Preliminary Environmental Assessment

FOR
HAWAIIAN ELECTRIC COMPANY
REQUEST FOR PROPOSALS
FOR
VARIABLE RENEWABLE DISPATCHABLE GENERATION

BARBERS POINT SOLAR PROJECT
OAHU, HAWAII

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Table of Contents

1.0 Introduction 1
1.1 Project Description 1
2.0 Natural Environment 4
2.1 Air Quality 4
2.1.1 Existing conditions 4
2.1.2 Short- and Long-Term Impacts 4
2.1.3 Best Management Practices and Mitigation 5
2.2 Biology 5
2.2.1 Wildlife 5
2.2.2 Vegetation 9
2.3 Climate 11
2.3.1 Existing Conditions 11
2.3.2 Short- and Long-Term Impacts 11
2.3.3 Best Management Practices and Mitigation 12
2.4 Soils 12
2.4.1 Existing Conditions 12
2.4.2 Short- and Long-Term Impacts 12
2.4.3 Best Management Practices and Mitigation 13
2.5 Topography and Geology 13
2.5.1 Existing Conditions 13
2.5.2 Short- and Long-Term Impacts 13
2.5.3 Best Management Practices and Mitigation 14
3.0 Land Regulation 14
3.1 Land Uses 14
3.1.1 Existing Conditions 14
3.1.2 Short- and Long-Term Impacts 15
3.1.3 Best Management Practices and Mitigation 16
3.2 Natural Hazards 16
3.2.1 Existing Conditions 16
3.2.2 Short- and Long-Term Impacts 16
3.2.3 Best Management Practices and Mitigation 16
3.3 Noise 17
3.3.1 Existing Conditions 19
3.3.2 Short- and Long-Term Impacts 19
3.3.3 Best Management Practices and Mitigation 20

3.4 Roadways and Traffic 20
3.4.1 Existing Conditions 20
3.4.2 Short- and Long-Term Impacts 20
3.4.3 Best Management Practices and Mitigation 21
3.5 Utilities 21
3.5.1 Existing Conditions 21
3.5.2 Short- and Long-Term Impacts 21
3.5.3 Best Management Practices and Mitigation 22
4.0 Socio-Economic Characteristics 22
4.1 Existing Conditions 22
4.2 Short- and Long-Term Impacts 22
4.3 Best Management Practices and Mitigation 23
5.0 Aesthetic/Visual Resources 23
5.1 Existing Conditions 23
5.2 Short and Long-Term Impacts 23
5.3 Best Management Practices and Mitigation 24
6.0 Hazardous Materials and Wastes 24
6.1 Existing Conditions 24
6.2 Short- and Long-Term Impacts 24
6.3 Best Management Practices and Mitigation 25
7.0 Water Quality 25
7.1 Existing Conditions 25
7.2 Short- and Long-Term Impacts 26
7.3 Best Management Practices and Mitigation 26
8.0 Public Safety Services 26
8.1 Existing Conditions 26
8.2 Short- and Long-Term Impacts 27
8.3 Best Management Practices and Mitigation 27
9.0 Recreation 27
9.1 Existing Conditions 27
9.2 Short- and Long-Term Impacts 28
9.3 Best Management Practices and Mitigation 28
10.0 Potential Cumulative and Secondary Impacts 28
11.0 References 30

List of Tables

Table 3.3-1. Hawai'i Maximum Permissible Sound Levels by Zoning District 18

List of Figures

Figure 1. Conceptual Project Overview 3

Acronyms and Abbreviations

Applicant	Innergex Renewables USA, LLC
BMP	best management practices
CDD	Community Development District
County	City and County of Honolulu
CUP	Conditional Use Permit
dB	decibels
DHHL	Department of Hawaiian Home Lands
DOFAW	Division of Forestry and Wildlife
EA	Environmental Assessment
GHG	greenhouse gas
HAR	Hawaii Administrative Rule
HCDA	Hawaii Community Development Authority
HDOH	Hawai‘i Department of Health
HECO	Hawaiian Electric Company
HMWMP	Hazardous Materials and Waste Management Plan
kV	kilovolt
LSB	Land Study Bureau’s
MW	megawatt
Project	Barbers Point Solar Project
SPCC	Spill, Prevention, Containment, and Countermeasure
SWPPP	Storm Water Pollution and Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMK	Tax Map Key
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

In response to the Hawaiian Electric Company's (HECO) Request for Proposals to provide renewable energy projects on Oahu, Innergex Renewables USA, LLC (Applicant) has prepared this Preliminary Environmental Assessment (EA). This Preliminary EA provides a summary of the anticipated impacts to resources for the Barbers Point Solar Project (Project) located south of the Kapolei Parkway and east of the Kalaeloa Airport on Oahu, Hawaii.

This Preliminary EA provides a high-level review of pre-existing environmental conditions, and potential short- and long-term impacts associated with, or resulting from, the proposed Project, including direct, indirect, and cumulative impacts associated with development, construction, operation and maintenance of the proposed Project in each of the environmental areas identified below. There is no proposed alternative site or project currently being considered, and therefore, no alternative is evaluated in this Preliminary EA. The assessment also describes proposed avoidance and minimization measures for each of the major environmental areas as presented below. Construction and operations of the proposed Project are expected to be minor short- and long-term, and cumulative impacts for each of the resource areas are described below. In conclusion, impacts from the proposed Project are expected to be minor relative to the benefits that the proposed addition of renewable energy to HECO would provide.

1.1 Project Description

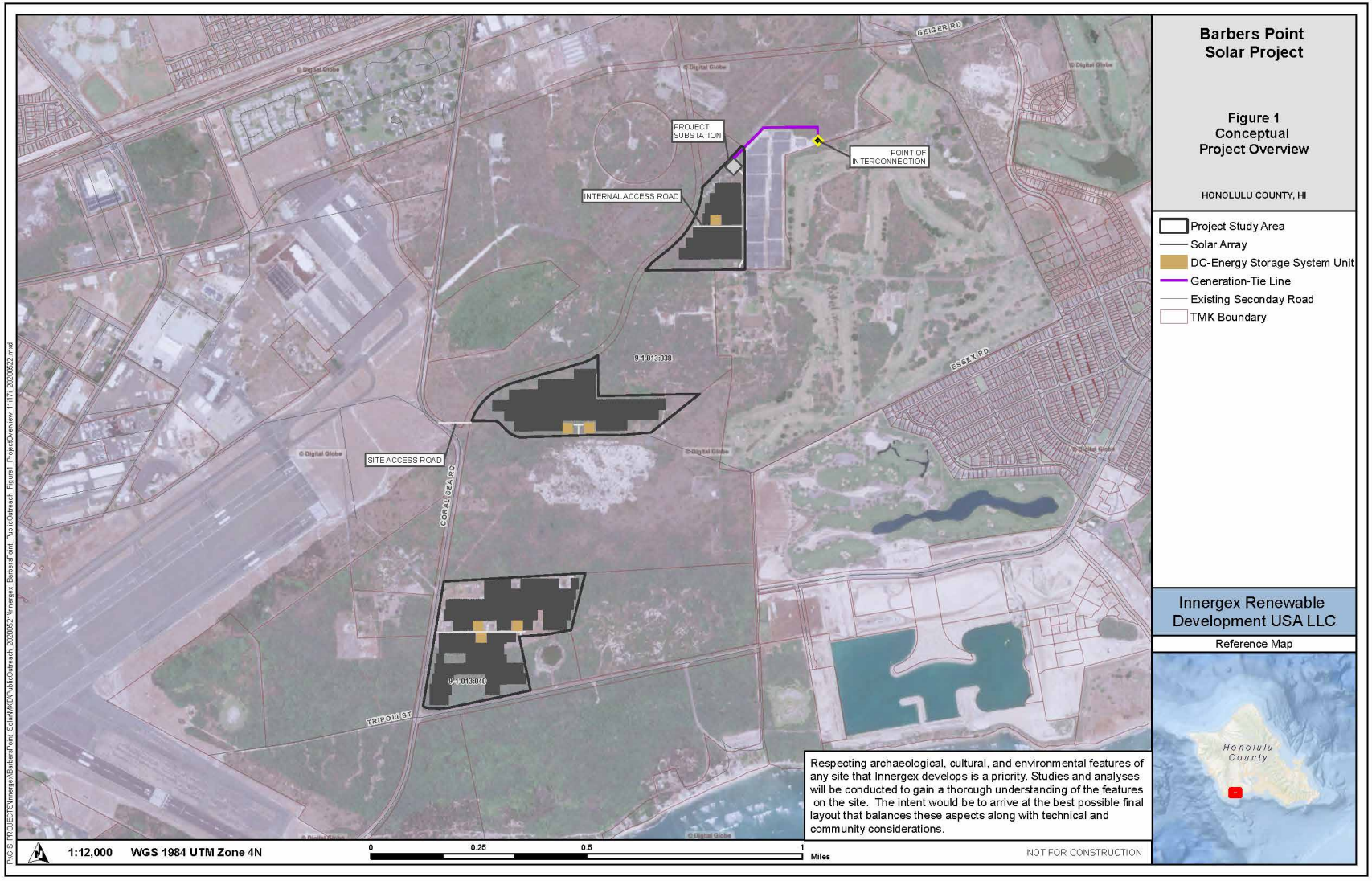
The Project would consist of a solar field with arrays of photovoltaic panels that would be arranged in rows on single-axis tracking foundations. The maximum height of the panels (at full tilt) would be 16 feet. Other equipment on site would include inverters, combiners, battery energy storage system, transformer(s), overhead and buried conduits, and onsite collection lines. The solar field and associated infrastructure would occupy approximately 150 acres of land owned by the Department of Hawaiian Home Lands (DHHL), primarily on Tax Map Key (TMK) parcels 9-1-013:038 (Parcel 38) and 9-1-013:040. No solar fields would be sited within an exclusion area located in the central portion of Parcel 38 due to the existence of revetments and historical sites (Figure 1); however, a portion of the Project's collector lines may be located within the exclusion area. The Project substation would be located within the northern solar array area of Parcel 38 and the Project point of interconnection (POI) would be located on federal land at the existing switchyard east of and adjacent to the Kalaeloa Renewable Energy Park solar facility. The generation-tie (gen-tie) line extending from the northern solar array area on Parcel 38 to the point of interconnection and the collector line extending from Parcel 40 to Parcel 38 would also cross federal land and may be located within the City and County of Honolulu right-of-way associated with Coral Sea Road. The conceptual Project overview is depicted in Figure 1.

Access to the northern portion of Parcel 38 will either be from the northeast over federally owned land or will be via the existing Coral Sea Road. Access to the southern portion of Parcel 38 will be via the existing Coral Sea Road and would require traversing federally owned land (U.S. Navy land) and use of these existing roadways will require a formal request for an easement from the U.S. Navy

which will require preparation of a legal description (i.e. metes and bounds survey). Access to Parcel 40 is currently via Coral Sea Road and would not require crossing federal (U.S. Navy) land.

The Project's power purchase agreement would be for 25-years. The Project infrastructure would have an estimated 35-year life based on the projected useful life of the solar panels. After that time, the Applicant, in discussions with DHHL and Hawaii Electric Company, would evaluate whether to continue operations of the Project or decommission the facility.

Figure 1. Conceptual Project Overview



2.0 Natural Environment

2.1 Air Quality

2.1.1 Existing conditions

The air quality in the State of Hawai'i, including Oahu, is ranked as one of the best in the United States (American Lung Association 2019), primarily because of the consistent trade winds that pass over the islands, and the limited emission sources present. Sources of pollutant air emissions within or adjacent to the Project Area are associated with emissions from vehicles on Roosevelt Avenue and Kapolei Parkway, emissions from airplanes at the Kalaeloa Airport or emissions from vehicles from nearby residences or businesses.

Both federal and state standards have been established to monitor ambient air quality. Seven parameters are regulated: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone, and lead. State of Hawai'i air quality standards are more stringent than comparable national standards, except for those pertaining to sulfur dioxide and particulate matter, which are equivalent. The closest air quality monitoring station to the Project Area is the Kapolei Station, located approximately 2 miles northwest of the Project Area. This area is currently in attainment of all National Ambient Air Quality Standards and Hawaii ambient air quality standards (HDOH 2016, 2019).

2.1.2 Short- and Long-Term Impacts

Short-term direct and indirect impacts on air quality are likely to occur as a result of Project construction, operation and decommissioning. Greenhouse gas (GHG) emission would result from:

- Production and transportation of Project components;
- Project construction and construction-related vehicle traffic;
- Project operation and operation-related vehicle traffic; and,
- Decommissioning of the Project, transport, and disposal of project components.

In addition, construction activities could result in generation of fugitive dust (which is measured as Particulate Matter $[PM]_{10}$ and $PM_{2.5}$). Air pollutants and fugitive dust levels would be highest in construction areas; however, lower levels may also be present along travel routes to and from construction areas.

The amount of air pollutants generated by construction equipment and construction-related vehicle traffic would be too low and their distance from sensitive receptors too great for combustion emissions to have a significant effect on air quality. Fugitive dust could have a more substantial effect on air quality than combustion engine emissions; but this will be minimized and mitigated as described in Section 2.1.3 and would only be generated in the short-term until vegetation is re-established or material is placed over exposed ground. The Project would establish a vegetation

management plan to ensure that ground cover is maintained to minimize airborne fugitive dust during operations. Short-term impacts to air quality will be low in intensity, localized in extent, and/or temporary in duration. Therefore, short-term impacts to air quality will be minor.

No long-term impacts to air quality are expected from construction, operation, or decommissioning of the Project because none of the equipment associated with the solar field or collection lines emit air pollutants. Some emissions will result from operations and maintenance vehicles, but these will be limited in number and frequency and would not result in long-term impacts to air quality in the area.

2.1.3 Best Management Practices and Mitigation

BMPs that may be implemented to minimize and avoid impacts to air quality include the following:

- All Project vehicles and equipment used during construction and operation will be maintained in proper working order and in compliance with state and federal emission standards.
- Fugitive dust will be mitigated throughout the construction period by implementation of best management practices (BMP) techniques to minimize dust, such as water spray, wind screens, covering soil piles, or establishing temporary ground cover.
- A vegetation management plan will be prepared and implemented to ensure that ground cover is maintained to minimize airborne fugitive dust during operations.

The Project would offset GHG emissions generated during construction, operations, and decommissioning by displacing GHG emissions produced by fossil fuel power sources. Overall, operation of the Project would result in beneficial impact to air quality by reducing annual emissions from fossil fuel consumption.

2.2 Biology

The assessment of biological resources within the Project Area is based on publicly available information and general knowledge of biological resources in this region. A comprehensive biological survey has not been conducted in the Project Area.

2.2.1 Wildlife

2.2.1.1 Existing Conditions

Although a site visit and wildlife surveys have not been conducted, based on what is known about resources in the vicinity, the Project Area is likely dominated by non-native wildlife species that are common throughout the lowlands of Oahu and the Hawaiian Islands. There is no designated or proposed critical habitat for animal species listed as threatened or endangered by the Endangered Species Act (ESA) of 1973, as amended, or the Hawaii Administrative Rules (HAR) Title 13 Chapter 124 pursuant to Hawaii Revised Statutes (HRS) Section 195D (listed species), within or adjacent to

the Project Area. However, based on review of available information and knowledge of listed species in Hawaii, seven federal- and state-listed wildlife species may have the potential to occur or transverse the Project Area or its vicinity (Tetra Tech 2019). These species include:

- Hawaiian hoary bat (*Lasiurus cinereus semotus*);
- Newell's shearwater (*Puffinus newelli*);
- Hawaiian petrel (*Pterodroma sandwichensis*);
- Hawaiian coot (*Fulica alai*);
- Hawaiian stilt (*Himantopus mexicanus knudseni*);
- Hawaiian moorhen (*Gallinula galeata sandvicensis*); and,
- Hawaiian short-eared owl (*Asio flammeus sandwichensis*).

Hawaiian hoary bat

The endangered Hawaiian hoary bat or opeapea is listed as endangered by the ESA and HRS. Research is currently ongoing to understand its distribution throughout the state, but Hawaiian hoary bats roost in both native and non-native trees over 15 feet tall and forages over a wide variety of habitats and elevational ranges (USFWS 2011a, Bonaccorso et al. 2015). Trees likely exist in the Project Area that could be used for roosting. Suitable foraging habitat is also likely to occur in the Project Area (Tetra Tech 2019). Hawaiian hoary bat's pupping season is between June 1 and September 15. Trimming or removal of trees taller than 15 feet should be avoided between June 1 and September 15, when juvenile Hawaiian hoary bat that are not yet capable of flying may be roosting in trees.

Hawaiian short-eared owl

The Hawaiian short-eared owl or pueo is listed as endangered by the State on the island of Oahu. Hawaiian short-eared owl is the only native owl species to Hawaii and occurs on all the main Hawaiian island from sea level to 8,000 ft. Hawaiian short-eared owls occupy a wide variety of habitats including open habitats such as grasslands and shrublands and may forage and potentially nest in areas within the Project Area.

Seabirds

The endangered Hawaiian petrel or uau, and threatened Newell's shearwater or ao (collectively referred to as seabirds), are listed as endangered by the ESA and HRS. Seabirds have not been documented in the Project Area, and suitable nesting habitat does not exist in the Project Area. However, suitable nesting habitat may exist in forested areas at upper elevations, suggesting the potential for these birds to fly over the Project Area at night while transiting between nest sites and the ocean. Suitable habitat for nesting seabirds is known to occur in high elevation areas in the Koolau and Waianae mountain ranges.

Disorientation and fallout resulting from light attraction could occur to seabird individuals due 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. The seabird peak fallout period (September 15–December 15) is also an important period as this is when fledglings are heading to sea.

Waterbirds

The Hawaiian coot or alae keokeo, Hawaiian stilt or aeo, and Hawaiian moorhen or alae ula constitute the waterbirds and are all listed as endangered under the ESA and HRS. Because these species share similar habitat needs and biological characteristics, waterbirds are discussed as a single group. In general, waterbirds require open water habitats or water features with emergent vegetation. This includes wetlands, natural ponds, marshes, streams, springs or seeps, lagoons, grazed wet meadows, taro and lotus fields, shrimp aquaculture ponds, reservoirs, sedimentation basins, sewage ponds, and drainage ditches (Shallenberger 1977, Nagata 1983, Banko 1987, Bannor and Kiviat 2002, Pratt and Brisbin 2002; USFWS 2011b).

Based on National Wetlands Inventory (NWI; USFWS 2019) and National Hydrography Dataset data (NHD; USGS 2017a), there are permanent water sources that are potentially suitable habitat for Hawaiian waterbirds within 1 mile of the Project Area. Ordy Pond is a large anchialine pool located southeast of Parcel 40 that waterbirds may utilize and the Hawaiian stilt is known to visit this pond (North Shore Consultants 2012). Hoakalei country club is also approximately half a mile to the east of the Project Area and has several water features that could potentially attract water birds to the Project Area. In addition, extreme rain events could result in flooding of low-lying areas, which would offer temporary waterbird habitat.

2.2.1.2 Short- and Long-Term Impacts

Short-term direct and indirect impacts on the Hawaiian hoary bat could occur during Project construction and operation due to vegetation removal that would be required during construction of the solar array and associated facilities. Direct impacts to bats can be avoided by timing removal efforts of potential roosting trees; however, the Project could result in some potential impacts to the species' habitats.

Short-term direct and indirect impacts on the Hawaiian short-eared owl could occur during Project construction and operation due to vegetation removal that could impact nests (if present) or alter foraging habitat. Direct impacts to nests can be avoided by conducting pre-construction nest surveys; however, the Project could result in some potential impacts to the species' habitats.

Short-term and long-term direct impacts to listed seabirds are not anticipated as the Project would avoid nighttime construction lighting and would shield nighttime facility lighting. No long-term impacts to seabirds are expected from operation of the Project because the operation of the proposed solar array does not entail activities that have the potential to affect the species or their habitats.

Short-term and long-term direct impacts to listed waterbirds are not anticipated as the Project would avoid impacting nesting or foraging habitat through the implementation of avoidance and minimization measures outlined in the BMPs Section 2.2.1.3.

Water-dependent birds are hypothesized to perceive arrays of photovoltaic panels 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 is termed the "lake effect." However, there is not enough scientific evidence to conclude whether water-dependent birds are attracted to solar arrays or how proximity to water sources may be related to avian mortality at solar facilities. According to Kagan et al. (2014), the "lake effect" may be more likely to occur if water is otherwise limited in the surrounding environment, such as in a desert or dense forest (Kagan et al. 2014). Furthermore, this effect has mostly been observed at projects in arid desert regions of the western continental United States. The potential impact of solar facilities on Hawaiian waterbirds in a region with ample water features is unknown.

In conclusion, short and long-term direct and indirect impacts to wildlife species are expected to be minor to negligible with the implementation of the Project BMPs during construction as outlined in Section 2.2.1.3. In addition, operation of the Project does not involve any activities that have the potential to affect the survival of any wildlife species and would not impact any designated critical habitats.

2.2.1.3 Best Management Practices and Mitigation

Consultation and coordination with the U.S. Fish and Wildlife Service (USFWS) and the Division of Forestry and Wildlife regarding potential impacts to federal and state-protected species occurring within the Project Area will be undertaken prior to Project construction. Consultation will include discussion of recommended surveys (and associated survey protocols) for assessing potential impacts to listed and sensitive species. Surveys that may be required could include general biological surveys, botanical surveys, and invertebrate surveys.

BMPs that may be implemented to minimize and avoid impacts to listed species include the following:

1. Seabird avoidance measures:
    - Restrict construction activities to daylight hours during the seabird peak fallout period (September 15–December 15).
    - Avoid the use of nighttime lighting that could attract seabirds and operational on-site lighting at Project facilities known to minimize attraction. Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.
    - Install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
2. Pueo avoidance measures:

- Conduct a pueo survey according to the Pueo Project Survey Protocol (UH Manoa 2017)
- If a ground nest or an owl nesting on the ground is observed, an approximately 50-foot perimeter buffer should be established and marked in the field.

3. Hawaiian hoary bat avoidance measures:
    - Avoid trimming or removal of trees taller than 15 feet between June 1 and September 15, when juvenile Hawaiian hoary bat that are not yet capable of flying may be roosting in the trees.
    - Fit Project fences with barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire.
4. Waterbird avoidance measures:
    - Avoid the creation, purposefully or inadvertently, of any permanent standing water. If standing water related to temporary sediment/water retention ponds is required during construction to manage stormwater and sediment erosion control, then bird diverters will be installed to divert waterbirds from using the temporary standing water areas as habitat.
    - Although not expected, if a nest or active brood is observed, establish a 100-foot buffer around the nest or brood and maintain the buffer around all active nests until chicks/ducklings have fledged. The USFWS will also be contacted for further guidance.
    - Post and implement speed limits within the Project Area to reduce the likelihood of collision, and inform Project personnel and contractors about the potential occurrence of endangered species on-site or nearby.

2.2.2 Vegetation

2.2.2.1 Existing Conditions

A botanical survey has not been conducted for the Project Area; however, the majority of the Project Area likely consists of shrub and brush rangeland dominated by non-native plant species. Based on aerial imagery, land in Parcel 38 consists of dense trees and shrubs. Grasses and other non-native herbaceous perennials are likely also present in small areas within this parcel. Parcel 40 also consists of dense trees and shrubs in the south portion of the parcel, while the northern half of the parcel is occupied by the former Kalaeloa raceway park.

Critical plant habitat (Oahu Lowland Dry – Unit 11) has been designated by the USFWS for 16 species of endangered plants along the borders of the Project Area between Parcels 38 and 40. Oahu Lowland Dry - Unit 11 consists of 166 ac of federal land (U.S. Navy) of dry forest and shrubland. Although it is considered critical habitat for 16 listed plant species, it is only currently

occupied by one listed plant – the endangered Ewa plains akoko (*Euphorbia* [*Chamaesyce*] *skottsbergii* var. *skottsbergii*) (USFWS 2012). It is not occupied by the other 15 plant species with designated critical habitat - *Anchyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Euphorbia* (*Chamaesyce*) *celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis*. Due to the nearby designation of critical habitat, there is potential that endangered plant species, particularly the Ewa plains akoko, could be found within the Project Area. It is unlikely the other 15 listed species with nearby critical habitat occur in or near the Project Area.

Detailed botanical surveys would be required to assess presence of listed species within the Project Area and to determine the potential for impact. Small numbers of rare species may occur even within degraded and non-native dominated areas; thus, focused botanical surveys will be necessary to assess potential impacts.

2.2.2.2 Short- and Long-Term Impacts

Short-term and long-term direct and indirect impacts on vegetation are likely to occur during Project construction and operation; however, impacts are expected to be minor.

The vegetation removal required during construction of the solar array and associated facilities would remove the majority of the existing vegetation on the site. However, as described in Section 2.2.2.1, the majority of existing vegetation is likely to consist of non-native plant species.

It is unlikely that listed plant species are present in the Project Area; however, if surveys determine the presence of any listed plant species, particularly Ewa Plains akoko, removal of individuals will be avoided as practicable. The likely absence of any listed plant species and the minimal presence of any native plant species means that vegetation removal activities associated with the Project does not constitute an adverse effect on vegetation and any impacts would be minor.

Heavy equipment, vehicles, and personnel associated with construction and operation of the Project could introduce invasive and/or non-native species to the Project Area (for example, on tires or boots). The introduction and spread of invasive species associated with Project construction would be minimized through the implementation of standard BMPs. Disturbance associated with Project construction would be localized and temporary, and with BMPs in place, is expected to have a minor impact, if any, on increasing invasive and/or non-native species in the Project Area.

2.2.2.3 Best Management Practices and Mitigation

Minimization and mitigation measures would include the following:

- Avoid removal of any listed plant species in the Project Area (if found) as practicable.
- Minimize the introduction and spread of invasive species associated with Project construction through the implementation of standard BMPs such as washing equipment

prior to entering construction sites from other areas and controlling the quality of seed mixtures used to revegetate disturbed areas.

- Reseed temporary construction areas and encourage them to return to pre-construction conditions.

2.3 Climate

2.3.1 Existing Conditions

The Hawaiian Islands have a semi-tropical climate, characterized by mild temperatures and moderate humidity throughout the year (except at high elevations), persistent northeasterly trade winds, and infrequent, severe storms. Two primary seasons are recognized including a 5-month summer season (May through September) when trade winds are prevalent 80 to 90 percent of the time (WRCC 2019a). Summer is typically warmer and drier than winter, with few storm events.

Local climate conditions in Hawaii are influenced by its rugged, mountainous topography and the persistent flow of the trade winds. The proposed Project is located in the lowlands of the leeward side of Oahu. In this vicinity, dry weather is prevalent, with the exception of sporadic trade wind showers and short-duration storms. Rainfall occurs primarily between the months of October and March. The average annual rainfall in this vicinity is 18.21 inches, with monthly totals ranging between 2.6 inches in January to approximately 0.4 inch in June and July (WRCC 2019b). In general, the lowlands have a narrow range of diurnal temperatures, with daytime temperatures in the 70s to 80s degrees Fahrenheit and nighttime temperatures in the 60s to 70s degrees Fahrenheit. The prevailing wind direction is from the east.

2.3.2 Short- and Long-Term Impacts

Short-term direct and indirect impacts on local climate conditions including temperature, rainfall, humidity, or wind patterns would not result from construction or operation of the Project. Although construction of the Project would contribute a minor amount of GHGs to the environment in the form of exhaust from construction equipment and vehicles, emissions would be temporary and localized and would not measurably contribute to regional or global GHG levels.

No long-term negative impacts to climate conditions are expected from construction or operation of the Project because none of the equipment associated with the solar field or collection lines emit GHGs. Some emissions will result from operations and maintenance vehicles, but these will be limited in number and frequency and would not result in long-term impacts to air quality in the Project Area. In the long term, Project operations would have a beneficial impact on the climate by replacing energy generated by the combustion of fossil fuels, thereby reducing emissions of GHGs.

2.3.3 Best Management Practices and Mitigation

All Project vehicles and equipment, including the generators used during operation, would be maintained in proper working order and in compliance with state and federal emission standards. This will ensure that the amount of GHGs emitted by the Project would be negligible.

2.4 Soils

2.4.1 Existing Conditions

According to the U.S. Department of Agriculture (USDA) National Resources Conservation Service soil surveys (NRCS 2019), there are two soil types mapped in the Project Area: coral outcrop and fill land, mixed. The coral outcrop soil type comprises approximately 80 percent of the Project Area and the fill land, mixed soil type comprises approximately 20 percent of the site. Coral outcrop soil consists of coral or cemented calcareous sand on the Island of Oahu (USDA 1972). Coral outcrop makes up about 80 to 90 percent of the acreage of this soil type while the remaining acreage consists of a thin layer of friable red soil material in cracks, crevices and depressions within the coral outcrop (USDA 1972). These soils are similar to the Mamala soil series, which have moderate permeability, very slow to medium runoff, and slight to moderate erosion hazard (USDA 1972). The fill land, mixed soil type consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources and this land type is used for urban development, housing, and industrial facilities (USDA 1972).

The Land Study Bureau's (LSB) Detailed Land Classification rates the agricultural suitability of soils using a five-class productivity rating. The rating is expressed using the letters "A", "B", "C", "D" and "E", with "A" representing lands of the highest productivity, and "E" the lowest or very poorly suited for agricultural production. The Project Area is unclassified by the LSB's Detailed Land Classification System because the Project is not in the State Agricultural Use District. The State of Hawaii Department of Agriculture's Agricultural Lands of Importance to the State of Hawaii indicates the Project Area is not located on "prime", "unique," and/or "other important" designated agricultural land.

2.4.2 Short- and Long-Term Impacts

Short-term direct impacts on soils would occur during construction of the proposed Project through ground disturbing activities, specifically extensive grubbing, which could increase the potential for soil erosion. Minimal grading would be required. Features designed to control storm water and minimize erosion would be included in the site design and engineering, and disturbed areas would be revegetated wherever possible upon completion of construction. As such, potential erosion impacts, including mass soil movement, would be minor. Long-term impacts to soils would occur from alteration of soil function at each Project structure including pads, generator-tie line poles, buildings, and access roads. Impacts would include a loss of productivity or vegetative growth from compaction, mixing, and/or shading. However, the vast majority of the Project site

would be occupied by the solar array, which will be emplaced with racking systems mounted on piles. In addition, the lands in the Project Area exhibit properties that exclude them from being classified as prime or unique agricultural land. As such, the loss of soil function will be minimal. Long term impacts to soils could also occur from routine servicing of all operational components of the proposed Project such as panels and access roads through vehicle access. However typical servicing would not require heavy equipment, and disturbance to soil and increases in erosion would be minimal. However, typical servicing would not require heavy equipment, and disturbance to soil and increases in erosion would be minor.

2.4.3 Best Management Practices and Mitigation

Erosion-reducing engineering and design features and industry-standard BMPs will be implemented to avoid and minimize impacts to soil resources including, but not limited to, the following:

- Features designed to control storm water and minimize erosion will be included in the site design and engineering.
- Disturbed areas will be revegetated wherever possible upon completion of construction.
- Grading and earthmoving will be minimized to the extent practicable.

2.5 Topography and Geology

2.5.1 Existing Conditions

The Project is located approximately 3.5 miles south of the Waianae Mountain Range, which is estimated to be about 4 million years old with the last eruptions estimated to have occurred about 2.5 million years ago (To-Hawaii 2019). The Project Area is underlain by calcareous reef rock and marine sediment (Qcrs) from the Pleistocene formed 150,000 to 11,000 years ago (Sherrod et al. 2007). The Project is located within the Ewa karst which covers about 31 square miles and is associated with limestone sinkholes where brackish water can flow (Townscape 2017). See Section 7.0 for a discussion regarding water quality and the Project's underlying aquifers.

The topography of the Project Area is gently sloping in southwesterly direction with elevations ranging between about 14 to 39 feet above mean sea level.

2.5.2 Short- and Long-Term Impacts

Short-term direct impacts to landscape function at the Project Area would occur from Project construction through ground disturbance. However, the Project Area where the proposed new structures would be located is flat to gently sloping, and excavation and earthmoving would be minimized to the extent practicable, thus, the Project would have little effect on the overall topography. As a result, impacts to topography and geology would be negligible.

Long-term impact to the landscape during operations would occur from installation of Project structures including solar panels, buildings, and associated infrastructure. BMPs would be used to minimize potential effects of ground disturbance on landscape function during operations, and wherever possible, ground surfaces would be restored. As such, potential long-term impacts on the overall topography and geology from Project construction and operations would be negligible.

2.5.3 Best Management Practices and Mitigation

The Project will result in minor impacts related to geology and topography; therefore, no additional avoidance, minimization, or mitigation measures are required.

3.0 Land Regulation

3.1 Land Uses

3.1.1 Existing Conditions

The Project Area is located on DHHL land and a portion of the facility's access roads and transmission line may be located on U.S. Navy owned land. The Project Area was formerly part of the Naval Air Station Barbers Point (NASBP) throughout the 1940s and 1950s it housed a number of revetments, bunkers, roads, and other infrastructure. The NASBP was closed in 1999 and the Project Area was eventually transferred to DHHL. Parcel 38 is currently unused by DHHL. The existing tenants currently have short-term rights-of-entry on approximately 9 acres of Parcel 40 (DHHL 2019).

The surrounding land uses include the Kalaeloa Airport and industrial development to the west, several golf courses to the east and north, residential and urban development to the north and east and the Hunt Solar Facility which is directly adjacent and to the west of the northern portion of Parcel 38. Kapolei, the closest town located approximately 1 mile north of the Project Area encompasses a diverse mix of land uses, including residential, business, and recreational.

Land within the Project Area lies entirely within the State Urban Land Use District and City and County of Honolulu (County) Military and Federal Preservation District (F-1) Zone and located within the Kalaeloa Master Plan and subject to the Kalaeloa Community Development District (CDD) rules which are enforced by the Hawaii Community Development Authority (HCDA). As the Project is located within the F-1 zone, is located on DHHL lands and potentially on U.S. Navy owned land, the Project is not subject to County zoning (DHHL 2018).

The State Urban District generally includes areas that are currently in urban use, as well as vacant areas for future development. There are no restrictions on solar energy development within the State Urban District. Therefore, the Project is anticipated to be compliant with the current state land use designation.

As specified in the Kalaeloa CDD, the southern solar array area of Parcels 38 and all of Parcel 40 are located within Transect Zone T2: Rural/Open Space Zone and the northern portion of Parcel 38 is

located with Transect Zone T3: General Urban Zone. Because the Project constitutes a man-made change on a lot greater than 40,000 square feet (0.92 acres) within the Kalaeloa CDD, the Project will require a Development Permit within any zone, per §15-215-78 of the CDD Rules (HCDA 2012). Per §15-215-79 of the CDD Rules, within Zone T2, solar facilities are "permitted by right" such that a Conditional Use Permit (CUP) is not required. Within Zone T3, solar facilities are an allowed use with an approved CUP (HCDA 2012).

The following development standards apply to the T2 and T3 Transect Zones.

- Front Yard Setback: 5'15" in both T2 and T3
- Side and Rear Yard Setback: 0' in both T2 and T3
- Maximum Height: 28' in T2; 60' in T3

The Kalaeloa CDD "Thoroughfare Plan" includes the Kualakai Parkway Extension, which intersects Parcel 38. Improvements to Tripoli Road are also included in the Thoroughfare Plan.

The Project Area is designated as "Industrial" in the Oahu Island Plan (DHHL 2014) and "Mixed Use" in the Kapolei Regional Plan (DHHL 2010). Lands in the Kalaeloa area are not intended for residential development but rather are intended for revenue generation (DHHL 2010). Solar development therefore complies with this land use requirement. Similar to other energy projects in the Kalaeloa area, the Project will provide DHHL with rent monies, which will be utilized to build homes and fund educational programs for native Hawaiians.

The DHHL Hoomaluo Energy Policy presented in the Kapolei Regional Plan consists of five objectives. The Project will directly support Objective 2: "Facilitate the use of diverse renewable energy resources (DHHL 2010)."

3.1.2 Short- and Long-Term Impacts

Short-term impacts to land use within the Project Area would occur because the land occupied by the solar array would be converted from its current use to a solar energy facility use. However, currently the Project Area consists of mostly vacant land and Innergex will work with DHHL to relocate the current tenants on Parcel 40 to the unused areas or otherwise minimize impacts to them. Therefore, any impacts to existing land use would be negligible. With the decommissioning and removal of Project facilities at the end of the Project's useful life (estimate 35 year) the land would be restored back to its existing use and would therefore have no long-term impacts. The Project is not anticipated to impact (in short or long term) the current land uses in the areas adjacent to the Project Area, because the neighboring land uses would not change or be limited in their current activities. As a result, short-term impacts to land use would be minor and long-term impacts would be negligible.

3.1.3 Best Management Practices and Mitigation

While impacts to land use are expected to be minor, the Project will implement BMPs, as described in sections 2.1.3 and 2.4.3, to further reduce any potential impacts to adjacent land uses from the construction and operations activities. In addition, Innergex will work with DHHL to minimize impacts to the current tenants on Parcel 40.

3.2 Natural Hazards

3.2.1 Existing Conditions

While uncommon, a variety of natural hazards can affect Hawaii, including hurricanes and tropical storms, tsunamis, volcanic eruptions, earthquakes, floods, and wildfires. All of the County is in an earthquake seismic hazard zone B, which means moderate shaking with only slight damage to structures likely to occur (USGS 2017b). The flood zone designation for the proposed Project is designated as Flood Zone D, which includes "areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted" (FEMA 2011, 2019). Localized flooding occasionally closes nearby Coral Sea Road and Tripoli Road during large storm events (HCDA 2006). The Hawaiian Islands are seasonally affected by Pacific hurricanes from the late summer to early winter months. The Hawaiian Islands are seasonally affected by Pacific hurricanes from the late summer to early winter months. True hurricanes are rare in Hawaii—only five have made landfall in the islands over the last 50 years (Bussinger 1998). The southern portion of Parcel 38 and all of Parcel 40 are located in the Extreme Tsunami Evacuation Zone and is within 1 mile of areas exposed to sea level rise (NOAA 2019, Tetra Tech 2019).

3.2.2 Short- and Long-Term Impacts

There is the potential for short and long-term impacts to Project construction or operations due to flooding during severe weather or extreme tsunami events. Although the occurrence rate is very low, construction and operations of the proposed Project could also be impacted in the short or long term by a hurricane or an earthquake. In the unlikely event that wind speeds are high enough to damage solar panels and cause them to break and scatter, the damage would likely be confined to the site and potentially the areas immediately adjacent. Depending on the severity of the tsunami, earthquake, or hurricane, electrical supply to the HECO grid could be disrupted.

The proposed Project could increase the risk of potential wildfires during construction and operations due to the use of vehicles and electrical equipment and increased human presence near the proposed Project. The risk would be highest during the construction phase and hot summer months. However, the impacts related to wildfires are anticipated to be minor with avoidance and minimization measures in place.

3.2.3 Best Management Practices and Mitigation

The potential for impacts from natural hazards, such as hurricanes, fires, and earthquakes, is low. However, the following BMPs will be implemented to ensure minor impacts from natural hazards:

- Structural aspects of the solar farm will be designed and constructed in accordance with governing local codes to reduce the risk of earthquake and hurricane damage.
- In the event that a storm watch or warning is issued, the site construction manager will be responsible for implementing the appropriate procedures in accordance with a developed Site Safety Handbook to ensure the safety of staff.
- An Emergency Response Plan, which would include a fire safety section, will be developed for construction and operation activities. Implementation of the plan will include training of onsite personnel and coordination with local emergency response personnel. Innergex will work with the local fire department to identify and mitigate safety risks to prevent incidents and protect employees, first responders, the public and the environment. A site visit with the fire department will be held to review procedures for different types of potential incidents.
- Maintenance (e.g., servicing, inspection and repair) of mechanical and electrical systems will be conducted on a routine basis to decrease the risk of fire.

3.3 Noise

The State of Hawai‘i regulates noise through HAR, §11-46, “Community Noise Control,” and provides for the prevention, control, and abatement of noise pollution in the State. “Noise” is defined as *“any sound that may produce adverse physiological or psychological effects or interfere with individual or group activities, including but not limited to communication, work, rest, recreation and sleep*.” Under certain conditions, noise can interfere with human activities at home or work and affect human health and well-being (HAR §11-46.2).

Sound pressure level is a measure of the sound pressure of a given noise source relative to a standard reference value (typically the quietest sound that a young person with good hearing can detect). Sound pressure levels are measured in decibels (abbreviated dB). The decibel scale is logarithmic, which means that a source that is 10 dB louder than another source sounds about twice as loud. Most people find a change of less than 3 dB difficult to perceive.

Broadband sound includes sound energy summed across the entire audible frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum can be completed to determine tonal characteristics. Typically, the frequency analysis examines 11 octave bands ranging from 16 hertz (low frequency) to 16,000 hertz (high frequency). The human ear is not equally sensitive to sound in all octave bands; thus, an A-weighted filter is applied to compensate for the frequency response of the human auditory system. The sound level, in decibels, using the A-weighted network is represented in dBA.

The State of Hawai'i Department of Health (HDOH) regulates noise levels by imposing maximum allowable sound levels at property boundaries for various zoning districts (Table 3.3-1). These noise limits are absolute (i.e., not relative to ambient conditions), are prescribed by receiving zoning class and time period, and are enforceable at the facility property boundaries. Zoning districts are determined by ordinances adopted by the applicable local, county or state government agencies. For mixed zoning districts, the primary land use designation is used to determine the applicable zoning district class and maximum permissible sound level. For instance, if a residential structure is surrounded by agricultural land, it may be considered Class A use on Class C land.

Table 3.3-1. Hawai'i Maximum Permissible Sound Levels by Zoning District

Receiving Zoning Class District	Maximum Permissible Sound Level (dBA)	
	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
Class A Zoning districts include all areas equivalent to land zoned residential, conservation, preservation, public space, or similar type.	55	45
Class B Zoning districts include all areas equivalent to lands zoned for multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type.	60	50
Class C Zoning districts include all areas equivalent to lands zoned agriculture, county, industrial, or similar type.	70	70

Source: HAR §11-46, "Community Noise Control"

Noise levels may exceed the prescribed limits up to 10 percent of the time within any 20-minute period. The maximum permissible sound level for impulsive noise is 10 dBA above the maximum permissible sound levels for the given receiving zoning class district. HAR § 11-46-5 provides further exemptions to these limits. Additionally, with issuance of a construction permit, noise produced by portable or movable equipment, such as construction equipment, are not subject to the 70-dBA limit under HDOH noise regulations. Instead, construction noise levels above these limits are regulated using a curfew system whereby noisy construction activities are not normally permitted during nighttime periods, on Sundays, and on holidays. Thus, with issuance of a construction permit, construction activities, which could typically exceed the sound level limit, are normally allowed during the normal -daytime work hours on weekdays and on Saturdays. If construction activities exceeding the maximum permissible levels will take place outside of these allowed construction hours, a community noise variance must be obtained from HDOH.

Pursuant to HAR § 11-46-7 and HAR § 11-48-8 a permit or variance may be obtained for operation of an excessive noise source beyond the maximum permissible sound levels. Factors that are considered in granting of such permits and variances include whether the activity is in the public interest and whether the best available noise control technology is being employed.

3.3.1 Existing Conditions

HAR defines "ambient or background noise" as the totality of sounds in a given place and time, independent of sound contribution of the specific source being measured. Existing sources of ambient noise in the vicinity of the Project Area include vehicle traffic on roadways, air traffic from the Kalaeloa Airport, and equipment use or other noise associated with residential, business, and recreational activities.

The Project is located in the (F-1) Military and Federal Preservation District per County Zoning and is in the Rural/Open Space and General Urban Transect Zones per HCDA. Consultation with HDOH will be needed to clarify what Receiving Zoning Class District the Project is located in; however, based on the existing and historic uses in the vicinity of the Project, the Class C district would likely apply. Therefore, the daytime and nighttime limits of 70 dBA would apply.

3.3.2 Short- and Long-Term Impacts

Project construction may result in temporary adverse noise impacts at nearby areas, including residences and the Barbers Point Golf Course. The closest residences are approximately 0.5 miles east of the Project and the Barbers Point Golf Course is approximately 400 feet from the proposed Project Area. Noise levels of construction equipment typically ranges from approximately 80 to 90 dBA at 50 feet. The actual noise levels produced would be dependent on the construction methods and equipment employed during each phase of construction. Louder construction equipment (e.g., pile driver, earth moving equipment, back-up alarms) are likely to be audible throughout the entire Project Area and potentially audible to residences to the east of the Project Area. Noise levels would be typical of standard construction activities, would cease with the completion of proposed construction activities, and would only occur during normal working hours unless a noise variance permit were obtained from HDOH. Construction workers would be subject to federal and local safety regulations requiring hearing protection. Adverse impacts from construction noise are not expected to pose a hazard to public health and welfare because of the temporary nature of the work and use of mitigative measures that will be employed to minimize noise impacts. Construction-related noise would terminate when construction is complete. As a result, short-term impacts from noise would be minor.

There would be negligible long-term noise impacts from Project operations as the Project would not generate noise that exceeds the acceptable noise levels beyond the Project Area.

Noise impacts will be reevaluated once Project design and construction plans are finalized. Further modeling would be required to make a full assessment of noise impacts. However, no significant short-term or long-term impacts on ambient noise associated with the Project are anticipated.

3.3.3 Best Management Practices and Mitigation

Prior to construction, the Applicant would coordinate with the HDOH to ensure noise concerns are addressed. If there is the potential for Project construction to result in excessive noise levels, a noise permit for construction would be obtained from the HDOH.

BMPs that could potentially be implemented to minimize noise impacts during construction include:

- Restricting loud procedures to weekdays during daylight hours to minimize noise impacts;
- Establishing and enforcing construction site and access road speed limits during the construction period;
- Using electrically-powered equipment instead of pneumatic or internal combustion powered equipment, where feasible;
- Locating material stockpiles and mobile equipment staging, parking, and maintenance areas as far as practicable from noise-sensitive receptors;
- Only using noise-producing signals, including horns, whistles, alarms, and bells, for safety warning purposes;
- Ensuring that no Project-related public address or music system would be audible at any adjacent receptor; and
- Equipping noise-producing construction equipment and vehicles using internal combustion engines with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features, ensuring these items are in good operating condition that meet or exceed original factory specification.

Acoustic modeling may be used to determine whether additional noise mitigation measures would be necessary to comply with the applicable requirements.

3.4 Roadways and Traffic

3.4.1 Existing Conditions

Access to the Project Area will be via new access roads constructed off of Coral Sea Road. Coral Sea Road is a minor collector road primarily serving the Barber's Point Air Station. It is a two-lane, two-way road Cora Sea Road is a City and County of Honolulu road right-of-way. Innergex will work with the county to obtain any required easements and permits required to improve existing or build new driveways off of Coral Sea Road.

3.4.2 Short- and Long-Term Impacts

Minor, temporary impacts to traffic along Coral Sea Road may occur during construction of new access road driveways. Temporary impacts to traffic are also expected during construction due to the increase in construction vehicles traveling to and from the Project Area. However, these

impacts are anticipated to be minimal because construction traffic will be limited during peak traffic hours. Impacts on traffic during operations and maintenance are expected to be negligible.

3.4.3 Best Management Practices and Mitigation

To ensure any potential impact on roadways and traffic on the Coral Sea Road are minimized, BMPs would be implemented during construction. These BMPS would likely include the following:

- Explore having deliveries for non-peak hours of traffic and minimizing the number of vehicles permitted on the roadways at a given time.
- Complete a traffic impact analysis as part of the HCDA Development Permit and CUP Applications.

3.5 Utilities

3.5.1 Existing Conditions

3.5.1.1 Electric

HECO provides electrical service to the Island of Oahu. There is currently no electrical power service to the Project Area. A Project substation would be located within Parcel 38 and the Project point of interconnection would be located on federal land at the existing switchyard east of Parcel 38 and adjacent to the Hunt Solar Facility. A collector line would extend from Parcel 40 to Parcel 38 and a gen-tie line would extend from the northern solar array area on Parcel 38 to the point of interconnection.

3.5.1.2 Telecommunications

Hawaiian Telcom is the largest local-access landline service provider on Oahu. Spectrum (formerly Oceanic Time Warner) and Hawaiian Telcom provide cable-based telecommunications services on the island and several cellular telephone service providers provide cell coverage on Oahu.

3.5.1.3 Water

There is presently no potable water available in the Project Area. The Honolulu Board of Water Supply (HBWS) manages water resources on Oahu. Currently, there is no sewer service to the Project Area.

3.5.2 Short- and Long-Term Impacts

The Project is not expected to negatively impact the existing water and telecommunication utilities. During construction, the Project may require a permit from the Department of Water Supply. However, construction and operation activities are not anticipated to impact the public water supply.

Construction of the Project is not anticipated to have an impact on the existing electricity supply to the area. The proposed Project would provide electricity to the existing power grid, providing a renewable source of energy. Therefore, the proposed Project would beneficially impact electric supply.

3.5.3 Best Management Practices and Mitigation

The Project is not anticipated to have a significant effect on existing utilities, including electric, telecommunications, water, or gas. Therefore, no mitigation measures are required. Relevant and applicable BMPs, as described in section 3.2.3, would still be implemented to further reduce the risk of accidental impacts resulting from construction and operation activities.

4.0 Socio-Economic Characteristics

4.1 Existing Conditions

The Project Area is located on undeveloped land within the Ewa region of Oahu and is surrounded by urban, residential, and recreational development to the north and east and the Kalaeloa Airport and James Campbell Industrial Park to the west. The closest communities to the Project Area include Kapolei, Ewa Villages, Ewa by Gentry, Ocean Pointe, Kalaeloa, and Ewa Beach. Employment in the region is largely industrial, commercial and retail.

According to the 2017 American Community Survey, the resident population of Kapolei numbered 21,086 people in 2017, the population of Ewa Villages numbered 8,087, the population of Ewa by Gentry numbered 24,181 and the population of Ocean Pointe Beach numbered 13,579 (U.S. Census Bureau 2017). Combined, this is approximately 6.8 percent of the total population of the Island of Oahu, which was estimated at 990,060 in 2017 (U.S. Census Bureau 2017).

4.2 Short- and Long-Term Impacts

The proposed Project is not expected to have an adverse impact on the existing population of Kapolei, Ewa Villages, Ewa Beach, or the general population in the vicinity of the Project Area, and no persons would be displaced by the Project. Additionally, the Project is not anticipated to place unexpected demands or additional burdens on infrastructure, housing, or public services in the Project's vicinity. Project construction would result in minor, temporary impacts to traffic in the vicinity of the Project; however, construction traffic is not expected to result in a substantial increase in traffic during peak hours.

During construction, temporary employment opportunities would be created. Much of the employment associated with the Project would be short term, lasting through completion of Project construction; however, permanent employment opportunities would also be created during Project operation. The Project would result in indirect economic benefits to the local communities and the Island of Oahu through new revenue associated with the purchase of fuel, insurance, food, services and supplies made by local supply chain manufacturers, and construction contractors.

4.3 Best Management Practices and Mitigation

Construction and operations of the Project would not affect the demographics or socioeconomic status of the surrounding communities; therefore, no mitigation is required.

5.0 Aesthetic/Visual Resources

5.1 Existing Conditions

The Project Area is located in the southwestern portion of Oahu. The visual setting surrounding the Project Area consists primarily of rural undeveloped land, as well as the Kalealoa Airport to the west of the Project Area, the Barbers Point Golf Course, Hoakalei Country Club, and the Kalealoa Renewable Energy Park and Aloha Solar facilities. The coastline is approximately 0.4 miles south of the Project Area. Elevations within the Project Area range between approximately 14 feet and 39 feet above mean sea level.

The Ewa Development Plan identifies several "significant views and vistas" in the region (City and County of Honolulu 2013). Views and vistas applicable to the Project Area include "distant vistas of the shoreline from the H-1 Freeway above the "Ewa Plain" and "mauka and makai views". The Project Area is relatively flat and, in general, covered by dense vegetation which limits views both of the site and from the site.

5.2 Short and Long-Term Impacts

Short-term visual impacts are expected during construction. These impacts would be temporary and would potentially impact views from the Barbers Point Golf Course and Hoakalei Country Club, Roosevelt Avenue, the Kalaeloa Airport, and the community of Ocean Pointe. Visual impacts include the visibility of construction crews, construction materials, dust, and construction activities within the Project Area and construction of access roads and the generator-tie line. Once construction is complete, all equipment no longer necessary for operation and maintenance of the Project would be removed. As a result, short-term visual impacts would be minor.

Long-term visual impacts would be associated with the operation and maintenance phase of the Project. The Project would consist of an array of photovoltaic panels arranged in rows, inverters, combiners, transformer(s), overhead and buried conduits, and onsite collection lines. The maximum height of the photovoltaic panels (at full tilt) would be 16 feet. While Project facilities would potentially be visible to the closest residences, as well as by golfers at the Barbers Point Golf Course, the Project would not likely be visible from the nearby communities of Kapolei, Ewa Villages, Ewa by Gentry, or Ocean Pointe. A visual impact assessment would be required to make a full assessment of visual impacts. However, only be minor long-term impacts on aesthetic/visual resources associated with the proposed Project are anticipated. The mountain and coastal scenic vistas and the open space areas would be maintained.

A glare analysis would be conducted to assess the potential for glare from each landing approach at Kalaeloa Airport and from sensitive receptors in the vicinity of the Project. As part of the glare

analysis, consultation with the Federal Aviation Administration would be conducted to address any glare concerns from an aviation perspective. The Project is anticipated to have only minor impacts associated with glare.

5.3 Best Management Practices and Mitigation

Impacts to aesthetic and visual resources from the proposed Project are anticipated to be minor; therefore, no mitigation is required. BMPs that could be implemented include implementation of a fugitive dust control plan during construction and operations and keeping the Project Area free of debris, trash, and waste during construction. The visual impact assessment would make a full assessment of visual impacts and produce visual simulations from key observation points.

6.0 Hazardous Materials and Wastes

6.1 Existing Conditions

Impacts associated with hazardous materials are often associated with storage tanks, and the storage, transport, use, and disposal of pesticides, fuels, lubricants, and other industrial substances. A Phase I Environmental Site Assessment to assess the potential presence of hazardous materials on the site has not been undertaken for the proposed Project Area; however, one would be conducted prior to construction.

6.2 Short- and Long-Term Impacts

Because heavy construction equipment will be used for installation of the solar array, there would be a short-term risk of impacts during construction from routine transport, use, storage, and disposal of hazardous materials such as antifreeze, diesel fuel, gasoline, hydraulic oil, lube oil, and grease which could occur via accidental spills and release of hazardous materials. If any hazardous materials are found during a Phase I assessment, mitigation measures would be implemented to minimize exposure of workers and the environment to these. Any ongoing permits or authorizations related to hazardous materials will be obtained as needed and adhered to. With implementation of a Hazardous Materials and Waste Management Plan (HMWMP), a Spill, Prevention, Containment, and Countermeasure (SPCC) Plan, and BMPs, the risk of potential impacts from hazardous materials during Project construction would be minor.

There will also be short-term impacts during construction from an increase in solid waste streams as a result of debris being generated during construction. The construction contractor will be responsible for the provision of waste collection facilities including maintenance, sorting, off-site transportation, and disposal. The capacity of waste disposal facilities on Oahu will accommodate construction of the proposed Project. Therefore, waste from constructing the proposed Project would result in minor impacts to the existing facilities and would not exceed the capacity of the facilities.

In addition to short-term impacts, there would be long-term risk of impacts during Project operations from routine transport, use, storage, and disposal of hazardous materials, and accidental

spills and release of hazardous materials. The risk during operations would be far less than during construction given there will be minimal use of heavy construction equipment once construction is completed. Most equipment to be installed as part of the photovoltaic array and associated electronics are dry-type, solid state equipment and will not pose a threat of hazardous waste except from coolant within inverters and the mineral-oil filled transformers. The potential for chemical releases from the constructed panels appears to be small since chemicals are present in sealed photovoltaic modules; releases from these are likely to occur only due to fires or other unusual accidents, which are extremely rare. The contents of the utility-scale batteries at battery storage facility would be sealed in the battery case and would not be classified as a hazardous material. Many batteries are doubly encapsulated so that a leak would be contained in the battery case. As a result, long-term impacts from waste associated with operation of the Project would be minor.

6.3 Best Management Practices and Mitigation

Design features, industry-standard BMPs, and Project-specific plans (e.g., Site Safety Handbook, SPCC Plan, and HMWMP) will minimize impacts from hazardous and regulated materials and wastes resulting in minor impacts to the existing conditions.

7.0 Water Quality

7.1 Existing Conditions

The Project Area is located approximately 0.4 mile north of marine waters of the Pacific Ocean. In addition, the proposed project is located in the Ewa Aquifer, one of five aquifers in the Pearl Harbor Sector (Hawaii Office of Planning 2019). There are two groundwater bodies underlying the Kalaeloa area, a shallow, predominantly caprock groundwater system and an underlying, deep basal aquifer. The deep, underlying aquifer is confined and not susceptible to contamination (Mink and Lau 1990). The shallow aquifer is unconfined, and highly vulnerable to contamination but is brackish and not suitable for drinking water. Both groundwater bodies are in direct hydrologic contact with the Ocean. The depth to ground water varies from about 60 feet along north Kalaeloa to zero along the coast (U.S. Navy 1994).

The National Wetlands Inventory, National Hydrography Dataset, and Hawaii Department of Aquatic Resources datasets did not identify any potentially jurisdictional wetlands or waters within the Project Area (Tetra Tech 2019). However, it is possible that there are wetlands or drainage features within the Project Area not identified by these datasets.

Ordy Pond is a large anchialine pool located southeast of Parcel 40. Anchialine ponds are unique coastal water bodies that have no surface connection to the sea but have an underground connection to the ocean and groundwater table (Holthuis 1973). Given the porous substrate and presence of known anchialine pools in the area, it is possible that anchialine pools occur within the Project Area.

7.2 Short- and Long-Term Impacts

The Project has the potential to cause short-term impacts to marine water quality and the shallow aquifer during construction from ground disturbance activities, and use of hazardous materials such as fuels, lubricants, cleaning solvents, and paints, through the conveyance of soils or hazardous materials during periods of heavy rainfall in the event this runoff travels overland from the Project Area to coastal waters or seeps into the groundwater. However, a site-specific Storm Water Pollution and Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control (TESC) Plan would be prepared for the Project and would identify BMPs and erosion control measures that would be implemented to minimize the potential for sediments and pollutants from reaching surface waters through stormwater runoff. In addition, a Project SPCC Plan would be implemented, which would reduce potential impacts to groundwater. Therefore, short-term impacts to water quality from the Project are expected to be minor.

Additional surveys are needed to determine whether anchialine pools occur within the Project Area. If present, it is likely the pools would be avoided and therefore, no impacts to these features, or the connected groundwater table or ocean would occur.

Permanent Project structures and platforms including the array of solar panels would result in an increase in the amount of new impervious and semi-impervious surfaces contributing to an increase in stormwater runoff and potentially a decrease in groundwater recharge beneath those areas. However, the long-term impact to water quality associated with this would be negligible.

7.3 Best Management Practices and Mitigation

Prior to construction of facilities, site-specific measures to minimize impacts to water quality would be developed and outlined in the Project's TESC Plan and SWPPP. BMPs to protect water quality may include, but are not limited to, installing and maintaining silt fences, avoiding earthwork during adverse weather conditions, and revegetating or stabilizing disturbed areas as soon as possible. Additionally, a SPCC Plan would be prepared prior to construction, which would include measures for the safe transport, handling, and storage of hazardous materials.

8.0 Public Safety Services

8.1 Existing Conditions

Police and fire services on Oahu are provided by the City and County of Honolulu. The Project Area obtains police protection from the Honolulu Police Department, District 8 Kapolei Station, located about 2.5 miles from the Project Area. Fire control services would be provided by the Honolulu Fire Department, Fire Station 43 East Kapolei or Fire Station 24 Ewa Beach, located about 1 mile and 2 miles, respectively, from the Project Area.

The primary health service provider in the vicinity of the Project Area is Queen's Medical Center-West Oahu, approximately 4 miles northeast of the Project Area. Emergency services are provided at this facility. Other medical health centers and clinics in the vicinity of the Project Area include

Kapolei Health Care Center and Kaiser Permanente Kapolei Clinic in Kapolei. Honolulu Emergency Medical Services has 20 advanced life support ambulances, one of which is stationed in the East Kapolei Fire Station.

8.2 Short- and Long-Term Impacts

The Project could result in short-term impacts to public safety services during construction, as the transport of equipment and materials to and from the site, the increased activity at the site and on surrounding roads, and the increased presence and activity of site personnel would increase the potential for traffic accidents, injuries, and fires, which would require a response by police and fire protection services. However, these short-term impacts are expected to be minor with the implementation of BMPs described in section 8.3.

The long-term operation of the solar Project would not be expected to significantly impact the current service levels. However, there is a risk of fire hazard during operation. Impacts related to wildfires are anticipated to be minor with BMPs in place.

8.3 Best Management Practices and Mitigation

A Site Safety Handbook will be prepared for construction of the Project, and all persons entering the construction areas would be required to review and adhere to the Site Safety Handbook. The implementation of a Site Safety Plan and observance of safe working practices during construction are expected to substantially reduce the potential for serious accidents. In the event of an incident, fire, police, and emergency services would all be available, and expected to be adequate to accommodate the demand. As such, construction of the proposed Project would not be expected to significantly impact the current service levels.

The BMPs discussed in Section 3.2.3 regarding fire prevention and suppression will reduce fire hazards. Additionally, maintenance (e.g., servicing, inspection and repair) of mechanical and electrical systems will be conducted on a routine basis to decrease the risk of an emergency, including fire. With the implementation of these measures and observance of safe working practices during operations, impacts to public safety services from operation of the Project would be negligible.

9.0 Recreation

9.1 Existing Conditions

The Project Area is located west of the Barbers Point Golf Course and Hoakalei Country Club and north of the Kalaeloa Beach Park and White Plains Beach subdivision. Recreational activities in the vicinity of the Project include swimming, surfing, fishing, boating, fishing, golfing, running and walking. The Kalaeloa Master Plan identifies Coral Sea Road as a potential bicycle trail that would connect the coastline to Roosevelt Avenue and Kapolei Parkway. The site is owned by the DHHL and while access to the site is currently largely unrestricted to the general public no recreational activities are known to occur within the proposed Project Area.

9.2 Short- and Long-Term Impacts

Some short-term indirect impacts to recreational resources in the vicinity of the Project Area may occur due to Project-related traffic during construction; however, this impact would be temporary and minor. Construction of the Project would also create noise that may affect nearby recreational facilities including the Barbers Point Golf, Hoakalei Country Club, Kalaeloa Beach Park, and White Plains Beach. Construction noise, however, would be temporary, intermittent and would likely have a minor to negligible effect on these recreational resources.

No long-term direct or indirect impacts to recreational resources are anticipated from construction or operations of the proposed Project. No Project infrastructure would be placed within any existing recreation resource area.

9.3 Best Management Practices and Mitigation

Impacts to recreational resources from construction and operation of the proposed Project would be negligible; therefore, no additional mitigation measures are proposed to address these impacts.

10.0 Potential Cumulative and Secondary Impacts

The ongoing and reasonably foreseeable actions considered in the cumulative impacts analysis are those that would overlap in time and space with the effects of construction and/or operation of the Project. The Ewa Development Plan (City and County of Honolulu 2013) describes actions related to the development of a second urban center for Oahu in the Kapolei area that includes: the City of Kapolei becoming a nucleus; development of new residential areas; job centers created in resort areas and industrial areas nearby; and promotion of tourism at Ko Olina and Ocean Pointe. Additionally, the Kapolei Regional Plan notes that Kapolei is the "fastest growing region in the State of Hawaii (DHHL 2010) and the Kalaeloa Master Plan describes actions related to the development of the Kalaeloa CDD, such as residential and commercial development, improvements to the road network, and development of bicycle trails and a mass transit corridor (HCDA 2006).

Specific past, present and foreseeable future actions in the Project Area include Kalaeloa Barbers Point Harbor Fuel Pier & Harbor Improvements; Kalaeloa Barbers Point Harbor dredging; Kapolei Harborside Industrial Park; Kapolei Business Park; Kapolei West; Ko Olina, Makaiwa Hills; Kalaeloa Harbor Access Road; Kapolei Interchange Complex; Kapolei Parkway Improvements; Kalaeloa Boulevard Improvements; Honolulu Rail Transit project- East Kapolei Station; the Western Kapolei Regional Drainage; the Hawaiki Submarine Fiber Optic cable; the Kalaeloa Renewable Energy Park solar facility; the Aloha Solar project; and the University of Hawaii West Oahu Campus.

The resources and issues that have been evaluated for potential cumulative impacts in this section include: air quality; biology; climate; noise; roadways and traffic; socioeconomic characteristics; aesthetic/visual resources; hazardous materials and solid waste; water quality; public safety; and recreation. The resource and issues that are considered to not create impacts outside the Project footprint are not discussed further in this section and include: land uses; topography and geology; soils; and natural hazards. In all resource areas evaluated, minor cumulative impact and no

significant secondary impacts are anticipated to result from construction and operations of the proposed Project.

Air pollutant and GHG emissions may increase in the Kapolei region due to higher vehicle traffic, construction equipment and addition of homes and tourist developments. The increases in emissions may be ameliorated by improved operational efficiencies, equipment, and technology; use of cleaner-burning fuels; adherence to pollution control rules and regulations. The Proposed Project would have a beneficial effect on climate change and air quality by reducing the use of fossil fuels and GHG emissions, as such would not contribute negatively to cumulative impacts on climate and air quality.

Noise due to non-Project traffic in the Kapolei region may increase in the future. There will also be unavoidable, potentially significant noise impacts related to construction related to development, however these will be temporary and mitigable. The proposed action will not contribute significantly to cumulative noise impacts in the Project Area.

Traffic volumes in the Kapolei region will likely increase over time due to population, recreational, and business growth in the area. The Project will not increase traffic beyond a temporary increase during construction, and will not contribute significantly to cumulative impacts to roadways and traffic.

Solid waste from development and construction sites on the Island of Oahu including in the Kapolei region will place additional demands on construction debris disposal facilities on the Island. Construction waste from the Project will contribute to demand on solid waste management temporarily, but is not expected to contribute significantly to cumulative impacts.

The visual and aesthetic character of the Kapolei region has been rapidly changing from sugarcane fields, as late as the mid-1990s, to urban and industrial development. The Proposed Project will change the visual character of the Project Area from undeveloped land to fields supporting solar arrays, but the visual impact will be moderate and mitigation measures such as screening, the Project's contribution to cumulative impact on visual resources will be minor.

Hazardous material impacts in the Kapolei region may increase with continued growth in the region. Given strict adherence to petroleum operation rules and regulations, hazardous materials handling rules, and BMPs, the Project's contribution to cumulative impacts will be minor.

Water quality may be affected by the continued development of the Kapolei region as there will be an increase in impervious surfaces, reduced infiltration through the soils, and potentially reduced wetland function, in combination with potentially increasing storm water runoff and introducing sediment and other pollutants to the nearshore environment. The Project will implement BMPs to control, treat, or reduce runoff before entering nearby surface waters and the ocean as such the Project's contribution to cumulative impacts will be minor.

The cumulative demands on public safety services of developments in the Kapolei region over time will generate the need for additional police, fire and medical services. However, increases in public services and related facilities have been and continue to be planned for in accordance with these

developments. As the Project is not expected to have any impacts on public services, it will not contribute to the cumulative impact created by other projects in the region.

Demand on recreational facilities in the Kapolei region will likely increase due the future development of resort and residential communities. The Project however, will not affect demand for or access to recreational facilities as such will not contribute to cumulative impact.

Socio-economics in the Kapolei region have and will continue to change due to past, present and future actions, specifically planned residential, tourism, commercial development and population growth. The project will not adversely impact socio-economic components, instead will create benefits through temporary employment opportunities during construction.

Terrestrial and marine biological resources, including vegetation, birds, invertebrates, mammals, and their habitats, coral reef resources, and sea turtles are continuously being negatively impacted by anthropogenic and natural activities throughout the Hawaiian Islands. The growth and development in the Kapolei region will contribute to impacts to sensitive biological resources through such factors as decreases in quality of habitat, increases in noise, and direct injury. However, impacts from any given project are not easily measurable, and many impacts are likely minor. The Project's contribution to the cumulative impacts to biological resources in the area is anticipated to be minor.

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