa Sdr GPS point: #2 GPS coordinates: (D.ddddddd, -D.ddddddd) 21.422827 -157.981921

Date: 2/10/21 Visit # (1, 2 or 3): 3 Survey Start Time: 5:00pm Survey Stop Time: 6:58pm Observers: J. Dutson

Temperature: 76 Cloud cover (Clear, PC, MC, Cloudy): Clear Rain: None Wind (0-7): 1-2 From East

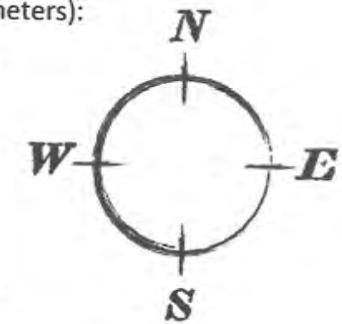
Detection start time	Detection end time	Number	Initial distance	Initial direction	Sounds	Behavior	Habitat
—	—	—	—	—	—	—	—

% Habitat w/in 400 m or surveyed area (must be 100%):

Developed	Wetland	Agricultural Crops	Agricultural Dirt	Grasslshort Grazed	Grasslshort Golf	Grasslshort Mowed
Grassland Fallow	Grasslands Tall >75cm	Shrublands	Non Native Forest	Native Forest	Other	Total
		30%	70%			100%

Surveyed area (max visible meters):

N:	S:
NE:	SW:
E:	W:
SE:	NW



Observations: PAGP seen on road, no owl detected



GOV. MSG. NO. 1197

EXECUTIVE CHAMBERS
HONOLULU

DAVID Y. IGE
GOVERNOR

June 8, 2015

The Honorable Ronald D. Kouchi,
President
and Members of the Senate
Twenty-Eighth State Legislature
State Capitol, Room 409
Honolulu, Hawai'i 96813

The Honorable Joseph M. Souki,
Speaker and Members of the
House of Representatives
Twenty-Eighth State Legislature
State Capitol, Room 431
Honolulu, Hawai'i 96813

Dear President Kouchi, Speaker Souki, and Members of the Legislature:

This is to inform you that on June 8, 2015, the following bill was signed into law:

HB623 HD2 SD2 CD1

RELATING TO RENEWABLE STANDARDS
ACT 097 (15)

Sincerely,

A handwritten signature in black ink, appearing to read "David Y. Ige".

DAVID Y. IGE
Governor, State of Hawai'i

EXHIBIT "11"

Approved by the Governor
on JUN 8 2015

ORIGINAL

ACT 097

HOUSE OF REPRESENTATIVES
TWENTY-EIGHTH LEGISLATURE, 2015
STATE OF HAWAII

H.B. NO.

623
H.D. 2
S.D. 2
C.D. 1

A BILL FOR AN ACT

RELATING TO RENEWABLE STANDARDS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 SECTION 1. The legislature finds that Hawaii's dependency
2 on imported fuel drains the State's economy of billions of
3 dollars each year. A stronger local economy depends on a
4 transition away from imported fuels and toward renewable local
5 resources that provide a secure source of affordable energy.

6 The legislature further finds that alternative energy
7 technologies have advanced significantly in recent years, leading
8 to an explosion of new markets, jobs, and local energy sources.
9 Due to these and other advances, Hawaii is currently ahead of its
10 timeline in reaching its goal of becoming forty per cent
11 renewable by 2030.

12 The legislature also finds that Hawaii is in a period of
13 energy transition, with many long-term agreements soon to be
14 executed for new forms of imported fuels that may act as
15 temporary "bridge" fuels until local sources of renewable energy
16 can be developed.

17 The purpose of this Act is to update and extend Hawaii's
18 clean energy initiative and renewable portfolio standards to
19 ensure maximum long-term benefit to Hawaii's economy by setting a
20 goal of one hundred per cent renewable by 2045; provided that

1 extending the renewable portfolio standard goals and transition
2 to energy independence beyond 2030 shall be undertaken in a
3 manner that benefits Hawaii's economy and all electric customers,
4 maintains customer affordability, and does not induce renewable
5 energy developers to artificially increase the price of renewable
6 energy in Hawaii. This target will ensure that Hawaii moves
7 beyond its dependence on imported fuels and continues to grow a
8 local renewable energy industry.

9 SECTION 2. Section 269-92, Hawaii Revised Statutes, is
10 amended as follows:

11 1. By amending subsection (a) to read:

12 "(a) Each electric utility company that sells electricity
13 for consumption in the State shall establish a renewable
14 portfolio standard of:

15 (1) Ten per cent of its net electricity sales by
16 December 31, 2010;

17 (2) Fifteen per cent of its net electricity sales by
18 December 31, 2015;

19 (3) [Twenty-five] Thirty per cent of its net electricity
20 sales by December 31, 2020; [and]

21 (4) Forty per cent of its net electricity sales by
22 December 31, 2030[.];

- 1 (5) Seventy per cent of its net electricity sales by
2 December 31, 2040; and
3 (6) One hundred per cent of its net electricity sales by
4 December 31, 2045."

5 2. By amending subsection (d) to read:

6 "(d) Events or circumstances that are outside of an
7 electric utility company's reasonable control may include, to
8 the extent the event or circumstance could not be reasonably
9 foreseen and ameliorated:

- 10 (1) Weather-related damage;
11 (2) Natural disasters;
12 (3) Mechanical or resource failure;
13 (4) Failure of renewable electrical energy producers to
14 meet contractual obligations to the electric utility
15 company;
16 (5) Labor strikes or lockouts;
17 (6) Actions of governmental authorities that adversely
18 affect the generation, transmission, or distribution
19 of renewable electrical energy under contract to an
20 electric utility company;

- 1 (7) Inability to acquire sufficient renewable electrical
- 2 energy due to lapsing of tax credits related to
- 3 renewable energy development;
- 4 (8) Inability to obtain permits or land use approvals for
- 5 renewable electrical energy projects;
- 6 (9) Inability to acquire sufficient cost-effective
- 7 renewable electrical energy;
- 8 (10) Inability to acquire sufficient renewable electrical
- 9 energy to meet the renewable portfolio standard goals
- 10 beyond 2030 in a manner that is beneficial to Hawaii's
- 11 economy in relation to comparable fossil fuel
- 12 resources;
- 13 [(10)] (11) Substantial limitations, restrictions, or
- 14 prohibitions on utility renewable electrical energy
- 15 projects; and
- 16 [(11)] (12) Other events and circumstances of a similar
- 17 nature."

18 SECTION 3. Section 269-95, Hawaii Revised Statutes, is
19 amended to read as follows:

20 "**S269-95 Renewable portfolio standards study.** The public
21 utilities commission shall:

- 1 (1) By December 31, 2007, develop and implement a utility
2 ratemaking structure, which may include performance-
3 based ratemaking, to provide incentives that encourage
4 Hawaii's electric utility companies to use cost-
5 effective renewable energy resources found in Hawaii
6 to meet the renewable portfolio standards established
7 in section 269-92, while allowing for deviation from
8 the standards in the event that the standards cannot
9 be met in a cost-effective manner or as a result of
10 events or circumstances, such as described in section
11 269-92(d), beyond the control of the electric utility
12 company that could not have been reasonably
13 anticipated or ameliorated;
- 14 (2) Gather, review, and analyze empirical data to:
- 15 (A) Determine the extent to which any proposed
16 utility ratemaking structure would impact
17 electric utility companies' profit margins; and
- 18 (B) Ensure that the electric utility companies'
19 opportunity to earn a fair rate of return is not
20 diminished;



- 1 (3) Use funds from the public utilities special fund to
2 contract with the Hawaii natural energy institute of
3 the University of Hawaii to conduct independent
4 studies to be reviewed by a panel of experts from
5 entities such as the United States Department of
6 Energy, National Renewable Energy Laboratory, Electric
7 Power Research Institute, Hawaii electric utility
8 companies, environmental groups, and other similar
9 institutions with the required expertise. These
10 studies shall include findings and recommendations
11 regarding:

12 (A) The capability of Hawaii's electric utility
13 companies to achieve renewable portfolio
14 standards in a cost-effective manner and shall
15 assess factors such as:

16 (i) The impact on consumer rates;
17 (ii) Utility system reliability and stability;
18 (iii) Costs and availability of appropriate
19 renewable energy resources and
20 technologies [+], including the impact of
21 renewable portfolio standards, if any, on



the energy prices offered by renewable
energy developers;

(iv) Permitting approvals;

(v) Effects on the economy;

(vi) Balance of trade, culture, community,
environment, land, and water;

(vii) Climate change policies;

(viii) Demographics; [and]

(ix) Cost of fossil fuel volatility; and

[{ix}] (x) Other factors deemed appropriate by the
commission; and

(B) Projected renewable portfolio standards to be set
five and ten years beyond the then current
standards;

(4) Evaluate the renewable portfolio standards every five
years, beginning in 2013, and may revise the standards
based on the best information available at the time to
determine if the standards established by section
269-92 remain effective and achievable; and

(5) Report its findings and revisions to the renewable
portfolio standards, based on its own studies and



1 other information, to the legislature no later than
2 twenty days before the convening of the regular
3 session of 2014, and every five years thereafter."

4 SECTION 4. Statutory material to be repealed is bracketed
5 and stricken. New statutory material is underscored.

6 SECTION 5. This Act shall take effect on July 1, 2015.

APPROVED this 8 day of JUN , 2015


GOVERNOR OF THE STATE OF HAWAII



KS -Waiawa
LUC Motion to Amend Service of Process Checklist

December 10, 2021

HAR § 15-15-94(a) requires service of a Motion to Amend to be made "on all parties to the boundary amendment proceeding in which the condition was imposed or in which the order was issued, and to any person that may have a property interest in the subject property as recorded in the county's real property tax records at the time the motion is filed."

On behalf of the Trustees of the Estate of Bernice Pauahi Bishop, dba Kamehameha Schools ("KS"), we filed a Motion to Amend with the State Land Use Commission on December 10, 2021 in LUC Docket A87-610. Under said Docket, in 1988, the Land Use Commission granted the reclassification of 1,395 acres of land from the Agricultural District to the Urban District (the "**Petition Area**"). KS owns the Petition area. In order to comply with HAR § 15-15-94(a), KS obtained title reports for the parcels within the Petition Area in order to determine the identity of any persons that may have a recorded property interest in any portion of the Petition Area, so that KS could serve such persons with copies of the Motion. The persons served with the Motion to Amend are listed on the Certificate of Service that was filed with the LUC on December 10, 2021. This chart identifies the recorded encumbrances within the Petition Area. The 8 TMK Nos. are:

1. 9-4-006: 034 (aka Land Court Lot 16461), consisting of 1.165 acres. Title Report Order No. 4600061 dated 4/18/2014.
2. 9-4-006: 035 (Lot 16462), consisting of 2.564 acres. Title Report Order No. 4600062 dated 5/2/2014.
3. 9-4-006: 036 (Lot 16463), consisting of 21.345 acres. Title Report Order No. 4600066 dated 5/2/2014.
4. 9-4-006: 037 (Lot 16464), consisting of 36.330 acres (only a portion of Parcel 37 in Petition Area). Title Report Order No. 4600064 dated 4/18/2014.
5. 9-6-004: 024, consisting of 1,566.977 acres. Title Report Order No. 4600068 dated 5/2/2014.
6. 9-6-004: 025, consisting of 76.241 acres. Title Report Order No. 4600070 dated 5/2/2014.
7. 9-6-004: 026, consisting of 47.036 acres. Title Report Order No. 4600067 dated 5/2/2014.
8. 9-6-005: 003, consisting of 1,831.445 acres (only a portion in Petition Area). Title Report Order No. 4900786 dated 6/1/2015.

KS Exhibit 12

Tab	Document/Encumbrance for LUC Motion Service of Process Only	Affected TMK(s) Per Title Reports	Party or Parties to Serve
1	<p>Declaration of Conditions Imposed by the LUC in Docket No. A87-610, recorded in Liber 22151 Page 250, filed July 19, 1988 as Land Court Document No. 1565292.</p> <p>As amended by Amendment to Declaration of Conditions Imposed by the Land Use Commission, recorded Nov. 10, 1992, Doc. No. 92-182606, Land Court Document No. 1969166.</p> <p>A second Declaration of Conditions Imposed by the State Land Use Commission was recorded January 21, 2015, as Document No. A-54991338.</p> <p>A third Declaration of Conditions Imposed by the State Land Use Commission was recorded April 8, 2020, as Document No. A-74030801.</p>	<u>All:</u> 9-4-006: 034, 035, 036, and 037 9-6-004: 024, 025, and 026 9-6-005: 003	<p>N/A</p> <p>These Declarations do not give anyone a recorded property interest in the Petition Area. However, under HAR §15-15-94(a), when filing a Motion to Amend with the LUC, the moving party must serve all parties to the original boundary amendment proceeding. Those parties were Tom Gentry and Gentry Pacific, Ltd.</p> <p>Tom Gentry, died in 1998. No service of Motion necessary.</p> <p>Gentry-Pacific, Ltd. Attn: Victoria Slovak 733 Bishop Street, Suite 1400 Honolulu, HI 96813</p>
2, 3	<p>Unilateral Agreement and Declaration for Conditional Zoning.</p> <p>KS as Fee Owner, and GIP, as Declarant, recorded Dec. 3, 1997 as Regular System Doc. No. 97-168626 and Land Court Doc. No. 2423720.</p> <p>The foregoing document was amended by Ordinance No. 98-69 and the Amendment to Unilateral Agreement and Declaration for Conditional Zoning recorded on Nov. 24, 1998 as Regular System Doc. No. 98-176077.</p>	<u>All:</u> 9-4-006: 034, 035, 036, and 037 9-6-004: 024, 025, 026 9-6-005: 003	<p>N/A</p> <p>GIP was the Declarant, due to holding the rights of the Buyer under the Agreement of Sale, Master Lease and Development Agreement. That agreement has been terminated and GIP has no rights as Declarant under this UA.</p>

4	Unilateral Agreement and Declaration for Conditional Zoning re Ordinance No. 03-01. GIP, as Declarant, and KS as fee owner, recorded Jan. 28, 2003 as Regular System Doc. No. 2003-015986.	9-6-04: 024(por.)	N/A GIP was the Declarant, due to holding the rights of the Buyer under the Agreement of Sale, Master Lease and Development Agreement. That agreement has been terminated and GIP has no rights as Declarant under this UA.
5	Notice of Termination (and of Rights and Obligations that Survive Termination) and Quitclaim, between KS, GIP, and WRD. ¹ Dated 1/1/09, recorded 8/25/09 as Regular System Doc. No. 2009-129931 and Land Court Doc. No. 3891022.	All: 9-4-006: 034, 035, 036, 037 9-6-004: 024, 025, 026 9-6-005: 003	N/A Per the 2012 Notice of Surrender, GIP terminated and surrendered all of its rights under the "Restated Agreement" thus, no rights should remain under this Notice of Termination.
6	Notice of Surrender, executed by WRD, GIP, and KS, recorded Aug. 31, 2012 as Regular System Doc. No. A-46260711 and Land Court Doc. No. T-8278443	All: 9-4-006: 034, 035, 036, 037 9-6-004: 024, 025, 026 9-6-005: 003	N/A Notice of Surrender surrendered and terminated all agreements, rights and obligations that survived termination of the Restated Agreement.
7	Deed and Agreement. WRD as Grantor. KS as Grantee. Additional Parties: GIP, Waiawa Development LLC, and A&B Waiawa, LLC. Recorded Aug. 31, 2012 as Regular System Doc. No. A-46260713A thru A-46260713B and Land Court Doc. No. T-8278445A thru T-827844B.	9-4-006: 035 9-6-004: 026	No service necessary. All rights in favor of KS.
8	Land Court Order No. 144521, recorded Jan. 10, 2002 noting KS' and GIP's petition for subdivision, and designating Easements 6373 and 6374.	9-4-006: 034, 035, 036, and 037	N/A Land Court Order does not give rights to any party.

¹ Waiawa Ridge Development LLC.

9, 10	<p>The rights to all ground irrigation systems above the 650 foot elevation, including all ditches, siphons, dams, reservoirs, intake adits, pumps and pipelines conveyed to Waiahole Water Company, Ltd. as set forth in the Bill of Sale dated 6/10/1915, recorded as Book 426 Page 294.</p> <p>These rights were later conveyed to Waiahole Irrigation Company, Ltd, by Deed, Grant and Assignment, dated 9/18/70, recorded in Book 7213, Page 338.</p>	9-6-004: 026 9-6-005: 003	<p>Waiahole Irrigation Company, Ltd merged with AMFAC Land Company, Ltd.; AMFAC Land Company, Ltd. then merged with KLC Holding Corp. in 2002.</p> <p>KLC Holding Corp. Attn: Kaanapali Land, LLC 1100 Alakea Street, Suite 2100 Honolulu, HI 96813</p>
11	Grant of Easement for underground communication cable and incidental purposes, in favor of USA, dated May 16, 1946, recorded as Book 2026 Page 182	9-6-004: 024 9-6-005: 003	<p>USA</p> <p>U.S. Department of Justice 950 Pennsylvania Avenue, NW Washington, DC 20530-0001</p>
12, 13	Grant of Easement for underground communication cable and incidental purposes, from KS in favor of USA, acting through the Secretary of the Army, dated Dec. 24, 1956, recorded as Book 3240 Page 149. Partially reconveyed to KS by Quitclaim Deed dated Sept. 30, 1965, recorded as Book 5173 Page 246.	9-6-004: 024 9-6-005: 003	<p>USA</p> <p>U.S. Secretary of the Army Attn: John McHugh 1500 Army Pentagon Washington, D.C. 20310-1500</p> <p>U.S. Department of Justice 950 Pennsylvania Avenue, NW Washington, DC 20530-0001</p>
14, 15	Easement Tract WR-8 (5.29 acres), described in the Declaration of Taking, Civil No. 705, recorded as Book 1973 Page 206. Easement conveyed to the State of Hawai‘i, BLNR by Quitclaim Deed recorded June 20, 1985 as Book 18721 Page 536.	9-6-004: 024 9-6-005: 003	State of Hawai‘i, Board of Land and Natural Resources 1151 Punchbowl Street, Room 220 Honolulu, HI 96813

16	Grant of perpetual easement for utility and incidental purposes from KS to HECO, ² dated 6/17/61, recorded as Book 4091 Page 428.	9-6-004: 024 9-6-005: 003	HECO Hawaiian Electric Company, Inc. Attn: Susan A. Li 900 Richards Street, Room 404 Honolulu, HI 96813
17	Grant of Easement Noy(R)-68088, from KS to USA, acting through the Department of the Navy, for an infiltration tunnel to collect, take and remove water from the property, and incidental purposes, dated 10/11/65, recorded as Book 5192 Page 423.	9-6-004: 024	USA, Department of the Navy 1200 Navy Pentagon Washington, D.C. 20350-1200 U.S. Department of Justice 950 Pennsylvania Avenue, NW Washington, DC 20530-0001
18	Grant of Easement from Tom Gentry to State of Hawaii (DOT) for slope purposes for Highway, dated 2/18/90, recorded as Land Court Doc. No. 1708437.	9-4-006: 036 (Easement 4760 as shown on Map 731, L. C. App. 1000)	State of Hawai‘i, Department of Transportation Aliiāimoku Building 869 Punchbowl Street Honolulu, HI 96813
19	Any and all access rights in favor of the owners of TMK No. 9-6-004: 003 over and across the land herein described, to a public road, if any, which parcel is landlocked.	9-6-004: 024	The fee owners of Parcel 003 are the Dorothy Y. Yoshimura Trust and Yoshimasa I. Yoshimura Trust. 94-306 Kahualena Street Waipahu, HI 96797
20, 21	Grant of Easement from KS to HECO, dated 7/31/70, recorded at Book 7153 Page 358. Partial Cancellation of Easement, dated 6/18/97, recorded as Regular System document No. 97-089976.	9-6-004: 024	HECO Hawaiian Electric Company, Inc. Attn: Susan A. Li 900 Richards Street, Room 404 Honolulu, HI 96813

² Hawaiian Electric Company.

22	Grant of Easement (for slope maintenance) from KS in favor of City & County, dated 8/24/76 recorded as Book 13472 Page 230	9-6-004: 024	City & County of Honolulu Acting Corporation Counsel Paul S. Aoki, Corporation Counsel 530 S. King Street, Room 110 Honolulu, HI 96813
23	Grant of Easement (for water pipeline and incidental purposes), from KS to City & County and the Board of Water Supply, dated 2/14/83, recorded as Book 16964 Page 83.	9-6-004: 024	Board of Water Supply, City & County of Honolulu 630 S. Beretania Street, Honolulu, HI 96843
24	Grant of Easement (for utility purposes) from KS to HE CO, dated 11/7/96, recorded as Regular System Doc. No. 96-175593.	9-6-004: 024	HECO Hawaiian Electric Company, Inc. Attn: Susan A. Li Hawaiian Electric Company, Inc. 900 Richards Street, Room 404 Honolulu, HI 96813
25	Lease No. 14,748, dated 12/2/64, from KS to Hawaiian Telephone Company (now Hawaiian Telcom, Inc.), and AT&T, ³ recorded as Book 5117 Page 381. 65-year lease beginning Sept. 1, 1964 and ending in 2029.	9-6-004: 024	Hawaiian Telcom, Inc. Attn: Gwen Massiah Legal Department 1177 Bishop Street Honolulu, HI 96813 AT&T Corp. Attn: The Corporation Company, Inc. 1136 Union Mall, Suite 301 Honolulu, HI 96813

³ American Telephone and Telegraph Company; name changed to AT&T Corp. 4/20/1994

26	<p>Lease of Easement No. 28,889, from KS to GTE Hawaiian Telephone Company Incorporated (now Hawaiian Telecom, Inc.) as lessee, dated 6/8/99, recorded as Doc. No. 99-102567.</p> <p>Amendment of Lease of Easement (nka Easement T-1), recorded as Doc. No. 2000-164469.</p>	<p>9-6-04: 024 9-6-005: 003</p>	<p>Hawaiian Telcom, Inc. Attn: Gwen Massiah Legal Department 1177 Bishop Street Honolulu, HI 96813</p>
27, 10, 28	<p>Grant of Easement in the ahupua‘a of Waiawa for the construction and use of a tunnel, conduit, water course, shafts, etc. from KS in favor of Waiahole Water Company, Ltd., dated 1/1/1913, recorded at Book 388 Page 460.</p> <p>Waiahole Water Company, Ltd. conveyed these rights to Waiahole Irrigation Company, Ltd., by Deed, Grant and Assignment dated 9/18/70, recorded at Book 7213 Page 338.</p> <p>Waiahole Irrigation Company, Ltd. later assigned these rights to Agribusiness Development Company, Limited, an instrumentality of the State of Hawai‘i, Department of Agriculture, by Quitclaim Assignment dated 7/9/99, recorded as Regular System Doc. No. 99-109934 and Land Court Doc. No. 2558831.</p>	9-6-005: 003	<p>Agribusiness Development Corporation State Office Tower 235 S. Beretania Street, Room 205 Honolulu, HI 96813</p>
29	Grant of Easement for pole and wire lines, from KS to The Hawaiian Electric Company, Limited, dated 6/12/1962, recorded at Book 4406 Page 189.	9-6-005: 003	HECO
30	Supplemental Grants of Easement, from KS to Hawaiian Electric Company, Inc., dated 1/30/1979, recorded at Book 13673 Page 733.	9-6-005: 003	HECO