**Preliminary environmental assessment of the Kualapuʻu CBRE Site**

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Solar and battery storage projects have a number of impacts to the environment, cultural resources, and to activities in the surrounding area. Through the use of standard best management practices (BMPs) and other forms of due diligence - such as interviewing of local community members and experts, surveying and analysis of the build site - the project can have a successful assessment and finding of no significant impact (AFONSI).

One concern with solar projects is associated with the construction phase. Though temporary and often deemed insignificant, construction activities impact the soil, air, local ecosystems (protected plants and animals), historic and cultural resources, noise and light pollution levels, and traffic conditions. It also threatens to contaminate water via hazardous material (e.g., diesel and gasoline) and possibly introduce a burden to public services (e.g., police, fire, EMS). Though BMPs should be used to mitigate impacts and risks, the overall negative effect is minor.

Another concern with solar projects is associated with its infrastructure. The creation of impervious surfaces, though minimal, indirectly impacts local water recharge, accessibility, and quality. Glare from panels can threaten visual resources (i.e., scenic vistas and viewpoints) as well as airplane pilots flying nearby. Batteries present a fire and contamination risk and must be equipped with proper containment/suppression, monitoring, and alarm systems.

Other impacts exist, such as disturbing native animal and plant habitats or culturally significant sites (i.e., iwi kupuna burial grounds or makahiki ceremonial spaces). If protected species are discovered they are reported, given space, and activity is reduced or halted. If a culturally significant site is discovered, it is reported and a protocol is developed in close collaboration with Native Hawaiian groups.

Below is a preliminary assessment of the existing conditions at the site as well as any potential impacts and associated mitigation measures.

Surrounding Land Use

The proposed project will be located on the island of Molokai, Hawaii. The parcel is located on the North side of Kualapuʻu Town center in the Ahupuaʻa of Naiwa, near the border of the Hoʻolehua Ahupuaʻa. The project site is at the corner of Alahula St and Uwao St, which are both smaller residential roads off of Farrington Ave (State Hwy 480)[[1]](#footnote-1). The property is an existing Parking lot serving a Park and Community Center in a largely residential neighborhood with a small commercial center with several small businesses. The Park has a densely forested area immediately behind the park.

The project is not expected to impact surrounding land use and is a permitted use for existing zoning.

Climate, Topography and Soils

The climate of Hawaii is tropical and characterized by mild temperatures year-round, the presence of northeasterly trade winds, and moderate humidity. There are only two distinct seasons: a wet and a dry season. However, there is significant variation in rainfall and other environmental conditions based on topography and geography[[2]](#footnote-2).

Molokai Airport is the closest location to the project site that has documented temperatures. The average annual low temperature is 69.1ºF and the high is 82.9ºF. From 2016 to 2020, the annual rainfall in Kaunakakai, has ranged from as low as 3.47 inches to as high as 15.20 inches of rain[[3]](#footnote-3). The “winter” season from October to April generally experiences the most rainfall[[4]](#footnote-4).

Most of Hawaii is composed of volcanic rock. More specifically, the soil underlying the proposed project site is classified as Lahaina silty clay (LaB) according to a soil survey by the USDA. There is medium runoff and the land is well drained[[5]](#footnote-5).

The topography of the site is characterized by sloping lands and elevations ranging from around 800 ft to 1000 ft above sea level[[6]](#footnote-6).

Potential impacts to the soil and topography could include erosion and ground disturbance while grading, trenching to put in lines, compacting soil for construction vehicles, and creating impervious surfaces for new infrastructure. These impacts are expected to be minimal considering the site is already an impervious surface. Impacts could be mitigated by revegetation around the array if needed.

Additional potential impacts to soil could result from hazardous waste release into the environment including during panel cleaning and vegetation maintenance, removing pre-existing infrastructure that may contain asbestos or lead-based paint, or in the case of a battery failure leading to thermal runaway. Mitigation measures include: use of more innovative water-less and dry brushing techniques for panel washing; use of BMPs to manage fire hazard vegetation growing around panels to avoid use of herbicides; utilizing a Battery Management System to cool the BESS units and isolate any failing units; selecting a battery chemistry less prone to thermal runaway, such as LFP; and of operation life project decommissioning to remove, reuse, and recycle equipment (all probably to the continental U.S.)

Flood and Tsunami Hazards

According to flood maps by the Federal Emergency Management Agency (FEMA), the site is located entirely within Flood Zone X which is an “Area of Minimal Flood Hazard.” This flood zone has been determined to be outside of the annual 0.2% chance of flooding[[7]](#footnote-7).

Tsunamis do not present a significant threat to  this land parcel since it is located in the tsunami safe zone, well outside of the Tsunami evacuation zone[[8]](#footnote-8).

According to the 2017 Hawaii Sea Level Rise and Climate Adaptation Report, the project site is not located in the Sea Level Exposure Area[[9]](#footnote-9) and therefore should not experience adverse effects from sea level rise in the near future.

Because the site is outside of major hazard areas, impacts, such as equipment failure due to inundation, are not expected to result from flooding at the site.

Air Quality, Water Quality, Noise Pollution

The air quality on Molokai as well as the rest of the Hawaiian Islands is generally very good. Data from the EPA shows that the Daily AQI (Air Quality Index) values from 2010 to 2022 on Molokai, rarely dipped below the good (<= 50 AQI) which is the best possible air quality category[[10]](#footnote-10). No immediate features in the Kualapuʻu area appear to be relevant, influencing the air quality at the project site.

The water quality in Maui County meets or exceeds the state and national standards. Much of the water utilized on Molokai is groundwater and the pH of the water on Molokai generally ranges from 7.2-7.9[[11]](#footnote-11).

Factors that could contribute to noise at the parcel include traffic on Farrington Ave and recreational events at the Community Center and Park.

Potential short-term impacts to air quality could result from vehicle and equipment exhaust and creating dust when disturbing the land. These impacts will be mitigated by using BMPs to maintain vehicles and equipment to minimize over exhaust and using electric equipment when possible.

Impacts to water quality could include decreased discharge of groundwater and runoff/contamination of surface water as a result of creation of impervious surfaces. Mitigation of these impacts could include limiting the use of impervious surfaces to only under the BESS and other necessary locations. Due to the low annual rainfall in the area, the project is not expected to significantly alter the amount of rainwater recharge into Molokai’s aquifers.

Potential impacts to noise include sound from construction operations and low levels of noise from the equipment, particularly the BESS cooling fans, during operation. Mitigations measures include: using electrically-powered equipment instead of pneumatic or IC powered when possible; siting stockpiles, equipment staging, parking, and maintenance areas away from noise-sensitive areas; loud procedures kept to weekday daylight hours; noise-producing signals limited to use for safety and warning purposes; use of mufflers, air-inlet silencers, and other shrouds, shields, and noise-reducing features to minimize construction equipment/vehicle noise.

Biology

There are several decorative trees along and in the middle of the parking lot at the Kualapuʻu Park and Community Center. There are 8 small trees along the south edge of the parking lot bordering Alahula St. There are 4 medium size trees lining the middle of the parking lot. The rest of the park property has several other trees, palms and a maintained lawn. With the developed nature of the area, it is unlikely that any threatened or endangered species of flora or fauna are present.

Potential impacts could include harming protected plants and animals, if present, or accidentally introducing invasive species. Mitigation measures include: creation of spatial and activity buffers if protected species is discovered; notifying the proper authorities if protected species is discovered; creation of education programs to help personnel identify and appropriately address protected species; pre- and post-construction plant and nesting bird surveys; restriction of construction activities to day-time, and have lights operate on a motion sensor;  and other specific protocols as needed (i.e. dawn/dusk surveillance for pueo or no tree/shrub disturbance during ‘ope’ape’a pupping season).

Land Use and Public Safety

There is significant recreational use of the Park and Community Center. Picnic Areas are used for outdoor events. There are also basketball and baseball fields used for team sports. There are also indoor facilities available for meetings and other events.

The closest Police Station is the Maui County Police Department Molokai Station in Kaunakakai around 7 miles away. The closest Hospital, Molokai General Hospital, is also in Kaunakakai. The closest Fire Station is 1 mile away in Hoʻolehua. The closest airport, Hoʻolehua Airport, is approximately 5 miles away.

Potential impacts to land use and public safety could include increased traffic congestion in the area and glare from panels impacting air traffic. Mitigation measures could include scheduling deliveries for off-peak traffic hours and coordinating with local agencies to ensure maintenance and safety of roads, pedestrian and bicycle paths. Because parabolic troughs, heliostats, mirrors or tall structures are not part of the project design, air traffic concerns should not be applicable.

No secondary or cumulative impacts were considered in this analysis at this time.

1. County of Maui. <https://www.mauicounty.gov/Archive/ViewFile/Item/22212>  [↑](#footnote-ref-1)
2. National Weather Service.1983. “Climate of Hawaiʻi”.  <https://www.weather.gov/hfo/climate_summary> [↑](#footnote-ref-2)
3. Hawai‘i State Department of Hawaiian Homelands, Annual Reports and Records. 2020. <https://sbdc.dev.hyperspective.com/wp-content/uploads/2021/10/2020-Maui-Data-Book.pdf> [↑](#footnote-ref-3)
4. National Weather Service.1983. “Climate of Hawaiʻi”.  <https://www.weather.gov/hfo/climate_summary> [↑](#footnote-ref-4)
5. United States Department of Agriculture. “Web Soil Survey” <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.  [↑](#footnote-ref-5)
6. United States Geological Survey. “TNM Download (v2.0)”. <https://apps.nationalmap.gov/downloader/#/>  [↑](#footnote-ref-6)
7. State of Hawaii, Department of Land and Natural Resources. “Flood Hazard Assessment Tool.” <http://gis.hawaiinfip.org/FHAT/>  [↑](#footnote-ref-7)
8. NOAA. <https://tsunami.coast.noaa.gov/#/>, 2017.  [↑](#footnote-ref-8)
9. Hawaii Sea Level Rise and Climate Adaptation Report. <https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report_Dec2017.pdf>, 2017.  [↑](#footnote-ref-9)
10. EPA Air Quality Data. <https://www.epa.gov/outdoor-air-quality-data/air-data-multiyear-tile-plot>.  [↑](#footnote-ref-10)
11. County of Maui. “Water Quality”. <https://www.mauicounty.gov/faq.aspx?TID=64>. [↑](#footnote-ref-11)