Appendices

A Preliminary Engineering Report for Nanakuli Community Baseyard. Hida, Okamoto & Associates, Inc. January 2010

B. Market Analysis and Employment Forecast, Proposed Tropic Land LLC Industrial Park. Hastings, Conboy, Braig & Associates, Ltd. March 2008

C. Agricultural Feasibility Report, TMK 8-7-009: 002, Nanakuli, Oahu, Hawaii. John J. McHugh, Jr. Ph.D., May 2008

D. Biological Surveys Conducted on the Tropic-Land LLC, Nānākuli Light Industrial Park Site, Waiʻanae District, Oʻahu, Hawaiʻi. Reginald E. David and Eric Guinther, June 2008

E. Traffic Impact Analysis Report for the Proposed Nanakuli Industrial Park. Traffic Management Consultant, January 2010

F. An Archaeological Inventory Survey for the Proposed Lualualei Golf Course, Lualualei, Waiʻanae, Oʻahu. Hallet H. Hammatt, Ph.D., Jennifer J. Robins, and Mark Stride, January 1991

G. Cultural Impact Assessment—Final Report. Janelle L. Kaohu, Angelita S. Aipoalani, and Hanalei Y. Aipoalani, July 2009

H. Correspondence related to Chapter 6E-42, Historic Preservation Review for TMK: (1) 8-7-009: 002

I. Nānākuli/Māʻili Neighborhood Board Resolutions

J. Economic/Fiscal Impact Analysis of the Proposed Nanakuli Community Baseyard, Hastings, Conboy, Braig & Associates, Ltd. February 2010

K. Correspondence related to Lualualei Naval Access Road

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M. Environmental Impact Statement Preparation Notice (EISPN): Comments Received

APPENDIX A

Preliminary Engineering Report for Nanakuli Community Baseyard.
Hida, Okamoto & Associates, Inc., January 2010

PRELIMINARY ENGINEERING REPORT

for

NANAKULI COMMUNITY BASEYARD

Lualualei, Nanakuli, Oahu, Hawaii

Tax Map Key: 8-7-9: por. 02

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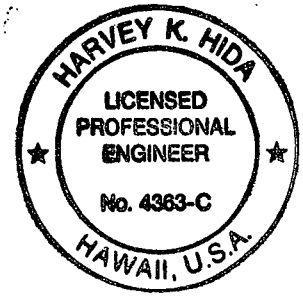

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January 2010

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I. INTRODUCTION

Nanakuli Community Baseyard project, proposed by Tropic Land, LLC, is an approximately 41 lots light industrial horizontal condominium development in Lualualei Valley, Nanakuli, situated just makai of the Lualualei Naval Ammunition Depot and lies approximately 9000 feet into Lualualei Naval Access Road (Lualualei Road) from Farrington Highway intersection. It is bounded along its southerly (makai) and westerly boundary by the Lualualei Road. The northerly (mauka) and northeasterly boundary of the site runs along the edge of Lualualei Naval Ammunition Depot complex. To the east, the project is bounded by privately-owned and State lands comprising Puu Haleakala ridge. (see Figure 1–Location Map). The project area is approximately 96 acres on the east side of Lualualei Road (TMK: 8-7-09: portion 02).

This report will present information on infrastructure requirements for the proposed Nanakuli Community Baseyard. Specifically, this report will address:

1. Background information on the proposed project;
2. Existing conditions;
3. Modifications after development; and
4. Potential impact due to development and proposed mitigation measures.

II. PROJECT BACKGROUND

2.1 Proposed Project

The proposed industrial park would consist of approximately 41 lots, averaging two acres each. The project would have a single secured entry off of Lualualei Road and secondary access for fire and emergency purposes. The existing linear tree farm along the Lualualei Road will remain as a 30-foot landscaped setback area. The north and south property lines have 15-foot setbacks. An additional strip of land, approximately 100feet wide and mauka of the industrial lots, will be used for drainage improvements and rock fall hazard mitigation measure.

2.2 Topographic Features

The project site ranges in elevation from about 60 feet mean sea level (MSL) at Lualualei Road, to an elevation of 1,864 feet at Puu Haleakala ridge. Generally, the project site slopes in a southwesterly direction towards the Lualualei Road (see Figure 2 – Topographic Map). Approximately 1/3 of the site, situated below the 200 foot above sea level elevation, is relatively flat, sloping at a 12% rate from Lualualei Road upward to the foothills of Puu Heleakala ridge. Ulehawa Stream, an intermittent stream, may cross the site along a course that is generally parallel to Lualualei Road.

Above the 200-feet elevation level, the site takes on a more abrupt slope upward toward the back of the subject site. It is estimated that the slope within this "second tier" of the subject site is within the 10-30% range. The rest of the site along the foothills of Puu Haleakala ridge and the rear portions of the project site slope radically upward towards the peak of the ridge; however, no construction will occur on this portion of the site as it will be left in its current, undeveloped state and will remain in the preservation zone.

2.3 Existing Uses

The project site is currently undeveloped land. The site is vacant and covered mostly with grasses, haole koa bushes, and isolated kiawe trees. The property has remained largely vacant and unused. A truck farm operated on 15 acres for a brief period in the 1980s, closed voluntarily in 1988. There is limited use of the property at present time. Grasses are mowed periodically for fire control purpose. 30-foot wide landscape buffer on the east side of Lualualei Road is provided, trees were planted in a linear strip fronting the roadway in the summer of 2007.

2.4 Climate

The climate in the Lualualei region is relatively warm and dry. Trade winds from the north east occur much of the time, with occasional Kona winds. Temperature range in this area usually varies between the lower 60's (degrees Fahrenheit) to the upper 80's. rainfall in the region is generally light, with a mean annual rainfall of approximately 26 inch near the project site.

2.5 Land Use and Zoning

The proposed Nanakuli Community Baseyard will require zoning changes from P-2 (Preservation) to an I-1 (Limited Industrial) and State Land Use Re-classification from Agricultural to Urban for approximately 96 acres. The remaining acreage will remain in Preservation use. The proposed changes in land use require change to the Land Use Map of Waianae Sustainable Communities Plan and amend to Urban District boundary by the State Land Commission.

2.6 Soils

The soil types within the project site are identified in the U.S. Department of Agriculture, Soil Conservation Service, Soil Survey. The soil types are listed below and depicted on Figure 3 – Soils Map.

Lualualei extremely stony clay (LPE)
Lualualei clay (LuB)
Rock land (rRK)
Pulehu very stony clay loam (PvC)
Lualualei stony clay (LvA)

III. DRAINAGE

3.1 Watershed Hydrology

The proposed development is situated within a 3,178-acre watershed in southwestern Oahu. Located on the leeward side of the island, the climate is warm and relatively dry with an annual average of 26 inches of rainfall across the watershed. Originating in the Waianae mountain ridge at the 3,098 feet elevation of Palikea, the watershed slopes westerly towards its lower bound at Ulehawa Beach Park a distance of over 4.5 miles.
Land use in the watershed is primarily undeveloped, the lower valley is characterized by a mix of residential and commercial area along Farrington Highway. The upper valley is occupied by the Naval Magazine – Lualualei. The western area is dominated by numerous agricultural lots and lower Lualualei Road corridor has an industrial character including landfill and a waste processing facility.

3.2 Drainage Criteria/Standards

The City and County of Honolulu Drainage Standards (Drainage Standards) will apply to this development. Rainfall intensity Plate Maps from Drainage Standards were used to calculate rainfall intensities. These intensities were then used to estimate peak flows for a 10-year, 50-year and 100-year period event.

The rational Method was used to calculate peak flows for the 10-year and 50-year event, based on a 1-hour rainfall duration with rainfall intensities of 1.8 inches/hour and 2.7 inches/hour, respectively (as per Plate 1 and 2 of the Drainage Standards). Using these 1-hour intensities, a correction factor was applied (as per Plate 4 of Drainage Standards) to estimate peak intensities for varying time of concentrations as summarized in Table 1.

TABLE 1
RAINFALL INTENSITY FOR VARIOUS DURATIONS

Time of Concentration (min)	Correction Factor	Intensity (inches/hour)	
		10-Year	50-year
5	2.8	5.0	7.6
10	2.35	4.2	6.4
15	1.9	3.4	5.1
30	1.45	2.6	3.9
60	1.0	1.8	2.7

Peak flow estimates with tributary area greater than 100 acres, were developed using Plate 6 from Drainage Standards.

In this report, the peak flow estimate using Plate 6 are referred to as the "100-year" event. Table 2 below summarizes the peak discharge versus area relationship obtained from Plat 6, with the proposed site being located in the Group C area.

TABLE 2
"100-YEAR" PEAK DISCHARGE VS. AREA RELATIONSHIP
(FOR AREAS LARGER THAN 100 ACRES)

Area (acres)	"100-year" Peak Discharge (cfs)
100	500
200	825
400	1,400
600	1,850
800	2,250
1,000	2,700
1,500	3,600
2,000	4,500

Time of concentration was estimated for a subcatchment, based on the overland slope and length; as well as Plates 3 and 5 in the Drainage Standards.

3.3 Existing Conditions

The watershed originates above the proposed development site and runoff from offsite area is conveyed through the development via the gulchs and overland flow. Runoff from the site and upstream offsite regions is conveyed across Lualualei Road through 4 culverts, eventually draining on to Ulehawa stream. The existing Ulehawa Stream pass through north-east tip of the project site. The drainage basin for Ulehawa Stream covers over 1,000 acres and that the Q_{100} is about 2,800 cfs.

The watershed was divided into 3 subcatchment areas in an effort to determine the peak discharge using the Drainage Standards. Figure 4 illustrates the pre-development subcatchments' boundaries and corresponding drainage area ID's. Runoff peak flow estimates were developed for each subcatchment areas for the 100-year recurrence events. The peak flow estimates are summarized in Table 3.

TABLE 3
PRE-DEVELOPMENT PEAK FLOW

Tributary Area ID	Area (acres)	100-year Flow (cfs)[1]
A	1,084	2,800
B-1	370	1,350
B-2	236	840
C	1,488	3,600
Total	3,178	8,590

1. "100-year"flows were determined using Plate 6 from Drainage Standards.

3.4 Modifications After Development

Development will impact the hydrology of the watershed as sections of undeveloped areas and land will be replaced with impervious surfaces (roads, building, parking, etc.) and the vegetative surface cover will be altered. The corresponding impact will result in higher runoff volumes and peak flows. Since large areas in the upper watershed will remain undeveloped, the impact on peak flows downstream of the site should not be significant.

Building setback encompassing Ulehawa Stream will be delineated and established. Setback distance will be determined from the inundated areas impacted from Ulehawa Stream runoff volume.

The construction of new roadways and industrial subdivision transecting across the hillside, however, the existing drainage patterns and subcatchment areas will likely be remained. Figure 5 illustrates the post-development subcatchment area for B-2 and drainage node ID's with proposed road network and lot layout superimposed. The estimated 10-year, 50-year and 100-year peak flows through the development are summarized below in Table 4.

TABLE 4
POST-DEVELOPMENT PEAK FLOWS

Area ID	Tributary Area (acres)	10-year Flow (cfs)	50-year Flow (cfs)	100-year Flow (cfs)
A	1084			2,800
B-1	370			1,350
B-2-1	52	72	90	
B-2-2	88	121	152	
B-2-3	52	135	169	
B-2-4	44	115	143	
C	1,488			3,600
Total	3,178			

3.5 Impacts and Mitigation Measures

Retention (or detention) facilities are typically constructed to retain increases in storm drainage runoff that occurs as a result of development. These facilities include: open basins, detention ponds, underground storage tanks and lakes. Drainage improvements in approximately 100 feet wide strip of land mauka of the industrial lots will be designed to accommodate peak runoff from the hillside. It is intended that the strip of land serve as detention facilities, dampening the peak runoff generated from hillside. By incorporating these improvements into industrial park design, the discharge of peak storm runoff from the project site is not expected to increase from the existing conditions.

3.6 Stormwater Quality

The project will be meet the City and County of Honolulu stormwater quality requirements as outlined in the Rules Relating to Storm Drainage Standards, dated January 2000.

During the more detailed design of the infrastructures to service the site, engineer will work with the City and County of Honolulu to determine the necessary water quality standards and which BMP's would be most effective for the project. The objectives of the water quality BMP's would be to mitigate the impact of pollutants (sediment, grit, oil, heavy metals) that enter the drainage system from the frequent, smaller rainfall. Plants and landscaping can be incorporated into the design to absorb particles and filter heavy metals. Additional water quality BMP's includes construction of infiltration swales alongside the roadway. These swales collect runoff, filter particles and provide infiltration to recharge the groundwater.

3.7 Off-Site Improvements

Runoff from the proposed development will be conveyed across Lualualei Road through the existing culverts. On the northern side of Lualualei Road, runoff flow through Ulehawa Stream. Capacity of the culverts across Lualualei Road will be examined during the preliminary design stage to assess whether improvements are required to convey peak flows from the project site.

IV. GRADING AND SOIL EROSION

4.1 Grading

The grading concept for lots will be to provide relatively level lot. Total earthwork quantities of cut and fill for the development is anticipated to be approximately 450,000 cu. yds. An effort to balance earthwork quantities is expected to minimize the cost of purchasing offsite borrow material and disposing excess excavated material at an offsite location. Grading operations will be in conformance with the applicable ordinances of the City and County of Honolulu. Soils investigations will be performed as the project proceeds. The project soils engineers will recommend mitigation measures as roadway and lot locations are further defined.

4.2 Site Characteristics

The project site is divided into two subareas for the purpose of calculating soil erosion potential (see Figure 6).These subareas represent sites within the project area that vary in soil erosion potential characteristics such as terrain and/or drainage network.

Subarea A, a part of the Ulehawa Stream drainage basin, is directly abutting the Lualualei Road and covering the flatter portion of the project site. The subarea occupies approximately 96 acres and is bounded north by Lualualei Naval Ammunition Depot, south by the ridge line of Puu Haleakala and west by the Lualualei Road and east by an approximately 190 foot contour. The entire area of subarea A will be graded for industrial park development.

Subarea B is located south of subarea A and is bounded on south and east by ridge line, and north by 190 foot contour and occupies approximately 140 acres. The subarea is currently a medium-dense and rocky outcropping becoming numerous with slopes ranging 25 to 60 percent. The development is not planned for this subarea and will remain for preservation.

4.3 Calculation of Soil Erosion Potential

The U.S. Department of Agriculture, Soil Conservation Service, uses the Universal Soil Loss Equation (USLE) to estimate long-term average annual soil losses from sheet and rill erosion. It is used to estimate erosion on forest land, farm fields, construction/development sites, and other areas. Soil losses can be estimated for present conditions or for a future condition. The soil loss equation is –

A = RKLSCP

where:
- A = soil loss (tons per acre per year)
- R = rainfall factor
- K = soil erodability factor
- L = slope length factor
- S = slope gradient factor
- C = cover and management factor
- P = erosion control practice factor

Based on the U.S. Soil Conservation Service (SCS) Erosion and Sediment Control Guide for Hawaii, the rainfall factor (R) is 220. A soil readability factor (K) was selected for each subarea after evaluating the U.S. Department of Agricultural Soil Survey and the City and County of Honolulu Soil Erosion Standards and Guidelines. The K values for the site are based on a weighted average of all K values for soil types in each subarea.

The cover and management factor (C) is also based on a weighted average for C values within each subarea and will be recalculated accordingly after development. Both R and K factors will remain the same for the site before and after the proposed industrial park is constructed.
The slope length factor (L) and slope gradient factor (S) are combined into a LS factor for calculations. This factor also remains constant before and after development. However, each subarea will have different factors to reflect the differences in topography.

4.4 Existing Soils Erosion Potential

The existing soil erosion potential for the site can be estimated by the USLE using the following parameters:

	SUBAREA	
USLE Parameters	**A**	**B**
R	220	220

K	0.20	0.28
LS	6.3	56
C	0.015	0.011
P	1	1

The existing soil erosion potential for each subarea is listed below.

TABLE 4
Soil Erosion Potential (Existing Conditions)

Subarea	Acres	Tons/Acre/Yr	Tons/Yr
A	96	4.2	403
B	140	37.9	5,306
Total	236		5,706

Thus, for the entire project, the existing erosion potential is 5,709 tons/year.

4.5 Soil Erosion Potential After Development

The long-term change in soil erosion potential can be estimated by the USLE for the new land use at the site. Appropriate USLE factors for the site after industrial park development are –

	SUBAREA	
USLE Parameters	**A**	**B**
R	220	220
K	0.20	0.28
LS	2.82	56
C	0.005	0.011
P	1	1

The C factor for subareas have decreased to account for industrial park development.

TABLE 5
Soil Erosion Potential (Developed Conditions)

Subarea	Acres	Tons/Acre/Yr	Tons/Yr
A	96	0.62	60
B	140	37.9	5,306
Total	236		5,366

Thus, for the entire project, the estimated soil erosion potential after development is 5,366 tons/year.

4.6 Impacts and Mitigation Measures

4.6.a Long-Term Impacts

Based on the USLE, soil erosion potential at the project site should decrease after development of the industrial park. The erosion potential of subarea A is estimated to decrease by 3.58 tons/acre/year (343 tons/year), or 85 percent. Thus, sediment transport to the Ulehawa Stream should decrease after development.

TABLE 6
Summary of Soil Erosion Potential

Subarea	Existing Conditions (ton/yr)	Developed Conditions (ton/yr)	Percent Decrease (%)
A	403	60	85
B	5,306	5,306	0
Total	5,709	5,366	6.0

4.6.b Short-Term Impacts and Mitigation Measures

Construction of the industrial park will involve land disturbing activities that result in soil erosion. These land disturbing activities include removal of existing vegetation (clearing and grubbing) and leveling, removing, and replacing soil. Short-term impacts due to construction are estimated to last 18 months.

The USLE can be used to estimate soil erosion potential based on these short-term construction impacts. For purposes of calculation, it is assumed that the areas will be exposed for a period of one year (January through December). The rainfall factor, R, is revised to represent the fraction of annual rainfall falling within the grading period. The CP factor is 0.7 for bare soil without mitigation measures.

Thus, in the short term 36,861 tons of soil erosion are calculated for a one-year period. Of this amount, approximately 10 percent (3,690 tons) will impact Ulehawa Stream.

Mitigation measures can be implemented to reduce short-term soil erosion. For example, limiting grading to not more than 15 consecutive acres at a time and installation of a

sedimentation basin at least 12,000 square feet in size at the onsite of grading will reduce estimated soil erosion potential for the site by 89 percent to 29 tons. Thus, the estimated impact on the Ulehawa Stream is reduced by 2.5 tons/acres/year (235 tons).

Additional control measures could be taken to lessen construction impacts even further. These are –

1. Minimize time of construction.
2. Retain existing ground cover until latest date before construction.
3. Early construction of drainage control features.
4. Use of temporary area sprinklers in nonactive construction areas when ground cover is removed.
5. Station water truck on site during construction period to provide for immediate sprinkling, as needed, in active construction zones (weekends and holidays included).
6. Use temporary berms and cutoff ditches, where needed, for control of erosion.
7. Thorough watering of graded areas after construction activity has ceased for the day and on weekends.
8. Sod or plant all cut and fill slopes immediately after grading work has been completed.
9. Implementing Sedimentation basins.
10. Use of slope stabilization materials where needed.

Grading and Erosion Control Plans will be prepared in compliance with Chapter 14, Revised Ordinances of Honolulu. Further, the contractor will be required to perform all grading and stockpiling operation in conformance with the applicable provisions of Chapter 54 (Water Quality Standards) and Chapter 55 (Water Pollution Control) of Title 11 Administrative Rules of the State Department of Health.

V. ROADS

5.1 Existing Conditions

The project site is located in the Lualualei Valley, north of Farrington Highway and south of U.S. Naval Magazine Lualualei. The property is approximately 2.2 miles north of Lualualei Road and Farrington Highway intersection. Current formal access to the property is via Hakimo Road. An easement from the Navy links the property across Lualualei Road. The City and County of Honolulu formally declined to acquire Lualualei Road from the Navy. The current status is that the Navy has granted Tropic Land, LLC access through Lualualei Road as a direct access route from Farrington Highway. Tropic Land, LLC is currently working with the Navy (NAVFAC) to obtain for a definitive long term agreement.

5.2 Modifications After Development

A Traffic Impact Assessment Report (TIAR) will be prepared for this project. The TIAR will outline the requirements and impacts for access to the development and improvements to supporting infrastructure.
On site roadways will consist of a collector road serving local roadway within the industrial park. A collector road will have a single secured connection to the Lualualei Road. It is also planned to provide secondary access for fire and emergency purposes.

5.3 Impacts and Mitigation Measures

Impact and mitigation will be identified in the TIAR. The project will generate additional traffic on the roadways in the vicinity of the project site. The TIAR will indicate impact to the existing traffic along Lualualei Road and Farrington Highway, also will address the roadway improvements if necessary.

VI. WATER

6.1 Existing Condition

The property is vacant and covered with a weedy mixture of grasses and haole koa shrubs, and isolated kiawe trees. About 15 acres within the lower level portions of the site were cultivated for vegetable crops until early 1988. Currently, the property is not cultivated and there are no existing residences.

The Board of Water Supply's (BWS) Puu-O-Hulu systems services the properties along Hakimo Road. The storage facility located closest to the project site is Puu-O-Hulu Reservoir, with a 1.5 MG capacity and spillway elevation at 241.75 feet. The reservoir services through a 20-inch transmission line and 8-inch distribution main along Hakimo Road (see Figure 7 – Existing Water Transmission and Storage Map)). Currently, the Lualualei Booster Station has limited capacity of 25,000 gallon per day (GPD). The existing water system can only provide a flow of approximately 2,200 gallons per minute (gpm) to a fire hydrant at the intersection of Paakea road and Hakimo Road.

6.2 Projected Demand

TABLE 7
ESTIMATED POTABLE WATER USE DEMAND

Land Use	No. of Lot	Average No. of Employees	(gpd/capita)	Other Usage (gpd/lot)	Average Daily Demand (gpd)

Industrial Subdivision	41	10	25	300	22,550

Based on the development information in the above Table 7, 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 and a Peak Hour Demand of 67,650 GPD.

Since the Nanakuli Community Baseyard will be developed as a condominium, its CC&R (Covenants, Conditions and Restrictions) will control the type of the businesses and limit the water use demand for each lot and the total demand for the project. The Association of Owners will implement and enforce the CC&R.

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

6.3 Proposed Potable Water System

The proposed potable water system will be connected to the existing 20-inch BWS water main at the intersection of Paakea Road and Hakimo Road. A new 16-inch transmission line with new service road will be located along Paakea Road extension and cross the Lualualei Road and enter into the project site. BWS indicated that the installation of a new 16-inch watermain will provide aequate fire flow to the proposed industrial development. Design and construction of the potable water distribution system will be in accordance with the Board of Water Supply (BWS) Standards and the easements and the systems will be dedicated to the BWS. Refer to Figure 8 for the proposed potable water transmission and distribution system.

6.4 Potential Impact and Mitigation Measures

Nanakuli Community Baseyard will impact the Waianae regional water system by increasing the demand for potable water. Introducing a dual water system; using non-portable water for irrigation, reduce the water demand. In addition, proposed project will upgrade the fire protection system for the vicinity. The development schedule for Nanakuli Community Baseyard will be governed by implementation of the BWS improvements in the Waianae region and will be coordinated with the Board of Water Supply.

VII. WASTEWATER

7.1 Existing Conditions

To date, there are no existing wastewater facilities within the project site. The adjoining residential areas between the project site and the junction of Waiolu Street and Hakimo Road are mainly served by the cesspools. Wastewater disposal by the cesspools is a major issue within the Waianae Sustainable Communities Plan areas. The City and County, Department of Environmental Services has no plans to serve the Agricultural District surrounding the proposed project areas.

The municipal sewer main nearest to the project site is 8-inch gravity sewer at Mohihi Street, some 2 mile south of the project site along Lualualei Road.

7.2 Projected Wastewater Flows

Wastewater will be generated from the various facilities within the proposed Nanakuli Community Baseyard at an estimated average rate of 22,550 GPD or 0.023MGD 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, its CC&R will control the type of the businesses and limit the wastewater discharge for each lot and total discharge from the project. The Association of Owners will implement and enforce the CC&R.

7.3 Proposed Wastewater Infrastructures

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

7.3.a Collection System

The proposed on-site wastewater collection system for the project is illustrated on Figure 10. The collection system will consist of gravity sewers, and sewer easements. Preliminary size sizes range from 8” to 10” mains. Design and construction of the system will be in accordance with City and County Standards. The on-site wastewater collection system will be privately operated and maintained.

7.3.b Wastewater Treatment Unit

The proposed location of wastewater treatment unit is shown in Figure 10. The cyclic biological treatment (CBT) is a single basin reactor with continuous activated sludge system. The treatment unit processes all the steps of flow equalization, biological oxidation, nitrification, denitrification and solids-liquids separation in the same basin. Thus, extensive piping and multiple task for those processes are not required. The clock/microprocessor automatically coordinates all the equipment and phases of each cycle.

In addition to the CBT unit, filtration and chlorination units, storage buildings, pumps, piping, and appurtenances will be required. A total fenced area of approximately 10,000 square feet should be sufficient for the wastewater treatment facility.

7.3.c Effluent Disposal

The treated wastewater effluent will be chlorinated, disinfected and pumped to a non-potable water irrigation system. Effluent may be diluted with potable water for irrigation purpose. Ultimately 100 percent of the estimated irrigation water requirement can be supplied by the treated effluent.

7.4 Impacts and Mitigation Measures

Irrigation of the project site with treated effluent will reduce the demand for irrigation water from potable sources.

With the proper operation, objectionable odors will not be generated from the WWTP. Pumps and blowers normally associated with WWTP will be enclosed within a control building to reduce the impact of operating noises.

Placement of the WWTP below ground level and landscaping the perimeter fence, the area will reduce the visual impact on the general public passing on Lualualei Road.

VIII. NON-POTABLE WATER

8.1 Existing Condition

The State of Hawaii Department of Health Wastewater Branch is the jurisdictional agency for the

application of recycled water under HAR 11-62-27. According to the Guidelines for Treatment and Use of Recycled Water (hereinafter referred to as Guidelines), allowable R-1 irrigation uses include the following areas: golf courses, parks, playgrounds, schoolyards, athletic fields, residential property where managed be an irrigation supervisor, and roadside and medians. There is not existing R- 1 distribution system or non-potable water tank located within the vicinity of the project site. BWS does not have any capital improvement project in the near future to develop the R-1 distribution system.

8.2 Proposed Non-Potable Water System

Ultimately 100 percent of the estimated irrigation water demand can be supplied by the treated effluent from wastewater treatment unit. A proposed pump system and non-potable water distribution main will dispenses non-potable water for irrigation (see Figure 9). Pipes and pump shall be sized to accommodate maximum daily irrigation flow with the residual pressure of 20 psi at the critical location.

8.3 Projected Demand

The potential non-potable water uses for this project include irrigation of the buffer area, commercial landscape, and roadway medians. This non-potable water demand is estimated to be 0.023 MGD. See Table 8 below. To accommodate the irrigation flow requirement for duration of one day the minimum irrigation water storage tank will be 0.03 MG.

TABLE 8
ESTIMATED NON-POTABLE WATER USE DEMAND

Land Use	Acre	gpd/acre	Daily Demand (gpd)
Landscaped Setback Area	3.5	1,440	5,040
Roadway Median/Commercial Landscape Area	5.0	1,440	7,200
Rock Fall Hazard Mitigation Area	7.3	1,440	10,512
		TOTAL	22,750
		CALL	0.023 MGD

8.4 Impacts and Mitigation Measures

Positive impacts resulting from the proposed non-potable water system include: (1) using non-potable sources for irrigation and landscaping.

A water reuse plan will be developed since effluent water from the wastewater treatment plant will be used for irrigation. This plan would include additional information about the irrigation,

management, public education, and other required information per the Recycled Water Guidelines.

IX. SOLID WASTE

9.1 Existing Condition

Currently, the site is undeveloped and does not generate solid waste. A refuse service does not presently serve the project site.

9.2 Projected Solid Waste Generation and Characteristics

The proposed project will generate solid waste during construction and after development. The construction wastes will primarily be made up of vegetation and debris resulting from clearing the site prior to grading. Most of these wastes will be combustible. The typical range of per capita solid waste generated from occupancy source is approximately 2.0 to 5.0 pounds per capita per day (lb/capita/day).

It is anticipated that at full development the project site induce a de factor population of 410, who will generate approximately 2.0 pounds of refuse per capita, for a total 820 pound of solid waste per day. The solid waste composition is expected to be typical for a municipal source.

9.3 Modifications After Development

It is anticipated that refuse generated by the proposed Nanakuli Community Baseyard development will be collected by a private refuse collection company. It is estimated that refuse collection from the site will necessitate 1 truck trip per week. The number of truck trip is based on a manually loaded 20 cubic yard compactor truck capable of achieving a typical compaction density of 500 pounds per cubic yard.

9.4 Impacts and Mitigation Measures

Proposed development will be a new solid waste generator. Disposal of construction wastes due to clearing and grubbing of the site will be a short term impact. The contractor will be required to remove all debris from the project site to mitigate the environmental impact.

The City and County is currently operating a landfill site in Waimanalo Gulch and the H-Power waste energy recovery facility on the Campbell Industrial Park. The Land Use Commission has partially approved the City's request and has extend the life of the Waimanalo Gulch landfill from current 2008 permit expiration to 2011 (18 months). The City is currently exploring

alternative means of handling solid waste since it is an ongoing island wide concern. Other programs being implemented are recycling and reuse of green waste.

X. ELECTRIC AND TELEPHONE SERVICES

10.1 Existing Conditions

There is an existing wood joint pole line along the Honolulu side of the Lualualei Road right-of-way that abuts the project site. All the poles contain HECO 3 ph, 11.5 kV, HTCOM, and OTWC lines. Power to this primary line is supplied by the Mikilua Substation feeder No. 3 on Paakea Road which has available capacity to serve the subject expansion.

10.2 Modification After Development

It is anticipated that Hawaiian Electric Company, (HECO), Hawaiian Telcom (HTCOM), and Oceanic Time Warner Cable (OTWC), 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 existing substation at Mikilua Substation. The project site will not require its own substation.

10.3 Impacts and Mitigating Measures

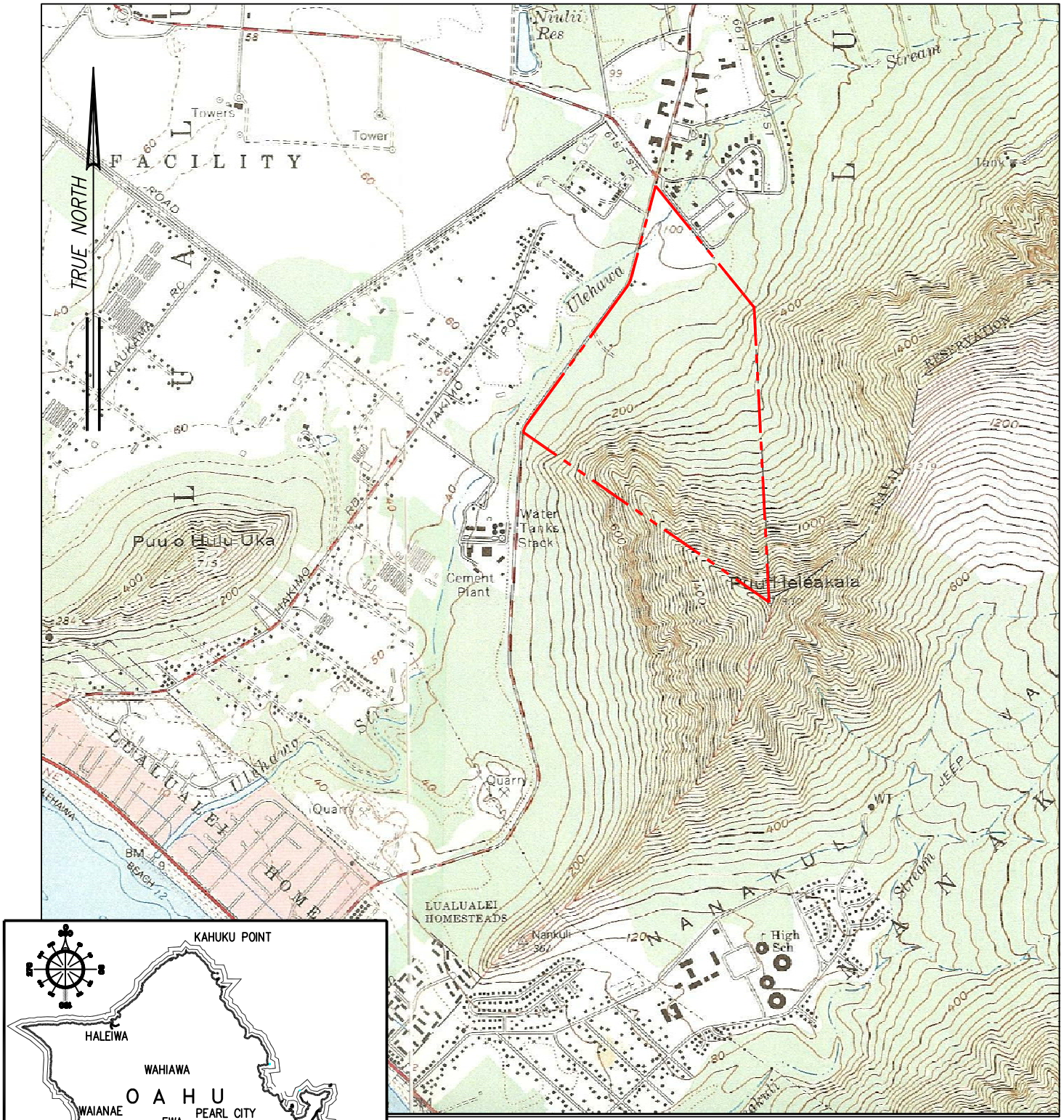
The proposed Nanakuli Community Baseyard will place additional demands on the utilities. The developer will work closely with HECO for timely design and construction of the utility infrastructure and delivery of required services.

No other mitigating measures are necessary since HECO has indicated that adequate service can be provided. However, the project will promote to use of alternative, renewable energy source such as the photovoltaic to reduce energy demand from HECO.

Utility lines will be placed underground to mitigate any visual impacts.

The developer will maintain contact with HTCOM and OTWC to assure necessary service levels.

FIGURES



GRAPHIC SCALES 1:24000 (APPROX.)

1 MILE 1/2 0 1

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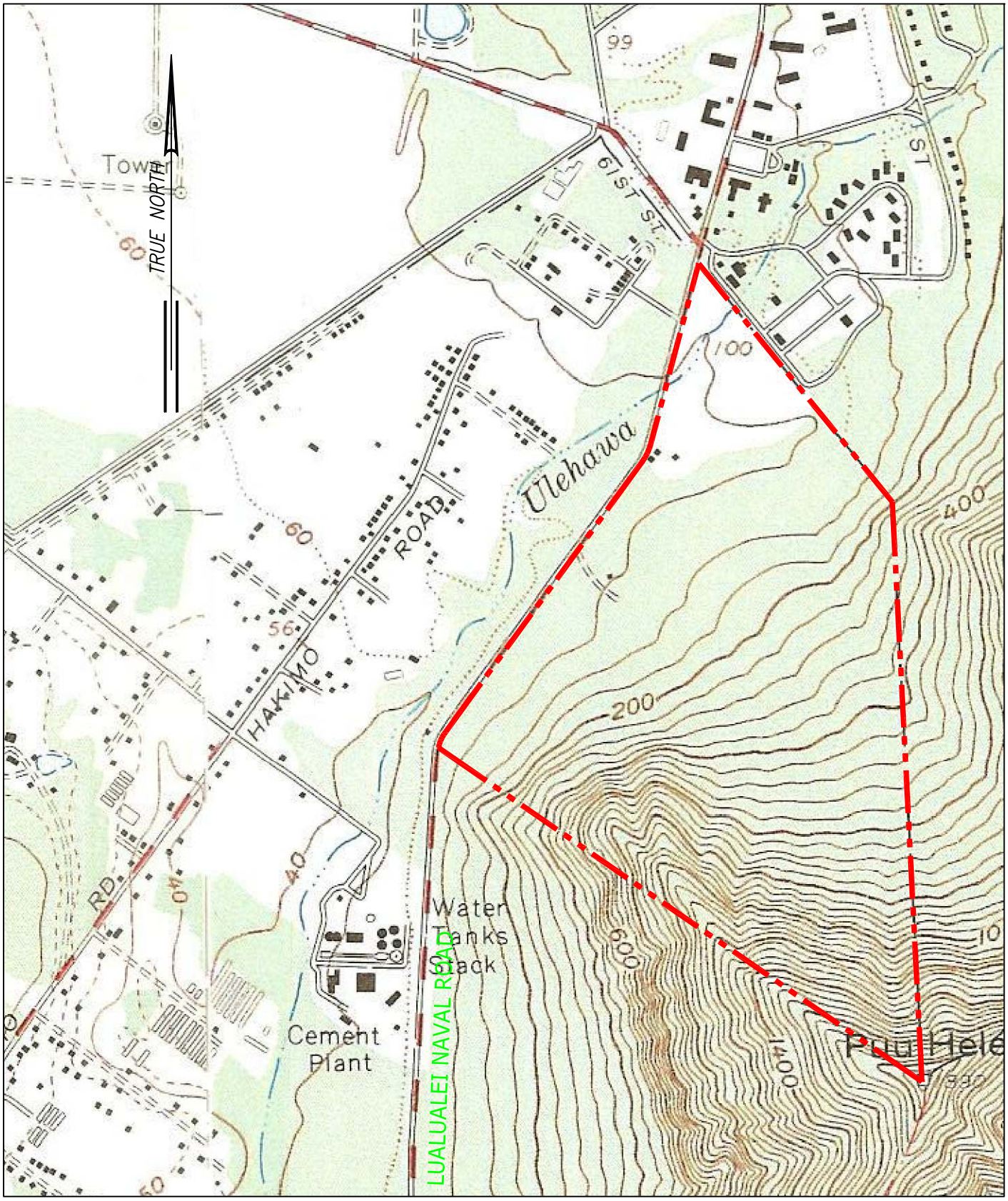
FIGURE 1

LOCATION MAP

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1:12000 (APPROX.)

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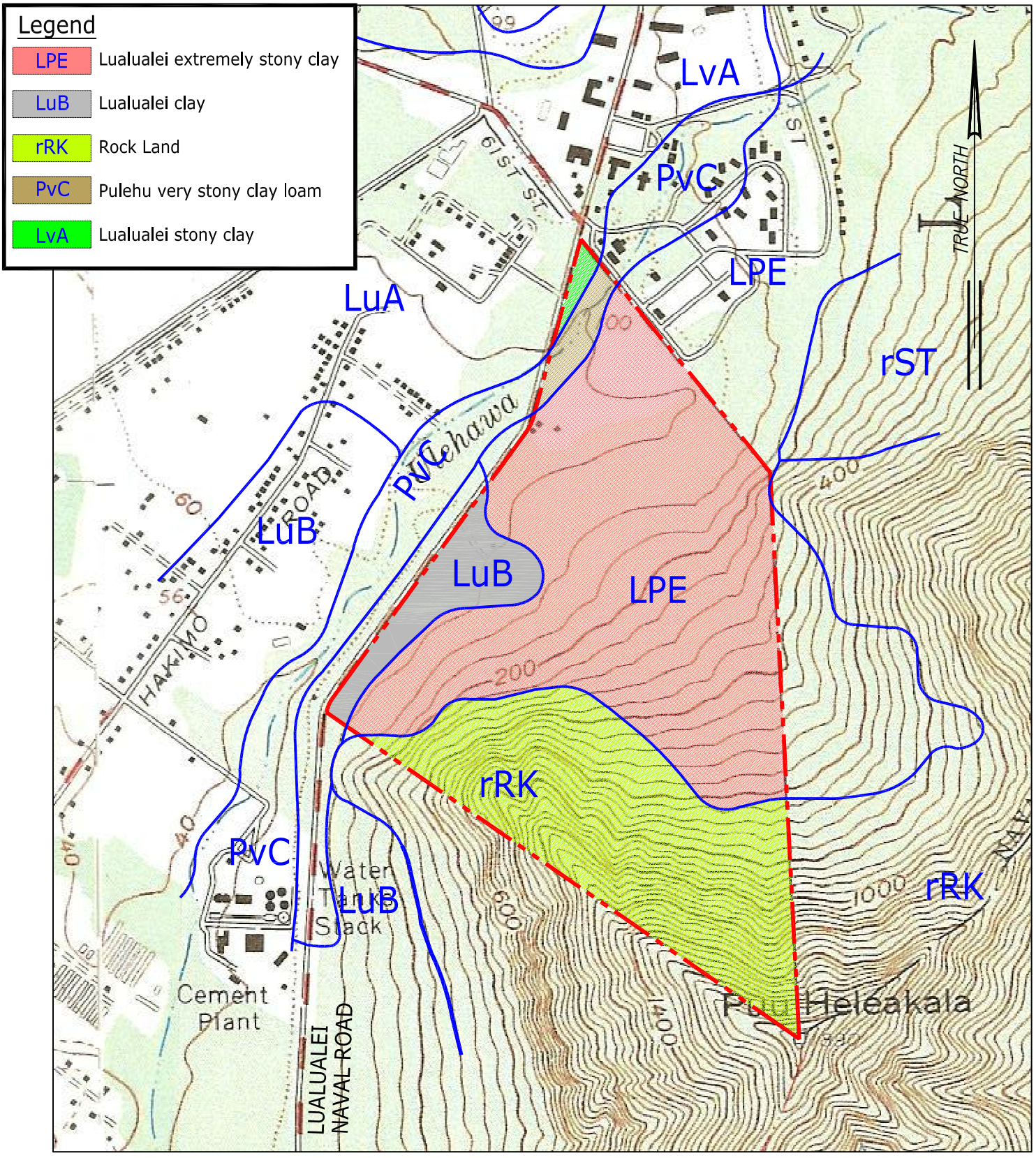
FIGURE 2

TOPOGRAPHIC MAP

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



Source: Soil Map, NRCS, September 19, 2006
The Background Digital Raster Graphics was published by U.S.G.S. on August 2003.

GRAPHIC SCALES 1:12000 (APPROX.)

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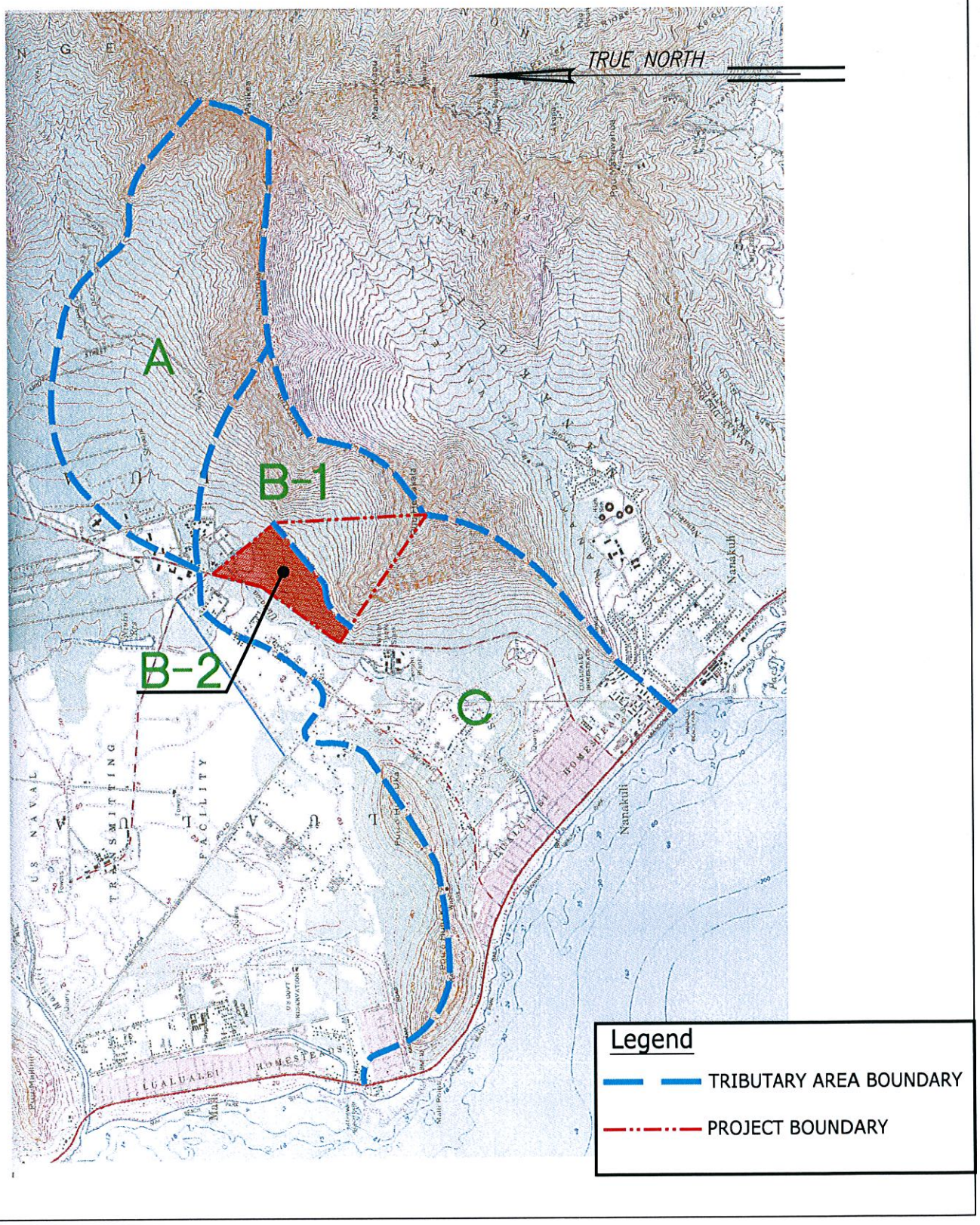
FIGURE 3

SOILS MAP

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1: 48000

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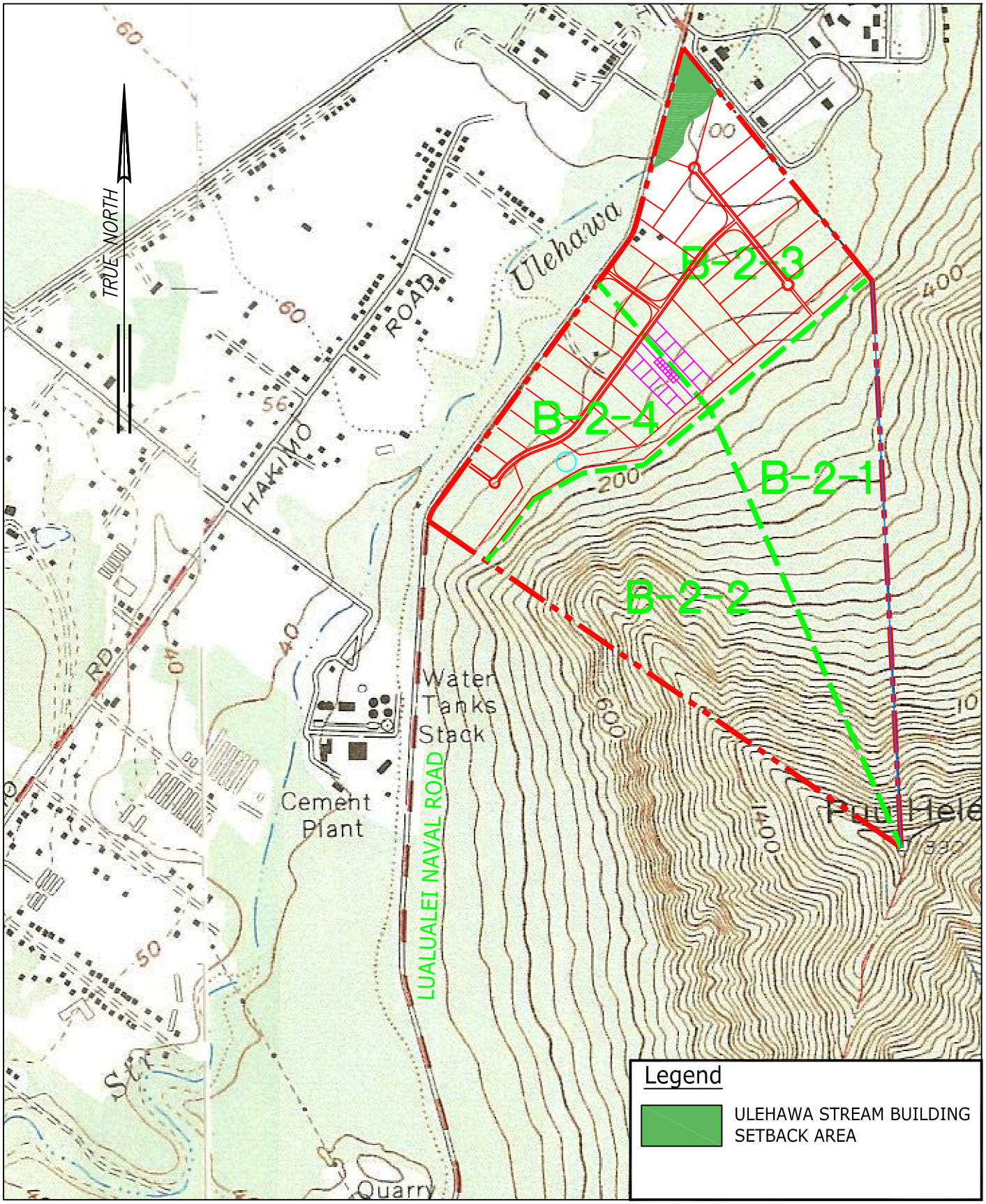
FIGURE 4

PRE-DEVELOPMENT CATCHMENT AREAS

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1:12000 (APPROX.)

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FIGURE 5

DEVELOPMENT CATCHMENT AREAS

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii

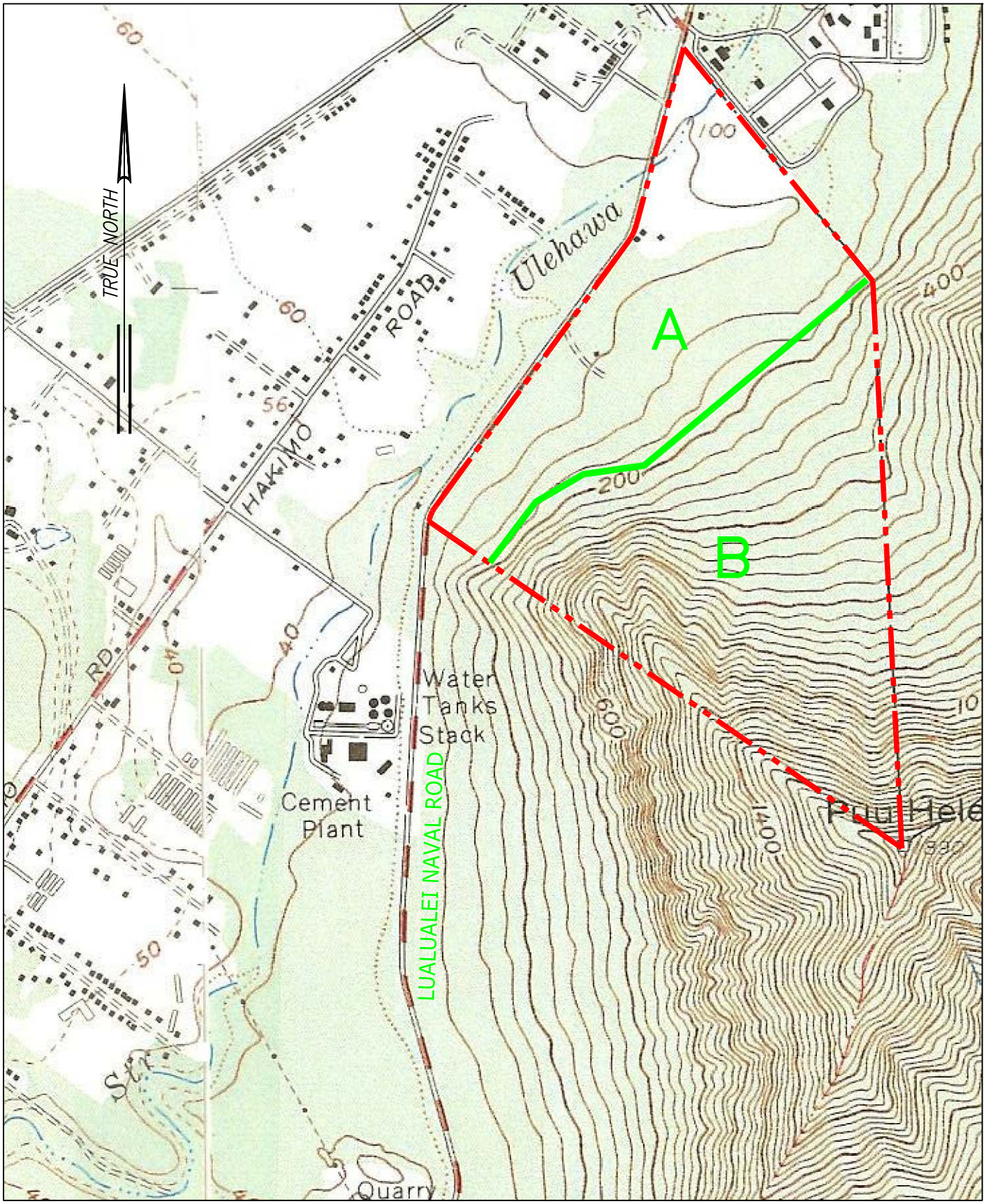

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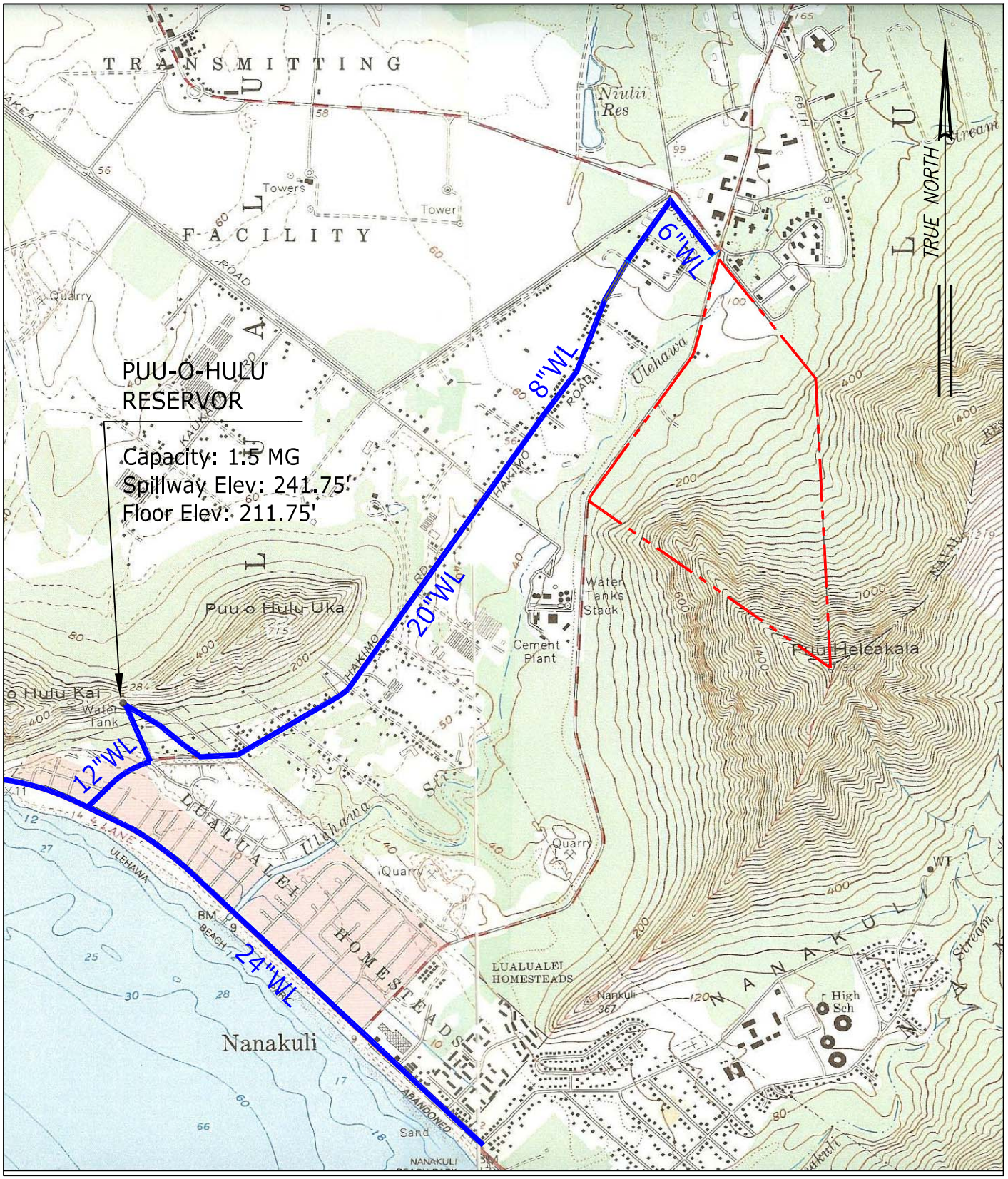
FIGURE 6

SUBAREAS FOR CALCULATION OF SOIL EROSION POTENTIAL

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1:24000

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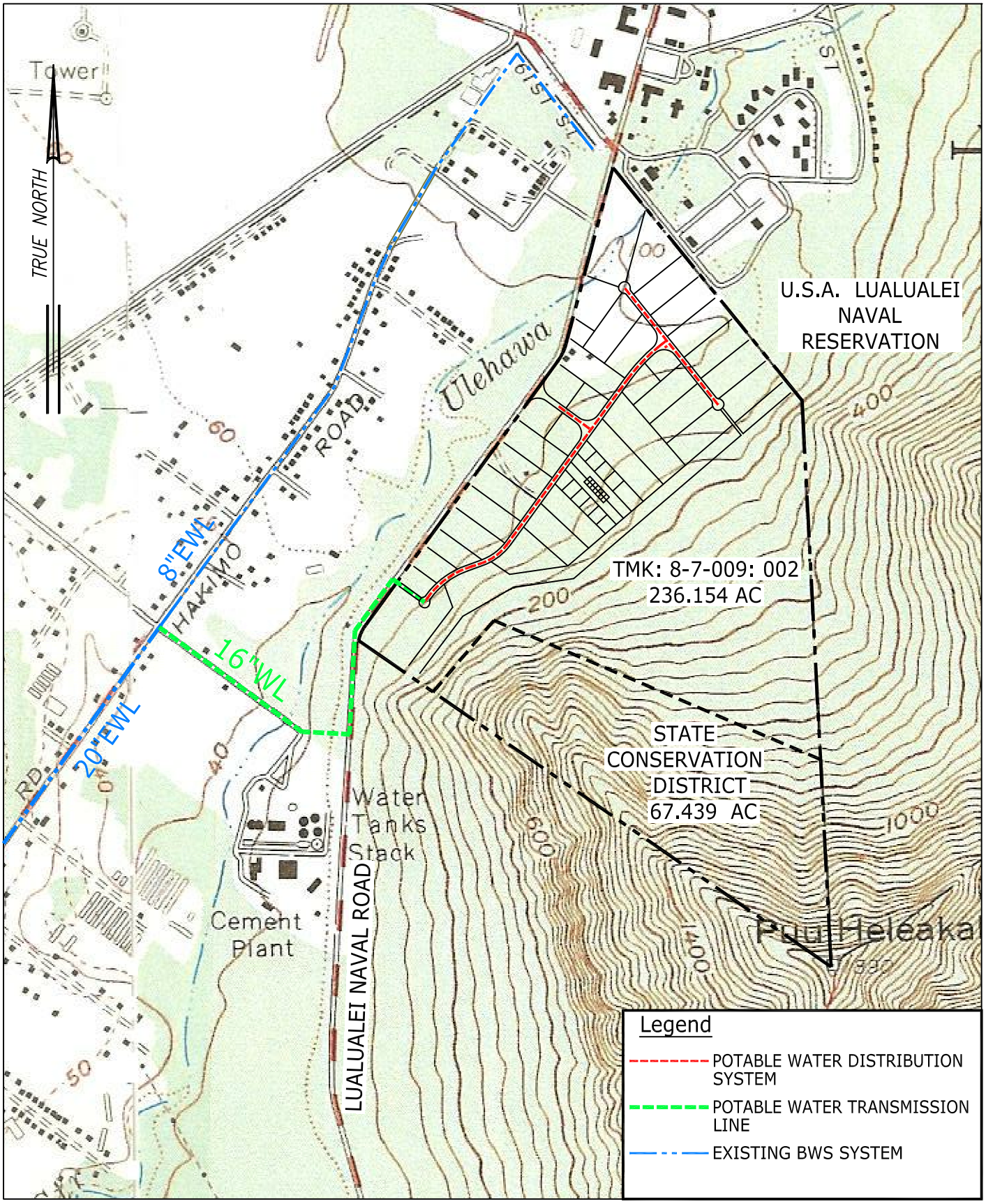
FIGURE 7

EXISTING WATER TRANSMISSION AND STORAGE MAP

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1:12000 (APPROX.)

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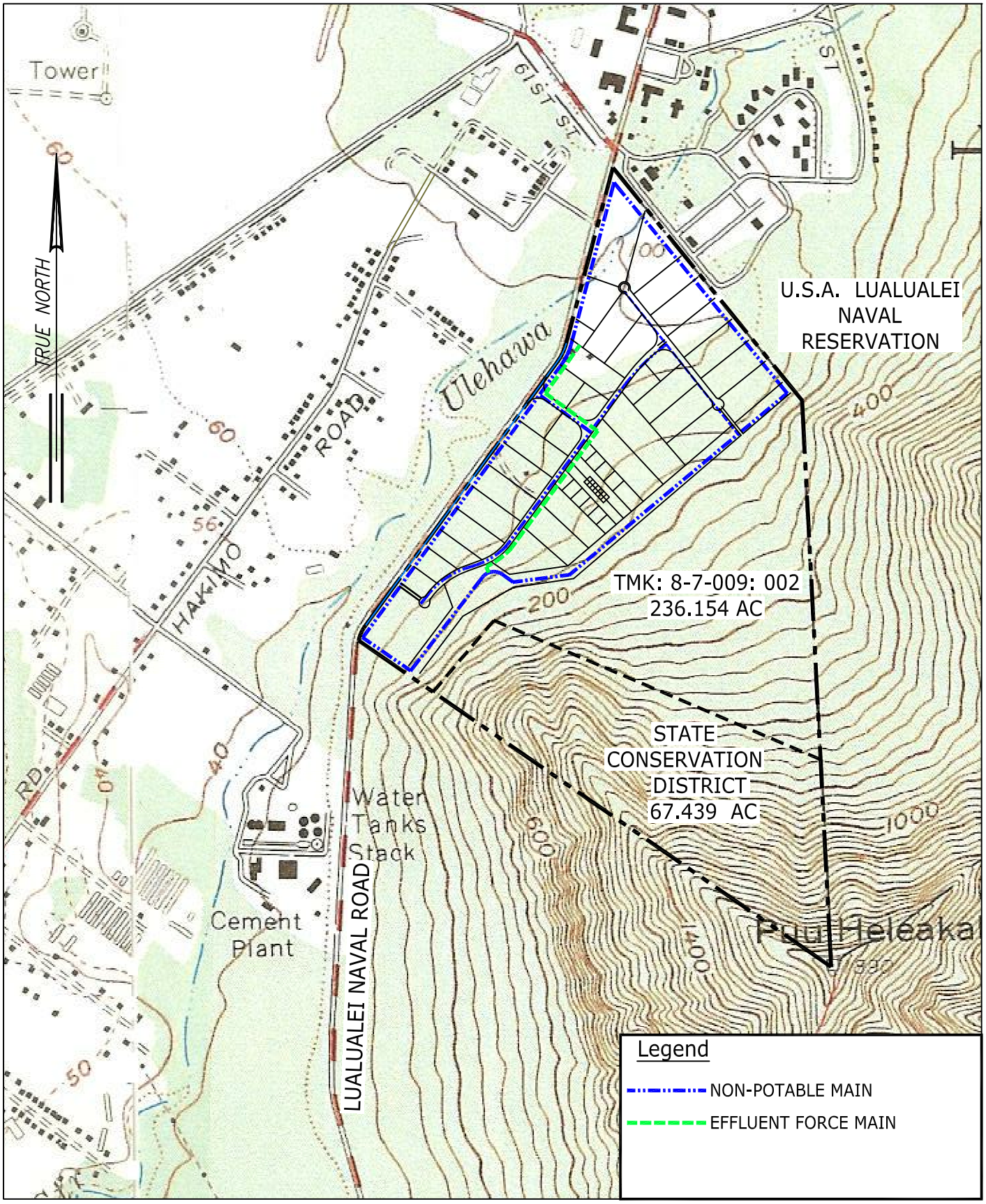
FIGURE 8

PROPOSED POTABLE WATER DISTRIBUTION SYSTEM

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1:12000 (APPROX.)

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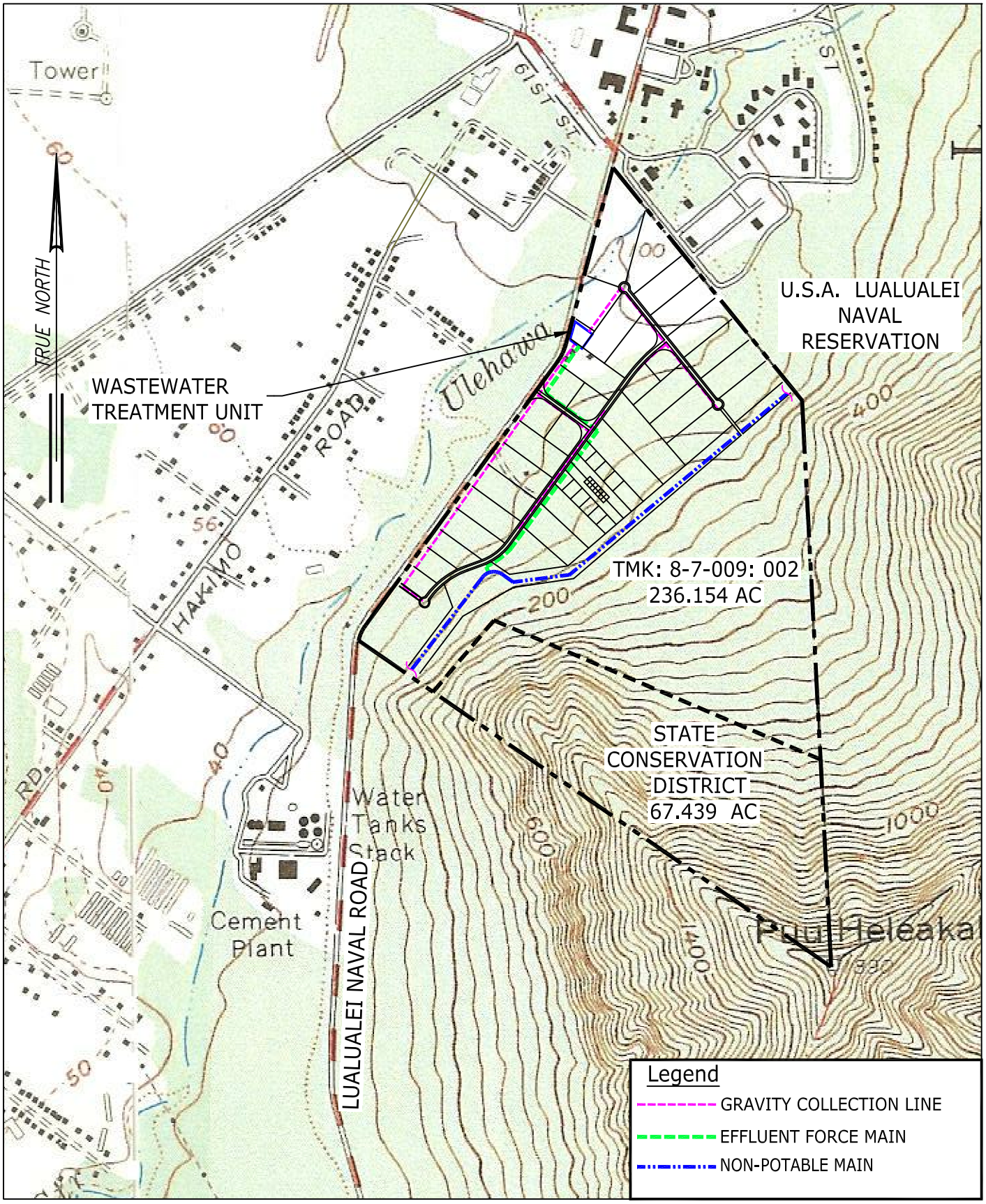
FIGURE 9

PROPOSED NON-POTABLE WATER INFRASTRUCTURES

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii



GRAPHIC SCALES 1:12000 (APPROX.)

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FIGURE 10

PROPOSED WASTEWATER INFRASTRUCTURES

Hida, Okamoto & Associates, Inc.
Consulting Engineers
Honolulu Hawaii

APPENDIX B

Market Analysis and Employment Forecast, Proposed Tropic Land LLC Industrial Park. Hastings, Conboy, Braig & Associates, Ltd., March 2008

Market Analysis and
Employment Forecast

PROPOSED TROPIC LAND LLC
INDUSTRIAL PARK

Located at
Lualualei, Waianae District,
Island of Oahu, State of Hawaii

As of March 2008

April 3, 2008

Ms. Nancy Nishikawa
Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, Hawaii 96814

Dear Ms. Nishikawa:

We have completed a market analysis and employment forecast for a proposed industrial park development located in Lualualei Valley, Waianae District, Island of Oahu, State of Hawaii. The proposed subject development is identified herein as the Proposed Tropic Land LLC Industrial Park. The effective date of our market analysis and employment forecast for the proposed subject development is March 31, 2008.

The subject property is located along the eastern side of Lualualei Naval Access Road, inland of Farrington Highway and south of the U.S. Navy Magazine Lualualei. The proposed subject development site encompasses a land area of approximately 96 acres and is identified on State of Hawaii Tax Maps as First Division, Tax Map Key 8-7-09, Parcel 2 (Portion).

The Proposed Tropic Land LLC Industrial Park is slated to be a 35-lot subdivision with an average lot size of two acres. Anticipated uses at the proposed development will consist of light industrial activities. It is our understanding the proposed industrial park will require a State Land Use district boundary amendment to Urban District and a City and County zoning change to I-1 in order to accommodate its future development.

Our analysis and conclusions regarding the Proposed Tropic Land LLC Industrial Park are set forth in the accompanying report. Based on our research and investigation, it is our opinion that the proposed subject development represents a significant potential benefit to the local community from an economic land use and future employment perspective.

We appreciate the opportunity to have undertaken this counseling assignment.

Sincerely,

HASTINGS, CONBOY, BRAIG
& ASSOCIATES, LTD.

Robert R. Braig, MAI, SRA
Executive Vice President

/7371

TABLE OF CONTENTS

I. INTRODUCTION AND EXECUTIVE SUMMARY

A. Introduction

Our firm, Hastings, Conboy, Braig & Associates, Ltd., has been contracted by Kimura International, Inc. to conduct a real estate counseling analysis of the Proposed Tropic Land LLC Industrial Park development located at Lualualei, Waianae District, Island of Oahu, State of Hawaii. The subject site encompasses a land area of approximately 96 acres and is identified on State of Hawaii Tax Maps as First Division, Tax Map Key 8-7-09, Parcel 2 (Portion).

The site of the proposed development is located along the eastern side of Lualualei Naval Access Road, approximately 1.5 miles inland of Farrington Highway. As contemplated, the proposed subject development will be a 35-lot, light industrial subdivision with an average subdivision lot size of two acres. The proposed project will be developed and marketed under a condominium form of fee simple ownership.

It is our understanding the Proposed Tropic Land LLC Industrial Park will require a number of land use entitlement approvals at various levels of local government. Necessary government approvals include, but are not limited to, a Sustainable Communities Plan (SCP) amendment, a State Land Use (SLU) district boundary amendment from Agricultural to Urban District, and a City and County zoning change to I-1, Limited Industrial District.

As part of the application processes relating to these desired governmental approvals, our firm has been contracted to prepare a market analysis, land use demand forecast, and manpower/employment forecast for the Proposed Tropic Land LLC Industrial Park. The effective date of this counseling analysis is March 31, 2008.

B. Executive Summary

A summary of some of the more pertinent characteristics and conclusions resulting from our research, investigation and market analysis of the Proposed Tropic Land LLC Industrial Park development at Lualualei is presented as follows.

- Tropic Land LLC proposes to develop an industrial park that would occupy approximately 96 acres on TMK 8-7-9: 02, on the east side of Lualualei Naval Access Road. The industrial park would consist of approximately 35 lots, averaging two acres each. The project will be structured under a condominium form of ownership with individual lots and common ownership of internal roads and infrastructure. The anticipated opening is approximately 18 months from receipt of government approvals. The preliminary cost of the light industrial park is estimated at $29 million.

- Among the references to industrial land use within Section 3.9 of the Waianae Sustainable Communities Plan is the following statement: "The projected growth in population may create a need for more support retail commercial and industrial acreage, although recent trends indicate a shifting of shopping habits away from local stores to the larger commercial centers in the Ewa District. Some local leaders have voiced the need for more local industrial parks."

- Our assignment was to prepare a market demand analysis and employment forecasts associated with the Proposed Tropic Land LCC Industrial Park development. The effective date of the analysis is March 31, 2008.

- Primary emphasis for this assignment was placed on the research and collection of current socioeconomic forecast data pertaining to the State of Hawaii and the City and County of Honolulu. Data sources at the State level, as reported by the State Department of Business Economic Development and Tourism (DBEDT), include: *Population and Economic Projections for the State of Hawaii to 2035; 2002 State Input-Output Study; and Report on Urban Lands in the State of Hawaii (2006)*. Data sources at the City and County level, as reported by the City and County Department of Planning and Permitting (DPP), include: *Year 2000 Community Profiles; Socioeconomic Projections 2000 - 2030 by Development Plan Area and Subarea; and Waianae Sustainable Communities Plan (July 2000)*.

- According to data compiled as of Year-End 2007 by Colliers Monroe Friedlander (Colliers), the total supply of existing industrial space on the Island of Oahu is estimated at approximately 36.4 million square feet of floor area within 1,668 buildings. The indicated overall vacancy rate within Oahu's industrial marketplace is three percent. An additional supply of approximately 750,000 square feet of industrial floor space would be the estimated requirement to effectuate a normal, equilibrium vacancy rate of five percent.

- Existing industrial development on Oahu is overwhelmingly concentrated within three designated Development Plan Areas, namely, the Primary Urban Center, Ewa, and Central Oahu. Based on the Colliers data, the combined inventory of industrial space within the remaining Development Plan Areas of East Honolulu, Koolaupoko, Koolauloa, North Shore, and Waianae totals less than 1.0 million square feet, or only 2.7 percent of the island-wide total.

- The subject property's regional setting and relevant surrounding market area is defined as the Waianae Development Plan Area. The Waianae Development Plan Area is characterized as an outlying, rural-agricultural district for the Island of Oahu. Almost one-fourth of the total land area within this Waianae market area is categorized as agricultural. Only about five percent of the total land area is categorized as urban, with most of the urban designated land devoted to single-family residential use.

- The Department of Planning and Permitting Socioeconomic Projections for the Waianae Development Plan Area forecast a steady and moderate growth in population for the area but a contrasting, no-growth/declining scenario regarding the future outlook for job opportunities in the area. The population forecast for Waianae increases from 44,656 in 2005 to 52,285 in 2030 while the job/employment forecast for Waianae fluctuates at a modest level from 7,253 in 2005 to 7,126 in 2030.

- There is a disparity in population and job distribution associated with the Waianae area. Although the Waianae Development Plan Area accounts for almost 5.0 percent of the total population count on the Island of Oahu, Waianae has less than 1.5 percent of Oahu's total island-wide job count. This disparity is even greater with respect to jobs within the traditional industrial sectors of employment (represented by the employment categories of Transportation, Communications, Utilities; Industrial; and Construction). For industrial sector jobs, Waianae barely accounts for 1.0 percent of Oahu's island-wide total.

- The available market data indicate the existence of a geographic disconnect between a growing resident population and potential industrial labor force residing within the Waianae market area and the scarcity of any discernable new industrial development and employment opportunities within the same market area. The Proposed Tropic Land LLC Industrial Park has the potential to alleviate or mitigate some of the effects of this ongoing disconnect between labor force and job market locations.

- The Department of Planning and Permitting Socioeconomic Projections industrial sector job forecast for Waianae indicates an anticipated downward trend marked by a dramatic decline in projected construction employment. Obviously, if this forecasted decline in industrial employment were proven to be accurate there would be no compelling requirement or need for any new industrial development within the Waianae market area.

- Rather than accepting the Department of Planning and Permitting assertion of a less than one percent capture rate of Oahu's total industrial sector jobs to the Waianae market area, we have substituted a proposed range of alternative, increased capture rates of 1.5 to 2.0 percent. An industrial employment capture rate of 1.5 percent results in a forecasted industrial sector employment increase for the Waianae area of roughly 50 percent, from 1,109 jobs in 2005 to 1,682 jobs in 2030. A 2.0 percent capture rate of Oahu's island-wide total results in a forecast that approximately doubles the amount of industrial sector jobs from 1,109 in 2005 to 2,242 in 2030. An approximate mid-range capture rate of 1.7 percent results in a forecasted employment increase from 1,109 in 2005 to 1,906 in 2030.

- At the high end forecast, based on a 2.0 percent capture rate of Oahu's industrial sector jobs to the Waianae area, industrial land use demand within the subject market area is forecast to be sufficient to absorb approximately 100 to 115 net

acres of additional industrial land between 2010 and 2020. By comparison, the proposed subject project is anticipated to introduce 70 acres of new industrial land onto the market during this same approximate time period.

- At the mid-range forecast, based on a 1.7 percent capture rate of Oahu's industrial sector jobs to the Waianae DP Area, industrial land use demand within the subject market area is forecast to be sufficient to absorb approximately 65 to 80 net acres of additional industrial land between 2010 and 2020. Again, the proposed subject project is anticipated to introduce 70 acres of new industrial land onto the market during this same approximate time period.

- At the low end forecast, based on a 1.5 percent capture rate of Oahu's industrial sector jobs to the Waianae DP Area, industrial land use demand within the subject market area is forecast to be sufficient to absorb approximately 45 to 55 net acres of additional industrial land between 2010 and 2020. Under this scenario, the effective market absorption of the proposed subject project is anticipated to extend beyond a 15 to 20-year time horizon, and this would clearly represent an undesirable outcome.

- In our opinion, the future success or failure of the Proposed Tropic Land LLC Industrial Park is probably more directly related to the government approval process involving current land use entitlement issues than it is to potential private sector marketing issues.

- If the Proposed Tropic Land LLC Industrial Park were to be successful in obtaining the necessary land use entitlement approvals, it is our opinion that there is sufficient potential demand in the marketplace to achieve project absorption within, perhaps, a three- to five-year time frame.

- The Proposed Tropic Land LLC Industrial Park is anticipated to open approximately 18 months following the receipt of government approvals. Given this projected timetable and assuming a two- to four-month planning period prior to the start of actual construction, we estimate the construction period of the Proposed Tropic Land LLC Industrial Park to be approximately 15 months.

- During the 15-month construction period, the on-site job requirement forecast for the proposed project ranges from 100 to 125 person-years, and the off-site job requirement forecast ranges from 20 to 25 person-years. The overall short-term employment forecast for the proposed project during its construction period is equal to the sum of the on-site and off-site job requirement forecasts. Therefore, the total short-term employment forecast for the Proposed Tropic Land LLC Industrial Park is estimated at 120 to 150 person-years.

- On an assumed, stabilized operational basis, the total long-term employment forecast for the Proposed Tropic Land LLC Industrial Park is estimated at 840 to 1,260 jobs. This total long-term operational job forecast includes all forecasted direct, indirect, and induced employment effects attributable to the proposed

project. The forecast is based on an estimated range of 560 to 840 full-time, direct jobs created by the project, at operational status, in conjunction with a selected employment multiplier factor of 1.50. The employment multiplier factor accounts for potential indirect and induced job creation effects associated with the subject project.

II. ASSIGNMENT AND PROJECT DESCRIPTION

A. Assignment

Our assignment was to prepare a market demand analysis and employment forecasts associated with a proposed industrial park development located within Lualualei Valley in the Waianae District of the Island of Oahu. The effective date of the analysis is March 31, 2008.

The subject property has a gross land area of approximately 96 acres and is identified on State of Hawaii Tax Maps as First Division, Tax Map Key 8-7-09, Parcel 2 (Portion). The industrial park concept under consideration for the subject property is being proposed by the current property owner, Tropic Land LLC. Our client for this assignment is Kimura International, Inc., a contracted representative of Tropic Land LLC.

B. Scope of Work

This counseling analysis has been prepared in conformance with the Uniform Standards of Professional Appraisal Practice (USPAP) of the Appraisal Foundation and the Code of Professional Ethics and Standards of Professional Practice of the Appraisal Institute. The use of this report is subject to the requirements relating to review by duly authorized representatives of the Appraisal Institute.

The primary objectives of this assignment involve the following two areas of analysis:

1. Prepare a Market Demand Forecast/Analysis for the Proposed Tropic Land LLC Industrial Park.

2. Provide an Employment/Manpower Forecast for the Proposed Tropic Land LLC Industrial Park.

In order to complete this assignment, we have undertaken a series of independent investigations and analyses, and have relied upon selected information and data from office files that are updated on a recurring basis. A summary of the investigations conducted and the primary data sources researched in conjunction with this analysis are presented in the following paragraphs.

Primary emphasis for this assignment was placed on the research and collection of current socioeconomic forecast data pertaining to the State of Hawaii and the City and County of Honolulu. Data sources at the State level, as reported by the State Department of Business Economic Development and Tourism (DBEDT), include: *Population and Economic Projections for the State of Hawaii to 2035; 2002 State Input-Output Study; and Report on Urban Lands in the State of Hawaii (2006)*.