Outflow from culvert for Ulehawa Stream which runs under Lualualei Naval Access Road from the project site to the west (Mākaha) side of the road. Normally a dry streambed, this photo was taken immediately after the winter storm of December 11-14, 2008.

Rockfall Hazard

Existing Conditions

The proposed development is sited below the 200-foot contour line. Above the 200-foot elevation, the parcel takes on a more abrupt slope. It is estimated that the slope within this "second tier" of the parcel is within the 10-30% range. The rest of the parcel includes the foothills of the Pu'u Heleakala ridge which slopes radically upward towards the peak of the ridge.

Potential Impacts and Mitigation Measures

There is a potential for loose rocks to fall from the slopes behind the proposed development. To mitigate adverse impacts from falling rocks, a 100-foot wide buffer has been set aside along the

entire *mauka* boundary of the proposed industrial park. Tropic Land proposes to construct a swale or an unlined channel with possible fencing to catch falling rocks and debris, as well as to serve as a drainage detention basis. A licensed geotechnical engineer will be retained to prepare a rockfall and slope stability analysis and to design the channel during the project design phase. Tropic Land anticipates complying with the recommendations of the rockfall and slope stability analysis, including other mitigation measures that would be implemented during construction.

Seismic Activity

Existing Conditions

The island of O‘ahu rarely experiences earthquakes because the island is not situated in a highly seismic area. The Uniform Building Code (UBC) provides minimum design criteria to address the potential for damages due to seismic disturbances. The UBC seismic provisions contain six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10% chance of severe shaking in a 50-year interval). O‘ahu is in UBC Seismic Zone 2A.

Potential Impacts and Mitigation Measures

All structures and facilities will be designed to current seismic standards.

5.5 Vegetation Resources

A detailed botanical survey of the project site was conducted by AECOS Consultants and is included in the study titled *Biological Surveys Conducted on the Tropic-Land LLC, Nānākuli Light Industrial Park Site, Wai‘anae District, O‘ahu, Hawai‘i*, dated June 2008 (see Appendix D). An earlier botanical study was conducted in September 1990 for the proposed golf course by Char & Associates. The information discussed below is taken from the AECOS study, unless otherwise noted.

The AECOS botanical survey was undertaken on June 25, 2008, following a wandering transect that traversed all parts of the project site up to about the 200-foot elevation. The ~~site~~ survey was conducted early in the dry season and, therefore, a few plants typical of the site, especially annuals, might have completed their lifecycle and been missed or gone dormant.

Existing Conditions

Kiawe forests, which vary from open woodland to closed-canopy stands, form the dominant vegetation type within the project site. Buffel grass is the most common ground cover associated with this forest type. At about the 100-foot elevation contour, the composition of the forest changes with the trees more open 30 to 50% cover, and Guinea grass and green panic grass

becoming co-dominant with buffel grass at this elevation level. At about the 200 to 250 foot elevation and higher, rocky outcroppings become numerous and *koa haole* shrubs become more commonplace.

Char (1990) developed a longer plant species list with 61 species compared to the 52 species found by AECOS in 2008. However the Char study included a larger area corresponding to the footprint of the proposed golf course. The 24 plant species listed as present in 1990 and not observed in 2008 are mostly common weedy species. At the same time, the AECOS study included 15 species not reported in 1990. A total of 76 species have been identified in the project area, when the results of the 1990 and 2008 survey data are combined. See Table 8 ~~1 in Appendix D~~ for a list of plants for the project site. No plant species classified as endangered or threatened or proposed as a candidate for listing as threatened or endangered by the Federal or State government was found in the project area.

No part of the project site is included in a federally designated plant critical habitat. However, a critical habitat, identified by the U.S. Fish and Wildlife Service as Unit 15, encompasses the adjacent Pu‘u Heleakala and the ridgeline above the project area extending to the northeast (Federal Register 2003). Unit 15 extends all along the Wai‘anae ridge to the upper end of Lualualei Valley. In the project area, the boundary of this unit descends to approximately the 500-foot elevation on the ridges to the northeast and southwest, rising to the 1,000-foot contour in the valley behind the proposed industrial park. The portion of the property containing the area of critical habitat is entirely within the State Conservation District, which will not be included from any development.

The portion of the property in the Agricultural District lacks habitat for valuable native plants. This area has seen various uses and activities over the years and a portion is presently used for property maintenance. The project area has been subjected to more than one wildfire; Char (1990) reported the site as partly burned during her survey.

Table 8 - Listing of Plants (Flora)

Species listed by family	*Common name*	*Status*	*Relative Abundance*	*Notes*
	FLOWERING PLANTS			
	DICOTYLEDONES			
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat.	U1	(2)
AIZOACEAE				
Trianthema portulacastrum L.	---	Nat.	U2	(1)
AMARANTHACEAE				
Achyranthes aspera L.	---	Nat.	---	(2)
Alternanthera pungens Kunth	khaki weed	Nat.	R	(1,2)
Amaranthus spinosus L.	spiny amaranth	Nat.	O	(1,2)
Amaranthus virdis L.	slender amaranth	Nat.	R	(1)
ASTERACEAE (COMPOSITAE)				
Ageratim conyzoides L.	*maile hohono*	Nat.	---	(2)
Bidens pilosa L.	beggar's tick	Nat.	---	(2)
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat.	U	(2) †
Eclipta prostrata (L.) L.	---	Nat.	R3	
Emilia fosbergii Nicolson	*pualele*	Nat.	R	(2)
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat.	R1	(2)
Sonchus oleraceus L.	sow thistle	Nat.	R	(2)
Tridax procumbens L.	coat buttons	Nat.	U2	(2)
Verbesina encelioides (Cav.) Benth.	golden crownbeard	Nat.	---	(2)
Xanthium strumarium var. *canadense* (Mill.) Torr. ex A. Gray	cocklebur	Nat.	---	(2)
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip tree	Orn.	R2	
BORAGINACEAE				
Heliotropium procumbens Mill.	---	Nat.	R2	
BUDDLEIACEAE				
Buddleia asiatica Lour.	dog tail	Nat.	---	(2)

Species listed by family	***Common name***	***Status***	***Relative Abundance***	***Notes***
CACTACEAE				
Opuntia ficus-indica (L.) Mill.	prickly pear	Nat.	---	(2)
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian saltbush	Nat.	R2	
Chenopodium murale L.	*ʻaheahea*	Nat.	---	(2)
CONVOLVULACEAE				
Ipomoea indica (J. Burm.) Merr.	*koali ʻawa*	**Ind.**	---	(2)
Ipomoea obscura (L.) Ker-Gawl.	field bindweed	Nat.	U	(2)
Ipomoea triloba L.	little bell	Nat.	U	
Jacquemontia ovalifolia (Choisy) H. Hallier	*pāʻū-o-Hiʻiaka*	**Ind.**	U2	(2)
Merremia aegyptica (L.) Urb.	hairy merremia	Nat.	---	(2)
CUCURBITACEAE				
Cucumis dipsaceus Ehrenb. ex Spach	teasel goard	Nat.	R	
EUPHORBIACEAE				
Chamaesyce hirta (L.) Millsp.	garden spurge	Nat.	R	(2)
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	Nat.	U2	(2)
Euphorbia lactea Haworth	mottled-candlestick	Orn.	R	
Ricinus communis L.	castor bean	Nat.	U	(2)
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat.	O	(2)
Crotalaria incana L.	fuzzy rattlepod	Nat.	O	(2)
Desmanthus pernambucanus (L.) Thellung	virgate mimosa	Nat.	A	(2)
Erythrina sandwicensis Degener	*wili wili*	**End**	---	(2)
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat.	C	(2)
Indigofera hendecaphylla Jacq.	creeping indigo	Nat.	R2	
Indigofera suffruticosa Mill.	indigo	Nat.	U	(2)
Macroptilium lathyroides (L.) Urb.	cow pea	Nat.	U	(2)
Pithecelobium dulce (Roxb.) Benth.	*ʻopiuma*	Nat.	R	

Species listed by family	*Common name*	*Status*	*Relative Abundance*	*Notes*
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat.	A	(2)
Samanea saman (Jacq.) Merr.	monkeypod	Nat.	R	(2)
LAMIACEAE				
Hyptis pectinata (L.) Poit.	comb hyptis	Nat.	O3	(2)
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat.	A	(2)
Ocium gratissimum L.	wild basil	Nat.	R	(2)
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat.	---	(2)
Abutilon incanum (Link) Sweet	hoary abutilon	**Ind.**	R1	(2)
Malvastrum coromandelianum (L.) Garck	false mallow	Nat.	O	(1,2)
Malva parviflora L.	cheeseweed	Nat.	R	(1)
Sida ciliaris L.	---	Nat.	U	(1)
Sida fallax Walp.	*'ilima*	**Ind.**	O3	(2)
Sida rhombifolia L.	Cuba jute	Nat.	---	(2)
Sida spinosa L.	prickly sida	Nat.	U2	(2)
MORACEAE				
Ficus microcarpa L.	Chinese banyan	Nat.	R	(2)
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false alena	Nat.	---	(2)
PASSIFLORACEAE				
Passiflora foetida L.	love-in-a-mist	Nat.	---	(2)
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat.	R	
SOLANACEAE				
Nicandra physalodes (L.) Gaertn.	apple-of-Peru	Nat.	R	(2)
Solanum americanum Mill.	pōpolo	**Ind.**	---	(2)
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G. Anderson, & Jansen	wild cherry tomato	Nat.	U	(2)

Species listed by family	*Common name*	*Status*	*Relative Abundance*	*Notes*
STERCULIACEAE				
Waltheria indica L.	*ʻuhaloa*	**Ind.**	U	(2)
VERBENACEAE				
Lantana camara L.	lantana	Nat.	---	(2)
MONOCOTYLEDONES				
COMMELINACEAE				
Commelina benghalensis L.	hairy *honohono*	Nat.	---	(2)
POACEAE				
Bothriochloa pertusa (L.) A Camus	pitted beardgrass	Nat.	---	(2)
Cenchrus ciliaris L.	buffelgrass	Nat.	AA	(2)
Cenchrus echinatus L.	sand bur	Nat.	R	
Chloris barbata (L.) Sw.	swollen fingergrass	Nat.	O3	(2)
Chloris radiate (L.) Sw.	radiate fingergrass	Nat.	---	(2)
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat.	---	(2)
Digitaria insularis (L.) Mez. ex Ekman	sourgrass	Nat.	---	(2)
Eleusine indica (L.) Gaertn.	wiregrass	Nat.	R	(1,2)
Melinus minutiflora P. Beauv.	molasses grass	Nat.	R	
Melinus repens (Willd.) Zizka	Natal redtop	Nat.	---	(2)
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat.	U	(2)
Urochloa maxima (Jacq.) Webster	Guinea grass	Nat.	AA	(2)

Legend for Table 8

STATUS = distributional status for the Hawaiian Islands:

ind. = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

ABUNDANCE = occurrence ratings for plants by area:

R – Rare	seen in only one or perhaps two locations.
U - Uncommon-	seen at most in several locations
O - Occasional	seen with some regularity
C - Common	observed numerous times during the survey
A - Abundant	found in large numbers; may be locally dominant.
AA - Very abundant	abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area. The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this where abundance, where encountered, tends to be greater than the occurrence rating:

1 – several plants present
2 - many plants present
3 – locally abundant

NOTES: (1) – Generally associated with unimproved roads and other recently disturbed sites.
(2) – Previously reported by Char (1990) from the property. .
(3) – Plant lacking key diagnostic characteristics (flower, fruit).
† -- Seen only as dead plant matter.

Potential Impacts and Mitigation Measures

Modifications to the site from clearing and development are not expected to result in any deleterious impacts to native botanical species. Since the plant species within the project site are common throughout the Hawaiian Islands and elsewhere, no special mitigation measures are proposed by the Petitioner with respect to existing vegetation. In response to concerns from the Navy regarding invasive plant species, Tropic Land will limit landscaping of common areas to non-invasive and/or native plants. CC&Rs will identify acceptable planting material.

The biological surveys (Rana Productions and AECOS 2008) noted that human activity could increase the potential for fires that could spread upslope. On the other hand, human presence and a secure facility increases vigilance and reduces opportunities for arson and malicious activities. A fire contingency plan will be formulated prior to project construction with the *mauka* buffer area also serving as a fire break. Firefighting resources in the project area will be improved because the facility will be outfitted with a water system that complies fully with the Honolulu Fire Department's requirements. Engineering plans will be submitted to the Fire Department for review and approval.

5.6 Wildlife Resources

A faunal survey was conducted by Rana Productions and is included in a report titled *Biological Surveys Conducted on the Tropic Land LLC, Nānākuli Light Industrial Park Site, Wai'anae District, O'ahu, Hawai'i*, dated June 2008 (Appendix D). The 2008 survey updates a report by Andrew Berger entitled *Terrestrial Vertebrae Animals of the Proposed Lualualei Golf Course*, August, 1990, that was prepared for the golf course project. The information below is taken from the more recent Rana study, unless otherwise noted.

An avian and mammalian survey was conducted by Rana Productions on June 25, 2008. Eight avian count stations were evenly spaced across the approximately 100-acre proposed development area. Each station was counted once. Field observations were made with the aid of binoculars and by listening for vocalizations. Counts were concentrated in the early morning hours. Time not spent counting was used to search the site and the surrounding area for species and habitats not detected during count sessions. Areas upslope of the project site were covered as well to look for additional habitats or species beyond the proposed disturbance area.

Existing Conditions

A total of 227 individual birds of 17 species, representing 12 separate families, were recorded during station counts. All of the 17 species detected are considered to be alien to the Hawaiian Islands. No avian species currently listed as threatened or endangered, or proposed as a candidate for listing as threatened or endangered, and no critical habitat for any such species under either the Federal or State endangered species programs was detected during the course of this survey (DLNR 1998, Federal Register 2005, USFWS 2005, 2008).

Avian diversity and densities were in keeping with the location and xeric habitat present on the site. Four exotic species: House Sparrow (*Passer domesticus*), Spotted Dove (*Streptopelia chinesis*), Common Waxbill (*Estrilda astrild*), and Zebra Dove (*Geopelia striata*), accounted for slightly more than 54% of the total number of all birds recorded during station counts. The most common recorded species was House Sparrow, which accounted for approximately 17% of the total number of individual birds recorded. An average of 28 birds were detected per station count. Table 9 shows the list of avian species detected on the project site. ~~may be found in Table 2 in Appendix D.~~

The Rana survey in 2008 detected three mammalian species within the project site: domestic dog (*Canis f. familiaris*), small Indian mongoose (*Herpestes a. auropunctatus*), and cat (*Felis catus*). Although undetected during the 2008 survey, it is likely that four rodent species use various resources in the project area: Roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*), and possibly Polynesian rat (*Rattus exulans*).

Anthropods. A comprehensive study of anthropods or insects was not conducted for this EIS. However, biologist, Reginald David, was consulted on the possibility of that any protected insect species might be endangered by the proposed action. According to Mr. David, the only listed species that could be affected is the Blackburn's Hawk Moth *(Manduca blackburni)*, which has not been seen on the island O‘ahu since the early 1930s. Because the project site has been disturbed by wildfires so many times, impact on threatened or endangered anthropods is not a concern.

Potential Impacts and Mitigation Measures

The findings made by Rana Productions in 2008 are consistent with the findings of a previous study conducted on the subject property (Berger 1990), and with at least three other avian surveys conducted in 2004, 2005, and 2007 on lands immediately adjacent to the site (David 2007). Given the highly disturbed nature of the site and the almost completely alien-dominated vegetation present, all avian species detected were common lowland alien species. Berger reached similar conclusions in 1990—that there is no suitable native forest habitat for any of the Hawaiian forest birds anywhere on or near the project site and there is no suitable wetland habitat for any of the endangered Hawaiian waterbirds on or anywhere near the project site.

Although not detected during the course of the 2008 survey, the 1990 survey or recent surveys of the adjacent property, it is possible that the Hawaiian endemic sub-species of the Short-eared Owl (*Asio flammeus sandwichensis*) or *pueo* forages within the project site upon occasion (Berger 1990, David 2007). The O‘ahu population of this species is listed as endangered under State of Hawai‘i endangered species statutes, but it is not listed under the Federal Endangered Species Act. Because the habitat on site changes on a regular basis due to man-made alterations and fire, the site likely does not contain suitable nesting habitat for this species. From the *pueo*’s

perspective, there is nothing unique about the habitat present on the project site. There are larger areas of better foraging and nesting habitat within the military installation located in close proximity to the project site. Clearing of the project site may temporarily disturb foraging *pueo*, although such activity is unlikely to result in adverse impact to this species.

~~Since the project will not have any adverse effect on any endemic ecosystem or on any endangered or threatened animal species in the area, no mitigation measure is proposed by the Petitioner with respect to the project's impacts on wildlife within or near the project site~~.

The project will not have any adverse effect on any endemic ecosystem or on any endangered or threatened animal species in the area. In support of wildlife habitats maintained within the JBPHH Lualualei Annex, Tropic Land and occupants of the industrial park will not be permitted to feed or promote the expansion of feral or stray cat populations that could have detrimental effects on avian species.

Table 9. Avian Species Detected on the Park Site

Common Name	Scientific Name	ST	RA
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Erckel's Francolin	*Francolinus erckelii*	A	1.38
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Rock Pigeon	*Columba livia*	A	0.13
Spotted Dove	*Streptopelia chinensis*	A	4.13
Zebra Dove	*Geopelia striata*	A	2.88
	STRIGIFORMES		
	TYTONIDAE - Barn Owls		
Barn Owl	*Tyto alba*	A	0.13
	PASSERIFORMES		
	PYCNONOTIDAE – Bulbuls		
Red-vented Bulbul	*Pycnonotus cafer*	A	1.63
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	1.38
	MIMIDAE - Mockingbirds & Thrashers		
Northern Mockingbird	*Mimus polyglottos*	A	1.13
	STURNIDAE – Starlings		
Common Myna	*Acridotheres tristis*	A	0.63
	EMBERIZIDAE - Emberizids		
Red-crested Cardinal	*Paroaria coronata*	A	0.25
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	1.50
	FRINGILLIDAE - Fringilline and Carduline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	1.63
	PASSERIDAE - Old World Sparrows		
House Sparrow	*Passer domesticus*	A	4.75
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Common Waxbill	*Estrilda astrild*	A	3.63
Nutmeg Mannikin	*Lonchura punctulata*	A	2.75
Chestnut Munia	*Lonchura atricapilla*	A	0.25
Java Sparrow	*Padda oryzivora*	A	0.25

Key to Table 9.

ST	Status
A	Alien species – introduced to Hawai‘i by humans
RA	Relative Abundance: Number of birds detected divided by the number of count stations (8)

5.7 Agricultural Resources

The information in this section is based on an Agricultural Feasibility Report prepared by John J. McHugh, Jr. Ph.D. of Crop Care Hawai‘i, LLC dated May 2008 (Appendix C).

Existing Conditions

The property is undeveloped and is not used currently for agriculture. It is overgrown with non-native trees, shrubs, and grasses. Much of the property is heavily sloped with a gradient rise of over 70% in some sections. The lowest sections of the property contain slopes of greater than 10%. Rainfall in the area is less than 20 inches annually which makes it difficult to graze animals without the use of expensive irrigation water.

Soil Analysis

Half of the property is Lualualei extremely stony clay soil (LPE) which is characterized by slopes of 3 to 35%. The LPE soil has a Capability Classification of VIIs which has very severe limitations rendering it unsuitable for cultivation because of unfavorable texture as well as being extremely stony and rocky.

The remainder of the soil is composed of Lualualei clay (LuB) which has a slope of 2 to 6%, Lualualei clay of 0% slope (LuA), and Pulehu very stony clay loam (PvC) with slopes of 0 to 12%.

LuA and LuB soils, if not irrigated, have a Capability Classification of VIs which has extreme limitations that make them generally unsuited to cultivation and have a stony or rocky texture. If irrigated, the Capability Classification improves to IIIs for the LuA soil and IIIe for the LuB. Class III soils can have severe limitations that reduce the choice of crop plants. IIIs soils are challenged because of stoniness and/or unfavorable texture, resulting in poor water holding capacity, while IIIe soils are subject to severe erosion if cultivated and not protected.

A band of soils indentified as Pulehu very stony clay loam (PvC) can be found in the northwest section of the site. PvC soils have a Capability Classification of IVs which indicates very severe limitations that also can reduce the choice of crop plans and require careful management. These soils are stony, shallow with unfavorable texture, and have low water holding capacity coupled with severe shrink/swell characteristics. Irrigation does not improve the Capability Classification of PvC soils.

Land Classification and Crop Productivity Ratings by the Land Study Bureau, University of Hawai‘i

Approximately 80% of the project site has an overall agricultural productivity rating of E—as determined by the University of Hawai‘i Land Study Bureau. Lands rated in this low category are characterized by soils in their native state having serious limitations relative to agricultural

productivity. Because much of the parcel is stony, agricultural options for the project site, without amendment or modification, are considered to be minimal. A small portion of the site is accorded an overall agricultural productivity rating of B if it is irrigated (Figure 16).

Ratings under the ALISH System

Maps detailing Agricultural Lands of Importance to the State of Hawai‘i (ALISH) were first created in 1977 as a joint effort between the U.S. Department of Agriculture, Soil Conservation Service (now known as the Natural Resource Conservation Service) and the University of Hawai‘i, College of Tropical Agriculture and Human Resources. Lands were broken down into four categories: 0 = Unclassified, 1 = Prime Agricultural Lands, 2 = Unique Lands, 3 = Other Lands. The LuA, LuB, and PvC soils combine to form that portion of the property considered to be Prime Agricultural Lands under the ALISH system (Figure 16).

Potential Impacts and Mitigation Measures

To bring the more agricultural suitable areas of the property into agricultural use would require water sources that are not readily available to new agricultural operations on the Wai‘anae Coast of O‘ahu. For the approximately 40 acres of farmable land, the water requirement in the hot and dry climate of Nānākuli, would be 5,400 gallons per acre per day using drip irrigation technology. This amounts to a water demand for crops grown on those acres of 216,000 gallons per day. This type of water consumption would be difficult to provide which further renders the property unsuitable for agricultural production. The combination of poor soil conditions and high water requirement makes it unlikely that any prospective farming operator would consider this property for active agriculture.

The difficulties experienced by farmers who worked the property, as described in Section 4.3, confirms that agricultural activity on the property is not sustainable.

Statistics for the amount of agricultural land at the sub-county level are unavailable. However, the extent of lands in the State Agricultural District along the Wai‘anae Coast is shown in Figure 17. Of course, all lands are not currently undeveloped and available for agriculture. With the availability of more favorable options, including several thousand acres of Campbell land in Kunia, Dole land in Wahiawā and Waialua, and Galbraith Estate land in Wahiawā, there are more affordable options with better access to irrigation water resources than are present on the Wai‘anae Coast.

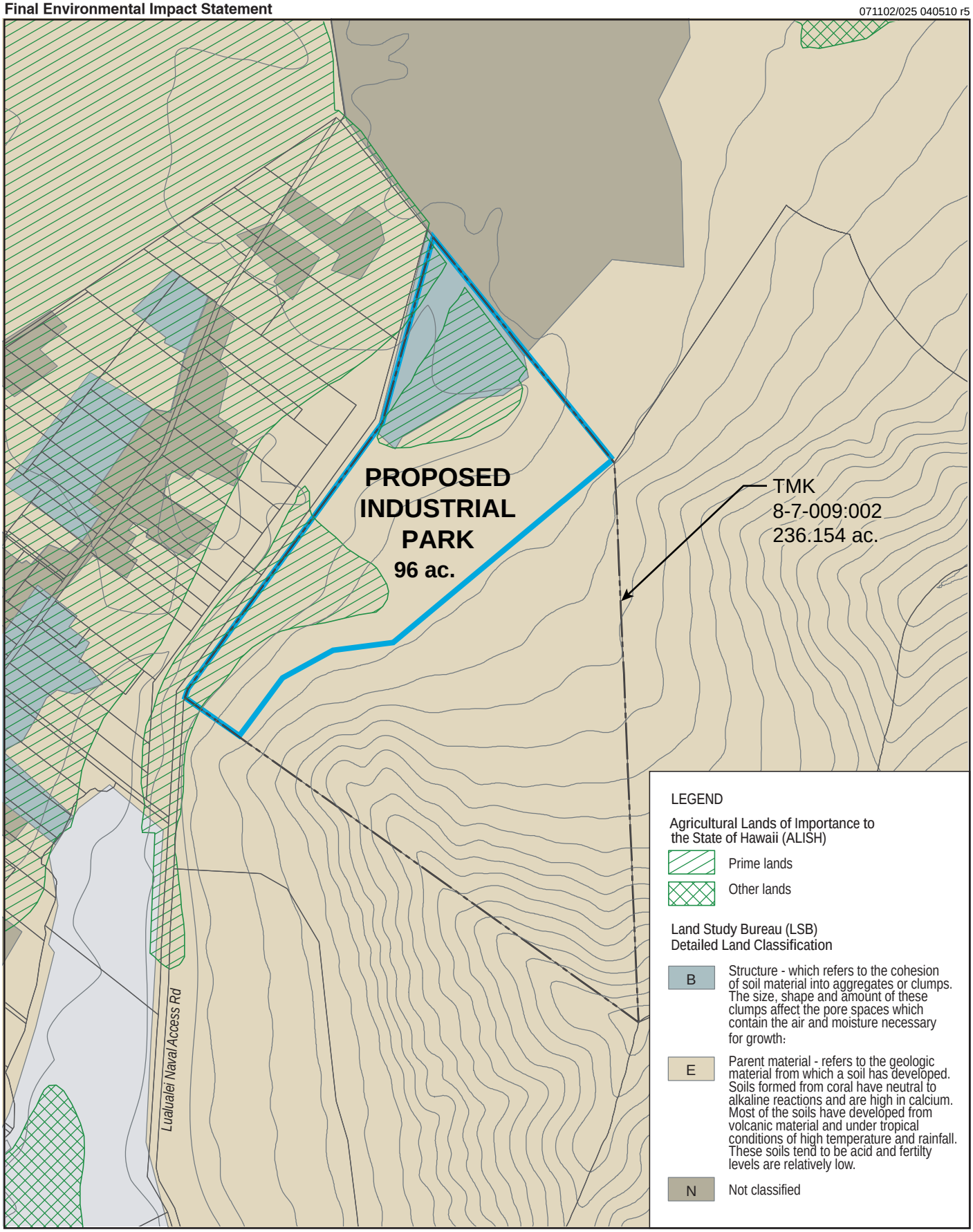


Figure 16
ALISH-LSB Map
March 2010

071102/048 033010 r2

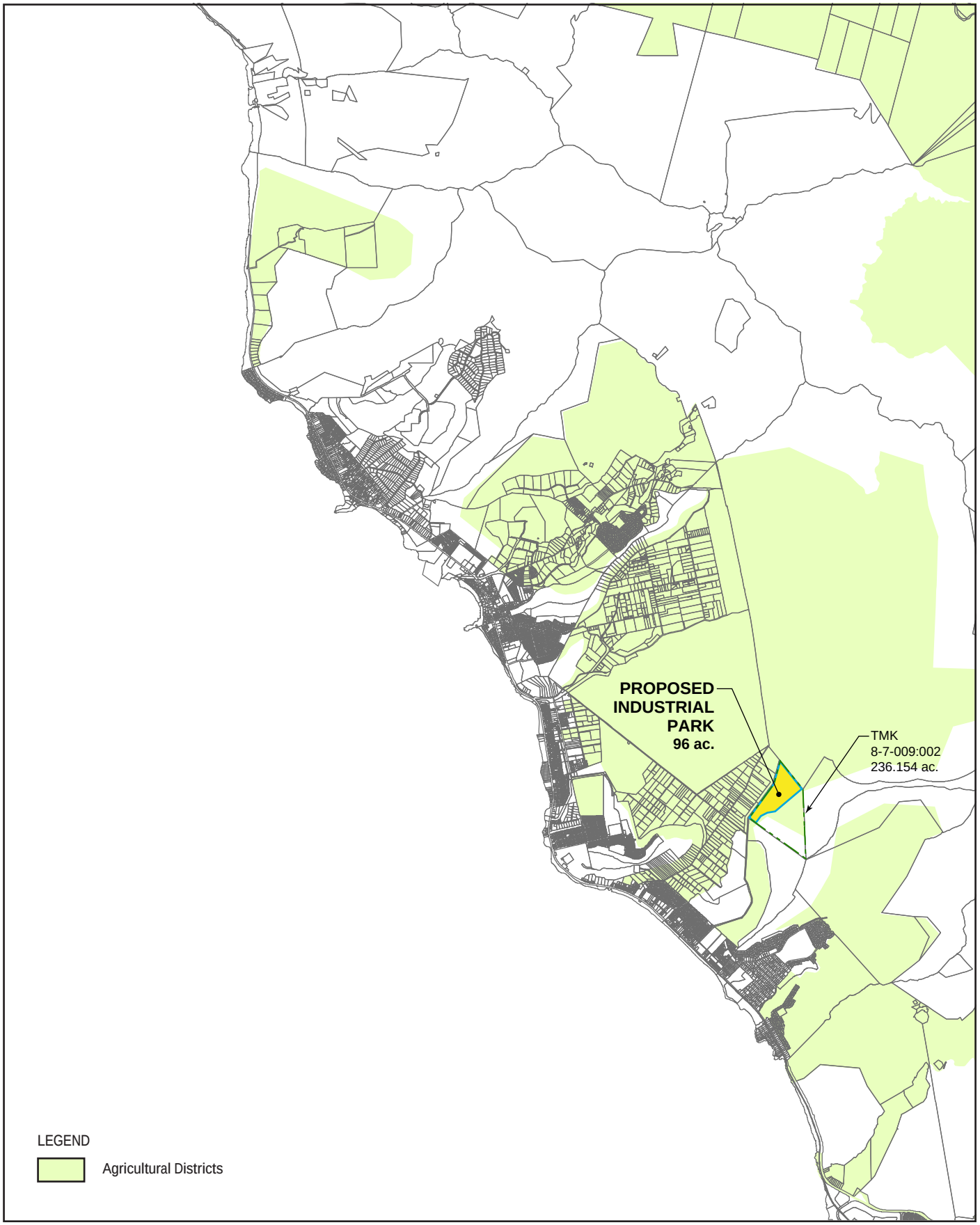


Figure 17
Agricultural Districts, Waianae Coast
March 2010

5.8 Archaeological, Historic, and Cultural Resources

An archaeological survey of the project site was conducted in November, 1990 by Cultural Surveys Hawai‘i and the findings and conclusions of that survey are contained in *An Archaeological Inventory Survey for the Proposed Lualualei Golf Course, Lualualei, Wai‘anae, O‘ahu*, January, 1991 (Appendix F). Information in this section is based on that report.

Archaeological and Historic Resources

Existing Conditions

An archaeological survey of the project site was conducted in November, 1990 by Cultural Surveys Hawai‘i. The findings and conclusions of that survey are contained in *An Archaeological Inventory Survey for the Proposed Lualualei Golf Course, Lualualei, Wai‘anae, O‘ahu*, January, 1991. Information in this section is based on that report.

Figure 18 shows cultural resources in the larger region and Figure 19 shows cultural resources that have been identified within TMK 8-7-09: 02. A total of seven archaeological sites have been identified in the vicinity of what is now the site of the proposed industrial park. Only two of the sites (50-80-08-4366 and -4367) are interpreted as being attributable to traditional Hawaiian activity, with one site (50-80-08-4366) probably representing prehistoric, recurrent habitation on the foothills of Pu‘u Heleakala. This is primarily evidenced by the presence of a probable hearth feature within the site complex.

Site 50-8-08-4367, a remnant wall section running adjacent to an intermittent stream bed, suggests an agricultural usage possible constructed to retain or divert water. Given the weathered condition of the structure, this site is the only site in the petition area that may be prehistoric.

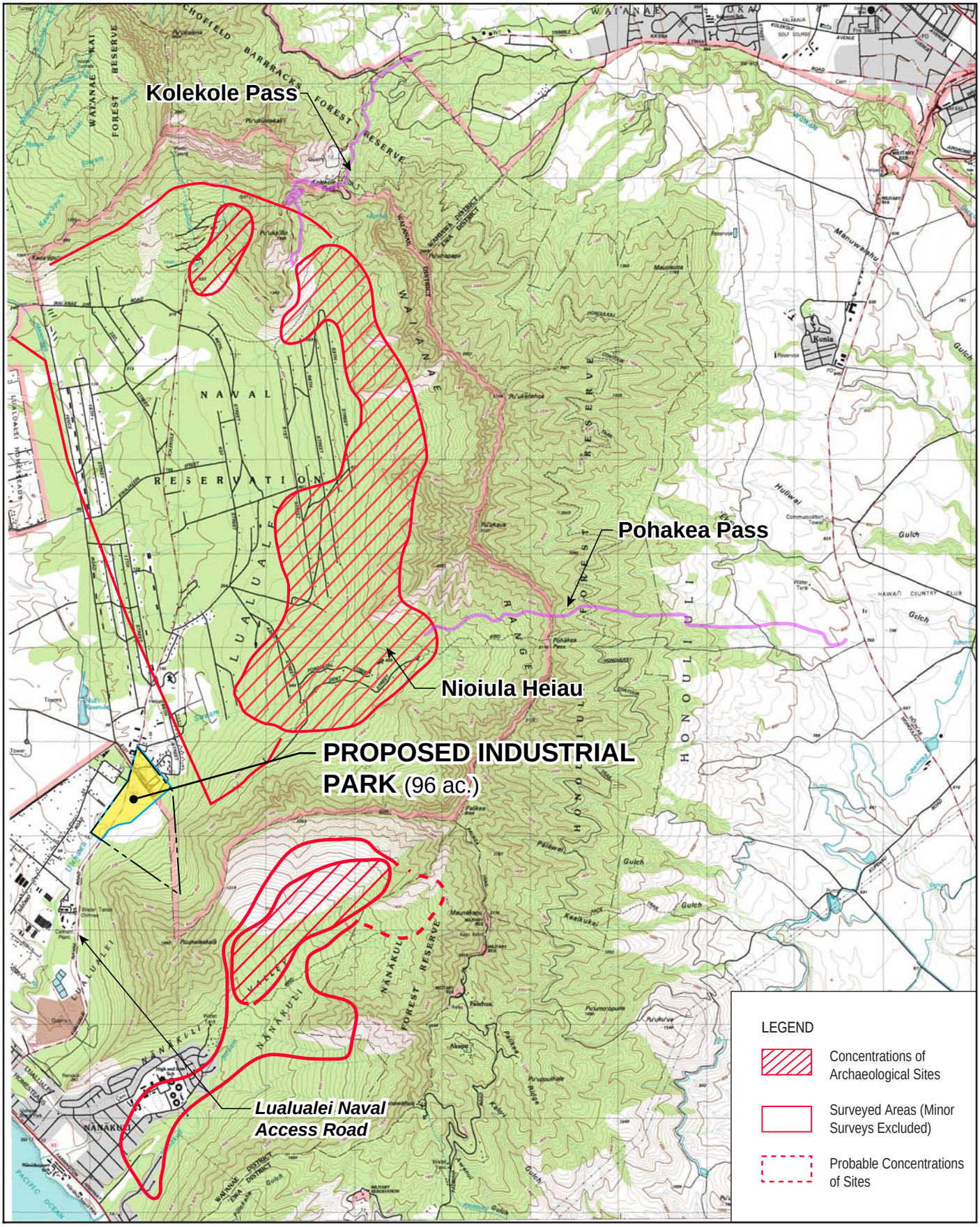
The five remaining sites identified within the project area are attributable to historic land usage. Four sites (50-80-08-4364, -4370, -4372, and -4373) are associated with cattle ranching and include cattle walls, an historic house lot, and various other ranching infrastructure. One site (50-80-08-4365) represents a military shelter evidenced by bullets and C-ration cans.

Six of the seven sites in the project area were evaluated as “no longer significant” (NLS) because of lack of cultural or scientific interest beyond their plotted distribution. One Site 50-80-08-4366 was determined likely to yield information important to prehistory or history. This site lies outside what was then the proposed golf course, and is similarly outside the proposed industrial park and, therefore, will not be disturbed. Table 10 summarizes the archaeological and historical sites and their significance.

Table 10
Archaeological Sites Summary and Significance, TMK 8-7-09: 02

State Site #	Site Type	Function	Significance	Recommendation
50-80-08-4364	Wall	Ranching	NLS	None
50-80-08-4365	Shelter	Military	NLS	None
50-80-08-4366	Structural complex	Habitation	D	Preserve
50-80-08-4367	Wall remnant	Agriculture	NLS	None
50-80-08-4370	House lot	Ranching	NLS	None
50-80-08-4372	Foundation	Ranching	NLS	None
50-80-08-4373	Incinerator	Ranching-Military	NLS	None

NSL: No longer significant
D: Significance criteria "D" per National Historic Preservation Act, wherein the site may be likely to yield information important to prehistory or history
Source: Cultural Surveys Hawai'i. January 1991. *An Archaeological Inventory Survey for the Proposed Lualualei Golf Course, Lualualei, Wai'anae, O'ahu*.



Source: Waianae Sustainable Communities Plan, City and County of Honolulu, 2000.

Figure 18
Cultural Resources Map (Regional)
March 2010

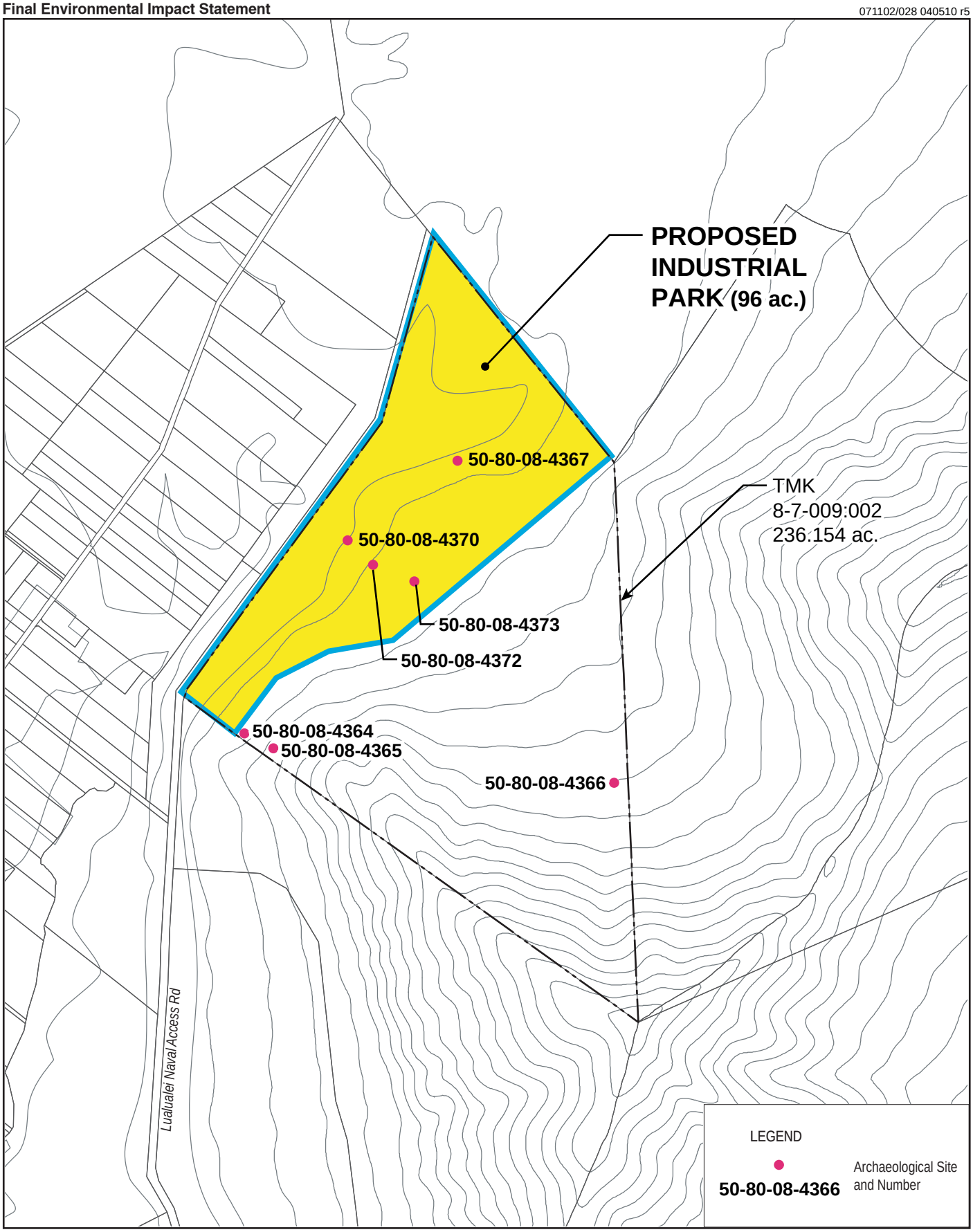


Figure 19
Cultural Resources Map (Site)
March 2010

Potential Impacts and Mitigation Measures

The Department of Land and Natural Resources, State Historic Preservation Division (SHPD) was consulted during the environmental review process for the earlier golf course proposal. At that time, the SHPD determined that the golf course project would have no adverse impact on significant historical resources (see correspondence from SHPD in Appendix H). The project limits of the proposed industrial park are contained within the boundaries of the proposed golf course, and is not expected adversely affect historic resources. However, should any archaeological resource be encountered during construction, all work in the immediate vicinity will cease and the appropriate authorities will be contacted promptly. The contractor(s) for this project will be required to follow all procedures specified in Section 6E-46.6, Hawai‘i Revised Statutes and Chapter 13-300, Hawai‘i Administrative Rules in the event that inadvertent discoveries are made.

Cultural Resources

Existing Conditions

The information in this section is based on the *Cultural Impact Assessment-Final Report*, July 2009, prepared by Jannel L. Kaohu (JLK Management, LLC) and Angelita S. Aipoalani and Hanalei Y. Aipoalani (Mother Earth Foundation).

Areas within the Lualualei *ahupua‘a* are believed to have been used for cultivation of the warrior art of *Lua*, a Native Hawaiian form of martial arts. However, there is no evidence that the project area was or is currently being used for traditional practices, such as gathering of native materials or for any cultural or religious purpose. No burials are believed to exist within the project area. There were no commoner land claims within the project area. Although some Native Hawaiian activity may have occurred on the project area, the patterns of land use are relatively clear that the Native Hawaiians did not use this land nearly as intensively as the coastal areas, well-watered areas, and forest zones.

Recorded Hawaiian legends, *mo‘olelo*, describe a location within the Lualualei *ahupua‘a* as the birth place of Maui, son of Mauiakalana and Hina‘akealoha. None of the physical locations associated with Maui or any other legend are on the property. According to literature, Maui’s birthing place is located on the south side of Wai‘anae at Ulehawa and Kaolae (west-southwest of the project site).

> **Maui Rock.** In the 1930’s, McAllister recorded Site 148 in his work. McAllister described a large rock referred to as “Maui” located about 1.1 miles from Nānākuli station toward Pu‘u O Hulu (McAllister 1933: 110). This rock represents the place where Maui first landed in the Hawaiian Islands from the south. The stone was surrounded by water and is where he reposed and sunned himself. The rock is memorialized at Garden

> Groves, a private condominium development off of Farrington Highway in Lualualei. (p. 7)

Hawaiian mythology also accounts for Maui venturing the Wai‘anae Coast of O‘ahu. Kaneana, cave of Kane, commonly known as Mākua cave, is said to have been frequented by demigod Maui and the home of Nanue, the shark man. The cave is located at the base of a 200-foot outcropping of rock along Farrington Highway in Mākua (near Ka‘ena Point), approximately 9 miles west-northwest of the project site.

There are no registered historic sites within the project site. However, according to the National and State Register of historic Places, Nioiula Heiau, a registered historic site is located several miles from the Tropic Land parcel within the JBPHH Lualualei Annex.

> **Nioiula.** Roy Kakulu Alameida, author of *Na Mo‘olelo Hawai‘i o ka Wa Kahiko*, refers to Nioiula Heiau in his story about Kawelo. Alameida writes, “Kawelo then picked up the man. He took him to the *ali‘i nui* of O‘ahu to offer as a sacrifice to the gods at Nioiula Heiau at Lualualei.
>
> Thos G. Thrum’s compilation of data, recorded in the Hawaiian Almanac and Annual from 1907 states that Nioiula Heiau (Halona, Lualualei), a paved and walled *heiau* of *pookanaka* class, about 50 feet square in two sections; [was] recently destroyed.
>
> According to Kahu Kamaki Kanahele, a long-time resident of Nānākuli and respected cultural practitioner, “Nioiula is located on Halona ridge in Lualualei next to the forest reserve. Part of the *heiau* has been complete destroyed with the stones being used by the McCandless ohana (1930’s-1940’s) of the Silva family. It was *kapu* when we were little because *kupuna*(s) told us that people were sacrificed there to the ancient gods. It belonged to the O‘ahu god—King Kākuihewa.” (p. 8)

Research into the *heiau*’s location using the Geographic Information System (GIS) supported by the City and County of Honolulu and State Department of Land and Natural Resources indicate that Nioiula Heiau is situated within the JBPHH Lualualei Annex. (TMK: 8-8-01: 01). The Tropic Land property extends to the ridgeline, but the proposed industrial park is located at the base of the cliffs at or below the 200-foot elevation.

Potential Impacts and Mitigation Measures

The Cultural Impact Assessment concluded that the project site does not have a direct or indirect adverse impact on culturally significant sites. Nor does it obstruct access to culturally significant sites. Effects stemming from the development of the project on Hawaiian culture would be minimal due to its geographic location and lack of surface water, burial sites, and commoner land claims. If Native Hawaiian activity occurred within the project area, it would not have been nearly as intensively utilized as coastal areas, well-watered areas, and forest zones.

5.9 Roadways and Traffic

The information in this section is based on a *Traffic Impact Analysis Report* prepared by the Traffic Management Consultant dated ~~September 2008~~ January 2010 (Appendix E).

Existing Conditions

Farrington Highway is the primary arterial highway on the Leeward coast of O'ahu, carrying over 48,000 vehicles per day in both directions. Farrington Highway is a four-lane highway, which is generally oriented in a north-south direction. Farrington Highway is signalized at Lualualei Naval Access Road. A left-turn lane is not provided on southbound Farrington Highway at this intersection. The posted speed limit is 35 miles per hour (mph).

Lualualei Naval Access Road is a two-lane, two-way roadway which provides access to the JBPHH Lualualei Annex. The posted speed limit on this road varies between 25 mph and 45 mph.

Tropic Land LLC has reached an agreement with the U.S. Navy for the use of the Lualualei Naval Access Road. The Navy has agreed to grant a long term easement to Lualualei Naval Access Road to an association to be organized by the adjoining property owners, including Tropic Land LLC, who would be required to maintain the road. Tropic Land LLC is currently discussing the form of a definitive easement agreement with the Navy. Correspondence with the Navy regarding Lualualei Naval Access Road may be found in Appendix K.

Field Investigation and Data Collection

Manual traffic count surveys were conducted at the intersection Farrington Highway and Lualualei Naval Access Road on May 1-2, 2008 during the peak periods of traffic from 5:30 AM to 8:00 AM and from 2:30 PM to 5:00 PM. Additional surveys were conducted on Lualualei Naval Access Road at an existing baseyard on the project site on July 21-22, 2008.

Existing AM Peak Hour Traffic

The AM peak hour of traffic on Farrington Highway varies between 5:00 AM and 7:00 AM. The AM peak hour selected for the analysis—5:45 AM to 6:45 AM—was based on the observed AM peak hour of traffic on Lualualei Naval Access Road. During this period, Farrington Highway carries about 2,800 vehicles per hour (vph) total for both directions. Lualualei Naval Access Road carried a total of 430 vph at Farrington Highway during the AM peak hour of traffic. At the project site, the traffic volume on Lualualei Naval Road was about 120 vph.

The intersection of Farrington Highway and Lualualei Naval Access Road operated at an overall Level of Service "D" with a v/c ratio of 1.12 during the AM peak hour. Southbound Farrington Highway operated at LOS "E." The left-turn movement from Lualualei Naval Access Road on Farrington Highway operated at LOS "F."

Existing PM Peak Hour Traffic

The PM peak hour of traffic was defined as 3:15 PM to 4:15 PM when Farrington Highway carries about 3,500 vph total for both directions. Lualualei Naval Access Road carried a total of of over 500 vph during the PM peak hour. At the project site, traffic volume on Lualualei Naval Access Road was about 100 vph.

During the PM peak hour, the shared through/left-turn lane on southbound Farrington Highway at Lualualei Naval Access Road operated as a de facto left-turn lane. The intersection of Farrington Highway and Lualualei Naval Access Road operated on at an overall LOS "C" with a v/c ration of 094. The left-turn movement from Lualualei Naval Access Road onto Farrington Highway operated at LOS "D."

Capacity Analysis Methodology

The highway capacity analysis used in the analysis is based on procedures described in the Highway Capacity Manual (HCM) published by the Transportation Research Board, 2000. HCM defines Level of Service (LOS) as "a quality measure describing operational conditions within a traffic stream." Several factors may be included in determining LOS, such as speed, travel time, freedom to maneuver, traffic interruptions, driver comfort and convenience. LOS "A," "B," and "C" are considered satisfactory levels of service. LOS "D" is generally considered a "desired minimum" operating level of service. LOS "E" is an undesirable condition, and LOS "F" is an unacceptable condition. Intersection LOS is based primarily on average delay, which is measured in seconds per vehicle (sec/veh).

Table 11
Level of Service Criteria (Highway Capacity Manual)

LOS	Signalized Intersections	Unsignalized Intersections
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	≤10	≤10
B	> 10 – 20	> 10 – 15
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

Source: *Highway Capacity Manual*, 2000
Note: sec/veh = seconds per vehicle

Volume-to-capacity (v/c) ratio is a measure comparing the relative traffic demand to the roadway's capacity. HCM defines capacity as "the maximum number of vehicles that can pass a given point during a specified period under prevailing roadway, traffic flow, and traffic control conditions." A v/c ratio of 0.50 indicates that the traffic demand is utilizing 50% of the roadway's capacity. A v/c ratio in excess of 1.0 indicates that the traffic demand exceeds the carrying capacity of the highway facility.

Future Traffic Conditions

Background Growth in Traffic. The O'ahu Transportation Regional Plan 2030 (ORTP) was prepared for the O'ahu Metropolitan Planning Organization (OMPO) in April 2006 and amended in May 2007. The Year 2030 socio-economic forecasts indicated about a 0.5% annual increase in population and employment on the Wai'anae Coast. Based on the ORTP socio-economic forecast, an annual growth of 0.55% was applied uniformly to the existing peak hour traffic to estimate the Year 2020 peak hour traffic demands without the proposed project.

Year 2020 AM Peak Hour Traffic Without Project. During the AM peak hour without the project, traffic demands at the intersection of Farrington Highway and Lualualei Naval Access Road are expected to exceed the carrying capacity of the existing intersection, operating at an overall LOS "F" with a v/c ratio of 1.23. The southbound approach of Farrington Highway and the left-turn movement from Lualualei Naval Access Road are expected to operate at LOS "F."

Year 2020 PM Peak Hour Traffic Analysis Without Project. The PM peak hour demand without the project is expected to exceed the existing carrying capacity of the intersection of Farrington Highway and Lualualei Naval Access Road, operating at LOS "D" with a v/c ratio of 1.01. Southbound Farrington Highway and the left-turn movement from Lualualei Naval Access Road are expected to operate at LOS "D."

Potential Impacts

Project-related Trip Generation Characteristics and Trip Distribution

During the AM peak hour, the project is expected to generate a total of 522 vph—433 vph entering the site and 98 vph exiting the site. The proposed project is expected to generate a total of 518 vph—109 vph entering the site and 409 vph exiting the site during the PM peak hour.

The trip distribution is based on the projected growth in the 'Ewa and Wai'anae regions. By 2020, the population of the 'Ewa region is expected to exceed the Wai'anae region by a ratio of 3 to 1. Similarly, employment in the 'Ewa region is expected to be 6.7 times that of the Wai'anae Coast. Table 12 summarizes the traffic assignment splits during the peak hours of traffic.

Table12
Traffic Assignment

Peak Hour	Direction	Northbound	Southbound
AM	Enter	75%	25%
	Exit	15%	85%
PM	Enter	85%	15%
	Exit	75%	25%

Source: Traffic Management Consultant. *Traffic Impact Analysis Report,* September 2008.

AM Peak Hour Traffic Impact With Project

With project implementation, the intersection of Farrington Highway and Lualualei Naval Access Road is expected to operate at an overall LOS "F" and a v/c ratio of 1.86 during the AM peak hour. Southbound Farrington Highway and Lualualei Naval Access Road approaches are expected to operate at LOS "F."

PM Peak Hour Traffic Impact With Project

With project implementation, the intersection of Farrington Highway and Lualualei Naval Access Road is expected to operate at LOS "F" with a v/c ratio of 1.39. Both Farrington Highway approaches and Lualualei Naval Access Road are expected to operate at LOS "F."

Mitigation Measures

To mitigate the impacts of project-generated traffic, Tropic Land will discuss traffic mitigation measures with the State and City, and is willing to participate in a fair share arrangement with the State of Hawaii and other users of Lualualei Naval Access Road to improve the intersection of Farrington Highway and Lualualei Naval Access Road.

Improvements recommended by the Traffic Impact Analysis Report (TIAR) and the project engineer include:

- Widening of southbound Farrington Highway to provide an exclusive left-turn lane (350 feet in length and 11 feet in width)
- A tapered median area (300 feet in length) along northbound Farrington Highway to align with the southbound left-turn lane
- Widening Lualualei Naval Access Road to provide double left-turn lanes (350 feet in length; 11 feet in width) and an exclusive right-turn lane
- Relocation of existing traffic signals, utility poles, and drainage structures affected by the widening

Table 13 summarizes projected traffic impacts under scenarios with and without the proposed development, and with mitigation measures.

AM peak hour traffic in 2020 is projected to be virtually the same "with" or "without" the project. In either case, the intersection of Farrington Highway and Lualualei Naval Access Road performs at LOS "F" in the southbound and westbound directions. Minimal delays are experienced in the northbound direction (toward Mākaha) during the AM peak hour with LOS "A" conditions. With construction of the industrial park and intersection improvements (as described above), the TIAR calculates that intersection performance will improve from LOS "F" to LOS "E" in the southbound through and westbound left-turn directions. The addition of an exclusive left-turn lane from Farrington Highway onto Lualualei Naval Access Road will improve LOS in this direction from "F" to "A." However, northbound traffic on Farrington will experience a decrease in LOS from "A" to "C" with changes in the traffic signal phase shortening "green time" to accommodate left-turning vehicles in the southbound direction. Nevertheless, the recommended improvements would raise LOS to "C" from LOS "F" for 2020 AM peak hour traffic under "without project" or "with project" scenarios.

Without the project, the intersection of Farrington Highway and Lualualei Naval Access Road is expected to perform at LOS "C" and "D" levels during the PM peak hour in 2020. If the proposed industrial park is constructed without intersection improvements, level of service is expected to decrease to unacceptable levels. However, with improvements LOS "D" and "E" conditions are expected, with the intersection as a whole performing at LOS "D."

Improvements to Lualualei Naval Access Road itself will be determined in consultation with the U.S. Navy as part of the negotiations for an easement to use, operate and maintain the road.

Table 13
Capacity Analysis: Farrington Highway and Lualualei Naval Access Road

Scenario			SB Thru	SB Left	NB Thru	NB Right	WB Left	WB Right	Int.
Existing AM Peak Hour Traffic		LOS	E		A		F	B	D
		v/c	1.12		0.37		0.79	0.23	1.12
		Delay*	76.0		3.4		94.6	18.7	52.8
Existing PM Peak Hour Traffic		LOS	C	C	C		D	C	C
		v/c	0.67	0.95	0.92		0.73	0.59	0.95
		Delay	29.7	27.3	23.9		50.4	24.5	26.7
2020 AM Peak Hour Traffic Without Project		LOS	F		A		F	B	F
		v/c	1.23		0.40		0.82	0.24	1.23
		Delay	125.6		3.6		98.3	18.3	84.0
2020 PM Peak Hour Traffic Without Project		LOS	D	D	C		D	C	C
		v/c	0.81	1.01	0.95		0.76	0.66	1.01
		Delay	48.2	41.1	28.1		53.5	31.3	34.7
2020 AM Peak Hour Traffic With Project	Without Improvements	LOS	F		A		F	C	F
		v/c	1.86		0.63		1.06	0.27	1.86
		Delay	408.1		6.3		136.8	21.9	237.3
	With Improvements	LOS	E	A	C		E	A	C
		v/c	0.88	0.71	0.84		0.61	0.10	0.88
		Delay	73.0	7.2	26.1		59.6	6.4	22.0
2020 PM Peak Hour Traffic With Project	Without Improvements	LOS	F	F	F		F	D	F
		v/c	1.39	1.14	1.09		1.16	0.64	1.39
		Delay	245.7	100.4	82.4		136.6	43.1	97.2
	With Improvements	LOS	E	A	D		E	D	D
		v/c	0.82	0.52	1.00		0.95	0.70	1.00
		Delay	60.4	7.9	43.4		75.9	46.6	38.0

Source: Traffic Management Consultant. *Traffic Impact Analysis Report,* September 2008.

SB = Southbound Farrington Highway (to Honolulu)
NB = Northbound Farrington Highway (to Mākaha)
WB = Westbound Lualualei Naval Access Road (*makai*)
Int. = Intersection
* Delay measured in seconds

5.10 Air Quality

Existing Conditions

Climate

Lualualei Valley is relatively arid. Mean annual rainfall is approximately 20 to 30 inches and varies from about 3.5 inches in December and January to about 0.4 inches in June and July. Mean pan evaporation is approximately 70 to 80 inches annually and varies from over 8 inches in July and August to about 4 inches in December and January. There is an evaporation deficit of approximately 50 inches annually and there are no months when rainfall equals pan evaporation.

Average temperatures within the area surrounding the project site varies from 70.3 degrees (January) to 76.7 degrees (October). Prevailing tradewinds come from a northeast direction at an average 10 mph (January) to 13.6 mph (July). Cloud cover varies from 51% in the summer to 63% in spring. Sunshine percentages range from 59% in the winter to 75% in the summer.

On an annual basis, wind conditions in the area are dominated by brisk trade winds; however, there is a marked seasonal difference in the velocity and persistence of such trade winds. Trade winds tend to decline in the fall and winter months (light and variable) which can contribute to higher pollutant concentrations. Near coastal areas also experience land-sea breeze regimes with onshore winds during the day and offshore winds at night.

Air Quality

In August 2009, HECO made available a website for the West O‘ahu Air Quality Monitoring Program, part of its overall plan to develop the Campbell Industrial Park Generating Plant. Posted on the website are readings from four air quality monitoring stations, including the Lualualei Monitoring Station, located at the Nānākuli Civil Defense Site. This station collects data on 12 parameters of air quality: sulfur dioxide (24-hour average), ozone (8-hour average), carbon monoxide (8-hour average), nitrogen dioxide (1-hour average), nitric oxide (1-hour average), oxides of nitrogen (1-hour average), sulfur dioxide (1-hour average), sulfur dioxide (3-hour average), ozone (1-hour average), carbon monoxide (1-hur average), and particulates (PM10, 1-hour average). Data is available in real time via the Internet. In addition to the specific parameter, the Air Quality Index reports daily air quality.

Given the recentness of the air quality station, long-term data are not available. However, available data indicate that local air quality is in compliance with State and Federal standards. The project area is rural and lightly developed. The nearest major stationary sources, the PVT Landfill and Pineridge Farms operations, are located downwind of the site under normal trade winds and, thus, would impact the project site air quality only during southerly (kona) wind conditions.

Similarly, the large power plant located some five miles away at Kahe Point is also downwind during trade wind conditions. Mobile source activity along Lualualei Access Road is so low that such activity has minimal air quality impact.

Impacts and Mitigation Measures

Short-term Air Quality Impacts

Construction activities will result in temporary and localized impacts on air quality in areas adjacent to the construction site. Equipment used during the construction phase will emit exhaust and airborne particulates, and construction work will produce dust. Due to the low background levels of pollutants in the area and favorable climatic conditions, increased vehicular emissions are not expected to be significant. The contractor will be required to use vehicles that are properly maintained.

To control dust during the construction phase, BMPs will be specified in construction plans, including the following:

- Water active work areas and temporary unpaved work roads
- Use wind screens and/or limit the area that is disturbed at any given time
- Mulch or use chemical soil stabilizers on inactive areas of the project site
- Cover transported or stored soils
- Implement a tire washing program to reduce dust emissions from trucks tracking dirt onto paved roadways in the project area
- Establish landscaping early in the construction schedule

Construction activities will employ fugitive dust emission control measures in compliance with provisions of the State Department of Health Rules and Regulations (Chapter 43, Section 10), and Hawai‘i Administrative Rules (HAR), Chapter 11-60.1, “Air Pollution Control,” Section 11-60.1-33 on Fugitive Dust.

Long-term Air Quality Impacts

Long-term air quality impacts from project operation are not expected to be significant. This conclusion is based, in part, on the findings of an air quality study conducted for an industrial park project known as Kapolei Harborside Center.[1] This project involves approximately 345 acres and is anticipated to provide 3,800 permanent jobs at full buildout and occupancy. The project area is surrounded by major roads, including Kalaeloa Boulevard and Kapolei Parkway and is situated adjacent to Campbell Industrial Park in Ewa, where “several large industrial

[1] B. D. Neal & Associates. 2006. “Air Quality Study for the Proposed Kapolei Harborside Center Project, Kapolei, Oahu, Hawaii.” Reproduced as Appendix I, Air Quality Assessment in *Kapolei Harborside Center Final Environmental Impact Statement*, Prepared by Group 70 International, Inc. for Kapolei Property Development, LLC, November 2006.

sources of air pollution are located" (B. D. Neal and Associates, 2006: 26). Computerized emission and atmospheric dispersion models were used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide was selected for modeling because it is the most stable and most abundant of pollutants generated by motor vehicles, and considered a pollutant that can be addressed locally. The models estimated worst-case 1-hour and 8-hour concentrations. All of the predicted concentrations were within State and federal air quality standards.

In comparison, Nānākuli Community Baseyard is approximately one-fourth the size of Kapolei Harborside Center. Nānākuli Community Baseyard occupies an area that is 27% of Harborside's acreage, and its high-end employment projection is 22% of Harborside's projection. Given the significantly smaller scale of Nānākuli Community Baseyard, and ambient conditions that are no worse than on the Ewa Plain, Harborside's air quality study serves as an appropriate reference.

No specific mitigation measures are proposed to reduce vehicle-generated carbon monoxide levels at the Farrington Highway/Lualualei Access Road intersection or any other portion of the route to the site due to the insignificant increase in expected air emissions in these areas. Worse-case projected levels of emissions at these areas will be well within the State of Hawai'i and federal ambient air quality standards because of the low current traffic volumes along the route and insignificant increases to such volumes which would be attributable to the project.

5.11 Noise

Existing Conditions

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels (dB). Another common measure is the Day-Night Average Level (Ldn), which is a weighted average of the intensity of a sound with corrections for time of day, and is averaged over 24 hours. Of particular significance are sensitive receptors—activities or land uses that may be subject to the stress of interference from noise. Land uses associated with sensitive receptors often include residential dwellings, hotels, hospitals, nursing homes, education facilities, churches, and libraries.

Existing background ambient noise levels in the project environs are controlled by traffic on Lualualei Naval Access Road, birds, dogs, wind, and foliage.

For residences in the vicinity of the project site, which are removed from Lualualei Access Road, existing average background ambient noise levels range from 45 to 55 Ldn, which is in the "minimal exposure, unconditionally acceptable" noise exposure category. Existing noise levels in the residential areas further to the west of the proposed development are low. During quiet periods between local traffic, background ambient noise levels along the roadway are dominated by the sounds of dogs, birds, wind, and distant traffic.

With the exception of a single residence, located on Lualualei Naval Access Road opposite the southern tip of the project site, there are no known land uses generally defined as noise sensitive. Figure 20 shows land uses within a 300-foot radius of the project site. The 300-foot distance demarcates the area typically required for notification of major land-use actions because of potential impacts. The map also shows several structures within the JBPHH Lualualei Annex that are within 300 feet of the project boundary. Although specific uses are unknown, these buildings are likely to be air-conditioned and, therefore, more insulated from external environmental conditions.

Existing traffic noise levels along Lualualei Naval Access Road are moderate (approximately 61 to 62 Ldn) at 50 feet setback distance from the roadway center line. Maximum noise levels (Lmax) associated with heavy truck and bus traffic on the two roadways are in the order of 78 to 85 dB at this setback distance. Minimum background ambient noise levels of approximately 35 to 50 dB occur between periods of traffic flow.

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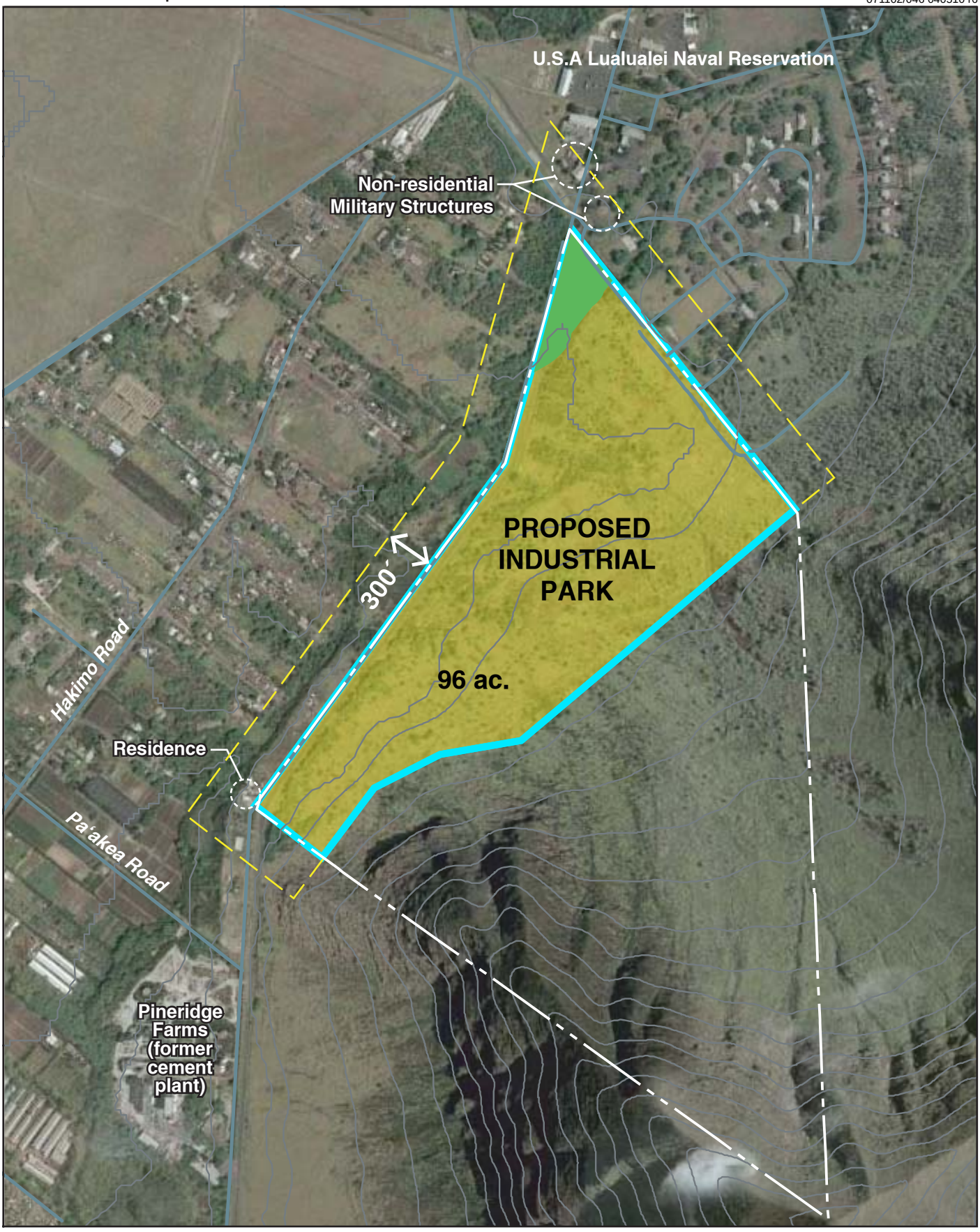

Figure 20
Land Uses within 300' of Project Site
March 2010

Potential Impacts and Mitigation Measures

Short-term, Construction Noise

Audible construction noise will be unavoidable during project construction. Short-term noise impacts associated with project construction will occur. Actual noise levels produced during construction will be a function of the methods employed during each stage of construction. Equipment likely to be used include excavator, backhoe, front-end loader, grader, forklift, semi-trucks, dump trucks, concrete trucks, compactors, paving equipment, and compressors. Typical ranges of construction equipment noise vary between 70 and 95 dBA, which exceeds permissible levels. Earthmoving equipment, e.g., backhoes, front loaders, bulldozers, and diesel-powered trucks, will probably be the loudest equipment used during construction. The contractor will be required to maintain and properly muffle construction equipment and on-site vehicles that exhaust gas or air.

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels, a permit will be obtained from the State Department of Health under Hawai'i Administrative Rules Chapter 11-46, Rules on Community Noise. In order for the DOH to issue a construction noise permit, the contractor must submit a noise permit application to the DOH which describes the construction activities for the project. Before issuing the permit, the DOH may require the contractor to incorporate noise mitigation into the construction plan. The DOH may also require the contractor to conduct a noise monitoring or community meeting inviting the neighboring residences and businesses to discuss construction noise.

The contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on machines with diesel and gasoline engines, using property tuned and balanced machines, and so forth. The DOH may require additional noise mitigation treatments, such as a temporary barrier around a generator.

Specific permit restrictions required for construction projects by the DOH are:

- No permit shall allow construction activities creating excessive noise before 7:00 am and after 6:00 pm of the same day
- No permit shall allow construction activities which emit noise in excess of 95 dBA except between 9:00 am and 5:30 pm of the same day
- No permit shall allow construction activities which exceed the allowable noise levels on Sundays and on certain holidays. Pile driving and other activities exceeding 95 dBA will be prohibited on Saturdays.

The DOH noise permit does not limit the noise level generated at the construction site, but rather the *times* at which noisy construction can take place. Therefore, noise mitigation for construction activities will be addressed using project management to ensure compliance with time constraints.

Properly muffled and maintained construction equipment will be required on the job site. The incorporation of State Health Department construction noise limits and curfews will also be applied to project construction.

Future Traffic Noise Environment

Moderate noises increases generated by project-related traffic and non-project-related traffic are predicted to occur along Lualualei Naval Access Road. Intermittent vehicular noise along this roadway from project-generated traffic would represent a minimal increase in noise. For most sources, a doubling of distance results in a dBA fall in noise level. The closest noise sensitive receptor in the project area is a single residence set back from Lualualei Naval Access Road. Therefore, traffic noise impacts associated with the project are not considered to be significant. Along Farrington Highway where traffic volumes, speeds, and noise levels are significantly high, the added noise contributions from project-generated traffic should not be significant when compared to non-project traffic noise contributions. Project traffic noise impacts along the highway are not anticipated because of the dominating influence of non-project traffic noise over project-generated traffic noise.

These conclusions are consistent with the findings of an acoustical study conducted for an industrial development project known as Kapolei Harborside Center.[2] Although Kapolei Harborside Center is almost three times larger in scale than Nanakuli Community Baseyard, the noise models predicted vehicular traffic noise impacts on the surrounding community that are not considered to be significant.

5.12 Visual Resources

Existing Conditions

The Waiʻanae Sustainable Communities Plan (2000) shows Farrington Highway as a beautification area. This main thoroughfare along the Waiʻanae Coast provides scenic views of both the coastline and the Waiʻanae Mountain Range. The project site, located approximately 1.5 mile inland, is not visible from Farrington Highway.

Cultural Significance of Visual Resources

During scoping meetings with the community and in response to the EISPN, concerns were raised about the significance of the Waianae mountain range silhouette framing Lualualei Valley; in particular, the mountainous silhouette of the demigod Maui. The area in question lies to the

[2] D.L.Adams Associates. Ltd. 2006. "Environmental Noise Assessment Report, Kapolei Harborside Center, Kapolei, Oahu, Hawaii." Reproduced as Appendix J, Acoustic Study in *Kapolei Harborside Center Final Environmental Impact Statement*, Prepared by Group 70 International, Inc. for Kapolei Property Development, LLC, November 2006.

north and east of the project site, lying within the JBPHH Lualualei Annex. The Waiʻanae Sustainable Communities Plan (reference Open Space Map) also shows that area with a concentration of archaeological sites. The project site is outside the view plane to that area, and does not adversely impact any view of a silhouette of Maui.

Potential Impacts and Mitigation Measures

The proposed industrial park is located off the main highway, where it will not detract from either the scenic views of the coast, the Waianae mountain range, or the ambiance of small commercial villages in nearby Nānākuli and Māʻili.

Development of the light industrial park will alter the physical appearance of the site. The existing landscape of various grasses and isolated *kiawe* trees will be replaced by buildings and roads. Figure 21 provides simulations that indicate how the light industrial park might appear when fully developed. With an I-1 zoning designation, the maximum building height would be 40 feet.

The view at street level will be buffered by trees and fencing along the entire Lualualei Naval Road frontage. Aesthetic treatment at the front gate, including signage and accent landscaping will provide an attractive entry to the project. Within the industrial park, sidewalks, street trees, and street lights will provide a uniform appearance to the overall project. Covenants, Conditions, and Restrictions (CC&Rs) will be developed and implemented for the purpose of regulating standards of appearance and orderliness on individual lots for the benefit of all owners and the community in general.

Visual Simulation - Industrial Park

Visual Simulation - Front Gate

Figure 21
Visual Simulations
March 2010

5.13 Social and Economic Characteristics

Existing Conditions

Demographics

The decennial censuses provide the most accurate and comprehensive set of socio-economic data. For the latest census, conducted in 2000, the U.S. Census Bureau divided the Waiʻanae Coast into seven census tracts (see Figure 22). The project site is located in Census Tract (CT) 96.01, which also includes Nānākuli Valley. Lualualei Naval Access Road is the dividing line between CT 96.01 and CT 96.04—the latter containing the residential areas of Lualualei. For purposes of the EIS analysis, the Waiʻanae Coast is separated into two subareas:

Nānākuli-Lualualei-Maʻili
- CT 96.01 Nānākuli-Lualualei
- CT 96.03 Maʻili
- CT 96.04 Niuliʻi Reservoir
- CT 97.02 Lualualei Homesteads

Waiʻanae-Mākaha
- CT 96.01 Waiʻanae Kai
- CT 98.01 Mākaha
- CT 98.02 Mākaha Valley-Mākua

Table 14
Resident Population by Census Tract, Subareas, Region, County, and State
1990 and 2000

Geographic Area	1990	2000	Net Change	Percent Change
Census Tracts				
CT 96.01 Nānākuli-Lualualei	5,974	6,854	880	14.7%
CT 96.03 Maʻili	6,820	7,946	1,126	16.5%
CT 96.04 Niuliʻi Reservoir	4,733	5,624	891	18.8%
CT 97.02 Lualualei Homesteads	6,153	8,125	1,972	32.0%
CT 97.01 Waiʻanae Kai	5,523	5,480	-43	-0.8%
CT 98.01/02 Mākaha	8,208	8,229	21	0.3%
Subareas				
Nānākuli-Lualualei-Maʻili	23,680	28,549	4,869	20.6%
Waiʻanae-Mākaha	13,731	13,709	-22	-0.2%
Waiʻanae Coast	37,411	42,258	4,847	13.0%
% of Oʻahu	*4%*	*5%*	*12%*	
Oʻahu (City & County of Honolulu)	836,231	876,156	39,925	4.8%
State of Hawaiʻi	1,108,229	1,211,537	103,308	9.3%

Sources: U.S. Census, 1990, 2000

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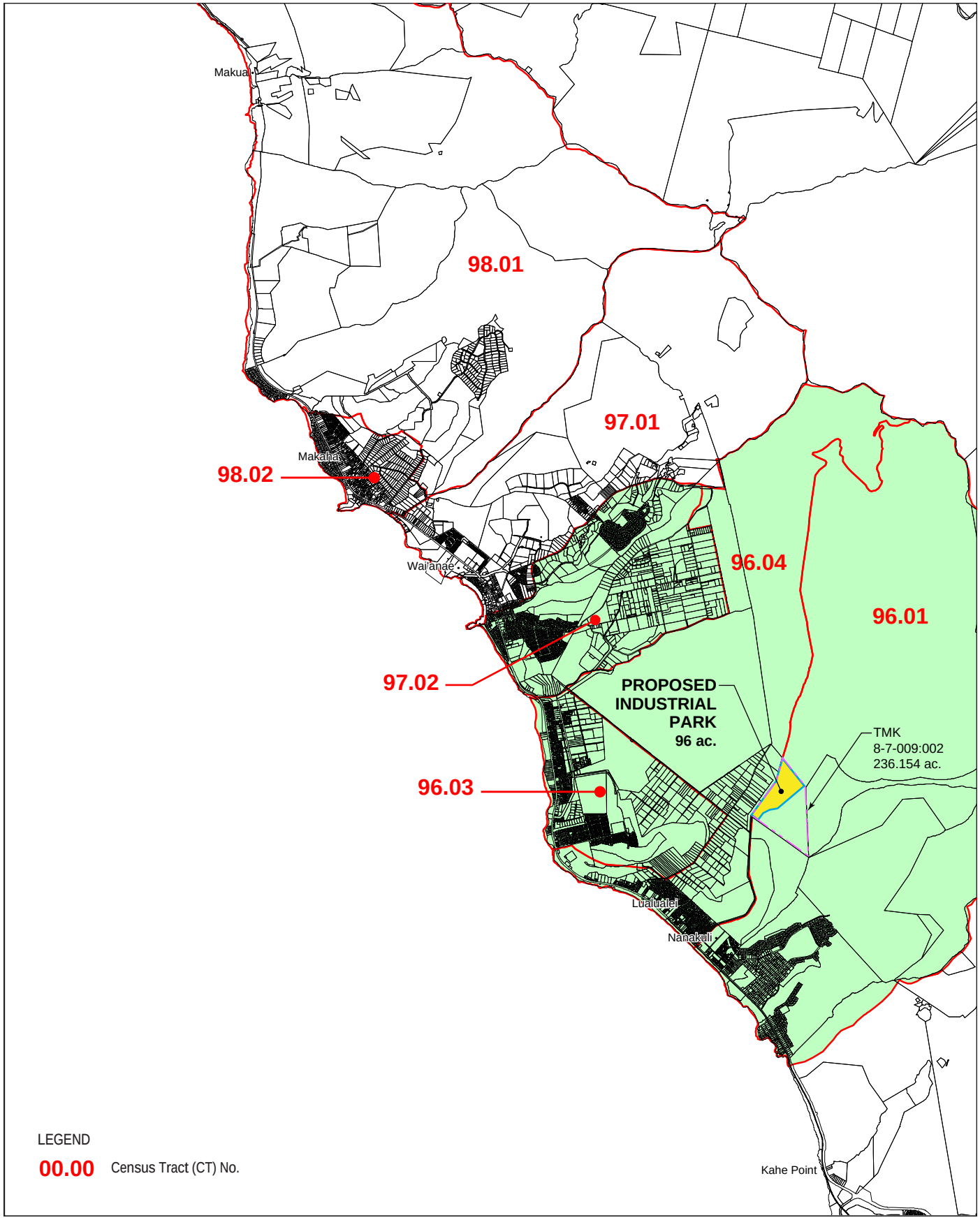

Figure 22
2000 Census Tracts
March 2010

In 2000, there were 6,854 residents in CT 96.01 (Nānākuli-Lualualei). The larger community of Nānākuli-Lualualei-Māʻili had a residential population of 28,549. Together with the Waiʻanae-Mākaha community, the Waiʻanae Coast had a population of 42,258. Relative to the island as a whole, approximately 5% of Oʻahu's population lived on the Waiʻanae Coast.

Although the Waiʻanae Coast has a relatively small share of the islandwide population, population *growth* was relatively high through the 1990s. The Waiʻanae Coast experienced a net increase of 4,847 people or a growth rate of 13.0%. In comparison, the island of Oʻahu had a growth rate of only 4.8%. All of the net increase in population along the Waiʻanae Coast occurred in the Nānākuli-Lualualei-Māʻili area. The upper portion of the Waiʻanae Coast, Waiʻanae-Mākaha, experienced a small net decrease in population between 1990 and 2000.

Employment and Income

The Waiʻanae Coast accounts for almost 5.0 percent of total population on Oʻahu, but less than 1.5 percent of the island's employment. The imbalance is not expected to improve into the future. The Department of Planning and Permitting prepares socio-economic projections that are reported in the *Annual Report on the Status of Land Use on Oʻahu*. The *Annual Report for Fiscal Year 2006* indicates that population in the Waiʻanae Development Plan area will grow moderately from 44,656 in 2005 to 52,285 in 2030. Over the same period, however, employment is projected to decrease from 7,253 in 2005 to 7,126 in 2030.

Table 15 shows the occupational profile of the Waiʻanae Coast labor market. Compared to the island as a whole, Waiʻanae residents are less likely to hold jobs in management positions. On the other hand, they are concentrated in blue-collar occupations, including construction, extraction, and maintenance, as well as production, transportation, and material moving.

Table 15
Occupational Profile for Waiʻanae Coast and Oʻahu, 2000

Occupational Category	Waiʻanae Coast		Oʻahu	
	No. of Persons	Percent	No. of Persons	Percent
Management	3,173	22%	129,513	34%
Services	3,205	22%	75,149	20%
Sales	3,878	27%	111,376	29%
Farming	221	2%	2,534	1%
Construction	1,878	13%	30,180	8%
Production	2,180	15%	33,716	9%
All Occupations	14,535	100%	382,468	100%

Source: U.S. Census, 2000

Potential Impacts and Mitigation Measures

Demographics. ~~The proposed development is not expected to affect the number of residents or the demographic characteristics of people who live in the area.~~ When companies move into the new industrial park, there is a possibility that workers who do not live in the region currently will relocate to reside closer to their workplace. However, the influx of new residents is not expected to be significant nor expected to create adverse impacts on the local housing market.

Employment and Income. The proposed development is expected to have a beneficial impact on the region as a job-producing and economy sustaining land use. Historically, the Wai‘anae Coast has experienced disproportionately high rates of unemployment and underemployment. The industrial park has the potential to become an employment center offering well-paid jobs that are within convenient commuting distance of Wai‘anae Coast communities. The employment forecast is based on an analysis by Hastings, Conboy, Braig & Associates, Ltd dated March 2008 (see Appendix B).

Short-term Employment. During the 15-month period for construction of project infrastructure, the on-site job requirement is estimated to range from 80 to 100 workers. The daily on-site job count will probably vary depending on factors such as phasing and scheduling of construction work and availability of work crews. In addition to on-site jobs, there is a reasonable expectation of related off-site job creation. Off-site jobs potentially include construction material suppliers and transportation services. The potential off-site job requirement is estimated at 20 percent of the on-site job requirement or between 15 to 20 workers. Construction of buildings and improvements on the 41 condominium units is estimated to have a similar impact.

Long-term Employment. The long-term employment impact ranges from 840 to 1,260 jobs. This number includes direct, indirect, and induced job creation effects. Direct job creation includes employment generated by businesses operating or based at the proposed light industrial park. Indirect job creation refers to a secondary level of employment generation because of goods and services purchased by businesses operating at the light industrial park. Induced job creation is a tertiary level of employment generation because of goods and services purchased from the incomes of people with jobs directly or indirectly related to industrial park businesses. In this way, employment impacts have a ripple effect throughout the larger economy. The number of direct jobs created by the proposed development is forecast at 560 to 840 full-time jobs. The direct job forecast is based on the estimated amount of developed industrial land multiplied by a factor of 8 to 12 employees per acre.

The creation of indirect and induced jobs was forecast using employment multipliers in the *2002 State Input-Output Study* published by the State Department of Business and Economic Development and Tourism, June 2006. Using a comparatively low employment multiplier factor of 1.5, the total long-term employment forecast—combining direct, indirect, and induced employment—is estimated at 840 to 1,260 jobs.

Fiscal Impacts. An analysis of fiscal impacts was conducted by Hastings Conboy Braig & Associates, February 2010 (see Appendix J). Table 16 summarizes costs and revenues to both State and City and County governments. The short to mid range revenues will be generated during the period of development to full build out, while the long range revenues will be generated during the period of long-term operations. In either time frame, revenues derived from various taxes and fees are expected to exceed public costs.

Table 16
Fiscal Impacts

	Short to Mid Range (1 to 10 Years) Cumulative Amount		Long Range (Beyond 10 Years) Annual Amount	
	Revenues	Costs	Revenues	Costs
State Government	$1,565,000	None	$1,820,000	$1,024,000
City and County Government	$305,000	None	$1,240,000	$320,000

Mitigation. No mitigation is necessary.

5.14 Land Use

Existing Conditions

The project site is vacant and covered mostly with grasses, *koa haole* bushes, and isolated *kiawe* trees. ~~Level portions of the site were used for sugar cane production, but production ceased in the early 1900s. A truck farm operated on 15 acres for a brief period in the 1980s, closing voluntarily in 1988.~~ Tadashi Araki and his brother farmed approximately 17 acres on the project site for approximately 25 years, ending in the early 1980s. Subsequently, the Higa family operated a truck farm on 15 acres for several years, closing voluntarily in 1988. Since then, the property has remained largely vacant and unused.

There is limited use of the property at the present time. Grasses are mowed periodically for fire control purpose and used for silage. The entire site is subject to an existing Unilateral Agreement (UA) related to the development of a golf course. In compliance with a UA condition to provide a 30-foot wide landscaped buffer on the east side of Lualualei Naval Access Road, trees were planted in a linear strip fronting the roadway in the summer of 2007.

Surrounding Land Uses

Land uses in the Lualualei Valley are generally divided into four zones. The lower valley or *makai* zone is characterized by a mix of residential and commercial uses that developed along Farrington Highway. The upper valley is occupied by the U.S. military, including the JBPHH Lualualei Annex which connects over the ridge to Schofield Barracks in central O‘ahu.

The western zone is dominated by numerous lots that are arrayed along the *mauka-makai* oriented Hakimo Road. Lualualei Naval Access Road is the *mauka-makai* transportation spine for the eastern zone of the valley. Unlike Hakimo Road, the parcels on Lualualei Naval Access Road are larger and much fewer in number. This corridor has a distinctly industrial character, conveyed by the presence of the PVT landfill for construction and demolition debris and the former cement plant, now operated as a waste processing facility by Pineridge Farms. The project site lies *mauka* of Pineridge Farms, and abuts the Naval installation. The foothills of Pu‘u Heleakala Ridge form the site’s eastern and southern boundaries.

Regional Industrial Land Use

According to 2007 data compiled by commercial real estate brokers Colliers Monroe Friedlander, the total supply of existing industrial space on the island of O‘ahu was estimated to be approximately 36.4 million square feet of floor area. The overall vacancy rate within O‘ahu’s industrial marketplace was estimated at 3%. Existing industrial development on O‘ahu is overwhelmingly concentrated within three designated Development Plan Areas, namely, the Primary Urban Center, ‘Ewa, and Central O‘ahu. Based on the Colliers data, the combined inventory of industrial space within the remaining Development Plan Areas totaled less than 1.0 million square feet, or 2.7% of the islandwide total.

Figure 23 shows the existing distribution of industrially zoned land on the Wai‘anae Coast. The industrial acreages are mainly occupied by public and quasi-public entities, such as the HECO power generation plant at Kahe, Wai‘anae Wastewater Treatment Plant, and Wai‘anae Transit Center. The only privately-owned sites are 25 acres in the Lualualei Valley occupied by West O‘ahu Aggregates and Pineridge Farms, and 4.76 acres in Wai‘anae. Small businesses in the Wai‘anae Coast looking for industrial space to lease or own have virtually no options but to locate outside their community.

Potential Impacts and Mitigation Measures

Tropic Land intends to seek a zone change to the I-1 district for approximately 96 acres of the parcel on the east side of Lualualei Naval Access Road. As defined by the Honolulu Land Use Ordinance, I-1 is a limited industrial district and would be compatible with the rural milieu and lifestyle of the Wai‘anae District. The proposed industrial development is expected to have few environmental impacts and uses are intended to complement the development scale of the communities they would serve. Land uses permitted within the industrial park will be further specified in the project’s covenants, conditions, and restrictions.

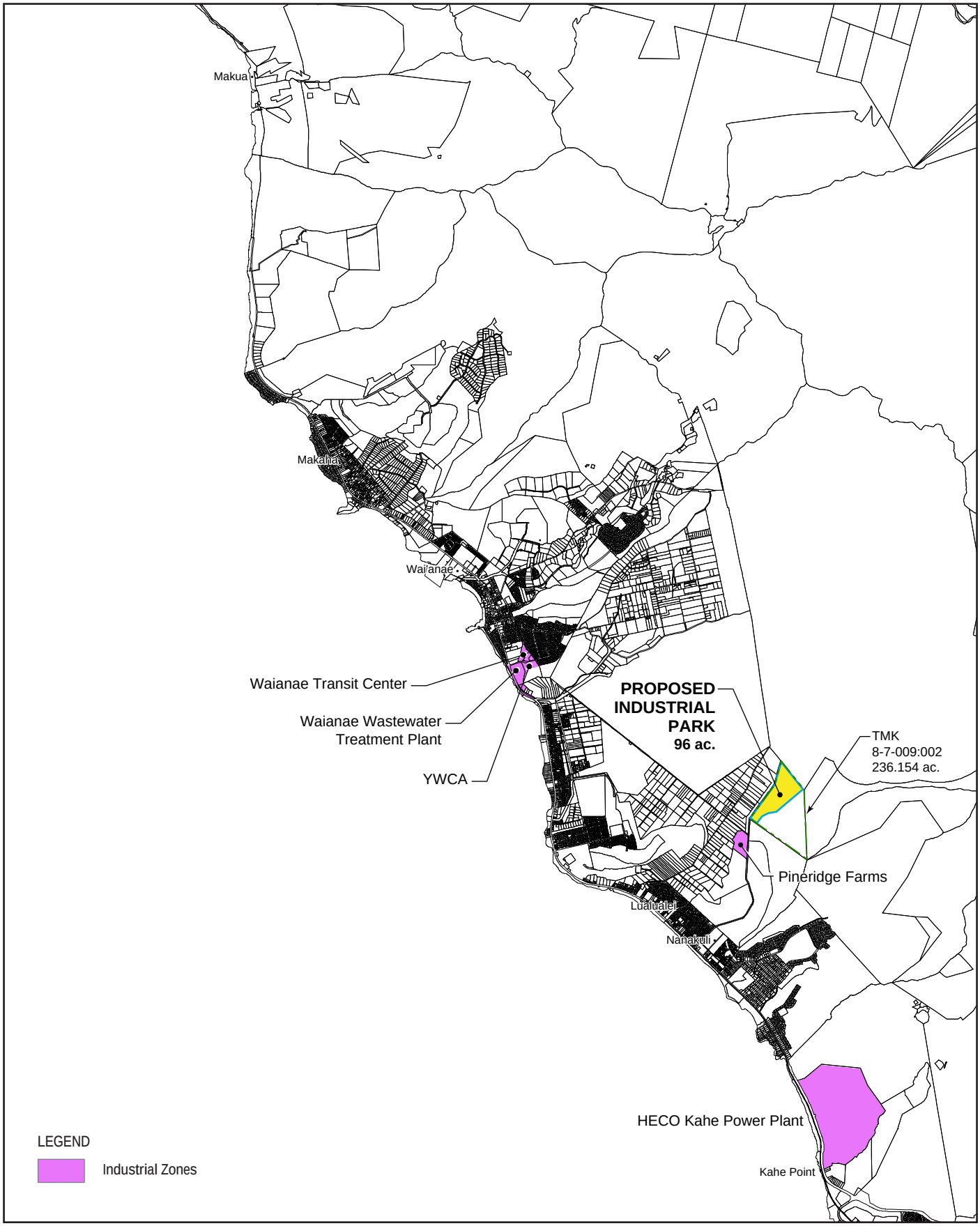

Figure 23
Existing Industrial Zones, Waianae Coast
March 2010

5.15 Infrastructure

5.15.1 Water

Existing Conditions

The Board of Water Supply (BWS) Pu‘u-o-Hulu system services properties along Hakimo Road (Figure 24). The water storage facility located closest to the project site is Pu‘u-o-Hulu Reservoir, with a 1.5 million gallon (MG) capacity and spillway elevation at 241.75 feet. The reservoir provides water services through a 20-inch transmission line and an 8-inch distribution main along Hakimo Road. Currently the Lualaulei Booster Station has limited capacity of 25,000 gallons per day (GPD). The existing water system provides a flow of approximately 2,200 gallons per minute (GPM) to a fire hydrant at the intersection of Pa‘akea Road and Hakimo Road.

Project Water Demand

Based on development information shown in Table 17, the average daily demand for the development is estimated to be 22,550 GPD. The maximum daily demand is estimated to be 45,100 GPD with a Peak Hour Demand of 67,650 GPD.

Since the proposed light industrial park will be developed as a condominium, the Covenants, Conditions, and Restrictions (CC&Rs) will define the types of business permitted and impose any restrictions on quantity of water used. The Association of Owners will implement and enforce the CC&Rs.

The projected water demand for fire protection is 4,000 GPM over a three-hour duration for the industrial park with a fire hydrant to be located within 125 linear feet of each lot. This demand is based on the BWS Standards, Table 100-19, Fire Flow Requirement.

Table 17
Estimated Drinking Water Use Demand

Land Use	No. of Lots	Average De Facto Population*	GPD/Capita	Other Usage (GPD/Lot)	Average Daily Demand (GPD)
Industrial	41	10	25	300	22,550

* De facto population is based on a percentage of employment to estimate employees on site throughout the work day.

Source: Hida, Okamoto & Associates, Inc. *Preliminary Engineering Report*, January 2010

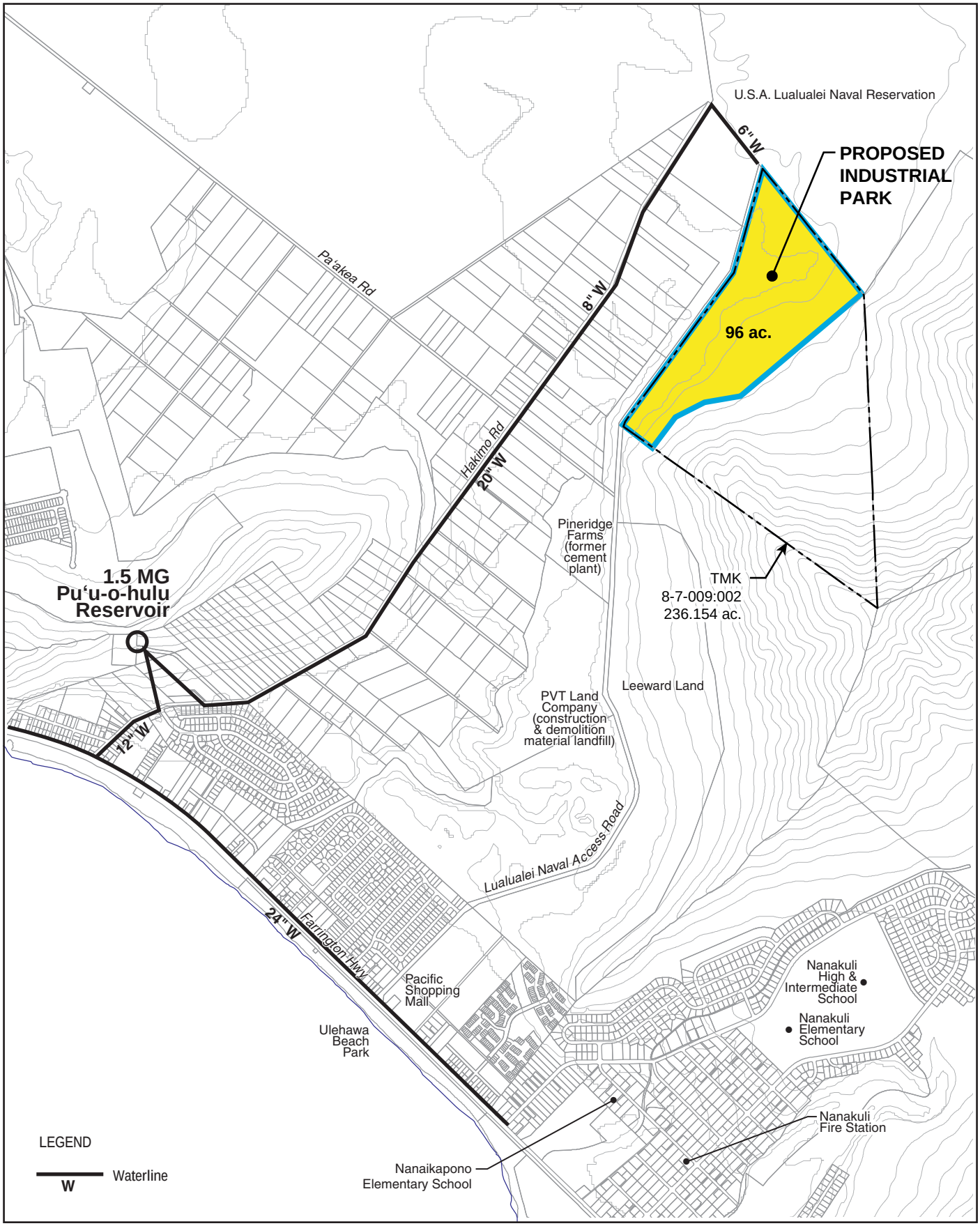

Figure 24
Existing Public Infrastructure
March 2010

Proposed Water Supply System

The proposed drinking water system will be connected to the existing 20-inch BWS water main at the intersection of Pa‘akea Road and Hakimo Road. A new 16-inch transmission line will be located along Pa‘akea Road and Lualualei Naval Access Road, entering into the project site. An easement from the Navy will be needed for a portion of the water line to be constructed under Pa‘akea Road and Lualualei Naval Access Road.

By letter dated July 2, 2009, BWS indicated that installation of a new 16-inch water main will provide adequate fire flow to the proposed industrial development. Design and construction of the drinking water distribution system will be in accordance with BWS Standards. The easement and water systems will be dedicated to the BWS.

Impacts and Mitigation Measures

The proposed Nānākuli Community Baseyard will impact the Wai‘anae regional water system by increasing the demand for drinking water. The industrial park’s water system will upgrade fire protection resources in the vicinity.

To reduce the demand for drinking water, non-drinking water—treated wastewater effluent—will be used for irrigation. Another water-saving measure is the requirement that industrial park businesses that wash fleet vehicles on-site install systems that recycle wash water. This requirement would also be administered through the CC&Rs.

5.15.2 Wastewater Facilities

Existing Conditions

Presently, the property is not served by the City and County’s wastewater collection and disposal system. Residential areas between the project site and the junction of Waiolu Street and Hakimo Road are mainly serviced by cesspools. Wastewater disposal by cesspools is a major issue within the Wai‘anae planning area. The City has no plans to serve the Agricultural District surrounding the project area with public sewers.

The municipal sewer main nearest to the project site is an 8-inch gravity sewer at Mohihi Street, approximately two miles south of the project site along Lualualei Naval Access Road.

Project Wastewater Facilities Demand

Wastewater will be generated from the various facilities within the proposed Nānākuli Community Baseyard at an estimated average rate of 22,550 GPD or 0.23 MGD and will be typical of domestic wastewater in composition. Projected wastewater flows are based on a de facto population of 410 with 25 GPD/capita and 300 GPD/lot. Since the project will be

developed as a condominium, CC&Rs will regulate permitted types of businesses, as well as the composition and quantity of wastewater discharges from each lot. The Association of Owners will implement and enforce the CC&Rs.

Proposed Wastewater System

The major components of the proposed wastewater system are: (1) the gravity wastewater collection system, (2) the wastewater treatment unit, and (3) the wastewater effluent disposal system. The proposed wastewater infrastructure will serve only the Nānākuli Community Baseyard project.

Collection System. The proposed on-site wastewater collection system is illustrated in Figure 5 (Chapter 3). Gravity sewers will be located within sewer easements. Preliminary pipe line sizes range from 8 to 10 inches in diameter. Design and construction of the system will be in accordance with standards established by the City and County and State Department of Health. The on-site wastewater system will be privately operated and maintained.

Wastewater Treatment Unit. The proposed wastewater treatment unit will be sited in a relatively central location and at a lower elevation fronting Lualualei Naval Access Road, as shown in Figure 5 (Chapter 3). The unit will use a cyclic biological treatment (CBT) technology consisting of a single basin reactor with continuous activated sludge system. The self-contained treatment unit processes all steps of flow equalization, biological oxidation, nitrification, de-nitrification, and solids-liquids separation in the same basin. A microprocessor automatically coordinates all the equipment and phases of each cycle.

In addition to the CBT unit, filtration and chlorination units, pumps, piping, and appurtenances will be required—all housed within a building. A total fenced area of approximately 10,000 square feet is expected to be sufficient for the entire wastewater treatment facility.

Effluent Disposal. The treated wastewater effluent will be chlorinated, disinfected, and pumped to a non-drinking water irrigation system. In the early stages of development, when wastewater levels are relatively low, effluent may be diluted with drinking water for irrigation purpose. Ultimately, 100% of the estimated irrigation water requirement can be supplied by the treated effluent. Sludge will be removed and disposed of in accordance with applicable State laws.

Impacts and Mitigation Measures

With proper operation, the wastewater system will provide for safe and reliable treatment and disposal of project-generated wastewater. Objectionable odors will not be generated by the wastewater treatment facility. Pumps and blowers normally associated with wastewater processing will be enclosed within a control building to reduce the impact of operating noises.

Placement of the treatment unit below ground level and landscaping around the perimeter fence will reduce the visual impact on motorists passing on Lualualei Naval Access Road.

5.15.3 Non-Drinking Water

Existing Conditions

The project area is located entirely within the No Pass zone, which means that untreated effluent cannot be injected underground. The project proposes to use treated effluent for surface discharge which is a permitted method of disposal. The State of Hawai'i, Department of Health, Wastewater Branch regulates the application of recycled water under Hawai'i Administrative Rules Section 11-62-27. According to the Guidelines for Treatment and Use of Recycled Water, allowable R-1 irrigation uses include golf courses, parks, playgrounds, schoolyards, athletic fields, residential property managed by an irrigation supervisor, and roadsides and medians. The project site currently has no R-1 distribution system.

Proposed Non-Drinking Water System

In the long-term, treated effluent from the wastewater treatment unit is expected to supply the entire estimated demand for irrigation water on the project site. The non-drinking water system will consist of a pump system and non-drinking water distribution main to dispense non-drinking water for irrigation. Pipes and pumps will be sized to accommodate the maximum daily irrigation flow with a residual pressure of 20 pounds per square inch (PSI) at the critical location.

Project Demand

The potential non-drinking water uses for this project include irrigation of the buffer area, commercial landscaping, and roadway medians. The non-drinking water demand is estimated to be 0.023 MGD (Table 18). To accommodate the irrigation flow requirement for one day, the minimum irrigation water storage tank will be 0.03 MG.

Table 18
Estimated Non-Drinking Water Use Demand

Land Use	Acre	GPD/Acre	Daily Demand (GPD)
Landscaped Setback Area (Front, Sides)	3.5	1,440	5,040
Roadway Median, Commercial Landscaped Area	5.0	1,440	7,200
Rockfall Hazard Mitigation Area	7.3	1,440	10,512
Total			22,750
Rounded			0.023 MGD

Source: Hida, Okamoto & Associates, Inc. *Preliminary Engineering Report*, January 2010

Impacts and Mitigation Measures

The proposed non-drinking water system will have beneficial impacts by reducing the demand for drinking water and providing a safe and efficient means of disposing project-generated effluent.

A water reuse plan will be developed for effluent water from the wastewater treatment plant. The plan will include additional information about irrigation practices, management, public education, and other required information per the DOH Recycled Water Guidelines.

5.15.4 Solid Waste Disposal Facilities

Existing Conditions

The primary solid waste disposal site on O‘ahu is the Waimanalo Gulch Sanitary Landfill, which is owned by the City and County of Honolulu and contracted to Waste Management of Hawai‘i for management and operation. Opened in 1989, the landfill is located in the Kahe Valley. This facility is permitted to operate until July 31, 2012. It accepts approximately 300,000 tons of municipal solid waste and 100,000 tons of ash and residue from H-POWER annually.

The PVT Land Company waste disposal site is approximately 5,500 feet from the project site. The privately owned PVT facility is the only authorized location on O‘ahu that accepts construction and demolition debris material.

Because the project site is vacant and unused land, it is not serviced by the City refuse collection program or any comparable private refuse collection service.

Projected Solid Waste Generation and Characteristics

The proposed light industrial park will generate solid waste during construction and after development. Construction wastes primarily will consist of vegetation and debris when clearing the site prior to grading. Most of these wastes will be combustible.

When the project is fully built out, solid waste generation is expected to be approximately 1 ton per day based on average generation of 5.0 pounds per capita per day and a de facto population of 410. The composition of solid waste is expected to be typical for a municipal source.

Certain industrial uses may have the potential to generate hazardous or regulated waste. Quantities have not been estimated because the precise nature of future occupants is unknown. However, the intent of the light industrial park is to limit occupants to those who would generate, use, and handle only incidental volumes of hazardous and regulated materials.

Impacts and Mitigation Measures

Refuse generated by the industrial park will be collected by a private refuse collection company for disposal at the H-POWER Plant or Waimanalo Gulch landfill. To reduce the waste stream, Tropic Land will develop a recycling plan for the construction and operational phases of the project. As appropriate, the plan will include a collection system for plastics, glass, paper and cardboard, cans, recyclable construction material, and green waste. Source separated material will be diverted to recovery facilities.

Where possible and appropriate, the project will specify or use products with recycled content, such as pavement material, concrete aggregate fill, and steel. In other cases, products produced locally will be used where possible and appropriate, including soil amendment and hydro-mulch. Individual unit owners will also be encouraged to develop and implement their own recycling plans.

All unit owners will be required to comply with State and federal regulations for the handling, storage, treatment, transport, and disposal of hazardous wastes. The State Department of Health oversees the reporting of inadvertent releases or spills. Once specific businesses are established at the site, facility operators will be encouraged to contact the State of Hawai‘i Department of Health Compliance Assistance Office (CAO) to ensure that the proper State and federal environmental regulations are followed.

5.15.5 Electricity and Telecommunications Services

Existing Conditions

There is an existing wood joint pole line along the Honolulu side of the Lualualei Naval Access Road right-of-way that abuts the project site. All of the poles contain Hawaiian Electric Co. (HECO) 3-phase, 11.5 kV, Hawaiian Telcom, and Oceanic Time Warner Cable lines. Power to this primary line is supplied by the ~~Mikiloa~~ Mikilua Substation Feeder No. 3 on Pa‘akea Road which has available capacity to serve the proposed development.

Modifications After Development

It is anticipated that HECO, Hawaiian Telcom and Oceanic will provide the necessary electrical, telephone, cable TV, and high-speed Internet services to the project site. The total diversified electrical demand for the entire development is estimated to be 1.05 MVA. Power is planned to be supplied to the site via the existing ~~Mikiloa~~ Mikilua Substation. The project site will not require its own substation.

Impacts and Mitigation Measures

The proposed Nānākuli Community Baseyard will place additional demands on the electrical and telecommunication utilities. Tropic Land will work with each utility for timely design and construction of utility infrastructure and delivery of required services. Utility lines within the project area will be placed underground to mitigate visual impacts.

Energy efficiency design guidelines will be incorporated into the project's Covenants, Conditions, and Restrictions (CC&Rs) to promote energy conservation. Among the guidelines that will be considered for inclusion in the CC&Rs are:

- Use of heat pumps, solar heating systems, and photovoltaic systems.
- Use of high-efficiency appliances and air conditioners.
- Use of timer or motion-sensing light and air condition controls.
- Promotion of energy saving opportunities through green building design, including building orientation and insulation.
- Use of landscaping to minimize heat islands, with preference for native, drought-tolerant plant species.

5.16 Public Facilities and Services

5.16.1 Police and Fire Protection

Existing Conditions

Police: The amendment area falls within the service area of District 8 which stretches from ʻEwa Beach to Kaʻena Point. The District 8 headquarters are located in Kapolei. There is a substation in Waiʻanae which serves as a base for personnel patrolling the Waiʻanae Coast.

Fire: The closest fire station, located in Nānākuli valley, is approximately 3.4 miles from the project site. The Nānākuli Station houses an engine unit and a tanker unit, as well as emergency medical services (EMS) unit. Back-up fire and EMS services are provided from the Waiʻanae Fire Station, approximately 8 miles away.

Impacts and Mitigation Measures

By letter dated June 2, 20009, the Honolulu Police Department indicated that the project will have no significant impact on its facilities or operations. As security measures, the light industrial park will be fenced along the Lualualei Naval Road frontage and side boundaries. The main entry is via a front gate manned by a security guard or electronic security system after normal business hours.

New water lines, fire hydrants, and emergency access will be constructed by Tropic Land as prescribed by the Honolulu Fire Department and Board of Water Supply. The 100-foot buffer along the *mauka* boundary of the proposed development is intended to serve as a fire break. These improvements will accommodate the fire protection needs of the proposed industrial park. No short- or long-term adverse impacts to fire protection capability are anticipated.

5.16.2 Health Care Facilities

Existing Conditions

The primary health care facility on the Waiʻanae Coast is the Waiʻanae Comprehensive Health Center in Māʻili. This facility provides 24-hour emergency services. Additional round the clock emergency health services are provided by Hawaiʻi Medical Center West, located in ʻEwa Beach, with 102 beds for acute and critical care. Ambulance services to the site would come from the Waiʻanae Fire Station where ambulance services are available round the clock.

Impacts and Mitigation Measures

Existing health care facilities should be adequate to accommodate the needs of the proposed development. These facilities, including the Waiʻanae Coast Comprehensive Health Center and St. Francis-West Medical Center, have the general and emergency medical capabilities to treat injuries that might arise from light industrial uses. No short- or long-term adverse impacts are expected.

5.16.3 Schools

Existing Conditions

The campuses of Nānākuli Elementary School and Nānākuli Intermediate and High School are located in the valley to the east of the project site. The Lualualei and Nānākuli valleys are separated by a ridge of the Waiʻanae mountain range and connected by Farrington Highway

Impacts and Mitigation Measures

The proposed development is not expected to add additional students to the current public school enrollment.

5.16.4 Park and Recreational Facilities

Existing Conditions

There are no existing parks and recreational facilities in the immediate environs of the project site. According to the *Wai'anae Sustainable Communities Plan* (2000), City parks in the vicinity are located on the coast, including Nānākuli Beach Park, Ulehawa Beach Park, and Lualualei Beach Park, encompassing an area of almost 137 acres.

Impacts and Mitigation Measures

There would be no short- or long-term impact on park or recreational resources.

5.16.5 Civil Defense Facilities

There is no civil defense facility on the project site. However, Tropic Land LLC has provided an access road through its property across the street—on the west side of Lualualei Naval Access Road—that is part of the City and County of Honolulu's network "back roads" that, together, comprise an emergency access route for Wai'anae Coast communities.

Impacts and Mitigation Measures

If required by the State Land Use Commission as a condition of reclassification Tropic Land LLC will fund on a fair share basis and construct adequate solar powered civil defense measures to serve the petition area as determined by the State of Hawai'i Department of Defense and City and County of Honolulu Department of Emergency Management.

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6. RELATIONSHIP TO EXISTING LAND USE PLANS, POLICIES, AND CONTROLS

This chapter discusses the relationship of the project to the objectives and policies of the Hawai‘i State Plan and Functional Plans, the State Land Use Commission Rules, the Coastal Zone Management Program, the City and County of Honolulu General Plan, and the Wai‘anae Sustainable Communities Plan.

6.1. Hawai‘i State Plan

The Hawai‘i State Plan, Chapter 226 Hawai‘i Revised Statutes (HRS), established a set of goals, objectives and policies that serve as long-range guidelines for the growth and development of the State. The purpose of the Hawai‘i State Plan is to "…serve as a guide for the future long-range development of the State; provide a basis for determining priorities and human resources, land, energy, water and other resources; improve coordination of federal, state and county plans, policies, programs, projects and regulatory activities; and to establish a system for plan formulation and program coordination to provide for an integration of all major state and county activities" (Chapter 226-1: Findings and Purpose, HRS).

The project's compatibility with applicable elements of the State Plan are described below.

Section 226-6, Objective and policies for the economy—in general.

Objectives: (a) Planning for the State's economy shall be directed toward achievement of the following objectives:
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i's people.
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.

Policies:

(7) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawai‘i's small scale producers, manufacturers and distributors.
(1) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.

Discussion: The intent of the proposed light industrial park is to increase opportunities for new and small businesses along the Leeward Coast and West O'ahu. The Leeward coast is an area with historically high unemployment rates, and is especially vulnerable to disruptions in overseas transportation because of its distance and geographic isolation from urban Honolulu. The project is intended to support small local businesses and enhance the economic self-sufficiency of these communities.

6.2 State Functional Plans

Part of the overall State planning system is the development of State Functional Plans. While the Hawai'i State Plan establishes long-term objectives, the purposes of the Functional Plans are to define strategies for the function area and to provide strategies for departmental policies, programs, and policies.

There are twelve State Functional Plans that serve as the primary implementing vehicle for the goals, objectives and policies of the State Plan. The following discusses the State Functional Plans that are applicable to the project.

Employment Functional Plan

The State Employment Functional Plan, completed in 1989, identified five major objectives:

- Improve the qualification of entry-level workers and their transition to employment
- Develop and deliver education, training, and related services to ensure and maintain a quality and competitive workforce
- Improve labor exchange
- Improve the quality of life for workers and families
- Improve planning of economic development, employment, and training activities.

The following objectives and policies apply to the project:

Objective: (I.B) Develop and deliver education, training and related service to ensure and maintain a quality and competitive workforce.
Problem 1: There are insufficient opportunities for occupational skill training, upgrading skills, retraining, entrepreneurial and customized training.

Discussion: This section of the Employment Functional Plan identifies the need for entry-level training services, upgrading the skills of the existing work force, and supporting small businesses. Specifically the plan states, "Nurturing existing small businesses and new entrepreneurs will provide opportunities for new ownership which may help retain, expand and diversify managerial and technological expertise in Hawai'i." (State Employment Functional Plan, p. 19).

A major purpose of the proposed light industrial park is to encourage local entrepreneurship, and establish a setting where small, local businesses can develop, thrive, and reach their full potential. The proposed incubator facility can also develop into an employment and training center for the Leeward Coast, which historically has experienced disproportionate rates of unemployment.

State Agriculture Functional Plan

Objective: (H) Achievement of productive agricultural use of lands most suitable and needed for agriculture.
Policy: (H.2) Conserve and protect important agricultural lands in accordance with the Hawai‘i State Constitution.

Discussion: The proposed industrial park site is located within the State Agricultural District. The Applicant's petition to the State Land Use Commission is requesting that 96 acres be reclassified from the Agriculture to the Urban District. Portions of the site are classified as "prime lands" under the Agricultural Lands of Importance to the State of Hawai‘i (ALISH) and an isolated section is rated "B" Under the Land Study Bureau (LSB) Detailed Land Classification System.

Notwithstanding their classification, these lands are not desirable agricultural lands. The project area's clayey and rocky soils are poorly suited for diversified agriculture. The project site is situated between industrial uses and the military installation in a location that has not experienced economically viable agricultural activity for decades.

State Transportation Functional Plan

The 1991 State Transportation Functional Plan identified the four most critical issues of transportation: congestion, economic development, funding and education. Objectives, policies and implementing actions were identified for each issue. The following objectives and policies apply to the project:

Objective: (I.B) Reduction of travel demand through zoning and decentralization initiatives.
Policies: (I.B.1) Close the gap between where people live and work through decentralization, mixed zoning, and related initiatives.

Discussion: The proposed light industrial park will provide business and employment opportunities to residents of the Wai‘anae Coast, an area that presently lacks commercial and industrial centers. The proposed development will reduce the need for local residents to commute to jobs outside the community, reducing commuter traffic along the narrow and chronically congested Farrington Highway corridor.

Energy Functional Plan

The priority of the 1991 State Energy Functional Plan was to lessen the State's reliance on petroleum and other fossil fuels. The plan noted that the State depends on fossil fuels for about 90 percent of our total energy needs, and emphasized the need to develop alternate and renewable energy sources, energy conservation, and an integrated approach for more effective energy development and management.

Issue Area: Overdependence upon oil and other fossil fuels for energy needs.

Objective: (A) Moderate the growth in energy demand through conservation and energy efficiency.
Policy: (A.2.1) Stimulate and promote greater energy efficiency and conservation in the transportation sector.

Discussion: As discussed under the Transportation Functional Plan above, the proposed project will expand business and employment opportunities closer to where people live, reducing the need to commute to other areas of the island for work, or to buy appropriate goods and services.

6.3 State Land Use Classification

The State Land Use Commission, pursuant to Chapter 205 and 205A, HRS and Chapter 15-15, Hawai‘i Administrative Rules, is empowered to classify all lands in the state into one of four land use districts: Urban, Rural, Agricultural, and Conservation.

Figure 25 shows the State land use districts of the project area and vicinity. Currently, TMK 8-7-09: 02 is partially located in the Agricultural District (168.764 acres) and partially located in the Conservation District (67.439 acres). The Conservation District land, consisting of a steep ridge of Pu‘u Heleakala, is not affected by the proposed action. The proposed industrial park site is wholly located within the Agricultural District. Tropic Land will petition the State Land Use Commission to reclassify approximately 96 acres from Agricultural to Urban (Table 19).

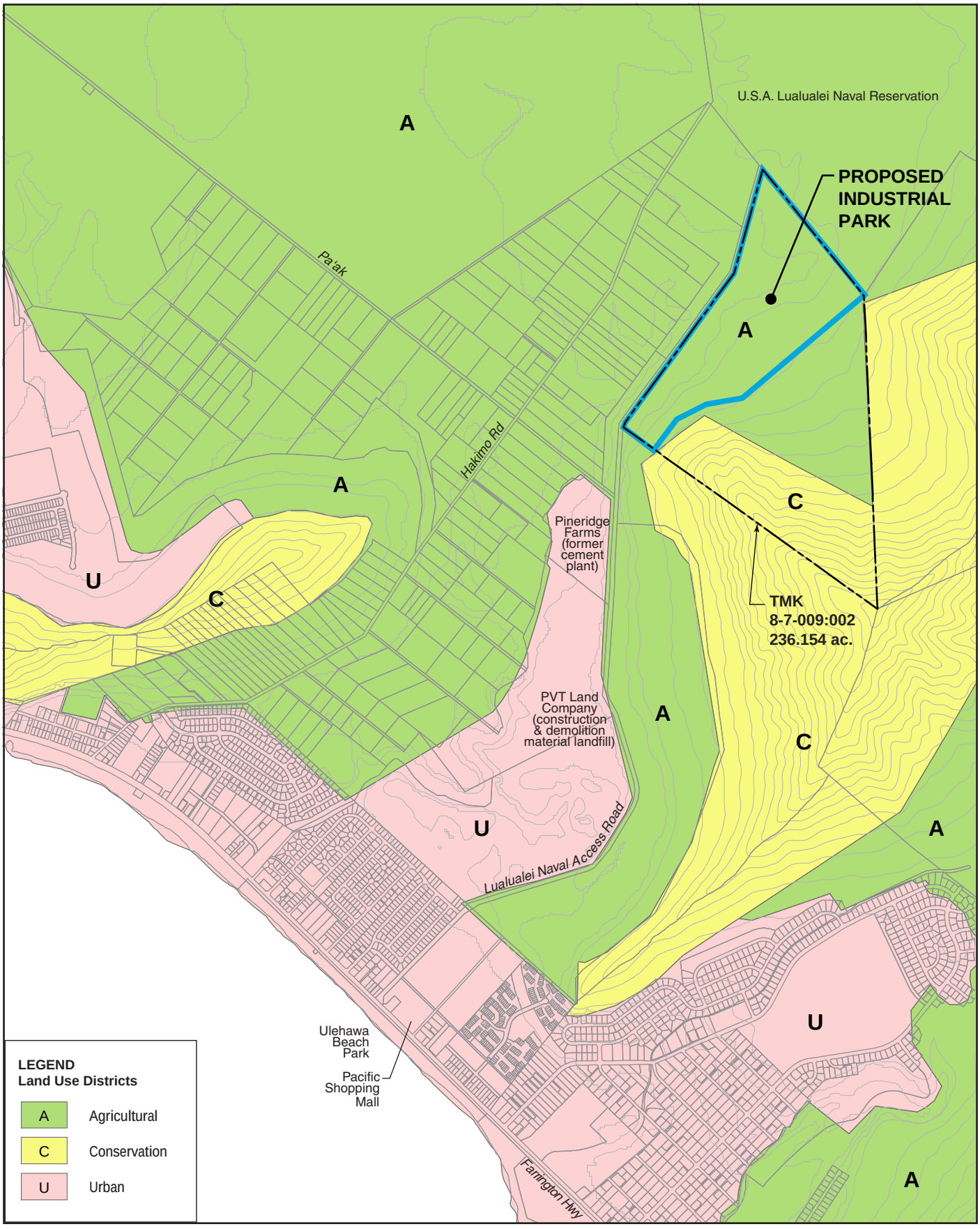

Figure 25
State Land Use Map
March 2010

Table 19
Current and Proposed State Land Use Classifications
TMK: 8-7-09: 02

Land Use Districts	Current Acres	Proposed Acres
Agricultural	168.764	72.764
Conservation	67.439	67.439
Urban	0	96.000
Total	236.154	236.154

The State Land Use Commission Rules require that an application for a boundary amendment show that it is "reasonable, not violative of Section 205-2, HRS, and consistent with the policies and criteria established pursuant to Sections 205-16, 205-17, and 205A-2, HRS." (Hawai'i Land Use Commission Rules, Section 15-15-77). In reviewing petitions for reclassification of district boundaries, the Commission must specifically consider the following:

(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives and policies of the Hawai'i State Plan and relates to the applicable priority guidelines of the Hawai'i State Plan and the adopted functional plans.

***Discussion*:** As discussed in Sections 5.1 and 5.2 above, the project conforms to the most applicable goals, objectives and policies and the guidelines of the Hawai'i State Plan and State Functional Plans.

(2) The extent to which the proposed reclassification conforms to the applicable district standards.

Discussion: The applicable standards for the Urban District are found in HAR Section 15-15-18 of the Land Use Commission Rules. The eight (8) standards are discussed below:

(1) It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses
(2) It shall take into consideration the following specific factors:
(A) Proximity to centers of trading and employment except where the development would generate new centers of trading and employment;
(B) Availability of basic services such as schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, pubic utilities, and police and fire protection; and

(C) Sufficient reserve areas for foreseeable urban growth;

The project is consistent with the urban standards, including the proposed ~~"city like"~~ concentration of people, structures, streets, and urban level of services ~~and other related land uses and proximity~~ appropriate to employment centers. Services such as water, sanitation, and police and fire protection are or will be available to serve the project.

(3) It shall include lands with satisfactory topography, drainage, and reasonably free from the danger of any flood, tsunami, unstable soil condition, and other adverse environmental effects;

The project area includes lands with satisfactory topography, drainage, which are reasonably free from danger of flood, tsunami, unstable soil condition, and other adverse environmental effects.

(4) Land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on state or county general plans;

(5) It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the state and county general plans;

The project site is contiguous to ~~the Naval Munitions Center (NMC) Lualualei~~ JBPHH Lualualei Annex, a military ordnance storage and communications facility, which although not in the Urban District, ~~is an urban type activity~~ has elements of techno-industrial urban type activity. It is also very close to industrial lands owned by Pineridge Farms and the PVT Land Company, which are in the Urban District. The WSCP was in the process of being updated when this ~~DEIS~~ FEIS was prepared, and an application is pending to change the Rural Community Boundary to incorporate the proposed industrial park site. The Department of Planning and Permitting's Draft Waiʻanae Sustainable Communities Plan Revision for 2009 identifies "industrial" as an alternative land use for this site. The project directly supports the Waiʻanae Sustainable Communities Plan's stated Community Values to provide economic choices in Waiʻanae, including jobs in Waiʻanae which will allow families to spend less time commuting.

(6) It may be include lands which do not conform to the standards in paragraphs (1) to (5):

(A) When surrounded by or adjacent to existing urban development; and

(B) Only when those lands represent a minor portion of this district;

As indicated above, the project site is adjacent to the Naval Munitions Center (NMC) Lualualei, Pineridge Farms, and the PVT Land Company landfill, which can all be characterized as urban and industrial uses. Although the site and surrounding areas are within the Agricultural land use district, the University of Hawaiʻi Land Study Bureau

has rated 80% of the site as Class E, or "marginally" suitable for agricultural use. Much of the parcel is stony, and agricultural use would require soil amendment and modification. The remainder of the site is rated Class B, "prime" or "good" agricultural land if it is irrigated. This would require water sources that are not readily available to new agricultural operations on the Wai'anae coast.

The site is only a minor portion of the Agricultural designated lands on O'ahu. With the availability of more favorable options, including several thousand acres of Campbell land in Kunia, Dole land in Wahiawa and Waialua, and Galbraith Estate land in Wahiawa, there are more affordable options with better access to irrigation water resources than the subject property or other areas along the Leeward coast.

(7) It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services; and

As indicated above, the project site is adjacent to the Naval Munitions Center (NMC) Lualualei, Pineridge Farms, and the PVT Land Company landfill, which are considered urban and industrial uses. Petitioner proposes to construct utilities necessary to support the project.

(8) It may include lands with a general slope of twenty percent or more if the commission finds that those lands are desirable and suitable for urban purposes…

Not applicable. The project site is relatively flat, sloping at a 12% rate from Lualualei Access Road upward to the foothills of Pu'u Heleakala ridge.

(3) Impact on the following areas of Statewide concern:

- **Preservation or maintenance of important natural systems and habitats;**
- **Maintenance of valued cultural, historical, or natural resources;**
- **Maintenance of other natural resources relevant to Hawai'i's economy, including but not limited to agricultural resources;**
- **Commitment of state funds and resources;**
- **Provision of employment opportunities and economic development; and**
- **Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups.**

Discussion: There are no threatened or endangered species or significant historic or archaeological resources within the project area. The State Historic Preservation Division has concurred that the project will have "no effect" on historic sites. Although the site is on agricultural land, the UH Land Study Bureau has found that 14% of the 96-

acre project site is classified as containing Class B (prime or good) agricultural lands, while 86% of the site contains Class E lands, which are only marginally suitable for agricultural use according to the LSB soils rating system. It is believed that in the early 1900s, the site was used primarily for pasturage rather than agriculture. ~~Other than a small truck farm that ceased operation~~ Two truck farms (Araki and Higa) operated on a small 17-acre portion of the project site for 25-30 years, ending in 1988, but no other crop production has occurred on the site since that time. .

The project will not require a commitment of state funds or resources. The proposed industrial park will support local start up businesses, resulting in a positive impact on employment opportunities and economic development for the Wai‘anae Coast. The project will not directly affect housing opportunities. It will, however, provide needed jobs and economic opportunities for small businesses, enhancing the ability of local families to remain adequately housed.

(4) In establishing the boundaries of the districts in each county, the commission shall give consideration to the general plan of the county in which the land is located.

Discussion: The City and County of Honolulu General Plan is discussed in Section 5.6 below. The project is consistent with the General Plan objectives and policies in the areas of Economic Activity, Natural Environment, and Physical and Urban Design.

(5) The representations and commitments made by the petitioner in securing a boundary change, including a finding that the petitioner has the necessary economic ability to carry out the representations and commitments relating to the proposed use or development.

Discussion: The petitioner, Tropic Land LLC, has reported that it has the financial ability to implement the project.

(6) Lands in intensive agricultural use for two years prior to the date of filing of a petition or lands with a high capacity of intensive agricultural use shall not be taken out of the agricultural district unless the commission finds either that the action:

(A) will not substantially impair actual or potential agricultural production in the vicinity of the subject property or in the county or State; or

(B) is reasonably necessary for urban growth.

Discussion: Not applicable. As noted above, the property has not been used for agriculture for more than twenty years, since a succession of two small truck farms on the site ceased operation in 1988.

6.4 Coastal Zone Management Act (CZMA)

Objectives and policies of the Coastal Zone Management Program are described in Chapter 205A-2, Hawai‘i Revised Statutes, Part I. The site is within the State's Coastal Zone Management Area, which includes all lands with the exception of forest reserves.

Special Management Area guidelines are found in Part II of the same chapter. The site lies approximately two miles from the coastline, and is outside the City and County of Honolulu's Special Management Area (see Section 5.9). The project's conformance with the policies and objectives of the Coastal Zone Management Program is discussed below:

Recreational Resources

CZM Objective: Provide coastal recreational opportunities accessible to the public.

Discussion: The project will not affect existing fishing, surfing or other nearby recreational opportunities accessible to the public. The site is located approximately two miles from the coastline.

Historic Resources

CZM Objective: Protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

***Discussion*:** The project will not have an adverse effect on natural or man-made historic or prehistoric resources in the CZM area. An archaeological survey of the project site was conducted in 1990 for the formerly proposed golf course development. A total of eight archaeological sites were identified in and around what is now the proposed industrial park. Only two of the sites were interpreted as attributable to traditional Hawaiian activity; a remnant of an agricultural wall and a probable hearth feature. The six other sites are attributable to historic land usage, primarily cattle ranching. The DLNR State Historic Preservation Division was consulted during the environmental review for the previously proposed golf course. At that time, the SHPD determined that the golf course project would have no adverse impact on significant historical resources. The currently proposed industrial park is within the boundaries of the proposed golf course, and is not expected to adversely affect historic resources.

Scenic and Open Space Resources

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

Discussion: The project site is currently open space. The project area is not visible from any public highway or the coastal area, and is not located within any designated scenic corridor.

Coastal Ecosystems

CZM Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Discussion: The project will not adversely impact coastal ecosystems or water quality. The site is located two miles from the coastline. During construction, erosion control measures will be required to eliminate any potential for storm water runoff to reach near shore areas.

Economic Uses

CZM Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Discussion: The development of a light industrial park with business incubator space will be an asset to the rural economy of the Leeward Coast. The project location is appropriate, as it is tucked away on Lualualei Naval Access Road, away from the scenic coastline and near the JPBHH Lualualei Annex and other light industrial uses.

Coastal Hazards

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

Discussion: The project site is located outside the tsunami inundation zone, and is located within the area designated as Zone D, areas of undetermined flood hazard, on the Flood Insurance Rate Map (FIRM). The proposed industrial park will not will not affect the occurrence or likelihood of damage from various natural disasters on adjacent properties.

Managing Development

CZM Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

***Discussion*:** The roject has no impact on this CZM objective.

Public Participation

CZM Objective: Stimulate public awareness, education, and participation in coastal management.

***Discussion*:** The project has no impact on this CZM objective. However, the proposal for a light industrial park was developed through consultation with the Nānākuli/Māʻili and Waiʻanae Neighborhood Boards and various community groups, who were asked for recommendations on an appropriate use for the property. Several suggestions were made, but the community consensus was for development of a light industrial park.

Beach Protection

CZM Objective: Protect beaches for public use and recreation.

***Discussion*:** The project has no impact on the use or protection of public beaches.

6.5 Hawai‘i Enterprise Zone (EZ) Partnership Program

The Hawai‘i Enterprise Zone (EZ) Partnership Program was established by the State Legislature to help stimulate business activity and employment in areas where they are most needed or most appropriate. Each county can select up to six zones that satisfy statutory income or unemployment criteria, and each zone designation is valid for a period of 20 years. Qualified businesses that locate within a designated enterprise zone can receive tax and other incentives. Since 1994, 21 zones have been created statewide, including one on the Leeward Coast. On O‘ahu, 132 firms were enrolled in the EZ program in 2006, the last year for which data have been reported. On the Leeward Coast, however, there were zero participants.[1]

The economic development impact of the EZ program has been significant. In 2006 alone, participating firms produced a combined total of 830 new jobs. Since job creation occurred in areas targeted by unemployment or income criteria, the benefits of the EZ program are all the more noteworthy.

The enterprise zones on O‘ahu are typically oriented around new or established employment centers. For example, Zone 1 includes the former O‘ahu Sugar Mill site in Waipahu, Campbell Industrial Park, and all of Kapolei. Zone 2 includes the Mililani Tech Park and parts of Wahiawā. Zone 3 includes the former Waialua Sugar Mill site. Zone 4 is in urban Honolulu from the airport through Kalihi to the Kaka‘ako redevelopment area. Zone 5 is the Leeward Coast, but in contrast to the other zones, does not have a well-defined place to incubate and grow new businesses, provide training activities, and promote other types of economic development activities.

The western portion of the amendment area (23 acres) is already located within the existing Leeward Coast Enterprise Zone. The eastern portion of the amendment area, including the area proposed for the light industrial park, is in a census tract that is eligible for EZ designation. As the proposed industrial park site moves forward in the entitlement process, Tropic Land will seek to expand the EZ boundary to encompass the industrial park.

[1] State of Hawai‘i, Department of Business, Economic Development & Tourism. 2006. “Enterprise Zones Partnership, Report to the Governor for Calendar Years, 2003-2006.” See Appendix B: Firms Enrolled by County, Zone, and Type.